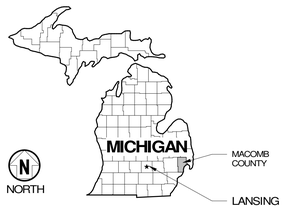
MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

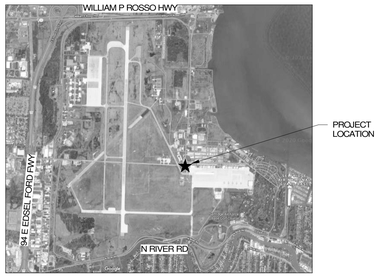
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ANG NO.: VGLZ162323

STATE MAP



VICINITY MAP:



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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: PJC
DRAWN BY: PJC
CHECKED BY: RCL, REK
DO NOT SCALE DRAWINGS.

SHEET CONTENTS
COVER SHEET

SHEET NO.:
G-001

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BUILDING CODE ANALYSIS (INTERNATIONAL BUILDING CODE 2018)

OCCUPANCY CLASSIFICATION

NON-SEPARATED MIXED USE:
GROUP B (BUSINESS)
GROUP S-1 (STORAGE)
ACCESSORY GROUP A (ASSEMBLY)

CONSTRUCTION TYPE

TYPE II-B (UNPROTECTED, NON-COMBUSTIBLE, SPRINKLERED)

HEIGHT & AREA

HEIGHT	34 FT
NUMBER OF STORIES	1
AREA	19,147 SF

ALLOWABLE HEIGHT & AREA

GROUP S-1 - ALLOWABLE

HEIGHT	75 FEET (IBC TABLE 504.3)
MAXIMUM STORIES	3 (IBC TABLE 504.4)
ALLOWABLE AREA	70,000 SQ. FEET / FLOOR (IBC TABLE 506.2)

NOTE:
1. INCLUDES ALLOWANCES FOR FULLY SPRINKLERED BUILDINGS
2. DOES ACCOUNT ANY ALLOWABLE INCREASES FOR FRONTAGE

STRUCTURAL COMPONENT RATINGS

(IBC TABLE 601)

PRIMARY STRUCTURAL FRAME	– 0 HOUR RATING
BEARING WALLS:	
EXTERIOR WALLS	– 0 HOUR RATING
INTERIOR WALLS	– 0 HOUR RATING
NON-BEARING WALLS:	
EXTERIOR AND PARTITIONS	– 0 HOUR RATING
INTERIOR AND PARTITIONS	– 0 HOUR RATING*
FLOOR CONSTRUCTION AND SECONDARY MEMBERS	– 0 HOUR RATING
ROOF CONSTRUCTION AND SECONDARY MEMBERS	– 0 HOUR RATING**

*UNLESS OTHERWISE REQUIRED BY OTHER IBC AND/OR UFC PROVISIONS.
**ROOF COVERINGS MUST BE APPROVED AND LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL). CLASS C ROOF COVERINGS ARE NOT PERMITTED (UFC 3-600-01 §15-1). FIRE RETARDANT TREATED (FRT) PLYWOOD MUST NOT BE USED IN ANY PART OF THE ROOF OR ROOFING SYSTEM (UFC 3-600-01 23-1).

INTERIOR FIRE SEPARATION REQUIREMENTS

- HANGAR BAY FIRE AREAS - 2-HOUR RATED FIRE BARRIER (UFC §4-211-01 §3-3.1.3)
- FIRE RISER ROOM - 1-HOUR RATED FIRE BARRIER (UFC 4-211-01 §3-6.7)
- UTILITY ROOMS - 1-HOUR FIRE RESISTANCE INTERIOR SEPARATION (NFPA 101 §8.7.1.1)
- ELECTRICAL ROOM - DRY TYPE TRANSFORMER OVER 112.5kVA (NFPA 70 ARTICLE 450.21) - 1 HOUR RATING

FIRE SEPARATION DISTANCES

IBC TABLE 602

EXTERIOR WALL FIRE RESISTANCE RATINGS			
FIRE SEPARATION DISTANCE (FEET)	CONSTRUCTION TYPE	OCCUPANCY	REQUIRED FIRE RATING (HOUR(S))
< 5	IIB	2	1
5 ≤ OR < 10	IIB	1	1
10 OR GREATER	IIB	0	0

A FIRE SEPARATION DISTANCE OF 30 FEET HAS BEEN PROVIDED ON ALL SIDES OF THE BUILDING, THEREFORE NON RATED EXTERIOR WALLS ARE PERMITTED.

OPENING PROTECTION

IBC TABLE 705.8

MINIMUM AREA OF EXTERIOR WALL OPENINGS		
FIRE SEPARATION DISTANCE (FEET)	DEGREE OF OPENING PROTECTION	ALLOWABLE AREA
3 TO LESS THAN 5	UNPROTECTED	15%
5 TO LESS THAN 10	UNPROTECTED	25%
10 TO LESS THAN 15	UNPROTECTED	45%
15 TO LESS THAN 20	UNPROTECTED	75%
20 TO LESS THAN 25	UNPROTECTED	NO LIMIT

UNLIMITED UNPROTECTED OPENINGS ARE PERMITTED BASED ON FIRE SEPARATION DISTANCES

LIFE SAFETY CODE ANALYSIS (NFPA 101 2021)

OCCUPANCY CLASSIFICATION

BUSINESS (CHAPTER 38)
INDUSTRIAL (CHAPTER 40)
STORAGE (CHAPTER 42)
ASSEMBLY (CHAPTER 12)

OCCUPANT LOAD

ACTUAL - 120
(SEE CALCULATED OCCUPANT LOAD TABLE ON SHEET G-011 FOR DETAILS)

CAPACITY OF MEANS OF EGRESS

DOORS & CORRIDORS: 0.2 in/ PERSON

EXIT COMPONENT WIDTH

ALLOWABLE:
MINIMUM REQUIRED:
DOORS - 32" (§7.2.1.2.3.2)
CORRIDORS - 44" (§28.2.3.3)

ACTUAL - 36" (DOOR)
63" (CORRIDOR)

NUMBER OF EXITS

EXITS REQUIRED	EXITS PROVIDED
2 (§7.4)	5

TRAVEL DISTANCE

ALLOWABLE:
BUSINESS: 300 ft (§38.2.5.3)
INDUSTRIAL: 400 ft (§28.2.6.3.1)

ACTUAL: 97 ft

NOTE TRAVEL DISTANCE LIMITATIONS DO NOT APPLY IN THE HANGAR BAY IAW UFC 4-211-01 §3-3.1.9

DEAD END

ALLOWABLE:
BUSINESS: 50 ft (§38.2.5)
INDUSTRIAL: 50 ft (§40.2.5)
MECHANICAL 50 ft (§7.13.1(1))

ACTUAL: 16 ft

COMMON PATH

ALLOWABLE:
BUSINESS: 100 ft (§38.2.5.3)
INDUSTRIAL: 100 ft (§28.2.5.4)
MECHANICAL: 100 ft (§7.13.1(1))

ACTUAL:
BUSINESS: 37 ft
MECHANICAL: 41 ft

INTERIOR FINISH CLASSIFICATIONS

GROUP	SPRINKLERED (NFPA 101)		
	EXIT PASSAGEWAYS	EXIT ACCESS CORRIDORS	ROOMS AND ENCLOSED SPACES
BUSINESS	CLASS A OR B	CLASS A, B, OR C	CLASS C
INDUSTRIAL (F-1)	CLASS C	CLASS A, B, OR C	CLASS C
STORAGE	CLASS C	CLASS A, B, OR C	CLASS C

UFC 3-600-01, FIRE PROTECTION ENGINEERING FOR FACILITIES (CHANGE 5, 24 SEPTEMBER 2020)

AUTOMATIC SPRINKLER PROTECTION

REQUIRED: YES (§9-7.2.1.1)
PROVIDED: YES

FIRE ALARM SYSTEM

REQUIRED: YES (§9-18.5.1 & §9-18.6.1))
PROVIDED: YES

STANDPIPE SYSTEMS

REQUIRED: NO
PROVIDED: NO

MASS NOTIFICATION SYSTEM

REQUIRED: YES (UFC 4-010-01)
PROVIDED: YES

FIRE EXTINGUISHERS

REQUIRED: YES (UFC 3-600-01 §9-17.1 & NFPA 101 §38.3.5)
PROVIDED: YES

CARBON MONOXIDE DETECTORS

REQUIRED: YES (§9-19.1.1)
PROVIDED: YES

CALCULATED OCCUPANT LOAD

ROOM NO.	ROOM NAME	AREA (ft^2)	NFPA 101 USE PER TABLE TABLE 7.3.1.2	OCCUPANT LOAD FACTOR (SQF PER PERSON)	# OF OCCUPANTS	IBC OCCUPANCY CLASSIFICATION	NFPA 101 OCCUPANCY CLASSIFICATION
103	MAINTENANCE/CORROSION DOCK	6071	HANGAR	500	13	GROUP S-1: MODERATE HAZARD STORAGE	INDUSTRIAL
104	MAINTENANCE/CORROSION DOCK	6071	HANGAR	500	13	GROUP S-1: MODERATE HAZARD STORAGE	INDUSTRIAL
105	CLASSROOM/BREAK	892	ASSEMBLY	15	60	GROUP A: ASSEMBLY	ASSEMBLY
106	OPEN OFFICE	339	BUSINESS	150	3	GROUP B: BUSINESS	BUSINESS
107	OFFICE	120	BUSINESS	150	1	GROUP B: BUSINESS	BUSINESS
108	CORRIDOR	179	BUSINESS	150	2	GROUP B: BUSINESS	BUSINESS
109	CORRIDOR	304	BUSINESS	150	3	GROUP B: BUSINESS	BUSINESS
110	JANITOR	24	STORAGE	500	1	ACCESSORY STORAGE	INCIDENTAL STORAGE
111	MEN'S	358	BUSINESS	150	3	GROUP B: BUSINESS	BUSINESS
112	WOMEN'S	187	BUSINESS	150	2	GROUP B: BUSINESS	BUSINESS
113	OFFICE	120	BUSINESS	150	1	GROUP B: BUSINESS	BUSINESS
114	CORRIDOR	83	BUSINESS	150	1	GROUP B: BUSINESS	BUSINESS
115	EXTERNAL FUEL TANK OFFICE/TOOL STORAGE	431	BUSINESS	150	3	GROUP B: BUSINESS	BUSINESS
116	ELECTRICAL	98	STORAGE	500	1	ACCESSORY STORAGE	BUSINESS
117	FIRE PROTECTION ROOM	292	STORAGE	500	1	ACCESSORY STORAGE	INCIDENTAL STORAGE
118	UTILITY	352	STORAGE	500	1	ACCESSORY STORAGE	INCIDENTAL STORAGE
121	VESTIBULE	41	BUSINESS	150	1	GROUP B: BUSINESS	BUSINESS
123	WASHROOM	82	BUSINESS	50	2	GROUP B: BUSINESS	BUSINESS
124	SHOWER	63	BUSINESS	150	1	GROUP B: BUSINESS	BUSINESS
125	GEAR LOCKER/ LAUNDRY	233	BUSINESS	150	2	GROUP B: BUSINESS	BUSINESS
126	STORAGE	99	STORAGE	500	1	ACCESSORY STORAGE	INCIDENTAL STORAGE
127	STORAGE	99	STORAGE	500	1	ACCESSORY STORAGE	INCIDENTAL STORAGE
128	SHOWER	62	BUSINESS	150	1	GROUP B: BUSINESS	BUSINESS
129	VEST	56	BUSINESS	150	1	GROUP B: BUSINESS	BUSINESS
130	VEST	57	BUSINESS	150	1	GROUP B: BUSINESS	BUSINESS
				TOTAL:	120		

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12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
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DATE: December 16, 2022
DESIGNED BY: RAB
DRAWN BY: RAB
CHECKED BY: RDV
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SHEET CONTENTS
B154 CODE SUMMARY

SHEET NO.:
G-011

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BUILDING CODE ANALYSIS (INTERNATIONAL BUILDING CODE 2018)

OCCUPANCY CLASSIFICATION

GROUP S-1 (STORAGE)

CONSTRUCTION TYPE

TYPE II-B (UNPROTECTED, NON-COMBUSTIBLE, SPRINKLERED)

HEIGHT & AREA

HEIGHT	15 FT
NUMBER OF STORIES	1
AREA	763 SF

ALLOWABLE HEIGHT & AREA

GROUP S-1 - ALLOWABLE

HEIGHT	75 FEET (IBC TABLE 504.3)
MAXIMUM STORIES	3 (IBC TABLE 504.4)
ALLOWABLE AREA	70,000 SQ. FEET / FLOOR (IBC TABLE 506.2)

NOTE:
1. INCLUDES ALLOWANCES FOR FULLY SPRINKLERED BUILDINGS
2. DOES ACCOUNT ANY ALLOWABLE INCREASES FOR FRONTAGE

STRUCTURAL COMPONENT RATINGS

(IBC TABLE 601)

PRIMARY STRUCTURAL FRAME	– 0 HOUR RATING
BEARING WALLS:	
EXTERIOR WALLS	– 0 HOUR RATING
INTERIOR WALLS	– 0 HOUR RATING
NON-BEARING WALLS:	
EXTERIOR AND PARTITIONS	– 0 HOUR RATING
INTERIOR AND PARTITIONS	– 0 HOUR RATING*
FLOOR CONSTRUCTION AND SECONDARY MEMBERS	– 0 HOUR RATING
ROOF CONSTRUCTION AND SECONDARY MEMBERS	– 0 HOUR RATING**

*UNLESS OTHERWISE REQUIRED BY OTHER IBC AND/OR UFC PROVISIONS.
**ROOF COVERINGS MUST BE APPROVED AND LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL). CLASS C ROOF COVERINGS ARE NOT PERMITTED (UFC 3-600-01 §15-1). FIRE RETARDANT TREATED (FRT) PLYWOOD MUST NOT BE USED IN ANY PART OF THE ROOF OR ROOFING SYSTEM (UFC 3-600-01 23-1).

INTERIOR FIRE SEPARATION REQUIREMENTS

- FIRE PUMP ROOM - 1-HOUR RATED FIRE BARRIER (UFC 6-600-01 §9-5.1.2)

FIRE SEPARATION DISTANCES

IBC TABLE 602

EXTERIOR WALL FIRE RESISTANCE RATINGS			
FIRE SEPARATION DISTANCE (FEET)	CONSTRUCTION TYPE	OCCUPANCY	REQUIRED FIRE RATING (HOUR(S))
< 5	IIB	2	1
5 ≤ OR < 10	IIB	1	1
10 OR GREATER	IIB	0	0

A FIRE SEPARATION DISTANCE OF 30 FEET HAS BEEN PROVIDED ON ALL SIDES OF THE BUILDING, THEREFORE NON RATED EXTERIOR WALLS ARE PERMITTED. AT LEAST 50 FEET IS PROVIDED BETWEEN THE FIRE PUMP HOUSE AND ANY BUILDING SERVED BY THE FIRE PUMP IN ACCORDANCE WITH NFPA 20.

OPENING PROTECTION

IBC TABLE 705.8

MINIMUM AREA OF EXTERIOR WALL OPENINGS		
FIRE SEPARATION DISTANCE (FEET)	DEGREE OF OPENING PROTECTION	ALLOWABLE AREA*
3 TO LESS THAN 5	UNPROTECTED	15%
5 TO LESS THAN 10	UNPROTECTED	25%
10 TO LESS THAN 15	UNPROTECTED	45%
15 TO LESS THAN 20	UNPROTECTED	75%
20 TO LESS THAN 25	UNPROTECTED	NO LIMIT

UNLIMITED UNPROTECTED OPENINGS ARE PERMITTED BASED ON FIRE SEPARATION DISTANCES

LIFE SAFETY CODE ANALYSIS (NFPA 101 2021)

OCCUPANCY CLASSIFICATION

STORAGE (CHAPTER 42)

OCCUPANT LOAD

ACTUAL - 3
(SEE CALCULATED OCCUPANT LOAD TABLE ON SHEET G-012 FOR DETAILS)

CAPACITY OF MEANS OF EGRESS

DOORS: 0.2 in/ PERSON

EXIT COMPONENT WIDTH

ALLOWABLE:
MINIMUM REQUIRED:
DOORS - 32" (§7.2.1.2.3.2)

ACTUAL - 36" (DOOR)

NUMBER OF EXITS

EXITS REQUIRED	EXITS PROVIDED
1 (§7.4)	1

TRAVEL DISTANCE

ALLOWABLE:
MECHANICAL: 100 ft (§7.13.1(1))

ACTUAL:
MECHANICAL: 44 ft

COMMON PATH

ALLOWABLE:
MECHANICAL: 100 ft (§7.13.1(1))

ACTUAL:
MECHANICAL: 44 ft

INTERIOR FINISH CLASSIFICATIONS

GROUP	SPRINKLERED
	ROOMS AND ENCLOSED SPACES
STORAGE	CLASS A, B, OR C

UFC 3-600-01, FIRE PROTECTION ENGINEERING FOR FACILITIES (CHANGE 5, 24 SEPTEMBER 2020)

AUTOMATIC SPRINKLER PROTECTION

REQUIRED: NO (§9-7.2.1.1)
PROVIDED: YES

FIRE ALARM SYSTEM

REQUIRED: YES (§9-18.5.1 & §9-18.6.1))
PROVIDED: YES

STANDPIPE SYSTEMS

REQUIRED: NO
PROVIDED: NO

MASS NOTIFICATION SYSTEM

REQUIRED: NO (UFC 4-010-01)
PROVIDED: NO

FIRE EXTINGUISHERS

REQUIRED: NO (UFC 3-600-01 §9-17.1 & NFPA 101 §42.3.5)
PROVIDED: YES

CARBON MONOXIDE DETECTORS

REQUIRED: YES (§9-19.1.1)
PROVIDED: YES

CALCULATED OCCUPANT LOAD

ROOM NO.	ROOM NAME	AREA (ft^2)	NFPA 101 USE PER TABLE TABLE 7.3.1.2	OCCUPANT LOAD FACTOR (SQF PER PERSON)	# OF OCCUPANTS	IBC OCCUPANCY CLASSIFICATION	NFPA 101 OCCUPANCY CLASSIFICATION
101	FIRE PUMP ROOM	679	STORAGE	500	2	GROUP S-1: STORAGE	STORAGE
102	ELECTRICAL	83	STORAGE	500	1	GROUP S-1: STORAGE	STORAGE
				TOTAL:	3		

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WE STAND READY

MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: RAB
DRAWN BY: RAB
CHECKED BY: RDV
DO NOT SCALE DRAWINGS

SHEET CONTENTS
B158 CODE SUMMARY

SHEET NO.:
G-012

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GENERAL NOTES

A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.

KEYED NOTES

5.155 NORMALLY UNNOCCUPIED ROOM <100 SQ. FT. MAY HAVE THEIR SOLE MEANS OF EGRESS THROUGH HANGAR BAY.

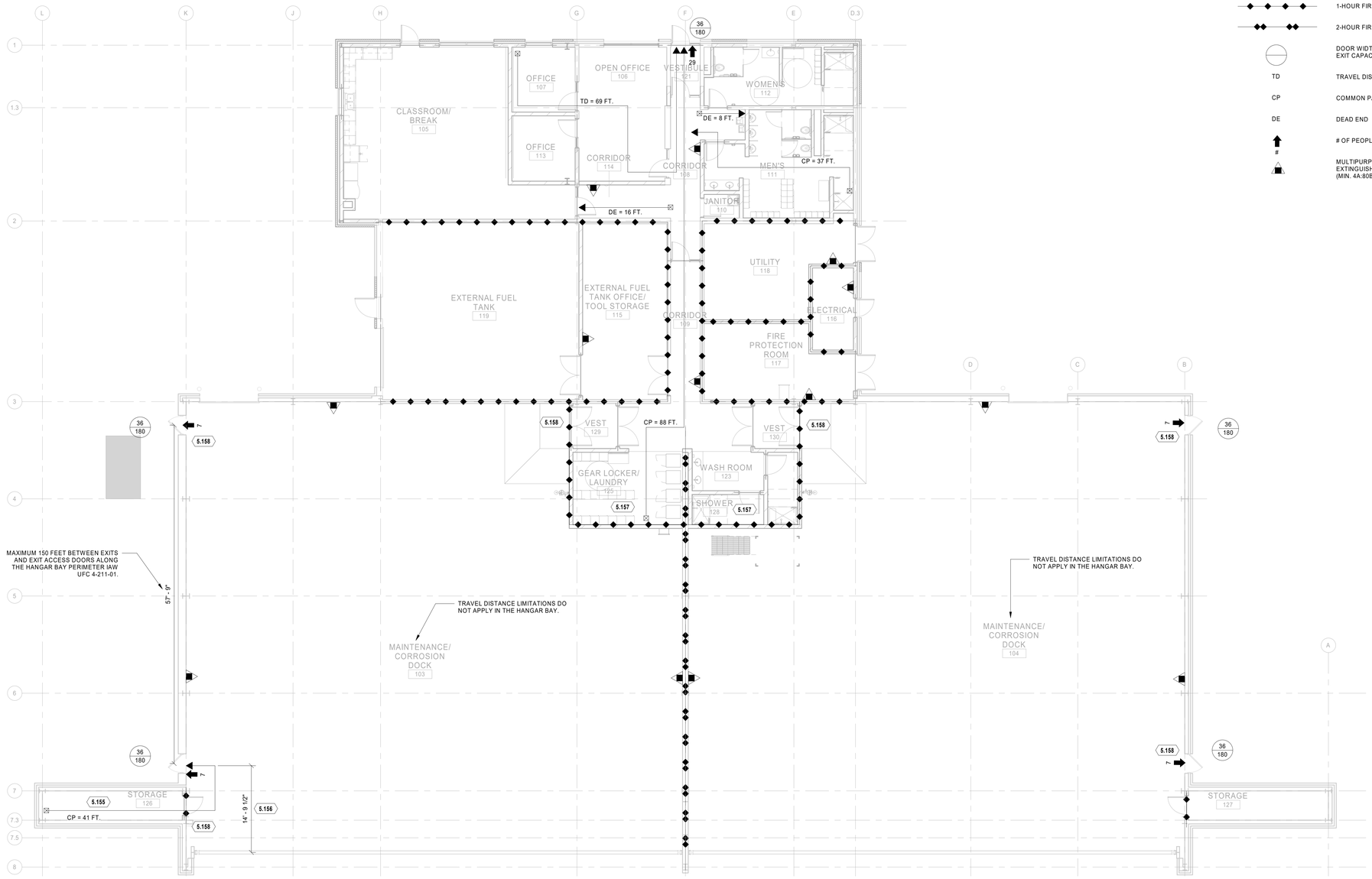
5.156 EXIT IS WITHIN 20 FT OF HANGAR BAY DOOR OPENING.

5.157 PROVIDE FIRE RATING FOR CEILING OF ROOMS EXPOSED TO HANGAR AREA.

5.158 PROVIDE EACH REQUIRED EXIT OR EXIT ACCESS DOOR FROM THE HANGAR BAY WITH PANIC HARDWARE, AND SWING THE DOOR IN THE DIRECTION OF EGRESS TRAVEL.

LEGEND

- PATH OF TRAVEL
- 1-HOUR FIRE BARRIER
- 2-HOUR FIRE BARRIER
- DOOR WIDTH (in) / EXIT CAPACITY (# OF PEOPLE)
- TD — TRAVEL DISTANCE
- CP — COMMON PATH OF TRAVEL
- DE — DEAD END
- # — # OF PEOPLE EXITING
- MULTIPURPOSE DRY CHEMICAL FIRE EXTINGUISHER (MIN. 4A:80B:C RATING)



N 1 **LIFE SAFETY PLAN**
1/8" = 1'-0"

TETRA TECH Mead & Hunt
Joint Venture with
Mason & Hanger
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SHEET CONTENTS
B154 LIFE SAFETY PLANS

SHEET NO.:
G-021

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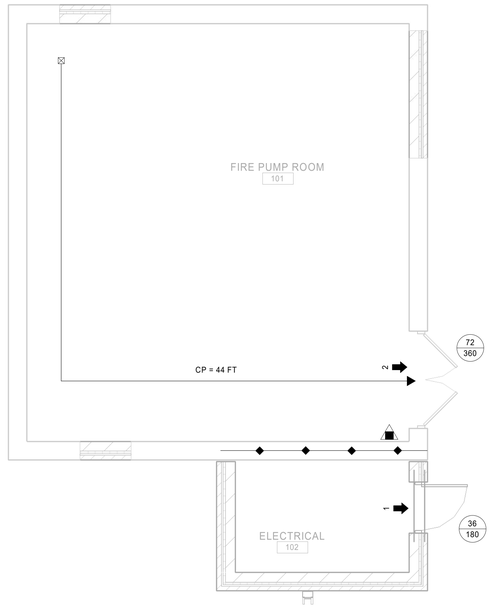
GENERAL NOTES

A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.

LEGEND

	PATH OF TRAVEL
	1-HOUR FIRE BARRIER
	DOOR WIDTH (in) EXIT CAPACITY (# OF PEOPLE)
TD	TRAVEL DISTANCE
CP	COMMON PATH OF TRAVEL
#	# OF PEOPLE EXITING
	MULTIPURPOSE DRY CHEMICAL FIRE EXTINGUISHER (MIN. 2-A RATING)



1 LIFE SAFETY PLAN
1/4" = 1'-0"

TETRA TECH
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SHEET CONTENTS
B158 LIFE SAFETY PLANS

SHEET NO.:
G-022

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OPERATIONAL SAFETY DURING CONSTRUCTION

BASE ACCESS:

1. APPLICATIONS FOR CIVILIAN AND CONTRACTOR IDENTIFICATION CARDS MUST BE OBTAINED. CONTRACTOR IS REQUIRED TO COMPLETE THE 127TH SECURITY FORCES VETTING FORM AS REQUIRED BY AFMAN 31-113. CONTRACTOR SHALL SUBMIT COMPLETED FORMS TO: 127.MSG.PASS.AND.ID@US.AF.MIL

2. BASE ACCESS REQUESTS DEADLINES ARE AS FOLLOWS,
   A. FOR LISTS UP TO 30 NAMES: A MINIMUM OF 3 BUSINESS DAYS
   B. FOR LIST OF 31-75 NAMES: A MINIMUM OF 5 BUSINESS DAYS
   C. FOR LIST OF 75 OR MORE NAMES: A MINIMUM OF 10 BUSINESS DAYS.

3. THE FOLLOWING INFORMATION WILL BE REQUIRED ON THE VETTING FORM; LAST NAME, FIRST NAME, MIDDLE NAME, SUFFIX (JR/SR), DATE OF BIRTH, DRIVER'S LICENSE OR STATE/FEDERAL ID, STATE OF ISSUE, GENDER, RACE, NATIONALITY, COMPANY, LOCATION ON BASE, SPONSOR & PHONE NUMBER, BEGIN DATE, END DATE, TIME FRAME, DAYS OF THE WEEK.

4. CONTRACTOR IS REQUIRED TO HAVE ALL PERSONNEL, INCLUDING SUBCONTRACTORS AND SUPPLIERS ENTERING BASE TO INCLUDE FORMS, PERSONNEL INFO REQUIRED FOR SECURITY FORCES/BACKGROUND CHECKS, BASE ACCESS BADGES, ASSOCIATED TRAINING (I.E.: FLIGHT LINE, LINE BADGES, ETC.), PRIOR TO BEING ALLOWED ON BASE.

5. PRIOR TO BEING ALLOWED ON BASE, THE CONTRACTOR IS SUBJECT TO INSPECTION OF PERSONNEL, HAULING EQUIPMENT AND MATERIALS . THE CONTRACTOR SHALL COORDINATE MATERIAL DELIVERIES AT GATE. THE CONTRACTOR IS RESPONSIBLE FOR INCLUDING INSPECTION TIMES INTO THE MATERIAL DELIVERY SCHEDULE, SUCH THAT THE ADDITIONAL TIME NEEDED FOR INSPECTION DOES NOT INTERFERE WITH THE MATERIAL MEETING SPECIFICATION REQUIREMENTS (I.E. MATERIAL TEMPERATURE, BONDING PROPERTIES, CONCRETE TIME FROM PLANT TO PLACEMENT, ETC.). MATERIAL NONCOMPLIANCE TO SPECIFICATIONS RESULTING IN MATERIAL REPLACEMENT WILL BE BORNE BY THE CONTRACTOR AND SHALL NOT BE EXPENSED TO THE GOVERNMENT AS A RESULT OF CONTRACTOR NEGLIGENCE ON MATERIAL SCHEDULING.

HAUL ROUTE:

1. THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS ON THE BASE IN A MANNER THAT WILL MINIMIZE INTERFERENCE WITH THE NORMAL OPERATIONS OF BASE FACILITIES THAT ARE TO REMAIN OPEN TO AIR TRAFFIC, AND THE CONTRACTOR SHALL IMPLEMENT ALL SPECIFIED AND OTHER APPROPRIATE MEASURES TO ENSURE THE SAFETY OF ALL USERS OF THE BASE.

2. THE CONTRACTOR SHALL ALSO ABIDE BY ALL AIR NATIONAL GUARD (ANG) REQUIREMENTS CONTAINED WITHIN THE SPECIFICATIONS.

3. CONTRACTOR SHALL NOT USE RADIO EQUIPMENT OR CELL PHONES WITHIN 400 FEET OF AIRCRAFT.

4. HAUL ROUTES AND ACCESS TO THE CONSTRUCTION SITES WILL BE DISCUSSED AT THE PRE-BID CONFERENCE. CONTRACTOR SHALL NOT DEVIATE FROM APPROVED HAUL ROUTE AS SHOWN ON CONTRACT DRAWINGS.

   A. THE HAUL ROUTE IS FOR USE BY MULTIPLE CONTRACTORS.
   B. THE CONTRACTOR SHALL REPAIR ANY AND ALL HAUL ROUTES DAMAGED BY CONSTRUCTION/HAULING ACTIVITIES AT NO ADDITIONAL COST TO THE GOVERNMENT. USE OF UNAUTHORIZED HAUL ROUTES SHALL NOT BE PERMITTED.
   C. ROADS USED BY THE CONTRACTOR FOR ACCESS OR HAULING SHALL BE KEPT CLEAN AND ACCESSIBLE TO ALL OTHER BASE AND AIRPORT TRAFFIC FOR THE ENTIRE DURATION OF THE PROJECT.
   D. WHEN MOVING EQUIPMENT IS REQUIRED ACROSS ACTIVE APRONS, TAXIWAYS AND TAXILANES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING PRIOR APPROVAL FROM AIRSIDE OPERATIONS AND USE ESCORTS. THE CONTRACTOR SHALL PROVIDE AN OPERATOR WITH A VACUUM SWEEPER TO KEEP THE AREA FREE FROM DUST AND DEBRIS.

FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT:

1. FOD AT AIRPORTS INCLUDES ANY LOOSE OBJECT(S) FOUND THAT CAN DAMAGE AIRCRAFT, EQUIPMENT, OR BASE PERSONNEL. ON CONSTRUCTION SITES, FOD TYPICALLY IS COMPRISED OF LOOSE GRAVEL, BLOWING SAND, WIRE BRISTLES FROM SWEEPER HEADS, FOOD WRAPPERS, MATERIAL PACKAGING, AMONG OTHER DEBRIS. THE PRESENCE OF FOD POSES A SIGNIFICANT THREAT TO THE SAFETY OF AIR TRAVEL. FOD HAS THE POTENTIAL TO DAMAGE AIRCRAFT DURING CRITICAL PHASES OF FLIGHT, WHICH CAN LEAD TO CATASTROPHIC LOSS OF LIFE AND AIRCRAFT, AND AT THE VERY LEAST INCREASED MAINTENANCE AND OPERATING COSTS.

2. THE CONTRACTOR SHALL PERFORM CONSTRUCTION IN A MANNER THAT, AT THE END OF THE CLOSURE PERIOD, THE SAFETY AREAS AND AIRFIELD PAVEMENT ARE CLEAN AND IN A CONDITION SUITABLE FOR AIRSIDE OPERATIONS TO REOPEN THE PAVEMENT SECTION TO AIRCRAFT OPERATIONS.

3. CONTRACTOR SHALL BE HELD RESPONSIBLE TO PROVIDE A FOD MANAGEMENT PREVENTION PLAN THAT SHOULD ADDRESS THE FOLLOWING:
   - PROPER STORAGE, SHIPPING AND HANDLING OF MATERIAL COMPONENTS AND EQUIPMENT.
   - COMPONENTS AND EQUIPMENT TECHNIQUES TO CONTROL DEBRIS.
   - HOUSEKEEPING
   - ACCOUNTABILITY/CONTROL OF TOOLS AND HARDWARE.
   - CONTROL OF PERSONAL ITEMS, EQUIPMENT AND CONSUMABLES.
   - QUALITY WORKMANSHIP ("CLEAN AS YOU GO" INSPECTIONS).
   - HOW TO REPORT FOD INCIDENTS OR POTENTIAL INCIDENTS.

4. CONTRACTOR SHALL INSTRUCT PERSONNEL ABOUT THE IMPORTANCE OF MANAGING THEIR WASTE AND CONDUCT DAILY INSPECTION OF THE WORK SITE TO ENSURE THAT LOOSE MATERIALS ARE SECURED.

5. CONTRACTOR OPERATIONS ON OR NEAR AIRCRAFT OPERATING SURFACES SHALL BE KEPT CLEAN OF LOOSE DEBRIS.

6. DIRT AND DEBRIS CREATED BY CONTRACTOR OPERATIONS SHALL BE PROMPTLY REMOVED AND THE SURFACE CLEANED.

7. THE CONTRACTOR SHALL HAVE SWEEPING OR VACUUMING CAPABILITIES ON-SITE AT ALL TIMES IN ORDER TO REMOVE DEBRIS AS IT OCCURS. UPON COMPLETION, THE CONTRACTOR IS RESPONSIBLE FOR INSURING THAT THE AREA OF CONCERN IS RETURNED TO ITS ORIGINAL CONDITION.

FUEL SUPPORT:

1. ANY TYPE OF FUELING SUPPORT FACILITY OR DEVICE USED TO REFUEL CONSTRUCTION EQUIPMENT IS SUBJECT TO ANG FIRE INSPECTION. LOCAL FIRE CODES AND SAFETY STANDARDS SHALL BE MET PRIOR TO COMMENCEMENT OF WORK.

RESTRICTED/SAFTEY AREAS:

1. RUNWAYS, TAXIWAYS, AND APRON: CONSTRUCTION ACTIVITY ADJACENT TO THE RUNWAYS, TAXIWAYS, AND APRONS WHICH WILL BE IN USE SHALL BE COORDINATED THROUGH THE CONTRACTING OFFICER. CONSTRUCTION ACTIVITY WILL BE AUTHORIZED AFTER NOTAMS (NOTICES TO AIRMEN) HAVE BEEN ISSUED BY THE BASE; AND AFTER IT HAS BEEN DETERMINED THAT THE HEIGHT OF EQUIPMENT AND MATERIALS IS BEYOND THE REACH OF THE AIRCRAFT OR SAFELY BELOW ANY PART OF THE AIRCRAFT USING THE OPERATIONS AREAS WHICH MIGHT OVERHANG THESE AREAS. INFORMATION FOR RUNWAY APPROACHES AND OTHER AREAS WILL BE SUPPLIED BY THE CONTRACTING OFFICER IF IT IS REQUIRED.

2. EXCEPT AS PROVIDED ON THE CONTRACT PLANS OR IN CONTRACT SPECIAL PROVISIONS OR AS MAY BE AUTHORIZED BY THE CONTRACTING OFFICER IN WRITING, THE CONTRACTOR SHALL NOT PERFORM CONSTRUCTION ACTIVITIES WITHIN 80 FEET OF THE EDGE OF AN ACTIVE TAXIWAY OR APRON, WITHIN 250 FEET OF AN ACTIVE RUNWAY CENTERLINE, OR WITHIN 1000 FEET OF A RUNWAY END. WHEN SO AUTHORIZED TO PERFORM CONSTRUCTION ACTIVITIES WITHIN SUCH AREAS, THE CONTRACTOR SHALL FIRST IMPLEMENT APPROPRIATE MARKING AND LIGHTING PROVISIONS.

3. EXCAVATION AND OPEN TRENCHES LOCATED WITHIN 250 FEET FROM THE CENTERLINE OF AN ACTIVE RUNWAY SHALL BE ADEQUATELY SIGNED, MARKED AND LIGHTED. EXCAVATIONS AND OPEN TRENCHES LOCATED ADJACENT TO TAXIWAY AND APRON PAVEMENT SHALL BE ADEQUATELY SIGNED, MARKED AND LIGHTED.

4. DEBRIS SHALL NOT BE DEPOSITED ON ANY PORTION OF AN OPERATIONAL RUNWAY, TAXIWAY, OR APRON. SHOULD ANY DEBRIS BE DEPOSITED ACCIDENTALLY, IT SHALL BE REMOVED IMMEDIATELY.

5. OPEN-FLAME WELDING OR TORCH-CUTTING OPERATIONS ARE PROHIBITED UNLESS ADEQUATE FIRE AND SAFETY PRECAUTIONS ARE PROVIDED AND HAVE BEEN APPROVED BY THE SELFRIDGE FIRE DEPT. ALL VEHICLES ARE TO BE PARKED AND SERVICED BEHIND THE CONSTRUCTION RESTRICTION LINE 750 FEET OR MORE FROM AN ACTIVE RUNWAY CENTERLINE OR 200 FEET FROM AN ACTIVE TAXIWAY CENTERLINE.

6. MATERIALS SHALL BE STORED WITHIN THE FENCE PERIMETER OR THE BUILDING ITSELF. MATERIALS SHALL BE SUBJECT TO RANDOM INSPECTIONS BY SECURITY FORCES.

MARKING AND LIGHTING:

1. ALL HAZARDOUS AREAS (SUCH AS EXCAVATIONS OR STOCKPILED MATERIALS) ON THE AIRFIELD MUST BE DELINEATED WITH LIGHTED BARRICADES ON ALL EXPOSED (VISIBLE OR ACCESSIBLE) SIDES.
   A. PURPOSE - HAZARD MARKING AND LIGHTING PREVENTS PILOTS FROM ENTERING AREAS CLOSED TO AIRCRAFT AND PREVENTS CONSTRUCTION PERSONNEL FROM ENTERING AREAS OPEN TO AIRCRAFT.
   B. EQUIPMENT - CONTRACTOR SHALL MARK THE LIMITS OF CONSTRUCTION WITH LOW-PROFILE LIGHTED BARRICADES TO WARN PILOTS OF AREAS UNDER CONSTRUCTION. CONTRACTOR SHALL PROVIDE A REPRESENTATIVE WHO WILL BE ON-CALL 24-HOURS A DAY TO PERFORM EMERGENCY MAINTENANCE OF ANY CONTRACTOR ERECTED SIGN,
   C. BARRICADE, OR WARNING LIGHTS DURING THE CONSTRUCTION PERIOD. AT A MINIMUM, CONTRACTOR SHALL INSTALL LOW PROFILE BARRICADES WHERE DIRECTED BY CONTRACTING OFFICER.
   D. BARRICADES SHALL CONFORM TO FAA AC 150/5370-2F SPECIFICATIONS AND PERFORMANCE STANDARDS. BARRICADES ARE TO BE WATER FILLED, WITH THE FLASHING LIGHTS, WITH A MAXIMUM HEIGHT OF 18-INCHES.
   E. RED LIGHTS MUST BE SECURELY MOUNTED ON BARRICADE AND SPACED NO MORE THAN 10 FEET APART. LIGHTS MUST BE OPERATED FROM SUNSET TO SUNRISE AND DURING PERIODS OF LOW VISIBILITY. THE LIGHTS MAY BE OPERATED BY PHOTOCELL; HOWEVER THE CONTRACTOR MAY HAVE TO TURN THEM ON MANUALLY AT TIMES DURING LOW VISIBILITY DURING DAYTIME HOURS.
   F. THE CONTRACTOR SHALL COMPLY WITH THE FAA WHEN ALIGNING CONSTRUCTION FLOODLIGHTS AS TO NOT INTERFERE WITH THE VISION OF AIRCRAFT PILOTS AND AIR TRAFFIC CONTROLLERS WHEN OPERATIONS ARE TAKING PLACE.

2. PAVEMENT MARKINGS DAMAGED BY CONSTRUCTION SHALL BE STRIPED IN ACCORDANCE WITH AFMAN 32-1040 AND THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), PUBLISHED BY THE DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION. AIRFIELD MARKINGS SHALL BE REPAIRED IN ACCORDANCE WITH UFC 3-260-04.

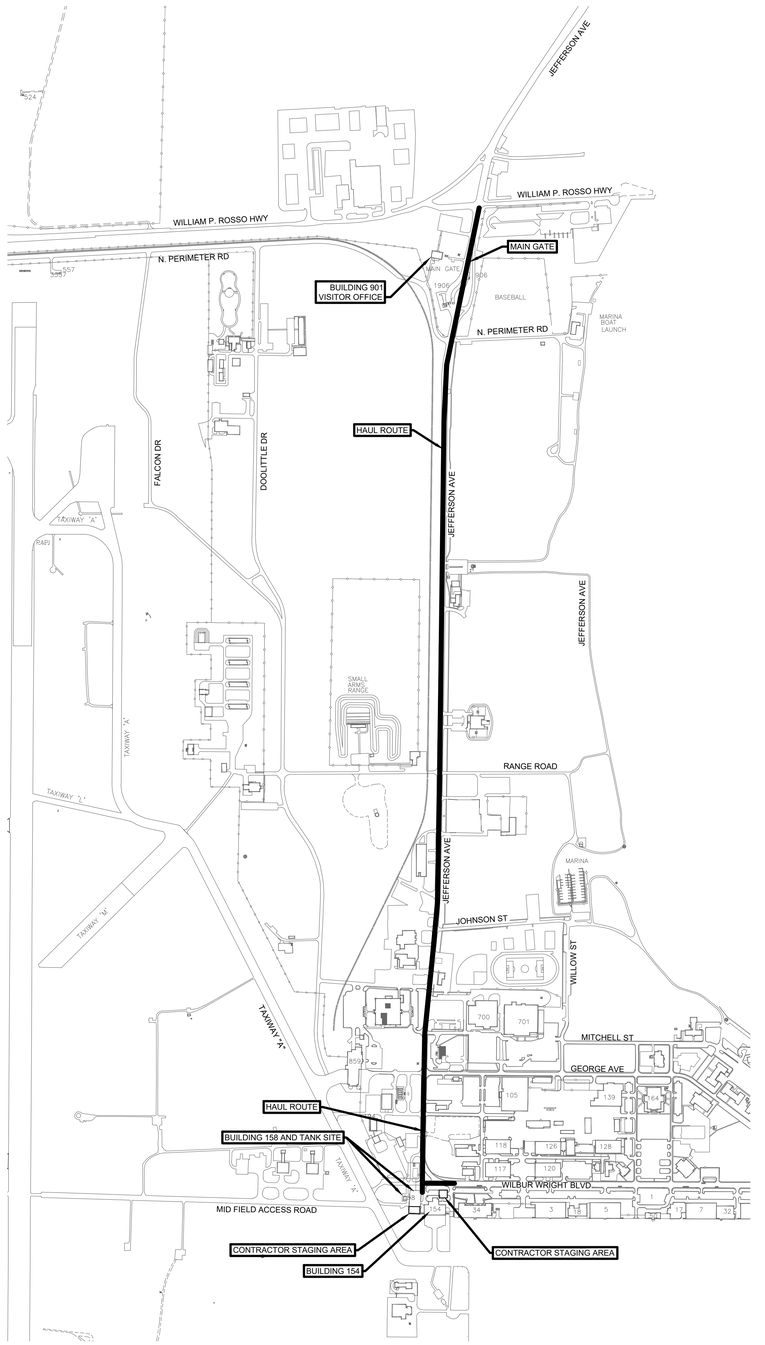
3. TEMPORARY LOW PROFILE LIGHTED BARRICADES AND LIGHTING PROVISIONS SHALL BE PROVIDED ALONG THE NORTH LANE OF THE SERVICE ROAD WHEN CONTRACTOR ACTIVITIES ARE WITHIN THE AIRFIELD PAVEMENT TO PROTECT CONSTRUCTION EXCAVATION AND WORK ADJACENT TO SECONDARY TAXI ROUTE.

4. TEMPORARY OBSTRUCTIONS, SUCH AS CRANES, MUST BE MARKED AND LIGHTED IN ACCORDANCE WITH FAA AC 70/7460-1. CONTRACTOR SHALL SUBMIT FAA FORM 7460-1 TO THE FAA PRIOR TO THE START OF CONSTRUCTION FOR ANY TEMPORARY OBSTRUCTIONS WITH HEIGHTS ABOVE 20 FEET. FAA APPROVAL MAY TAKE UP TO 45 DAYS. CONTRACTOR SHALL CONFIRM WITH CONTRACTING OFFICER PRIOR TO CONSTRUCTION IF AN AIRFIELD WAIVER WILL BE REQUIRED.

ENFORCEMENT:

1. VIOLATION OF THESE RULES AND REGULATIONS, DEPENDING UPON SEVERITY OF THE VIOLATION, MAY RESULT IN ONE OR MORE OF THE FOLLOWING:
   A. A VERBAL AND/OR WRITTEN WARNING.
   B. REVOCATION OF AOA BADGE AND/OR VEHICLE ACCESS PERMIT.
   C. THE CONTRACT WORK BEING STOPPED UNTIL CORRECTIVE MEASURES ARE TAKEN TO PRECLUDE A RECURRENCE OF THE VIOLATION.

2. CONTRACTOR SHALL ALSO ABIDE BY ALL ANG REQUIREMENTS CONTAINED WITHIN THE SPECIFICATIONS.



HAUL ROUTE MAP

SCALE: 1" = 500'

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HARRISON TWP, MICHIGAN

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12/16/22 TYPE B3 FINAL
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ANG NO.: VGLZ162323
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DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
HAUL ROUTE MAP

SHEET NO.
V-001

C:_PROJECTS\ERC\20-39\46-20000\SHEETFILES\VGLZ162323-BLDG 154 - BV-001.DWG
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STRUCTURE NAME	LOCATION NORTHING	LOCATION EASTING	RIM ELEVATION (FT)	STRUCTURE TYPE	PIPE SIZE	MATERIAL	INVERT DIRECTION	RIM TO INVERT DEPTH (FT)	INVERT ELEV. (FT)	COVER TYPE	STRUCTURE MATERIAL TYPE	STRUCTURE DIAMETER
123	407660.63	13539563.81	575.08	CATCH BASIN						GRATED ROUND	BRICK	6'
					24"	RCP	W	5.6	569.48			
					24"	RCP	E	5.7	569.38			
					12"	RCP	N	4.7	570.38			
					12"	RCP	S	3.9	571.18			
133	407663.69	13539169.34	576.31	CATCH BASIN						GRATED ROUND	BRICK	4'
					18"	RCP	N	5.7	570.61			
					12"	RCP	S	5.9	570.41			
					18"	RCP	W	6.3	570.01			
					24"	RCP	E	6.4	569.91			
134	407717.62	13539169.33	576.42	CATCH BASIN						GRATED ROUND	PRECAST	4'
					24"	RCP	NE	6.1	570.32			
					18"	RCP	S	6.4	570.02			
135	407743.16	13539188.82	576.36	CATCH BASIN						GRATED ROUND	PRECAST	4'
					24"	RCP	SW	6.0	570.36			
					24"	RCP	N	6.0	570.36			
					12"	STEEL	E	5.4	570.96			
143	407925.63	13540131.1	576.34	MANHOLE								
162	407771.72	13539725.12	575.85	CATCH BASIN	6"	PVC	S	3.6	572.25	SQUARE GATE	PRECAST	4'
					12"	RCP	N	3.9	571.95			
180	407656.9	13540078.38	575.13	CATCH BASIN						GRATED ROUND	`BRICK	4'
					12"	CLAY	N	4.9	570.23			
					24"	RCP	W	6.6	568.53			
					24"	RCP	E	6.5	568.63			
					12"	CLAY	S	5.9	569.23			
184	407850.41	13539659.76	575.56	COMM						SOLID ROUND	PRECAST	5'
					6"	CONDUIT	N-S	4.8	570.76			
						WIRE	N-S	2.8	572.76			
185	407929.61	13539433.64	576.52	SIGNAL						SOLID ROUND	BRICK	4'
						WIRES		4.3	572.22			
191	407772.86	13540125.6	575.61	CATCH BASIN						CURB INLET	PRECAST	4'
					12"	RCP	NW	4.5	571.11			
					12"	RCP	E	4.6	571.01			
200	407899.23	13540114.82	575.25	CATCH BASIN						SQUARE GRATE	PRECAST	4'
					24"	RCP	E	5.4	569.85			
					12"	RCP	S	5.3	569.95			
					18"	RCP	W	5.4	569.85			
238	407936.37	13539902.9	576.11	MANHOLE						SOLID ROUND	BLOCK	3'
					12"	RCP	N	3.55	572.56			
					8"	PVC	SE	3.80	572.31			
239	407949.06	13539902.15	575.62	CATCH BASIN							PRECAST	3'
					12"	RCP	N	2.75	572.87			
					12"	RCP	S	2.75	572.87			
240	407993.08	13539903.29	575.43	CATCH BASIN						CURB INLET	PRECAST	2'
					12"	RCP	S	2.65	572.78			
					6"	CPP	W	2.40	573.03			
242	407927.38	13539883.27	576.26	MANHOLE								
372	407916.76	13540045.02	574.78	CATCH BASIN						CURB INLET	PRECAST	3'
					12"	RCP	SSE	3.10	571.68			
432	407840.29	13540096.9	575.39	CATCH BASIN						CURB INLET	PRECAST	4'
					12"	RCP	SE	5.4	569.99			
					12"	RCP	NNE	5.4	569.99			
451	407854.12	13540048.74	575.09	CATCH BASIN						CURB INLET		
					12"	RCP	N	3.50	571.59			
507	407772.61	13540021.01	575.63	CATCH BASIN						GRATED ROUND	BRICK	4'
					6"	PVC	W	4.0	571.63			
					4"	CLAY	E	3.9	571.73			
					4"	CLAY	SSE	2.8	572.83			
529	407854.58	13539924.07	575.39	CATCH BASIN						CURB INLET	PRECAST	3'
					12"	RCP	N	3.80	571.59			
530	407900.29	13539924.94	575.29	CATCH BASIN						SQUARE GRATE	PRECAST	3'
					12"	RCP	W	4.60	570.69			
					12"	RCP	S	4.75	570.54			
568	407856.08	13539845.09	575.41	CATCH BASIN						SQUARE GRATE	PRECAST	2'
					12"	RCP	NNW	3.60	571.81			
569	407892.32	13539856.46	576.03	SANITARY MANHOLE						SOLID ROUND	PRECAST	4'
					6"	PVC	S	6.0	570.03			
					12"	RCP	E	12.0	564.03			
					12"	RCP	W	12.0	564.03			
570	407911.58	13539863.82	576.09	MANHOLE						SOLID ROUND	BRICK	4'
					10"	CLAY	N	9.70	566.39			
					12"	CLAY	S	10.50	565.59			
571	407903.27	13539832.37	576.4	MANHOLE								
					18"	RCP	E	5.60	570.80	HOLES IN COVER	PRECAST	4'
					18"	RCP	S	5.60	570.80			
					12"	RCP	SSE	5.00	571.40			
615	407901.29	13540051.65	575.28	STMH						ROUND WITH HOLES	PRECAST	6'
					12"	RCP	NNW	4.60	570.68			
					18"	RCP	E	5.20	570.08			
					18"	RCP	W	5.20	570.08			
					12"	RCP	S	4.60	570.68			
692	407994.33	13539722.62	574.99	CATCH BASIN						CURB INLET	PRECAST	2'
					12"	RCP	S	2.3	572.69			
693	407950.72	13539722.81	575.06	CATCH BASIN						CURB INLET	PRECAST	3'
					12"	RCP	N	2.4	572.66			
694	407912.65	13539729.1	574.74	CATCH BASIN						SQUARE GRATED	PRECAST	4'
					8"	PVC	S	3.45	571.29	SOLID ROUND	BRICK	3'
730	407946.4	13539600.97	575.75	MANHOLE						SOLID ROUND		
731	407927.43	13539603.51	575.75	MANHOLE						SOLID ROUND		
747	407951.87	13539561.43	575.35	CATCH BASIN						CURB INLET	PRECAST	4'
					12"	PVC	S	3	572.35			
748	407995.77	13539561.57	575.46	CATCH BASIN						CURB INLET	PRECAST	4'
845	407911.97	13539562.91	575.24	CATCH BASIN								
849	407903.53	13539591.63	575.67	MANHOLE						HOLES IN COVER	PRECAST	4'
					18"	RCP	E	3.9	571.77			
					18"	RCP	W	3.9	571.77			
					12"	RCP	S	3.9	571.77			
					12"	RCP	SW	3.9	571.77			
850	407892.14	13539620.17	575.87	SANITARY MANHOLE						SOLID ROUND	PRECAST	4'
					12"	RCP	E	11.2	564.67			
					12"	RCP	W	11.2	564.67			
					6"	PVC	N	9.6	566.27			
					6"	PVC	S	8.8	567.07			
851	407859	13539590.1	575.26	CATCH BASIN						SQUARE GRATE	PRECAST	2'
					12"	RCP	N	3.1	572.16			
864	407899.62	13539727.87	575.17	MANHOLE						HOLES IN COVER	PRECAST	4'
					10"	PVC	N	4.1	571.07			
					18"	RCP	W	4.1	571.07			
					18"	RCP	E	4.1	571.07			
					12"	RCP	S	3.9	571.27			
865	407856.92	13539723.19	574.49	CATCH BASIN						CURB INLET	PRECAST	3'
865	407856.9	13539723.2	574.49	CATCH BASIN						SQUARE GRATED	PRECAST	4'
					12"	RCP	S	3.0	571.49			
5003	407908.29	13538534.79	578.17	SANITARY MANHOLE							PRECAST	4'
					12"	PVC	E	9.61	568.56			
					12"	PVC	W	9.61	568.56			
					12"	PVC	S	9.61	568.56			
5005	407903.84	13538464.45	577.67	CBR						GRATED ROUND	PRECAST	4'
					24"	RCP	ESE	4.48	573.19			
					12"	RCP	WSW	4.68	572.99			
5007	407865.12	13538399.02	578.09	CATCH BASIN						SQUARE GRATE	PRECAST	3'
					12"	RCP	ENE	4.4	573.69			
5236	407996.06	13538383.32	577.83	CATCH BASIN						CURB INLET	BLOCK	4'
5245	408013.47	13538444.1	577.63	CATCH BASIN							BLOCK	3'
5255	407957.07	13538482.91	578.37	MANHOLE								
5260	407940.36	13538530.67	578.98	MANHOLE						HOLES IN COVER	PRECAST	4'
5305	407970.66	13538383.75	577.59	CATCH BASIN						CURB INLET	PRECAST	4'
					6"	CPP	E	2.36	575.23			
					6"	CPP	W	2.25	575.34			
5340	407947.7	13538610.32	578.26	MANHOLE						SOLID ROUND	PRECAST	4'
					12"	PVC	S	2.35	575.91			
					6"	PVC	SE	2.9	575.36			
5348	408020.55	13538512.13	577.62	CATCH BASIN						CURB INLET	BLOCK	3'
5381	407960.19	13538645.96	577.84	CATCH BASIN						CURB INLET	BLOCK	3'
					6"	PVC	S	1.44	576.4			
5480	407843.2	13538520.13	578.84	MANHOLE						SOLID ROUND	PRECAST	4'
					12"	CLAY	N	9.68	569.16			
5481	407824.67	13538553.75	577.86	CBR							GRATED ROUND	BLOCK
					10"	CLAY	E	4.52	573.34			
					10"	CLAY	S	4.64	573.22			
					8"	CLAY	W	4.64	573.22			
5482	407832.71	13538611.9	578.11	CBR						GRATED ROUND	BLOCK	4'
					24"	RCP	WNW	4.91	573.2			
					10"	CLAY	W	4.9	573.21			
					12"	PVC	N	4.71	573.4			
					24"	RCP	S	4.95	573.16			
5518	407945.01	13538639.15	578.22	CATCH BASIN						SQUARE RATE	PRECAST	2'
					6"	PVC	E	1.66	576.56			
5519	407915.91	13538644.11	578.69	CBR						GRATED ROUND	PRECAST	2'
5603	407826.62	13538708.33	578.2	CBR						GRATED ROUND	BLOCK	4'
					12"	PVC	E	5.4	572.8			
5613	407826.96	13538650.21	578.41	CBR						GRATED ROUND		4'
					10"	CLAY	W	4	574.41			
5667	407825.17	13538768.64	577.66	CBR						GRATED ROUND	PRECAST	4'
					4"	PVC	SE	1.15	576.51			
5671	407902.81	13538804.3	580.06	SANITARY MANHOLE						SOLID ROUND	PRECAST	4'
					12"	PVC	E	12.4	567.66			
					12"	PVC	W	12.4	567.66			
5703	407891.32	13538866.67	579.65	MANHOLE						SOLID ROUND	PRECAST	3'
5785	407956.12	13538876.29	577.57	CATCH BASIN						CURB INLET	BLOCK	2'
					4"	CPP	W	2.5	575.07			
					4"	CPP	E	2.5	575.07			
					6"	PVC	S	2.4	575.17			
5813	407943.47	13538878.38	578.18	CATCH BASIN						SQUARE GRATE	BLOCK	4'
					6"	PVC	N	2.37	575.81			
5894	407824.85	13538824.33	577.6	CBR						GRATED ROUND	BLOCK	4'
					4"	PVC	E	1.48	576.12			
5929	407826.91	13538883.56	577.99	CBR						BEE HIVE	BLOCK	4'
5951	407824.86	13538958.88	576.96	CBR						BEE HIVE	BLOCK	4'
					12"	RCP	SE	5	571.96			
6031	407980.96	13539171.61	577.24	MANHOLE								
6048	407996.33	13539392.8	576.03	CATCH BASIN						CURB INLET	PRECAST	3'
					12"	RCP	SW	2	574.03			
6078	407998.86	13539141.69	576.89	CATCH BASIN						CURB INLET	BLOCK	4'
6099	408000.27	13538926.76	577.55	CATCH BASIN						CURB INLET	BLOCK	4'
6141	407956.02	13539141.14	576.81	CATCH BASIN						CURB INLET	BLOCK	3'
					6"	CPP	S	2.67	574.14			
					12"	RCP	N	3.87	572.94			
6188	407900.49	13539054.09	577.78	SANITARY MANHOLE							PRECAST	4'
					12"	PVC	E	11.45	566.33			
					12"	PVC	E	11.45	566.33			
					8"	PVC	S	8.8	568.98			
6203	407859.57	13539189.74	576.42	MANHOLE						GRATED ROUND	PRECAST	4'
					24"	RCP	S	6	570.42			
					12"	RCP	W	6	570.42			
					18"	RCP	NNW	6.1	570.32			
					12"	RCP	E	6	570.42			
6238	407859.26	13539044.87	577.4	SANITARY MANHOLE							PRECAST	4'
					12"	PVC	N	3.72	573.68			
					12"	RCP	E	5.32	572.08			
					6"	PVC	SE	4.6	572.8			
					18"	RCP	SW	5.32	572.08			
6239	407862.99	13539045.13	577	CATCH BASIN						CURB INLET	PRECAST	2'
					12"	PVC	S	2.99	574.01			
6316	407833.82	13539069.36	576.6	CBR						GRATED ROUND	BLOCK	4'
6350	407860.43	13539243.18	575.16	CATCH BASIN						CURB INLET	PRECAST	4'
					12"	RCP	E	5.2	569.96			
					12"	RCP	W	4.9	570.26			
6357	407860.93	13539277.5	575.49	CATCH BASIN						CURB INLET	PRECAST	4'
					4"	CLAY	WSW	4.4	571.09			
					12"	RCP	E	5.0	570.49			
					12"	RCP	W	5.1	570.39			
6452	407952.95	13539375.93	575.92	CATCH BASIN						CURB INLET	PRECAST	3'
					12"	RCP	NE	2.27	573.65			
6466	407939.67	13539380.42	577.04	MANHOLE							PRECAST	4'
					12"	RCP	NNW	4.54	572.5			
					10"	PVC	WSW	4.54	572.5			
6545	407860.16	13539375.47	575.14	CATCH BASIN						CURB INLET	PRECAST	2
					12"	RCP	W	3.9	571.24			
					12"	RCP	S	2.3	572.84			
6579	407858.53	13539554.38	575.12	CATCH BASIN						CURB INLET	PRECAST	2'
					12"	RCP	NE	2.7	572.42			
6621	407892.5	13539437.45	575.97	SANITARY MANHOLE						SOLID ROUND	PRECAST	4'
					12"	RCP	E	11	564.97			
					12"	RCP	W	11	564.97			
					6"	PVC	S	6.5	569.47			
6622	407914.9	13539417.93	576.16	MANHOLE						SOLID ROUND	BRICK	4'
					8"	CLAY	SSW	10.4	570.16			
					8"	CLAY	SSW	6.1	565.76			
6623	407827.92	13539564.27	575.84	MANHOLE						HOLES IN COVER	PRECAST	4'
					12"	RCP	WSW	4.9	570.94			
					6"	PVC	S	3.8	572.04			
6857	407713.3	13540025.98	575.86	MANHOLE						SOLID ROUND	PRECAST	4'
6958	407771.41	13539725.09	575.83	CATCH BASIN						SQUARE GRATE	PRECAST	4'
					8'	PIPE?	E-W	4.8	571.06			
6995	407704.32	13539564.04	575.76	MANHOLE						HOLES IN COVER	PRECAST	4'
					6"	PVC	SSW	3.6	572.23			
6996	407716.7	13539544.16	575.84	CBR						GRATED ROUND	BLOCK	4'
					12"	CLAY	NW	5.7	570.06			
					12"	CLAY	S	5.7	570.06			
7033	407823.53	13539544.46	575.97	CBR						GRATED ROUND	BLOCK	4'
					12"	CLAY	SE	5.6	570.24			
					12"	CLAY	N	5.6	570.24			
					6"	CLAY	N	3.7	572.14			
7098	407740.76	13539259.26	574.98	CBR						GRATED ROUND	BLOCK	2'
					12"	RCP	ENE	5.45	570.52			
					12"	CLAY	S	5.45	570.52			
7226	407774.94	13538084.52	577.45	SANITARY MANHOLE						HOLES IN COVER		
7291	407855.33	13538085.31	577.39	MANHOLE						SOLID ROUND	PRECAST	4'
					12"	CLAY	S	8	569.39			
					12"	CLAY	NE	8	569.39			
					12"	PVC	NW	7.6	569.79			
7436	407952.52	13538263.19	577.63	MANHOLE						HOLES IN COVER	PRECAST	4'
7484	407827.8	13538303.25	577.21	CBR						GRATED ROUND	BLOCK	4'
					12"	RCP	E	3.6				
7485	407913.38	13538347.36	578.38	MANHOLE								
7541	407902.05	13538904.8	579.82	SANITARY MANHOLE						SOLID ROUND	PRECAST	4'
					12"	RCP	E	12.49				
					12"	PVC	W	12.49				
					12"	RCP	S	12				
7584	407929.33	13539433.4	576.4	MANHOLE								
50062	407743	13539189	576.43	CBR						GRATED ROUND	PRECAST	4'
					12"	PVC	E	5.3	571.13			
					24"	RCP	SW	6	570.43			
					24"	RCP	N	6	570.43			
50409	407831.66	13539411.15	576.00	CO						SOILD CAP	PVC	4"
					4"	PVC	?	4.24	571.76			

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phone: 810-956-9300

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WE STAND READY

MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

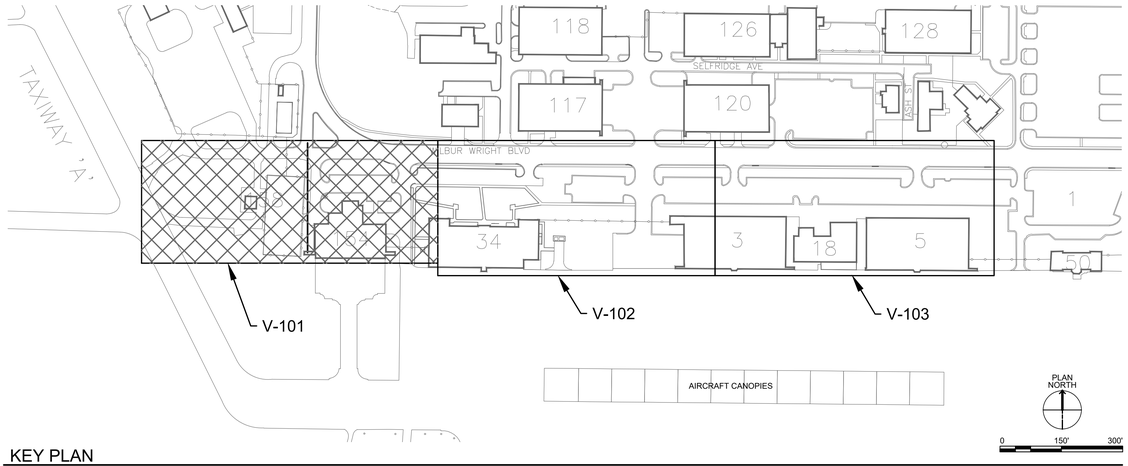
ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
EXISTING STRUCTURE INVENTORIES

SHEET NO.
V-002

C:_PROJECTS\BEROS-181646-2000\SHEETFILES\VOL2\162323-BLDG 154 - BV-002.DWG
12/8/2022 1:20:30 PM



KEY PLAN

SCALE: 1" = 150'

EXISTING LEGEND

SAN — SAN	GRAVITY SANITARY SEWER	BLDG.	EXISTING BUILDING
SD — SD	STORM SEWER		CONTROL POINT
CP — CP — CP — CP	CULVERT	CB	CATCH BASIN
W — W — W — W	PUBLIC WATER MAIN	CB	CATCH BASIN, ROUND
G — G	GAS	D	STORM MANHOLE
FOS — FOS	FUEL SERVICE PIPE	S	SANITARY MANHOLE
E — E — E — E	OVERHEAD ELECTRIC PRIMARY		FIRE HYDRANT
ES — ES — ES — ES — ES	UNDERGROUND ELECTRIC SECONDARY	W	VALVE
E — E — E — E — E	UNDERGROUND ELECTRIC PRIMARY	W	WATER MANHOLE
C/F — C/F	OVERHEAD COMMUNICATION AND FIBER	C	COMMUNICATION MANHOLE
COMM — COMM	UNDERGROUND COMMUNICATION AND FIBER	T	TELEPHONE MANHOLE
CATV — CATV	UNDERGROUND CABLE TV	E	ELECTRICAL MANHOLE
	DUCT BANK		SIGN
	FENCE		APPROXIMATE SOIL BORING LOCATION AND NUMBER
640	EXISTING CONTOUR & ELEVATION		

	POST
	LIGHT POLE
	ELECTRICAL TRANSFORMER
	COMMUNICATION PEDESTAL

NOTE:
NOT ALL ITEMS LISTED IN LEGEND WERE IDENTIFIED DURING SURVEY.

EXISTING TOPOGRAPHIC SURVEY

SCALE: 1" = 20'

SURVEY NOTES

HORIZONTAL CONTROL: MICHIGAN STATE PLANE COORDINATES, NAD83, NA2011, SOUTH ZONE, GEOID18, INTERNATIONAL FEET.

VERTICAL DATUM: NAVD88.

SURVEY WAS COMPLETED BY MUXLOW SURVEYING SERVICES (3503 VAN DYKE ROAD, MARLETTE, MI 48453) IN DECEMBER 2019

CONTROL COORDINATES

PointNo.	Northing(Y)	Easting(X)	Elev(Z)	Description
1	407926.92	13540139.65	576.70	CP
2	407940.41	13539795.46	575.88	CP
3	407886.88	13538646.17	579.54	CP
4	407960.14	13538343.82	578.46	CP

NOTES

THE UTILITIES SHOWN ARE FROM OBSERVED EVIDENCE OR WERE MARKED BY OTHERS. NO GUARANTEE IS GIVEN TO THE EXACT SIZE AND LOCATION. CONTACT LOCAL UTILITY CO. PRIOR TO CONSTRUCTION. UTILITIES HAVE BEEN MAPPED FROM PLANS AND GIS. GIS DATA IS CONSIDERED NOT RELIABLE. SUFFICIENT INFORMATION TO ALIGN GIS DATA TO THIS PROJECT WAS NOT PROVIDED, ALIGNMENT MAY NOT BE ACCURATE.

PLAN NORTH
0
20'
40'

TETRA TECH
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Mason&Hanger
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MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

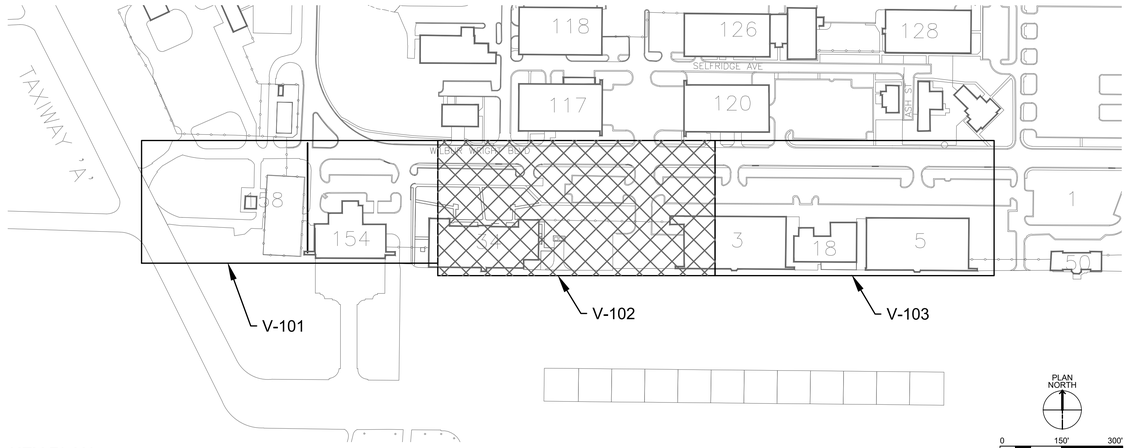
ANG NO.:	VGLZ162323
M&H NO.:	314170-181848.01
DATE:	December 16, 2022
DESIGNED BY:	DGW
DRAWN BY:	SHG
CHECKED BY:	KLJ

DO NOT SCALE DRAWINGS

SHEET CONTENTS
EXISTING TOPOGRAPHIC SURVEY

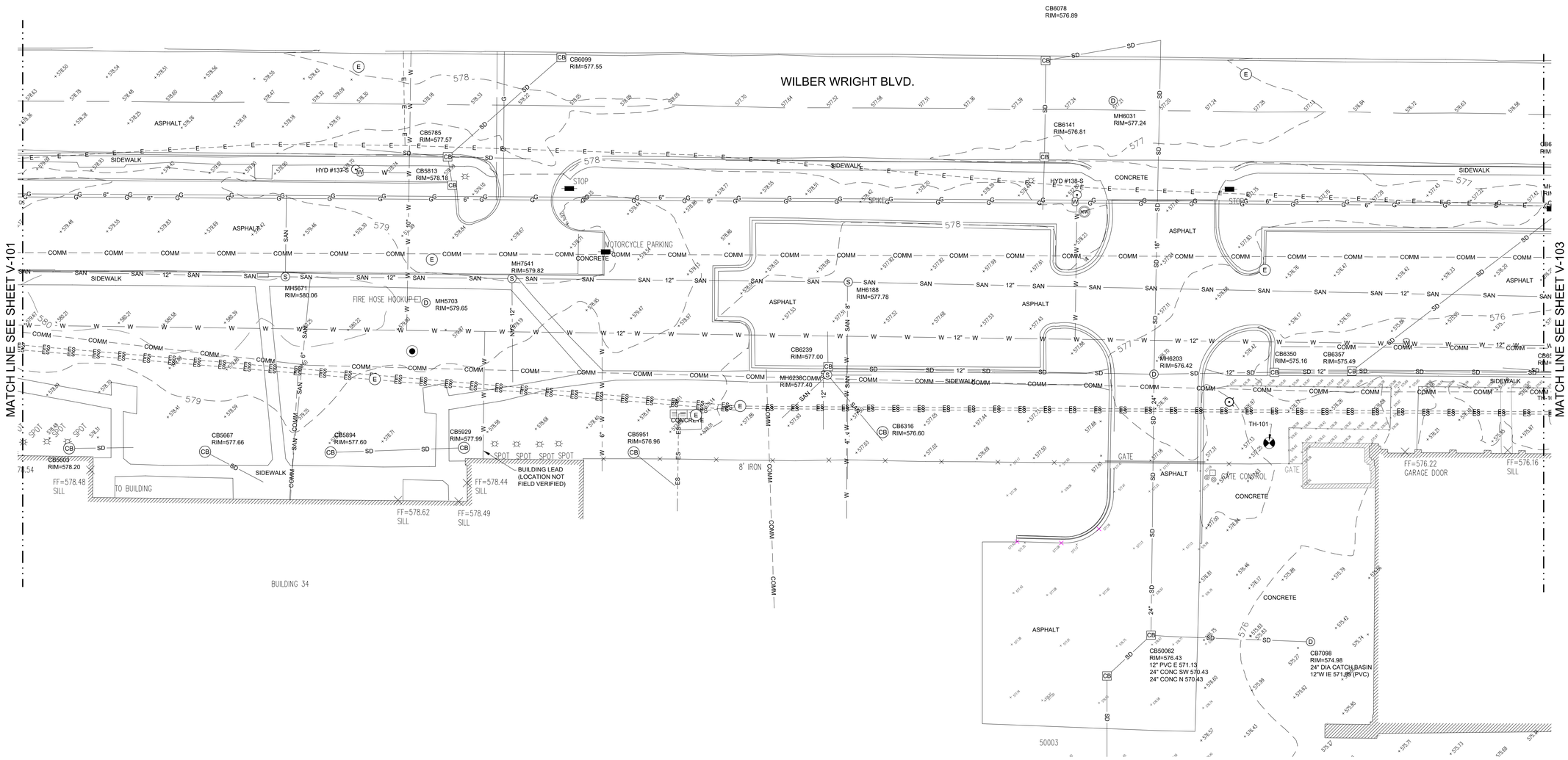
SHEET NO.
V-101

C:_PROJECTS\ERC\20-30546-20000\SHEETFILES\VGLZ162323-BLDG-154 - BV-161.DWG
12/6/2022 1:20:44 PM



KEY PLAN

SCALE: 1" = 150'



EXISTING TOPOGRAPHIC SURVEY

SCALE: 1" = 20'

PLAN NORTH

0 20' 40'

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.:	VGLZ162323
M&H NO.:	3141700-181848.01
DATE:	December 16, 2022
DESIGNED BY:	DGW
DRAWN BY:	SHG
CHECKED BY:	KLJ

DO NOT SCALE DRAWINGS

SHEET CONTENTS
EXISTING TOPOGRAPHIC SURVEY

SHEET NO.
V-102

C:_PROJECTS\BERG200-39546-200003\SHEETFILES\VGLZ162323-BLDG 154 - BW-101.DWG
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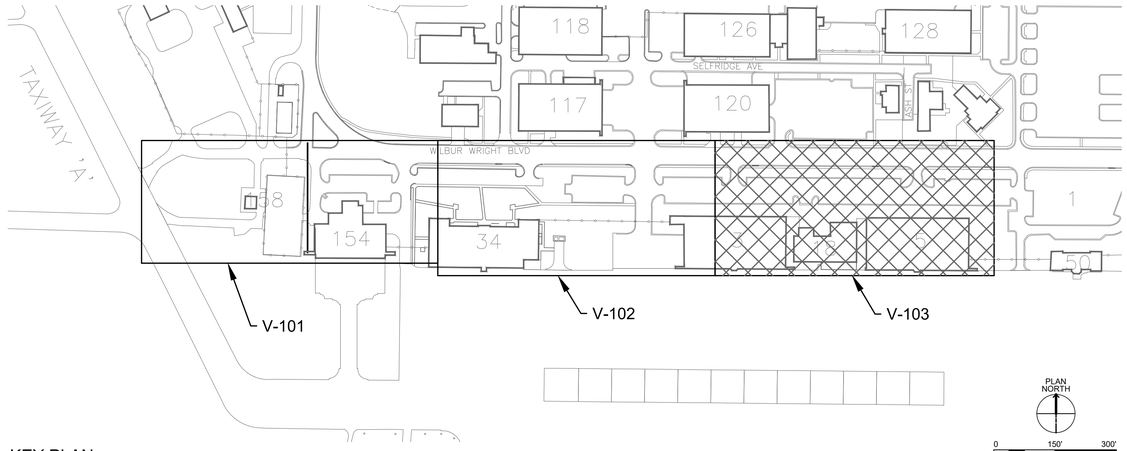
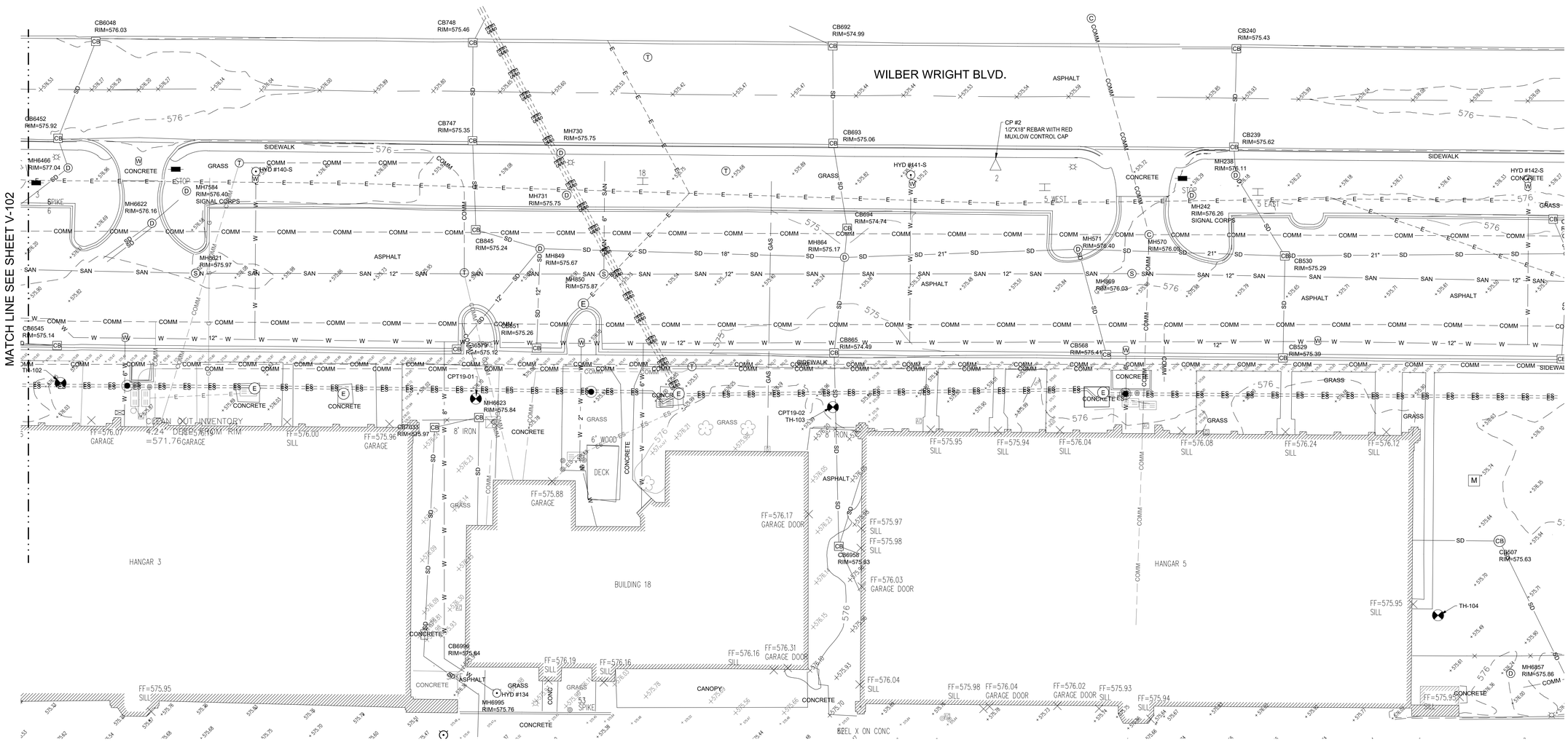


KEY PLAN

SCALE: 1" = 150'



EXISTING TOPOGRAPHIC SURVEY

SCALE: 1" = 20'

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Mead & Hunt
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MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.:	VGLZ162323
M&H NO.:	3141700-181848.01
DATE:	December 16, 2022
DESIGNED BY:	DGW
DRAWN BY:	SHG
CHECKED BY:	KLJ

DO NOT SCALE DRAWINGS

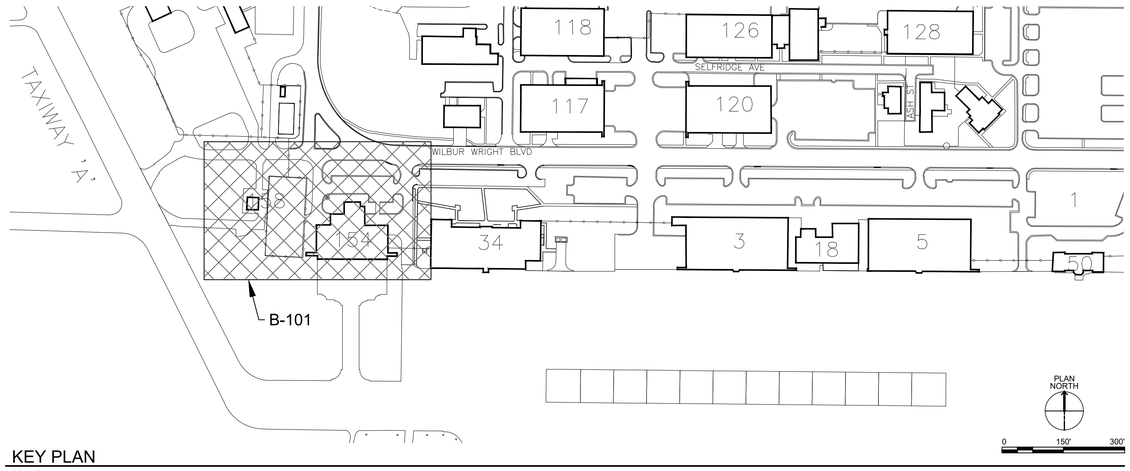
SHEET CONTENTS
EXISTING TOPOGRAPHIC SURVEY

SHEET NO.
V-103

C:_PROJECTS\BER200-39546-2000039\4ETRLES\VOL2\162323-BLDG 154 - BSV-101.DWG
12/6/2022 1:21:02 PM

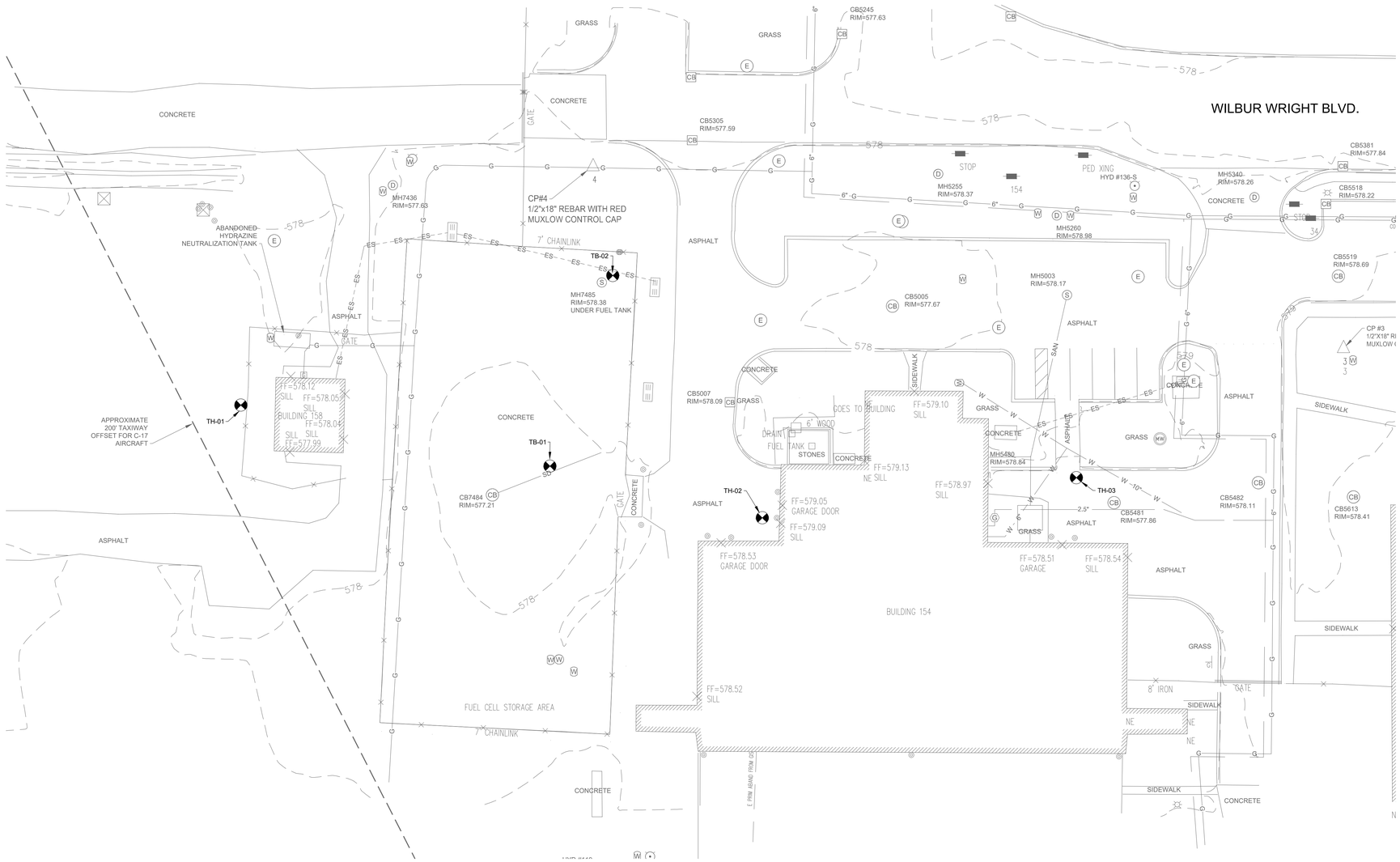
GENERAL NOTES

1. SOIL BORING LOCATIONS SHOWN ALONG THE FIRE PROTECTION WATERMAIN ROUTE NEAR HANGARS 3, 4, AND 5 WERE COMPLETED AS PART OF FACILITY IMPROVEMENTS, HANGARS 3-4-5 PROJECTS. THE REPORT ON GEOTECHNICAL INVESTIGATIONS, AS PREPARED BY: SOMAT ENGINEERING, DATED MAY 12, 2020, CAN BE PROVIDED UPON CONTRACTOR REQUEST.



KEY PLAN

SCALE: 1" = 150'



SOIL BORING MAP

SCALE: 1" = 20'

TETRA TECH
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WE STAND READY

MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
SOIL BORING MAP

SHEET NO.
B-101

C:_PROJECTS\EP\200-38\48-200035\HE\TTA\LES\VGLZ162323-BLDG 154 - IRB-101.DWG
12/6/2022 1:21:17 PM

PROJECT NO. 2019143A **DATE STARTED:** 12/17/2019 **DATE COMPLETED:** 12/17/2019 **LOG OF TEST BORING TH-01**

ELEVATION ft	DEPTH (ft)	SAMPLE NO.	SAMPLE RECOVERY (in)	NO. OF BLOWS PER 6-inch DRIVE	N-VALUE	SAMPLE T/P DEPTH (ft)	UNCONFINED COMP STRENGTH (psf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200
576.8	0											
	2.5											
		SS1	5	3-3-3	6	2.5	9000+*	11.6				
575.0	1.2											
	3.0											
		SS2	12	2-2-3	5	5.0	3500*	27.7				
	5											
		SS3	14	2-3-4	7	7.5	6000*	24.8				
570.0	6.0											
		SS4	18	1-3-2	5	10.0	2000*	34.6				
566.0	10											
	12.8											
	15	SS5	18	0-1-0	1	15.0	<>	54.1				
		SS6	18	0-0-0	0	20.0	<>	50.7				
	20											
		SS7	18	0-0-0	0	25.0	<>	38.1				
	25											
548.7	29.1											
548.0	29.8	SS8	14	1-2-11	13	30.0	9000+*	8.4				
	30											
	35											

Ground Surface Elevation 576.0 ft
Field Engineer reported 14 inches of sandy TOPSOIL
Hard LEAN CLAY with sand, trace gravel, brown (CL)
NOTE: Slight foreign odor
Stiff to very stiff LEAN CLAY, trace sand, trace gravel, brown with pockets of dark brown above 5 ft. (CL)
NOTE: Slight foreign odor
Stiff LEAN CLAY, trace sand, trace gravel, brown (CL)
NOTE: Slight foreign odor
LEAN CLAY, trace sand, trace gravel, gray (CL)
Hard LEAN CLAY with sand, trace gravel, gray (CL)
End of Boring at 30 feet

GROUNDWATER READINGS
First Encountered: none
Upon Completion: none

BORING LOCATION INFORMATION
Latitude: 42.60878
Longitude: -82.825553

Coordinates/GSE determined by: Measured offsets / Google Earth

KEY
Torvane
* Penetrometer
<> Disturbed Sample

Drilling Company: DLZ
Drill Rig: CME 850X ATV (Rig 400472)
Logged By: S. Panetta
Drilling Method: 3 1/4 inch HSA
Method Notes: ----
Hammer Type: Automatic
Backfilled With: Grout
Checked By: ALOG
QA/QC By:
Remarks:

Somat Engineering, Inc.

ADAL Fuel Cell and Corrosion Control, Building 154 Additions, and Water Reservoir
Selfridge Air National Guard (SANG) Base
Harrison Township, Michigan

PAGE 1 of 1

4/7/20

LOG OF TEST BORING 154FRDGE ADAL BLDG 154.GPJ SOMAT.GDT 4/7/20

PROJECT NO. 2019143A **DATE STARTED:** 12/18/2019 **DATE COMPLETED:** 12/19/2019 **LOG OF TEST BORING TH-02**

ELEVATION ft	DEPTH (ft)	SAMPLE NO.	SAMPLE RECOVERY (in)	NO. OF BLOWS PER 6-inch DRIVE	N-VALUE	SAMPLE T/P DEPTH (ft)	UNCONFINED COMP STRENGTH (psf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200
579.0	0											
	0.2											
578.3	0.7											
577.0	2.0	SS1	4	4-3-4	7	2.5						
	3.0											
574.0	5.0	SS2	4	1-2-3	5	5.0	<>	26.3				
		SS3	12	1-2-2	4	7.5	2000*	31.6				
	8.0											
569.0	10.0	SS4	18	2-3-3	6	10.0	2000*	36.7				
	10											
	15	SS5	18	0-1-0	1	15.0	400#	50.1				
		SS6	18	0-0-0	0	20.0	<>	47.3				
	20											
		ST7	24			25.0	410	43.1	79			
	25											
550.1	28.9											
	30	SS8	18	1-4-5	9	30.0	2000*	11.5				
	35	SS9	10	8-9-12	21	35.0	4000*	12.9				

Ground Surface Elevation 579 ft
8 inches of PORTLAND CEMENT CONCRETE
Field Engineer reported 2 inches of aggregate FILL
FILL - Mixed clay, silty sand and crushed aggregate
NOTE: Slight foreign odor detected
LEAN CLAY, trace sand, trace gravel, brown and dark gray (CL)
Stiff LEAN CLAY, trace sand, trace gravel, mottled brown and gray (CL)
Very soft LEAN CLAY, trace sand, trace gravel, gray (CL)
Stiff to very stiff SANDY LEAN CLAY, trace gravel, gray (CL)

GROUNDWATER READINGS
First Encountered: none
Upon Completion: n/a

BORING LOCATION INFORMATION
Latitude: 42.608653
Longitude: -82.824771

Coordinates/GSE determined by: Measured offsets / Google Earth

KEY
Torvane
* Penetrometer
<> Disturbed Sample

Drilling Company: DLZ
Drill Rig: CME 850X ATV (Rig 400472)
Logged By: S. Panetta
Drilling Method: 4.1/4 inch HSA/3 7/8 inch WR
Method Notes: ---
Hammer Type: Automatic
Backfilled With: Grout
Checked By: ALOG
QA/QC By:
Remarks:

Somat Engineering, Inc.

ADAL Fuel Cell and Corrosion Control, Building 154 Additions, and Water Reservoir
Selfridge Air National Guard (SANG) Base
Harrison Township, Michigan

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4/7/20

LOG OF TEST BORING 154FRDGE ADAL BLDG 154.GPJ SOMAT.GDT 4/7/20

PROJECT NO. 2019143A **DATE STARTED:** 12/18/2019 **DATE COMPLETED:** 12/19/2019 **LOG OF TEST BORING TH-02**

ELEVATION ft	DEPTH (ft)	SAMPLE NO.	SAMPLE RECOVERY (in)	NO. OF BLOWS PER 6-inch DRIVE	N-VALUE	SAMPLE T/P DEPTH (ft)	UNCONFINED COMP STRENGTH (psf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200
579.0	50											
		SS10	12	8-12-18	30	40.0	7000*	12.8				
	60											
		SS11	12	5-8-12	20	45.0	4500*	25.6				
530.4	48.6											
	50	SS12	5	50/5"	50 +	48.9	9000*	7.9				
		SS13	4	50/5"	50 +	53.9	9000*	8.5				
	55											
520.2	58.8	SS14	4	50/4"	50 +	58.8	9000*	9.2				
	60											
	65											
	70											

Ground Surface Elevation 579 ft
Stiff to very stiff SANDY LEAN CLAY, trace gravel, gray (CL)
Hard SANDY LEAN CLAY, occasional silt seams and fine sand seams, trace gravel, gray (CL) (Hardpan Material)
End of Boring at 58.83 feet

GROUNDWATER READINGS
First Encountered: none
Upon Completion: n/a

BORING LOCATION INFORMATION
Latitude: 42.608653
Longitude: -82.824771

Coordinates/GSE determined by: Measured offsets / Google Earth

KEY
Torvane
* Penetrometer
<> Disturbed Sample

Drilling Company: DLZ
Drill Rig: CME 850X ATV (Rig 400472)
Logged By: S. Panetta
Drilling Method: 4 1/4 inch HSA/3 7/8 inch WR
Method Notes: ----
Hammer Type: Automatic
Backfilled With: Grout
Checked By: ALOG
QA/QC By:
Remarks:

Somat Engineering, Inc.

ADAL Fuel Cell and Corrosion Control, Building 154 Additions, and Water Reservoir
Selfridge Air National Guard (SANG) Base
Harrison Township, Michigan

PAGE 2 of 2

4/7/20

LOG OF TEST BORING 154FRDGE ADAL BLDG 154.GPJ SOMAT.GDT 4/7/20

PROJECT NO. 2019143A **DATE STARTED:** 12/17/2019 **DATE COMPLETED:** 12/17/2019 **LOG OF TEST BORING TH-03**

ELEVATION ft	DEPTH (ft)	SAMPLE NO.	SAMPLE RECOVERY (in)	NO. OF BLOWS PER 6-inch DRIVE	N-VALUE	SAMPLE T/P DEPTH (ft)	UNCONFINED COMP STRENGTH (psf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	LIQUID LIMIT	PLASTICITY INDEX	% PASSING #200
577.8	0											
	0.2											
577.1	0.7											
		SS1	5	6-9-12	21	2.5						
574.8	3.0											
	5	DP2		2-2-3	5	5.0	2000*	25.7				
		SS3	5	1-2-2	4	7.5	2000*	27.8				
569.8	8.0											
567.8	10.0	SS4	18	1-2-2	4	10.0	4500*	26.7				
	10											
	15	SS5	18	1-2-2	4	15.0	<>	51.0				
		SS6	18	0-0-0	0	20.0	<>	48.8				
	20											
		ST7	24			25.0	280	34.1	93			
	25											
		SS8	18	0-0-0	0	26.5	<>	47.9				
548.0	29.8											
547.8	30.0	SS9	18	0-3-7	10	30.0	9000+*	27.0				
	30											
	35											

Ground Surface Elevation 577.8 ft
8 inches of PORTLAND CEMENT CONCRETE
FILL - Medium dense poorly graded fine sand with silt, few gravel, trace slag, occasional layers of black sand/possible cinders, brown, moist (SP-SM)
Stiff LEAN CLAY, trace sand, trace gravel, brown and dark gray (CL) (Possible Fill)
NOTE: No recovery on split spoon attempt at 5 ft., spoon pushed to retrieve sample
Very stiff LEAN CLAY, trace sand, trace gravel, brown with pockets of gray (CL)
LEAN CLAY, trace sand, trace gravel, gray (CL)
Hard LEAN CLAY with sand, trace gravel, gray (CL)
End of Boring at 30 feet

GROUNDWATER READINGS
First Encountered: none
Upon Completion: none

BORING LOCATION INFORMATION
Latitude: 42.609873
Longitude: -82.824261

Coordinates/GSE determined by: Measured offsets / Google Earth

KEY
Torvane
* Penetrometer
<> Disturbed Sample

Drilling Company: DLZ
Drill Rig: CME 850X ATV (Rig 400472)
Logged By: S. Panetta
Drilling Method: 3 1/4 inch HSA
Method Notes: ----
Hammer Type: Automatic
Backfilled With: Grout
Checked By: ALOG
QA/QC By:
Remarks:

Somat Engineering, Inc.

ADAL Fuel Cell and Corrosion Control, Building 154 Additions, and Water Reservoir
Selfridge Air National Guard (SANG) Base
Harrison Township, Michigan

PAGE 1 of 1

4/7/20

LOG OF TEST BORING 154FRDGE ADAL BLDG 154.GPJ SOMAT.GDT 4/7/20

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WE STAND READY

MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
SOIL BORING LOGS

SHEET NO.
B-102

C:_PROJECTS\ERDC\200-39546-20003\SHEETFILES\VOL2\162323-BLDG 154 - BB-102.DWG
12/6/2022 1:21:29 PM

GENERAL NOTES

1. FOR THE PURPOSE OF THE GENERAL NOTES BELOW, THE TERM SANGB SHALL MEAN "SELFRIDGE AIR NATIONAL GUARD BASE".
2. ALL LABOR, MATERIALS, AND METHODS OF CONSTRUCTION SHALL BE IN STRICT ACCORDANCE WITH THE MINIMUM ENGINEERING AND CONSTRUCTION STANDARDS ADOPTED BY THE U.S. AIR NATIONAL GUARD (ANG), WHERE CONFLICTS OR OMISSIONS EXIST, THE ANG STANDARDS SHALL DICTATE. SUBSTITUTIONS AND DEVIATION FROM PLANS AND SPECIFICATIONS SHALL BE PERMITTED ONLY WHEN WRITTEN APPROVAL HAS BEEN ISSUED BY THE CONTRACTING OFFICER.
3. SHOP DRAWINGS OF ALL MATERIALS BEING USED SHALL BE SUBMITTED AS PER SPECIFICATIONS (SUBMITTALS).
4. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL REQUIRED PERMITS ARE OBTAINED AND IN HAND BEFORE BEGINNING ANY CONSTRUCTION INCLUDING BASE SPECIFIC DIG PERMITS. NO CONSTRUCTION, EXCAVATION, OR FABRICATION OF ANY ITEM SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED ALL PLANS AND ANY OTHER DOCUMENTATION FROM ALL OF THE PERMITTING AND ANY OTHER REGULATORY AUTHORITIES. ANY PENALTIES, STOP WORK ORDERS OR ADDITIONAL WORK RESULTING FROM THE CONTRACTOR BEING IN VIOLATION OF THE REQUIREMENTS ABOVE, SHALL BE FULLY BORNE BY THE CONTRACTOR.
5. THE LOCATION OF ALL EXISTING UTILITIES AND STORM DRAINAGE SHOWN ON THE PLANS HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR INACCURACY. PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE VARIOUS UTILITIES AND TO MAKE THE NECESSARY ARRANGEMENTS FOR ANY RELOCATION OF THESE UTILITIES WITH THE OWNER OF THE UTILITY. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CROSSING UNDERGROUND UTILITIES, WHETHER SHOWN ON THE PLAN OR LOCATED BY THE UTILITY COMPANY. ALL UNFORESEEN UTILITIES WHICH INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE BASE ENGINEER FIRST. ANY FEES ASSOCIATED WITH UTILITY RELOCATIONS SHALL BE BORNE IN ACCORDANCE WITH RESPECTIVE UTILITY COMPANY STANDARDS. IT IS REQUESTED THAT UTILITY COMPANIES MOVE THEIR PARTICULAR UTILITIES. ANY DELAY OR INCONVENIENCE CAUSED TO THE CONTRACTOR BY THE RELOCATION OF THE VARIOUS UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT.
6. THE CONTRACTOR SHALL NOTIFY THE BASE ENGINEERING AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION AND AT LEAST 48 HOURS BEFORE REQUIRED INSPECTION ON EACH AND EVERY PHASE OF WORK. THE CONTRACTOR SHALL NOTIFY THE BASE ENGINEER A MINIMUM OF 48 HOURS NOTICE PRIOR TO ANY SCHEDULED TESTING.
7. FOR THE PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 174 OF 2013, THE CONTRACTOR SHALL CONTACT MISS DIG SYSTEM, INC. BY PHONE AT 811 OR 800-482-7171 OR VIA THE WEB AT EITHER ELOCATE.MISSDIG.ORG OR SINGLE ADDRESS OR RTE.MISSDIG.ORG A MINIMUM OF 3 BUSINESS DAYS PRIOR TO EXCAVATING, EXCLUDING WEEKENDS AND HOLIDAYS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING ANY CONSTRUCTION ACTIVITIES FROM TAKING PLACE OUTSIDE OF THE CONTRACTOR WORK LIMITS SHOWN ON THE PLANS. ALL AREAS DISTURBED BY CONTRACTOR OR SUB CONTRACTOR (EQUIPMENT AND/OR PERSONNEL VEHICLES) SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER, UNLESS OTHERWISE NOTED IN THE CONSTRUCTION DOCUMENTS.
9. THE CONTRACTOR SHALL MAINTAIN A CURRENT SET OF CONSTRUCTION DOCUMENTS AND ALL PERMITS ON THE JOB SITE DURING ALL PHASES OF CONSTRUCTION.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE NECESSARY TESTING TO ASSURE THAT THE PROPER COMPACTION HAS BEEN ACHIEVED ON THE SUBGRADE, BASE, AND ALL OTHER PERTINENT AREAS THAT HAVE BEEN COMPLETED. THE CONTRACTOR SHALL BEAR ALL COSTS ASSOCIATED WITH TESTING AND RETESTING OF THE AREAS AND SHALL PROVIDE THE OWNER AND THE CONTRACTING OFFICER WITH COPIES OF THE CERTIFICATION OF COMPACTION FROM THE TESTING COMPANY.
11. CONTRACTOR TO DETERMINE IF ANY OFF-SITE MATERIALS WILL NEED TO BE IMPORTED TO ACHIEVE THE GRADES SPECIFIED ON THE PLANS.
12. CONTRACTOR SHALL USE HAUL ROUTE SHOWN UNLESS DIRECTED OTHERWISE BY THE CONTRACTING OFFICER.
13. CONTRACTOR IS TO COORDINATE ALL WORK WITH OTHER ONGOING CONSTRUCTION.

DEMOLITION NOTES

1. CONTRACTOR IS REQUIRED TO SUBMIT A DEWATERING PLAN TO THE SELFRIDGE ENVIRONMENTAL OFFICE. THE DEWATERING PLAN MUST BE APPROVED BY THE ENVIRONMENTAL OFFICE PRIOR TO CONSTRUCTION ACTIVITIES.
2. ANY DEWATERING OPERATIONS THAT MAY BE REQUIRED WITH A RATED CAPACITY (THE RATED CAPACITY OF ALL PUMPS THAT SHARE A COMMON DISCHARGE POINT.) IN EXCESS OF 70 GPM, WILL NEED TO BE REGISTERED THROUGH MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKS (EGLE) WATER USE PROGRAM. ANY DEWATERING SYSTEM WITH A RATED CAPACITY OF MORE THAN 1,388 GPM WILL REQUIRE THE CONTRACTOR CONTACT EGLE PERMITTING TO RECEIVE A PERMIT, OR WAIVER FROM EGLE, FOR THEIR LARGE QUANTITY WITHDRAWAL.
3. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES OR LOCAL AUTHORITIES FURNISHING ELECTRICAL, POWER SERVICE SO THEY CAN. REMOVE, RELOCATE, DISCONNECT, CAP OR PLUG THEIR EQUIPMENT IN ORDER TO FACILITATE DEMOLITION. ALL OTHER UTILITIES (WATER, TELEPHONE OR SEWER) SHALL BE DISCONNECTED, CAPPED OR PLUGGED BY THE CONTRACTOR AS DIRECTED BY THE CONTRACTING OFFICER.
4. THE CONTRACTOR SHALL PROTECT ALL UTILITIES AND OTHER IMPROVEMENTS SHOWN ON THESE PLANS AND UTILITIES AND OTHER IMPROVEMENTS NOT SHOWN. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR REPAIRS OF UTILITIES AND OTHER IMPROVEMENTS DAMAGED DURING CONSTRUCTION AND SHALL MAINTAIN SUFFICIENT PROTECTION FOR ALL UTILITIES REQUIRED TO PROTECT THEM FROM DAMAGE AND TO PROTECT THE SANGB FACILITIES DURING CONSTRUCTION.
5. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL TREES, STRUCTURES, AND UTILITIES NOT MARKED FOR REMOVAL OR DEMOLITION AND SHALL PROMPTLY REPAIR ANY DAMAGE AS DIRECTED BY THE CONTRACTING OFFICER AT NO COST TO OWNER.
6. THE CONTRACTOR SHALL REMOVE PAVING MARKED FOR DEMOLITION WHICH INCLUDES ALL ASPHALT, CONCRETE AND BASE.
7. THE CONTRACTOR SHALL SAW-CUT A SMOOTH STRAIGHT EDGE ON ANY PAVEMENT PROPOSED FOR DEMOLITION PRIOR TO ITS REMOVAL AS DIRECTED IN THE DETAILS AND SPECIFICATIONS. PRIOR TO CONNECTING PROPOSED PAVEMENT TO EXISTING PAVEMENT, THE CONTRACTOR SHALL ENSURE THAT THE EDGE OF THE EXISTING PAVEMENT IS STRAIGHT AND UNIFORM THROUGH FULL DEPTH TO BOTTOM OF BASE.
8. CONTRACTOR TO DIVERT SOLID WASTE FROM THE LANDFILL AS REQUIRED IN THE SPECIFICATIONS. RECYCLE MATERIAL TO BE SEPARATED AND DIVERTED TO RECYCLING FACILITY. SOLID WASTE THAT CAN'T BE DIVERTED SHALL GO TO A STATE CERTIFIED LANDFILL.
9. CHANGES OR ADDITIONS TO DEMOLITION REQUIREMENTS SHOWN ARE SUBJECT TO APPROVAL FROM THE CONTRACTING OFFICER.
10. STAGING AREAS ARE TO BE RESTORED TO PRE-CONSTRUCTION CONDITIONS OR BETTER AS APPROVED BY THE CONTRACTING OFFICER.

SITE UTILITY NOTES

1. CONTRACTOR SHALL MAKE NECESSARY ARRANGEMENTS WITH THE CONTRACTING OFFICER FOR UTILITY LOCATES AND UTILITY SHUT-OFFS. ALL SHUT-OFFS REQUIRE WRITTEN NOTICE, A MINIMUM OF 14 CALENDAR DAYS PRIOR TO WORK BEING PERFORMED. CONTRACTOR IS REQUIRED TO PERFORM NECESSARY PREPARATORY WORK AND EXCAVATION REQUIRED TO ALLOW SERVICE CONNECTIONS TO BE CONSTRUCTED AND/OR TERMINATED. RESTORE DISTURBED SURFACES TO MEET OR EXCEED EXISTING CONDITIONS IMMEDIATELY FOLLOWING CONSTRUCTION
2. CONTRACTOR SHALL IMMEDIATELY REPAIR ANY UNDERGROUND UTILITIES DAMAGED BY CONSTRUCTION OPERATIONS. PAY ANY AND ALL DAMAGES ASSOCIATED WITH THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE UNDERGROUND FACILITIES AND UTILITIES.
3. EXISTING FIRE HYDRANTS TO BE PRESERVED SHALL BE MADE ACCESSIBLE TO FIRE DEPARTMENT ACCESS, UNLESS WRITTEN PERMISSION FROM THE FIRE DEPARTMENT IS OBTAINED.
4. CONTRACTOR SHALL MAKE NECESSARY ARRANGEMENTS WITH THE CONTRACTING OFFICER AND FIRE DEPARTMENT FOR ANY DISRUPTION OF WATER TO FIRE HYDRANTS.

SPILL CONTROL NOTES

1. IN ADDITION TO THE GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS NOTES OF THIS PLAN, THE FOLLOWING PRACTICES WILL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:
   a. MANUFACTURERS' RECOMMENDED METHODS FOR SPILL CLEANUP WILL BE CLEARLY POSTED AND SITE PERSONNEL WILL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES.
   b. ALL SPILLS WILL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY.
   c. SPILLS OF TOXIC OR HAZARDOUS MATERIAL WILL BE REPORTED TO THE APPROPRIATE BASE ENVIRONMENTAL FLIGHT, REGARDLESS OF SIZE.
   d. THE SPILL PREVENTION PLAN MUST BE ADJUSTED TO INCLUDE MEASURES TO PREVENT THIS TYPE OF SPILL FROM REOCCURRING AND HOW TO CLEAN UP THE SPILL IF THERE IS ANOTHER ONE. A DESCRIPTION OF THE SPILL, WHAT CAUSED IT, AND THE CLEANUP MEASURES WILL ALSO BE INCLUDED.
   e. THE SITE SUPERINTENDENT IS RESPONSIBLE FOR THE DAY-TO-DAY SITE OPERATIONS WILL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.

HAZARDOUS MATERIAL NOTES

1. CONTRACTORS USING HAZARDOUS MATERIALS, AS DEFINED IN SELFRIDGE DESIGN STANDARDS (2017), MUST REPORT THE TYPES AND QUANTITIES USED WHILE LOCATED AT SANGB USING FORM 23 - CONTRACTOR HAZMAT IDENTIFICATION FORM. THE SELFRIDGE DESIGN STANDARDS (2017) CAN BE FOUND ON THE INTERNET AT https://govtribe.com/file/government-file/03-selfridge-design-standards-10-nov-2017-dot-pdf
2. FORM 23 - CONTRACTOR HAZMAT IDENTIFICATION AND SAFETY DATA SHEETS (SDS) FOR EACH MATERIAL MUST ACCOMPANY THE FORM PRIOR TO MATERIALS BROUGHT ON BASE. MATERIAL SHALL BE APPROVED BY BASE ENVIRONMENTAL PRIOR BEING TRANSPORTED ON BASE.
3. CONTRACTORS ARE REQUIRED TO REPORT THE AMOUNT OF USED AND UNUSED HAZARDOUS MATERIALS ON-BASE AT THE BEGINNING, MID-POINT, AND END OF THE CONSTRUCTION PROJECT. CONTRACTORS MUST ALSO REPORT ANY LARGE HAZARDOUS MATERIAL TYPE OR QUANTITY CHANGES.
4. ALL MATERIALS RECYCLED OR DISPOSED OFF-SITE OF THE INSTALLATION SHALL BE QUANTIFIED ON THE AIR FORCE FORM 72 - SOLID WASTE AND DIVERSION TRACKING FORM.
5. THE PROJECT WILL REQUIRE ASBESTOS-CONTAINING MATERIAL (ACM) ABATEMENT ABOVE ESTABLISHED THRESHOLDS. CONTRACTOR IS RESPONSIBLE FOR NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP) NOTIFICATIONS AS DETAILED IN THE SPECIFICATIONS.

EROSION / SEDIMENTATION CONTROL NOTES

1. A SOIL EROSION AND SEDIMENTATION (SESC) CONTROL PERMIT IS REQUIRED FROM MACOMB COUNT, THE PROJECT LAND DISTURBANCE IS 2.1+/- ACRES.
2. METHODS SHOWN ON THESE PLANS ARE MEANT TO BE A GUIDE AND ARE ONLY MINIMUM REQUIREMENTS. THE CONTRACTING OFFICER MAY REQUIRE ADDITIONAL SEDIMENT AND EROSION CONTROL DURING THE CONSTRUCTION PERIOD IF NECESSARY.
3. MINOR EROSION CONTROL DEVICE LOCATION ADJUSTMENTS MAY BE MADE WITH THE APPROVAL OF THE CONTRACTING OFFICER. THE CONTRACTOR SHALL ENSURE THAT ALL RUNOFF FROM DISTURBED AREAS IS DIRECTED TO EROSION CONTROL MEASURES. THE CONTRACTOR MUST OBTAIN CONTRACTING OFFICER APPROVAL FOR ANY CHANGES TO THE SOIL EROSION CONTROL PLAN.
4. THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH THE BASE NPDES STORM WATER PERMITS DURING THE ENTIRE CONSTRUCTION PERIOD. A COPY OF ALL APPLICABLE PERMITS SHALL BE MAINTAINED ON SITE AT ALL TIMES.
5. STAGING THE WORK WILL BE DONE BY THE CONTRACTOR AS DIRECTED IN THESE PLANS AND AS REQUIRED TO ENSURE PROGRESSIVE STABILIZATION OF DISTURBED EARTH.
6. CONTRACTOR TO COORDINATE ALL EROSION CONTROL WORK WITH OTHER ONGOING CONSTRUCTION WORK.
7. ALL STREAMS, AND DRAINS TO INCLUDE THE MAIN STREAM OR TRUNK AND ALL TRIBUTARIES OR BRANCHES OF ANY CREEK OR RIVER, ANY WATERCOURSE OR DITCH, EITHER OPEN OR CLOSED, ANY COVERED DRAIN OR STORM SEWER OR CONDUIT AND ANY STRUCTURE OR MECHANICAL DEVICE THAT WILL INTRODUCE FLOW OF WATER INTO SAID DRAIN WILL BE PROTECTED FROM SOIL INFILTRATION.
8. ALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES WILL BE INSTALLED PRIOR TO OR IN CONJUNCTION WITH THE START OF EXCAVATION AND ARE TO REMAIN IN EFFECT UNTIL AREAS ARE STABILIZED.
9. CONSTRUCTION TRAFFIC SHALL ENTER AND EXIT THE CONSTRUCTION SITE THROUGH AN ACCESS ROADWAY. THE ROADWAY SHALL BE INSTALLED AS SHOWN ON THE CONSTRUCTION STAGING PLAN. CONTRACTOR SHALL REMOVE SOIL MATERIALS FROM EQUIPMENT AND VEHICLE TIRES ON SITE. STREETS SURROUNDING THE CONSTRUCTION SITE MUST ALWAYS BE KEPT CLEAN.
10. ROAD/SIDE CATCH BASINS ARE TO BE PROTECTED WITH TEMPORARY INLET PROTECTION. BURLAP AND HAY BALES ARE NOT ALLOWED.
11. CONTRACTOR SHALL GRADE TO DRAIN AND TURF ALL UN-SURFACED AREAS DISTURBED IN THE COURSE OF CONSTRUCTION. CONTRACTOR SHALL REPAIR AT NO EXPENSE TO THE GOVERNMENT ALL PAVED AND TURF AREAS
12. SEEDING OR SODDING OF EXPOSED BUFFER STRIP MUST BE COMPLETED IMMEDIATELY (WITHIN 7 DAYS) AFTER FINAL GRADING. WHENEVER THE COMPLETION DATE FALLS DURING A DORMANT SEASON. THE SITE WILL BE STRAW MULCHED. WITHIN 15 DAYS OF THE BEGINNING OF THE NEXT GROWING SEASON, GRASS WILL BE INSTALLED. DISTURB ONLY THE AREA NEEDED FOR CONSTRUCTION.
13. ANY EXCESS SOIL AREAS (SOIL PILES) MUST ALSO BE STABILIZED WITHIN 7 DAYS OF THE LAST CONSTRUCTION ACTIVITIES WITHIN THE AREA. THESE SOILS ARE TO BE SEEDED WITH MDOT TYPE T-TEMPORARY SEEDING. TEMPORARY EROSION CONTROL DEVICES MAY BE REMOVED WITH PERMISSION FROM THE CONTRACTING OFFICER WITHIN 30 CALENDAR DAYS FOLLOWING ESTABLISHMENT OF PERMANENT STABILIZATION IN ALL CONTRIBUTORY DRAINAGE AREAS.
14. PERMANENT SOIL STABILIZATION REQUIRED FOR ALL AREAS OF THE SITE.
15. THE CONTRACTOR SHALL PRESERVE NATURAL VEGETATION AS MUCH AS POSSIBLE.
16. FOR FINISH GRADING THE CONTRACTOR SHALL PROVIDE SUFFICIENT GRADIENTS SO AS TO PREVENT WATER FROM STANDING ON THE SURFACE FOR MORE THAN 24 HOURS AFTER THE END OF A RAINFALL (TYPICALLY AT LEAST 1% SLOPE), EXCEPT IN DESIGNATED COURSES AND SWALE FLOW AREAS WHICH MAY DRAIN AS LONG AS 48 HOURS AFTER THE END OF A RAINFALL. AREAS DESIGNED TO HAVE STANDING WATER SHALL NOT BE REQUIRED TO MEET THIS PROVISION.
17. THE CONSTRUCTION SITE SHALL BE INSPECTED BY A MICHIGAN CERTIFIED STORM WATER OPERATOR, PROVIDED BY THE CONTRACTOR, ONCE PER WEEK AND WITHIN 24 HOURS AFTER PRECIPITATION EVENTS THAT RESULT IN A DISCHARGE FROM THE SITE AND ENSURE THAT ANY NEEDED CORRECTIVE ACTIONS ARE CARRIED OUT. A LOG OF THE INSPECTIONS AND CORRECTIVE ACTIONS SHALL BE MAINTAINED AT THE CONSTRUCTION SITE READILY ACCESSIBLE TO BASE INSPECTORS, ENVIRONMENTAL MANAGEMENT OFFICE, AND REGULATORY AGENCIES, AS REQUIRED. A COPY OF ALL INSPECTIONS WILL BE PROVIDED TO THE CONTRACTING OFFICER TO BE KEPT FOR A PERIOD OF THREE YEARS AFTER THE PROJECT IS TERMINATED.
18. DAILY INSPECTIONS SHALL BE MADE BY CONTRACTOR TO DETERMINE EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES AND ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY.
19. GEOTEXTILE MATERIAL WILL BE USED UNDER ALL STONE USED FOR RIPRAP AND ACCESS ROADWAY BECAUSE OF THE HEAVY CLAY SOILS ON THE BASE.
20. UNSUITABLE SOILS SUCH AS MUCK, PEAT, TOPSOIL, MARL, SILT OR OTHER UNSTABLE MATERIALS SHALL BE UNDERCUT AND REPLACED WITH SATISFACTORY SOIL MATERIALS.
21. GOOD HOUSEKEEPING THE SITE SHALL BE KEPT IN AN ORDERLY FASHION, THE CONTRACTOR SHALL INSURE THE FOLLOWING ITEMS ARE ADDRESSED.
   a. AN EFFORT TO STORE ONLY WHAT IS NEEDED ON THE SITE.
   b. KEEP ALL STORED MATERIALS IN A NEAT AND ORDERLY FASHION IN THE ORIGINAL CONTAINERS WHEN POSSIBLE.
   c. FOLLOW ALL MANUFACTURERS RECOMMENDED PROCEDURES FOR DISPOSAL OF WASTE MATERIAL.
   d. INSPECT DAILY TO ENSURE WASTE MATERIAL IS DISPOSED OF PROPERLY.

GEOTECHNICAL SITE SUMMARY

1. A GEOTECHNICAL INVESTIGATION WAS CONDUCTED BY SOMAT ENGINEERING. SEE REPORT DATED MAY 12, 2020 TITLE "FACILITY IMPROVEMENTS, HANGAR 3-4-5 PROJECTS, SELFRIDGE AIR NATIONAL GUARD BASE, HARRISON TOWNSHIP, MICHIGAN" FOR DETAILED SITE FINDINGS AND RECOMMENDATIONS.
2. A GENERAL SUMMARY OF THE REPORT CONCLUSIONS AND RECOMMENDATIONS IS PROVIDED BELOW:
   a. FOUR SOIL BORINGS WERE DRILLED FOR THE DESIGN OF THE ADDITION AND NEW HANGAR STRUCTURES. THREE SOIL BORINGS WERE DRILLED TO A DEPTH OF ABOUT 60 FEET AND THE OTHER SOIL BORING WAS DRILLED TO A DEPTH OF 78 FEET BELOW EXISTING GRADE.
   b. THE GENERAL SOIL PROFILE ENCOUNTERED AT THIS SITE INCLUDED ABOUT 3 TO 5 FEET OF FILL SOILS OVERLYING STIFF TO HARD CLAYS, EXTENDING TO DEPTHS OF ABOUT 10 FEET BELOW EXISTING GRADE. VERY SOFT CLAY SOILS WERE ENCOUNTERED FROM 10 FEET TO ABOUT 32 FEET BELOW EXISTING GRADE. STIFF TO HARD CLAYS WERE ENCOUNTERED BELOW THE SOFT CLAYS AND EXTENDED TO A DEPTH OF ABOUT 44 TO 48 FEET BELOW EXISTING GRADE. BELOW THE STIFF TO HARD CLAYS, A HARDPAN MATERIAL CONSISTING OF HARD SANDY CLAY WITH INTERBEDDED COARSE-GRAINED LAYERS WAS ENCOUNTERED.
   c. A SITE WITH A VERY SOFT SOIL LAYER THICKER THAN 10 FEET, AND WITH A WATER CONTENT OF 40% OR HIGHER, AND A PLASTICITY INDEX (PI) OF 20 OR ABOVE CAN BE CONSIDERED AS A "SOFT SOIL" SITE. THE MOISTURE CONTENTS, THICKNESS OF THE VERY SOFT CLAY SOILS, AND THE PLASTICITY INDICES OF THE VERY SOFT CLAY SOILS AT THIS SITE MEET THE CRITERIA FOR A "SOFT SOIL" PROFILE. AS SUCH, THIS SITE CAN BE CLASSIFIED AS A SEISMIC SITE CLASS E.
   d. THE LONG-TERM GROUNDWATER LEVEL IS EXPECTED TO BE ENCOUNTERED AT DEPTHS OF ABOUT 8.5 TO 13.5 FEET BELOW EXISTING GRADE. STANDARD SUMP PIT AND PUMPING PROCEDURES SHOULD BE ADEQUATE TO CONTROL THE GROUNDWATER WITHIN THE EXCAVATIONS.

SEQUENCE OF CONSTRUCTION

1. THE FOLLOWING SEQUENCE OF CONSTRUCTION SHALL BE FOLLOWED:
   a. INSTALL SILT FENCE AS SHOWN ON THE PLANS.
   b. INSTALL A TEMPORARY MUD TRACKING DEVICE AT INGRESS/EGRESS POINTS TO THE SITE.
   c. CONTRACTOR AND OWNER SHALL AGREE ON TREE PROTECTION MEASURES PRIOR TO BEGINNING MASS GRADING.
   d. NO TREES SHALL BE REMOVED OUTSIDE OF GRADING LIMITS.
   e. INSTALL AND MAINTAIN EROSION CONTROL MEASURES AS WORK PROGRESSES.
   f. PROVIDE EROSION CONTROL MEASURES AT CATCH BASINS.
   g. CLEAN PAVEMENT, WALKS, CULVERTS, WATERCOURSES, AND STORM SEWER SYSTEMS OF ALL ACCUMULATED SEDIMENT IN CONJUNCTION WITH THE REMOVAL OF ALL TEMPORARY EROSION CONTROL MEASURES WHEN GROUND COVER HAS BEEN ESTABLISHED.

PARCEL LEGAL DESCRIPTION

THE PROJECT IS LOCATED WITHIN THE PROPERTY CONSTRAINT OF SELFRIDGE AIR NATIONAL GUARD BASE (SANGB). IF REQUIRED BY MACOMB COUNTY, THE CONTRACTOR CAN REQUEST A LEGAL DESCRIPTION FROM THE CONTRACTING OFFICER.

SOIL AND GROUNDWATER TESTING

1. ALL SOIL MOVEMENT ACTIVITIES AT THE INSTALLATION MUST BE COMPLIANCE WITH SANGB SOIL RELOCATION GUIDANCE LETTER (DATED 10/24/2018).
2. CROCK WELLS AND GROUNDWATER WELLS FOR ANY WATER USE IS NOT AUTHORIZED. WELLS MUST BE IN ACCORDANCE WITH SANGB CROCK WELLS AND GROUNDWATER GUIDANCE MEMO DATED 5/3/2002.
3. SOIL DISTURBANCE ACTIVITIES (UTILITY INSTALLATIONS) SHALL FOLLOW MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY (EGLE) MANDATED LAND-USE CONTROLS (LUCS) / INSTITUTIONAL CONTROLS (ICS) ASSOCIATED WITH THE INSTALLATION RESTORATION PROGRAM SITE 7 (EAST RAMP) AND IDENTIFIED PFAS LOCATIONS. FOLLOW IRP SITE 7 LAND-USE CONTROL CLOSURE LETTER DATED 06/20/2003 AND IRP SITE 7 NO FURTHER ACTION DECISION DOCUMENT WHICH SUMMARIZES ANALYTICAL DATA FOR IRP SITE 7. FOLLOW LUCS / ICS BMPs AT IDENTIFIED PFAS LOCATIONS.
4. SOILS REMOVED FROM THE PROJECT LIMITS MUST BE SCREENED FOR TOLERANCES AGAINST ABIOTIC STRESSES CAUSED BY SALINITY, PH, TEMPERATURE, LEAD AND PFAS CONTAMINATION. THE MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY (EGLE) PROHIBITS TRANS TRANSFER OF CONTAMINATED SOILS FROM ONE LOCATION TO ANOTHER LOCATION ON BASE UNLESS DETERMINED IMPACTS ARE BELOW CRITERIA. SEE SPECIFICATIONS FOR SOIL AND GROUNDWATER SAMPLING AND DISPOSAL PROCEDURES.
5. ANY SOIL OR GROUND WATER GENERATED FROM EXCAVATION WILL REQUIRE ANALYTICAL TESTING (CHARACTERIZATION) ANALYTICAL TESTING PARAMETERS WILL BE DETERMINED BY THE SANGB ENVIRONMENTAL MANAGEMENT OFFICE. IF PARAMETERS EXCEED ALLOWABLE TOLERANCES, THE SOIL WILL BE REQUIRED TO BE DISPOSED OF OFF-SITE. SOILS DETERMINED TO BE ACCEPTABLE CAN BE STOCKPILED BY THE CONTRACTOR, IN A LOCATION DETERMINED BY THE CONTRACTING OFFICER.
6. IF GROUNDWATER CONCENTRATIONS EXCEED CLEANUP CRITERIA REQUIREMENTS FOR RESPONSE ACTIVITY (FORMERLY THE PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS) IDENTIFIED, DEWATERED GROUNDWATER SHALL BE CONTAINERIZED AND PROPERLY DISPOSED VIA OFF-SITE DISPOSAL TO A LICENSED FACILITY AND/OR VIA GREAT LAKES WATER AUTHORITY (GLWA) SANITARY SEWER SYSTEM WITH APPROVAL OF A SPECIAL DISCHARGE PERMIT.

ENVIRONMENTAL FORMS

1. THE FOLLOWING FORMS ARE LOCATED AS ATTACHMENTS TO SPECIFICATION SECTION 00 31 00:
   1.1. FORM 23 - CONTRACTOR HAZMAT IDENTIFICATION
   1.2. SANGB SOIL RELOCATION GUIDANCE LETTER (DATED 10/24/2018)
   1.3. AIR FORCE FORM 72 - SOLID WASTE AND DIVERSION TRACKING FORM
   1.4. SANGB CROCK WELLS AND GROUNDWATER GUIDANCE MEMO (DATED 5/3/2002)
   1.5. IRP SITE 7 LAND-USE CONTROL CLOSURE LETTER (DATED 06/20/2003)
   1.6. IRP SITE 7 NO FURTHER ACTION DECISION LETTER

CIVIL SITE WORK LEGEND

RD	ROOF DOWNSPOUT DRAIN	PS	SANITARY PUMP STATION
SAN SAN	GRAVITY SANITARY SEWER		
SS SS SS SS	SANITARY SEWER FORCEMAIN	S	SANITARY MANHOLE
SD SD	STORM SEWER	CO	CLEAN OUT
CP CP CP CP	CULVERT	W	WATER VALVE VAULT
W	WATER MAIN	CB	CATCH BASIN ROUND
G G	GAS	CB	CATCH BASIN
COMM COMM	COMMUNICATIONS UNDERGROUND	SD 00	STORM CB/MH NUMBERING
E E E E	ELECTRICAL PRIMARY UNDERGROUND		POST INDICATOR VALVE
E E E E	ELECTRICAL PRIMARY OVERHEAD		REGULATOR VALVE
F	FIRE LINE		SIGN
S S	SECURITY FENCE		FIRE HYDRANT ASSEMBLY
	TEMPORARY SECURITY FENCE	+100.00	PROPOSED SPOT ELEVATION
	TEMPORARY FENCE	T 100.00	TOP OF CURB/WALK ELEVATION
	CENTERLINE OF DITCH\STREAM	G 100.00	GUTTER ELEVATION
640	CONTOUR & ELEVATION	I.E.	INVERT ELEVATION
	CENTERLINE	BM	BENCHMARK
	LIMITS OF CONSTRUCTION		BORING
	C.L. RAIL ROAD		TRAFFIC ARROW
	MATCH LINE	FLOW	DRAINAGE FLOW ARROW
	STREAM & DITCHES		TREE LINE
	BUILDING		CHECK DAM
	BITUMINOUS HMA PAVEMENT	FFE	FINISHED FLOOR ELEVATION
	CONCRETE PAVEMENT / SIDEWALK	TC	TOP OF CURB
	GRAVEL		

DEMOLITION LEGEND

	BITUMINOUS HMA PAVEMENT REMOVAL		STRUCTURE REMOVAL
	CONCRETE REMOVAL	XXXXXXXXXXXX-	REMOVE LINEAR FEATURE
	STRIP SOD & TOPSOIL		SAWCUT LINE

PROJECT LOCATION MAP FOR SESC PERMIT

SCALE: 1" = 200'

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WE STAND READY

MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CIVIL LEGEND & NOTES

SHEET NO.
C-001

C:_PROJECTS\EROS\200-39546-2000\SHEETFILES\VGLZ162323-BLDG 154 - BIC-001.DWG
12/9/2022 12:41 PM

AIRFIELD ACCESS SECURITY CONTROL GATE

ANY LOCKING DEVICE CONTROLLER VEHICLE ACCESS MUST BE UNDER CONTROL OF THE FIRE DEPARTMENT OR 24-HOUR SECURITY PERSONNEL LOCATED AT THE FACILITY

WILBER WRIGHT BLVD.

RELOCATED FIRE HYDRANT

110-FT OF HOSE FROM HYDRANT TO FDC

20' WIDE FIRE TRUCK ACCESS

20' WIDE FIRE TRUCK ACCESS

EX. FIRE HYDRANT

B158 FIRE PUMP HOUSE

WATER STORAGE TANK

APPROXIMATE 200' TAXIWAY OFFSET FOR C-17 AIRCRAFT

FIRE DEPARTMENT CONNECTION (FDC)

PRIMARY FIRE DEPARTMENT ENTRANCE

NEW FIRE HYDRANT

NEW ELECTRICAL TRANSFORMER

NEW GENERATOR

NEW ABOVE GROUND FUEL STORAGE

FUEL CELL STORAGE AREA

NEW ELECTRICAL EQUIPMENT

PRIMARY FIRE DEPARTMENT ENTRANCE

FIRE DEPARTMENT CONNECTION (FDC)

BUILDING 154

NEW FIRE HYDRANT

OS&Y GATE VALVE IN GATE WELL

20' WIDE FIRE TRUCK ACCESS

AIRFIELD ACCESS SECURITY CONTROL GATE

ANY LOCKING DEVICE CONTROLLER VEHICLE ACCESS MUST BE UNDER CONTROL OF THE FIRE DEPARTMENT OR 24-HOUR SECURITY PERSONNEL LOCATED AT THE FACILITY.

82' SEPARATION BETWEEN BUILDINGS

RELOCATED FIRE HYDRANT

FIRE TRUCK TURN AROUND

NFOA 409 50' HANGAR CLEAR SPACE LIMITS

NEW FIRE HYDRANT

20' WIDE FIRE TRUCK ACCESS

20' WIDE FIRE TRUCK ACCESS

MATCH LINE SEE RIGHT

MATCH LINE SEE LEFT

PAVEMENT MARKINGS

20' WIDE FIRE TRUCK ACCESS

PLAN NORTH

0 20' 40'

CODE COMPLIANCE SITE PLAN

SCALE: 1" = 20'

TAXIWAY 'A'

WILBUR WRIGHT BLVD

SELFRIDGE AVE

C-002

PLAN NORTH

0 150' 300'

KEY PLAN

SCALE: 1" = 150'

TETRA TECH
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MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CODE COMPLIANCE SITE PLAN - FIRE STORAGE TANK & PUMP HOUSE

SHEET NO.
C-002

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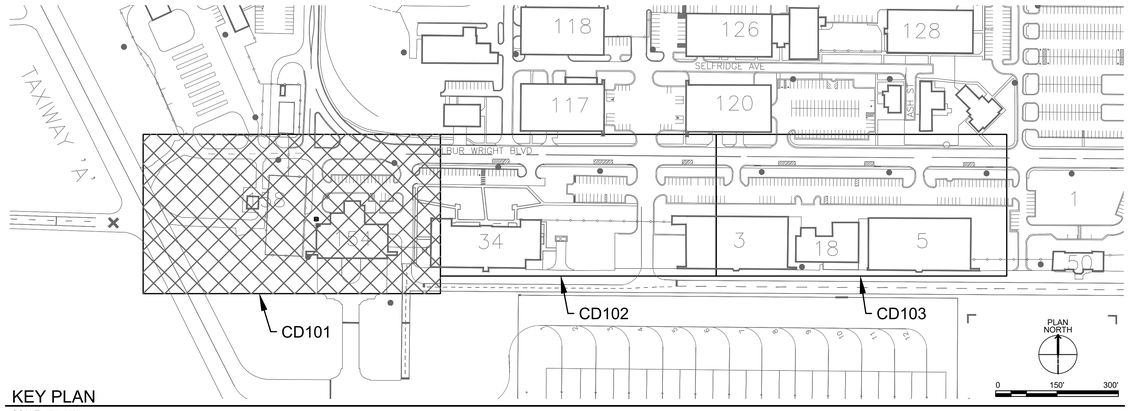


KEY PLAN

SCALE: 1" = 150'

DEMOLITION LEGEND

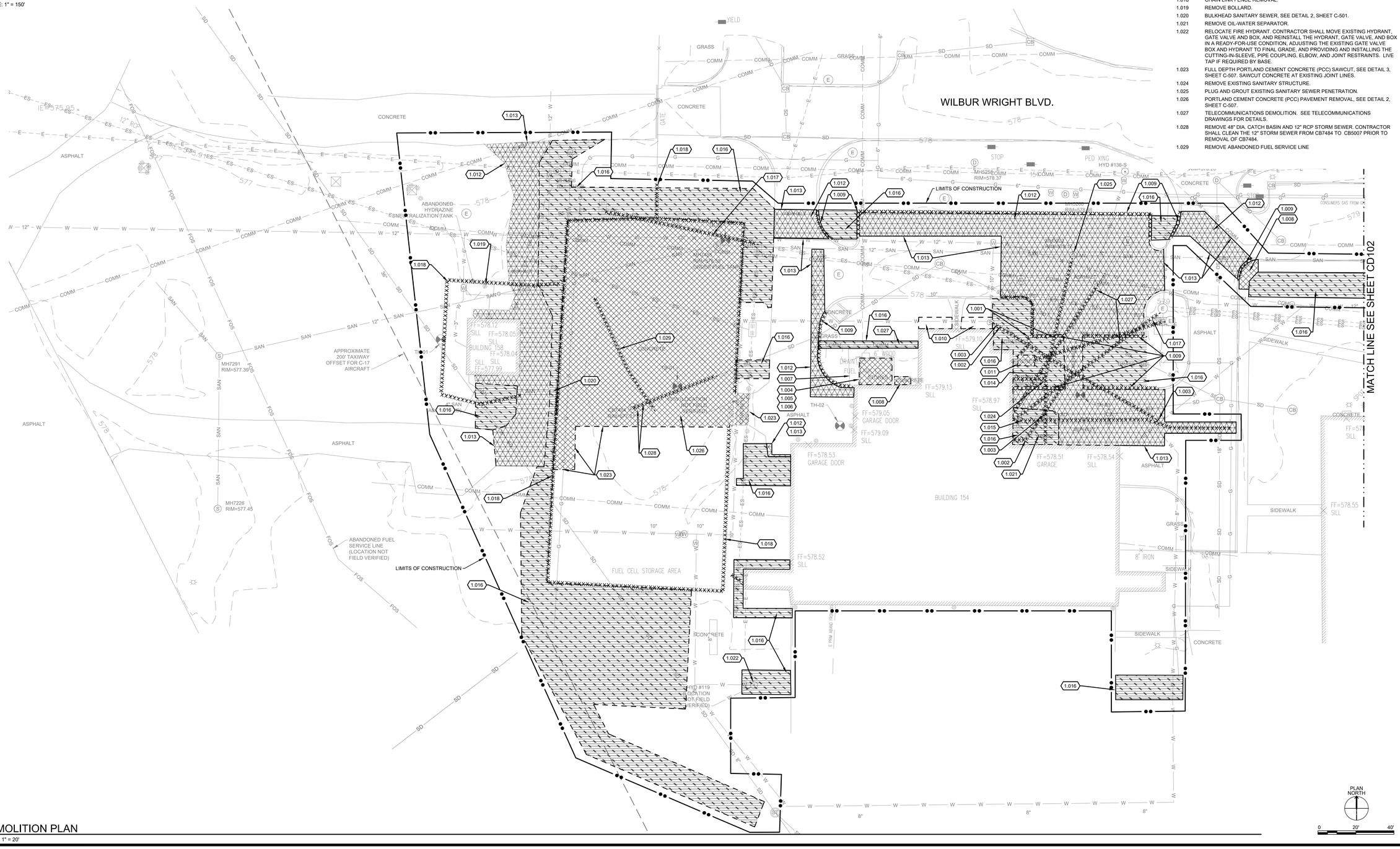
BITUMINOUS HMA PAVEMENT REMOVAL	STRUCTURE REMOVAL
CONCRETE REMOVAL	REMOVE LINEAR FEATURE
STRIP SOD & TOPSOIL	SAWCUT LINE

GENERAL NOTES

1. SEE DEMOLITION COORDINATE PLAN SHEETS FOR ADDITIONAL INFORMATION ON DEMOLITION LIMITS.

KEYED NOTES

1.001	CUT & CAP EX SANITARY SEWER.
1.002	ABANDON WATERMAIN WITH NON-STRUCTURAL FLOWABLE FILL CONSISTING OF EITHER TYPE 1 OR 1A MIXTURE OF PORTLAND CEMENT (50 LB/CYD), CLASS F OR C FLY ASH AS SPECIFIED BY ASTM C618 (WITHOUT LIMIT ON LOSS ON IGNITION) (500 LB/CY), 2NS SAND (2850 LB/CY) AND WATER (APPROX. 376 LB/CYD).
1.003	REMOVE WATERMAIN AS MAY BE REQUIRED FOR THE INSTALLATION OF PROPOSED UTILITIES. WHERE SECTIONS ARE TO BE REMOVED, CUT AND CAP REMAINING SECTIONS FOR ABANDONMENT WITH FLOWABLE FILL.
1.004	WOOD FENCING REMOVAL.
1.005	CONCRETE CONTAINMENT AREA REMOVAL INCLUDING CONCRETE CURBING, DRAINAGE PIPING AND ASSOCIATED MATERIALS.
1.006	RELOCATE JET FUEL JP-8 EQUIPMENT. SEE PLUMBING DEMOLITION SHEET, PD101, FOR EQUIPMENT REMOVAL DETAILS.
1.007	GRAVEL LANDSCAPE AND TIMBER REMOVAL.
1.008	NON-AIRFIELD CONCRETE PAVEMENT REMOVAL, SAWCUT CONCRETE SIDEWALK AT EXISTING JOINT LINES
1.009	CONCRETE CURB AND GUTTER REMOVAL.
1.010	SHRUB, BUSH, LANDSCAPE REMOVAL.
1.011	ELECTRICAL EQUIPMENT AND PAD REMOVAL.
1.012	HMA PAVEMENT REMOVAL.
1.013	HMA PAVEMENT SAWCUT, SEE DETAIL 8, SHEET C-502.
1.014	SANITARY SEWER MAIN AND/OR LEAD REMOVAL.
1.015	REMOVE EXISTING 2.5" GAS SERVICE MAIN.
1.016	STRIP SOD & TOPSOIL.
1.017	ELECTRICAL DEMOLITION. SEE ELECTRICAL DRAWINGS FOR DETAILS.
1.018	CHAIN LINK FENCE REMOVAL.
1.019	REMOVE BOLLARD.
1.020	BULKHEAD SANITARY SEWER, SEE DETAIL 2, SHEET C-501.
1.021	REMOVE OIL-WATER SEPARATOR.
1.022	RELOCATE FIRE HYDRANT. CONTRACTOR SHALL MOVE EXISTING HYDRANT, GATE VALVE AND BOX, AND REINSTALL THE HYDRANT, GATE VALVE, AND BOX IN A READY-FOR-USE CONDITION, ADJUSTING THE EXISTING GATE VALVE BOX AND HYDRANT TO FINAL GRADE, AND PROVIDING AND INSTALLING THE CUTTING-IN-SLEEVE, PIPE COUPLING, ELBOW, AND JOINT RESTRAINTS. LIVE TAP IF REQUIRED BY BASE.
1.023	FULL DEPTH PORTLAND CEMENT CONCRETE (PCC) SAWCUT, SEE DETAIL 3, SHEET C-507. SAWCUT CONCRETE AT EXISTING JOINT LINES.
1.024	REMOVE EXISTING SANITARY STRUCTURE.
1.025	PLUG AND GROUT EXISTING SANITARY SEWER PENETRATION.
1.026	PORTLAND CEMENT CONCRETE (PCC) PAVEMENT REMOVAL, SEE DETAIL 2, SHEET C-507.
1.027	TELECOMMUNICATIONS DEMOLITION. SEE TELECOMMUNICATIONS DRAWINGS FOR DETAILS.
1.028	REMOVE 48" DIA. CATCH BASIN AND 12" RCP STORM SEWER. CONTRACTOR SHALL CLEAN THE 12" STORM SEWER FROM CB7484 TO CB5007 PRIOR TO REMOVAL OF CB7484.
1.029	REMOVE ABANDONED FUEL SERVICE LINE



DEMOLITION PLAN

SCALE: 1" = 20'

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
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SHEET CONTENTS
DEMOLITION PLAN

SHEET NO.
CD101

C:_PROJECTS\EP\2020_MH\48-20\2020JMH48-20\2020JMHSHEETFILES\VGLZ162323-ALDG-154 - IEC010.DWG
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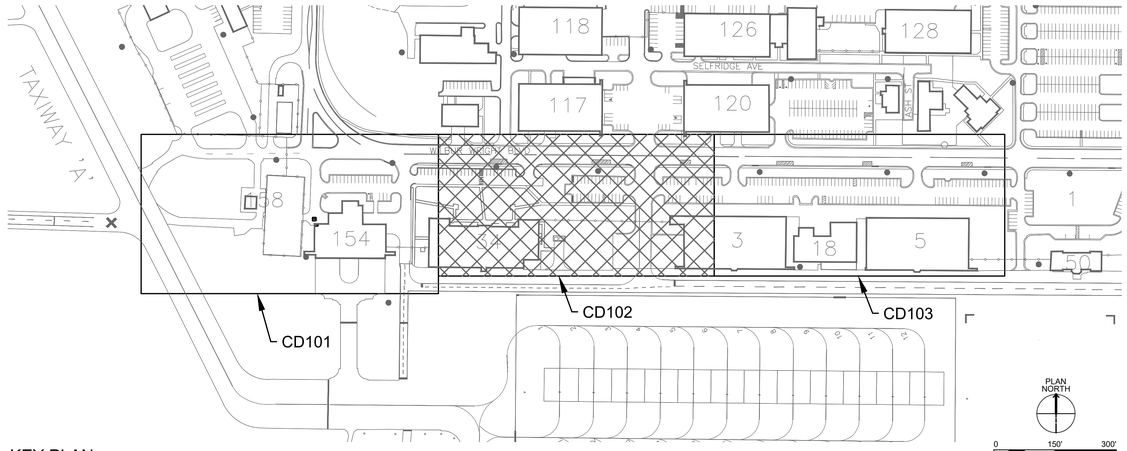


KEY PLAN

SCALE: 1" = 150'

DEMOLITION LEGEND

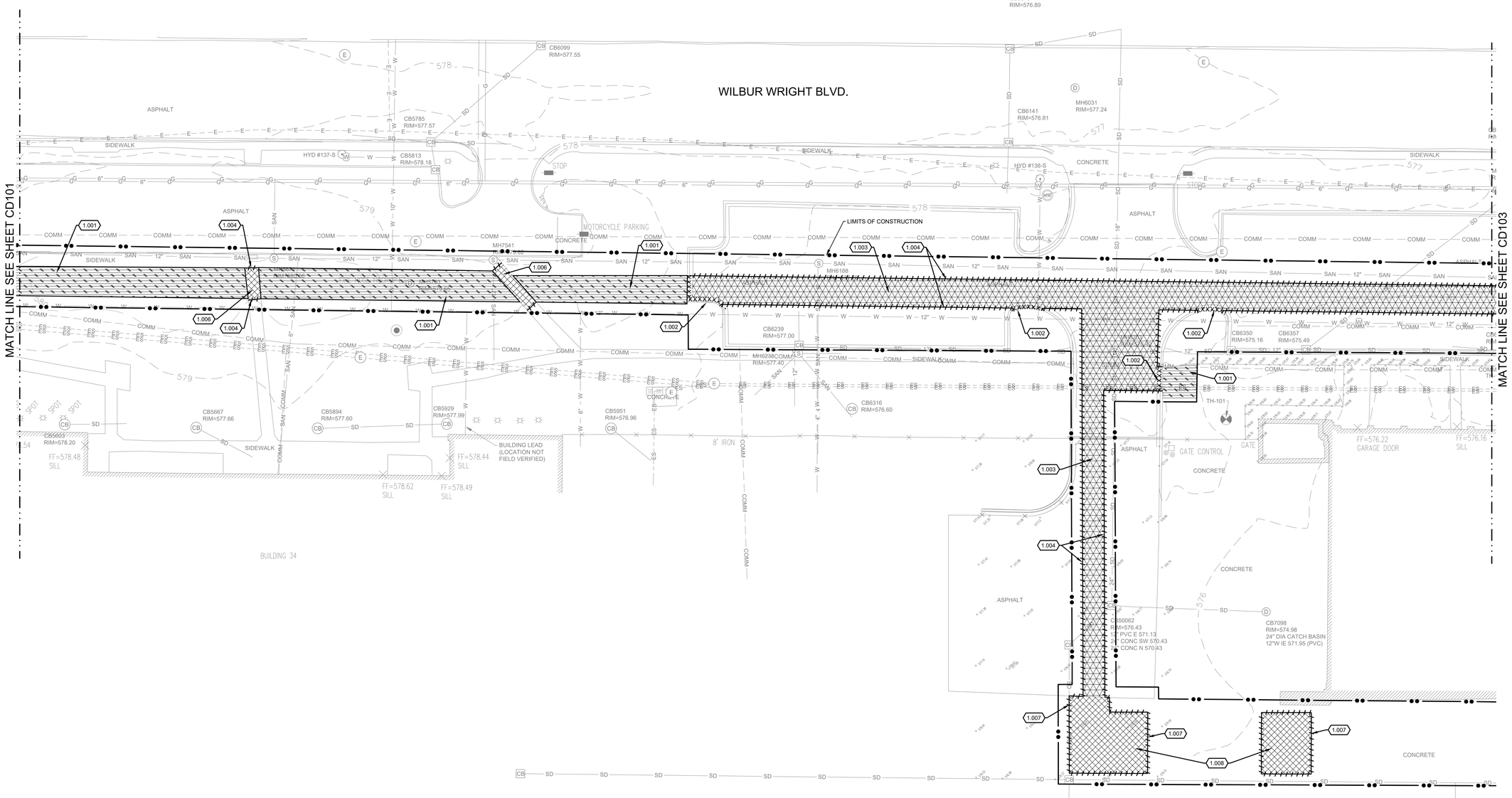
	BITUMINOUS HMA PAVEMENT REMOVAL		STRUCTURE REMOVAL
	CONCRETE REMOVAL	xxxxxxxxxxxxx	REMOVE LINEAR FEATURE
	STRIP SOD & TOPSOIL	-+-+-+-+-+-+-	SAWCUT LINE

GENERAL NOTES

1. SEE DEMOLITION COORDINATE PLAN SHEETS FOR ADDITIONAL INFORMATION ON DEMOLITION LIMITS.

KEYED NOTES

1.001	STRIP SOD & TOPSOIL
1.002	CONCRETE CURB AND GUTTER REMOVAL
1.003	HMA PAVEMENT REMOVAL
1.004	HMA PAVEMENT SAWCUT, SEE DETAIL 8, SHEET C-502
1.005	NOT USED.
1.006	NON-AIRFIELD CONCRETE PAVEMENT REMOVAL, SAWCUT CONCRETE SIDEWALK AT EXISTING JOINT LINES
1.007	SEE DETAIL 3, SHEET C-507. SAWCUT CONCRETE AT EXISTING JOINT LINES.
1.008	PORTLAND CEMENT CONCRETE (PCC) PAVEMENT REMOVAL, SEE DETAIL 2, SHEET C-507.



DEMOLITION PLAN

SCALE: 1" = 20'

PLAN NORTH

0 20' 40'

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28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

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DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
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SHEET CONTENTS
DEMOLITION PLAN

SHEET NO.
CD102

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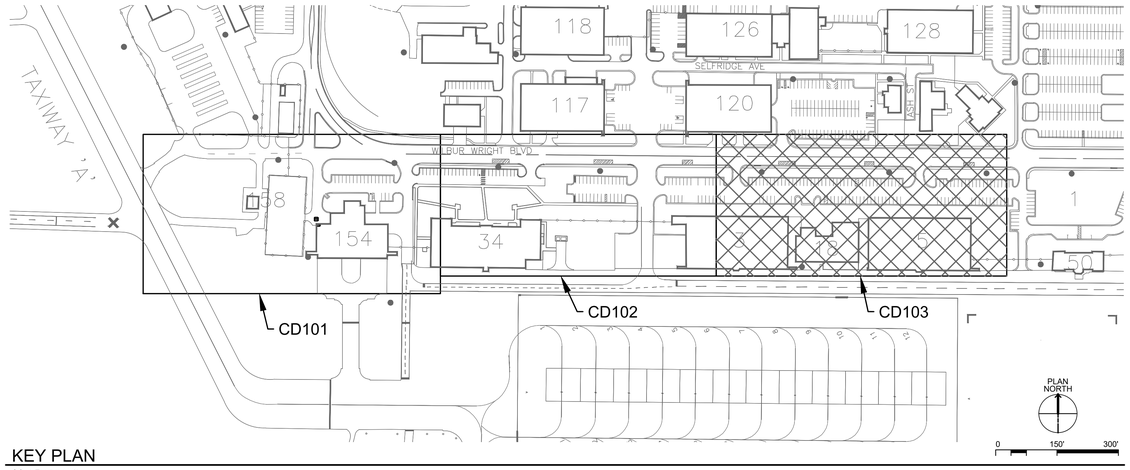


KEY PLAN

SCALE: 1" = 150'

DEMOLITION LEGEND

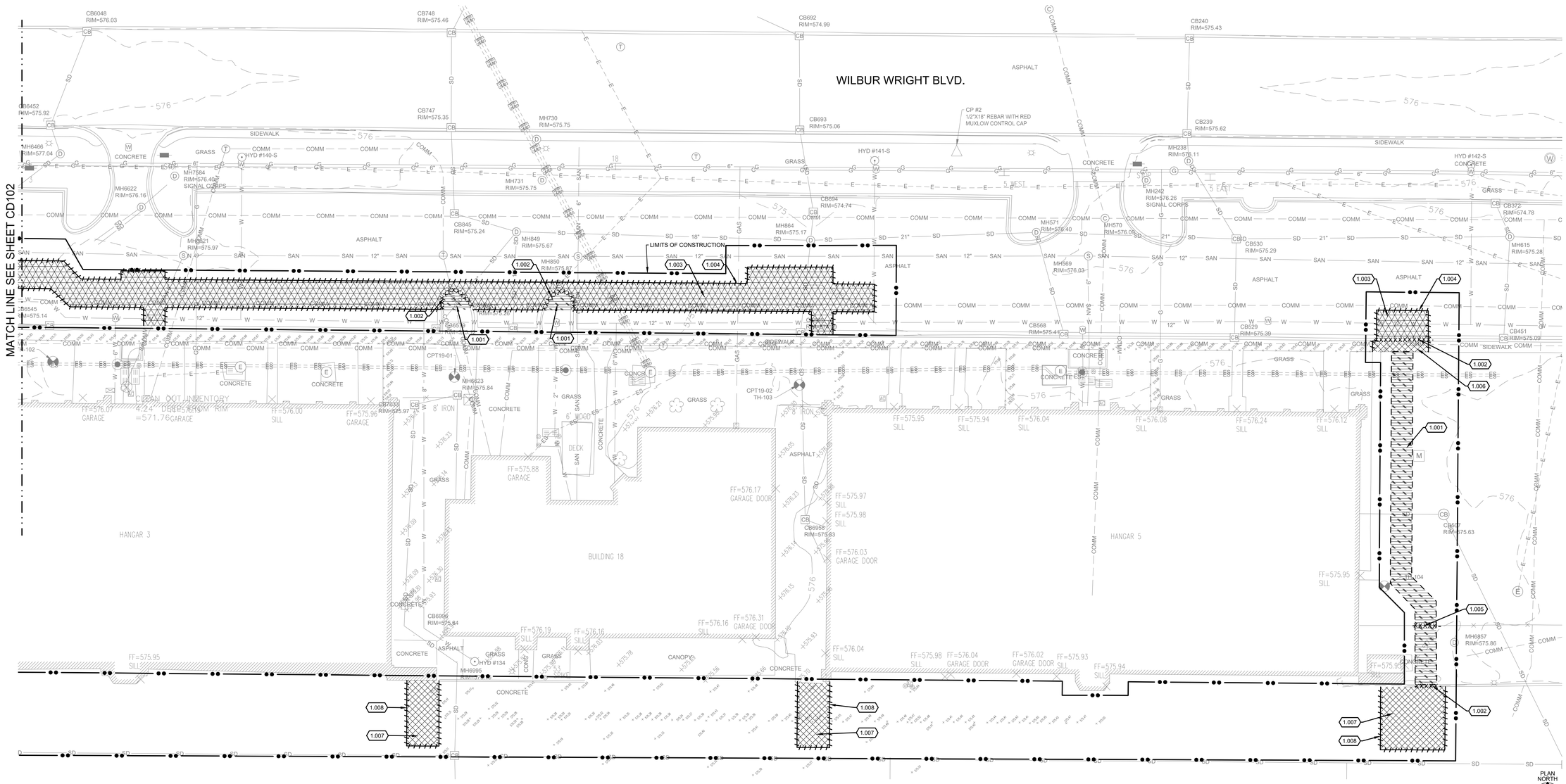
	BITUMINOUS HMA PAVEMENT REMOVAL		STRUCTURE REMOVAL
	CONCRETE REMOVAL	xxxxxxxxxxxxx-	REMOVE LINEAR FEATURE
	STRIP SOD & TOPSOIL	-/-/-/-/-/-/-/-	SAWCUT LINE

GENERAL NOTES

1. SEE DEMOLITION COORDINATE PLAN SHEETS FOR ADDITIONAL INFORMATION ON DEMOLITION LIMITS.

KEYED NOTES

1.001	STRIP SOD & TOPSOIL
1.002	CONCRETE CURB AND GUTTER REMOVAL
1.003	HMA PAVEMENT REMOVAL
1.004	HMA PAVEMENT SAWCUT, SEE DETAIL 8, SHEET C-502
1.005	FENCE REMOVAL
1.006	NON-AIRFIELD CONCRETE PAVEMENT REMOVAL, SAWCUT CONCRETE SIDEWALK AT EXISTING JOINT LINES
1.007	PORTLAND CEMENT CONCRETE (PCC) PAVEMENT REMOVAL, SEE DETAIL 2, SHEET C-507.
1.008	SEE DETAIL 3, SHEET C-507. SAWCUT CONCRETE AT EXISTING JOINT LINES.



DEMOLITION PLAN

SCALE: 1" = 20'

TETRA TECH
Mead & Hunt
Joint Venture with
Mason&Hanger
710 Avis Drive, Suite 100,
Ann Arbor, MI 48108
phone: 810-956-9300

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WE STAND READY

MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

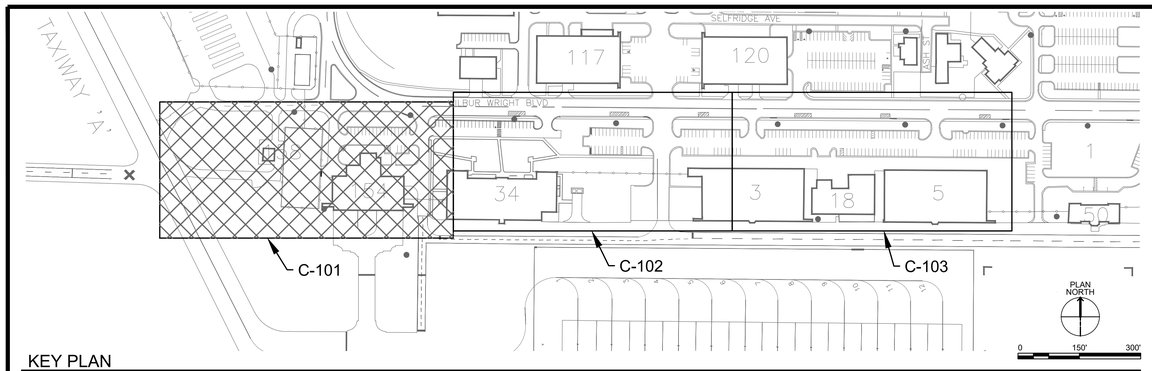
ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
DEMOLITION PLAN

SHEET NO.
CD103

C:_PROJECTS\ERCOM\3-38148-20005\SHEETFILES\VGLZ162323-BLDG-154 - REC010.DWG
12/6/2022 1:22:43 PM



KEY PLAN

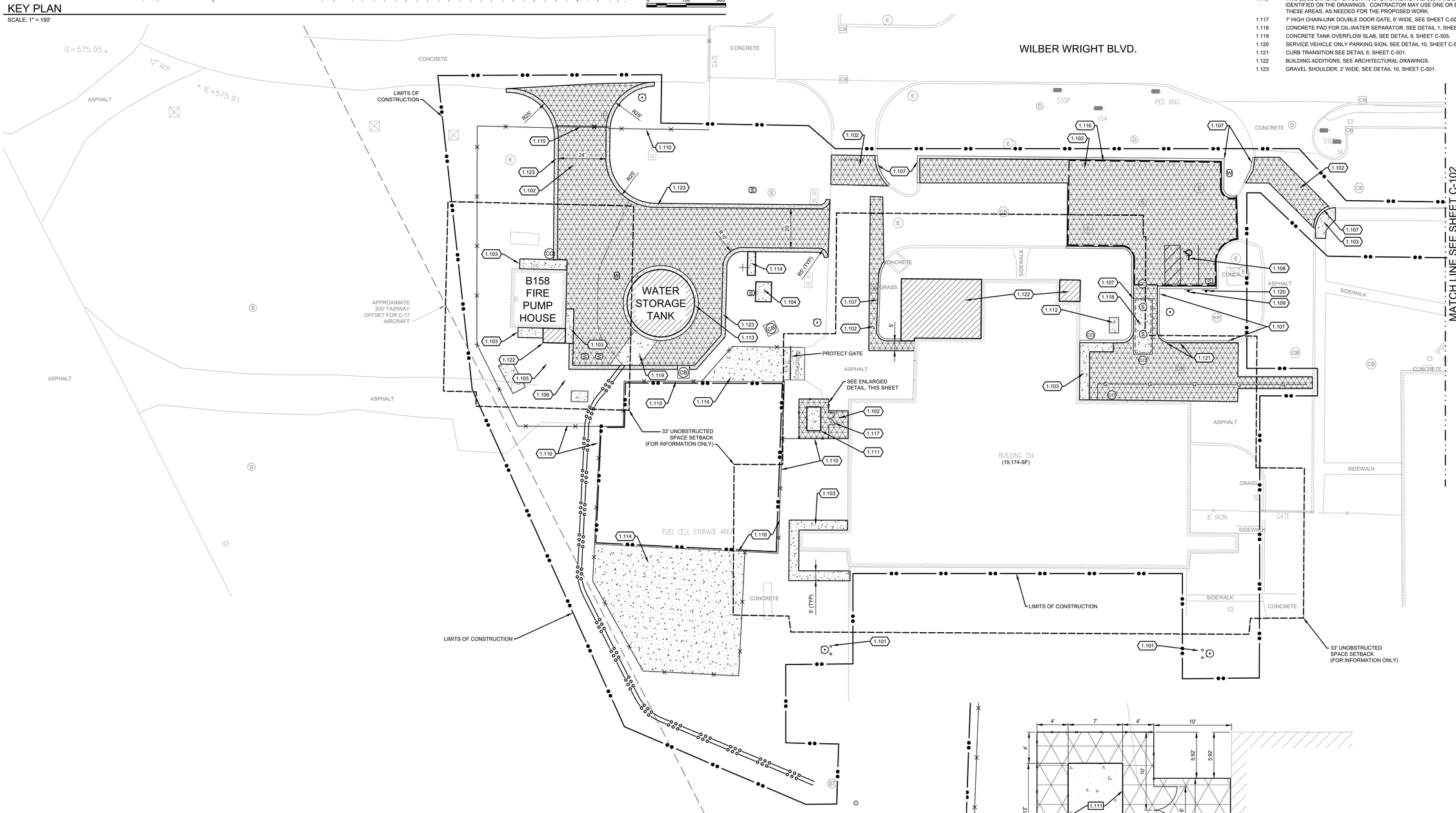
SCALE: 1" = 150'

GENERAL NOTES

1. ALL LAWN AREAS DISTURBED BY CONTRACTOR SHALL BE RESTORED WITH SOD. LAWN SHALL BE GRADED TO MATCH EXISTING.
2. SEE SITE PLAN COORDINATE PLAN SHEETS FOR ADDITIONAL INFORMATION ON SITE FEATURE LOCATIONS.
3. SEE SHEET C-001 FOR CIVIL LEGEND.
4. SEE SHEET C-112 FOR CONCRETE JOINT PLAN.

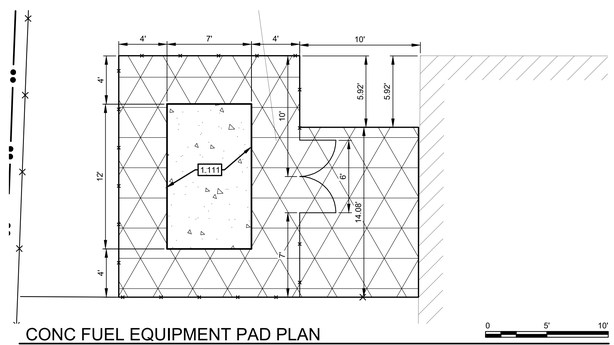
KEYED NOTES

1.101	INSTALL BOLLARD (TYP). SEE STRUCTURAL DRAWINGS.
1.102	HMA PAVEMENT, SEE DETAIL 5, SHEET C-502.
1.103	CONCRETE WALK, SEE DETAIL 1, SHEET C-502.
1.104	ALTITUDE VALVE VAULT, SEE DETAIL 1, SHEET C-504.
1.105	ELECTRICAL TRANSFORMER PAD, SEE ELECTRICAL DRAWINGS FOR DETAILS
1.106	GENERATOR PAD, SEE ELECTRICAL DRAWINGS FOR DETAILS
1.107	CONCRETE CURB & GUTTER, SEE DETAIL 1, SHEET C-501.
1.108	ADA PAVEMENT STRIPING, SEE DETAIL 3, SHEET C-502.
1.109	ADA PARKING SIGN, SEE DETAIL 7, SHEET C-502.
1.110	7' HIGH CHAIN-LINK FENCE WITH 3-STRAND BARBED WIRE, SEE SHEET C-506.
1.111	CONCRETE FUEL EQUIPMENT PAD, SEE STANDARD EXTERIOR HOUSEKEEPING PAD DETAIL ON SHEET S-511.
1.112	ELECTRICAL EQUIPMENT PAD, SEE ELECTRICAL DRAWINGS FOR DETAILS
1.113	WATER STORAGE TANK, SEE SHEET C-508.
1.114	THICKENED CONCRETE PAVEMENT SECTION, SEE DETAIL 6, SHEET C-502.
1.115	7' HIGH CHAIN-LINK STEEL DOUBLE SWING GATE, 20' WIDE. SEE DETAILS ON SHEET C-505.
1.116	TWO (2) LOCATIONS FOR CONTRACTOR STAGING AREA(S) HAVE BEEN IDENTIFIED ON THE DRAWINGS. CONTRACTOR MAY USE ONE OR BOTH OF THESE AREAS, AS NEEDED FOR THE PROPOSED WORK.
1.117	7' HIGH CHAIN-LINK DOUBLE DOOR GATE, 6' WIDE, SEE SHEET C-506.
1.118	CONCRETE PAD FOR OIL-WATER SEPARATOR, SEE DETAIL 1, SHEET C-505.
1.119	CONCRETE TANK OVERFLOW SLAB, SEE DETAIL 9, SHEET C-505.
1.120	SERVICE VEHICLE ONLY PARKING SIGN, SEE DETAIL 10, SHEET C-502.
1.121	CURB TRANSITION SEE DETAIL 6, SHEET C-501.
1.122	BUILDING ADDITIONS, SEE ARCHITECTURAL DRAWINGS.
1.123	GRAVEL SHOULDER, 2' WIDE, SEE DETAIL 10, SHEET C-501.



SITE PLAN

SCALE: 1" = 20'



CONC FUEL EQUIPMENT PAD PLAN

SCALE: 1" = 5'

PLAN NORTH

TETRA TECH
Mead & Hunt
Joint Venture with
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710 Avis Drive, Suite 100,
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WE STAND READY

MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.:	VGLZ162323
M&H NO.:	3141700-181848.01
DATE:	December 16, 2022
DESIGNED BY:	DGW
DRAWN BY:	SHG
CHECKED BY:	KLJ

DO NOT SCALE DRAWINGS

SHEET CONTENTS
SITE PLAN

SHEET NO.
C-101

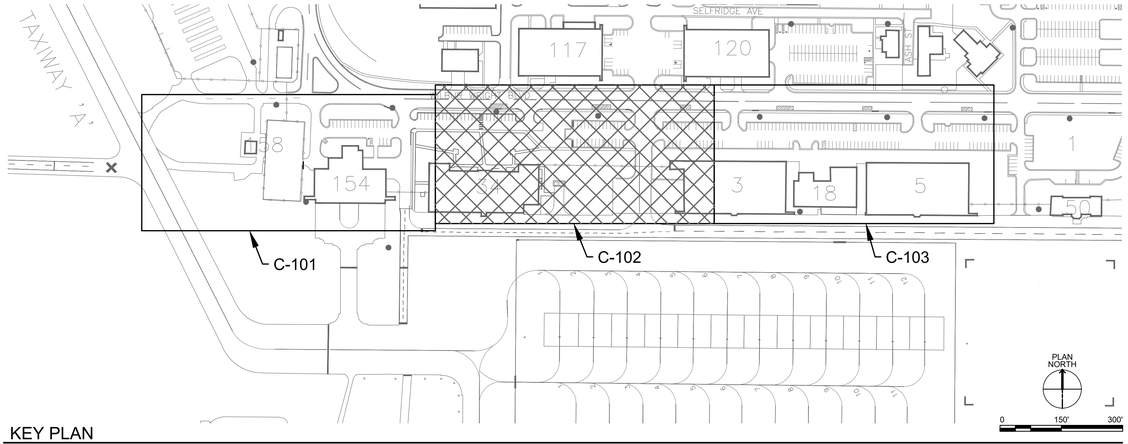
C:_PROJECTS\EIEIO\200-39546-2000\SHEETFILES\VGLZ162323-BLDG 154 - EIEIO.DWG
12/9/2022 1:23:02 PM

GENERAL NOTES

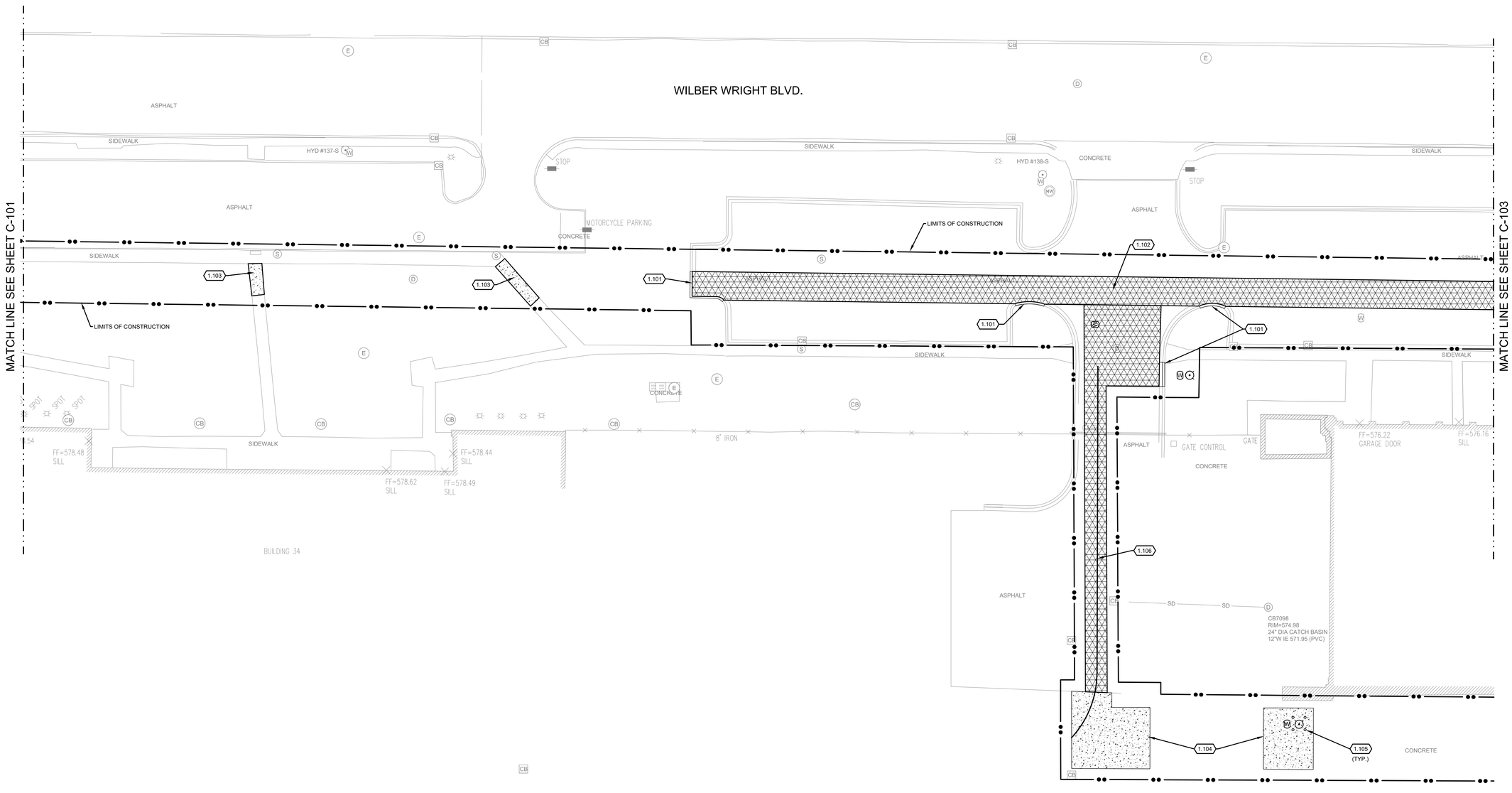
1. ALL LAWN AREAS DISTURBED BY CONTRACTOR SHALL BE RESTORED WITH SOD. LAWN SHALL BE GRADED TO MATCH EXISTING.
2. SEE SITE PLAN COORDINATE PLAN SHEETS FOR ADDITIONAL INFORMATION ON SITE FEATURE LOCATIONS.
3. SEE SHEET C-001 FOR CIVIL LEGEND.
4. SEE SHEET C-112 FOR CONCRETE JOINT PLAN.

KEYED NOTES

1.101	CONCRETE CURB & GUTTER, SEE DETAIL 1, SHEET C-501
1.102	HMA PAVEMENT, SEE DETAIL 5, SHEET C-502
1.103	CONCRETE SIDEWALK, SEE DETAIL 1, SHEET C-502
1.104	REINFORCED PCC PAVEMENT, SEE DETAIL 11, SHEET C-507.
1.105	INSTALL BOLLARD (TYP). SEE STRUCTURAL DRAWINGS.
1.106	PAVEMENT MARKING, 12-INCH, SOLID WHITE



KEY PLAN
SCALE: 1" = 150'



SITE PLAN
SCALE: 1" = 20'

TETRA TECH
Mead & Hunt
Joint Venture with
Mason & Hanger
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Ann Arbor, MI 48108
phone: 810-956-9300

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
SITE PLAN

SHEET NO.
C-102

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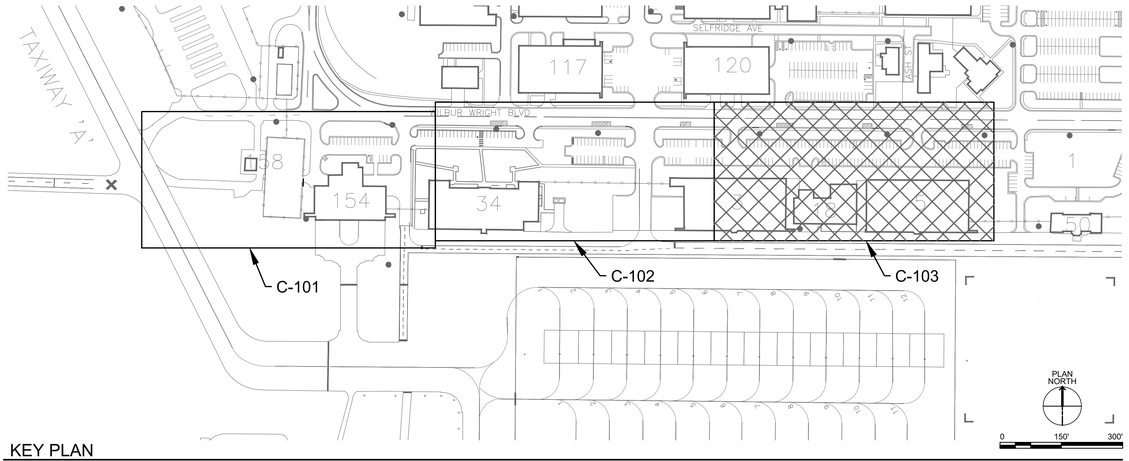


KEY PLAN

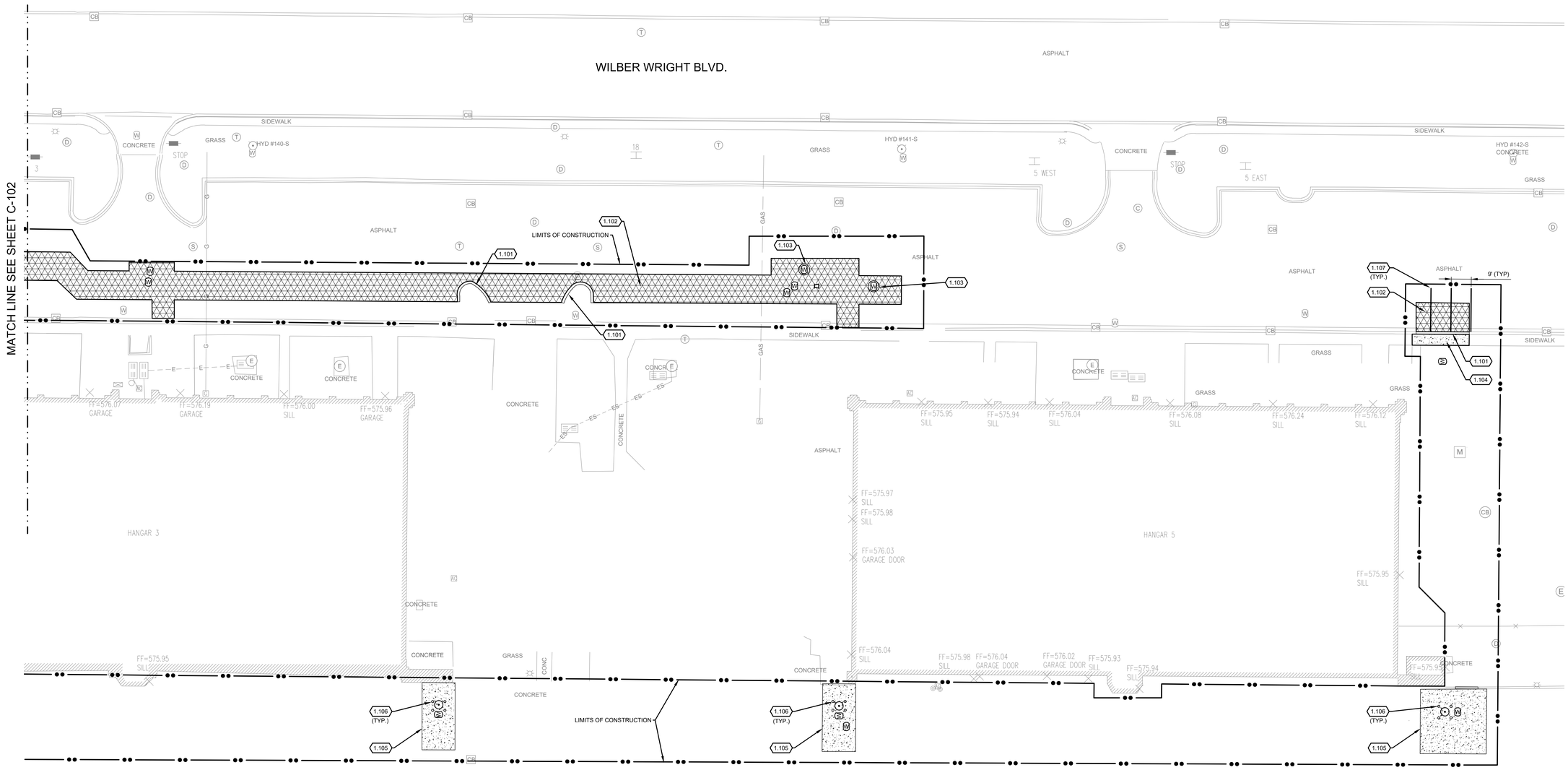
SCALE: 1" = 150'

GENERAL NOTES

1. ALL LAWN AREAS DISTURBED BY CONTRACTOR SHALL BE RESTORED WITH SOD. LAWN SHALL BE GRADED TO MATCH EXISTING.
2. SEE SITE PLAN COORDINATE PLAN SHEETS FOR ADDITIONAL INFORMATION ON SITE FEATURE LOCATIONS.
3. SEE SHEET C-001 FOR CIVIL LEGEND.
4. SEE SHEET C-112 FOR CONCRETE JOINT PLAN.

KEYED NOTES

1.101	CONCRETE CURB & GUTTER, SEE DETAIL 1, SHEET C-501.
1.102	HMA PAVEMENT, SEE DETAIL 5, SHEET C-502.
1.103	CONCRETE COLLAR, SEE DETAIL 9, SHEET C-502.
1.104	CONCRETE SIDEWALK, SEE DETAIL 1, SHEET C-502.
1.105	REINFORCED PCC PAVEMENT, SEE DETAIL 11, SHEET C-507.
1.106	INSTALL BOLLARD (TYP). SEE STRUCTURAL DRAWINGS.
1.107	PAVEMENT MARKINGS, 4-INCH WIDE, WHITE.



SITE PLAN

SCALE: 1" = 20'

TETRA TECH
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MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS:
SITE PLAN

SHEET NO.
C-103

C:_PROJECTS\EIR\200-39546-200005\SHEETFILES\VGLZ162323-BLDG 154 - EIC-101.DWG
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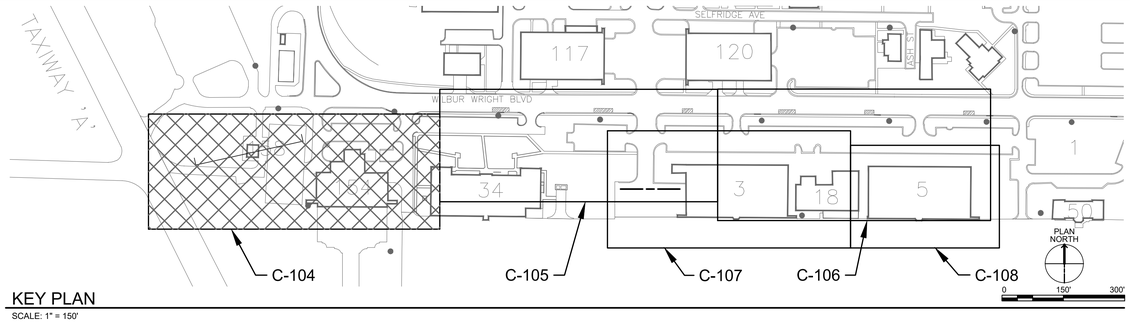
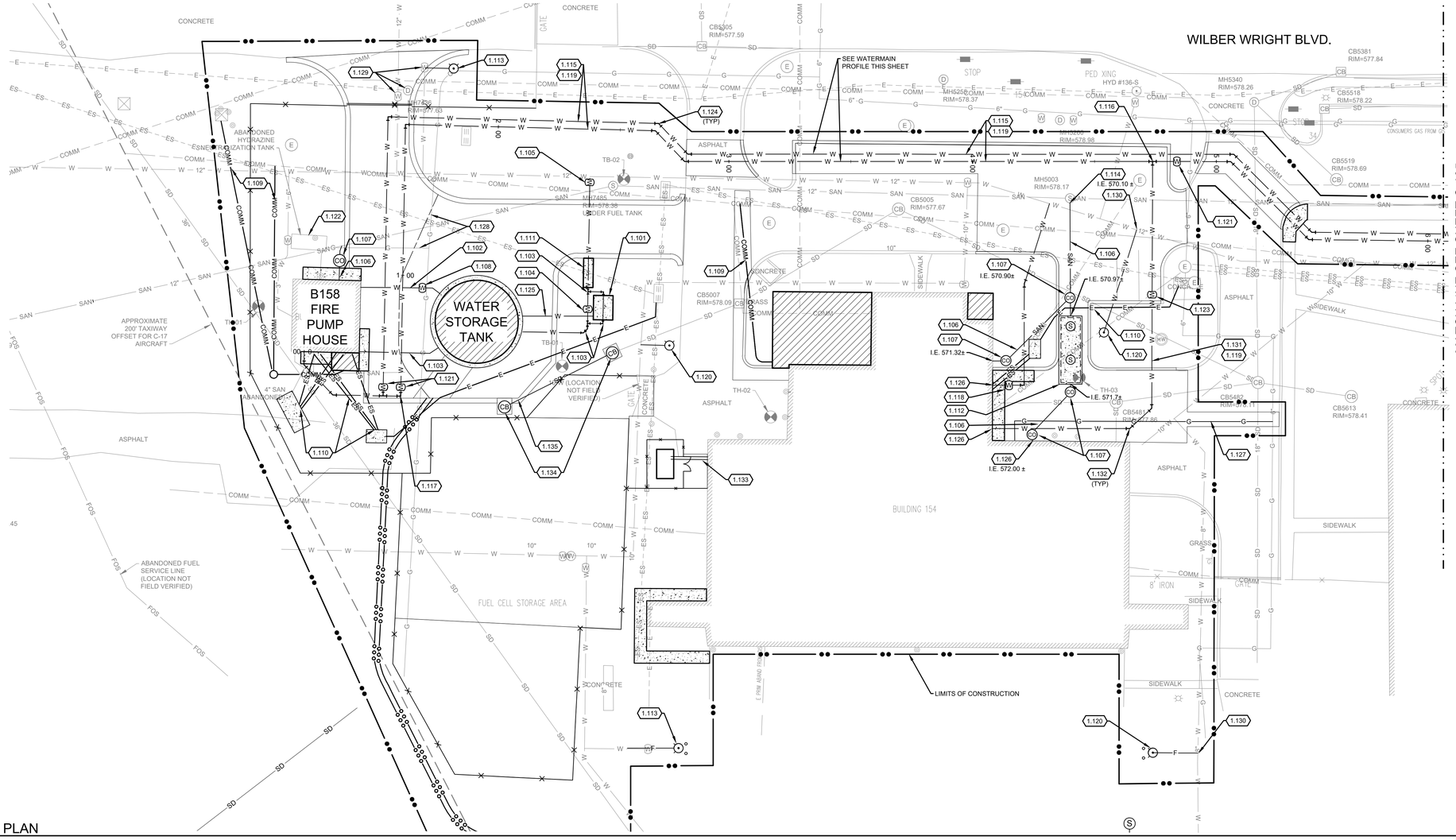


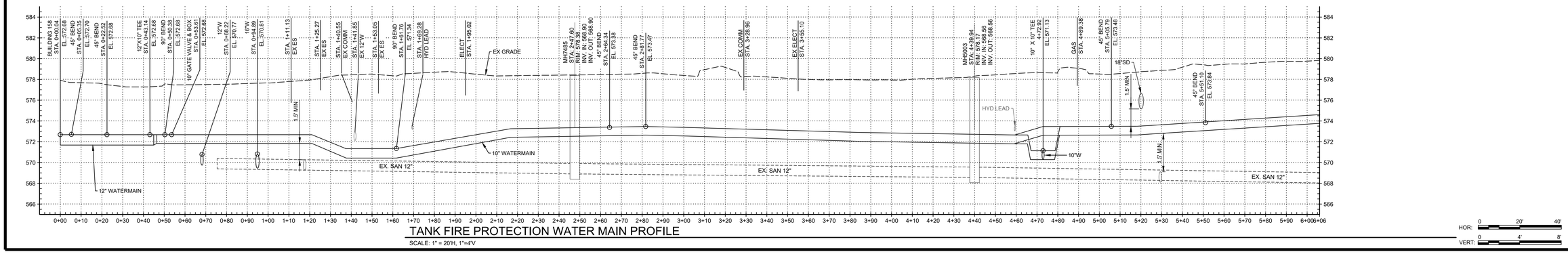
KEY PLAN

SCALE: 1" = 150'



UTILITY PLAN

SCALE: 1" = 20'



TANK FIRE PROTECTION WATER MAIN PROFILE

SCALE: 1" = 20'H, 1"=4'V

HOR: 0 20' 40'

VERT: 0 4' 8'

GENERAL NOTES

1. SEE UTILITY COORDINATE PLAN SHEETS FOR ADDITIONAL INFORMATION ON UTILITY LOCATIONS.
2. SEE SHEET C-001 FOR CIVIL LEGEND.

KEYED NOTES

1.101	ALTITUDE VALVE VAULT, SEE DETAIL 1, SHEET C-504.
1.102	WATER MAIN, 16" DIP CL 54 WITH POLYETHYLENE (PE) ENCASEMENT (PUMP FEED)
1.103	WATER MAIN, 12" DIP CL 54 WITH POLYETHYLENE (PE) ENCASEMENT (RETURN LINE).
1.104	GATE VALVE AND BOX, 12", SEE DETAIL 1, SHEET C-503.
1.105	12" TAPPING SLEEVE AND VALVE IN GATE WELL, SEE DETAIL 2, SHEET C-504.
1.106	SANITARY SEWER LEAD, 6" HDPE, MIN. 1% SLOPE. PROVIDE 4"X6" TRANSITION FITTING 5-FEET FROM BUILDING FOUNDATION.
1.107	SANITARY SEWER CLEAN-OUT, SEE PLUMBING DRAWINGS.
1.108	16" OS&Y GATE VALVE IN MANHOLE, SEE DETAIL 4, SHEET C-504.
1.109	SEE TECHNOLOGY SHEETS FOR COMMUNICATION SITE IMPROVEMENTS.
1.110	SEE ELECTRICAL SHEETS FOR ELECTRICAL SITE IMPROVEMENTS.
1.111	ENCLOSED BACKFLOW PREVENTER, SEE DETAIL 3, SHEET C-504.
1.112	OIL-WATER SEPARATOR, SEE SHEET C-505.
1.113	RELOCATED FIRE HYDRANT. SEE DEMOLITION NOTES ON C-101.
1.114	CORE INTO EXISTING SANITARY MANHOLE. SEE DETAIL 6, SHEET C-504.
1.115	WATER MAIN, 10" DIP CL 54 WITH POLYETHYLENE (PE) ENCASEMENT.
1.116	WATER MAIN, 10"X8" TEE.
1.117	WATER MAIN, 10", 90-DEGREE BEND.
1.118	DOMESTIC WATER SERVICE WITH CURB BOX, 3", SEE DETAIL 3, SHEET C-501.
1.119	CONTRACTOR TO VERIFY LOCATION OF EXISTING UTILITIES AND INSTALL VERTICAL OFFSETS WITH 45-DEGREE BENDS AS REQUIRED TO MAINTAIN REQUIRED SEPARATION.
1.120	FIRE HYDRANT, 6" GATE VALVE AND MAIN, SEE DETAILS 1 & 2, SHEET C-503.
1.121	GATE VALVE AND BOX, 10", SEE DETAIL 1, SHEET C-503.
1.122	CONTRACTOR TO PROTECT EXISTING ABANDONED HYDROZINE TANK. IF DISTURBED, CONTACT THE CONTRACTING OFFICER'S REPRESENTATIVE
1.123	8" OS&Y GATE VALVE IN MANHOLE, SEE DETAIL 4, SHEET C-504.
1.124	WATER MAIN, 10", 45-DEGREE BEND.
1.125	ALTITUDE VALVE LINE.
1.126	SEE PLUMBING PLANS FOR CONTINUATION INTO BUILDING.
1.127	CONTRACTOR SHALL COORDINATE NEW SERVICE LEAD WITH CONSUMERS ENERGY.. TOTAL GAS LOAD IS 3,966 MBH.
1.128	THE EXISTING GAS LEAD HAS BEEN ASSUMED TO BE ACTIVE AND IS ADEQUATE FOR A GAS LOAD OF 50 MBH. THE CONTRACTOR SHALL CONFIRM WITH CONSUMERS ENERGY THAT THIS ASSUMPTION IS ACCURATE.
1.129	ADJUST GATE VALVE/ VALVE BOX/ MANHOLE COVER TO PROPOSED GRADE.
1.130	CUT IN 6" BRANCH WATER MAIN TEE.
1.131	WATER MAIN, 8" DIP CL 54 WITH POLYETHYLENE (PE) ENCASEMENT.
1.132	WATER MAIN, 8", 45-DEGREE BEND.
1.133	UNDERGROUND FUEL AND VENT PIPING. SEE PLUMBING SUPPLY DRAWINGS FOR DETAILS.
1.134	HDPE STORM CATCH BASIN, SEE DETAIL 9, SHEET C-501. PIPE INVERT ELEVATIONS ON CB7484 WAS NOT AVAILABLE AT TIME OF TOPOGRAPHIC SURVEY. CONTRACTOR IS TO CONFIRM SLOPE FROM CB7484 TO CB5007 AND DETERMINE NEEDED INVERT ELEVATIONS AT NEW CATCH BASINS.
1.135	STORM SEWER, 12" HDPE AT 0.40%.

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MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
UTILITY PLAN & WATER MAIN PROFILE

SHEET NO.
C-104

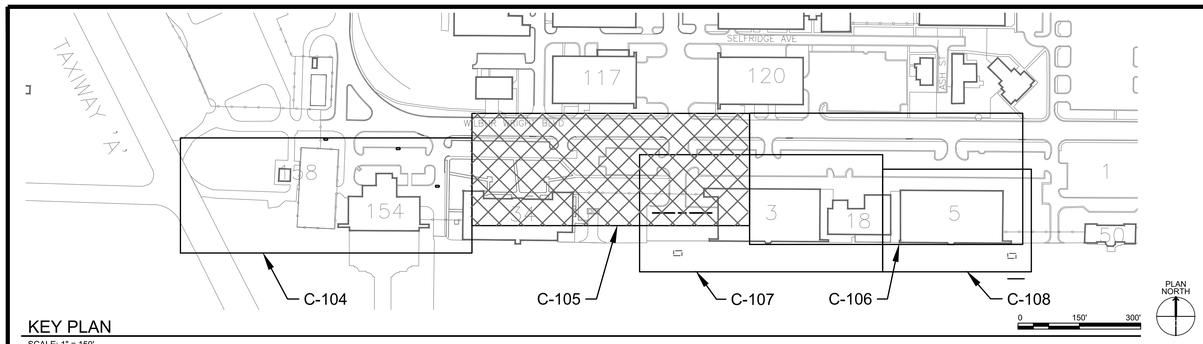
C:_PROJECTS\EP\2020_MI\Mi-2020\SHEETFILES\VGLZ162323-BLDG154 - IRC-104.DWG
12/9/2022 1:23:42 PM

GENERAL NOTES

1. SEE UTILITY COORDINATE PLAN SHEETS FOR ADDITIONAL INFORMATION ON UTILITY LOCATIONS.
2. SEE SHEET C-001 FOR CIVIL LEGEND.

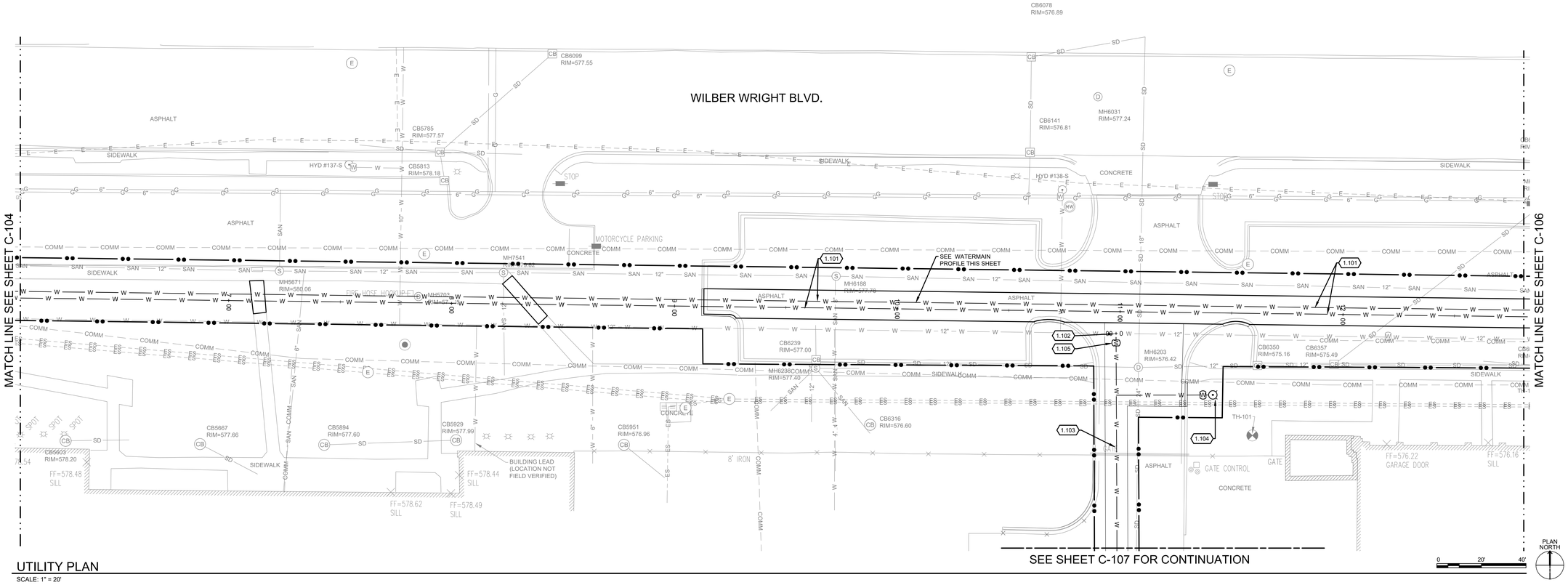
KEYED NOTES

1.101	WATER MAIN, 10" DIP CL 54 WITH POLYETHYLENE (PE) ENCASEMENT.
1.102	8" TAPPING SLEEVE AND GATE VALVE ON EXISTING 12" WATER MAIN. SEE DETAIL 2, SHEET C-504.
1.103	WATER MAIN, 8" DIP CL 54 WITH POLYETHYLENE (PE) ENCASEMENT.
1.104	FIRE HYDRANT WITH 6" GATE VALVE AND MAIN, SEE DETAILS 1 & 2, SHEET C-503.
1.105	GATE VALVE AND BOX, 8", SEE DETAIL 1, SHEET C-504.



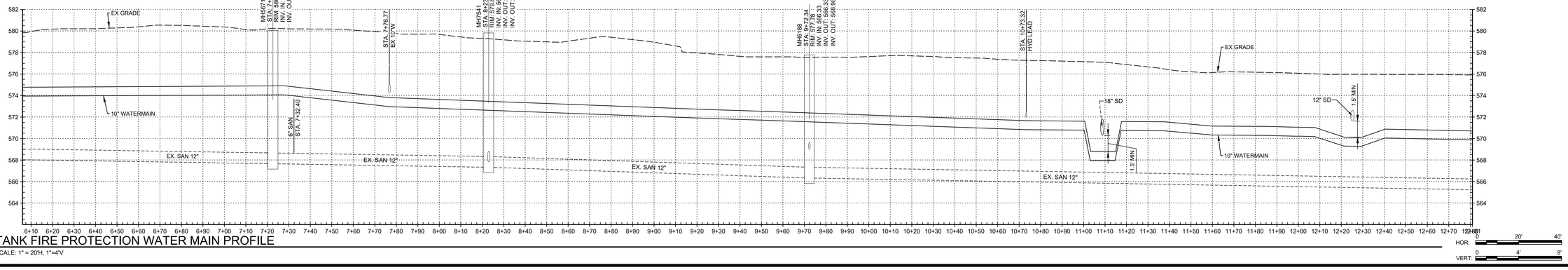
KEY PLAN

SCALE: 1" = 150'



UTILITY PLAN

SCALE: 1" = 20'



TANK FIRE PROTECTION WATER MAIN PROFILE

SCALE: 1" = 20'H, 1"=4'V

HOR: 0 20' 40'

VERT: 0 4' 8'

TETRA TECH
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MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

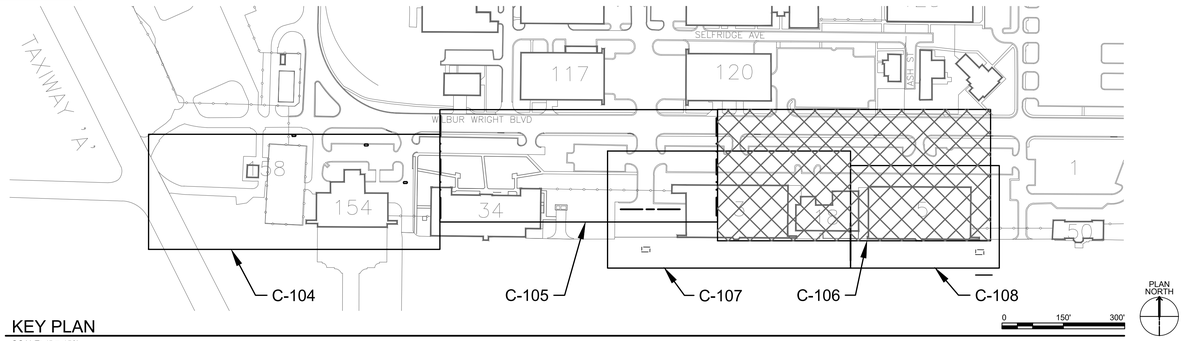
ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
UTILITY PLAN &
WATER MAIN PROFILE

SHEET NO.
C-105

C:_PROJECTS\ERC200-39546-2000035\SHEETFILES\VGLZ162323-BLDG 154 - BIC-104.DWG
12/6/2022 1:23:03 PM



KEY PLAN

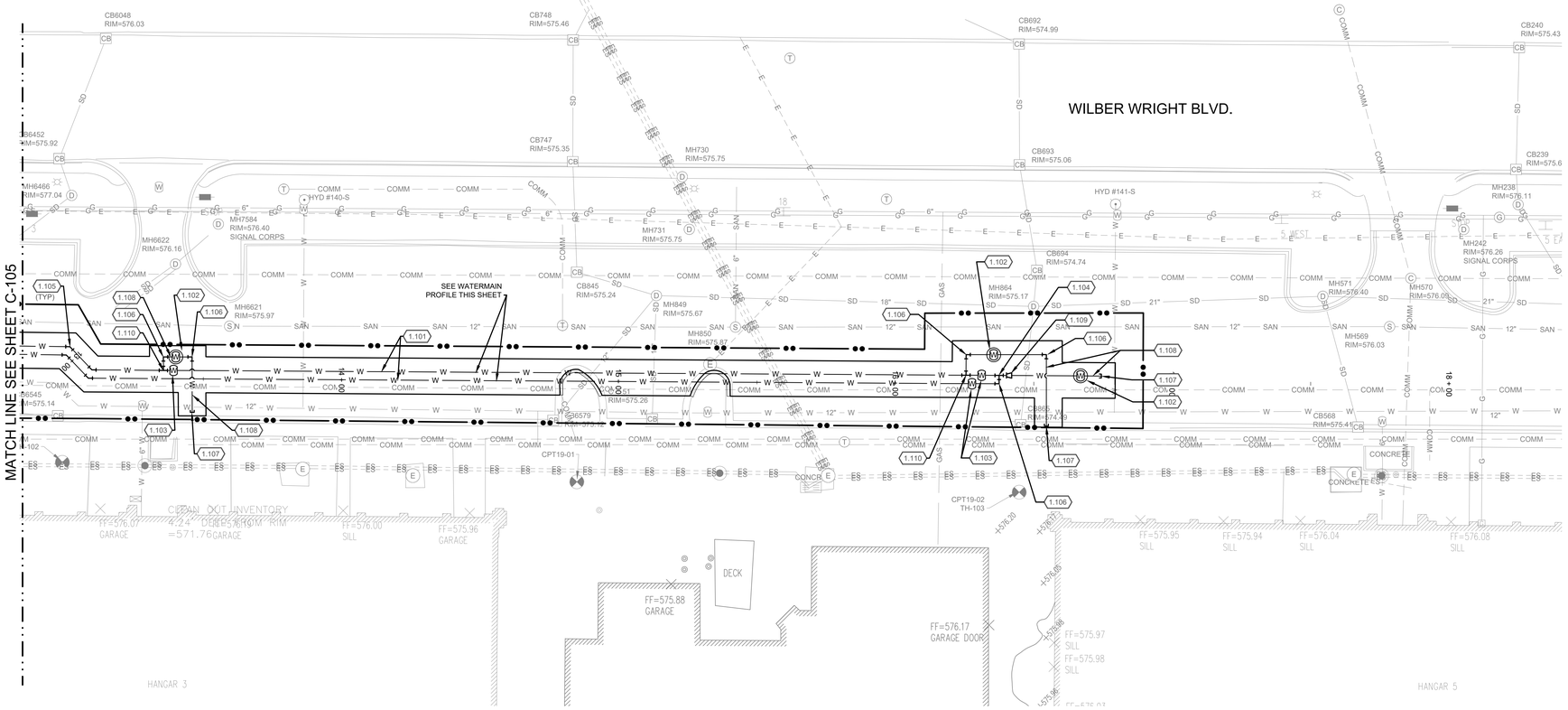
SCALE: 1" = 150'

GENERAL NOTES

1. SEE UTILITY COORDINATE PLAN SHEETS FOR ADDITIONAL INFORMATION ON UTILITY LOCATIONS.
2. SEE SHEET C-001 FOR CIVIL LEGEND.

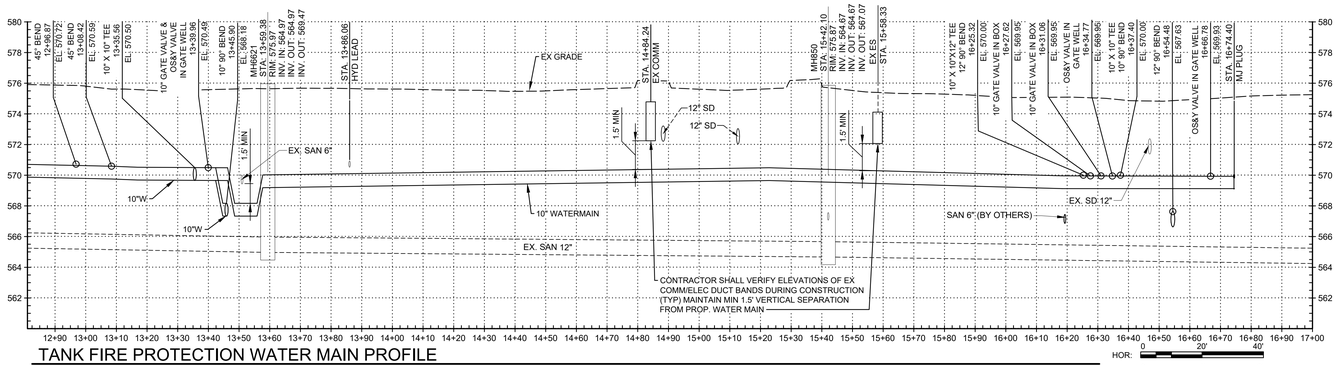
KEYED NOTES

1.101	WATER MAIN, 10" DIP CL 54 WITH POLYETHYLENE (PE) ENCASEMENT
1.102	12" OS&Y GATE VALVE IN GATE WELL, SEE DETAIL 4, SHEET C-504
1.103	GATE VALVE AND BOX, 10", SEE DETAIL 1, SHEET C-503
1.104	WATER MAIN, 10" X 10" X 10" TEE
1.105	WATER MAIN, 45-DEGREE BEND
1.106	WATER MAIN, 90-DEGREE BEND
1.107	MECHANICAL JOINT PLUG, 12"
1.108	WATER MAIN, 12" DIP CL 54 WITH POLYETHYLENE (PE) ENCASEMENT
1.109	WATER MAIN, 10"X12" REDUCER
1.110	WATER MAIN, 10"X10"X12" REDUCING TEE



UTILITY PLAN

SCALE: 1" = 20'



TANK FIRE PROTECTION WATER MAIN PROFILE

SCALE: 1" = 20'H, 1"=4'V

HOR: 0 20' 40'

VERT: 0 4' 8'

TETRA TECH Mead & Hunt
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MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
UTILITY PLAN &
WATER MAIN PROFILE

SHEET NO.
C-106

O:\PROJECT\ANN ARBOR\EIN\SHEETS\EXCEL\162323-BLDG-154 - REC-104.DWG
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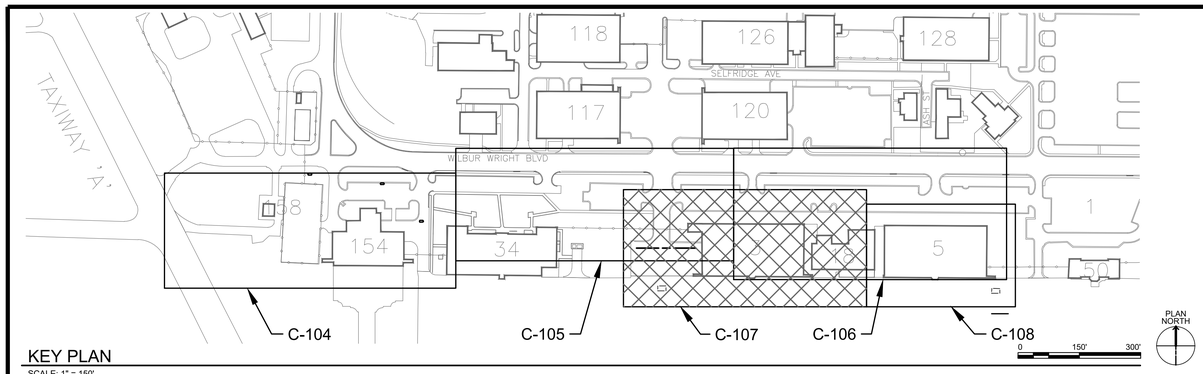
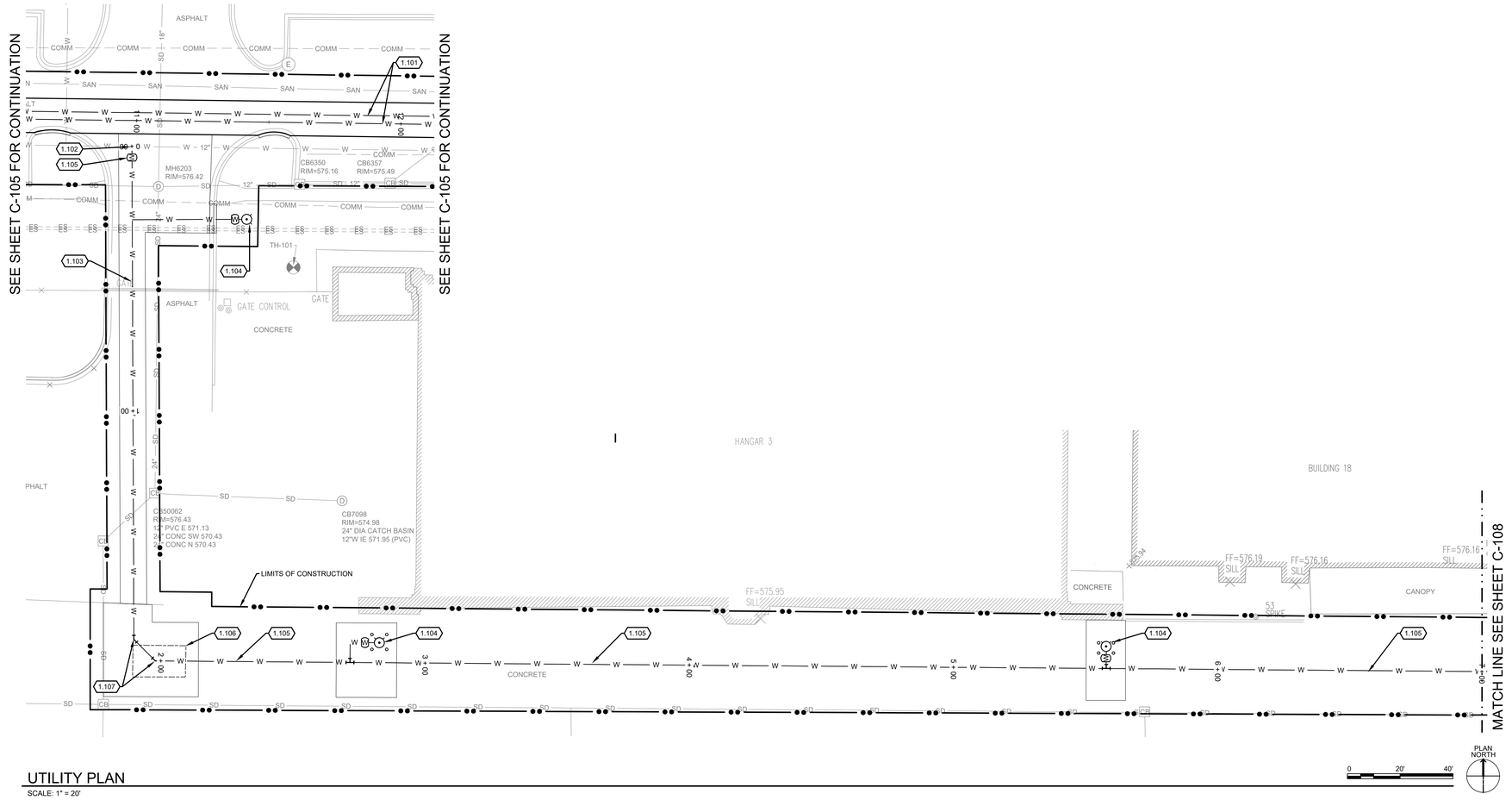


KEY PLAN

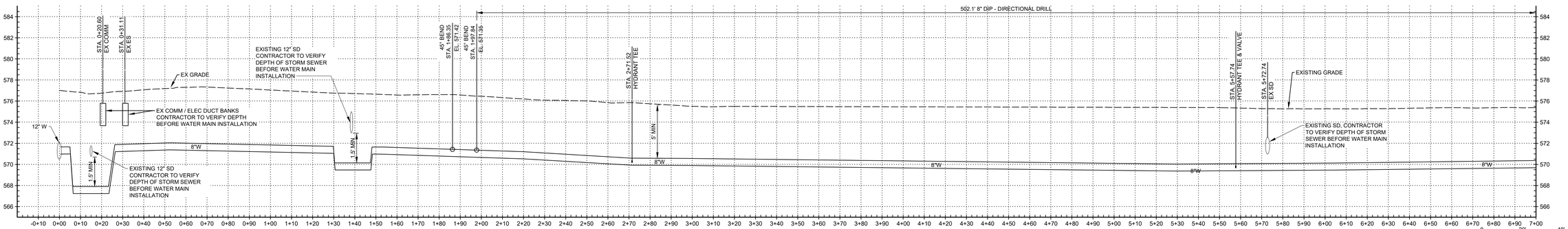
SCALE: 1" = 150'

WILBER WRIGHT BLVD.



UTILITY PLAN

SCALE: 1" = 20'



8" WATER MAIN PROFILE

SCALE: 1" = 20'H, 1"=4'V

HOR: 0 20' 40'

VERT: 0 4' 8'

GENERAL NOTES

1. SEE UTILITY COORDINATE PLAN SHEETS FOR ADDITIONAL INFORMATION ON UTILITY LOCATIONS.
2. SEE SHEET C-001 FOR CIVIL LEGEND.

KEYED NOTES

1.101	WATER MAIN, 10" DIP CL 54 WITH POLYETHYLENE (PE) ENCASEMENT.
1.102	CUT IN 8" WATER MAIN TEE
1.103	WATER MAIN, 8" DIP CL 54 WITH POLYETHYLENE (PE) ENCASEMENT.
1.104	FIRE HYDRANT WITH 6" GATE VALVE AND MAIN, SEE DETAILS 1 & 2, SHEET C-503.
1.105	WATER MAIN, 8" DIP CL 54. WITH POLYETHYLENE (PE) ENCASEMENT. DIRECTIONAL DRILLED.
1.106	12' X 20' BORE PIT FOR DIRECTIONAL DRILL OPERATION.
1.107	WATER MAIN, 45-DEGREE BEND
1.108	GATE VALVE AND BOX, 8", SEE DETAIL 1, SHEET C-503.

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

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12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
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SHEET CONTENTS
UTILITY PLAN &
WATER MAIN PROFILE

SHEET NO.
C-107

C:_PROJECTS\EP\200-3864\8-200\03\BIM\ETTALES\VGLZ162323-BLDG 154 - IRC-104.DWG
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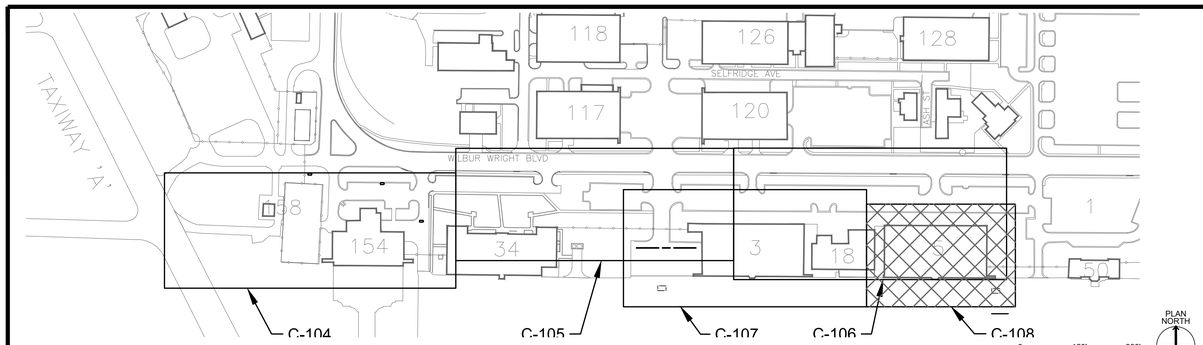
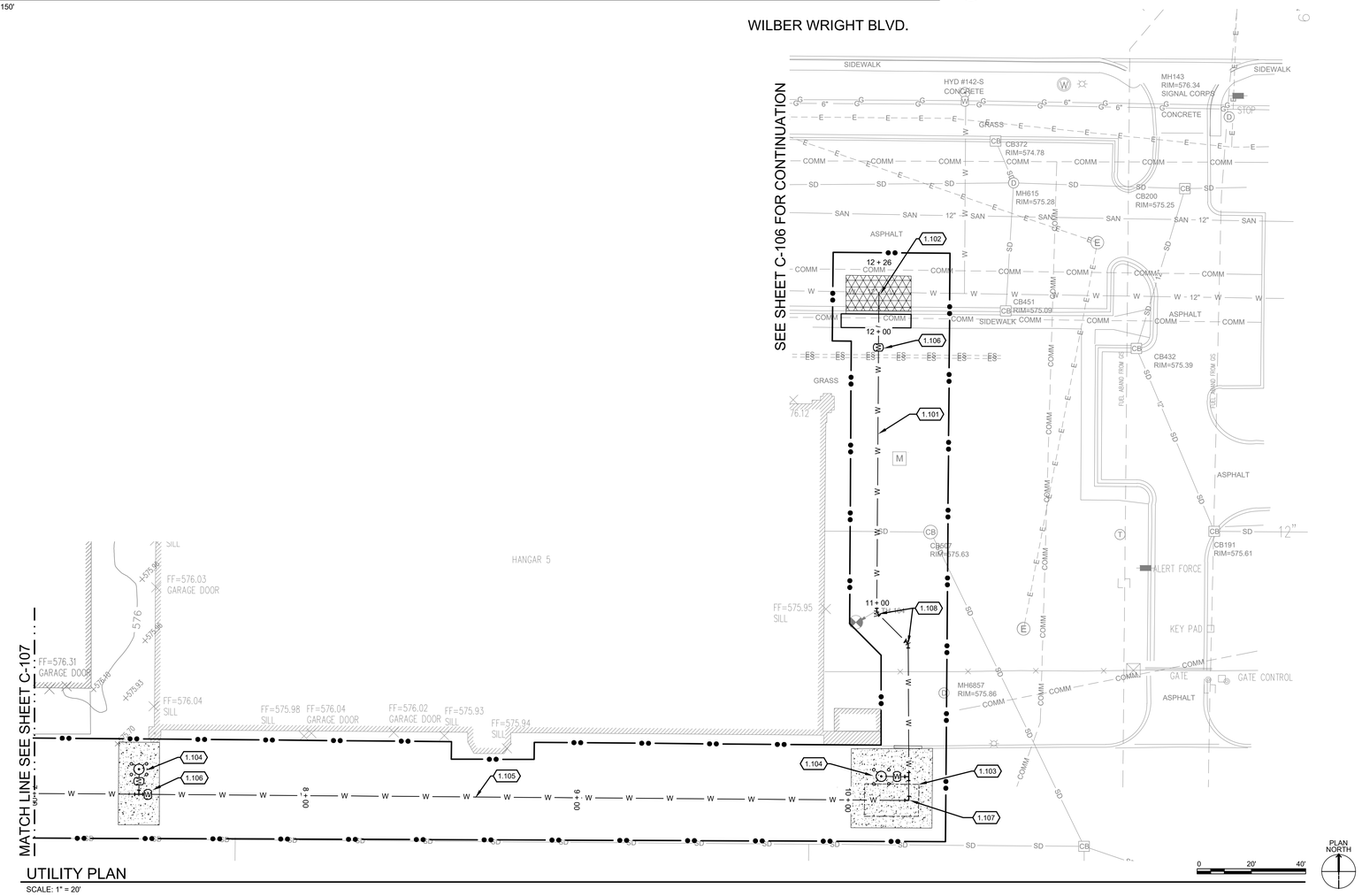


KEY PLAN

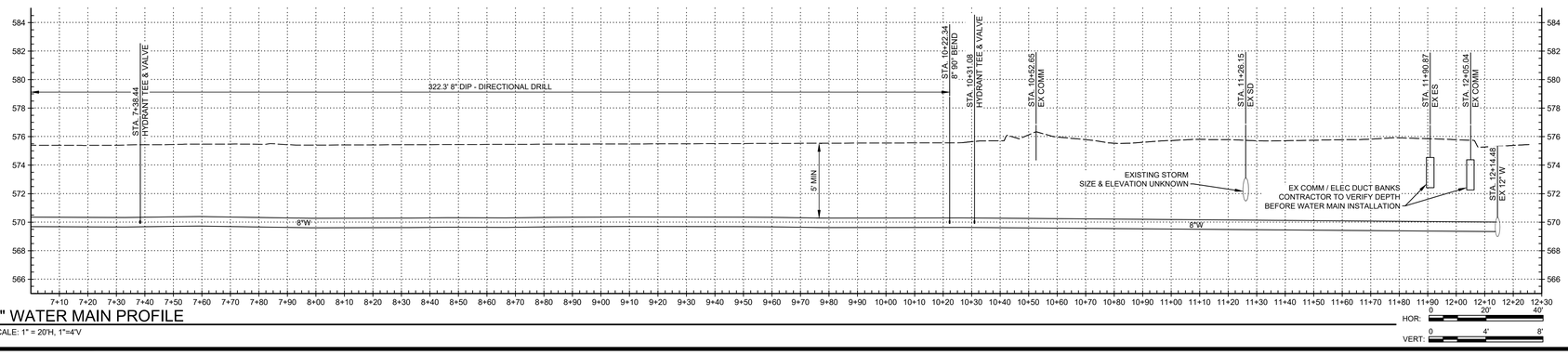
SCALE: 1" = 150'

WILBER WRIGHT BLVD.



UTILITY PLAN

SCALE: 1" = 20'



8" WATER MAIN PROFILE

SCALE: 1" = 20'H, 1"=4'V

GENERAL NOTES

1. SEE UTILITY COORDINATE PLAN SHEETS FOR ADDITIONAL INFORMATION ON UTILITY LOCATIONS.
2. SEE SHEET C-001 FOR CIVIL LEGEND.

KEYED NOTES

1.101	WATER MAIN, 8" DIP CL 54 WITH POLYETHYLENE (PE) ENCASEMENT.
1.102	CUT IN 8" WATER MAIN TEE
1.103	12' X 20' BORE PIT FOR DIRECTIONAL DRILL OPERATION.
1.104	FIRE HYDRANT WITH 6" GATE VALVE AND MAIN, SEE DETAILS 1 & 2, SHEET C-503.
1.105	WATER MAIN, 8" DIP CL 54. WITH POLYETHYLENE (PE) ENCASEMENT. DIRECTIONAL DRILLED.
1.106	GATE VALVE AND BOX, 8", SEE DETAIL 1, SHEET C-503.
1.107	WATER MAIN, 90-DEGREE BEND.
1.108	WATER MAIN, 45-DEGREE BEND.

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

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12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
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DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
UTILITY PLAN &
WATER MAIN PROFILE

SHEET NO.
C-108

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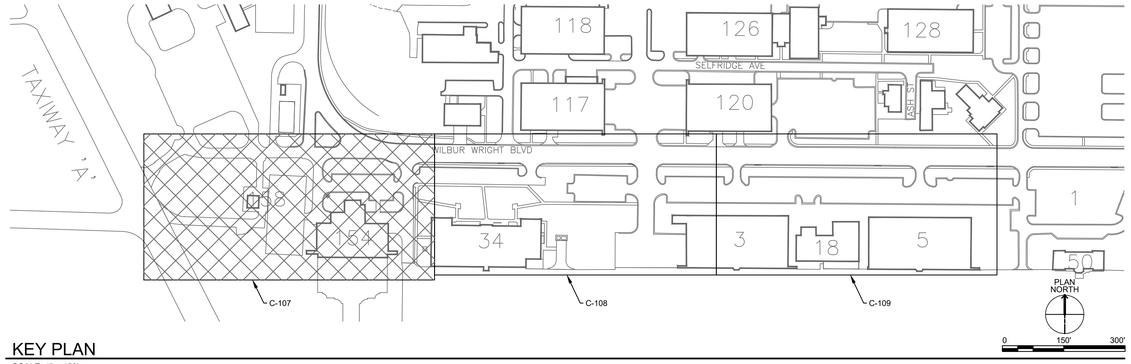

KEY PLAN

SCALE: 1" = 150'

KEYED NOTES

1.101	TEMPORARY INLET PROTECTION, SEE DETAIL 8, SHEET C-501
1.102	SILT FENCE, SEE DETAIL 7, SHEET C-501
1.103	TANK OVERFLOW CONCRETE SLAB, SEE DETAIL 9, SHEET C-501
1.104	LOWER RIM ELEVATION TO 577.68
1.105	EMERGENCY ROOF DOWNSPOUT NOZZLE. SEE PLUMBING DRAWINGS FOR DETAILS

WILBER WRIGHT BLVD.

B158 FIRE PUMP HOUSE

WATER STORAGE TANK

BUILDING 154

FUEL CELL STORAGE AREA

APPROXIMATE 200' TAXIWAY OFFSET FOR C-17 AIRCRAFT

LIMITS OF CONSTRUCTION

MATCH EXISTING GRADES

MATCH EXISTING GRADES (TYP UNLESS NOTED)

MH 5003 RIM 578.17

BLDG. ADDITIONS FFE 579.10

33' UNOBSTRUCTED SPACE SETBACK (FOR INFORMATION ONLY)

PED XING HYD #136-S

8" IRON

MATCH LINE SEE SHEET C-110

GRADING PLAN

SCALE: 1" = 20'

PLAN NORTH

0 20' 40'

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SHEET CONTENTS
GRADING & SOIL EROSION & SEDIMENTATION CONTROL PLAN

SHEET NO.
C-109

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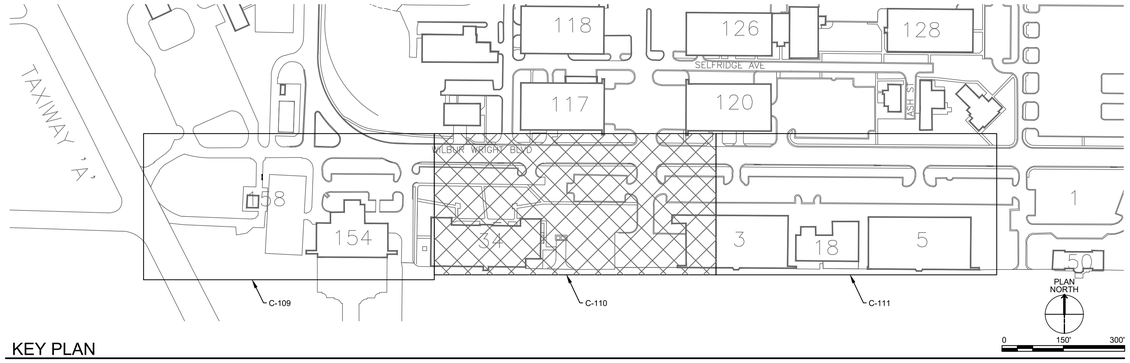
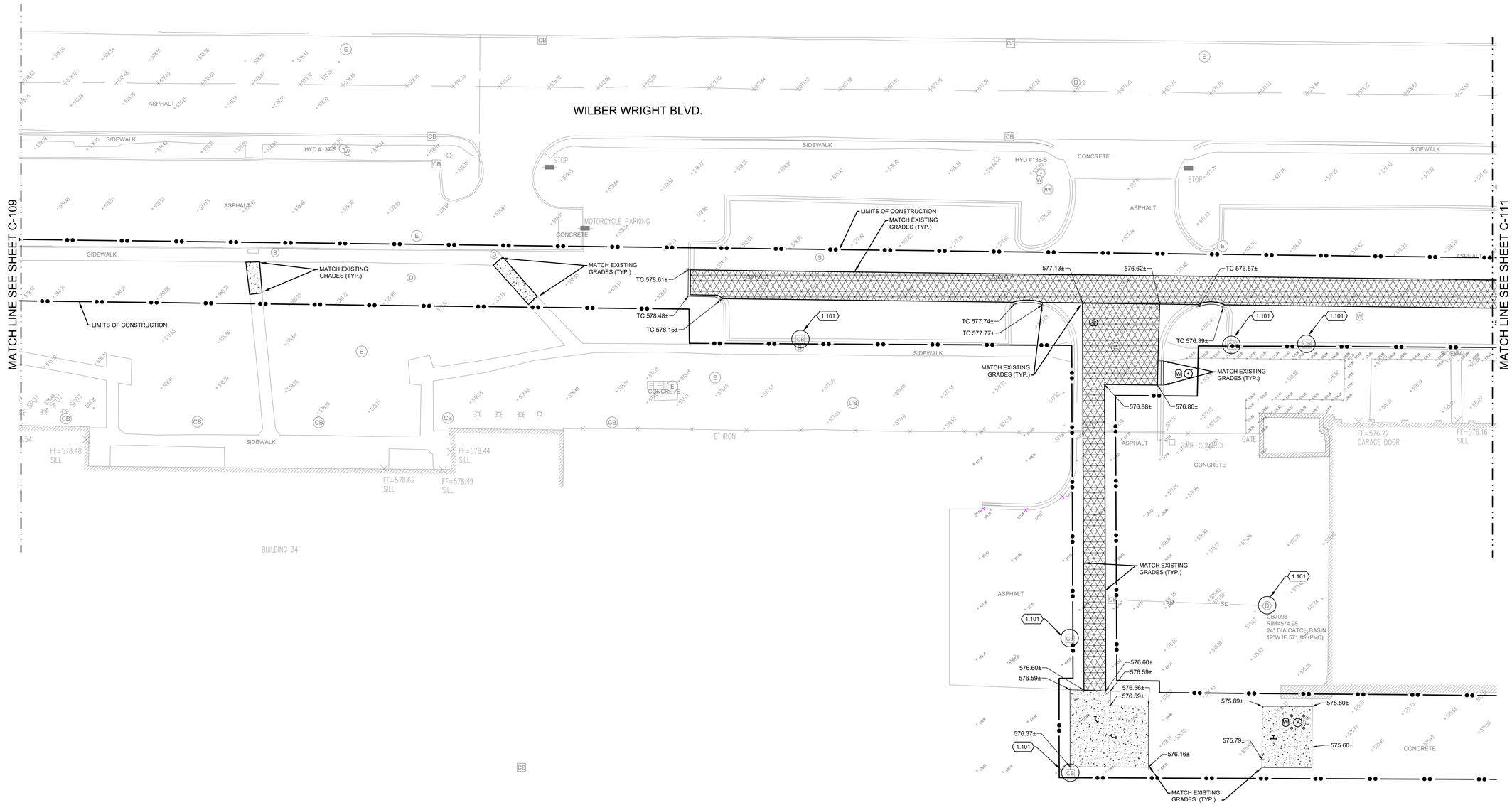


KEY PLAN

SCALE: 1" = 150'

KEYED NOTES

1.101 TEMPORARY INLET PROTECTION, SEE DETAIL 8, SHEET C-501



GRADING PLAN

SCALE: 1" = 20'

PLAN NORTH

0 20' 40'

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SHEET CONTENTS
GRADING & SOIL EROSION & SEDIMENTATION CONTROL PLAN

SHEET NO.
C-110

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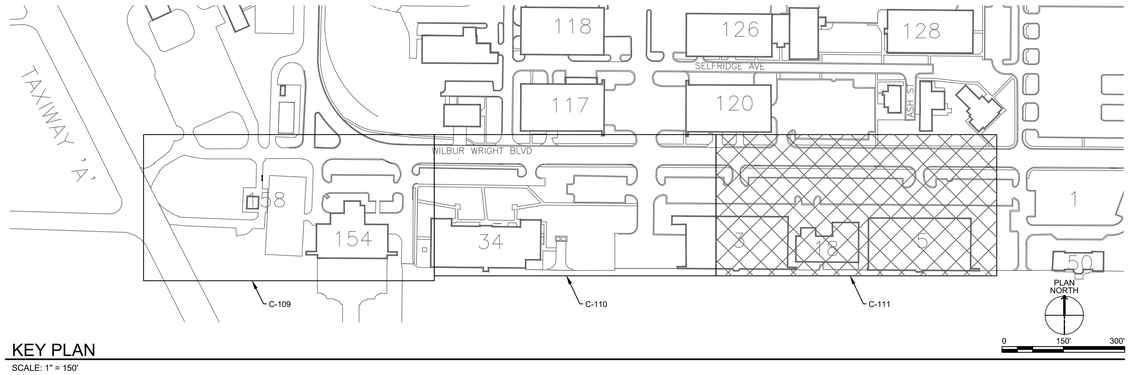
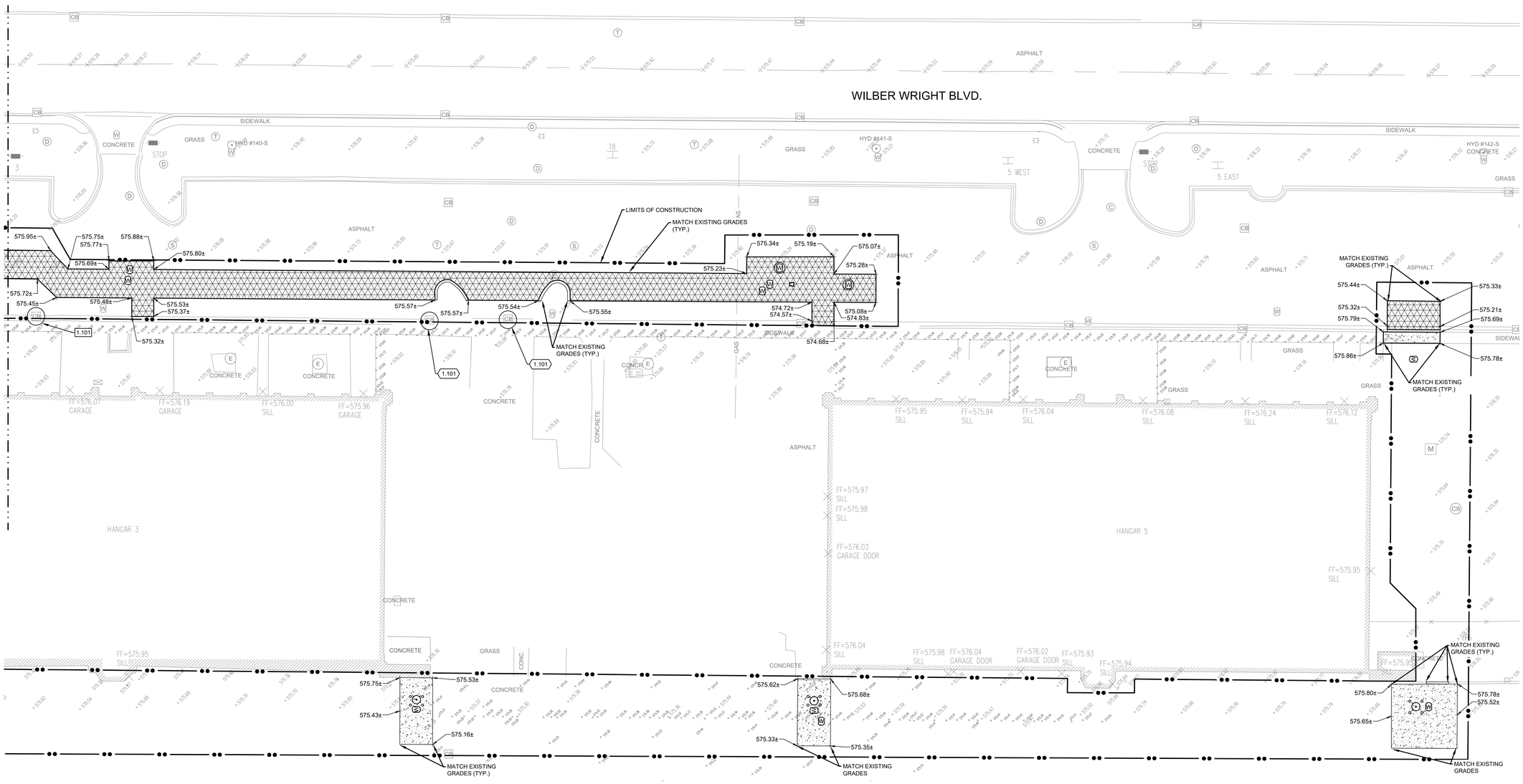


KEY PLAN

SCALE: 1" = 150'

KEYED NOTES

1.101 TEMPORARY INLET PROTECTION, SEE DETAIL 8, SHEET C-501



GRADING PLAN

SCALE: 1" = 20'

PLAN NORTH

0 20' 40'

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SHEET CONTENTS
GRADING & SOIL EROSION & SEDIMENTATION CONTROL PLAN

SHEET NO.
C-111

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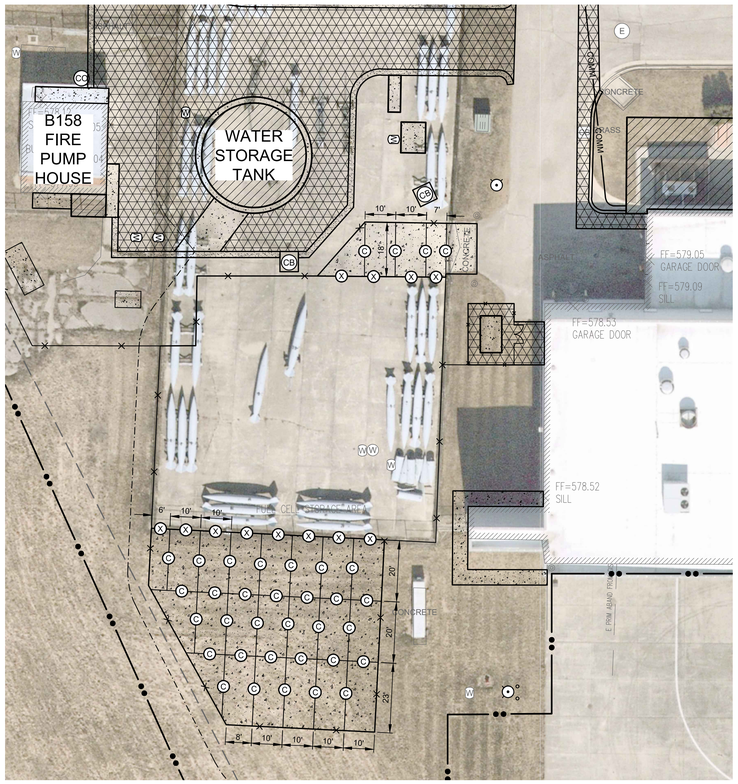

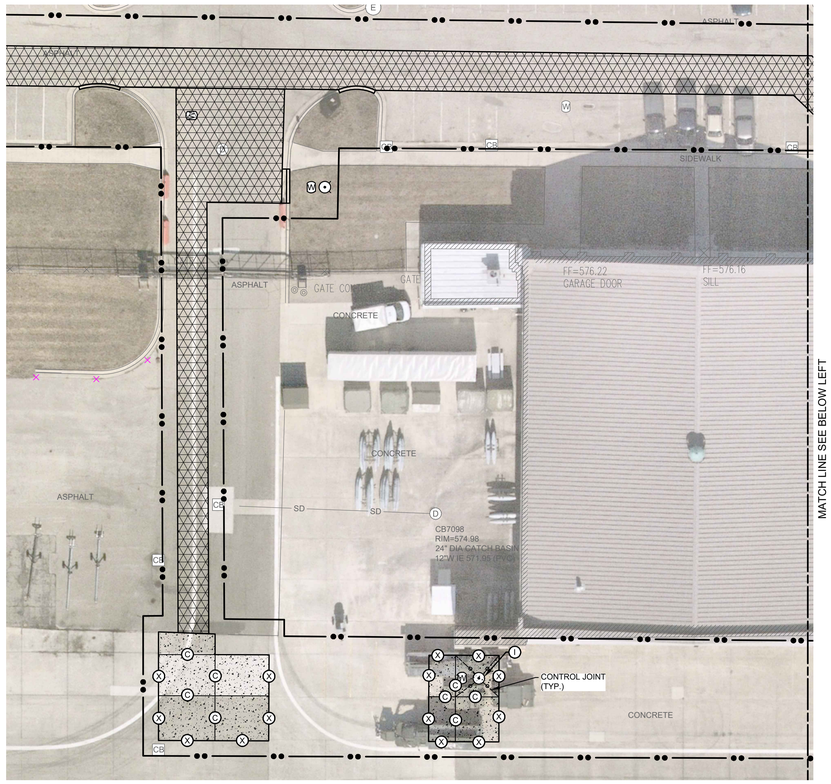

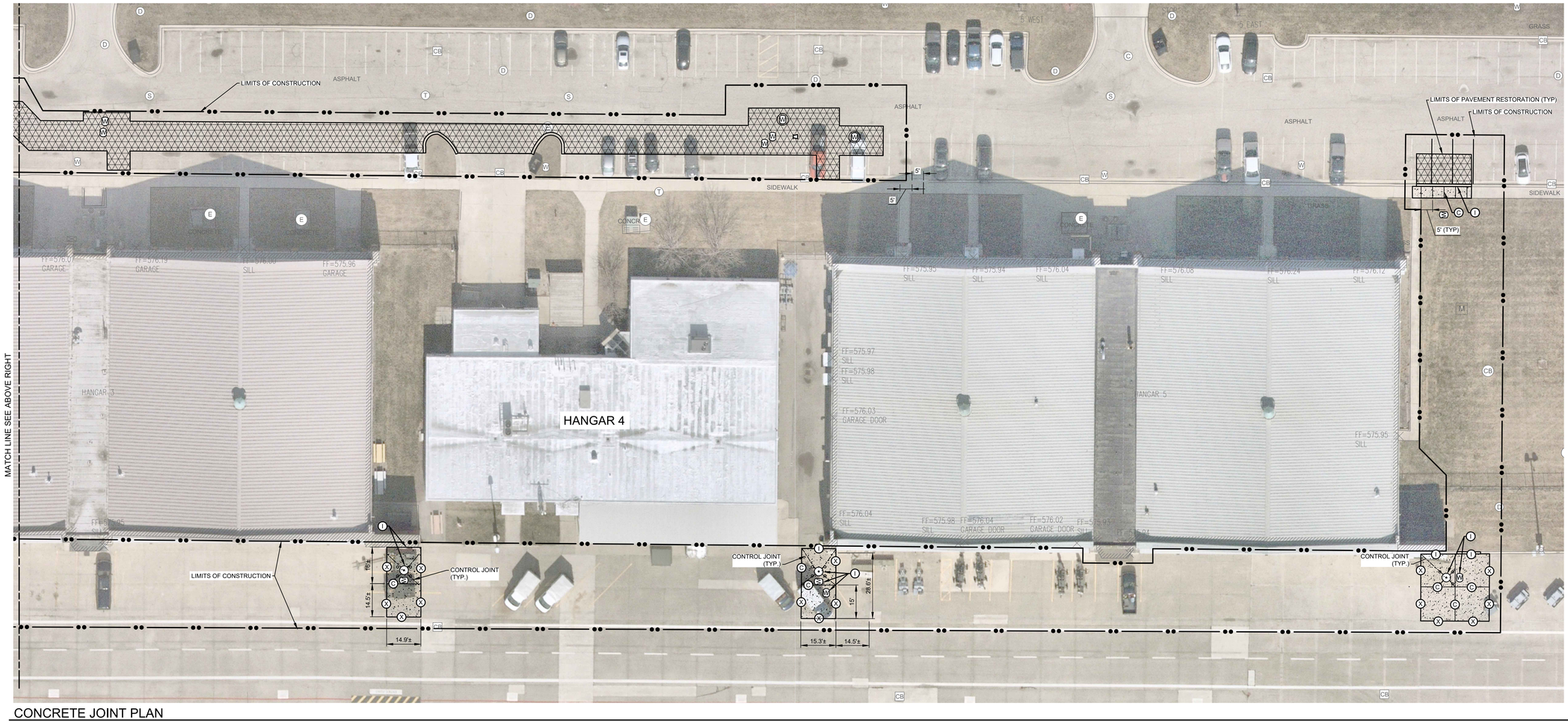

CONCRETE JOINT PLAN

SCALE: 1" = 20'

PLAN NORTH

0 20' 40'

NOTES

1. MATCH EXISTING JOINT PATTERN. JOINT DIMENSION VARIES. CONTRACTOR SHALL FIELD VERIFY EXACT JOINT LOCATION AND MAINTAIN EXISTING JOINT SPACING FOR ALL NEW JOINTS.

JOINT PLAN NOTES

C SAWED CONTRACTION JOINT, SEE DETAIL 1, SHEET C-507.

I ISOLATION JOINT, SEE DETAIL 12, SHEET C-502.

X DOWELED CONSTRUCTION JOINT AT EXISTING PAVEMENT, SEE DETAIL 4, SHEET C-507.

R PROVIDE REINFORCED PPC PAVEMENT PER DETAIL 5, SHEET C-507.

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28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

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HEF MOD

ANG NO.: VGLZ162323
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SHEET CONTENTS
CONCRETE JOINT PLAN

SHEET NO.
C-112

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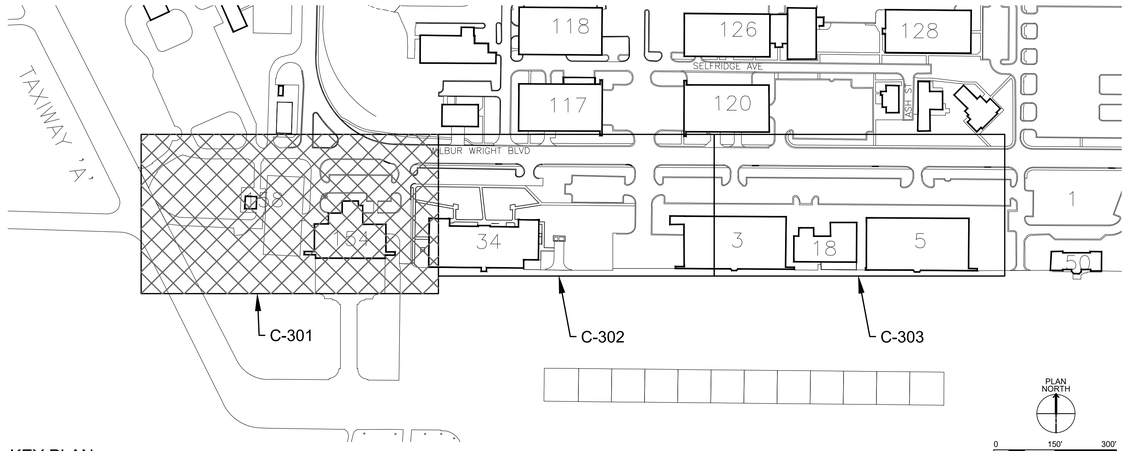
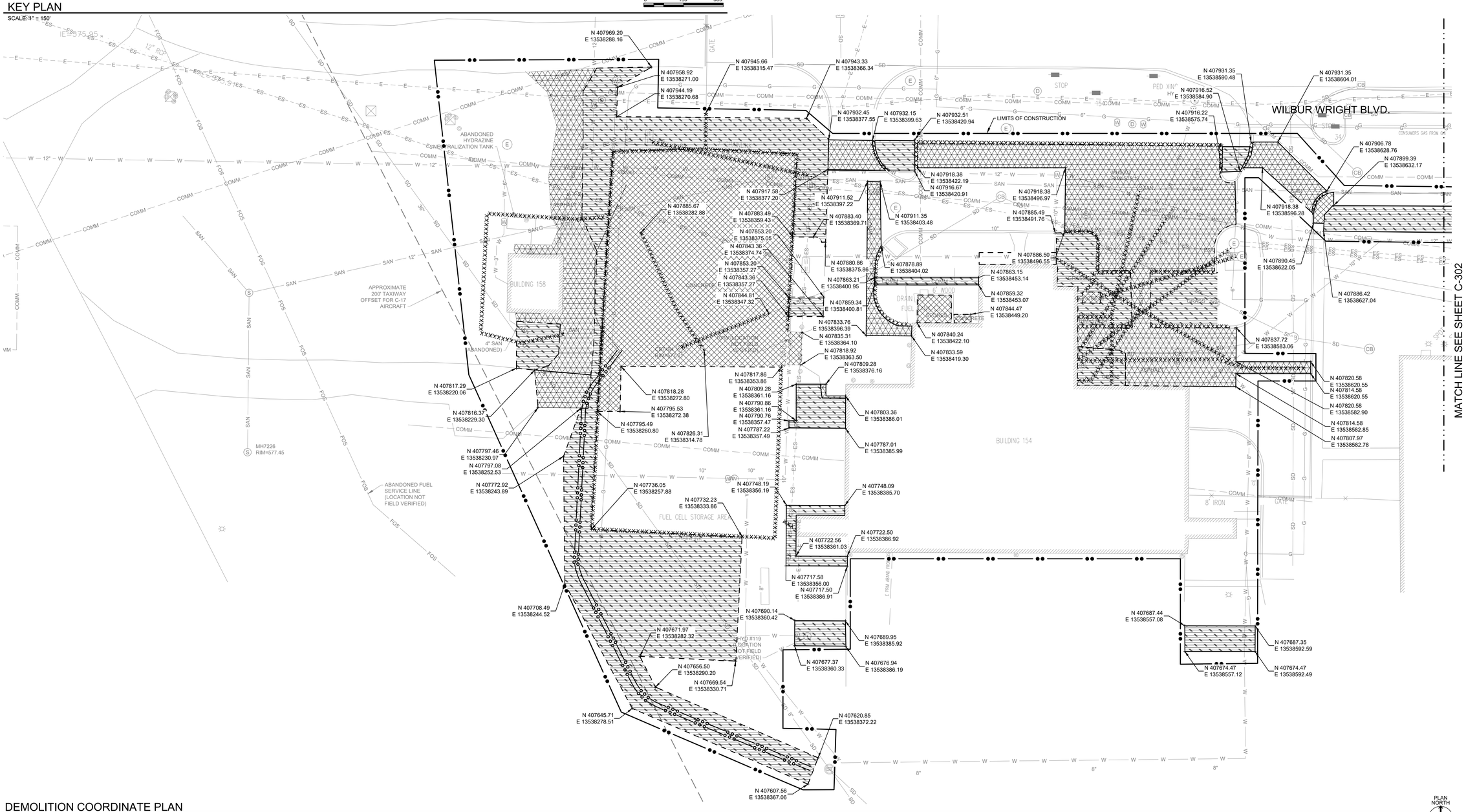


KEY PLAN

SCALE: 1" = 150'

DEMOLITION LEGEND

- BITUMINOUS HMA PAVEMENT REMOVAL
- CONCRETE REMOVAL
- STRIP SOD & TOPSOIL
- STRUCTURE REMOVAL
- REMOVE LINEAR FEATURE
- SAWCUT LINE



DEMOLITION COORDINATE PLAN

SCALE: 1" = 20'

PLAN NORTH

0 20' 40'

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CHECKED BY:	KLJ

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SHEET CONTENTS
DEMOLITION COORDINATE PLAN

SHEET NO.
C-301

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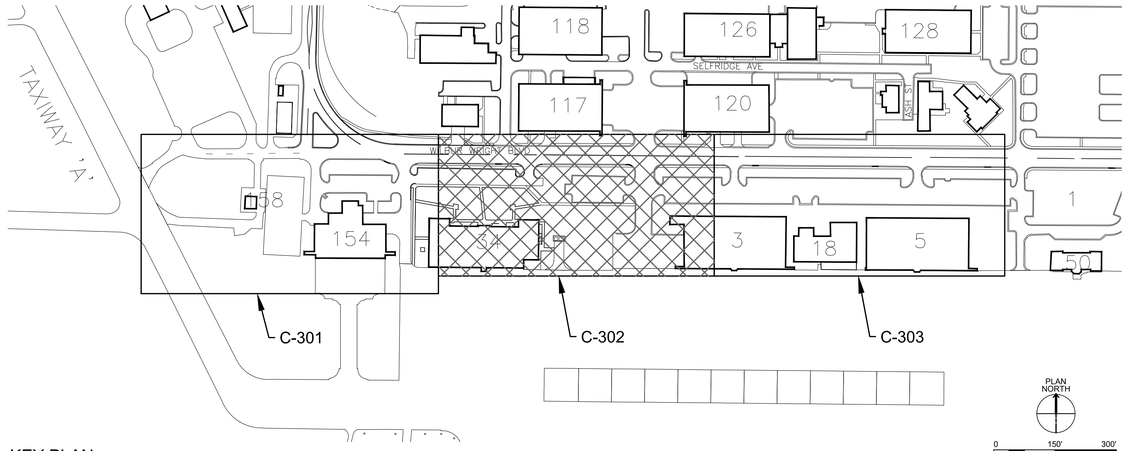
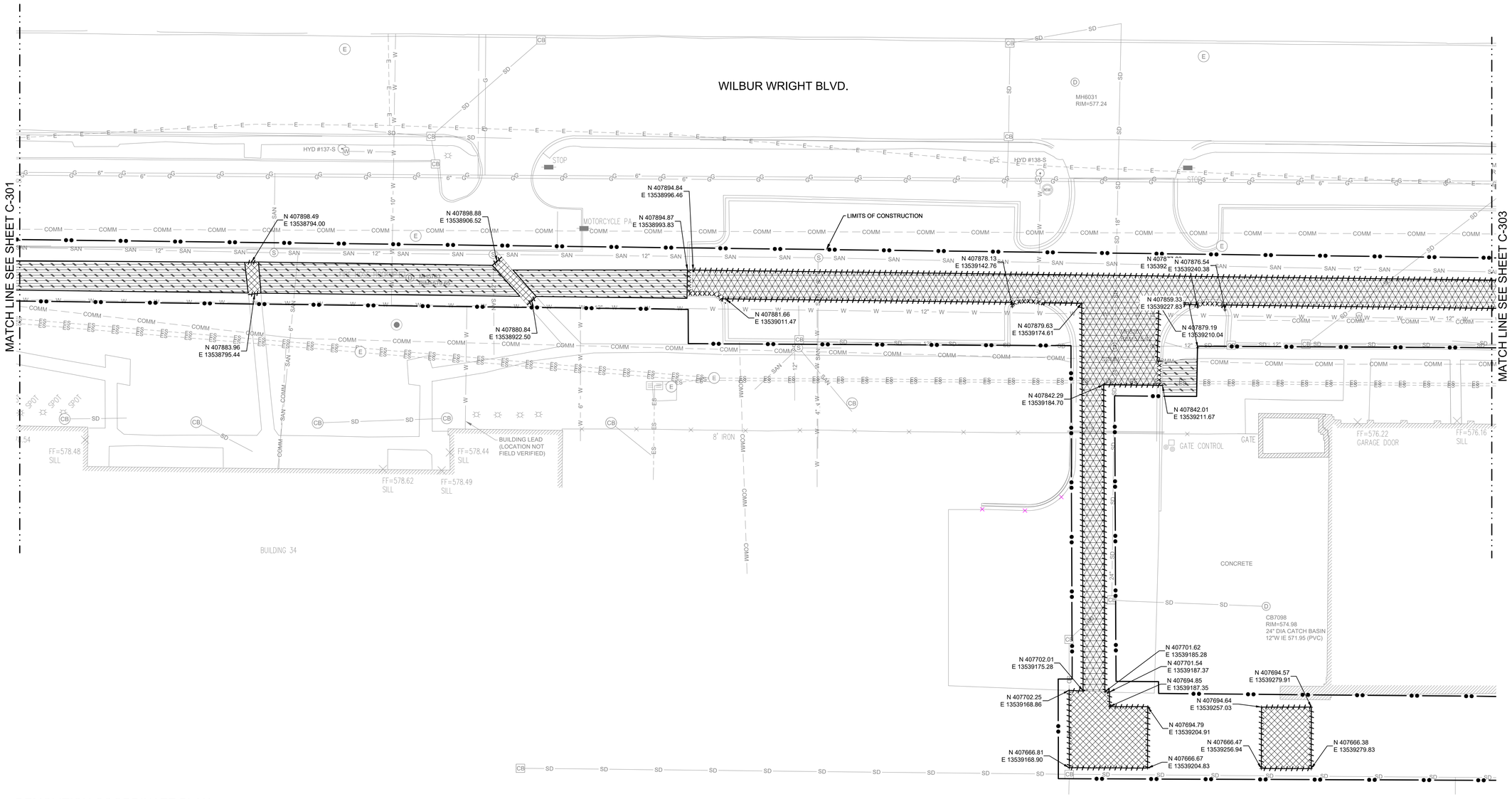


KEY PLAN

SCALE: 1" = 150'

DEMOLITION LEGEND

	BITUMINOUS HMA PAVEMENT REMOVAL		STRUCTURE REMOVAL
	CONCRETE REMOVAL	xxxxxxxxxxxx-	REMOVE LINEAR FEATURE
	STRIP SOD & TOPSOIL	-+-+-+-+-+-+-	SAWCUT LINE



DEMOLITION COORDINATE PLAN

SCALE: 1" = 20'

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SHEET CONTENTS
DEMOLITION
COORDINATE PLAN

SHEET NO.
C-302

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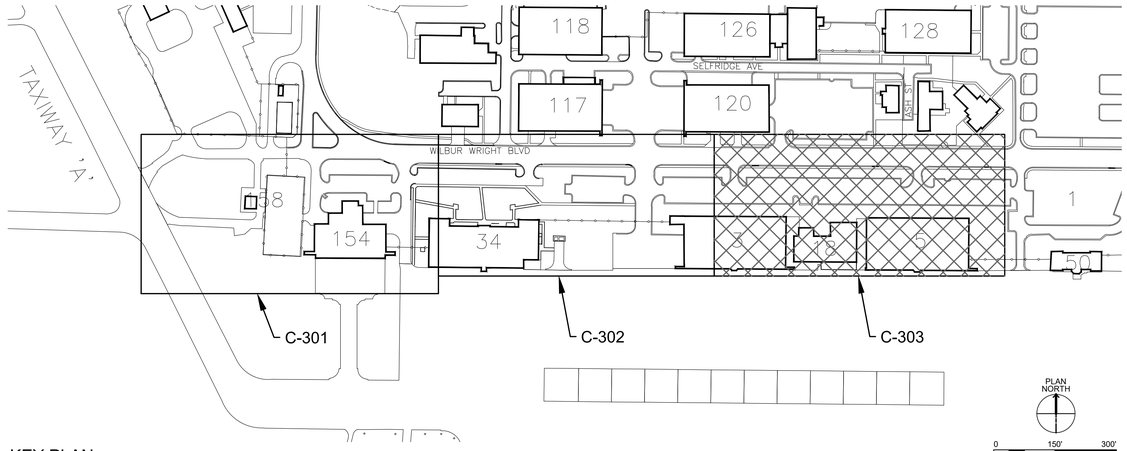
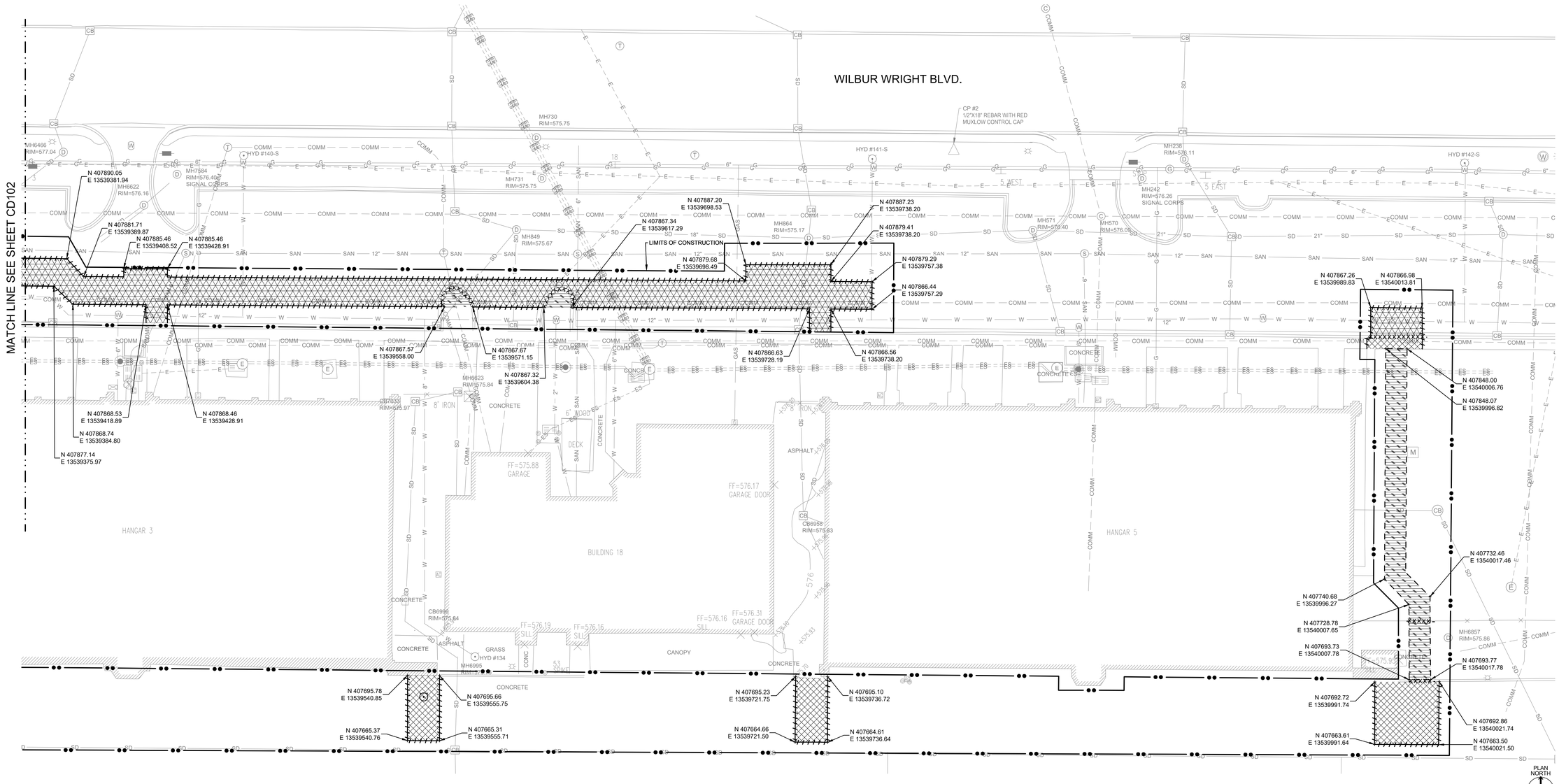


KEY PLAN

SCALE: 1" = 150'

DEMOLITION LEGEND

	BITUMINOUS HMA PAVEMENT REMOVAL		STRUCTURE REMOVAL
	CONCRETE REMOVAL	xxxxxxxxxxxxx	REMOVE LINEAR FEATURE
	STRIP SOD & TOPSOIL		SAWCUT LINE



DEMOLITION COORDINATE PLAN

SCALE: 1" = 20'

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HARRISON TWP, MICHIGAN

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SHEET CONTENTS
DEMOLITION COORDINATE PLAN

SHEET NO.
C-303

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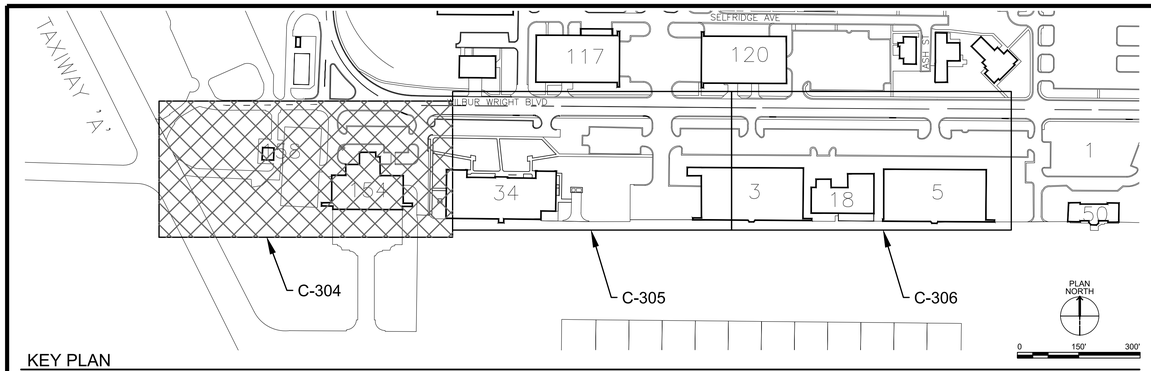
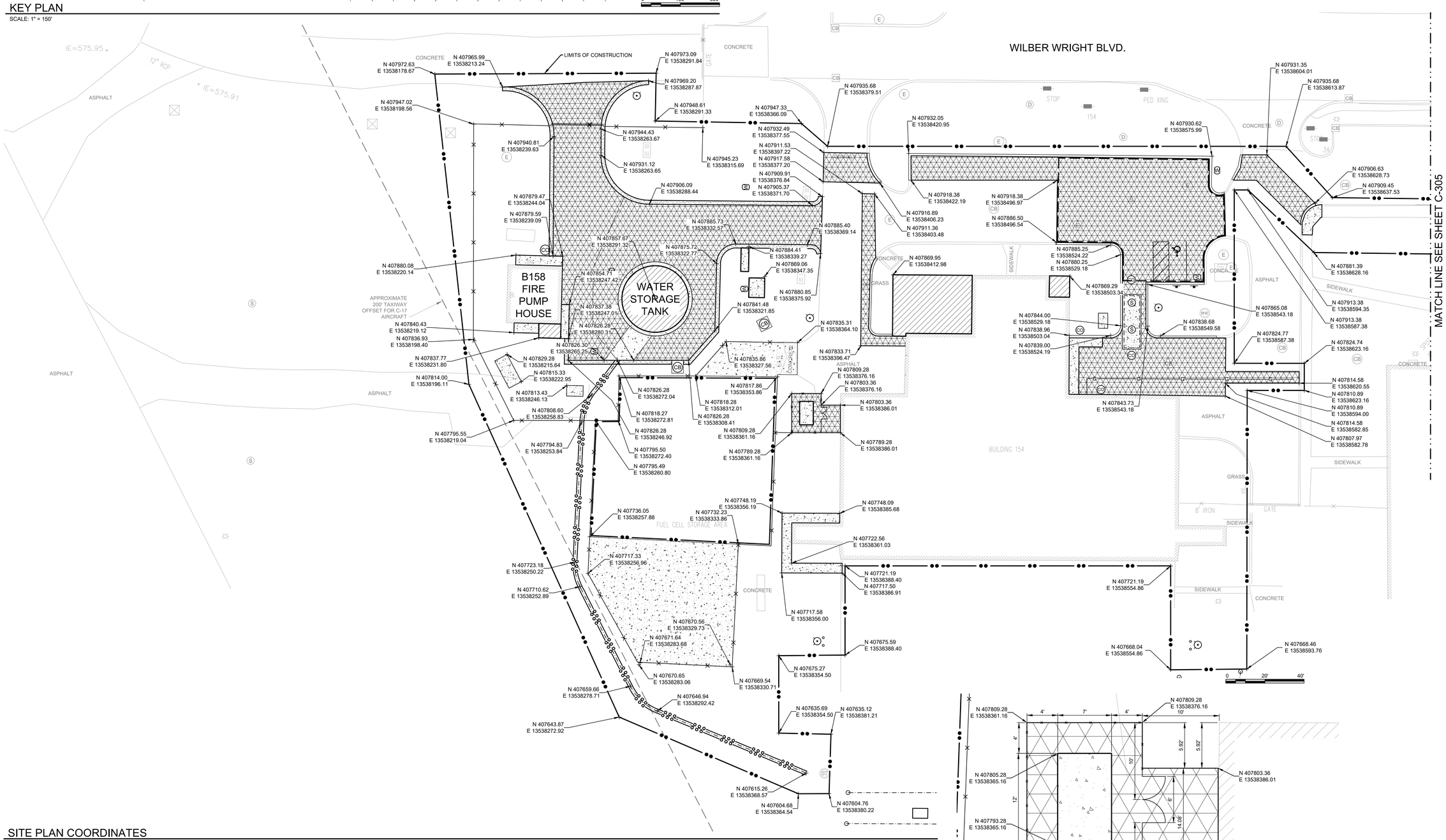


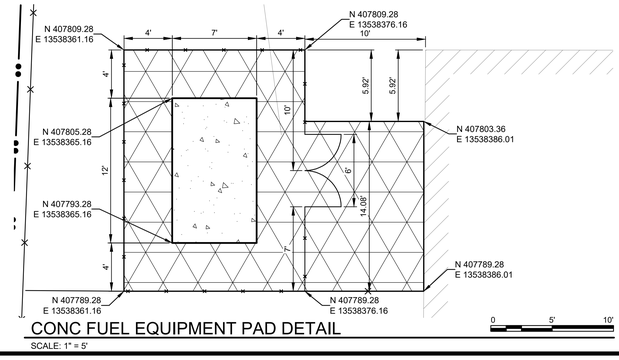
KEY PLAN

SCALE: 1" = 150'



SITE PLAN COORDINATES

SCALE: 1" = 20'



CONC FUEL EQUIPMENT PAD DETAIL

SCALE: 1" = 5'

PLAN NORTH

0
5'
10'

TETRA TECH
Mead & Hunt
Joint Venture with
Mason&Hanger

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WE STAND READY

MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.:	VGLZ162323
M&H NO.:	3141700-181848.01
DATE:	December 16, 2022
DESIGNED BY:	DGW
DRAWN BY:	SHG
CHECKED BY:	KLJ

DO NOT SCALE DRAWINGS

SHEET CONTENTS
SITE PLAN
COORDINATES

SHEET NO.
C-304

O:\PROJECTS\ANN ARBOR\REPLMS\60200.3864\8-200\CAD\SHEETFILES\VGLZ162323-BLDG-154 - BC-304.DWG
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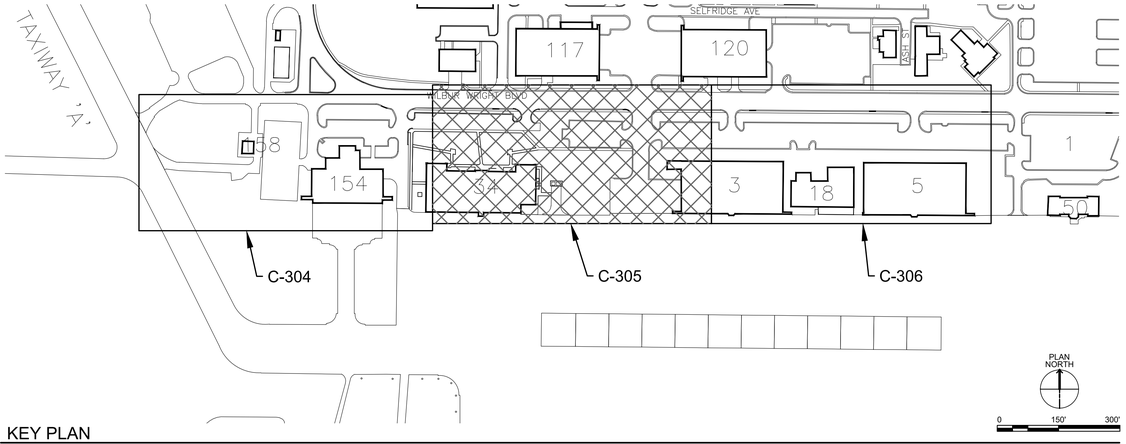
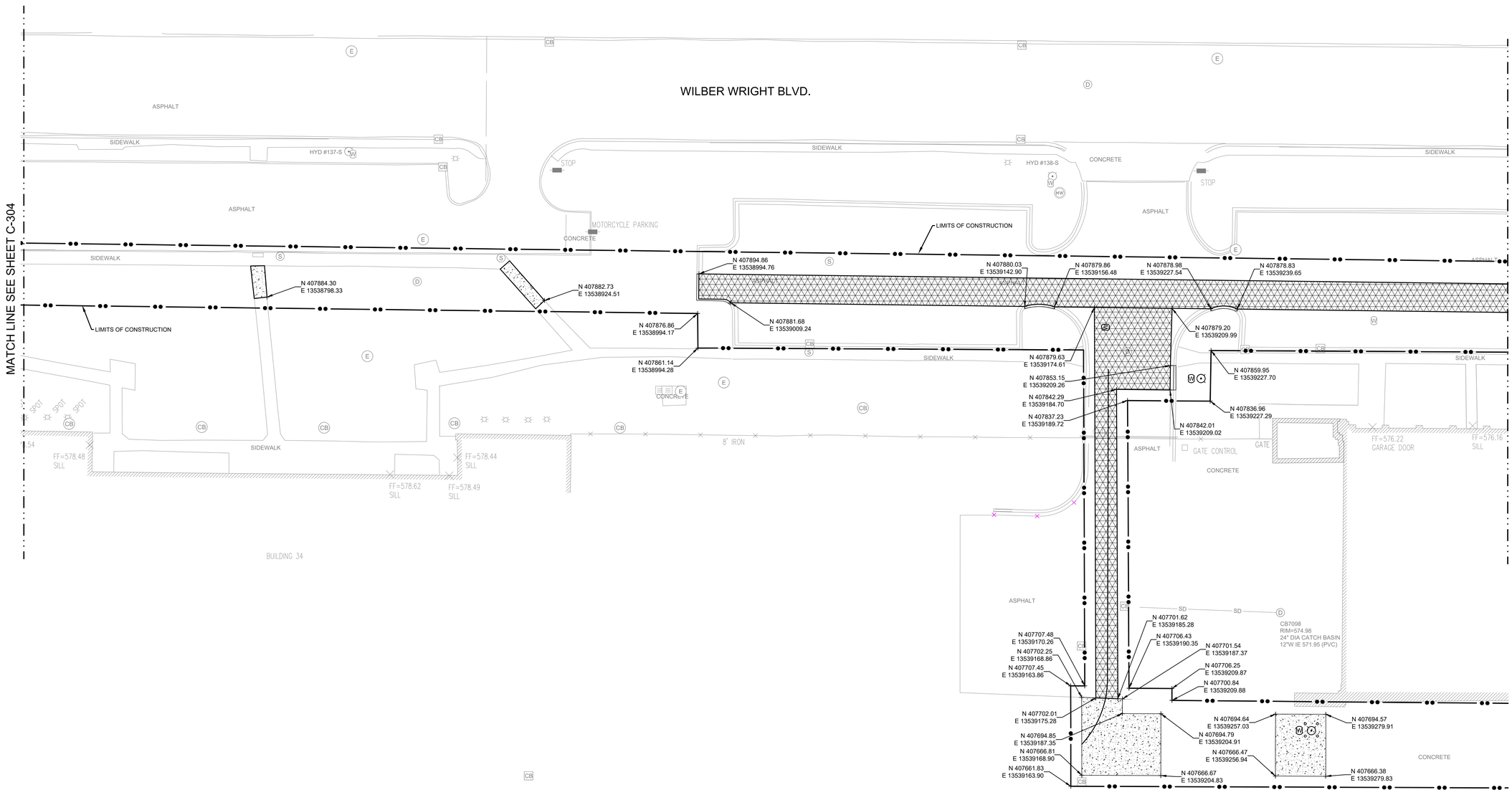


KEY PLAN

SCALE: 1" = 150'



SITE PLAN COORDINATES

SCALE: 1" = 20'

PLAN NORTH

0 20' 40'

TETRA TECH
Mead & Hunt
Joint Venture with
Mason & Hanger

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
SITE PLAN COORDINATES

SHEET NO.
C-305

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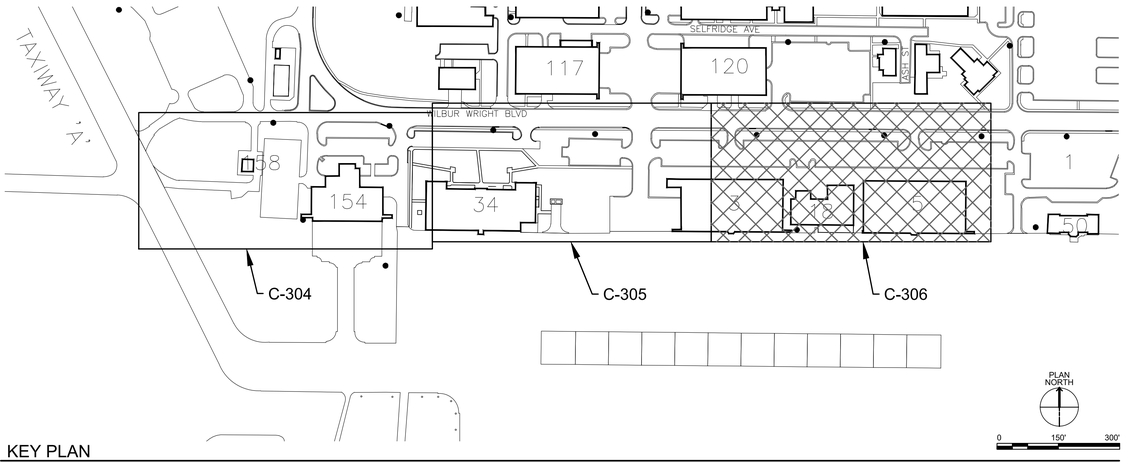
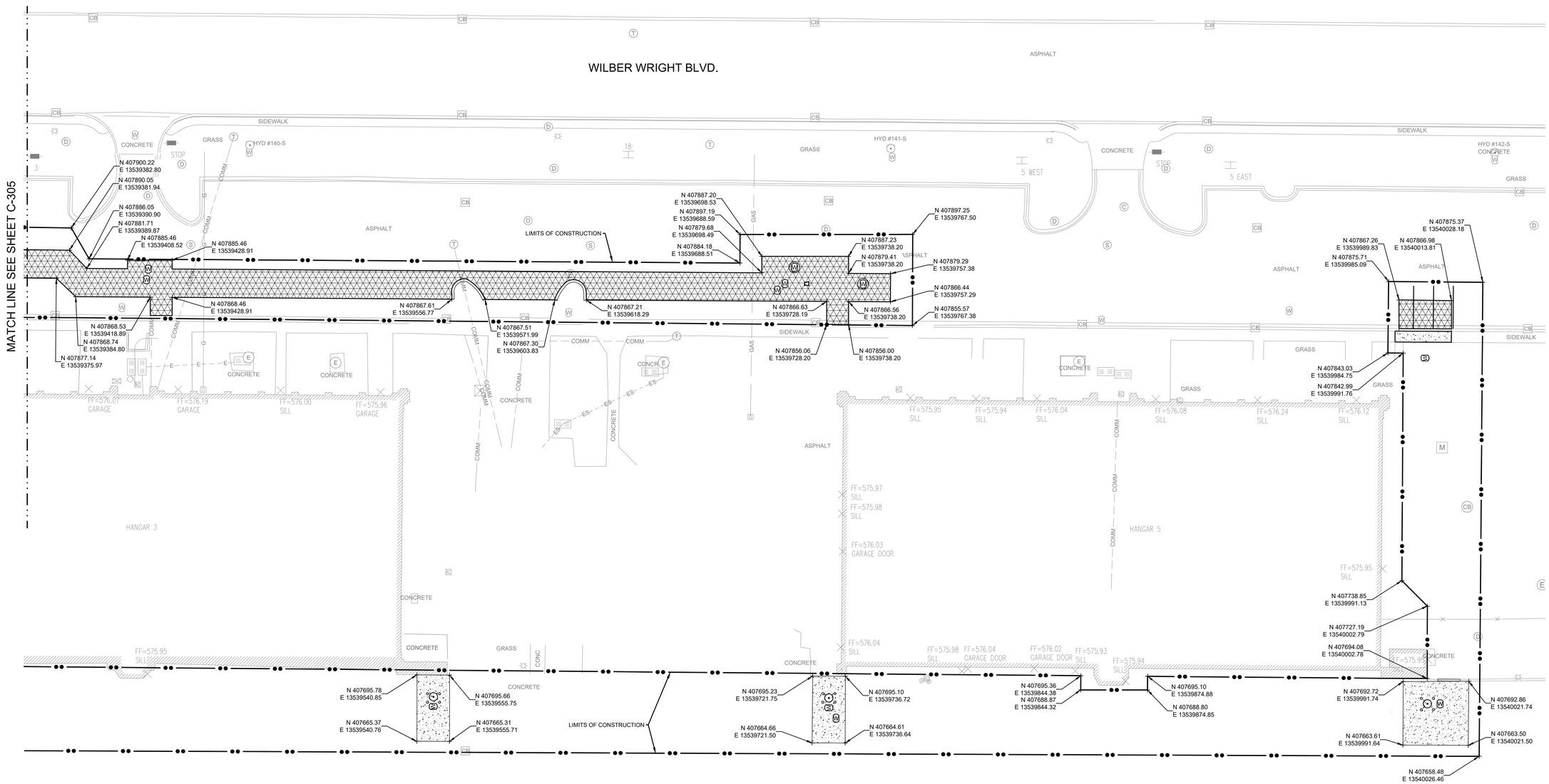


KEY PLAN

SCALE: 1" = 150'



SITE PLAN COORDINATES

SCALE: 1" = 20'

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

JOB NO.:	VGLZ162323
M&H NO.:	3141700-181848.01
DATE:	December 16, 2022
DESIGNED BY:	DGW
DRAWN BY:	SHG
CHECKED BY:	KLJ

DO NOT SCALE DRAWINGS

SHEET CONTENTS
SITE PLAN
COORDINATES

SHEET NO.
C-306

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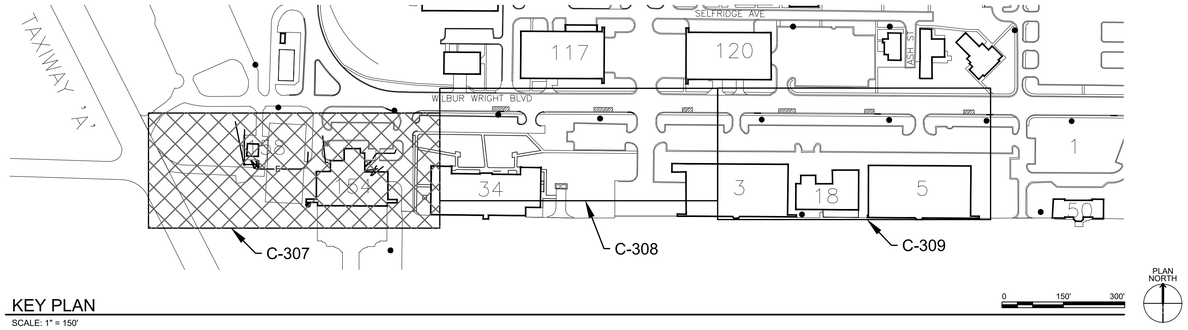
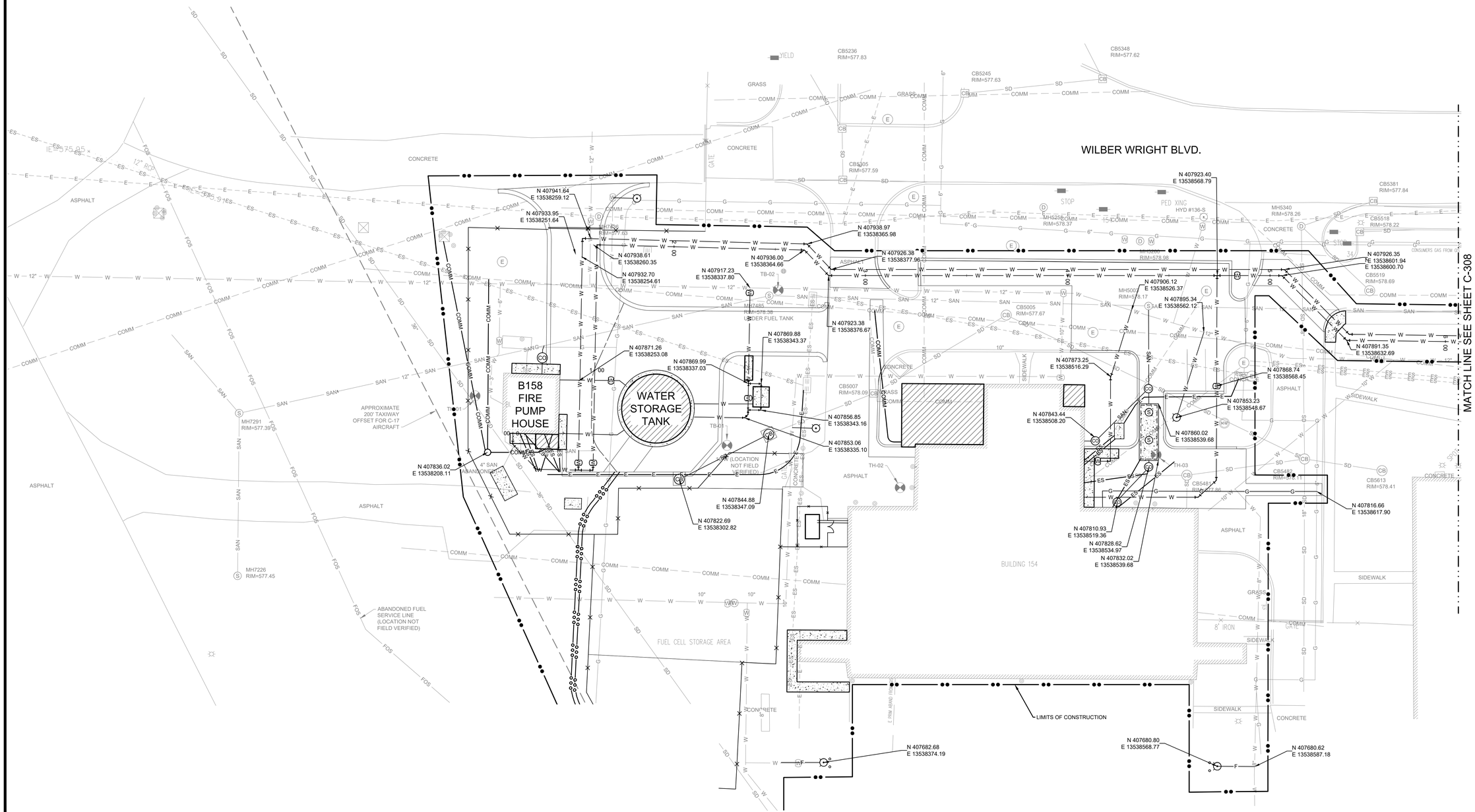


KEY PLAN

SCALE: 1" = 150'

0 150' 300'

PLAN NORTH



UTILITY COORDINATE PLAN

SCALE: 1" = 20'

PLAN NORTH

0 20' 40'

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.:	VGLZ162323
M&H NO.:	3141700-181848.01
DATE:	December 16, 2022
DESIGNED BY:	DGW
DRAWN BY:	SHG
CHECKED BY:	KLJ

DO NOT SCALE DRAWINGS

SHEET CONTENTS
UTILITY COORDINATE PLAN

SHEET NO:
C-307

C:_PROJECTS\87500-39546-200035\MET\FILES\VGLZ162323-BLDG-154 - BIC-307.DWG
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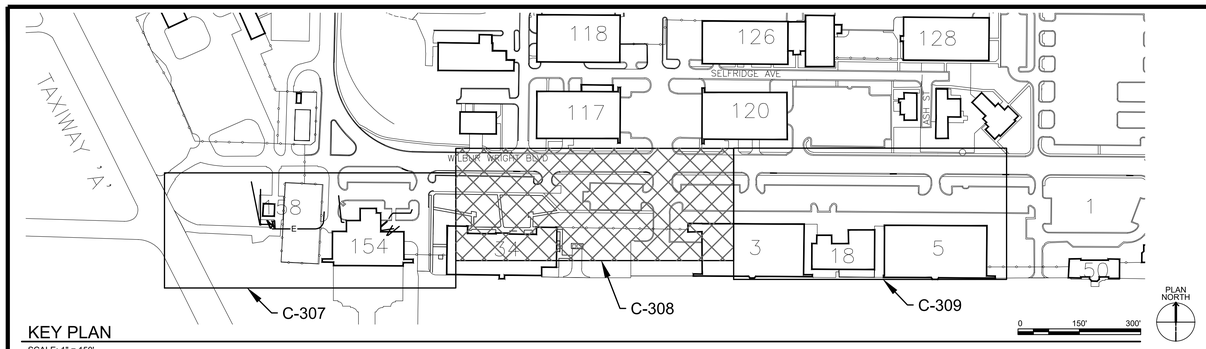
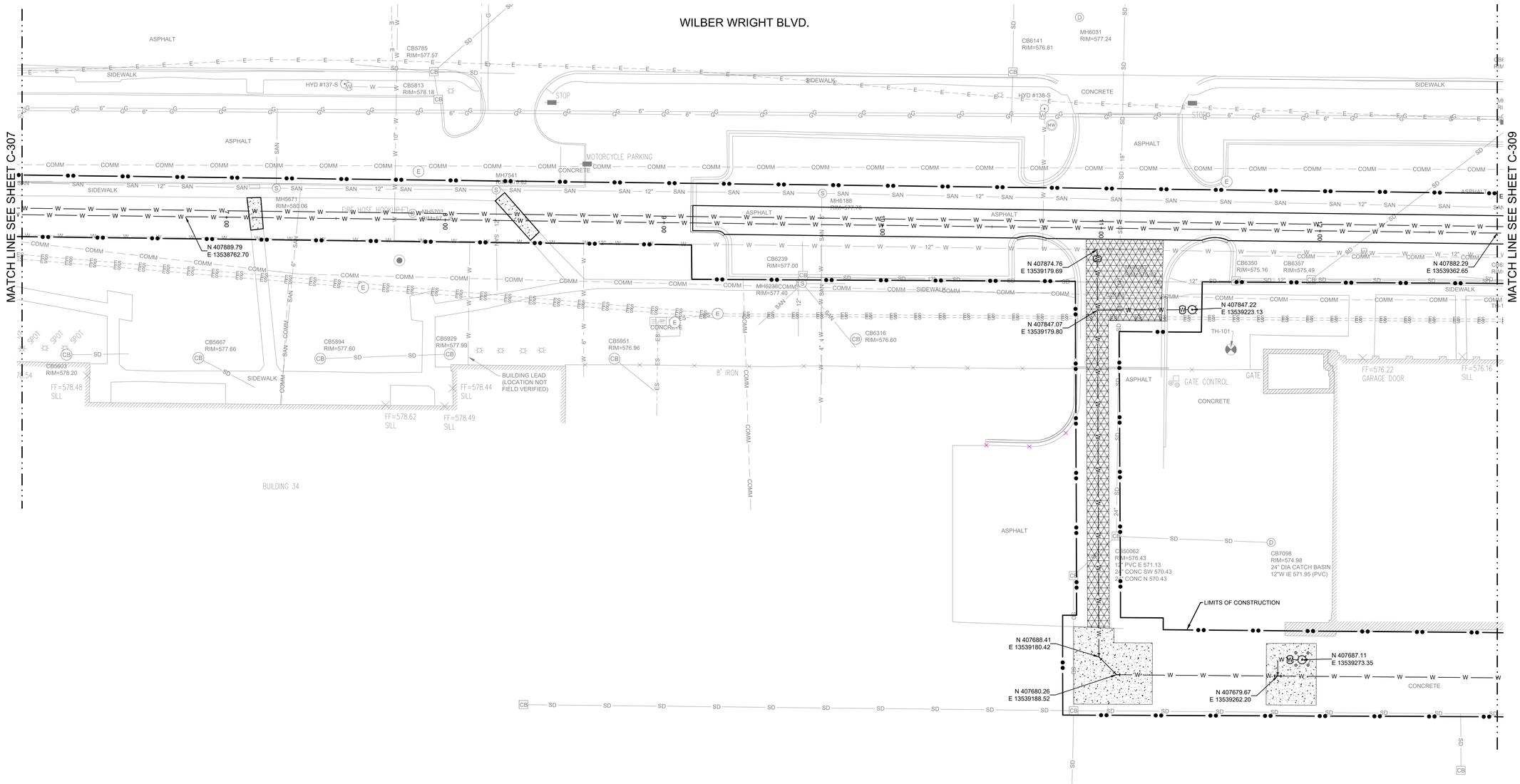


KEY PLAN

SCALE: 1" = 150'



UTILITY COORDINATE PLAN

SCALE: 1" = 20'

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.:	VGLZ162323
M&H NO.:	3141700-181848.01
DATE:	December 16, 2022
DESIGNED BY:	DGW
DRAWN BY:	SHG
CHECKED BY:	KLJ

DO NOT SCALE DRAWINGS

SHEET CONTENTS
UTILITY COORDINATE PLAN

SHEET NO.
C-308

C:_PROJECTS\BERGO-3854\6-2000S\SHEETFILES\VGLZ162323-BLDG-154 - BC-307.DWG
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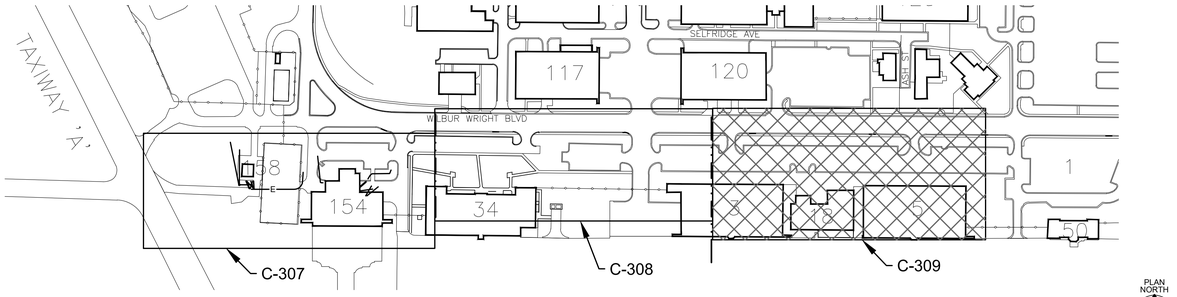
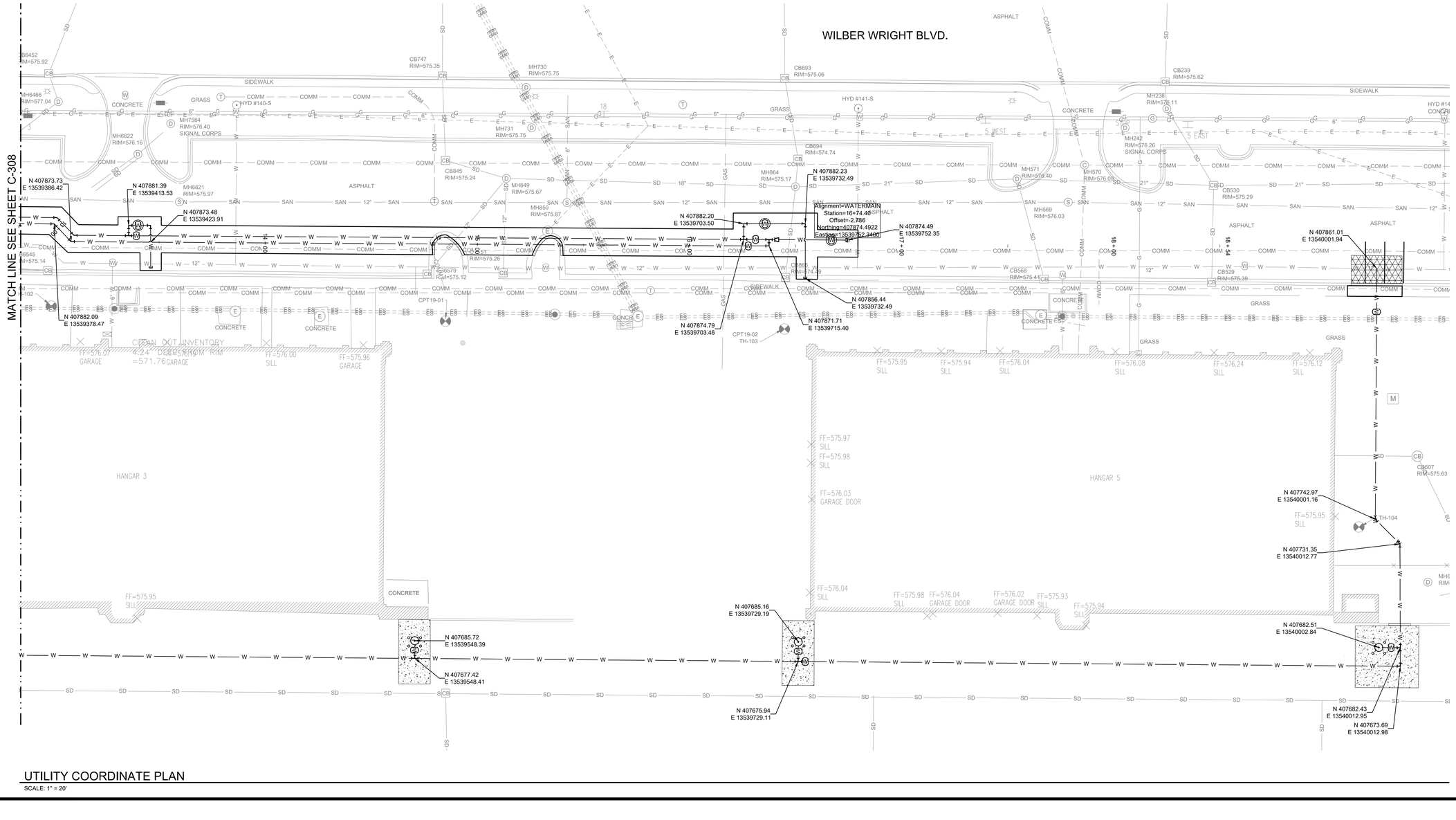


KEY PLAN

SCALE: 1" = 150'



UTILITY COORDINATE PLAN

SCALE: 1" = 20'

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
UTILITY COORDINATE PLAN

SHEET NO.
C-309

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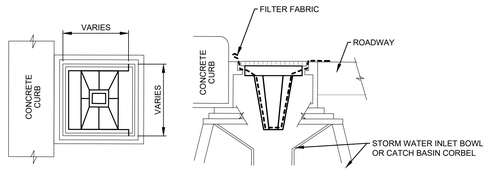
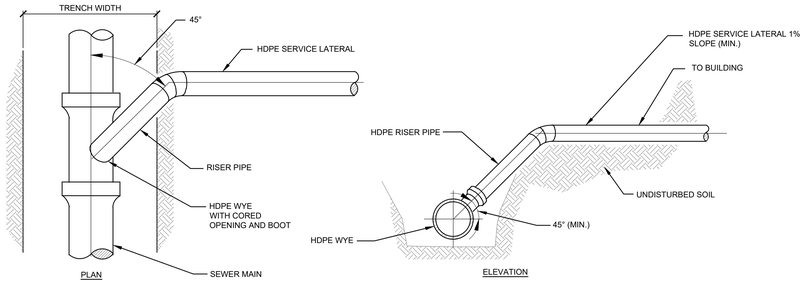


NOTES:

1. ADJUST BASKET DIMENSIONS TO FIT STORMWATER INLET TYPE.

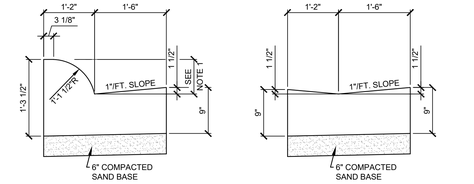
8 TEMPORARY INLET PROTECTION BASKET DETAIL

SCALE: NONE



5 SANITARY SEWER SERVICE CONNECTION DETAIL

SCALE: NONE

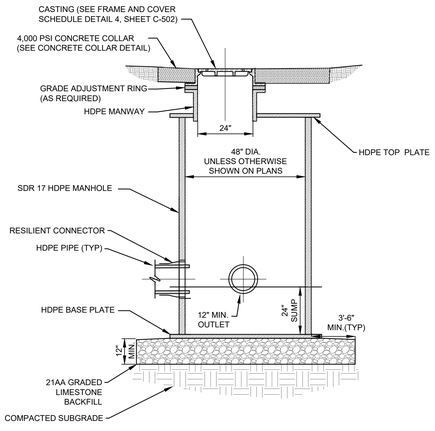


NOTE:

1. CURB HEIGHT VARIES FROM 3" TO 6". SEE GRADING PLAN.
2. CONCRETE MUST HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI FOR 28 DAYS. SEE SPECIFICATION 32 16 19.
3. SAND SUBGRADE SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR) BEFORE PLACEMENT OF NEW PAVEMENT. SAND SUBBASE SHALL BE MDOT CLASS II.

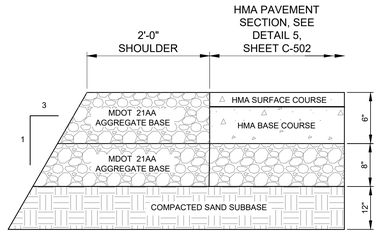
1 CONCRETE CURB AND GUTTER, MODIFIED

SCALE: NONE



9 HDPE CATCH BASIN DETAIL

SCALE: NONE

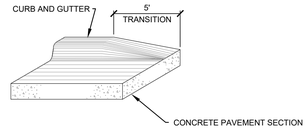


NOTES:

1. ALL MATERIALS SHALL MEET MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) MATERIAL SPECIFICATIONS.
2. AGGREGATE BASE COURSE SHALL BE MDOT 21AA PER SPECIFICATION 32 12 16.16.
3. SAND SUBGRADE SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR) BEFORE PLACEMTN OF NEW PAVEMENT. SAND SUBBASE SHALL BE MDOT CLASS II.

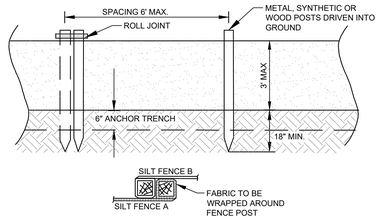
10 GRAVEL SHOULDER SECTION

SCALE: NONE

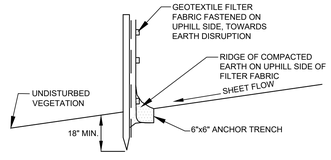


6 CURB TRANSITION DETAIL

SCALE: NONE



ROLL JOINTS

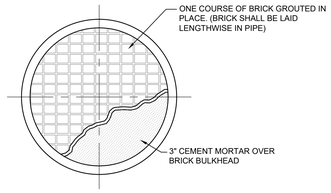


NOTES:

1. THE SPACING OF THE TIEBACKS SHALL EQUAL THE SPACING OF THE POST. ADDITIONAL POST DEPTH OR TIEBACKS MAY BE REQUIRED IN UNSTABLE SOILS.

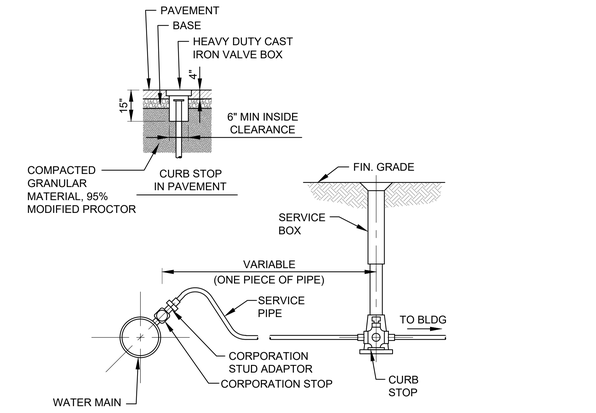
7 SILT FENCE

SCALE: NONE



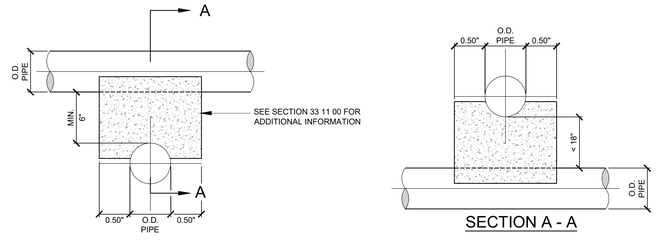
2 BULKHEAD DETAIL

SCALE: NONE



3 WATER SERVICE INSTALLATION

SCALE: NONE



NOTES:

1. THIS SHALL APPLY TO ALL CROSSINGS THAT CANNOT MAINTAIN A MINIMUM VERTICAL CLEARANCE OF 18". APPROVAL FROM THE COR REQUIRED FOR USE OF CONCRETE CRADLE..

4 CONCRETE PIPE CRADLE

SCALE: NONE

TETRA TECH
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MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CIVIL DETAILS

SHEET NO.
C-501

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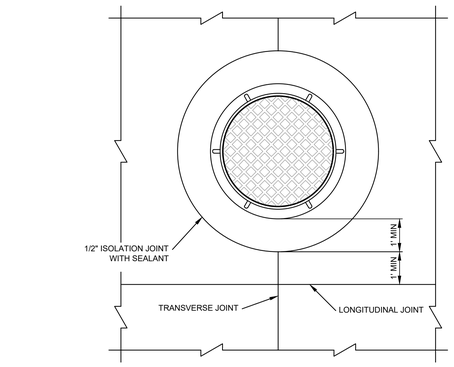
12/6/2022 1:27:29 PM

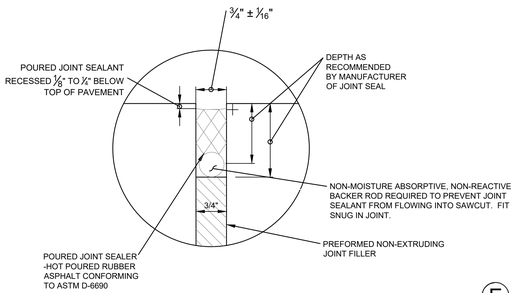


MATERIALS:

1. POURED JOINT SEALER -HOT POURED RUBBER ASPHALT CONFORMING TO ASTM D-6690
2. EXPANSION JOINT FILLER - FIBER TYPE CONFORMING TO ASTM D-1751
3. PREMOLDED STRIP INSERT - PLASTIC

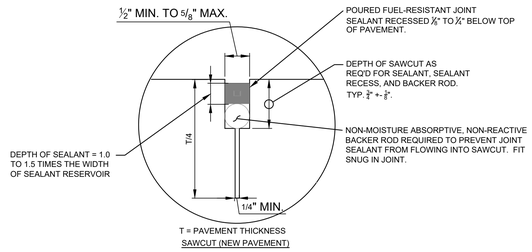
SYMBOL: I

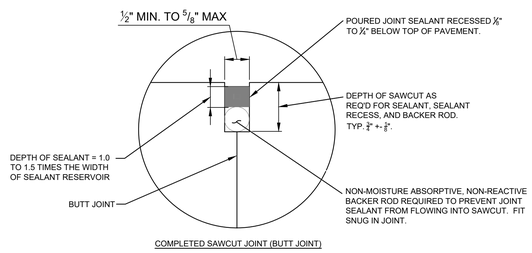
12 THICKENED CONCRETE ISOLATION JOINT DETAIL
SCALE: NONE



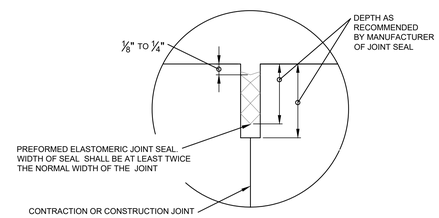
SYMBOL: E

13 THICKENED CONCRETE EXPANSION JOINT SEAL DETAIL
SCALE: NONE





14 THICKENED CONCRETE CONTRACTION JOINT SEALANT
SCALE: NONE



15 THICKENED CONCRETE ALTERNATE JOINT SEAL DETAIL
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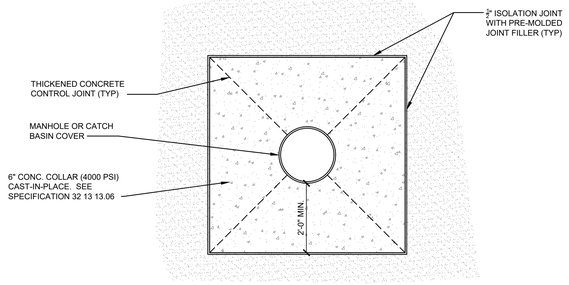
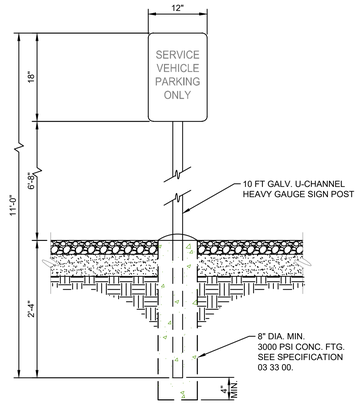
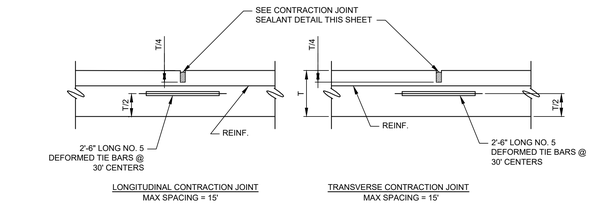
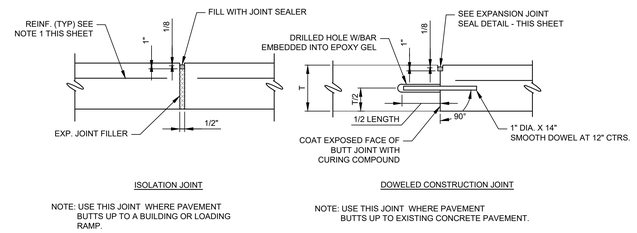


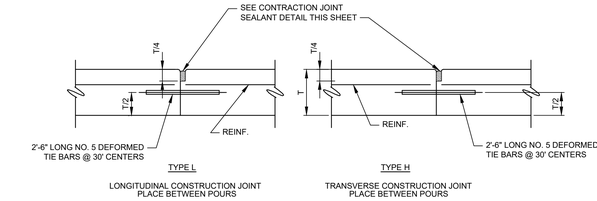
9 CONCRETE COLLAR
SCALE: NONE



10 SERVICE VEHICLE ONLY
SCALE: NONE







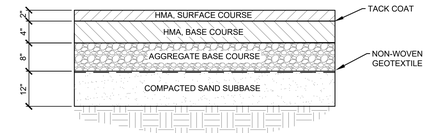
MATERIALS:

1. POURED JOINT SEALER -HOT POURED RUBBER ASPHALT CONFORMING TO ASTM D-6690
2. EXPANSION JOINT FILLER - FIBER TYPE CONFORMING TO ASTM D-1751
3. PREMOLDED STRIP INSERT - PLASTIC
4. JOINT SEALANT TO BE FUEL RESISTANT

NOTES:

1. STEEL REINFORCEMENT MESH FOR CONCRETE PAVEMENT IS TO BE 6"x6" - W2.1/W2.1, 0.042" SQUARE PER FOOT TYPICAL, OR HEAVIER.
2. T = PER DETAIL 6, THIS SHEET.

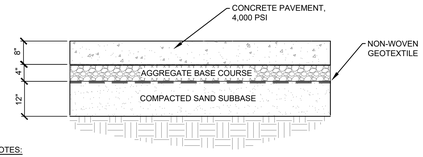
11 REINFORCED THICKENED CONCRETE JOINT DETAILS
SCALE: NONE



NOTES:

1. ALL MATERIALS SHALL MEET MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) MATERIAL SPECIFICATIONS.
2. HMA, SURFACE COURSE SHALL BE MDOT 36A, SPEC UFGS 32 12 16.16.
3. HMA, BASE COURSE SHALL BE MDOT 13A, SPEC UFGS 32 12 16.16.
4. AGGREGATE BASE COURSE SHALL BE MDOT 21AA, SPEC 32 11 23.
5. GEOTEXTILE SEPARATOR SHALL MEET THE REQUIREMENTS OF MDOT NON-WOVEN GEOTEXTILE SEPARATOR PER MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION TABLE 910-1.
6. SAND SUBGRADE SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR) BEFORE PLACEMENT OF NEW PAVEMENT. SAND SUBBASE SHALL BE MDOT CLASS II.

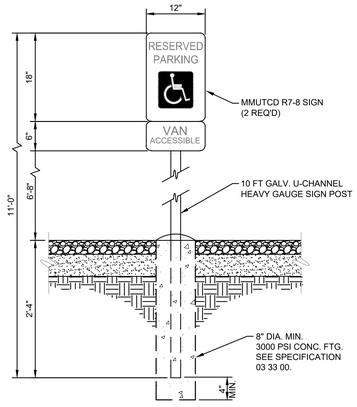
5 HMA PAVEMENT SECTION
SCALE: NONE



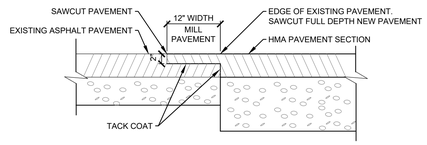
NOTES:

1. ALL MATERIALS SHALL MEET MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) MATERIAL SPECIFICATIONS.
2. CONCRETE PAVEMENT, SEE SPEC UFGS 32 13 13.06.
3. AGGREGATE BASE COURSE SHALL BE MDOT 21AA, SEE SPEC UFGS 32 11 23. COMPACTED TO 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR).
5. GEOTEXTILE SEPARATOR SHALL MEET THE REQUIREMENTS OF MDOT NON-WOVEN GEOTEXTILE SEPARATOR PER MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION TABLE 910-1.
6. SAND SUBGRADE SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR) BEFORE PLACEMENT OF NEW PAVEMENT. SAND SUBBASE SHALL BE MDOT CLASS II.

6 THICKENED CONCRETE PAVEMENT SECTION
SCALE: NONE



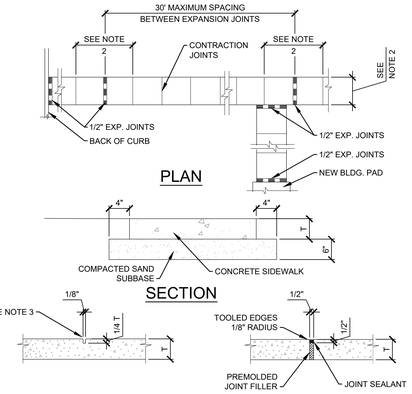
7 ADA PARKING SIGN - R7-8P
SCALE: NONE



NOTES:

1. WHERE PROPOSED ASPHALT PAVING ABUTS EXISTING ASPHALT PAVING, REMOVE 2 INCHES DEPTH EXISTING ASPHALT AND REPLACE WITH 2 INCHES NEW ASPHALT SURFACE AS SHOWN ABOVE.
2. WHERE EXISTING PAVING IS TO BE REMOVED AND REPLACED WITH VEGETATED SURFACE, PROVIDE CLEAN SAWCUT EDGE AS SHOWN ON THE PLANS.

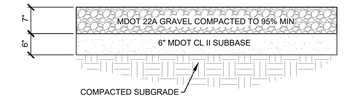
8 ASPHALT PAVEMENT SAWCUT DETAIL
SCALE: NONE



NOTES:

1. STANDARD SIDEWALKS SHALL BE 4 INCH THICK. (T=4). SIDEWALKS CROSSING DRIVEWAYS SHALL USE THE THICKEND CONCRETE PAVEMENT SECTION.
2. CONTRACTION JOINTS SHALL BE SPACED AT INTERVALS EQUAL TO THE WIDTH OF THE SIDEWALK, OR 5 FEET ON CENTER, WHICHEVER IS LESS.
3. CONTRACTION JOINTS SHALL BE 1.5 INCH DEEP AND 1/8 INCH WIDE.
4. 1/2 INCH EXPANSION JOINT FILLER WHERE CONCRETE SIDEWALK ABUTS CONCRETE STRUCTURE.
5. CONCRETE 28-DAY COMPRESSIVE STRENGTH SHALL BE 4,000 PSI (MINIMUM).
6. FINE HAIR BROOM FINISH CONCRETE IN A STRAIGHT PATTERN PERPENDICULAR TO THE NEAREST EDGE OF PAVEMENT.

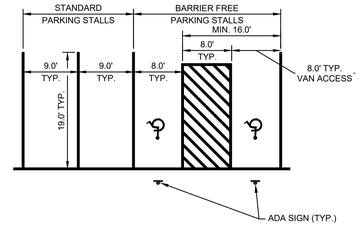
1 CONCRETE SIDEWALK DETAIL
SCALE: NONE



NOTES:

1. ALL MATERIALS SHALL MEET MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) MATERIAL SPECIFICATIONS.
2. SAND SUBGRADE SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR) BEFORE PLACEMTN OF NEW PAVEMENT. SAND SUBBASE SHALL BE MDOT CLASS II.

2 GRAVEL SURFACE SECTION
SCALE: NONE



3 ADA STRIPING DETAIL
SCALE: NONE

FRAME AND COVER SCHEDULE

TYPE	LOCATION	SPECIFICATION REFERENCE		TYPE OF COVER OR INLET
		SANITARY	STORM	
SANITARY MANHOLE	ALL	33 30 00	NA	MANHOLE FRAME & COVER SELF-SEALING
CATCH BASIN INLET	CURB & GUTTER	NA	33 40 00	MDOT COVER K
STORM MANHOLE	PAVEMENT/ SHOULDER	NA	33 40 00	MDOT COVER B
CATCH BASIN INLET	LAWN	NA	33 40 00	MDOT COVER E
CATCH BASIN INLET	PAVEMENT	NA	33 40 00	MDOT COVER D

NOTES:

1. STORM MANHOLE COVERS SHALL BE VENTED
2. COVERS SHALL BE AIRPORT RATED IN AIRFIELD CONCRETE AND H20 TRAFFIC RATED IN ALL OTHER AREAS.
3. AIRPORT RATED AS DEFINED BY FEDERAL AVIATION ADMINISTRATION (FAA) AC: 150/5370-10, ITEM D-751 AND FAA AC: 150/5320-6 APPENDIX 3. CASTING AND COVER MUST BE ABLE TO ACCEPT LOADING FROM 200,000 LBS.

4 FRAME AND COVER SCHEDULE
SCALE: NONE

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WE STAND READY

MICHIGAN AIR NATION GUARD ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

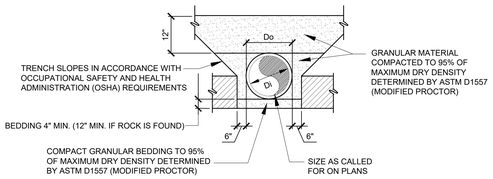
ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CIVIL DETAILS

SHEET NO.
C-502

C:_PROJECTS\BERGEN-3804\6-2000S\SHEETFILES\VGLZ162323-BLDG-154 - REC-502.DWG
12/5/2022 - 12:36 PM



PIPE BEDDING

NOTES:

1. COMPACTION PRESENTED AS MODIFIED STANDARD PROCTOR VALUES. (MAXIMUM UNIT WEIGHT)

6 BEDDING DETAIL

SCALE: NONE

PIPE RESTRAINT SCHEDULE							
GROUND BURIED PRESSURE PIPE - POLYETHYLENE ENCASED DUCTILE IRON PIPE							
PIPE DIAMETER	TEES, 90° BENDS	45° BENDS	22-1/2° BENDS	11-1/4° BENDS	DEAD ENDS	REDUCERS (ONE SIZE REDUCTION)*	REDUCERS (TWO SIZE REDUCTIION)*
4	13	5	3	1	40	--	--
6	19	8	4	2	58	31	--
8	24	10	5	2	75	30	70
12	34	14	7	3	107	57	116
16	43	18	9	4	139	59	137
20	52	22	10	5	169	59	134
24	61	25	12	6	199	60	132
30	73	30	15	7	242	85	168
36	84	35	17	8	281	84	168

NOTES:

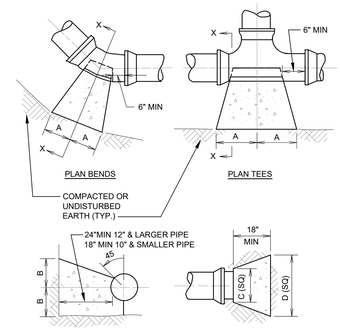
1. LENGTHS OF PIPE RESTRAINT ARE GIVEN IN FEET.
2. IF REQUIRED PIPE DIAMETER IS NOT LISTED IN THIS TABLE, THE NEXT LARGEST PIPE DIAMETER SHALL BE USED.
3. THIS TABLE IS BASED ON A TEST PRESSURE OF 180 PSI (OPERATING PRESSURE PLUS WATER HAMMER. FOR OTHER TEST PRESSURES, ALL VALUES TO BE INCREASED OR DECREASED PROPORTIONALLY.
4. THE VALUES PROVIDED OF RESTRAINT LENGTH ARE IN EACH DIRECTION FROM THE POINT OF DEFLECTION OR TERMINATION EXCEPT FOR TEES, AT WHICH ONLY THE BRANCH IN THE DIRECTION OF THE STEM.
5. IF TIE RODS ARE USED, USE FOUR RODS MINIMUM AND ADD 1/8-INCH TO BAR DIAMETER AS CORROSION ALLOWANCE.

* SIZE REDUCTION IS BASED UPON THE PIPE DIAMETER SHOWN IN THIS TABLE.

BASED UPON:
INTERNAL PRESSURE: 180
PIPE DEPTH: 5
BEDDING CLASS: TYPE 4
SOIL TYPE: GOOD SAND
SAFETY FACTOR: 2

4 PIPE RESTRAINT SCHEDULE

SCALE: NONE



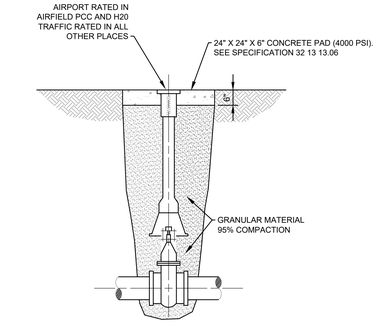
SIZE	1/4 BENDS		1/8 BENDS		1/16 BENDS		TEES		PLUGS	
	A	B	A	B	A	B	A	B	C	D
6"	16"	10"	9"	10"	6"	8"	10"	12"	10"	21"
8"	22"	13"	12"	13"	8"	10"	13"	16"	12"	29"
10"	26"	17"	14"	17"	10"	13"	16"	20"	14"	36"
12"	29"	21"	16"	21"	11"	16"	18"	24"	16"	41"
14"	35"	24"	19"	24"	12"	20"	22"	27"	18"	48"
16"	38"	27"	21"	27"	12"	24"	24"	30"	20"	54"

NOTES:

1. HYDRANT THRUST BLOCK DETAIL IS FOR SIZING THE CONCRETE BLOCK SHOWN IN THE FIRE HYDRANT ASSEMBLY DETAIL ONLY. THRUST BLOCKS ARE NOT PERMITTED IN ANY OTHER LOCATION.

5 THRUST BLOCK

SCALE: NONE

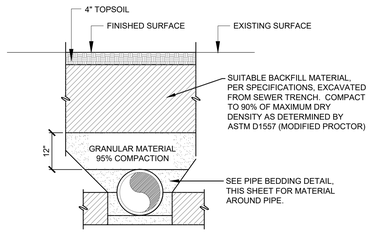


NOTES:

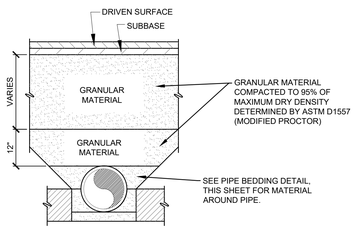
1. VALVE BOX SHALL NOT REST ON VALVE OR MAIN LINE PIPE.
2. WHERE VALVES ARE LOCATED IN THE AIRFIELD PAVEMENT, VALVE BOX ASSEMBLY SHALL BE AIRPORT RATED AS DEFINED BY FEDERAL AVIATION ADMINISTRATION (FAA) AC: 150/5370-10, ITEM D-751 AND FAA AC: 150/5320-6 APPENDIX 3. BASING MUST BE ABLE TO ACCEPT LOADING FROM 200,000 LBS.

1 VALVE BOX DETAIL

SCALE: NONE

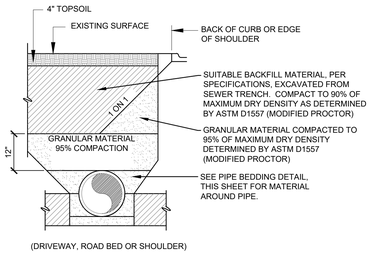


TRENCH TYPE A



(DRIVEWAY, ROAD BED OR SHOULDER)

TRENCH TYPE B

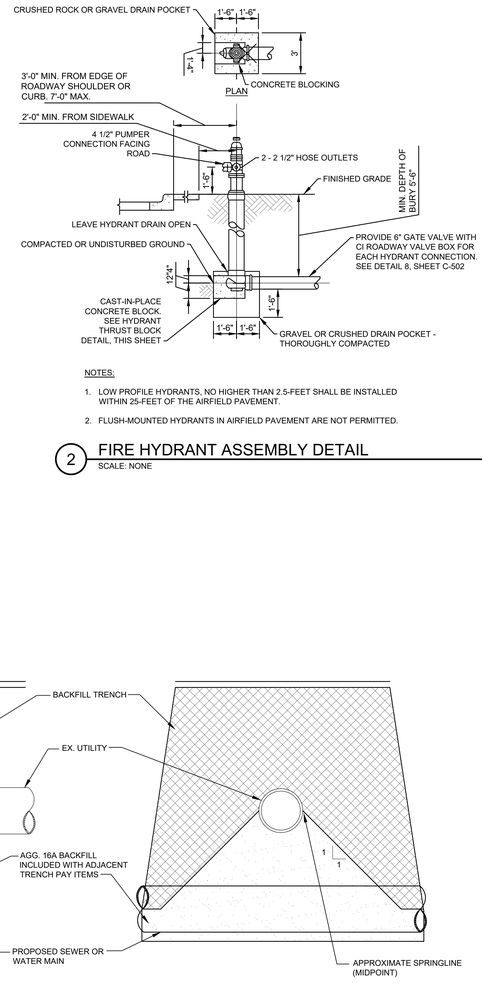


(DRIVEWAY, ROAD BED OR SHOULDER)

TRENCH TYPE C

7 TRENCH DETAILS

SCALE: NONE

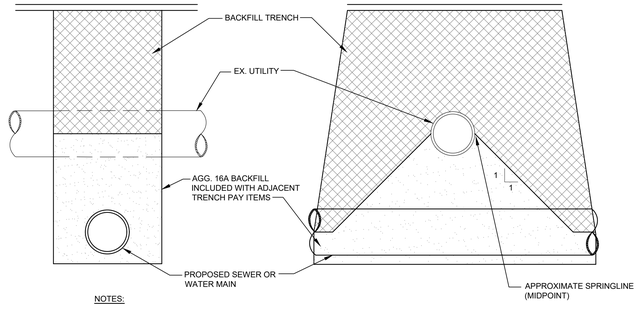


NOTES:

1. LOW PROFILE HYDRANTS, NO HIGHER THAN 2.5-FEET SHALL BE INSTALLED WITHIN 25-FEET OF THE AIRFIELD PAVEMENT.
2. FLUSH-MOUNTED HYDRANTS IN AIRFIELD PAVEMENT ARE NOT PERMITTED.

2 FIRE HYDRANT ASSEMBLY DETAIL

SCALE: NONE



NOTES:

1. THIS SHALL APPLY TO ALL CROSSINGS WITH A VERTICAL CLEARANCE OF 18" OR LESS AND THIS SHALL APPLY TO ALL CROSSINGS WHERE DIRECTED BY ENGINEER WITH A VERTICAL CLEARANCE GREATER THAN 18" AND LESS THAN 5'.
2. APPLICABLE TO ALL PROPOSED SEWERS.

3 TYPICAL DETAIL FOR PROPOSED SEWERS AND WATER MAIN CROSSING UNDER EXISTING UTILITIES

SCALE: NONE

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WE STAND READY

MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

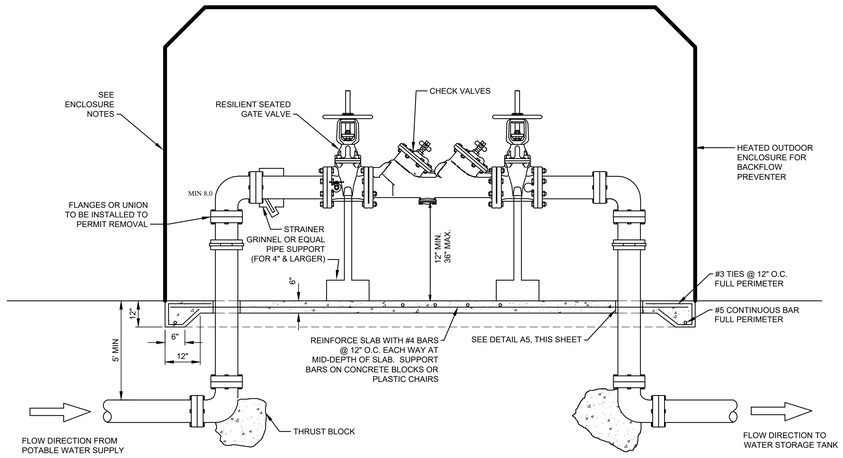
SHEET CONTENTS
CIVIL DETAILS

SHEET NO:
C-503

C:_PROJECTS\87500-39546-20035\845\ETFILES\VGLZ162323-BLDG-154 - BIC-501.DWG
12/6/2022 12:46 PM

ENCLOSURE NOTES:

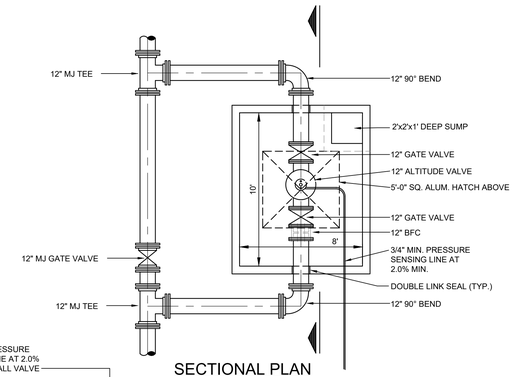
1. CONTRACTOR TO VERIFY SIZE OF OUTDOOR ENCLOSURE ONCE BACKFLOW PREVENTOR ASSEMBLY AND PIPING HAS BEEN SELECTED. PRELIMINARY SIZING BASED ON GENERALIZED PIPING AND ASSEMBLIES, INDICATE INSIDE DIAMETER NEEDED TO BE APPROXIMATELY 144" L X 40" W X 90" H.
2. THE MANUFACTURER OF THE OUTDOOR ENCLOSURE SHALL BE A COMPANY SPECIALIZING IN THE FIELD OF MANUFACTURING OF SUCH ENCLOSURES FOR AT LEAST 10 YEARS OF SUCCESSFUL FIELD INSTALLATIONS AND BE ASSE 1060 SEAL CERTIFIED.
3. ENCLOSURE SHALL MEET ASSE 1060-PERFORMANCE REQUIREMENTS FOR OUTDOOR ENCLOSURES FOR BACKFLOW PREVENTION ASSEMBLIES AND ASTM B206
4. MATERIALS FOR EXTERIOR WALLS SHALL BE 5052-H32 ALUMINUM (.050/18 GAUGE) AND SHALL COMPLY WITH ASTM B209. THE ALUMINUM SHALL HAVE A FACTORY MILL FINISH.
5. INSULATION SHALL BE A CLOSED CELL POLYISOCYANURATE FOAM CORE LAMINATED TO HEAVY BLACK GLASS FIBERREINFORCED FACERS ON EACH SIDE. THE INSULATION SHALL HAVE THE FOLLOWING PROPERTIES:
   - R-VALUE -
   - DIMENSIONAL STABILITY - 2% LINEAR CHANGE
   - COMPRESSIVE STRENGTH - 20 PSI AND 25 PSI
   - PRODUCT DENSITY - NOMINAL 2.0 PCF
   - WATER ABSORPTION - <1% BY VOLUME
   - SERVICE TEMPERATURE - (-100°F TO +250°F)
   - MOISTURE VAPOR TRANSMISSION - < ONE (1) PERM
   - FLAME SPREAD - 25
   - INSULATION SHALL BE 1.5" THICK
6. ADHESIVE SHALL HAVE THE FOLLOWING FEATURES:
   - BONDS FOAM PRODUCTS
   - WATER RESISTANT BOND
   - STAYS RESILIENT
   - 120 38 78 WILL NOT FREEZE
   - FREEZE/THAW STABLE
7. THE ROOF, WALLS AND ACCESS PANELS SHALL BE CONSTRUCTED OF 5052-H32 (.050/18 GAUGE) MILL FINISH MARINE GRADE ALUMINUM ASTMB B209 OUTSIDE WITH INSULATION 1.5" THICK (8.0 MIN. "R" VALUE) IN THE WALLS AND ACCESS PANELS AND 3" THICK (18.0 "R" VALUE) IN THE ROOF PANEL.
8. THE ABOVE COMPONENTS SHALL BE SECURELY BONDED TO FORM A COMPOSITE PANEL.
9. THE EXTERIOR OF THE PANELS SHALL HAVE A PROTECTIVE PVC MASKING TO PROTECT THE FINISH. THE PROTECTIVE MASKING SHALL BE REMOVED BY THE CUSTOMER IMMEDIATELY AFTER INSTALLATION OF THE ENCLOSURE.
10. THE ROOF AND WALL PANELS SHALL BE FASTENED TOGETHER WITH SELF-TAPPING STAINLESS STEEL SCREWS THROUGH HOLES PROVIDED IN PANELS. THE ROOF PANEL SHALL BE SECURED TO THE WALL PANELS BY STAINLESS STEEL SCREWS ON THE OUTSIDE AND SECURITY CLIPS ON THE INSIDE.
11. EACH ACCESS PANEL SHALL HAVE FACTORY INSTALLED LOCKS WITH MASTER KEYS PROVIDED.
12. DRAIN RELIEF PANEL FOR THE ENCLOSURE SHALL BE CONSTRUCTED OF SAME SAID MATERIALS AS WALL PANELS AND BE LOCATED IN ONE OR MORE OF THE ACCESS PANELS.
13. DRAIN RELIEF PANEL SHALL HAVE A STAINLESS STEEL HINGE AND STAINLESS STEEL SPRING AS A POSITIVE MEANS OF CLOSURE AFTER WATER DISCHARGE TO PREVENT THE INTRUSION OF OUTSIDE AIR, DEBRIS, AND SMALL ANIMALS.
14. ENCLOSURE SHALL HAVE HEATING EQUIPMENT PROVIDED BY MANUFACTURER TO MAINTAIN AN INTERIOR TEMPERATURE OF +40-DEG F WITH AND EXTERNAL TEMPERATURE OF -30-DEG F.
15. HEATER SHALL BE ETL, UL, OR CSA CERTIFIED.
16. ELECTRICAL POWER SOURCE FOR HEATER SHALL BE A DESIGNATED CIRCUIT WITH G.F.I. PROTECTION AND A MINIMUM OF 8" CLEARANCE FROM RECEPTACLE BASE TO TOP OF SLAB.
17. ENCLOSURE SHALL BE ASSEMBLED PER MANUFACTURER'S INSTRUCTIONS PROVIDED WITH ENCLOSURE.
18. ENCLOSURE SHALL BE MOUNTED TO CONCRETE PAD PER MANUFACTURER'S INSTRUCTIONS.
19. ENCLOSURE SHALL BE ASSEMBLED PLUMB AND SQUARE.



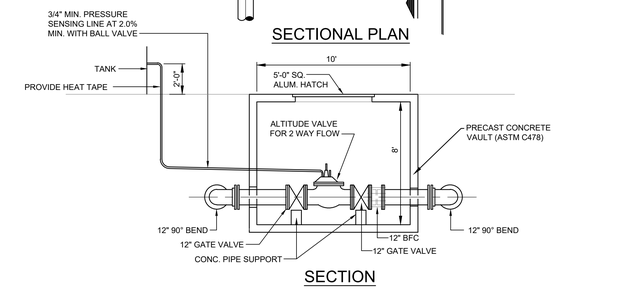
BACKFLOW PREVENTER NOTES:

1. GATE VALVES SHALL BE LOCKED IN THE OPEN POSITION.
2. BACKFLOW PREVENTER SHALL BE A COMPLETE ASSEMBLY FROM A SINGLE MANUFACTURER.
3. ASSEMBLY SHALL BE DOUBLE CHECK DETECTOR TYPE DESIGNED FOR USE IN ACCORDANCE WITH NON-HEALTH HAZARD CONTAINMENT REQUIREMENTS TO PREVENT REVERSE FLOW OF FIRE PROTECTION SYSTEM STAGNANT WATER FROM BEING PUMPED OR SIPHONED INTO THE POTABLE WATER SUPPLY.
4. PIPING AND BACKFLOW PREVENTER SHALL BE SIZED FOR 12-INCHES AND COMPLY WITH AWWA C510-92, WITH A MAXIMUM WORKING PRESSURE OF 175 PSI.
5. BACKFLOW PREVENTER BODY SHALL BE STAINLESS STEEL.
6. THE DOUBLE CHECK DETECTOR ASSEMBLY CONSISTS OF TWO INDEPENDENTLY OPERATING, SPRING LOADED CHECK VALVES, TWO UL, FM, OSY RESILIENT SEATED GATE VALVES, AND BYPASS ASSEMBLY. THE BYPASS ASSEMBLY CONSISTS OF A DOUBLE CHECK INCLUDING SHUTOFF VALVES AND REQUIRED TEST COCKS.
7. EACH CHECK VALVES SHALL BE INTERNALLY LOADED AND PROVIDE A POSITIVE DRIP TIGHT CLOSURE AGAINST REVERSE FLOW. VALVES INCLUDE STAINLESS STEEL ARM AND SPRING, RUBBER FACED DISC AND A REPLACEABLE SEAT. THERE SHALL BE NO BRASS OR BRONZE PARTS USED WITHIN THE CHECK VALVE ASSEMBLY. THE CHECK VALVE SEATS SHALL BE OF MOLDED THERMOPLASTIC CONSTRUCTION.
8. THE BYPASS LINE SHALL BE HYDRAULICALLY SIZED TO ACCURATELY MEASURE LOW FLOW. THE BYPASS LINE SHALL CONSIST OF A METER, A SMALL DIAMETER DOUBLE CHECK ASSEMBLY WITH TEST COCKS AND ISOLATION VALVES. THE BYPASS LINE DOUBLE CHECK VALVE SHALL HAVE TWO INDEPENDENTLY OPERATING MODULAR POPPET CHECK VALVES, AND TOP MOUNTED TEST COCKS.

3 BACKFLOW PREVENTER DETAIL
SCALE: NONE



SECTIONAL PLAN

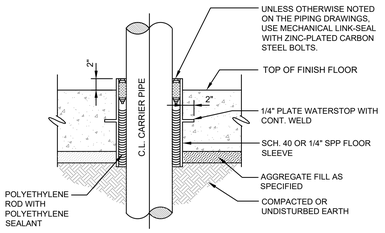


SECTION

NOTES:

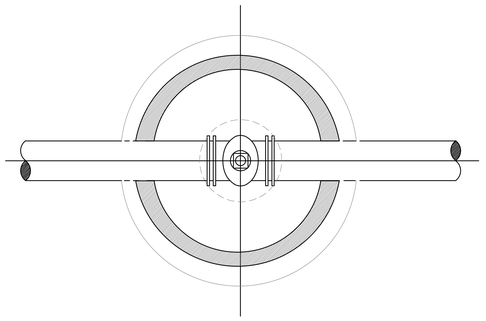
1. PROVIDE 6" MDOT CLASS II BEDDING, COMPACTED TO 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR).

1 ALTITUDE VALVE VAULT DETAIL
SCALE: NONE

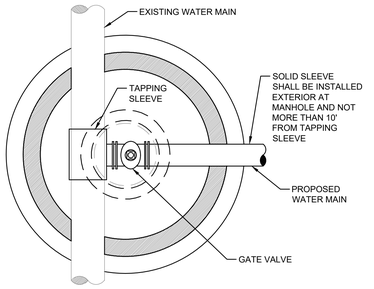


FOR PIPING 4" DIA. AND LARGER

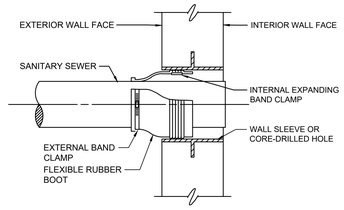
5 TYPICAL PIPE SLEEVE THROUGH BASE FLOOR SLAB
SCALE: NONE



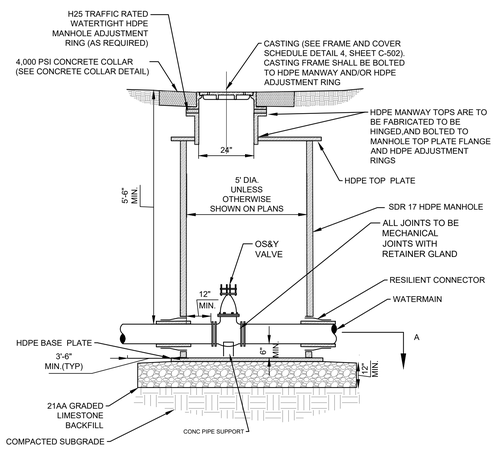
SECTION A-A



SECTION A-A

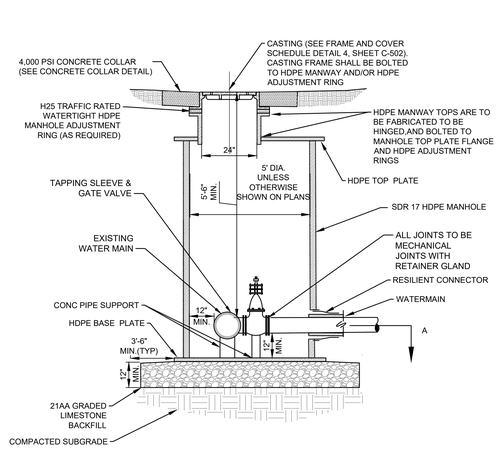


6 RESILIENT CONNECTOR UTILITY WALL PENETRATION DETAIL
SCALE: NONE



SECTION B-B

4 OS&Y VALVE MANHOLE
SCALE: NONE



SECTION B-B

2 TAPPING SLEEVE AND VALVE DETAIL
SCALE: NONE

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MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CIVIL DETAILS

SHEET NO.
C-504

C:_PROJECTS\EP\200-39546-2000\SHEETS\ESV\VGLZ162323-BLDG-154 - BIC-001.DWG
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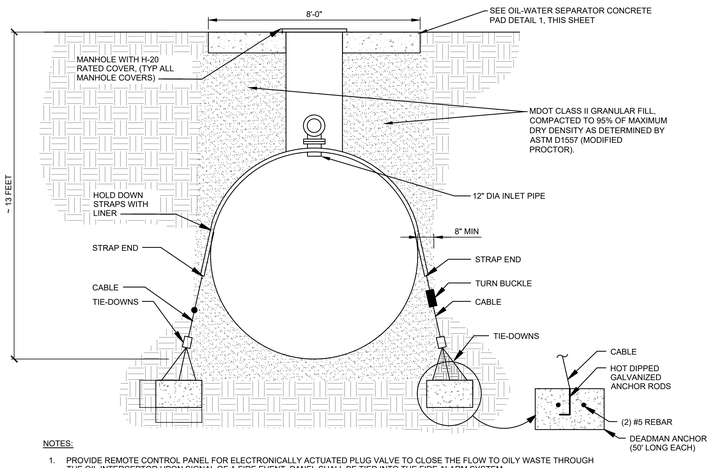
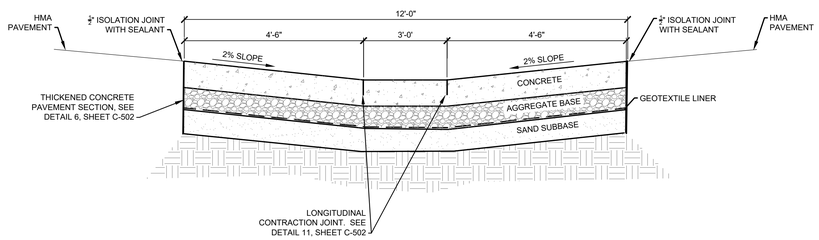


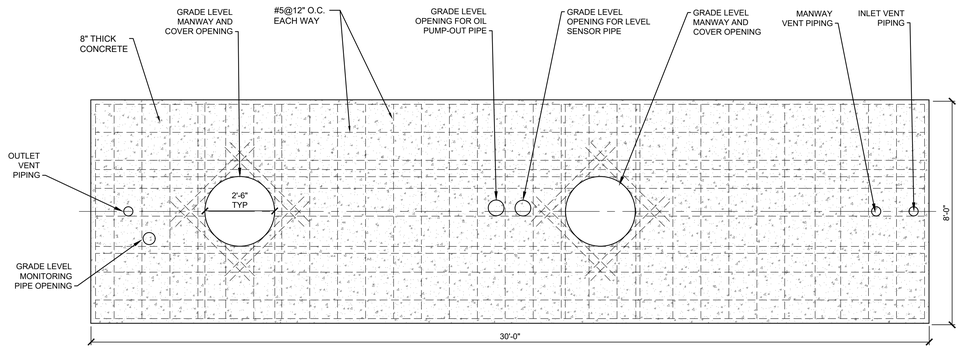
NOTES:

1. PROVIDE REMOTE CONTROL PANEL FOR ELECTRONICALLY ACTUATED PLUG VALVE TO CLOSE THE FLOW TO OILY WASTE THROUGH THE OIL INTERCEPTOR UPON SIGNAL OF A FIRE EVENT. PANEL SHALL BE TIED INTO THE FIRE ALARM SYSTEM.
2. DEADMAN ANCHOR DIMINSIONS SHALL COMPLY WITH TANK MANUFACTURER RECOMMENDATIONS.

3 OIL WATER SEPARATOR TANK ANCHORING
SCALE: NONE



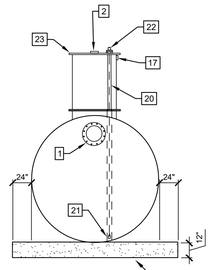
9 TANK OVERFLOW CONCRETE SLAB DETAIL
SCALE: NONE

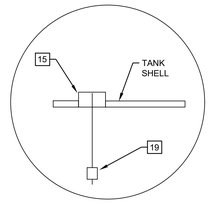


NOTES:

1. #5 BARS WITH MAX. SPACING OF 12".
2. PROVIDE (2) #5 BARS SPACED 3" ON CENTER ON EACH OF (8) SIDES OF MANWAY AS SHOWN. DIAGONAL BARS SHALL CROSS AT LEAST (3) OTHER BARS ON EACH SIDE OF MANWAY.
3. BARS SHALL BE SUPPORTED AT MID-DEPTH OF SLAB BY NON-METALLIC CHAIRS OR CONCRETE BRICKS.
4. PROVIDE MINIMUM 2" CONCRETE COVER OVER REINFORCING STEEL AT ALL EDGES AND FACES.
5. CONTRACTOR TO CONFIRM HOLE PENETRATION SIZE AND LOCATION WITH TANK MANUFACTURER.

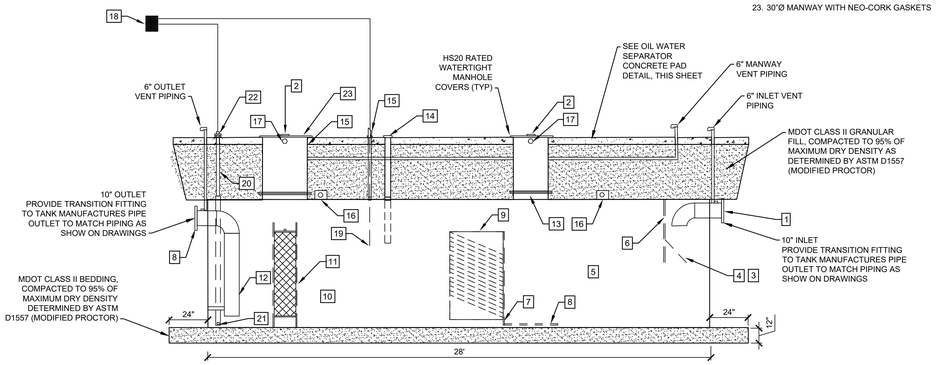
1 OIL-WATER SEPARATOR CONCRETE PAD DETAIL
SCALE: NONE





KEY NOTE EQUIPMENT LIST

1. 150# FLANGE W/ 2" FNPT FOR VENT
2. GAUGE WITH PLUG
3. VELOCITY HEAD DIFFUSION BAFFLE
4. WEAR PLATE
5. SEDIMENT CHAMBER
6. UNDERFLOW BAFFLE
7. SLUDGE BAFFLE
8. STRIKER PLATE
9. PARALLEL CORRUGATED PLATE COALESCER.
10. OIL/WATER SEPARATOR CHAMBER
11. COALESCER MATERIAL
12. OUTLET DOWNCOMER
13. 24"Ø MANWAY WITH NEO-CORK GASKETS.
14. OIL PUMP-OUT
15. LEVEL SENSOR
16. LIFTING LUG
17. VENT
18. ALARM / CONTROL PANEL, SEE ELECTRICAL DRAWINGS FOR LOCATION
19. FLOAT INTERFACE SENSOR W/ NEMA 4 CAP
20. LEAK SENSOR
21. LIQUID ONLY LEAK SENSOR
22. CAP FOR LEAK SENSOR
23. 30"Ø MANWAY WITH NEO-CORK GASKETS



SIDE VIEW

NOTES:

1. PROVIDE VALVE BOX AND COVER OVER ALL RISERS (PROVIDED EQUIPMENT ITEMS 14, 15 AND 22) UNLESS NOTED OTHERWISE.
2. PROVIDE REINFORCED CONCRETE ANCHOR PAD FOR ANTI-BUOYANCY PER TANK MANUFACTURER RECOMMENDATIONS.
3. CONTRACTOR TO COORDINATE VENTING SUCH THAT IS IS LOCATED OUTSIDE OF VEHICULAR TRAFFIC (IE. GRASS AREA OR ADJACENT TO BUILDING). PROVIDE MANUFACTURER RECOMMENDED PIPE SUPPORT. VENT HEIGHT TO BE DETERMINED BY MANUFACTURER'S RECOMMENDATIONS BASED ON PROPOSED LOCATION.
4. ROUTE FLOAT AND LEAK SENSOR WIRING TO BELOW-GRADE CONTROLLER. SEE ELECTRICAL DRAWINGS FOR LOCATION OF CONTROLLER.
5. OIL-WATER SEPARATOR SPECIFICATIONS:
   A. OVERALL TANK CAPACITY: 8,000 GALLONS (MIN.)
   B. TYPE: DOUBLE WALL, CYLINDRICAL
   C. FLOW RATE: 800 GPM
   D. HI OIL LEVEL: 20% TANK CAPACITY
   E. HI - HI OIL LEVEL: 43% TANK CAPACITY
   F. MAXIMUM EMERGENCY SPILL LEVEL: 80% TANK CAPACITY
   G. MINIMUM CONTAINMENT VOLUME: 5,000 GALLONS

2 OIL WATER SEPARATOR TANK
SCALE: NONE

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MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CIVIL DETAILS

SHEET NO.
C-505

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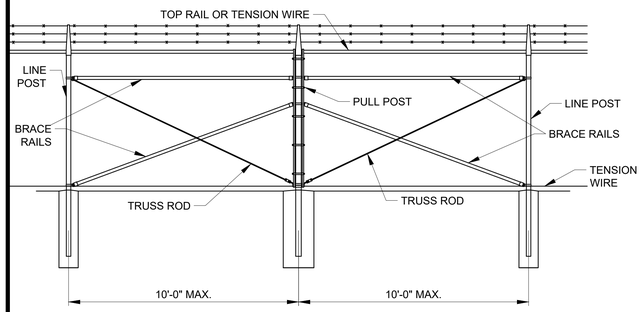
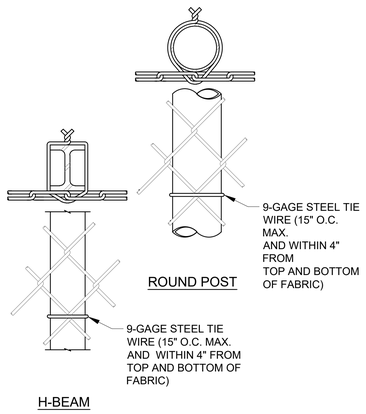
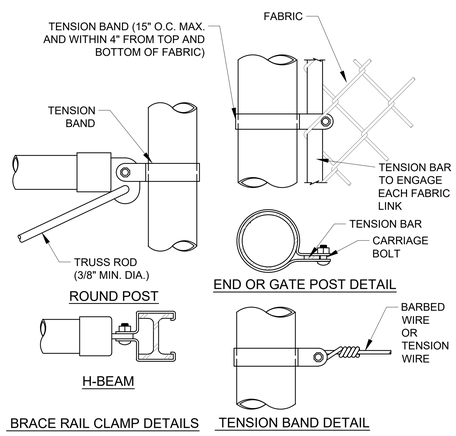


NOTE:
PROVIDE BRACE PANEL WHENEVER STRAIGHT RUNS EXCEED 500 FEET.

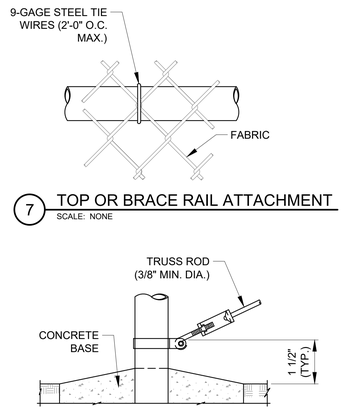
13 BRACE PANEL DETAIL
SCALE: NONE



10 LINE POST ATTACHMENTS
SCALE: NONE



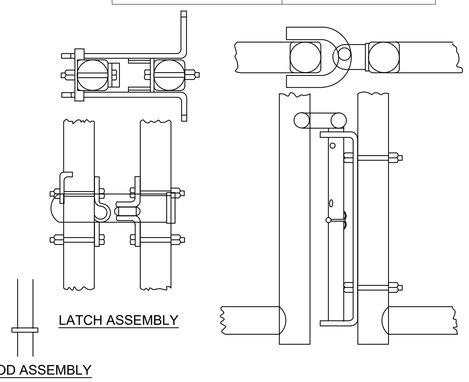
9 FASTENING DETAILS
SCALE: NONE

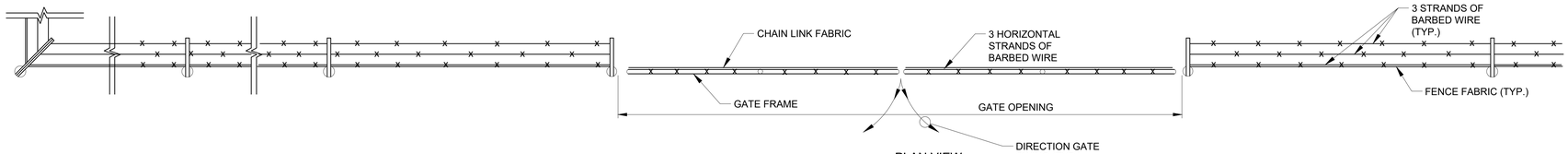


7 TOP OR BRACE RAIL ATTACHMENT
SCALE: NONE

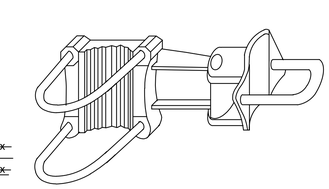
8 TRUSS ROD AND BAND DETAIL
SCALE: NONE

GATE POST SCHEDULE	
GATE LEAF WIDTH (NOMINAL)	OUTSIDE DIMENSION (NOMINAL)
6' OR LESS	2.875" OD 2.5" SQ
GREATER THAN 6' TO 12'	4.0" OD
GREATER THAN 12' TO 18'	6.625" OD
MORE THAN 18'	8.625" OD

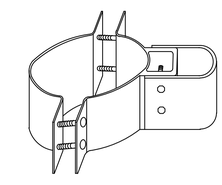




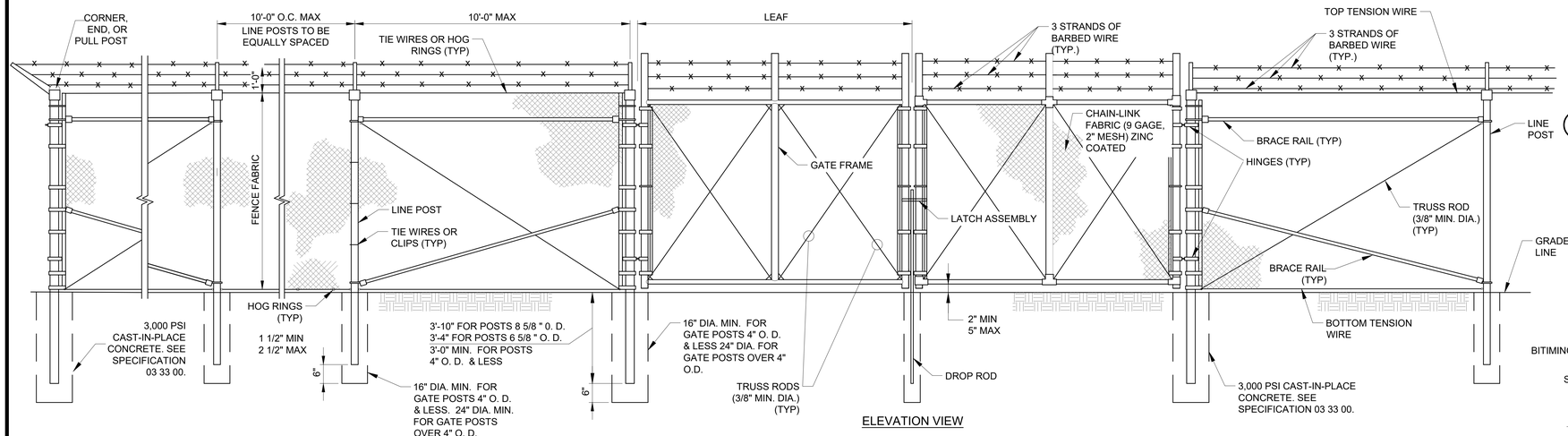
1 SWING GATE DETAILS
SCALE: NONE



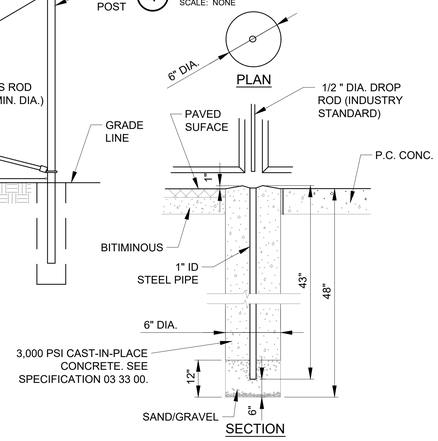
4 OFFSET HINGE DETAIL
SCALE: NONE



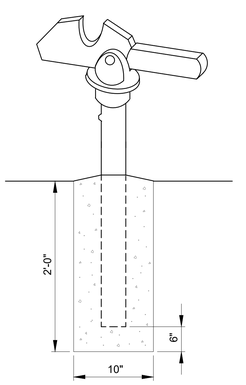
2 STANDARD HINGE DETAIL
SCALE: NONE



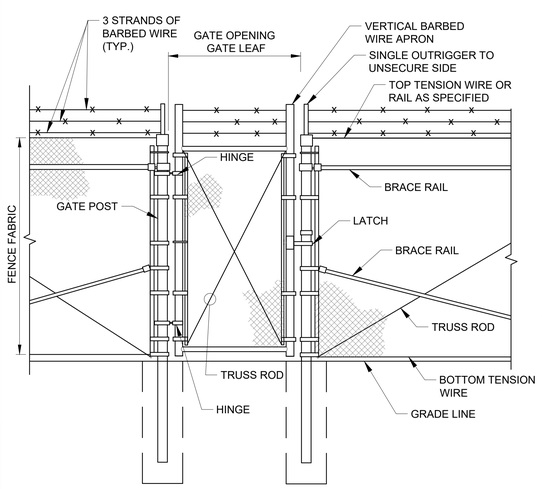
11 DOUBLE SWING GATE DETAIL
SCALE: NONE



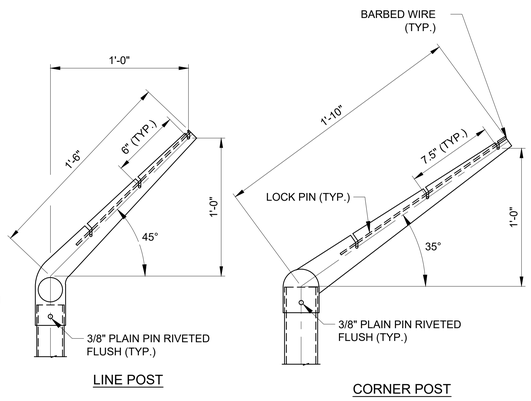
5 DROP ROD FOUNDATION DETAIL
SCALE: NONE



3 STANDARD HINGE DETAIL (TO HOLD GATE OPEN)
SCALE: NONE



14 PERSONNEL GATE FENCE DETAIL
SCALE: NONE



12 EXTENSION ARM DETAILS
SCALE: NONE

NOTES:

1. FENCE FABRIC SHALL BE 7 FEET IN HEIGHT.
2. SWING GATES SHALL BE CONSTRUCTED WITH DROP RODS, PADLOCKS, LATCH ASSEMBLY AND GATE KEEPERS EXCEPT AS NOTED.
3. ALL GATE FRAMES SHALL MEET THE MINIMUM REQUIREMENTS OF ASTM F900 1.90" NOMINAL (ROUND) OR 2.00" NOMINAL (SQUARE). GATE FRAMES SHALL BE OF WELDED CONSTRUCTION OR SHALL BE ASSEMBLED USING HEAVY FITTINGS. AT CONTRACTOR'S OPTION A WELDED HORIZONTAL BRACE MAY BE USED IN LIEU OF TRUSS RODS TO BRACE ALL-WELDED GATE FRAMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER RIGID CONSTRUCTION OF ALL GATES SUPPLIED.
4. DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPES OF FENCE SECTIONS AND METHODS OF INSTALLATION THAT COMPLY WITH THE SPECIFICATIONS.
5. WIRE TIES, RAILS, POSTS, AND BRACES SHALL BE CONSTRUCTED ON THE SECURE SIDE OF THE FENCE ALIGNMENT. CHAIN-LINK FABRIC SHALL BE PLACED ON THE SIDE OPPOSITE THE SECURE AREA.
6. ALL FENCE SHALL HAVE AN APRON EXTENDED OUTWARD FROM THE AREA BEING PROTECTED.
7. C-SECTION POSTS SHALL BE INSTALLED SO THAT THE VOID INSIDE THE POST IS COMPLETELY FILLED WITH CONCRETE UP TO THE TOP OF THE FOUNDATION.

STEEL POST SCHEDULE			
USE AND SECTION	MINIMUM OUTSIDE DIMENSIONS (NOMINAL)		
	FABRIC WIDTH 72" OR LESS	FABRIC WIDTH 84" TO 96"	FABRIC WIDTH 108" AND OVER
CORNER, END & PULL POSTS			
TUBULAR - ROUND	2.375" O.D.	2.875" O.D.	4.00" O.D.
TUBULAR - SQUARE	2.00" SQ.	2.50" SQ.	3.00" SQ.
C-SECTION (ROLL-FORMED)	3.50" X 3.50"	3.50" X 3.50"	
LINE POSTS			
TUBULAR - ROUND	1.90" O.D.	2.375" O.D.	2.875" O.D.
H-SECTION	2.25" X 1.70"	2.25" X 1.70"	2.25" X 1.70"
C-SECTION (ROLL-FORMED)	1.875" X 1.625"	2.25" X 1.70"	
TOP, BOTTOM & BRACE RAILS			
TUBULAR - ROUND	1.66" O.D.		
TUBULAR - SQUARE	1.50" SQ.		
H-SECTION	1.625" X 1.50"		
C-SECTION (ROLL-FORMED)	1.625" X 1.25"		

6 STEEL POST SCHEDULE
SCALE: NONE

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CIVIL DETAILS

SHEET NO.
C-506

C:_PROJECTS\BERG200-38548-200035\SHEETFILES\VGLZ162323-BLDG-154 - REC-501.DWG
12/5/2022 1:26:18 PM

MATERIAL SCHEDULE			
ITEM	SIZE	SECTION	REMARKS
DOWELS, 16" PCC	1-1/4" DIA. X 20" LONG @ 15" O.C.	32 13 14.13	EPOXY COATED, INCLUDING ENDS
DOWEL EPOXY RESIN	AS REQUIRED	32 13 14.13	SELECT CLASS B OR C PER ASTM C881/ C881M
REINFORCED SLABS	4X4 - W3.5 X W3.5 OR 6X6 - W5.5 X W5.5	32 13 14.13	SEE CONCRETE REINFORCING NOTES
JACK SLABS	#7 @ 12" EACH WAY TOP & BOTTOM	32 13 14.13	SEE CONCRETE REINFORCING NOTES

FIELD POURED, COLD APPLIED JOINT SEALANT NOTES:

1. DEPTH (D) AND WIDTH (W) OF JOINT SEALANT SHALL BE AS RECOMMENDED BY SEALANT MANUFACTURER.
2. FOR ALL JOINTS THE BACKER ROD MATERIAL SHALL BE COMPATIBLE WITH THE COLD POURED SEALANT AND SLIGHTLY OVERSIZED TO PREVENT MOVEMENT DURING THE JOINT SEALANT OPERATION.
3. JOINT SEALANT MUST MEET NFGS 02522, 02562, AND ASTM 5893.

FIELD POURED, HOT APPLIED JOINT SEALANT NOTES:

1. DEPTH (D) AND WIDTH (W) OF JOINT SEALANT SHALL BE AS RECOMMENDED BY SEALANT MANUFACTURER.
2. FOR ALL JOINTS THE BACKER ROD MATERIAL SHALL BE COMPATIBLE WITH THE HOT POURED SEALANT AND SLIGHTLY OVERSIZED TO PREVENT MOVEMENT DURING THE JOINT SEALANT OPERATION.
3. JOINT SEALANT MUST MEET ASTM D 3569.

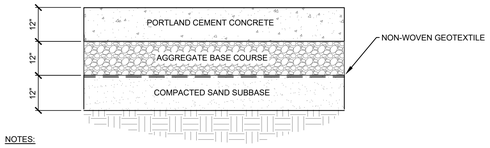
DOWEL BAR INSTALLATION NOTES

1. DOWEL SLEEVES OR INSERTS ARE NOT PERMITTED.
2. DOWELS TO BE EPOXY COATED FULL LENGTH OF DOWEL. APPLY A LUBRICANT BOND BREAKER TO THE EPOXY COATED DOWEL IMMEDIATELY PRIOR TO PAVING.
3. DOWEL BAR DIAMETER, LENGTH, AND SPACING TO BE AS SHOWN IN MATERIAL SCHEDULE (THIS SHEET).
4. DRILLING AND INSTALLATION METHOD SHALL BE CAPABLE OF MAINTAINING DRILL HOLES AND EMBEDDED BARS: (A) PARALLEL TO THE CONCRETE SURFACE AND (B) NORMAL TO THE JOINT LINE, WITHIN SECTION 32 13 14.13 TOLERANCES. USE GANG DRILL WITH 3 OR MORE DRILLS. HOLE DIAMETER TO BE APPROXIMATELY 1/8" LARGER THAN DOWEL. MINIMUM CURE TIME FOR DRILLING NEW CONCRETE PER SECTION 32 13 14.13.
5. AFTER THE DRILLING IS COMPLETE AND PRIOR TO INSTALLATION OF DOWELS, THE HOLES SHALL BE THOROUGHLY CLEANED BY HIGH PRESSURE AIR TO REMOVE DRILLING DUST, CONCRETE CHIPS, AND ANY MATERIAL DETRIMENTAL TO BONDING.
6. INSERT EPOXY INTO BACK OF DOWEL HOLE BY INJECTION NOZZLE WITH SUFFICIENT EPOXY PLACED SO A SLIGHT AMOUNT IS FORCED OUT WHEN DOWEL IS INSERTED AND TAPPED INTO CORRECT POSITION. EPOXY SHALL BE SOLID AROUND BARS WITH NO VOIDS. INSTALL METAL OR PLASTIC DOWEL RINGS TO RETAIN EPOXY. SUBMIT PROPOSED EPOXY INFORMATION FOR APPROVAL PRIOR TO STARTING WORK.
7. CONTRACTOR SHALL RETAIN DRILL BIT MANUFACTURER'S REPRESENTATIVE TO TRAIN THE DRILLING CREW AND MAKE ADJUSTMENTS AS REQUIRED TO THE COMPRESSOR AND DRILL RIG TO PRODUCE DRILL HOLES WITH MINIMAL EDGE SPALLING. MAXIMUM EDGE SPALLING ON FACE IS PER SPECIFICATION SECTION 32 13 14.13.

BASKET NOTES:

1. WIRE USED IN BASKETS SHALL CONFORM TO ASTM-A1064 COLD DRAWN WIRE.
2. DOWEL BAR ATTACHMENT MAY BE FABRICATED BY ARC OR RESISTANCE TYPE WELDING.
3. WIRE FRAME MEMBERS SHALL BE RESISTANCE WELDED EXCEPT FOR SPACER BARS WHICH MAY BE ARC WELDED.

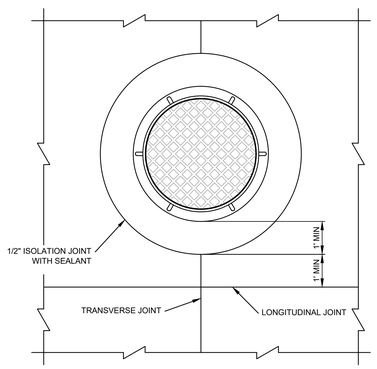
10 PCC PAVEMENT GENERAL NOTES
SCALE: NONE



NOTES:

1. PORTLAND CEMENT CONCRETE (PCC), 650 PSI FLEXURAL STRENGTH CONCRETE, SEE SPEC UFGS 32 13 14.13.
2. AGGREGATE BASE COURSE SHALL BE MDOT 21AA, SEE SPEC UFGS 32 11 23.
3. GEOTEXTILE SEPARATOR SHALL MEET THE REQUIREMENTS OF MDOT NON-WOVEN GEOTEXTILE SEPARATOR PER MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION TABLE 910-1.
4. SAND SUBGRADE SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR) BEFORE PLACEMTN OF NEW PAVEMENT. SAND SUBBASE SHALL BE MDOT CLASS II.
5. THE ABOVE CROSS-SECTION REPRESENT THE MINIMUM PAVEMENT REPAIR CROSS-SECTION. CONTRACTOR SHALL MATCH EXISTING CROSS-SECTION IF GREATER.
6. SEE DETAIL 5, THIS SHEET, FOR REINFORCING DETAILS.

11 PCC PAVEMENT SECTION
SCALE: NONE



MATERIALS:

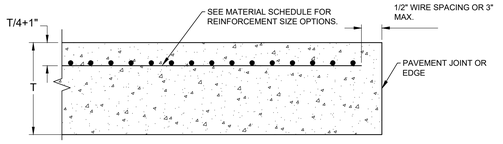
1. POURED JOINT SEALER -HOT POURED RUBBER ASPHALT CONFORMING TO ASTM D-6690
2. EXPANSION JOINT FILLER - FIBER TYPE CONFORMING TO ASTM D-1751
3. PREMOLDED STRIP INSERT - PLASTIC

NOTE:
1.STEEL REINFORCEMENT MESH FOR CONCRETE PAVEMENT IS TO BE 6"x6" - W2.1/W2.1, 0.042" SQUARE PER FOOT TYPICAL, OR HEAVIER.

12 PCC PAVEMENT ISOLATION JOINT DETAIL
SCALE: NONE

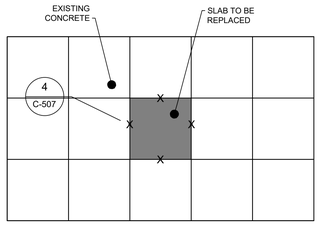
CONCRETE REINFORCING NOTES:

1. CONCRETE SLAB REINFORCEMENT SHALL BE EITHER:
   A.) FABRICATED DEFORMED STEEL BAR MATS CONFORMING TO ASTM A184 OR
   B.) STEEL WELDED WIRE FABRIC CONFORMING TO ASTM A1064.
2. ALL STEEL TO BE DELIVERED IN FLAT SHEETS, NO ROLL WILL BE ACCEPTABLE.
3. DEFORMED STEEL BARS TO BE OVERLAPPED A MINIMUM OF 24 BAR DIAMETERS. LAPPED BARS TO BE SECURELY WIRED TO PREVENT SEPARATION DURING CONCRETE PLACEMENT.
4. WIRE FABRIC TO BE OVERLAPPED DISTANCE EQUAL TO ONE SPACING OF WIRE IN THE FABRIC OR 32 WIRE DIAMETERS, WHICHEVER IS GREATER.
5. WELDED WIRE REINFORCEMENT WILL BE USED FOR ALL ODD SHAPED REINFORCED PANELS.
6. SEE MATERIAL SCHEDULE FOR REINFORCEMENT SIZING.

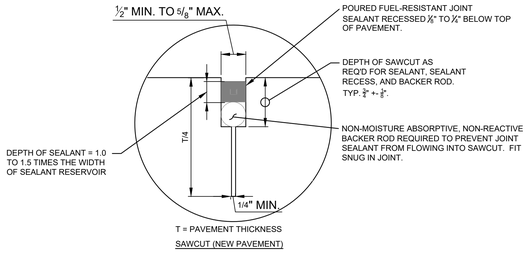


REBAR / WELDED WIRE REINFORCEMENT PLACEMENT

5 REINFORCED PCC PAVEMENT
SCALE: NONE
SYMBOL: R

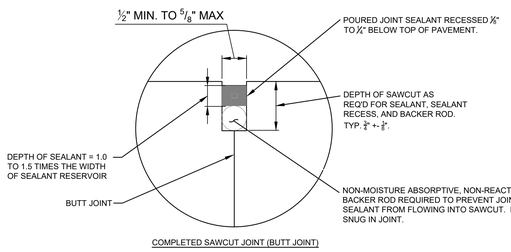


6 SLAB REPLACEMENT JOINT LAYOUT
SCALE: NONE



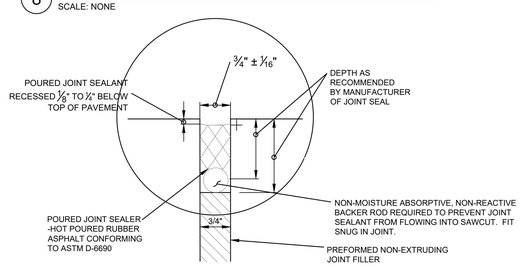
SAWCUT (NEW PAVEMENT)

7 CONSTRUCTION JOINT COLD APPLIED SEALANT DETAIL (SAWCUT)
SCALE: NONE

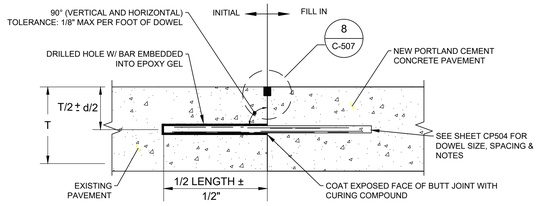


COMPLETED SAWCUT JOINT (BUTT JOINT)

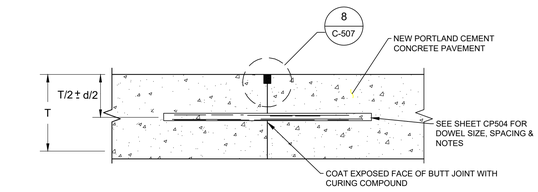
8 SAW CONTRACTION JOINT COLD APPLIED SEALANT DETAIL (BUTT JOINT)
SCALE: NONE



9 EXPANSION JOINT SEAL DETAIL
SCALE: NONE
SYMBOL: E

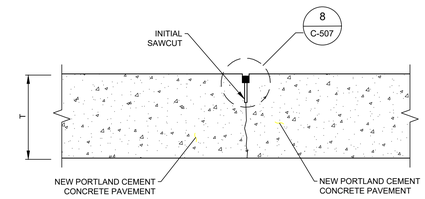


JOINT WHERE NEW PAVEMENT ABUTS EXISTING PAVEMENT

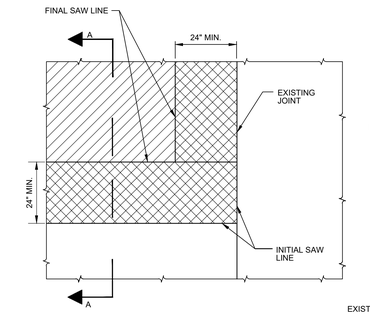


JOINT IN NEW PAVEMENT PLACED BETWEEN POURS

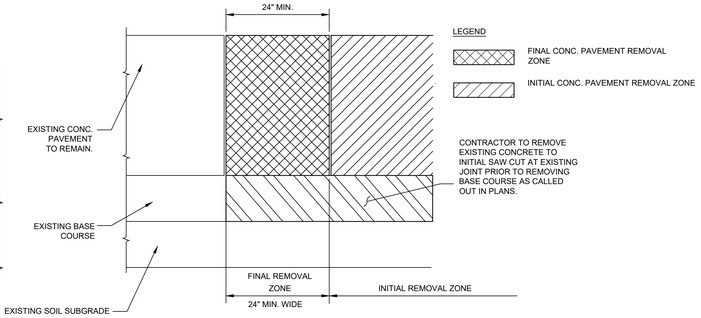
4 DOWELED CONSTRUCTION JOINT AT EXISTING/NEW PAVEMENT
SCALE: NONE
SYMBOL: X



1 SAWED CONTRACTION JOINT
SCALE: NONE
SYMBOL: C



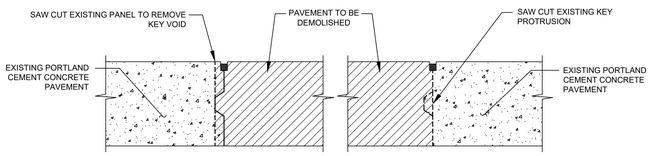
PLAN VIEW



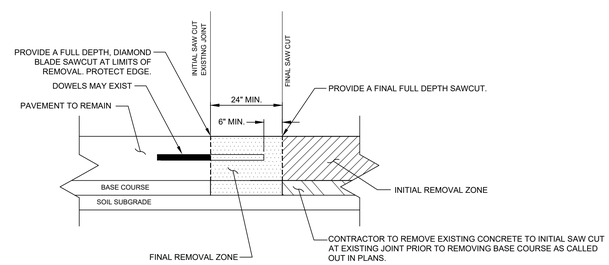
SECTION A-A
N.T.S.

NOTES:
1. CONTRACTOR SHALL REPLACE EXISTING TO REMAIN PANELS IF DURING THE COURSE OF DEMOLITION AND/OR CONSTRUCTION MORE THAN 10% OF THE ADJACENT PANEL PERIMETER IS DAMAGED.

2 PCC PAVEMENT REMOVAL TYPICAL PLAN
SCALE: NONE



TYPICAL SAWCUT FOR REMOVAL OF EXISTING KEY JOINTED PAVEMENT



TYPICAL SAWCUT FOR REMOVAL OF EXISTING PCC AIRFIELD PAVEMENTS

NOTES:
1. SAWCUTS SHALL BE FULL DEPTH.
2. CONTRACTOR SHALL VERIFY THICKNESS OF PAVEMENT AND SUBSTRATA TO CUT AT EACH LOCATION AND ADJUST CUT DEPTH ACCORDINGLY AT NO ADDITIONAL COST TO THE GOVERNMENT.
3. IF EXISTING JOINT IS A CONTRACTION JOINT THEN AN ADDITIONAL SAWCUT WILL BE REQUIRED TO GET A SMOOTH FACE.
4. IF PCC PAVEMENT SECTION HAS BITUMINOUS OVERLAY, FIRST MILL AND REMOVE BITUMINOUS OVERLAY THEN SAWCUT PCC SECTION. RECYCLE BITUMINOUS MILLINGS.

3 FULL DEPTH PCC SAWCUT
SCALE: NONE

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WE STAND READY

MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CIVIL DETAILS

SHEET NO.
C-507

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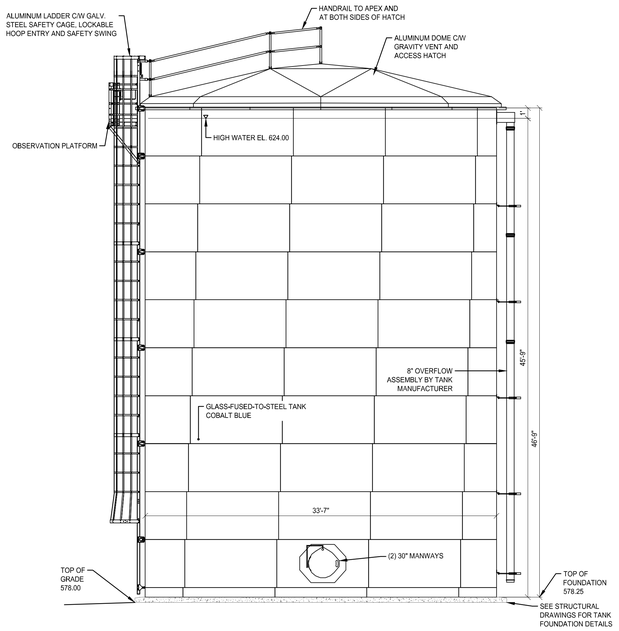
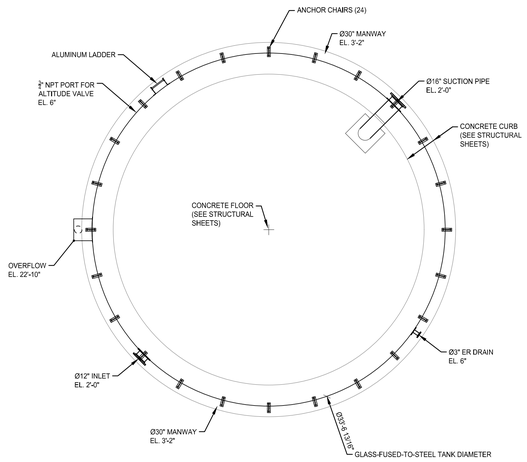
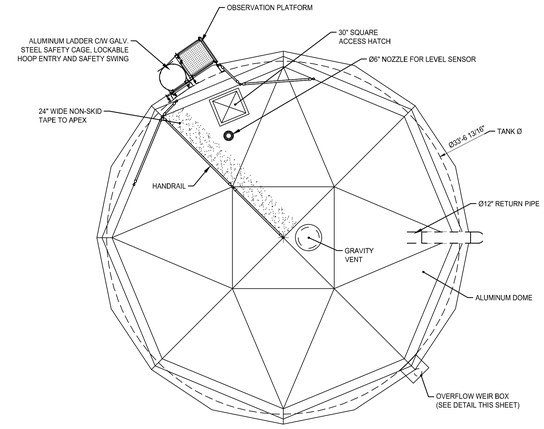


8 TANK ELEVATION
SCALE: NONE



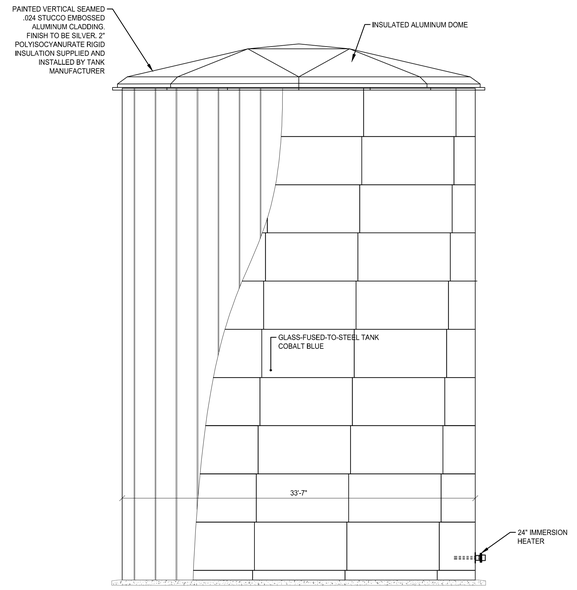
NOTES:
1. THE ORIENTATION OF THE FEATURES SHOWN ON THE TANK FLOOR PLAN WILL NEED TO BE ADJUSTED TO CORRESPOND WITH THE UTILITY PLAN. THE ABOVE DETAIL IS A SCHEMATIC DIAGRAM AND SHOULD BE USED AS A REFERENCE.
2. TANK MANUFACTURER IS REQUIRED TO SUBMIT SHOP DRAWINGS OF TANK FLOOR PLAN FOR COR REVIEW AND APPROVAL.
3. SEE STRUCTURAL TANK FOUNDATION PLAN.

6 TANK FLOOR PLAN
SCALE: NONE



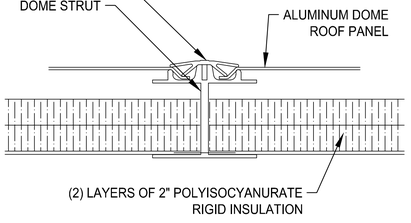
NOTES:
1. THE ORIENTATION OF THE FEATURES SHOWN ON THE TANK ROOF PLAN WILL NEED TO BE ADJUSTED TO CORRESPOND WITH THE UTILITY PLAN. THE ABOVE DETAIL IS A SCHEMATIC DIAGRAM AND SHOULD BE USED AS A REFERENCE.
2. TANK MANUFACTURER IS REQUIRED TO SUBMIT SHOP DRAWINGS OF TANK ROOF PLAN FOR COR REVIEW AND APPROVAL.
3. SEE SPECIFICATION 33 16 15 FOR TANK DOME ACCESSORIES, INCLUDING WALKWAS, MANWAY OBSERVATION PLATFORMS AND PERSONAL FALL ARREST SYSTEM.

3 TANK ROOF PLAN
SCALE: NONE

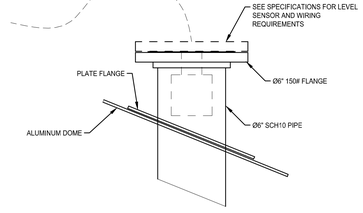


NOTES:
1. FLANGED TMI IMMERSION HEATER, MANUFACTURED BY CHROMALOX. 16.5 KW, 480V, 3PH, 10A LOAD, 5" 150# ANSI FLANGE, 24" IMMERSION LENGTH, TYPE K TERMOCOUPLE FOR OVER TEMPERATURE PROTECTION, SUPPLIED AND INSTALLED BY TANK MANUFACTURER.
2. PROCESS CONTROL PANEL, 480V, 3PH, UP TO 75A LOAD, SUPPLIED LOOSE BY TANK MANUFACTURER.
3. TYPE J THERMOCOUPLE KIT WITH THERMOWELL FOR PROCESS TEMPERATURE SENSING, SUPPLIED AND INSTALLED BY TANK MANUFACTURER.
4. BRASS HIGH TEMPERATURE SWITCH, SUPPLIED AND INSTALLED BY TANK MANUFACTURER.
5. NO WIRING IS PROVIDED BY THE TANK MANUFACTURER.

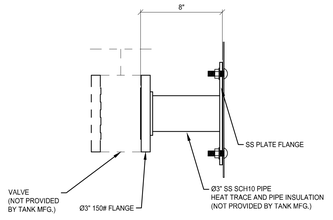
1 TANK INSULTATION AND HEATING
SCALE: NONE



2 DOME INSULATION DETAIL
SCALE: NONE



7 LEVEL SENSOR DETAIL
SCALE: NONE



4 EMERGENCY DRAIN DETAIL
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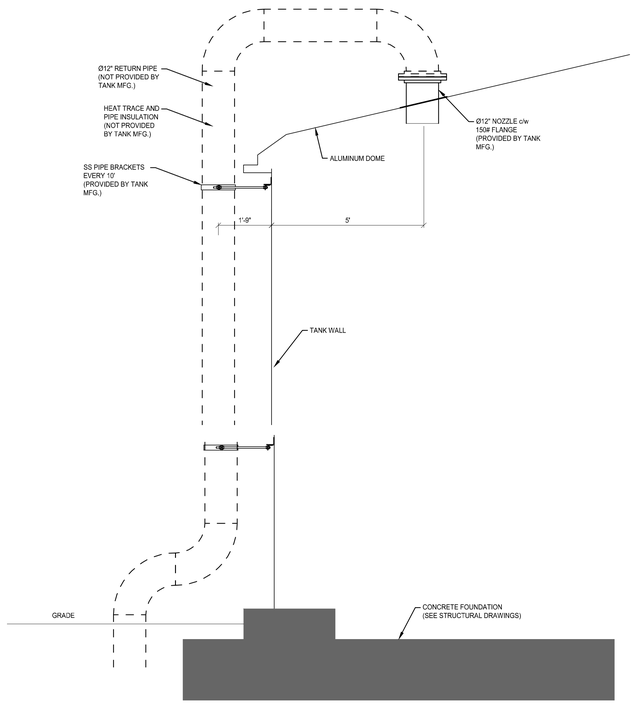
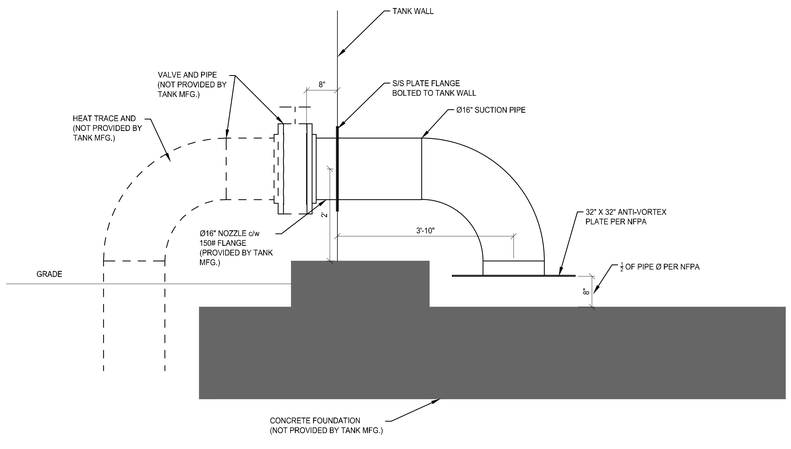
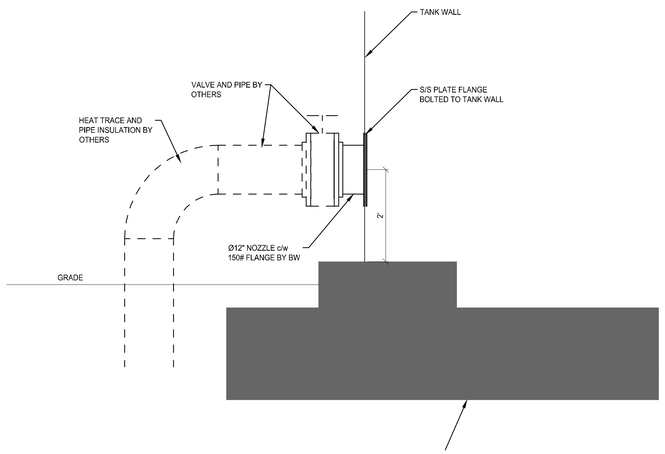




NOTES:
1. INTERIOR PIPING AND EXTERIOR NOZZLE PROVIDED BY TANK MANUFACTURER. ALL OTHER PIPING PROVIDED BY CONTRACTOR.
2. CONTRACTOR SHALL HEAT TRACE AND INSULATE ALL EXTERIOR PIPING TO PREVENT FREEZING.

9 SUCTION PIPE DETAILS
SCALE: 3/4" = 1'-0"



NOTES:
1. INTERIOR PIPING AND EXTERIOR NOZZLE PROVIDED BY TANK MANUFACTURER. ALL OTHER PIPING PROVIDED BY CONTRACTOR.
2. CONTRACTOR SHALL HEAT TRACE AND INSULATE ALL EXTERIOR PIPING TO PREVENT FREEZING.

7 INLET PIPE DETAILS
SCALE: 3/4" = 1'-0"

NOTES:
1. INTERIOR PIPING AND EXTERIOR NOZZLE PROVIDED BY TANK MANUFACTURER. ALL OTHER PIPING PROVIDED BY CONTRACTOR.
2. CONTRACTOR SHALL HEAT TRACE AND INSULATE ALL EXTERIOR PIPING TO PREVENT FREEZING.

4 RETURN PIPE DETAILS
SCALE: NONE

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MICHIGAN AIR NATION GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: DGW
DRAWN BY: SHG
CHECKED BY: KLJ
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CIVIL DETAILS

SHEET NO.
C-508

C:_PROJECTS\BR\200-3804\5-200205\SHEETFILES\VGLZ162323-BLDG-154 - RC-508.DWG
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ABBREVIATIONS

∠	ANGLE
@	AT
AB	ANCHOR BOLT
AC	ACOUSTIC
ACC	ACCESS
ACT	ACOUSTIC CEILING TILE
ACP	ACOUSTIC CEILING PANEL
AD	AREA DRAIN
ADD	ADDITIONAL
ADJ	ADJUSTABLE
AFF	ABOVE FINISH FLOOR
AHU	AIR HANDLING UNIT
AL	ALUMINUM
ALT	ALTERNATE
AP	ACCESS PANEL
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ASPH	ASPHALT
BB	BOND BEAM
BD	BOARD
BF	BOTH FACES
BFC	BELOW FINISH CEILING
BG	BUMPER GUARD
BIT	BITUMINOUS
BLDG	BUILDING
BLKG	BLOCKING
BLKT	BLANKET
BM	BEAM/BENCH MARK
BLK	BLOCK
BOT	BOTTOM
BRG	BEARING
BRKR	BREAKER
BRK	BRICK
BRKT	BRACKET
BS	BACK SPLASH
BSMT	BASEMENT
BTWN	BETWEEN
	CHANNEL
CAB	CABINET
CER	CERAMIC
CFCI	CONTRACTOR FURNISHED, CONTRATOR INSTALLED
CG	CORNER GUARD
CH	COAT HOOK
CIP	CAST IN PLACE
CJ	CONTROL JOINT/CONSTRUCTION JOINT
CLG	CEILING
CLO	CLOSET/CLOSURE
CLR	CLEAR
COL	COLUMN
COMB	COMBINATION
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
CONF	CONFERENCE
CONN	CONNECTION/CONNECT
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
CORR	CORRIDOR
CPT	CARPET
CR	COAT RACK/CURTAIN ROD
CSG	CASING
CT	CERAMIC TILE
CTR	CENTER/COUNTER
CTSK	COUNTERSUNK
CUH	CABINET UNIT HEATER
CW	COLD WATER
D	DEPTH
DBL	DOUBLE
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIR	DIRECTION
DIV	DIVISION
DM	DEMOUNTABLE PARTITION
DN	DOWN
DO	DITTO
DR	DOOR
DRWR	DRAWER
DS	DOWNSPOUT
DWG	DRAWING
DWL	DOWEL
DWS	DEFORMED WELDED STUD
EA	EACH
EC	ELECTRICAL CONTRACTOR
EF	EACH FACE
EH	ELECTRICAL HEATER/EXHAUST HOOD
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR/ELEVATION
EMBED	EMBEDDED
EMER	EMERGENCY
ENT	ENTRANCE
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EMERGENCY SHOWER
ESR	ELASTOMERIC SHEET ROOFING
ETR	EXISTING TO REMAIN
EVC	ELASTIC VINYL COATING
EW	EACH WAY
EWC	ELECTRIC WATER COOLER
EXC	EXCAVATE
EXP	EXPANSION
EXPD	EXPOSED
EXPF	EXPLOSION PROOF
EXT	EXTERIOR
FA	FIELD ADJUSTABLE
FV	FIELD VERIFY
FD	FLOOR DRAIN
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FHC	FIRE HOSE CABINET
FIN	FINISH
FIX	FIXTURE
FLEX	FLEXIBLE
FLR	FLOOR
FLRG	FLOORING
FP	FIREPROOF/FIRE PROTECTION
FR	FIRE RETARDANT
FS	FULL SIZE/FULL SCALE
FT	FEET
FTG	FOOTING
FURG	FURRING
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GEN	GENERAL
GFCI	GOVERNMENT FURNISHED, CONTRACTOR INSTALLED
GFGI	GOVERNMENT FURNISHED, GOVERNMENT INSTALLED
GFRC	GLASS FIBER REINFORCED CONCRETE
GFRG	GLASS FIBER REINFORCED GYPSUM
GL	GLASS
GMU	GLAZED MASONRY UNIT
GWB	GYPSUM WALL BOARD
GYP	GYPSUM
H	HEIGHT
HDBD	HARDBOARD
HDCP	HANDICAPPED
HDWD	HARDWOOD
HDWE	HARDWARE
HK	HOOK
HM	HOLLOW METAL
HP	HIGH POINT
HR	HANDRAIL
HT	HEIGHT
HVAC	HEATING VENTILATION AND AIR CONDITIONING
HWS	HEAD WELDED STUDS
ID	INSIDE DIAMETER
IMP	INSULATED METAL PANEL
IN	INCHES
INFO	INFORMATION
INSUL	INSULATION
INT	INTERIOR
IPW	INSULATED PLENUM WALL
IRF	INSULATED ROOF FILL
JAN	JANITOR
JS	JANITOR SINK
JST	JOIST
JT	JOINT
KD	KNOCKED DOWN
KO	KNOCK-OUT / KNEE OPENING
L	LENGTH
LAB	LABORATORY
LAM	LAMINATED
LB	POUND
LBS	POUNDS
LD	LINEAR DIFFUSER
LDG	LANDING
LF	LINEAR FOOT
LG	LONG
LGT	LIGHT
LKR	LOCKER
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERITICAL
LONG	LONGITUDINAL
LP	LOW POINT
LSH	LONG SLOTTED HOLE
LTG	LIGHTING
LVR	LOUVER
LWC	LIGHTWEIGHT CONCRETE
MACH	MACHINE
MAN	MANUAL
MAR	MARBLE
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MB	MACHINE BOLT
MBW	MASONRY BEARING WALL
MC	MECHANICAL CONTRACTOR
MDO	MEDIUM DENSITY OVERLAY
MECH	MECHANICAL
MEMB	MEMBRANE
MET	METAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MIN	MINIMUM
MIR	MIRROR
MISC	MISCELLANEOUS
MK	MARK
ML	METAL LATH
MLDG	MOLDING
MO	MASONRY OPENING
MP	METAL PARTITION
MS	MACHINE SCREW
MTD	MOUNTED
MTG	MOUNTING
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NS	NONSHRINK
NTS	NOT TO SCALE
NWC	NORMAL WEIGHT CONCRETE
OA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER/OVERFLOW DRAIN
OFF	OFFICE
OPNG	OPENING
OPP	OPPOSITE
OZ	OUNCE
PART	PARTITION
PC	PIECE
PCC	PRECAST CONCRETE
PCPL	PORTLAND CEMENT PLASTER
PDWR	PAPER TOWEL DISPENSER & WASTE RECEPTACLE
PH	PHILLIPS HEAD/PHASE
PL	PLASTIC LAMINATE/PLATE/PROPERTY LINE
PLAS	PLASTER
PLBG	PLUMBING
PLYWD	PLYWOOD
PM	PROTECTED METAL
PNL	PANEL
PNLG	PANELING
POL	POLISHED
PR	PAIR
PRE FAB	PREFABRICATED
PRE FIN	PRE-FINISHED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT/PAINT
PTM	PAINT TO MATCH
PVC	POLYVINYL CHLORIDE
QT	QUARRY TILE
QTY	QUANTITY
RAD	RADIUS
RAH	ROOFTOP AIR HANDLING UNIT
RB	RUBBER BASE
RC	REINFORCED CONCRETE
RCP	RADIANT CEILING PANEL / REFLECTED CEILING PLAN
RD	ROOF DRAIN
REC	RECESSED
REF	REFERENCE
REINF	REINFORCING
REL	RELOCATE
REM	REMAINDER
REQD	REQUIRED
RES	RESILIENT
RET	RETURN
RI	ROUGH IN
RM	ROOM
RO	ROUGH OPENING
RT	RUBBER TILE
RUB	RUBBER
SAT	STANDARD AGGREGATE TOPPING
SB	SOIL BEARING
SC	SEAMLESS COATING
SCF	SPECIAL CONCRETE FINISH
SCHD	SCHEDULE
SD	SOAP DISPENSER
SE	SHELF EDGE
SECT	SECTION
SF	SAND FLOAT
SG	SUPPLY AIR GRILLE
SGL	SINGLE
SH	SHELF
SHD	SHOWER DOOR
SHT	SHEET
SIM	SIMILAR
SJ	STEEL JOIST
SLV	SHORT LEG VERTICAL
SM	SMOOTH
SND	SANITARY NAPKIN DISPENSER
SNV	SANITARY NAPKIN VENDER
SOG	SLAB ON GRADE
SPEC	SPECIFICATION
SPR	SPRINKLER
SQ	SQUARE
SR	SHOWER ROD
SS	STAINLESS STEEL
ST	STREET
STD	STANDARD
STL	STEEL
STO	STORAGE
STRU	STRUCTURAL/STRUCTURE
SUSP	SUSPENDED
SV	SHEET VINYL
SYM	SYMMETRICAL
T & B	TOP AND BOTTOM
TB	TACKBOARD/TOWEL BAR
TBR	TO BE REMOVED
TCP	THIN COAT PLASTER
TD	TOWEL DISPENSER
TDW	TOWEL DISPENSER AND WASTE
TEMP	TEMPERATURE/TEMPERED
TER	TERRAZZO
TEX	TEXTURE
TFC	TROWELED FLOOR COVERING
T & G	TONGUE AND GROOVE
THK	THICK
TOB	TOP OF BEAM
TOC	TOP OF CURB/TOP OF CONCRETE
TOD	TOP OF DECK/TOP OF DUCT ELEVATION
TOF	TOP OF FOOTING
TOJ	TOP OF JOIST
TOP	TOP OF PIPE ELEVATION
TOS	TOP OF SLAB/TOP OF STEEL
TOW	TOP OF WALL
TPG	TOPPING
TPH	TOILET PAPER HOLDER
TRAN	TRANSOM
TRANS	TRANSVERSE
TS	TUBE STEEL
TWS	THREADED WELDED STUD
TYP	TYPICAL
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
UR	URINAL
V	VINYL
VB	VINYL BASE
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
VOL	VOLUME
VWC	VINYL WALL COVERING
W	WIDE FLANGE STEEL BEAM
W/	WITH
WAF	WELDED ANGLE FRAME
WC	WATER CLOSET
WD	WOOD
WDW	WINDOW
WF	WIDE FLANGE
WG	WIRE GLASS
W/O	WITHOUT
WP	WEATHERPROOF
WPFG	WATERPROOFING
WR	WASTE RECEPTACLE
WSCT	WAINSCOT
WSTP	WEATHERSTRIP
WTR	WATER
WWF	WELDED WIRE FABRIC
X	EXISTING

ABBREVIATIONS ABOVE ARE FOR ARCHITECTURAL SHEETS ONLY.

LEGEND - PLAN SYMBOLS

- SIM / 1 / A-101 — BUILDING SECTION SYMBOL
- SIM / 1 / A-101 — WALL SECTION SYMBOL
- 1 / A-101 — DETAIL SYMBOL
- 1 / A-101 — ENLARGED PLAN SYMBOL
- A201 1 — EXTERIOR ELEVATION SYMBOL
- A211 1 — INTERIOR ELEVATION SYMBOL
- 4.XXX — KEYED NOTE IDENTIFICATION
- ROOM NAME / 000 — ROOM NAME AND NUMBER
- XXX / X — WALL TYPE IDENTIFICATION
- W7 — WINDOW IDENTIFICATION
- 101A — DOOR IDENTIFICATION
- 1 HOUR FIRE RATED WALL
- 2 HOUR FIRE RATED WALL
- F.E. — FIRE EXTINGUISHER - SURFACE MOUNT
- F.E.C. — FIRE EXTINGUISHER CABINET AND FIRE EXTINGUISHER - SEMI-RECESSED
- FD — FLOOR DRAIN
- A100 — EXISTING GRID LINES
- A100 — NEW GRID LINES
- XXX / X' - X" — LEVEL OR SPOT ELEVATIONS
- 10'-10" / ACP-X — CEILING HEIGHT & FINISH

DEMOLITION LEGEND:

- EXISTING CONSTRUCTION TO REMAIN
- EXISTING CONSTRUCTION TO BE DEMOLISHED, TYP (U.N.O.)
- EXISTING DOOR TO REMAIN
- DOOR, FRAME, AND HARDWARE TO BE DEMOLISHED COMPLETE, TYP (U.N.O.)

GENERAL NOTES:

1. CONTRACTOR SHALL CONSTRUCT IN CONFORMANCE WITH AIR NATIONAL GUARD AND AIR FORCE GUIDELINES, MILITARY UFC'S, LOCAL CODES, ORDINANCES AND PROCEDURES UNDER THE JURISDICTION OF SELFRIDGE AIR NATIONAL GUARD BASE.
2. CONTRACTORS SHALL BE LICENSED TO PERFORM WORK WITHIN HARRISON TOWNSHIP, MI.
3. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY PROTECTION OF THE BUILDING ENVELOPE AND INTERIOR FROM INCLEMENT WEATHER, AS IT RELATES TO THE WORK OUTLINED IN THESE DOCUMENTS.
4. DO NOT SCALE FROM DRAWINGS.
5. DIMENSIONS ARE APPROXIMATE. ACTUAL FIELD VERIFIED DIMENSIONS SHALL BE OBTAINED BY GENERAL CONTRACTOR & SUB-CONTRACTORS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. FIELD CONDITIONS WHICH DIFFER FROM THOSE INDICATED ON THE CONSTRUCTION DOCUMENTS MUST BE BROUGHT TO THE ATTENTION OF THE CONTRACTING OFFICER AT THE TIME OF THEIR FINDING AND PRIOR TO THE COMMENCEMENT OF SAID WORK.
6. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO COORDINATE ARCHITECTURAL AND STRUCTURAL WITH OTHER BUILDING TRADES THAT SHALL CORRELATE TO SUCH WORK IN ORDER TO ENSURE THAT THE WORK DESIGNATED IS COMPLETED ON SCHEDULE.
7. REPAIR OR REPLACE EXISTING CONSTRUCTION (WINDOWS, WALLS, DOORS, CEILINGS, FLOORS, ETC.) TO REMAIN WHICH ARE DAMAGED DURING CONSTRUCTION. REPLACEMENT MATERIAL SHALL MATCH IN KIND.
8. REFER TO THE SPECIFICATIONS FOR ADDITIONAL INFORMATION RELATED TO THE CONSTRUCTION.
9. SEE STRUCTURAL DRAWINGS FOR FLOOR SLABS, MASONRY WALLS, CONCRETE WORK, LINTELS, AND OTHER STRUCTURAL ELEMENTS.
10. WHERE CUTTING IS NECESSARY FOR RENOVATED LAYOUT OR INSTALLATION OF MEP WORK, REFERENCE SPECIFICATION SECTION "SELECTIVE DEMOLITION" REGARDING CUTTING & PATCHING AND REMOVING & SALVAGING.
11. INTACT BUILDING MATERIALS DESIGNATED FOR REMOVAL SHALL BE PRESENTED TO THE CONTRACTING OFFICER FOR FIRST OPTION TO SALVAGE MATERIALS. IT SHALL BE AT THE CONTRACTORS DISCRETION, BUT IS ENCOURAGED, TO RECYCLE THE REMAINING DEMOLISHED MATERIALS TO MEET THE GUIDING PRINCIPALS 60% THRESHOLD FOR WASTE DIVERSION FROM LANDFILL.

HATCH SYMBOLS

- EARTHWORK
- GRAVEL
- PLASTER, SAND, GROUT
- CONCRETE
- CONCRETE MASONRY
- CLAY MASONRY
- PRECAST CONCRETE
- METAL
- PLYWOOD
- FINISH LUMBER
- WOOD STUDS, BLOCKING
- STEEL STUDS
- GYPSUM WALLBOARD
- ACOUSTICAL TILE
- BATT INSULATION
- RIGID INSULATION

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: PJC
DRAWN BY: PJC
CHECKED BY: NJD
DO NOT SCALE DRAWINGS

SHEET CONTENTS
NOTES & SYMBOLS

SHEET NO.:
A-001

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PARTITION NOTES:

A. PARTITIONS SHALL BE TYPE "MA8" UNLESS OTHERWISE NOTED.

B. ALL ELEMENTS OF PARTITIONS SHALL EXTEND TO ROOF/CEILING OR FLOOR DECK ABOVE AND ALL JOINTS AND PENETRATIONS OF ACOUSTIC RATED PARTITIONS SHALL BE FILLED AND SEALED.

D. REFER TO "INTERIOR PARTITION TYPE MODIFIERS" FOR SYMBOLS USED TO IDENTIFY ADDITIONAL REQUIREMENTS OR MODIFICATIONS TO BASIC PARTITION TYPES.

E. PARTITION TYPES DESCRIBE GENERAL REQUIREMENTS FOR PARTITIONS. REFER TO PRODUCT MANUFACTURERS' SPECIFICATIONS AND REQUIREMENTS FOR APPLICABLE TESTING AGENCIES FOR SPECIFICS OF PARTITION CONSTRUCTION.

F. PARTITION REQUIREMENTS SHOWN ARE CONSIDERED MINIMUM STANDARDS. WHERE CONDITIONS OF THE WORK CAUSE PARTITION(S) TO EXCEED LIMITS RECOMMENDED BY MANUFACTURER, REINFORCE PARTITION(S).

G. PENETRATIONS IN RATED PARTITIONS AND CONNECTIONS OF THE PARTITIONS TO OTHER PORTIONS OF THE WORK SHALL BE IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDED DETAILS AND IN COMPLIANCE WITH APPLICABLE TESTING AGENCY REQUIREMENTS.

I. REFER TO STRUCTURAL DRAWINGS FOR EXTENT AND DESCRIPTION OF INTERIOR STRUCTURAL WALLS NOT IDENTIFIED BY PARTITION TYPES.

J. INSTALL BLOCKING OR BACKER MATERIAL FOR ATTACHMENT/MOUNTING OF WALL HUNG ITEMS OR EQUIPMENT DESCRIBED IN THE DOCUMENTS.

K. FIRE RATED PARTITIONS: GA AND UL TEST NUMBERS MAY VARY DEPENDING ON THE MANUFACTURER OF COMPONENTS ACTUALLY USED.

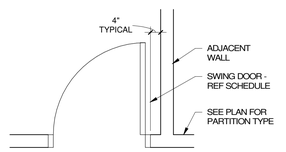
L. PROVIDE 5/8" TYPE "X" GYPSUM BOARD (UNLESS NOTED OTHERWISE)

N. PROVIDE WATER RESISTANT TYPE GYPSUM BOARD AT AREAS THAT ARE SCHEDULED TO RECEIVE CERAMIC TILE FINISH AND AT AREAS SO REQUIRED BY CODE TO RECEIVE IT.

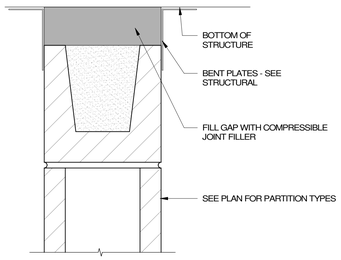
O. PROVIDE TILE BACKER BOARD AT SHOWER AREAS AND AT OTHER WET AREAS THAT ARE SCHEDULED IN ROOM FINISH SCHEDULE TO RECEIVE CERAMIC TILE FINISH.

R. TYPICAL FLOOR PLAN DIMENSIONS OF PARTITIONS ARE TO THE NOMINAL FINISH FACE OF GYPSUM BOARD UNLESS NOTED TO THE CENTERLINE OF THE PARTITION.

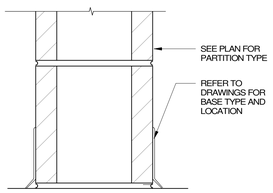
S. FIRE WALLS, FIRE BARRIERS, FIRE PARTITIONS, SMOKE BARRIERS, SMOKE PARTITIONS, OR ANY OTHER WALL REQUIRED TO HAVE PROTECTED OPENINGS MUST BE MARKED AND IDENTIFIED IN ACCORDANCE WITH THE IBC (UFC 3-600-01 §7-2). WALLS WILL BE PERMANENTLY IDENTIFIED WITH SIGNS OR STENCILS IN ANY ACCESSIBLE CONCEALED FLOOR, FLOOR-CEILING, OR ATTIC SPACES. SUCH IDENTIFICATION SHALL MEET THE FOLLOWING REQUIREMENTS:
- BE LOCATED WITHIN 15 FEET OF THE END OF EACH WALL AND AT INTERVALS NOT EXCEEDING 30 FEET MEASURED HORIZONTALLY ALONG THE WALL OR PARTITION.
- INCLUDE LETTERING NOT LESS THAN 3 INCHES IN HEIGHT WITH A MINIMUM 3/8-INCH STROKE IN CONTRASTING COLOR WITH WORDING SIMILAR TO "FIRE AND/ OR SMOKE BARRIER – PROTECT ALL OPENINGS."



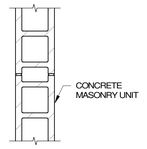
1 TYPICAL DOOR/FRAME LOCATION
1/2" = 1'-0"



2 PARTITION HEAD
3" = 1'-0"

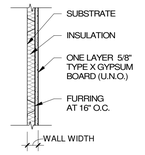


3 WALL BASE
3" = 1'-0"



"MA" SERIES

PTN TYPE	CMU WIDTH	WALL WIDTH	NOTES
MA4	3 5/8"	4"	
MA6	5 5/8"	6"	1 HR RATING AVAILABLE
MA8	7 5/8"	8"	2 HR RATING AVAILABLE
MA0	9 5/8"	10"	2 HR RATING AVAILABLE
MA2	11 5/8"	12"	2 HR RATING AVAILABLE
MA14	13 5/8"	14"	3 HR RATING AVAILABLE
MA16	15 5/8"	16"	3 HR RATING AVAILABLE

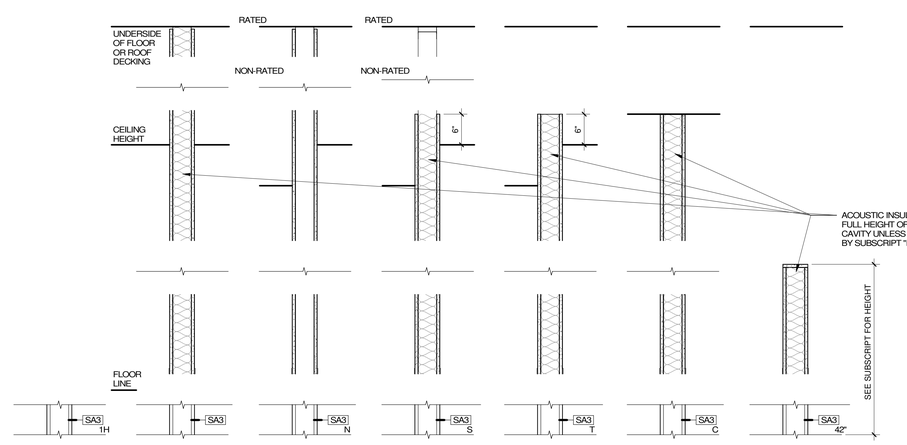


"FA" SERIES

PTN TYPE	STUD WIDTH	WALL WIDTH	NOTES
FA7/8	7/8"	1 1/2"	HAT CHANNEL
FA1	1"	1 5/8"	Z-FURRING
FA1.5	1 1/2"	2 1/8"	Z-FURRING
FA2	2"	2 5/8"	Z-FURRING
FA3	3"	3 5/8"	Z-FURRING

PARTITION TYPES
1" = 1'-0"

PARTITION TYPE SYMBOL AND SUBSCRIPT DEFINITIONS:



SUBSCRIPT (#H)
RATED PARTITION

NO SUBSCRIPT
EXTEND TOTAL PARTITION TO STRUCTURE

SUBSCRIPT (N)
NO ACOUSTIC INSULATION

SUBSCRIPT (S)
STUDS TO STRUCTURE, GYP BD TO 6" ABOVE HIGHEST ADJ. CEILING

SUBSCRIPT (T)
EXTEND TOTAL PARTITION TO 6" ABOVE ADJ. CEILING (BRACE AS NECESSARY)

SUBSCRIPT (C)
EXTEND TOTAL PARTITION TO CEILING (BRACE AS NECESSARY)

SUBSCRIPT (XX")
PARTITION HEIGHT IN INCHES AS NOTED. SEE ABOVE DETAIL FOR OTHER REQUIREMENTS

1" = 1'-0"

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DRAWN BY: PJC
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SHEET CONTENTS
PARTITION TYPES

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A-002

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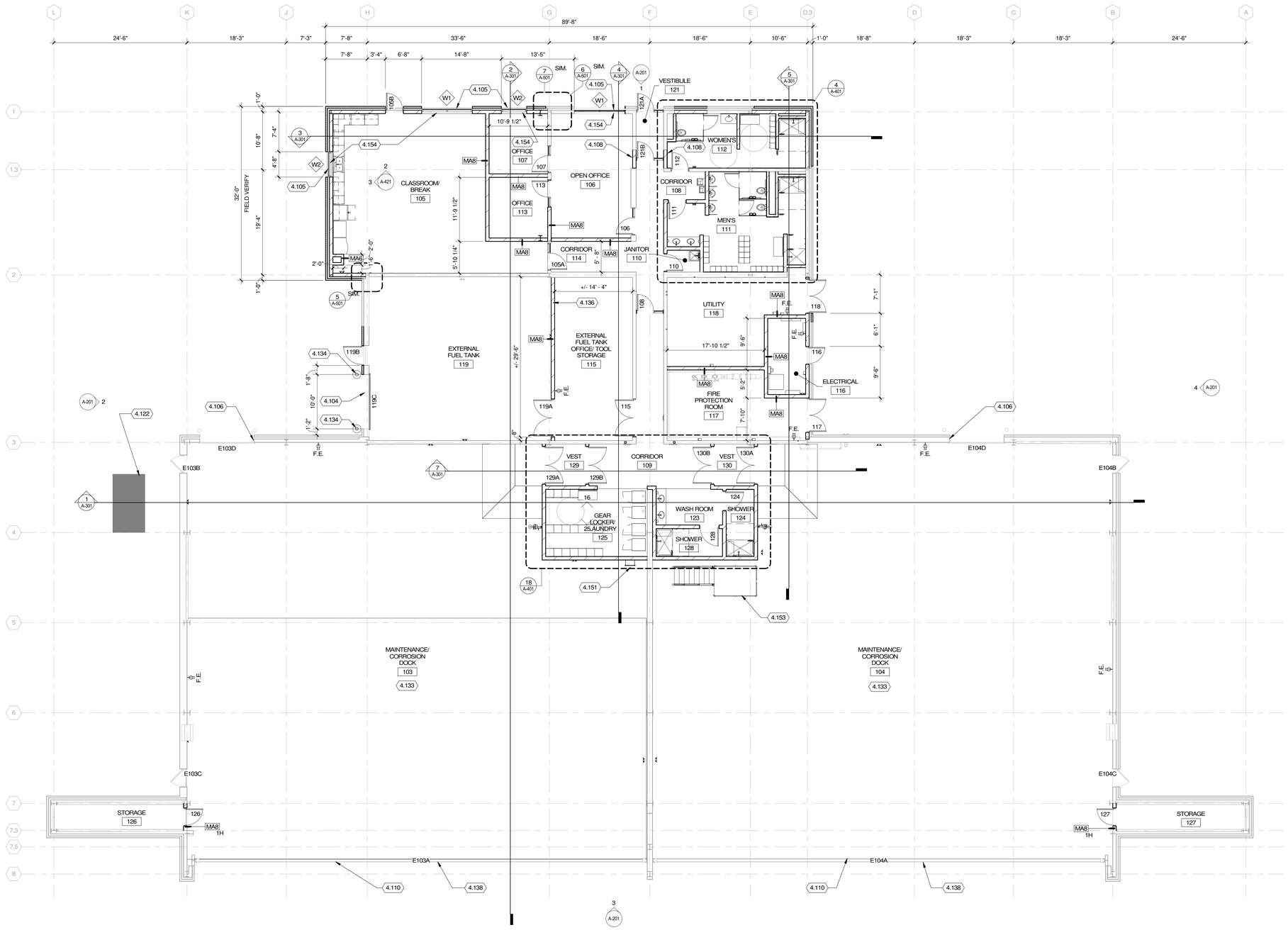


FLOOR PLAN GENERAL NOTES:

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON SITE PLAN = 100'-0" ON ARCHITECTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. ALL INTERIOR DIMENSIONS ARE FROM FINISH FACE OF WALLS (I.E. GYPSUM WALLBOARD OR CMU), UNLESS NOTED OTHERWISE.
4. FINISH FLOOR ELEVATIONS ARE TO THE TOP OF CONCRETE, UNLESS NOTED OTHERWISE.
5. REFERENCE SHEET G-011 AND G-021 FOR ALL CODE, FIRE RATING, AND SEPARATION REQUIREMENTS.
6. GENERAL CONTRACTOR SHALL PATCH AND REPAIR EXISTING CONSTRUCTION (WALLS, DOORS, CEILINGS, FLOORS, ETC.) AS REQUIRED FROM DEMOLITION OR CONSTRUCTION TO ALLOW FOR THE PREP WORK AND NEW OR COMPLETION OF EXISTING FINISHES. PROVIDE CONCRETE/PLASTER PARGE AT ALL CMU JAMBS AND PERPENDICULAR WALL REMOVAL. REPAIRS OR REPLACEMENTS MUST BE DURABLE, SEAMLESS, AND MATCH THE EXISTING MATERIAL.
7. GENERAL CONTRACTOR SHALL PATCH ALL FLOOR AND WALL PENETRATIONS CAUSED BY DEMOLITION OF MECHANICAL, ELECTRICAL, TECHNOLOGY, AND PLUMBING, INCLUDING BUT NOT LIMITED TO PIPING AND CONDUIT RUNS, IN A MANNER THAT IS CONSISTENT WITH THE EXISTING FLOOR AND WALL CONSTRUCTION AND FINISH. ALL PENETRATIONS SHALL MEET REQUIRED FIRE RATINGS.
8. COORDINATE THE INSTALLATION OF ALL OWNER-SUPPLIED EQUIPMENT. REFERENCE PLANS, SPECS, AND INTERIOR ELEVATIONS FOR SPECIFIC EQUIPMENT AND ITS INSTALLATION REQUIREMENTS.
9. GENERAL CONTRACTOR SHALL PROVIDE BLOCKING, STIFFENERS, BRACINGS, BACKING PLATES, SUPPORTING BRACKETS, AND NECESSARY SELECTIVE DEMOLITION REQUIRED FOR THE PROPER INSTALLATION OF ALL CASEWORK, TOILET ROOM ACCESSORIES, TOILET PARTITIONS AND MISCELLANEOUS EQUIPMENT.
10. EXISTING AND INFILL CONCRETE SUB-FLOOR SHALL BE MADE LEVEL, PLUMB AND IN SOUND CONDITION AS REQUIRED FOR THE INSTALLATION OF FINAL FLOOR FINISHES, TYPICAL. PROVIDE ARDEX OR EQUAL LEVELING CONCRETE TO PROVIDE A SMOOTH WALKABLE AREA.
11. ALL RECESSED CABINETS, PANELS, BOXES, ETC. LOCATED IN FIRE-RATED PARTITIONS SHALL BE INSTALLED IN A MANNER WHICH MAINTAINS THE FIRE RATED CONSTRUCTION.
12. SEE ENLARGED PLANS FOR NOTES, DIMENSIONS, AND WALL TYPES WITHIN THE DETAIL CALLOUT BOUNDARIES.
13. REFERENCE SHEET A-002 FOR INTERIOR PARTITION TYPES. INTERIOR PARTITION TAGS NOTED ENCOMPASS THE ENTIRE LENGTH OF WALL SHOWN TO CORNERS OF ROOM, OVER AND AROUND DOORWAYS SHOWN.
14. REFERENCE SHEET A-800'S FOR SIGNAGE LAYOUTS AND COORDINATION REQUIREMENTS.
15. REFERENCE SHEET A-900'S FOR FURNITURE AND EQUIPMENT LAYOUTS AND COORDINATION REQUIREMENTS.
16. REFERENCE V-001 FOR ALL CONSTRUCTION HAUL ROUTE AND STAGING REQUIREMENTS.

KEYED NOTES

4.104 PROVIDE OVERHEAD SECTIONAL DOOR AND FRAME - SEE SCHEDULE. PATCH, REPAIR AND INFILL ADJACENT OPENINGS WITH MASONRY AND EXTERIOR METAL PANEL CLADDING TO MATCH EXISTING WALL FINISH. PROVIDE PROPER METAL PANEL, I-CHANNEL OR SHEET METAL FLASHING CLOSURE ELEMENT AT CUT LOCATIONS.

4.105 PROVIDE ALUMINUM FRAME INSULATED GLAZED WINDOWS. REFERENCE WINDOW TYPES.

4.106 PROVIDE NEW SEALANT ALL AROUND PERIMETER, PAINT DOOR AND FRAME.

4.108 INFILL OPENING WITH CMU WALL TO MATCH EXISTING THICKNESS AND FINISH

4.110 HANGAR DOOR, UPGRADE ELECTRICAL TO PROVIDE EMERGENCY POWER AND OPERATION BY THE FIRE DEPARTMENT, SEE ELECTRICAL DRAWINGS FOR ADDITIONAL REQUIREMENTS.

4.122 RELOCATED EXTERNAL SOLVENT TANK, SEE CIVIL AND PLUMBING PLANS FOR ADDITIONAL REQUIREMENTS.

4.133 RESURFACE FLOOR, GRIND EXISTING FLOOR, PROVIDE ESD-1 (ELECTROSTATIC DISSIPATIVE) RESINOUS EPOXY FLOOR WITH POLYURETHANE TOP COAT.

4.134 INSTALL BOLLARDS, REFERENCE STRUCTURAL FOR DETAILS

4.135 METAL TRANSITION STRIP

4.136 INSTALL MASONRY WALL CLEAR OF EXISTING BRIDGE CRANE RAILS

4.138 (ABI #1) REPLACE FABRIC ON HANGAR DOORS - BOTH SIDES.

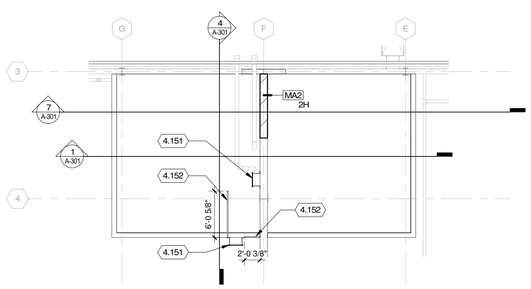
4.151 ROOF ACCESS LADDER

4.152 GUARD RAIL, EXTEND TO NEAREST WALL OR 6 FEET MINIMUM FROM SURFACE EDGE

4.153 GENERATOR ACCESS PLATFORM, REFERENCE STRUCTURAL AND ELECTRICAL DRAWINGS.

4.154 PROVIDE WINDOW BLINDS,

N 1 **FIRST FLOOR PLAN**
1/8" = 1'-0"



N 2 **MEZZANINE PLAN**
1/8" = 1'-0"

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: PJC
DRAWN BY: PJC
CHECKED BY: REK, KM
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SHEET CONTENTS
FIRST FLOOR PLAN

SHEET NO.:
A-101

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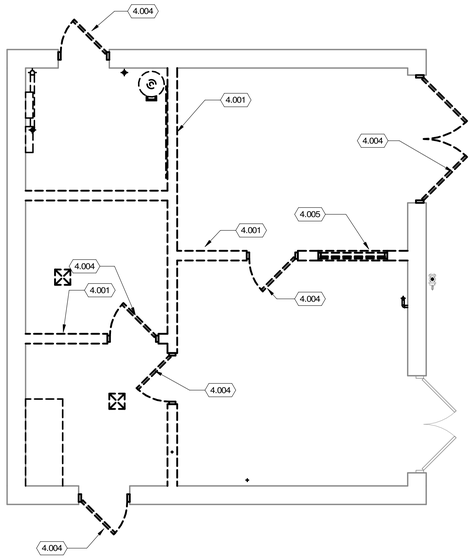


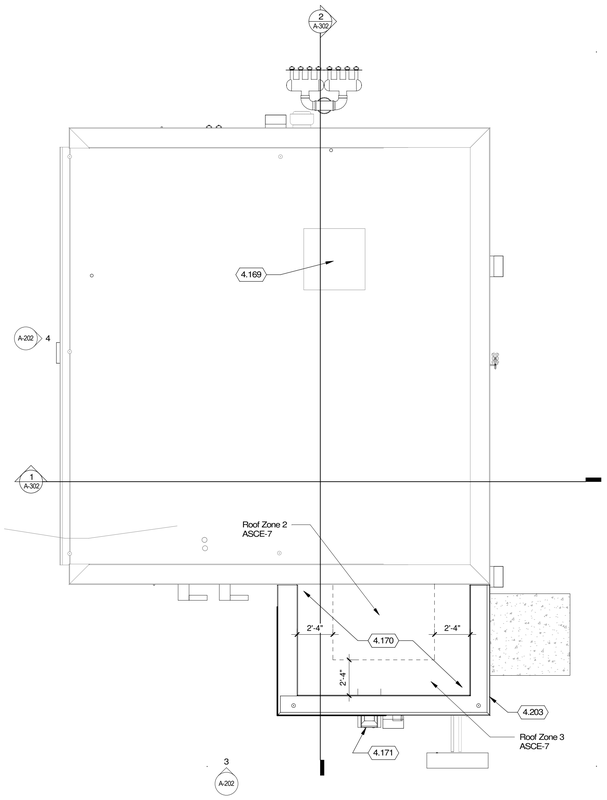
N 1 DEMOLITION PLAN
1/4" = 1'-0"

DEMOLITION PLAN GENERAL NOTES:

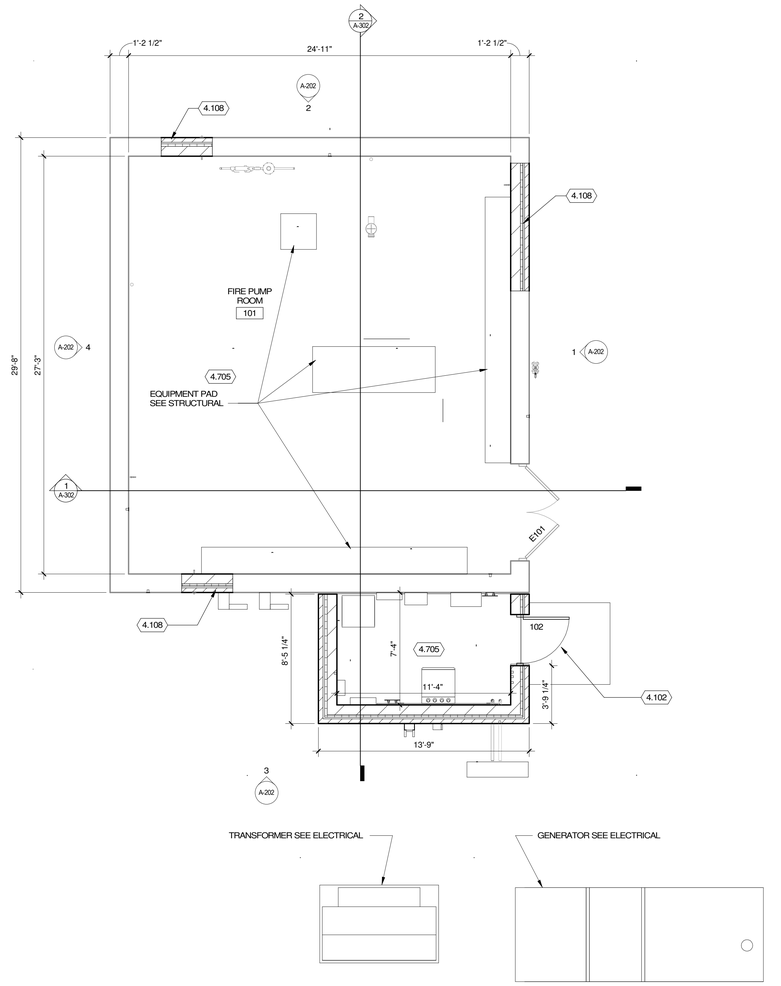
1. THE GENERAL CONTRACTOR SHALL VERIFY ALL BUILDING AND SITE CONDITIONS AND REPORT ANY DISCREPANCIES TO THE CONTRACTING OFFICER BEFORE PROCEEDING WITH ANY SCHEDULED DEMOLITION WORK.
2. THE GENERAL CONTRACTOR SHALL COORDINATE ARCHITECTURAL, STRUCTURAL, CIVIL, MECHANICAL, ELECTRICAL, TECHNOLOGY, AND PLUMBING WORK AND ALL SUBCONTRACTORS FOR DEMOLITION AND REPAIR WORK.
3. IT IS THE INTENT OF THESE DRAWINGS TO INDICATE THE REMOVAL OF ALL ITEMS WHICH INTERFERE WITH THE FINAL CONSTRUCTION AS SHOWN ON THE FLOOR PLANS, ELEVATIONS, DETAILS, AND SCHEDULES. ALL FLOOR FINISHES, BASE, CEILINGS, ABANDONED FURNITURE, WINDOW TREATMENTS, SHELVING, SIGNAGE, AND ROOFING MATERIALS SHALL BE DEMOLISHED IN THEIR ENTIRETY.
4. REMOVE ALL ITEMS OF DEMOLITION WORK FROM THE PROJECT DAILY AND DISPOSE OF PROPERLY.
5. EXISTING CONCRETE AND STEEL STRUCTURE TO REMAIN, TYP. PROTECT COLUMNS, PILASTERS, BEAMS, AND SLABS.
6. THE EXISTING MECHANICAL, ELECTRICAL,TECHNOLOGY, AND PLUMBING ITEMS AND/OR SYSTEMS, AND GAS, WATER AND ELECTRICAL METERS ARE GENERALLY INTENDED TO REMAIN. WHERE WORK CONFLICTS WITH NEW WORK, DEMOLITION OR REROUTING OF EXISTING INFRASTRUCTURE SHALL BE REQUIRED. REF: MEP FOR ALL ITEMS TO BE REUSED TYP. ALL ITEMS TO BE DEMOLISHED SHALL BE REMOVED IN THEIR ENTIRETY, BACK TO THE ORIGINAL SOURCE. SURROUNDING MATERIALS WHICH ARE DISTURBED OR DEMOLISHED THAT ARE SCHEDULED TO REMAIN SHALL BE PATCHED WITH LIKE SURROUNDING MATERIALS, TYPICAL.
7. DEMOLISH CONCRETE FLOOR SLABS AS REQUIRED TO INSTALL NEW EQUIPMENT, UNDERGROUND CONDUIT, PLUMBING SYSTEMS, AND FLOOR DRAINS, REF: STRUCTURAL, EQUIPMENT, ELECTRICAL, PLUMBING DEMOLITION, AND PLUMBING DRAWINGS.
8. PROTECT EXISTING SURFACES TO REMAIN DURING DEMOLITION AND CONSTRUCTION.
9. REPAIR OR REPLACE ANY EXISTING CONSTRUCTION (WINDOWS, WALLS, DOORS, CEILINGS, FLOORS, ETC.) TO REMAIN WHICH ARE DAMAGED DURING CONSTRUCTION. REPLACEMENT MATERIAL SHALL MATCH IN KIND.
10. REFERENCE SHEET G-101 PHASING PLAN FOR CONSTRUCTION PHASING / SEQUENCING AND SITE ACCESS.

FLOOR PLAN GENERAL NOTES:

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON SITE PLAN = 100'-0" ON ARCHITECTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. ALL INTERIOR DIMENSIONS ARE FROM FINISH FACE OF WALLS (I.E. GYPSUM WALLBOARD OR CMU), UNLESS NOTED OTHERWISE.
4. FINISH FLOOR ELEVATIONS ARE TO THE TOP OF CONCRETE, UNLESS NOTED OTHERWISE.
5. REFERENCE SHEET G-011 AND G-021 FOR ALL CODE, FIRE RATING, AND SEPARATION REQUIREMENTS.
6. GENERAL CONTRACTOR SHALL PATCH AND REPAIR EXISTING CONSTRUCTION (WALLS, DOORS, CEILINGS, FLOORS, ETC.) AS REQUIRED FROM DEMOLITION OR CONSTRUCTION TO ALLOW FOR THE PREP WORK AND NEW OR COMPLETION OF EXISTING FINISHES. REPAIRS OR REPLACEMENTS MUST BE DURABLE, SEAMLESS, AND MATCH THE EXISTING MATERIAL.
7. GENERAL CONTRACTOR SHALL PATCH ALL FLOOR AND WALL PENETRATIONS CAUSED BY DEMOLITION OF MECHANICAL, ELECTRICAL, TECHNOLOGY, AND PLUMBING, INCLUDING BUT NOT LIMITED TO PIPING AND CONDUIT RUNS, IN A MANNER THAT IS CONSISTENT WITH THE EXISTING FLOOR AND WALL CONSTRUCTION AND FINISH. ALL PENETRATIONS SHALL MEET REQUIRED FIRE RATINGS.
8. COORDINATE THE INSTALLATION OF ALL OWNER-SUPPLIED EQUIPMENT. REFERENCE PLANS, SPECS, AND INTERIOR ELEVATIONS FOR SPECIFIC EQUIPMENT AND ITS INSTALLATION REQUIREMENTS.
9. GENERAL CONTRACTOR SHALL PROVIDE BLOCKING, STIFFENERS, BRACINGS, BACKING PLATES, SUPPORTING BRACKETS, AND NECESSARY SELECTIVE DEMOLITION REQUIRED FOR THE PROPER INSTALLATION OF ALL CASEWORK, TOILET ROOM ACCESSORIES, TOILET PARTITIONS AND MISCELLANEOUS EQUIPMENT.
10. EXISTING AND INFILL CONCRETE SUB-FLOOR SHALL BE MADE LEVEL, PLUMB AND IN SOUND CONDITION AS REQUIRED FOR THE INSTALLATION OF FINAL FLOOR FINISHES, TYPICAL. PROVIDE ARDEX OR EQUAL LEVELING CONCRETE TO PROVIDE A SMOOTH WALKABLE AREA.
11. ALL RECESSED CABINETS, PANELS, BOXES, ETC. LOCATED IN FIRE-RATED PARTITIONS SHALL BE INSTALLED IN A MANNER WHICH MAINTAINS THE FIRE RATED CONSTRUCTION.
12. SEE ENLARGED PLANS FOR NOTES, DIMENSIONS, AND WALL TYPES WITHIN THE DETAIL CALLOUT BOUNDARIES.
13. REFERENCE SHEET A-002 FOR INTERIOR PARTITION TYPES. INTERIOR PARTITION TAGS NOTED ENCOMPASS THE ENTIRE LENGTH OF WALL SHOWN TO CORNERS OF ROOM, OVER AND AROUND DOORWAYS SHOWN.



N 3 ROOF PLAN
1/4" = 1'-0"



N 2 FIRST FLOOR PLAN
1/4" = 1'-0"

KEYED NOTES

4.001 REMOVE WALL IN ITS ENTIRETY. PATCH, REPAIR AND PREP ADJACENT SURFACES TO ACCEPT NEW CONSTRUCTION

4.004 REMOVE EXISTING DOOR, FRAME AND ASSOCIATED HARDWARE. PATCH REPAIR AND PREP FOR NEW CONSTRUCTION

4.005 REMOVE EXISTING ALUMINUM WINDOW, FRAME AND ASSOCIATED HARDWARE, PATCH, REPAIR AND PREP FOR NEW CONSTRUCTION

4.102 PROVIDE HM DOORS WITH HM FRAMES, AND HARDWARE - REFERENCE SCHEDULE.

4.108 INFILL OPENING WITH CMU WALL TO MATCH EXISTING THICKNESS AND FINISH

4.169 PATCH AND REPAIR ROOF WHERE MECHANICAL EQUIPMENT WAS REMOVED, SEE MECHANICAL PLANS, SPLICE NEW MEMBRANE TO EXISTING WITH MANUFACTURER'S RECOMMENDED CONNECTIONS TO MAINTAIN ROOF WARRANTY. MATCH SLOPE WITH ADJACENT ROOF SURFACES.

4.170 PROVIDE SINGLE PLY ROOF.

4.171 PROVIDE SCUPPER BOX AND DOWNSPOUT

4.203 PREFINISHED METAL COPING TO MATCH EXISTING PROFILE

4.705 ALL INTERIOR SURFACES TO RECEIVE PAINT FINISH (PT-1)

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

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12/16/22 TYPE B3 FINAL
HEF MOD

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DATE: December 16, 2022
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DRAWN BY: PJC
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SHEET CONTENTS
B158 FIRE PUMP
BUILDINGS PLANS

SHEET NO.:
A-102

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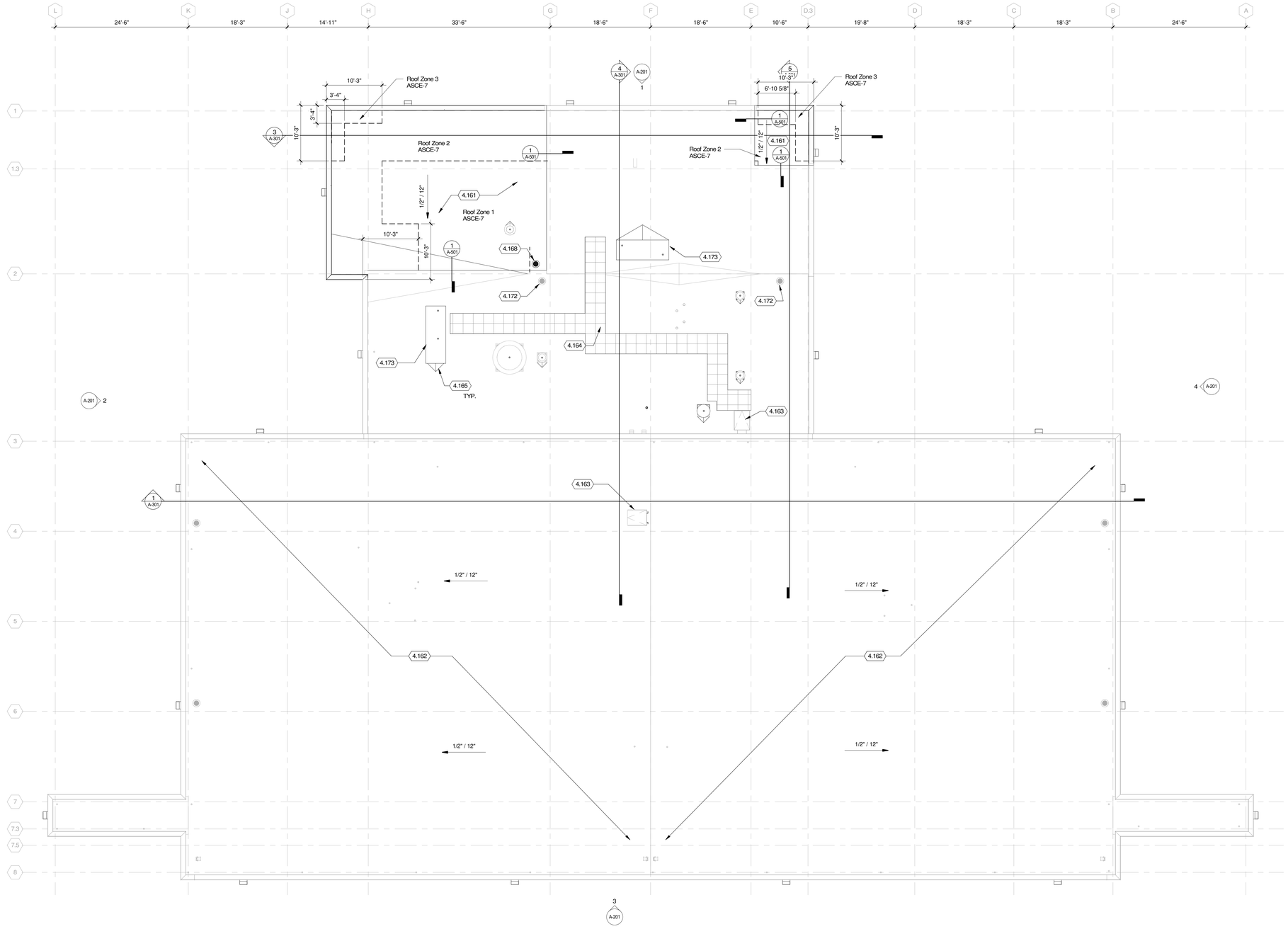

KEYED NOTES

4.161 PROVIDE SINGLE PLY ROOF MATCH EXISTING, SPLICE NEW MEMBRANE TO EXISTING WITH MANUFACTURER'S RECOMMENDED CONNECTIONS TO MAINTAIN ROOF WARRANTY. MATCH SLOPE WITH ADJACENT ROOF SURFACES.

4.162 EXISTING ROOF SYSTEM TO REMAIN

4.163 EXISTING ROOF HATCH TO REMAIN

4.164 ROOF WALK PADS TO ACCESS NEW MECHANICAL EQUIPMENT, COORDINATE ROUTING WITH FINAL LOCATIONS.

4.165 PROVIDE ROOF CRICKETS AT ALL MECHANICAL EQUIPMENT CURBS

4.168 PROVIDE OVERFLOW DRAIN.

4.172 EXISTING PRIMARY ROOF DRAIN TO REMAIN

4.173 SEE DETAILS 19 /20 A-501 FOR MECHANICAL EQUIPMENT CURB AND SUPPORT DETAILS

N 1 **ROOF PLAN**
1/8" = 1'-0"

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SHEET CONTENTS
ROOF PLAN

SHEET NO.:
A-103

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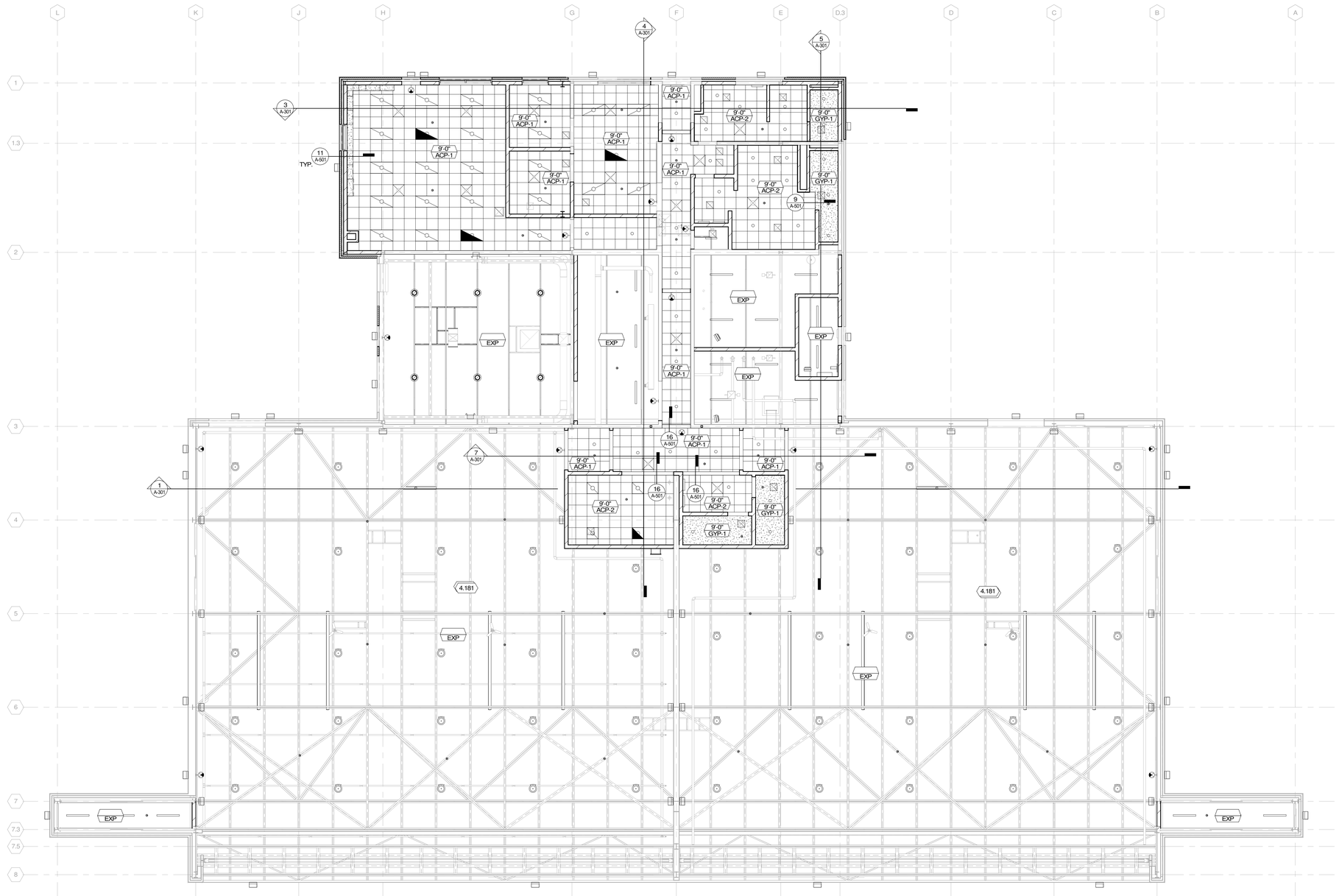

N 1 **REFELECTED CEILING PLAN**
1/8" = 1'-0"

CEILING PLAN GENERAL NOTES:

1. SEE ROOM FINISH SCHEDULE FOR FLOOR, WALL AND CEILING FINISHES AND ROOM HEIGHTS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. ALL RECESSED LIGHTS, SPRINKLERS, FIRE DETECTION EQUIPMENT, OCCUPANCY SENSORS, ETC. SHALL BE CENTERED IN THE TILES UNLESS NOTED OTHERWISE.
4. CENTER ALL CEILING GRIDS IN SPACE UNLESS NOTED OTHERWISE.
5. ALL METAL LINEAR DIFFUSERS SHALL BE PAINTED TO MATCH SURROUNDING WALL OR CEILING SURFACE.

KEYED NOTES

CEILING PLAN LEGEND:

SEE ELECTRICAL FOR EXACT FIXTURE MODEL

- 2' x 2' SUSPENDED CEILING GRID
- GYPSUM BOARD CEILING/ PORTLAND CEMENT PLASTER (PAINTED)
- LIGHT FIXTURE (RECESSED MOUNTED)
- LIGHT FIXTURE (RECESSED MOUNTED 4" WIDE OR LESS)
- on LIGHT FIXTURE (RECESSED MOUNTED)
- 6" 8" LIGHT FIXTURE (RECESSED CAN)
- LIGHT FIXTURE (SURFACE MOUNTED)
- LIGHT FIXTURE (SURFACE MOUNTED)
- LIGHT FIXTURE (SUSPENDED)
- on LIGHT FIXTURE (SUSPENDED)
- CEILING RECEPTACLES
- CEILING OCCUPANCY SENSOR
- CEILING FIRE ALARM DEVICES
- CEILING MASS NOTIFICATION DEVICE
- CEILING SPEAKER
- CEILING SECURITY STRODE
- CEILING CAMERA
- SPRINKLER HEADS
- SUPPLY AIR DIFFUSER
- RETURN AIR DIFFUSER / EXHAUST GRILL
- EXHAUST FAN

CEILING TYPE TAG
XX'-X"
XXX
- ELEVATION ABOVE FINISHED FLOOR
- CEILING TYPE

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

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HARRISON TWP, MICHIGAN

ISSUED
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HEF MOD

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SHEET CONTENTS:
FIRST FLOOR
CEILING PLAN

SHEET NO.:
A-121

12/14/2022 9:20:00 AM C:\Revit Local\3141700-181848.01-A-Central-2020_NateDeMaster.rvt

KEYED NOTES

4.102 PROVIDE HM DOORS WITH HM FRAMES, AND HARDWARE - REFERENCE SCHEDULE.

4.104 PROVIDE OVERHEAD SECTIONAL DOOR AND FRAME - SEE SCHEDULE. PATCH, REPAIR AND INFILL ADJACENT OPENINGS WITH MASONRY AND EXTERIOR METAL PANEL CLADDING TO MATCH EXISTING WALL FINISH. PROVIDE PROPER METAL PANEL J-CHANNEL OR SHEET METAL FLASHING CLOSURE ELEMENT AT CUT LOCATIONS.

4.105 PROVIDE ALUMINUM FRAME INSULATED GLAZED WINDOWS. REFERENCE WINDOW TYPES.

4.110 HANGAR DOOR, UPGRADE ELECTRICAL TO PROVIDE EMERGENCY POWER AND OPERATION BY THE FIRE DEPARTMENT, SEE ELECTRICAL DRAWINGS FOR ADDITIONAL REQUIREMENTS.

4.123 PROVIDE HM DOORS AND FRAMES, AND HARDWARE - SEE SCHEDULE. PATCH, REPAIR AND INFILL ADJACENT OPENINGS WITH MASONRY AND EXTERIOR METAL PANEL CLADDING TO MATCH EXISTING WALL FINISH. PROVIDE PROPER METAL PANEL J-CHANNEL OR SHEET METAL FLASHING CLOSURE ELEMENT AT CUT LOCATIONS.

KEYED NOTES

4.138 (ABI #1) REPLACE FABRIC ON HANGAR DOORS - BOTH SIDES.

4.201 THIN MASONRY VENEER TO MATCH EXISTING BUILDING. PROVIDE VERTICAL CONTROL JOINT BETWEEN NEW AND EXISTING, FILLED WITH BACKER ROD AND SEALANT TO MATCH BRICK COLOR

4.202 METAL PANEL TO MATCH EXISTING BUILDING. ALIGN JOINTS AND SEAMS IN THE SAME PATTERN AS EXISTING ADJACENT

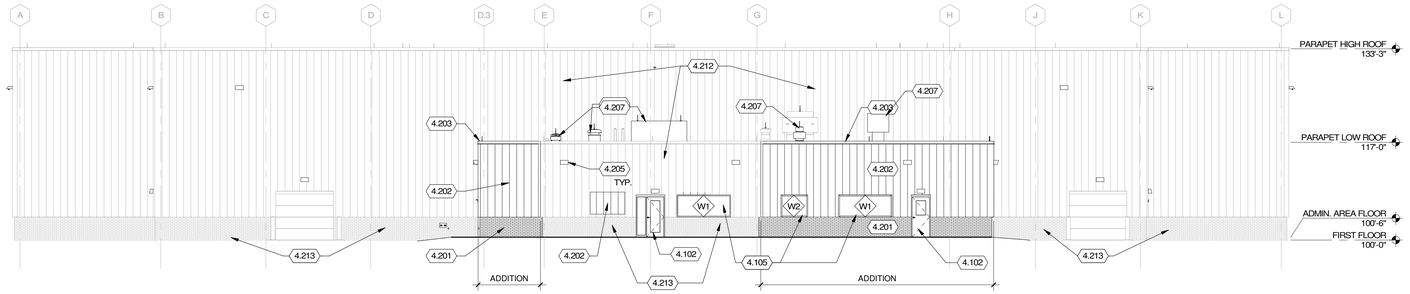
4.203 PREFINISHED METAL COPING TO MATCH EXISTING PROFILE

4.205 LIGHT FIXTURE, TYP. REFERENCE ELECTRICAL DRAWINGS

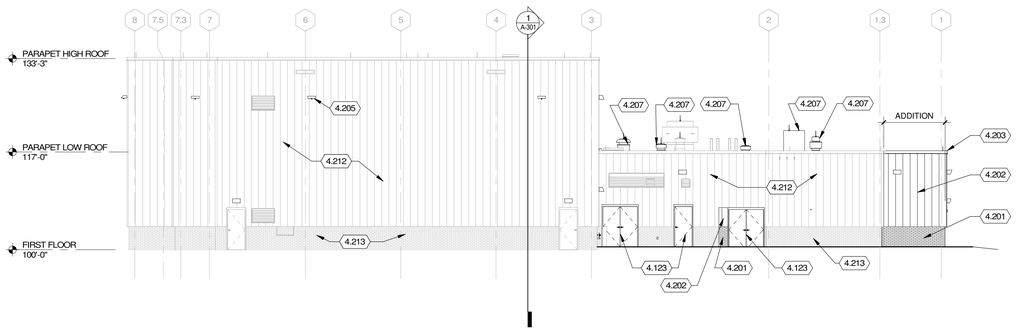
4.207 MECHANICAL EQUIPMENT, REFERENCE MECHANICAL DRAWINGS

4.212 EXISTING METAL PANEL TO REMAIN, TYP.

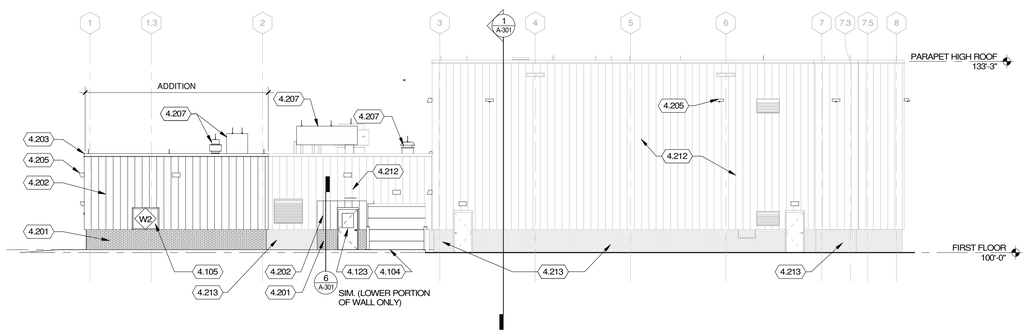
4.213 EXISTING BRICK TO REMAIN, TYP.



1 **NORTH ELEVATION**
3/32" = 1'-0"



4 **EAST ELEVATION**
3/32" = 1'-0"



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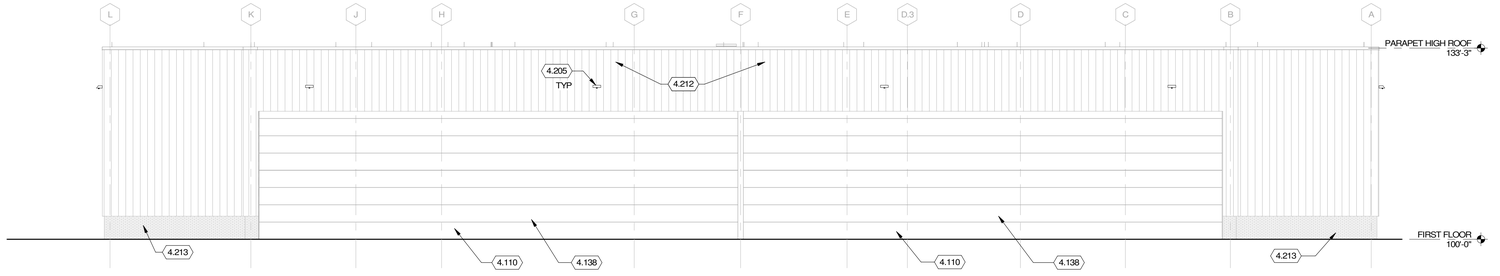
3/32" = 1'-0"



3 **SOUTH ELEVATION**
3/32" = 1'-0"

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
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DESIGNED BY: PJC
DRAWN BY: PJC
CHECKED BY: REK KM
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SHEET CONTENTS
EXTERIOR ELEVATIONS

SHEET NO.:
A-201

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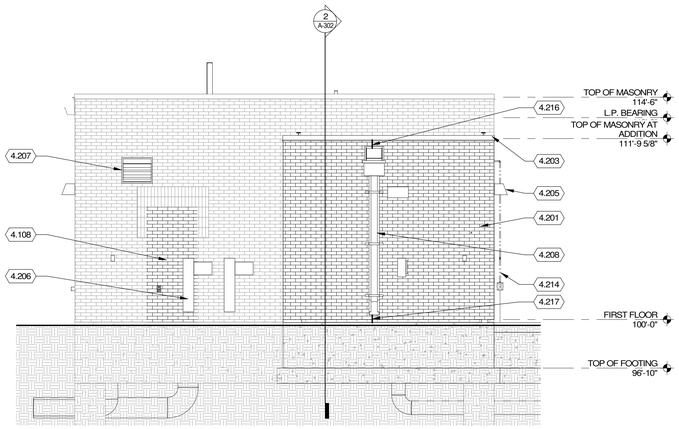
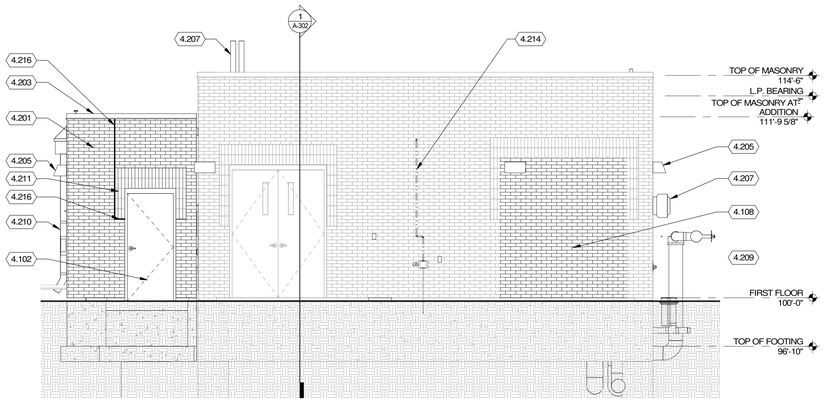


3 SOUTH
1/4" = 1'-0"



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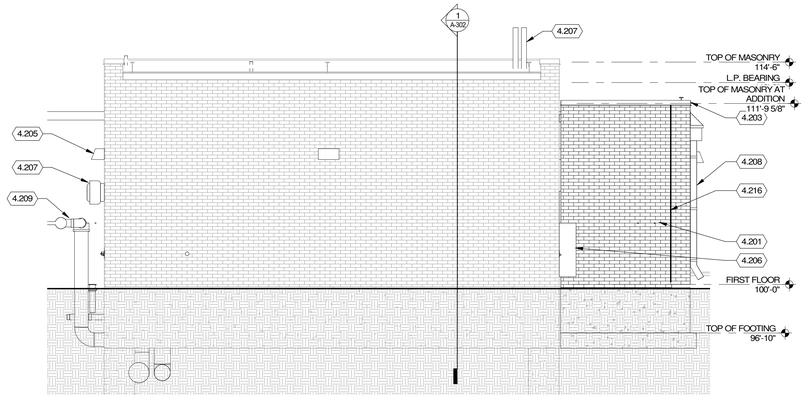
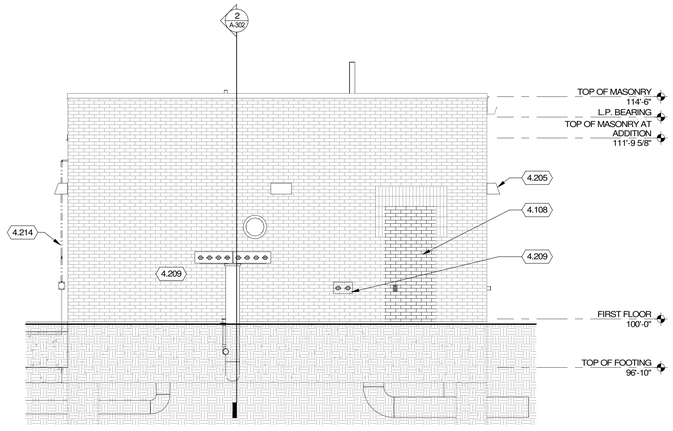


4 WEST
1/4" = 1'-0"



2 NORTH
1/4" = 1'-0"

KEYED NOTES

4.102 PROVIDE HM DOORS WITH HM FRAMES, AND HARDWARE - REFERENCE SCHEDULE.

4.108 INFILL OPENING WITH CMU WALL TO MATCH EXISTING THICKNESS AND FINISH

4.201 THIN MASONRY VENEER TO MATCH EXISTING BUILDING, PROVIDE VERTICAL CONTROL JOINT BETWEEN NEW AND EXISTING, FILLED WITH BACKER ROD AND SEALANT TO MATCH BRICK COLOR

4.203 PREFINISHED METAL COPING TO MATCH EXISTING PROFILE

4.205 LIGHT FIXTURE, TYP. REFERENCE ELECTRICAL DRAWINGS

4.206 ELECTRICAL EQUIPMENT, REFERENCE ELECTRICAL DRAWINGS

4.207 MECHANICAL EQUIPMENT, REFERENCE MECHANICAL DRAWINGS

4.208 MECHANICAL LOUVER, REFERENCE MECHANICAL DRAWINGS

4.209 FIRE PROTECTION EQUIPMENT/ PIPING, REFERENCE FIRE PROTECTION DRAWINGS

4.210 PROVIDE DOWNSPOUT AND SPLASH BLOCK

4.211 PROVIDE SOLDIER COURSING AT DOOR TO MATCH EXISTING DOORS

4.214 PLUMBING EQUIPMENT, REFERENCE PLUMBING DRAWINGS

4.216 MASONRY CONTROL JOINT, FILL WITH BACKER ROD AND SEALANT TO MATCH BRICK COLOR

4.217 MASONRY CONTROL JOINT, FILL WITH BACKER ROD AND SEALANT TO MATCH BRICK COLOR, LOCATE BEHIND DOWNSPOUT

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SHEET CONTENTS
B158 EXTERIOR ELEVATIONS

SHEET NO.:
A-202

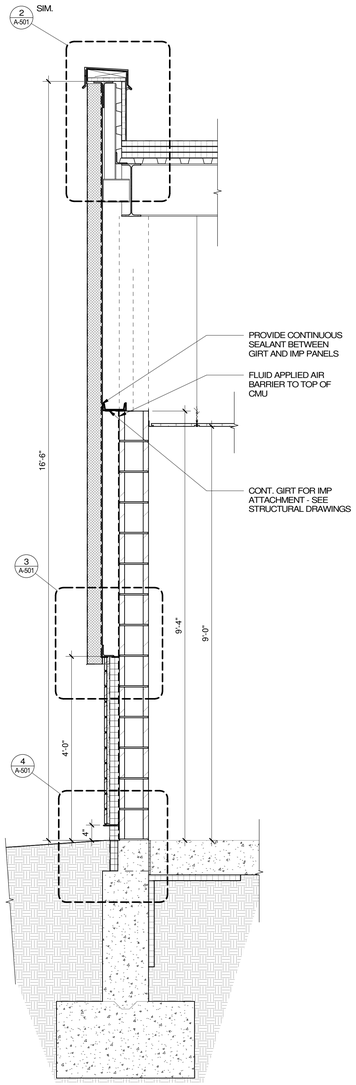
12/14/2022 9:34:17 AM C:\Revit Local\3141700-181848.01-A-FP-Central-2020_NateDaMaster.rvt

KEYED NOTES

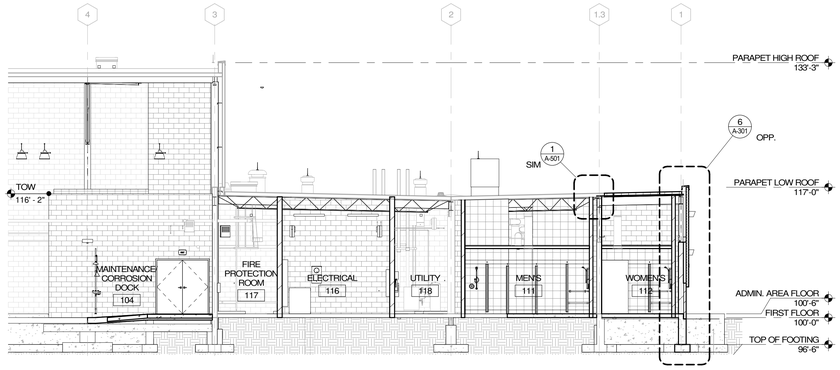
4.151 ROOF ACCESS LADDER

4.152 GUARD RAIL, EXTEND TO NEAREST WALL OR 6 FEET MINIMUM FROM SURFACE EDGE

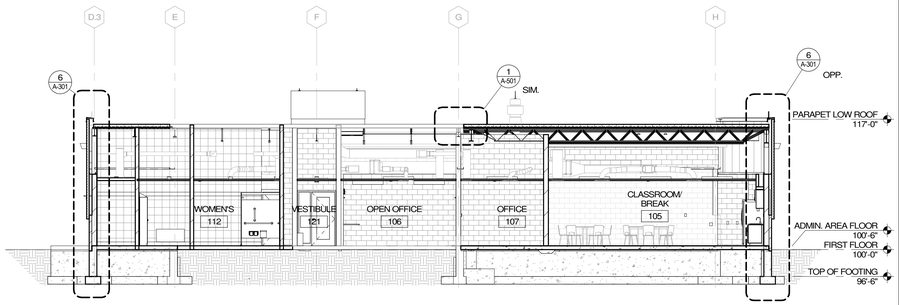
4.215 STRUCTURAL DETAIL, SEE STRUCTURAL DRAWINGS 19/S-521



6 TYP EXTERIOR WALL AT ADDITION
3/4" = 1'-0"



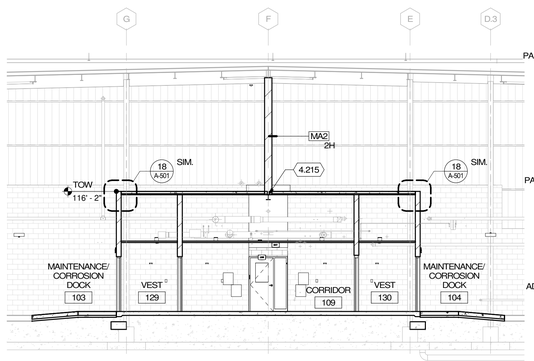
5 N/S THROUGH NEW RESTROOM ADDTION
1/8" = 1'-0"



3 E/W SECTION THROUGH ADDITIONS
1/8" = 1'-0"

4 N/S SECTION TRHOUGH GEAR LAUNDRY
1/8" = 1'-0"

2 NORTH SOUTH SECTION
1/8" = 1'-0"



7 SECTION AT CONTAMINATION CONTROL AREA
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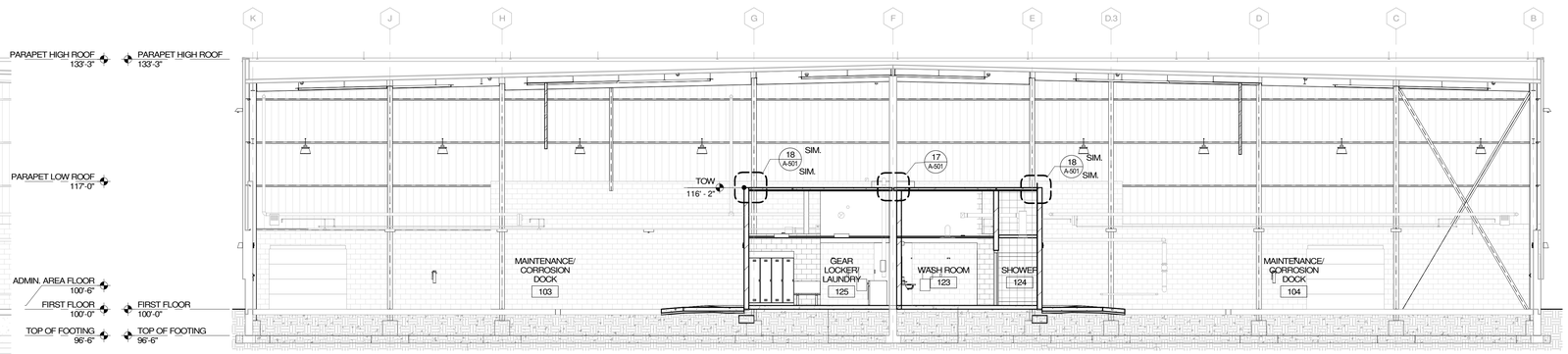

1 WEST EAST SECTION
1/8" = 1'-0"

TETRA TECH Mead & Hunt
Joint Venture with
Mason & Hanger
710 Avis Drive, Suite 100,
Ann Arbor, MI 48108
phone: 810-956-9300

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: PJC
DRAWN BY: PJC
CHECKED BY: REK.KM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
BUILDING SECTIONS

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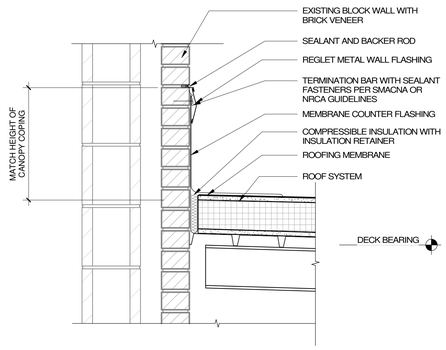
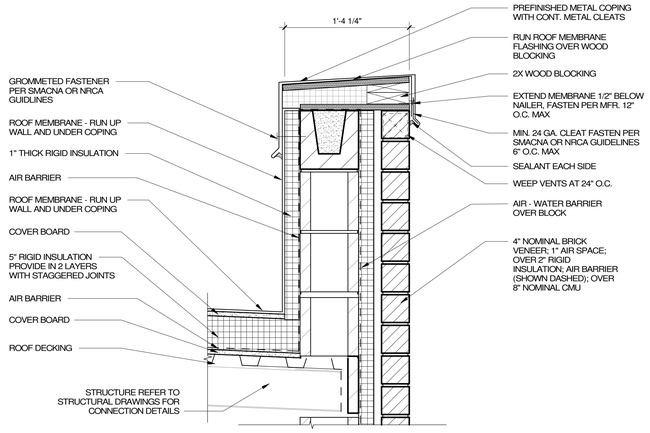
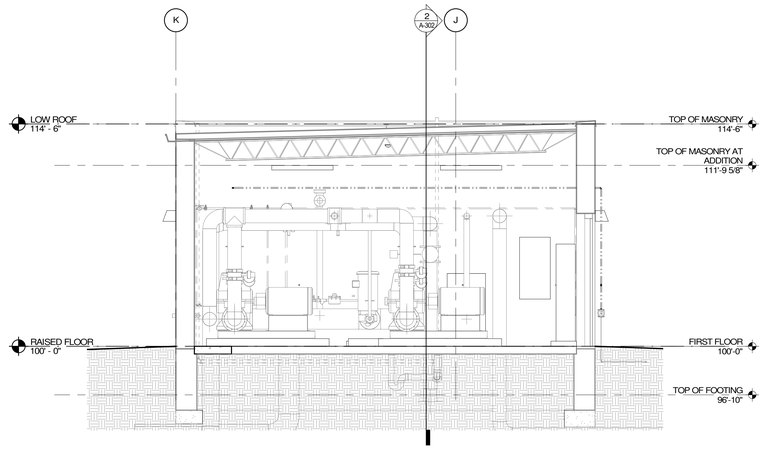
A-301

12/14/2022 9:20:15 AM C:\Revit Local\3141700-181848.01-A-Central-2020_NateDeMaster.rvt







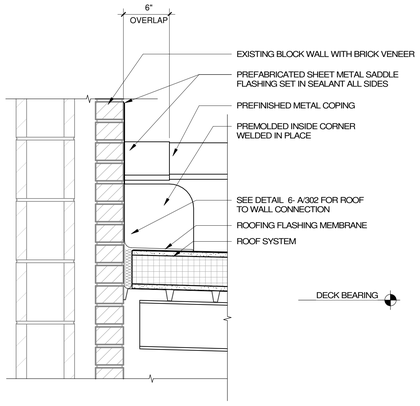
KEYED NOTES

4.170 PROVIDE SINGLE PLY ROOF.

4.203 PREFINISHED METAL COPING TO MATCH EXISTING PROFILE

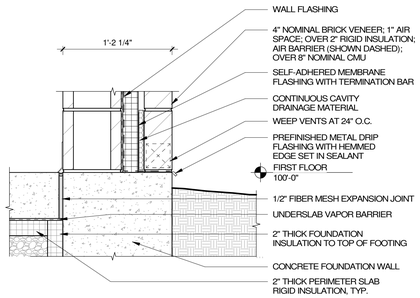
4.210 PROVIDE DOWNSPOUT AND SPLASH BLOCK

6 ROOF TO WALL
1 1/2" = 1'-0"



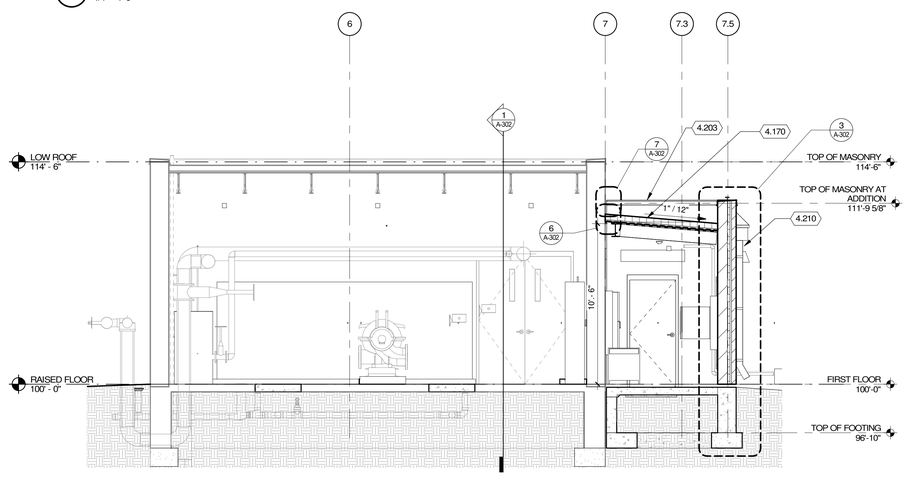
7 PARAPET TO WALL
1 1/2" = 1'-0"

5 PARAPET DETAIL
1 1/2" = 1'-0"

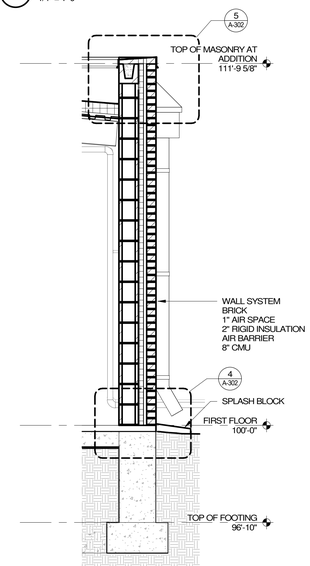


4 WALL BASE
1 1/2" = 1'-0"

1 EAST WEST SECTION
1/4" = 1'-0"



2 NORTH SOUTH SECTION
1/4" = 1'-0"



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

TETRA TECH
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Joint Venture with
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Ann Arbor, MI 48108
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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED:
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: PJC
DRAWN BY: PJC
CHECKED BY:
DO NOT SCALE DRAWINGS

SHEET CONTENTS
B158 BUILDING SECTIONS AND WALL DETAILS

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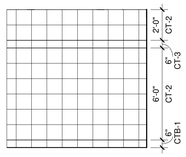
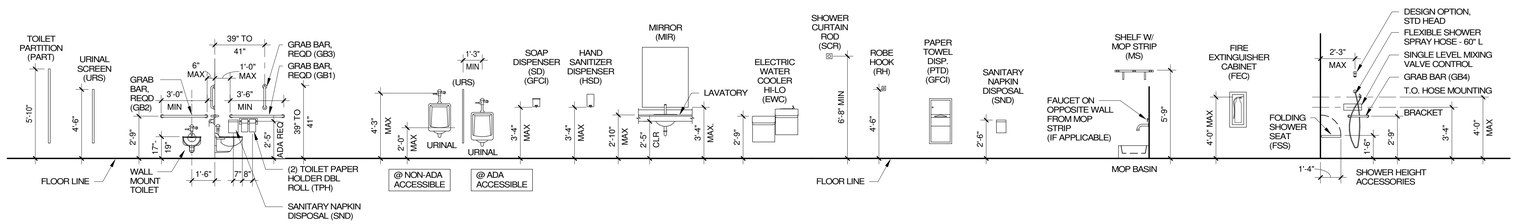
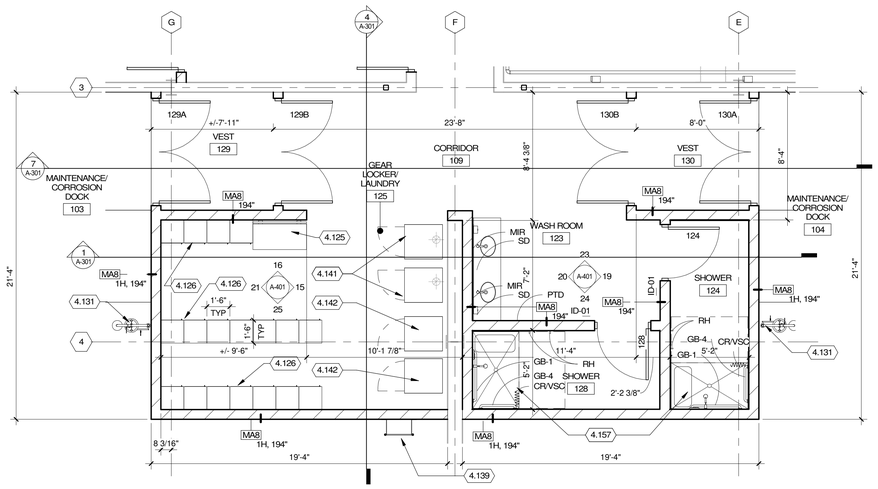
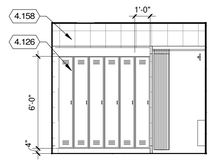




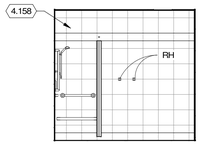
22 TYPICAL TILE WALL ELEVATION
1/4" = 1'-0"

17 ACCESSORY MOUNTING HEIGHTS
1/4" = 1'-0"

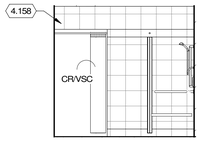




11 WOMENS LOCKER EAST
1/4" = 1'-0"



12 WOMENS SHOWER EAST
1/4" = 1'-0"



13 WOMENS SHOWER WEST
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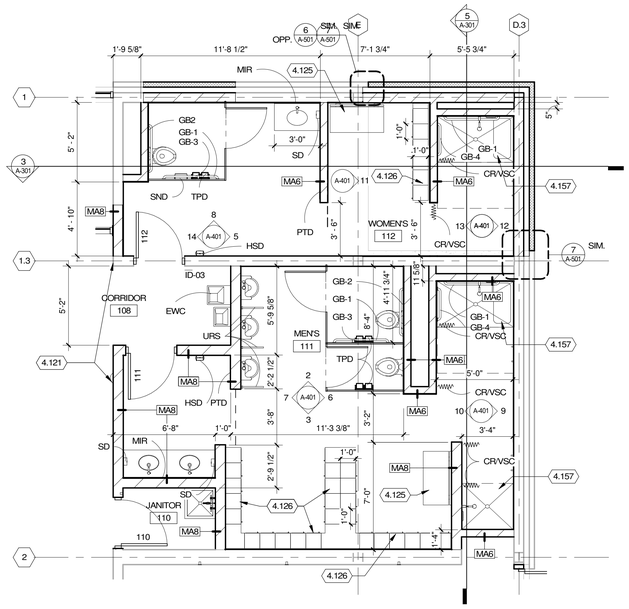
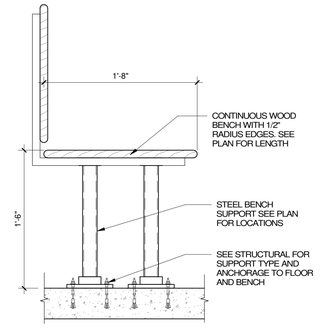
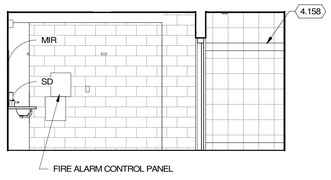


N 18 CONTAMINATION CONTROL AREA
1/4" = 1'-0"

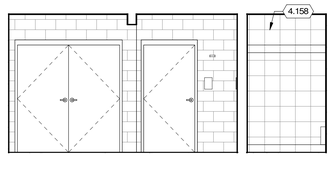
N 4 RESTROOMS
1/4" = 1'-0"



1 ADA LOCKER ROOM BENCH
1 1/2" = 1'-0"



23 WASHROOM NORTH
1/4" = 1'-0"



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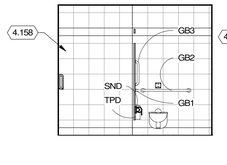
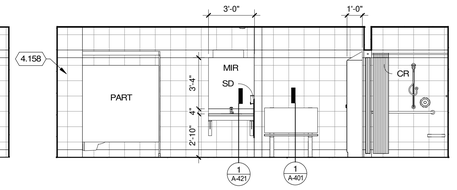
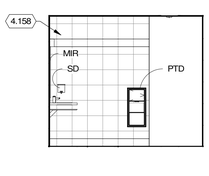
1/4" = 1'-0"



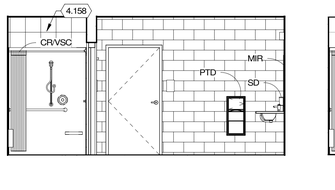
14 WOMENS WEST
1/4" = 1'-0"



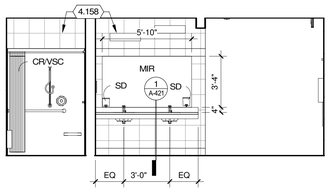
8 WOMENS NORTH
1/4" = 1'-0"



5 WOMENS EAST
1/4" = 1'-0"



24 WASHROOM SOUTH
1/4" = 1'-0"



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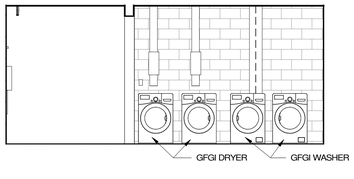

15 GEAR LOCKER/ LAUNDRY EAST
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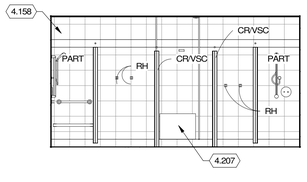
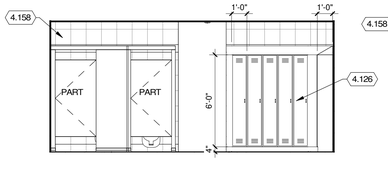


9 MENS SHOWER EAST
1/4" = 1'-0"



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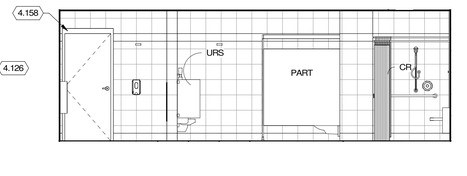
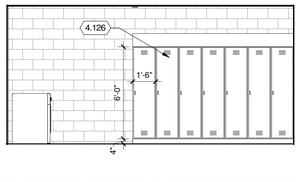
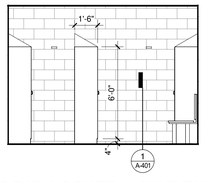


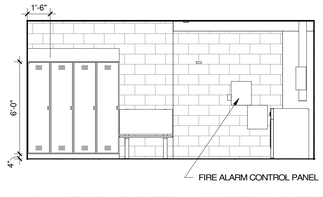
2 MENS NORTH
1/4" = 1'-0"



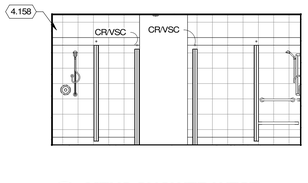
25 GEAR LOCKER/ LAUNDRY SOUTH
1/4" = 1'-0"



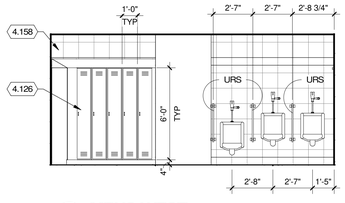
21 GEAR LOCKER/ LAUNDRY WEST
1/4" = 1'-0"



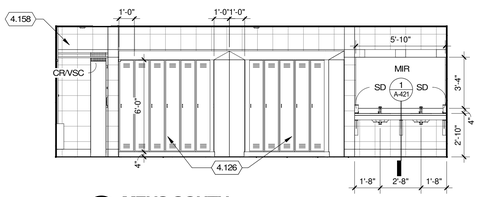
16 GEAR LOCKER/ LAUNDRY NORTH
1/4" = 1'-0"



10 MENS SHOWER WEST
1/4" = 1'-0"



7 MENS WEST
1/4" = 1'-0"



3 MENS SOUTH
1/4" = 1'-0"

TOILET ROOM ACCESSORY GENERAL NOTES:

1. LAVATORIES IN TOILET ROOM ARE SOLID SURFACE COUNTERTOPS WITH UNDERCOUNTER MOUNTED BOWLS, BACKSPLASH SHALL BE INTEGRAL WITH COUNTERTOP.
2. PROVIDE BLOCKING IN WALLS FOR ALL WALL MOUNTED ACCESSORIES.
3. ALL EXPOSED SURFACES OF MILLWORK TO BE P. LAMINATE ON 3/4" PART. BD., TYPICAL, UNLESS NOTED OTHERWISE.
4. PROVIDE WATER RESISTANT GYPSUM WALLBOARD AT ALL WET AREAS AND/OR AREAS TO RECEIVE WALL TILE.
5. SEE "ARCHITECTURAL FINISH SCHEDULE" FOR MATERIAL INFORMATION.
6. SEE SHEET A-121 FOR "CEILING FINISH" ABBREVIATIONS.
7. SEE DETAIL 7/ A-411 FOR ALL TOILET ACCESSORY MOUNTING HEIGHTS.

TOILET ACCESSORY KEY

FD = FLOOR DRAIN (PITCH FLOOR TO DRAIN)
CR = CURTAIN ROD (36" OPENING)
DCS = DIAPER CHANGING STATION
EWC = ELECTRIC WATER COOLER
FSS = FOLDING SHOWER SEAT
GB1 = GRAB BAR (36"w. x 54"d. x 33 A.F.F.)
GB2 = GRAB BAR (36" L. x 33" A.F.F.)
GB3 = GRAB BAR (42" L. x 33" A.F.F.)
GB4 = GRAB BAR (28" L. x 33" A.F.F.)
HSD = HAND SANITIZER DISPENSER
LSD = LIQUID SOAP DISPENSER (OWNER FURNISHED, CONTRACTOR INSTALLED)
MS = MOP STRIP
MIR = MIRROR - FRAMELESS
PTD = PAPER TOWEL DISPENSER/DISPOSAL
RH = ROBE HOOK
SCD = SEAT COVER DISPENSER (RECESSED)
SND = SANITARY NAPKIN DISPOSAL
SD = SOAP DISH
TPD = (2) TOILET PAPER DISPENSERS - (2 ROLL)
WR = WASTE RECEPTACLE
VSC = VINYL SHOWER CURTAIN

KEYED NOTES

4.121 ALIGN WALL WITH EXISTING WALL
4.125 ADA BENCH, REFERENCE SPECIFICATIONS
4.126 PROVIDE HDPE LOCKERS WITH SLOPE TOP, ON 4" BASE BY MFR.
4.131 PROVIDE EMERGENCY EYE WASH AND SHOWER, COORDINATE WITH PLUMBING.
4.139 ROOF ACCESS LADDER
4.141 FRONT LOAD DRYERS, GOVERNMENT FURNISHED, GENERAL CONTRACTOR TO INSTALL. (GFCI)
4.142 FRONT LOAD WASHERS, GOVERNMENT FURNISHED, GENERAL CONTRACTOR TO INSTALL. (GFCI)
4.157 SHOWER INSERT, REFERENCE PLUMBING DRAWINGS
4.158 SEE DETAIL 22/ A-401 FOR TYP. CT PATTERNING
4.207 MECHANICAL EQUIPMENT, REFERENCE MECHANICAL DRAWINGS

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CHECKED BY: REK,KM
DO NOT SCALE DRAWINGS.

SHEET CONTENTS
ENLARGED PLANS, ELEVATIONS AND DETAILS

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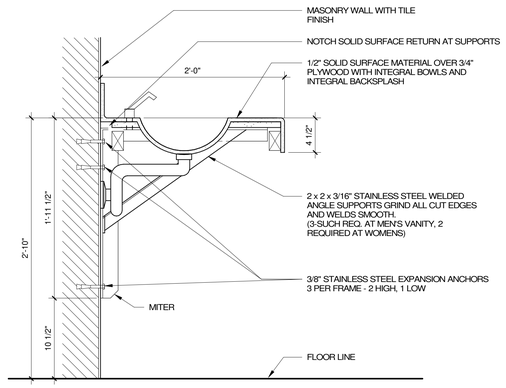
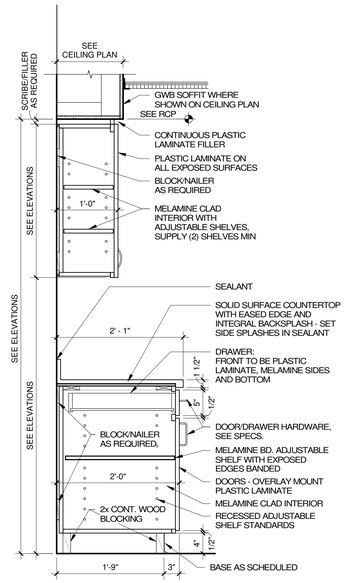
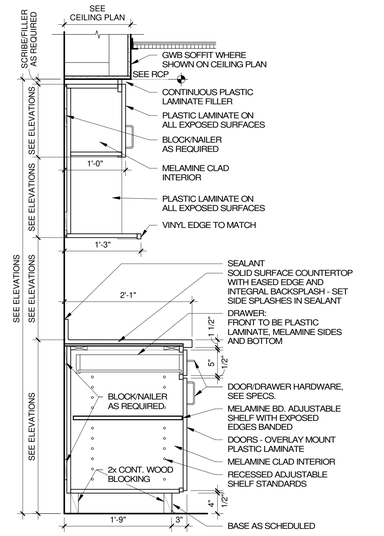


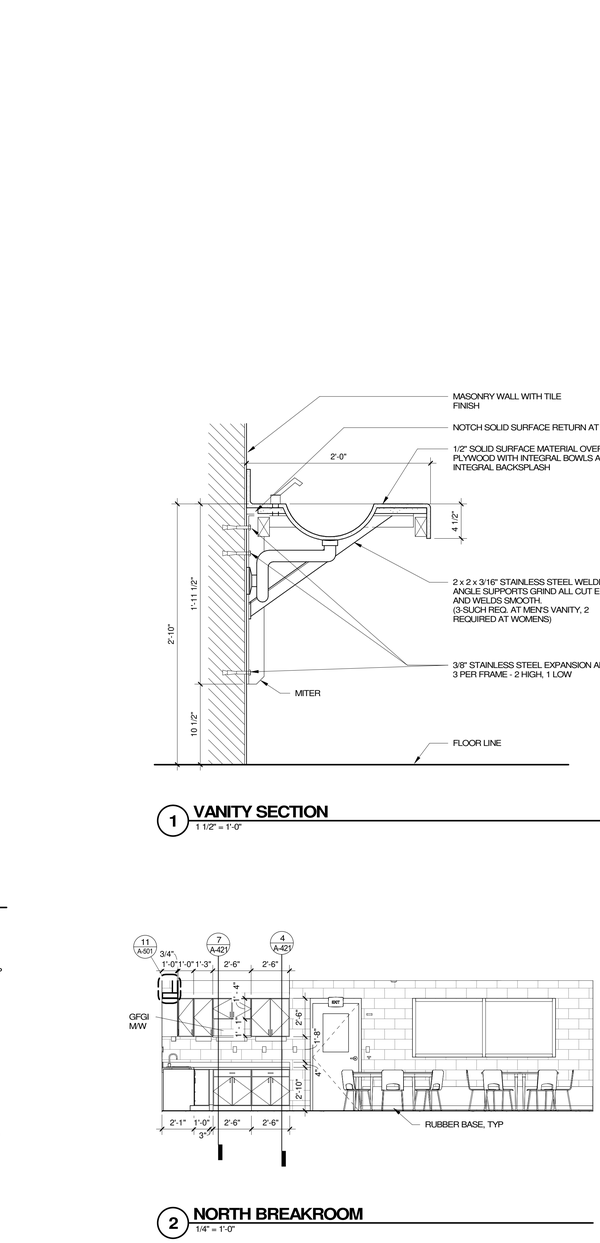
1 VANITY SECTION
1 1/2" = 1'-0"



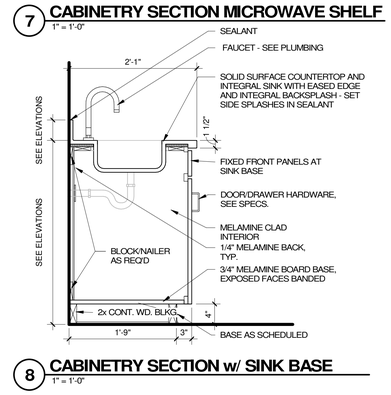
4 CABINETRY SECTION, TYPICAL
1" = 1'-0"



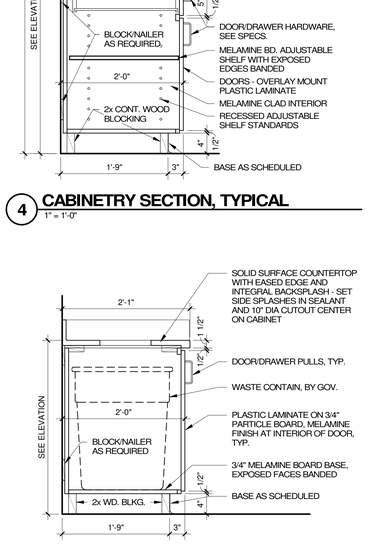
7 CABINETRY SECTION MICROWAVE SHELF
1" = 1'-0"



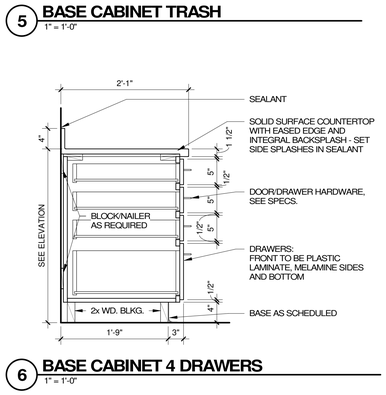
2 NORTH BREAKROOM
1/4" = 1'-0"



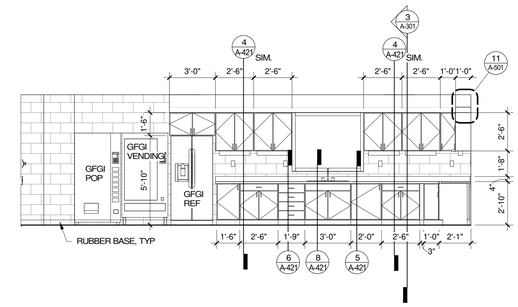
8 CABINETRY SECTION w/ SINK BASE
1" = 1'-0"



5 BASE CABINET TRASH
1" = 1'-0"



6 BASE CABINET 4 DRAWERS
1" = 1'-0"



3 WEST BREAKROOM
1/4" = 1'-0"

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Mason&Hanger
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Ann Arbor, MI 48108
phone: 810-956-9300

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

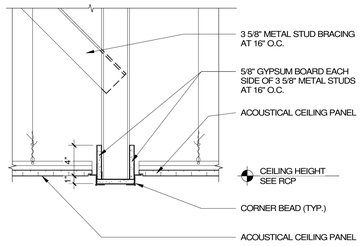
ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: PJC
DRAWN BY: PJC
CHECKED BY: REK-KM
DO NOT SCALE DRAWINGS

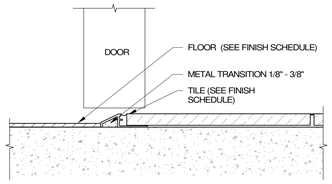
SHEET CONTENTS
ENLARGED CASEWORK PLANS, ELEVATIONS & DETAILS

SHEET NO.:
A-421

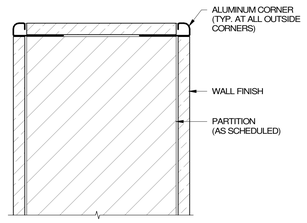
12/14/2022 9:20:34 AM C:\Revit Local\3141700-181848.01-A-Central-2020_NateDeMaster.rvt



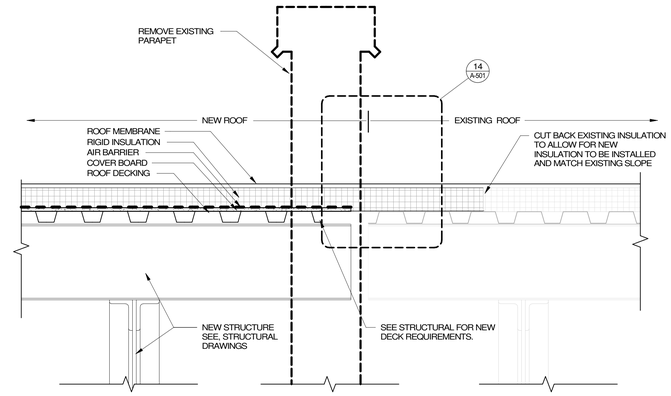
16 CEILING TRANSITION
1 1/2" = 1'-0"



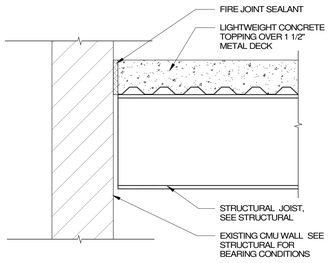
12 TRANSITION - TILE/RESINOUS
6" = 1'-0"



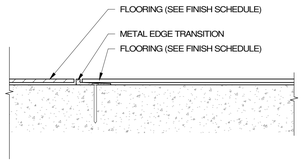
8 WALL TILE OUTSIDE CORNER
6" = 1'-0"



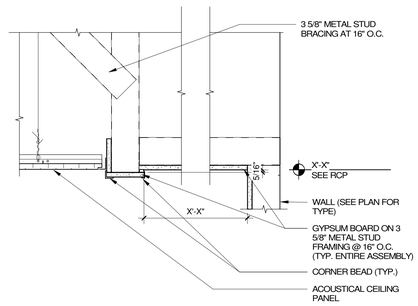
1 TYP ROOF CONNECTION
1 1/2" = 1'-0"



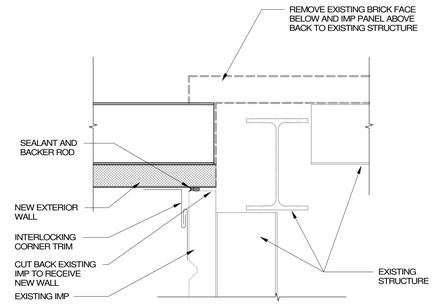
17 2 HR RATED CEILING CAP @ EXISTING WALL
1 1/2" = 1'-0"



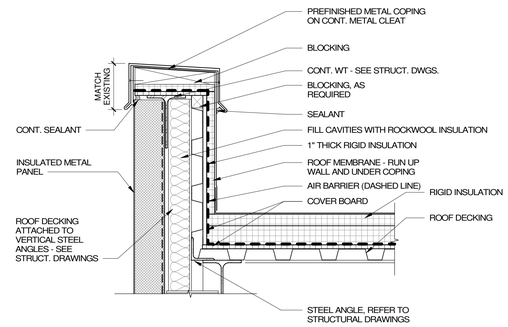
13 TRANSITION - RESINOUS/RESINOUS
6" = 1'-0"



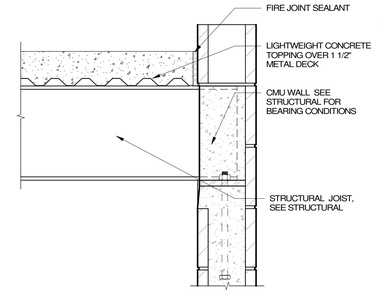
9 CEILING TRANSITION
1 1/2" = 1'-0"



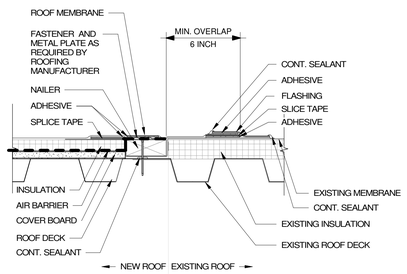
5 PLAN DETAILS INSIDE CORNER
1 1/2" = 1'-0"



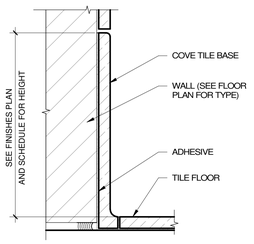
2 ADDITION WALL PARAPET, TYP
1 1/2" = 1'-0"



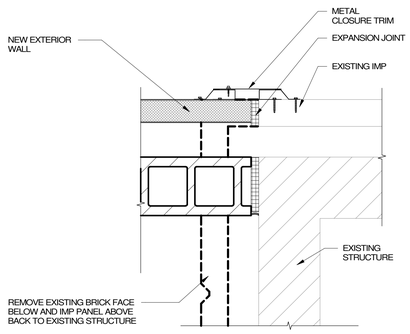
18 2 HR RATED CEILING CAP @ CMU WALL
1 1/2" = 1'-0"



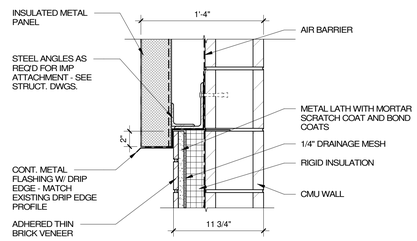
14 ROOF LAP DETAIL
3" = 1'-0"



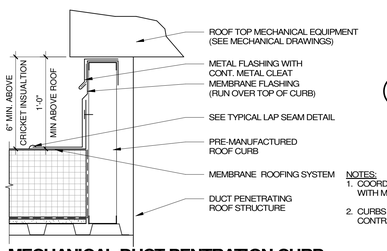
10 TILE BASE
6" = 1'-0"



6 PLAN DETAILS @ IMP
1 1/2" = 1'-0"

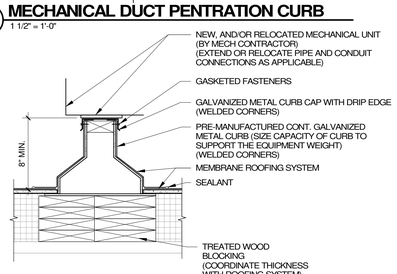


3 ADDITION WALL IMP/BRICK TRANSITION
1 1/2" = 1'-0"

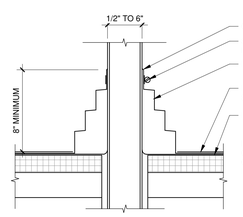


NOTES:
1. COORDINATE LOCATION, SIZE AND QUANTITY WITH MECHANICAL AND ELECTRICAL CONTRACTOR.
2. CURBS FOR ROOFTOP MECH. EQUIP. SUPPLIED BY MECHANICAL CONTRACTOR (UNLESS NOTED OTHERWISE).

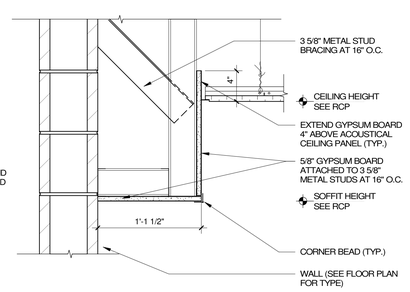
19 MECHANICAL DUCT PENTRATION CURB
1 1/2" = 1'-0"



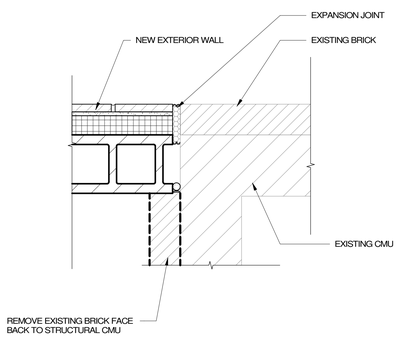
20 MECHANICAL EQUIPMENT SUPPORT CURB
1 1/2" = 1'-0"



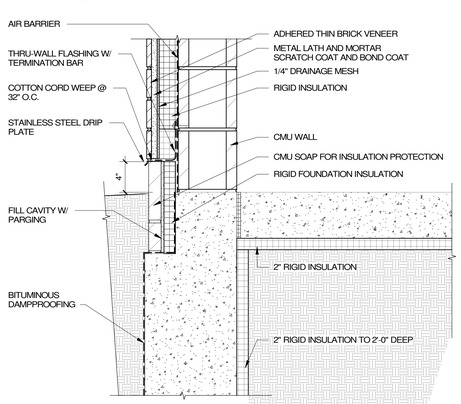
15 PIPE PENETRATION
1 : 1



11 SOFFIT DETAIL
1 1/2" = 1'-0"



7 PLAN DETAILS @ BRICK
1 1/2" = 1'-0"



4 ADDITION WALL BASE, TYP
1 1/2" = 1'-0"

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: PJC
DRAWN BY: PJC
CHECKED BY: REK KM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
DETAILS

SHEET NO.:
A-501

12/14/2022 9:20:35 AM C:\Revit Local\3141700-181848.01-A-Central-2020_NateDahlMaster.rvt

ROOM FINISH GENERAL NOTES:

1. PREP ALL EXISTING AND OR NEW WORK AREAS AS REQUIRED TO ACCOMMODATE SCHEDULED FINISHES.
2. ALL INSTALLATION BASED ON MANUFACTURER'S GUIDELINES, TYP.
3. FLOOR PREP BY INSTALLER FOR FLUSH TRANSITIONS.
4. ALL TILE GROUT TO BE EPOXY TYPE.
5. FLOOR LEVELING SHALL BE 1/8" TOLERANCE FOR GENERAL FLOORING, GRINDING, AND FILL.
6. GWB CONTROL JOINTS TO BE LOCATED AT A MAXIMUM 30FT. COORDINATE LOCATIONS WITH CONTRACTING OFFICER.
7. CONTRACTOR TO CAULK AROUND ALL WINDOW FRAMES. CAULK TO MATCH FRAME COLOR.
8. ALL WALLS PAINTED PT-1, U.N.O.
9. ALL PAINTED WALLS/CEILINGS SHALL BE PAINTED IN EGGSHELL SHEEN, U.N.O. GYPSUM BOARD SUBSTRATE SHALL HAVE LIGHT ORANGE PEEL TEXTURE.
10. ALL INTERIOR HM DOORS AND FRAMES FINISH TO BE PAINTED PT-3. EXTERIOR SIDE OF EXTERIOR DOORS TO BE PAINTED BASE STANDARD COLOR PT-4. COLOR SHALL BE CARRIED TO INSIDE OF THE DOOR STOP.
11. ALL METAL LINEAR DIFFUSERS, SHOP PRIMED ACCESS PANELS, ELECTRICAL PANELS, EXPOSED, CONDUIT, MECH PIPING, AND SPRINKLER PIPING SHALL BE PAINTED TO MATCH ADJACENT SURFACE, TYPICAL, U.N.O.
12. ALL EXPOSED MECHANICAL DUCTS SHALL BE GALVANIZED METAL.
13. ALL EXPOSED CONCRETE AND CMU NOT SCHEDULED TO RECEIVE A FINISH SHALL BE SEALED, U.N.O.
14. ALL COLUMNS SHALL RECEIVE PAINT, WITH COLOR SIMILAR TO TYPICAL ROOM COLOR, AND RB-1 WHEN CALLED FOR IN THE ROOM, TYP. U.N.O.
15. ALL FLOORING TRANSITIONS SHALL BE CENTERED UNDER DOOR IN CLOSED POSITION U.N.O.
16. VERIFY THAT ALL TRANSITION STRIP AND METAL EDGE PRODUCTS COORDINATE WITH FLOOR FINISH HEIGHTS PRIOR TO PROCUREMENT.
17. ALL PAINT TRANSITIONS ARE INTENDED TO MEET INSIDE CORNERS, TYP. COORDINATE ANY DISCREPANCIES WITH THE CONTRACTING OFFICER.
18. ALL EXPOSED CMU OUTSIDE CORNERS SHALL BE BULLNOSE.
19. WHERE TILE TURNS CORNERS, ALIGN GROUT LINES.
20. REFERENCE INTERIOR ELEVATIONS FOR MOUNTING HEIGHTS.
21. REFERENCE A-121 FOR CEILING FINISH COORDINATION.

ARCHITECTURAL FINISHES SCHEDULE

FINISH NUMBER	FINISH DESCRIPTION	PRODUCT DESCRIPTION			REMARKS
		STYLE	COLOR	SIZE	
ACP-1	ACOUSTIC CEILING PANEL - TYPE 1	MEDIUM TEXTURE TEGULAR	WHITE	24x24	BEVELED
ACP-2	ACOUSTIC CEILING PANEL - TYPE 2	WATER-REPELLANT TEGULAR	WHITE	24x24	WATERPROOF
CT-1	CERAMIC TILE - TYPE 1	PORCELAIN	CHARCOAL GRAY	12x12 / 2X2 MOSAIC	USE WITH GROUT 1 (GR-1), USE 2X2 MOSAIC TILES IN SHOWERS AND AROUND SLOPING DRAIN AREAS
CT-2	CERAMIC TILE - TYPE 2	PORCELAIN	LIGHT GRAY	12x12	USE WITH GROUT 2 (GR-2)
CT-3	CERAMIC TILE - TYPE 3	PORCELAIN	CHARCOAL GRAY	6X12	-
CTB-1	CERAMIC TILE BASE - TYPE 1	PORCELAIN	CHARCOAL GRAY	6X12	-
EM-1	ENTRY MAT - TYPE 1	HEAVY WEAR POLYESTER	CHARCOAL GRAY	24X24	NEEDLEBOND DIAGONAL
ESD-1	ELECTROSTATIC DISSIPATIVE EPOXY - TYPE 1	SOLID COLOR	MEDIUM GRAY	-	HEAVY USE
ESD-2	ELECTROSTATIC DISSIPATIVE EPOXY - TYPE 2	SOLID COLOR	LIGHT GRAY	-	HANGAR FLOORS
GR-1	GROUT COLOR - TYPE 1	-	PEWTER	-	-
GR- 2	GROUT COLOR - TYPE 2	-	OYSTER GRAY	-	-
PLAM-1	PLASTIC LAMINATE - TYPE 1	-	LIGHT GRAY	-	-
PT-1	PAINT COLOR - TYPE 1	-	WHITE	-	-
PT-2	PAINT COLOR - TYPE 2	-	LIGHT GRAY	-	-
PT-3	PAINT COLOR - TYPE 3	-	CHARCOAL GRAY	-	-
PT-4	PAINT COLOR - TYPE 4	-	WARMSHADOW	-	-
RB-1	RUBBER WALL BASE - TYPE 1	TRADITIONAL W/TOE	CHARCOAL GRAY	4"	-
RS-2	RESINOUS FLOOR - TYPE 2	ERGONOMIC W/ FLAKE	MEDIUM GRAY	-	-
RS-3	RESINOUS FLOOR - TYPE 3	HEAVY DUTY, SOLID COLOR	MEDIUM GRAY	-	HEAVY USE
SC-1	SEALED CONCRETE - TYPE 1	-	-	-	-
SCS-1	SOLID SURFACE - TYPE 1	GRAY AGGREGATE APPEARANCE	WHITE	-	20% RECYCLED CONTENT

ROOM FINISH SCHEDULE

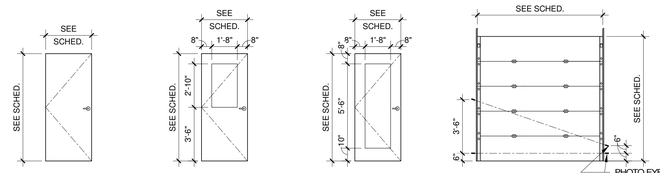
ROOM NO.	ROOM NAME	FLOOR	BASE	WALLS				CEILING		REMARKS
				NORTH	EAST	SOUTH	WEST	MTL	HEIGHT	
103	MAINTENANCE/ CORROSION DOCK	ESD-2	-	PT-1	PT-1	PT-1	PT-1	EXP		
104	MAINTENANCE/ CORROSION DOCK	ESD-2	-	PT-1	PT-1	PT-1	PT-1	EXP		
105	CLASSROOM/ BREAK	RS-2	RB-1	PT-1	PT-1	PT-2	PT-1	ACP-1	9'-0"	
106	OPEN OFFICE	RS-2	RB-1	PT-2	PT-2	PT-1	PT-1	ACP-1	9'-0"	
107	OFFICE	RS-2	RB-1	PT-2	PT-1	PT-1	PT-2	ACP-1	9'-0"	
108	CORRIDOR	RS-3	RB-1	PT-1	PT-1	PT-1	PT-1	ACP-1	9'-0"	
109	CORRIDOR	RS-3	RB-1	PT-1	PT-1	PT-1	PT-1	ACP-1	9'-0"	
110	JANITOR	CT-1	CTB-1	PT-2	PT-2	PT-2	PT-2	ACP-2	9'-0"	
111	MEN'S	CT-1	CTB-1	CT-2/3	CT-2/3	CT-2/3	CT2/3	ACP-2/GYP-1	9'-0"	PROVIDE PT-1 AT GYP-1 CEILINGS
112	WOMEN'S	CT-1	CTB-1	CT-2/3	CT-2/3	CT-2/3	CT2/3	ACP-2/GYP-1	9'-0"	PROVIDE PT-1 AT GYP-1 CEILINGS
113	OFFICE	RS-2	RB-1	PT-2	PT-1	PT-1	PT-2	ACP-1	9'-0"	
114	CORRIDOR	RS-3	RB-1	PT-1	PT-1	PT-1	PT-1	ACP-1	9'-0"	
115	EXTERNAL FUEL TANK OFFICE/ TOOL STORAGE	RS-3	RB-1	PT-1	PT-1	PT-1	PT-1	EXP/PT-1		
116	ELECTRICAL	SC-1	-	PT-2	PT-2	PT-2	PT-2	EXP/PT-1		
117	FIRE PROTECTION ROOM	SC-1	-	PT-2	PT-2	PT-2	PT-2	EXP/PT-1		
118	UTILITY	SC-1	-	PT-2	PT-2	PT-2	PT-2	EXP/PT-1		
119	EXTERNAL FUEL TANK	ESD-1	-	PT-1	PT-1	PT-1	PT-1	EXP/PT-1		
121	VESTIBULE	EM-1	RB-1	PT-1	PT-1	PT-1	PT-1	ACP-1	9'-0"	
123	WASH ROOM	RS-3	RB-1	PT-1	PT-1	PT-1	PT-1	ACP-1	9'-0"	
124	SHOWER	CT-1	CTB-1	CT-2/3	CT-2/3	CT-2/3	CT2/3	GYP-1	9'-0"	
125	GEAR LOCKER/ LAUNDRY	RS-3	RB-1	PT-1	PT-1	PT-1	PT-1	ACP-2	9'-0"	
126	STORAGE	RS-3	-	PT-1	PT-1	PT-1	PT-1	EXP		
127	STORAGE	RS-3	-	PT-1	PT-1	PT-1	PT-1	EXP		
128	SHOWER	CT-1	CTB-1	CT-2/3	CT-2/3	CT-2/3	CT2/3	GYP-1	9'-0"	
129	VEST	RS-3	RB-1	PT-1	PT-1	PT-1	PT-1	ACP-1	9'-0"	
130	VEST	RS-3	RB-1	PT-1	PT-1	PT-1	PT-1	ACP-1	9'-0"	

DOOR AND HARDWARE SCHEDULE

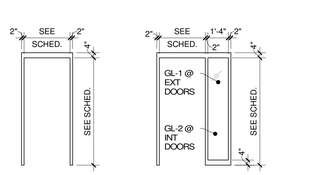
DOOR NUMBER	DOOR							FRAME						MISCELLANEOUS		REMARKS
	LEAF SIZE			TYPE	MAT'L	GLAZING TYPE	FINISH	TYPE	MAT'L	DETAILS			FINISH	LABEL	HDWR SET	
	QTY.	WIDTH	HEIGHT							HEAD	JAMB	OTHER				
105A	(1)	3'-0"	7'-0"	HG	HM	GL-2	PT	S	HM	4/A-601	5/A-601	6/A-601	PT		2.0	
105B	(1)	3'-0"	7'-0"	HG	HM	GL-1	PT	F	HM	1/A-601	2/A-601		PT		1.0	
106	(1)	3'-0"	7'-0"	F	HM		PT	S	HM	4/A-601	5/A-601	6/A-601	PT		7.0	
107	(1)	3'-0"	7'-0"	F	HM		PT	S	HM	4/A-601	5/A-601	6/A-601	PT		7.0	
108	(1)	3'-0"	7'-0"	HG	HM	GL-2	PT	S	HM	4/A-601	5/A-601	6/A-601	PT		2.0	
110	(1)	3'-0"	7'-0"	F	HM		PT	F	HM	4/A-601	5/A-601		PT		10.0	
111	(1)	3'-0"	7'-0"	F	HM		PT	F	HM	4/A-601	5/A-601		PT		11.0	
112	(1)	3'-0"	7'-0"	F	HM		PT	F	HM	4/A-601	5/A-601		PT		11.0	
113	(1)	3'-0"	7'-0"	F	HM		PT	S	HM	4/A-601	5/A-601	6/A-601	PT		7.0	
115	(2)	3'-4"	7'-0"	F	HM		PT	F	HM	4/A-601	5/A-601		PT	45 MIN	9.1	NEW DOOR AND FRAME IN EXISTING OPENING
116	(1)	3'-0"	7'-0"	F	HM		PT	F	HM	1/A-601	2/A-601		PT		3.0	
117	(2)	3'-0"	7'-0"	F	HM		PT	F	HM	1/A-601	2/A-601		PT		4.0	
118	(2)	3'-0"	7'-0"	F	HM		PT	F	HM	1/A-601	2/A-601		PT		4.0	
119A	(2)	3'-4"	7'-0"	F	HM		PT	F	HM	4/A-601	5/A-601		PT		9.0	
119B	(1)	3'-4"	7'-0"	HG	HM	GL-1	PT	F	HM	1/A-601	2/A-601		PT		1.0	
119C	-	10'-0"	8'-6"	SC1	STL		PT	-	STL	11/A-601	12/A-601		-		12.0	
121A	(1)	3'-0"	7'-0"	FG	HM	GL-1	PT	S	HM	1/A-601	2/A-601	9/A-601	PT		1.0	
121B	(1)	3'-0"	7'-0"	FG	HM	GL-2	PT	S	HM	4/A-601	5/A-601	6/A-601	PT		2.0	
124	(1)	3'-4"	7'-0"	F	HM		PT	F	HM	4/A-601	5/A-601		PT		8.0	
126	(1)	3'-0"	7'-0"	F	HM		PT	F	HM	4/A-601	5/A-601		PT	45 MIN	10.1	
127	(1)	3'-0"	7'-0"	F	HM		PT	F	HM	4/A-601	5/A-601		PT	45 MIN	10.1	
128	(1)	3'-4"	7'-0"	F	HM		PT	F	HM	4/A-601	5/A-601		PT		8.0	
129A	(2)	3'-4"	7'-0"	F	HM		PT	F	HM	4/A-601	5/A-601		PT	45 MIN	5.0	
129B	(2)	3'-4"	7'-0"	F	HM		PT	F	HM	4/A-601	5/A-601		PT		6.0	
130A	(2)	3'-4"	7'-0"	F	HM		PT	F	HM	4/A-601	5/A-601		PT	45 MIN	5.0	
130B	(2)	3'-4"	7'-0"	F	HM		PT	F	HM	4/A-601	5/A-601		PT		6.0	
E103A		83'-3"	27'-0"	-											-	(ABI #1) NEW FABRIC BOTH SIDES
E103B	(1)	3'-0"	7'-0"	F	EX		PT	EX	EX	EXIST	EXIST	EXIST	PT		-	
E103C	(1)	3'-0"	7'-0"	F	EX		PT	EX	EX	EXIST	EXIST	EXIST	PT		-	
E103D	-	10'-0"	8'-6"	SC1	EX		PT	EX	EX				PT		-	PROVIDE NEW SEALANT, PAINT DOOR AND FRAME (PT-4)
E104A		83'-3"	27'-0"	-											-	(ABI #1) NEW FABRIC BOTH SIDES
E104B	(1)	3'-0"	7'-0"	F	EX		PT	EX	EX	EXIST	EXIST	EXIST	PT		-	
E104C	(1)	F	3'-0"	7'-0"	F	EX	PT	EX	EX	EXIST	EXIST	EXIST	PT		-	
E104D	-	10'-0"	8'-6"	SC1	EX		PT	EX	EX				PT		-	PROVIDE NEW SEALANT, PAINT DOOR AND FRAME (PT-4)

DOOR AND HARDWARE SCHEDULE ABBREVIATIONS

DOOR/FRAME MATERIALS
- EX = EXISTING
- GL = GLAZING
- HM = HOLLOW METAL
- PT = PAINT
- STL = STEEL



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



FRAME TYPES
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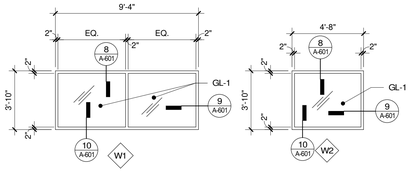
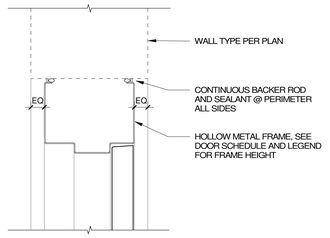
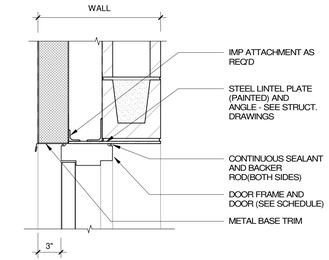


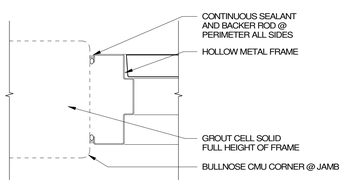
WINDOW TYPES
1/4" = 1'-0"



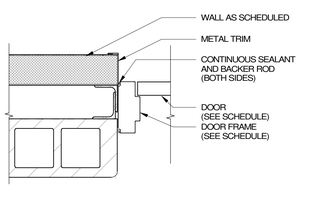
4 HM DOOR HEAD - CMU
3" = 1'-0"



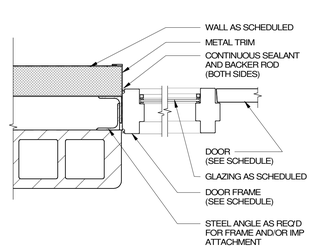
1 EXTERIOR HM DOOR HEAD AT IMP
1 1/2" = 1'-0"



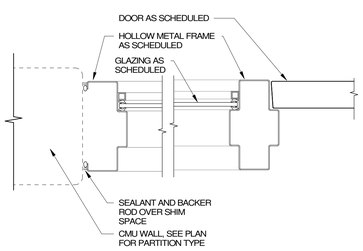
5 HM DOOR JAMB - CMU
3" = 1'-0"



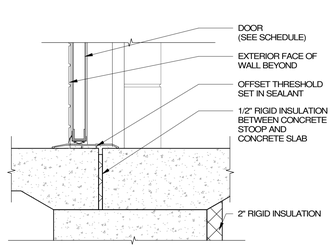
2 EXTERIOR HM DOOR JAMB AT IMP
1 1/2" = 1'-0"



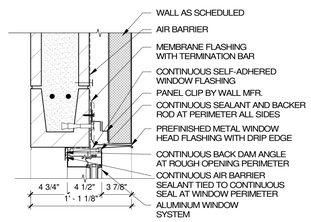
7 EXTERIOR HM DOOR JAMB WITH SIDELITE - IMP
1 1/2" = 1'-0"



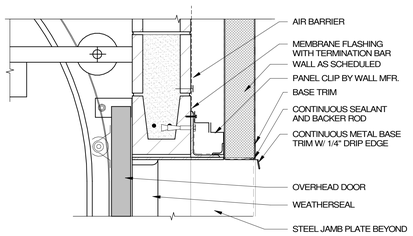
6 HM DOOR JAMB WITH SIDELITE - CMU
3" = 1'-0"



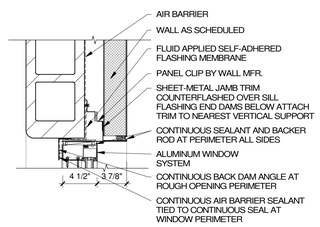
3 EXTERIOR HM DOOR SILL
1 1/2" = 1'-0"



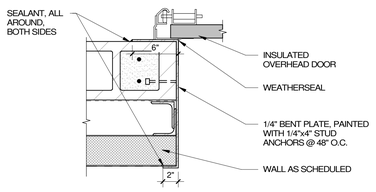
8 WINDOW HEAD
1 1/2" = 1'-0"



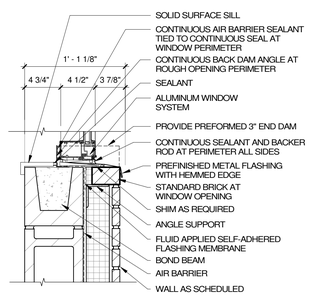
11 EXTERIOR SECTIONAL OVERHEAD DOOR HEAD
1 1/2" = 1'-0"



9 WINDOW JAMB
1 1/2" = 1'-0"



12 EXTERIOR SECTIONAL DOOR JAMB
1 1/2" = 1'-0"



10 WINDOW SILL
1 1/2" = 1'-0"

TETRA TECH
Mead & Hunt
Joint Venture with
Mason&Hanger
710 Avis Drive, Suite 100,
Ann Arbor, MI 48108
phone: 810-956-9300

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.:	VGLZ162323
M&H NO.:	3141700-181848.01
DATE:	December 16, 2022
DESIGNED BY:	PJC
DRAWN BY:	PJC
CHECKED BY:	REK,KM

DO NOT SCALE DRAWINGS

SHEET CONTENTS
SCHEDULES AND DETAILS

SHEET NO.:
A-601

12/14/2022 9:26:37 AM C:\Revit Local\3141700-181848.01-A-Central-2020_NateDeMaster.rvt

DOOR AND HARDWARE SCHEDULE

DOOR NUMBER	DOOR							FRAME						MISCELLANEOUS			REMARKS
	LEAF SIZE					GLAZING TYPE				DETAILS							
	QTY.	WIDTH	HEIGHT	TYPE	MAT'L		FINISH	TYPE	MAT'L	HEAD	JAMB	OTHER	FINISH	LABEL	HDWR SET	LINTEL	
102	(1)	3'-0"	7'-0"	F	HM	-	PT	F	HM	3/A-602	2/A-602		PT	-			
E101	(2)	3'-0"	8'-4"	N	EX	-	PT	EX	EX	-	-	-	PT	-			

DOOR AND HARDWARE SCHEDULE GENERAL NOTES

1. PROVIDE STAINLESS STEEL GUARD CHAIN WITH CAUTION SIGN ACROSS INTERIOR SIDE OF DOOR.
2. LINTEL L1 SHALL BE (2) #5 BARS, 1 COURSE HIGH.
3. OPERABLE LEAF SHALL BE DOOR TYPE B AND FIXED LEAF SHAL BE DOOR TYPE A.

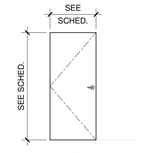
DOOR AND HARDWARE SCHEDULE ABBREVIATIONS

DOOR/FRAME MATERIALS
- AL = ALUMINUM
- EX = EXISTING
- FR = FABRIC ROLL-UP
- FRP = FIBERGLASS REINFORCED PLASTIC
- G = GALVANIZED
- HM = HOLLOW METAL
- PL = PLASTIC ROLL-UP
- R = RUBBER ROLL-UP
- SS = STAINLESS STEEL
- ST = STEEL
- WD = WOOD

GLAZING TYPES

DOOR AND HARDWARE SCHEDULE ABBREVIATIONS

- EX = EXISTING
- FG = FIRE GLASS
- IN = INSULATED
- L = LEXAN MARGARD
- P = 1/4" PLATE
- S = SAFETY
- T = TEMPERED

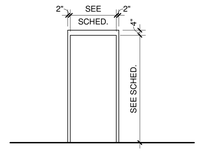


F

FLUSH DOOR

DOOR TYPES

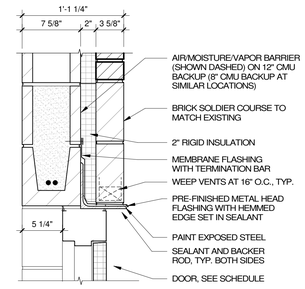
1/4" = 1'-0"



F2

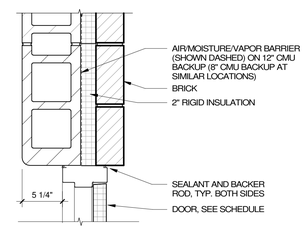
FRAME TYPES

1/4" = 1'-0"



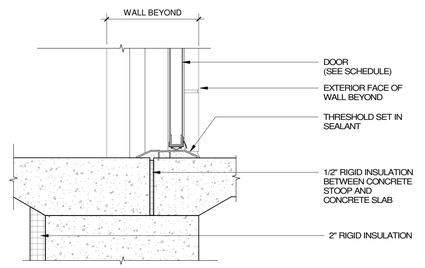
3 **EXTERIOR DOOR HEAD AT BRICK**

1 1/2" = 1'-0"



2 **EXTERIOR DOOR JAMB AT BRICK**

1 1/2" = 1'-0"



1 **EXTERIOR DOOR SILL**

1 1/2" = 1'-0"

TETRA TECH Mead & Hunt
Joint Venture with
Mason & Hanger
710 Avis Drive, Suite 100,
Ann Arbor, MI 48108
phone: 810-956-9300

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: PJC
DRAWN BY: PJC
CHECKED BY: REK

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SHEET CONTENTS
B158 SCHEDULES

SHEET NO.:
A-602

12/14/2022 9:34:20 AM C:\Revit Local\3141700-181848.01-A FP-Central-2020_NateDeMaster.rvt

1 SIGNAGE AND MARKINGS PLAN
1/8" = 1'-0"

HANGAR BAY STRIPING PLAN GENERAL NOTES:

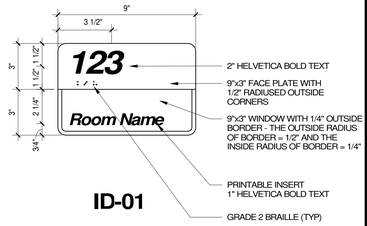
1. PERMANENTLY REMOVE EXISTING MARKINGS ON BOTH THE HANGAR FLOORS.
2. LINES SHOWN FOR GRAPHICAL REPRESENTATION ONLY. REFER TO KEYNOTE FOR FULL DESCRIPTION OF LINEWORK.
3. PROVIDE STRIPING OF SAFETY LANES, LEAD-IN LINES, NOSE GEAR STOP LINES, GROUNDING POINTS, EMERGENCY EYE WASH FIXTURES, FIRE EXTINGUISHERS AND OTHER SAFETY MARKINGS. COORDINATE COLORS, STRIPING AND GRIT LEVEL WITH THE CONTRACTING OFFICER.
4. PLACE STRIPING AND GROUNDING ROD MARKERS ACCORDING TO THE DRAWINGS. WHEN THE SECOND TOPCOAT IS WITHIN ITS RECOAT WINDOW, APPLY A WALKWAY STRIPE OF THE URETHANE TOPCOAT AT 3.0 MILS- (75 MICRONS-) DFT. USE SOLVENT RESISTANT TAPE TO PROTECT THE FLOOR COATING AGAINST STRIPE COAT BLEED. A THIN CLEAR COAT OF EITHER EPOXY OR URETHANE MAY BE REQUIRED TO PREVENT STRIP COAT BLEED PRIOR TO THE FULL APPLICATION OF THE COLORED STRIPE COAT. COMPLETELY HIDE THE TOPCOAT COLOR WITH THE STRIPE, IN ONE COAT. IF INSUFFICIENT HIDING OCCURS, APPLY ONE ADDITIONAL COAT.

KEYED NOTES

4.702 NOSE GEAR STRIPE LINE. 6" WIDE YELLOW LINE LOCATED AT DIMENSIONS INDICATED

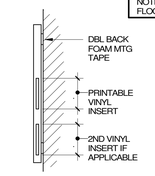
4.703 EYE WASH LINE. GREEN 3" WIDE STRIPE LOCATED 2'-0" FROM EYE WASH.

4.704 FIRE EXTINGUISHER LINE. RED 3" WIDE STRIPE LOCATED 2'-0" FROM FIRE EXTINGUISHER

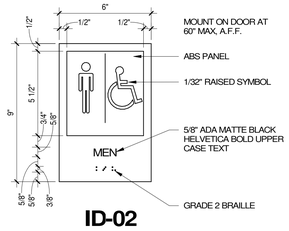


ID-01

ROOM NAMES ARE AS NOTED ON THE FLOOR PLANS



SIDE VIEW



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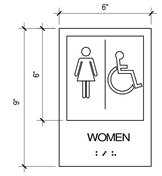
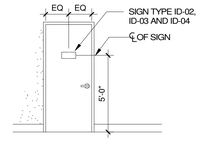
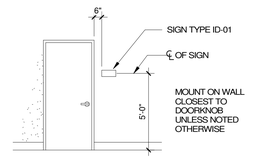


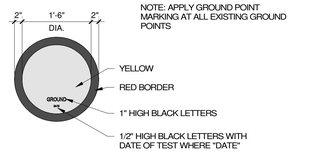
ID-03

2 SIGNAGE DETAILS
3" = 1'-0"





3 SIGN MOUNTING
1/4" = 1'-0"



GROUNDING POINT MARKING

TETRA TECH
Mead & Hunt
Joint Venture with
Mason & Hanger
710 Avis Drive, Suite 100,
Ann Arbor, MI 48108
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HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
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ANG NO.:	VGLZ162323
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DESIGNED BY:	PJC
DRAWN BY:	PJC
CHECKED BY:	REK

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SHEET CONTENTS
FIRST FLOOR
SIGNAGE AND
MARKING PLAN

SHEET NO.:

A-801

12/14/2022 9:20:40 AM C:\Revit Local\3141700-181848.01-A-Central-2020_NateDeMaster.rvt

FURNITURE PLAN GENERAL NOTES:

1. FURNITURE AND EQUIPMENT OUTLINES SHOWN ARE OWNER FURNISHED, OWNER INSTALLED AND FOR INFORMATIONAL PURPOSES ONLY FOR COORDINATION OF SERVICES AND UTILITIES.

N 1 **FIRST FLOOR PLAN**
1/8" = 1'-0"

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WE STAND READY

MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

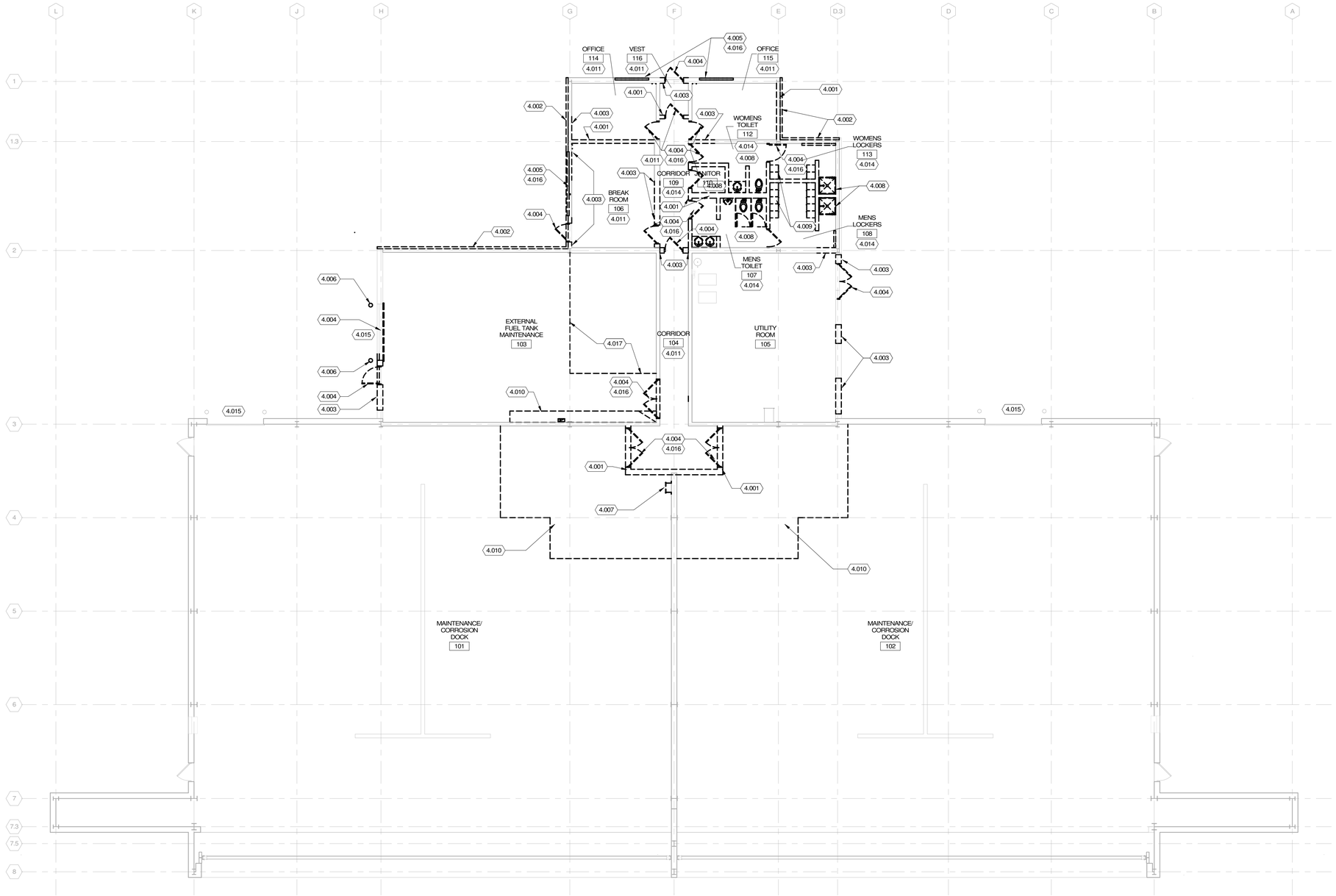
ISSUED:
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: PJC
DRAWN BY: PJC
CHECKED BY: REK
DO NOT SCALE DRAWINGS.

SHEET CONTENTS
FIRST FLOOR
FURNITURE PLAN

SHEET NO.:
A-901

12/14/2022 9:20:42 AM C:\Revit Local\3141700-181848.01-A-Central-2020_NateDeMaster.rvt



N 1 **FIRST FLOOR DEMOLITION PLAN**
1/8" = 1'-0"

DEMOLITION PLAN GENERAL NOTES:

1. THE GENERAL CONTRACTOR SHALL VERIFY ALL BUILDING AND SITE CONDITIONS AND REPORT ANY DISCREPANCIES TO THE CONTRACTING OFFICER BEFORE PROCEEDING WITH ANY SCHEDULED DEMOLITION WORK.
2. THE GENERAL CONTRACTOR SHALL COORDINATE ARCHITECTURAL, STRUCTURAL, CIVIL, MECHANICAL, ELECTRICAL, TECHNOLOGY, AND PLUMBING WORK AND ALL SUBCONTRACTORS FOR DEMOLITION AND REPAIR WORK.
3. IT IS THE INTENT OF THESE DRAWINGS TO INDICATE THE REMOVAL OF ALL ITEMS WHICH INTERFERE WITH THE FINAL CONSTRUCTION AS SHOWN ON THE FLOOR PLANS, ELEVATIONS, DETAILS, AND SCHEDULES. ALL FLOOR FINISHES, BASE, CEILINGS, ABANDONED FURNITURE, WINDOW TREATMENTS, SHELVING, SIGNAGE, AND ROOFING MATERIALS SHALL BE DEMOLISHED IN THEIR ENTIRETY.
4. REMOVE ALL ITEMS OF DEMOLITION WORK FROM THE PROJECT DAILY AND DISPOSE OF PROPERLY.
5. EXISTING CONCRETE AND STEEL STRUCTURE TO REMAIN, TYP. PROTECT COLUMNS, PILASTERS, BEAMS, AND SLABS.
6. EXISTING EXTERIOR CONSTRUCTION AT LOW ROOF PORTION OF THE BUILDING, CONSISTS OF 9'-4" HIGH CMU WALLS WITH STEEL GIRT STRUCTURE ABOVE. THE EXTERIORS ARE ENCLOSED WITH A 4'-0" HIGH BRICK BASE AND IMP'S ABOVE.
7. EXISTING INTERIOR CONSTRUCTION AT LOW ROOF PORTION OF THE BUILDING CONSISTS OF CMU WALLS UP TO THE STRUCTURE ABOVE.
8. THE EXISTING MECHANICAL, ELECTRICAL,TECHNOLOGY, AND PLUMBING ITEMS AND/OR SYSTEMS, AND GAS, WATER AND ELECTRICAL METERS ARE GENERALLY INTENDED TO REMAIN. WHERE WORK CONFLICTS WITH NEW WORK, DEMOLITION OR REROUTING OF EXISTING INFRASTRUCTURE SHALL BE REQUIRED. REF: MEP FOR ALL ITEMS TO BE REUSED TYP. ALL ITEMS TO BE DEMOLISHED SHALL BE REMOVED IN THEIR ENTIRETY, BACK TO THE ORIGINAL SOURCE. SURROUNDING MATERIALS WHICH ARE DISTURBED OR DEMOLISHED THAT ARE SCHEDULED TO REMAIN SHALL BE PATCHED WITH LIKE SURROUNDING MATERIALS, TYPICAL.
9. DEMOLISH CONCRETE FLOOR SLABS AS REQUIRED TO INSTALL NEW EQUIPMENT, UNDERGROUND CONDUIT, PLUMBING SYSTEMS, AND FLOOR DRAINS, REF: STRUCTURAL, EQUIPMENT, ELECTRICAL, PLUMBING DEMOLITION, AND PLUMBING DRAWINGS.
10. PROTECT EXISTING SURFACES TO REMAIN DURING DEMOLITION AND CONSTRUCTION.
11. REPAIR OR REPLACE ANY EXISTING CONSTRUCTION (WINDOWS, WALLS, DOORS, CEILINGS, FLOORS, ETC.) TO REMAIN WHICH ARE DAMAGED DURING CONSTRUCTION. REPLACEMENT MATERIAL SHALL MATCH IN KIND.
12. ASBESTOS ABATEMENT LOCATIONS ARE PRESENTED ON AD-101 AS A CONVENIENCE TO CONTRACTOR. CONTRACTOR REMAINS RESPONSIBLE FOR ABATEMENT OF MATERIALS PRESENTED IN THE REPORT. THE REPORT STATES THERE COULD BE OTHER HAZMAT IN AREAS THAT WERE INACCESSIBLE FOR INVESTIGATION. IF OTHER LOCATIONS NOT INCLUDED IN THE REPORT ARE FOUND, REPORT THE FINDINGS TO THE CONTRACTING OFFICER.
13. REFERENCE V-001 FOR ALL CONSTRUCTION HAUL ROUTE AND STAGING REQUIREMENTS.

DEMOLITION LEGEND:

- EXISTING CONSTRUCTION TO REMAIN
- EXISTING CONSTRUCTION TO BE DEMOLISHED, TYP (U.N.O.)
- EXISTING DOOR TO REMAIN
- DOOR, FRAME, AND HARDWARE TO BE DEMOLISHED COMPLETE, TYP (U.N.O.)

KEYED NOTES

4.001 REMOVE WALL IN ITS ENTIRETY. PATCH, REPAIR AND PREP ADJACENT SURFACES TO ACCEPT NEW CONSTRUCTION

4.002 REMOVE EXTERIOR BRICK AND METAL PANEL CLADDING, INSULATION AND SUPPORTING MEMBERS BACK TO PRIMARY STRUCTURAL FRAME, PATCH, REPAIR AND PREP ADJACENT SURFACES TO ACCEPT NEW CONSTRUCTION. REMOVE PARAPET AND STRUCTURAL MEMBERS BACK TO ROOF DECK ELEVATION FOR NEW ROOF INSTALLATION.

4.003 REMOVE PORTION OF WALL FOR NEW OPENING. PATCH, REPAIR AND PREP OPENING TO ACCEPT NEW CONSTRUCTION. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR OPENING LOCATIONS

4.004 REMOVE EXISTING DOOR, FRAME AND ASSOCIATED HARDWARE. PATCH REPAIR AND PREP FOR NEW CONSTRUCTION

4.005 REMOVE EXISTING ALUMINUM WINDOW, FRAME AND ASSOCIATED HARDWARE, PATCH, REPAIR AND PREP FOR NEW CONSTRUCTION

4.006 REMOVE EXISTING BOLLARDS.

4.007 REMOVE LADDER, CAGE AND PLATFORM, COMPLETE

4.008 REMOVE ALL PLUMBING FIXTURES, COUNTERS, CABINETRY, TOILET PARTITIONS, SHOWER BASES, AND ACCESSORIES. PATCH AND REPAIR SURFACES, PREP FOR NEW CONSTRUCTION.

4.009 REMOVE AND SALVAGE LOCKERS AND BENCHES AND OFFER TO GOVERNMENT. PROVIDE A CLEAN AND LEVEL FLOOR TO ACCEPT NEW CONSTRUCTION. TYPICAL

4.010 SAW CUT AND REMOVE EXISTING SLAB ON GRADE, REFERENCE STRUCTURAL DRAWINGS.

4.011 REMOVE VCT FLOORING, RUBBER BASE, AND ACT CEILINGS IN THEIR ENTIRETY, PREP AND PREPARE SPACES FOR NEW CONSTRUCTION.

4.012 REMOVE, STORE AND REINSTALL EXTERNAL SOLVENT TANK TO NEW LOCATION, REFERENCE CIVIL AND PLUMBING PLANS FOR ADDITIONAL REQUIREMENTS.

4.013 REMOVE EXISTING EQUIPMENT, REFERENCE ELECTRICAL, MECHANICAL AND PLUMBING DEMOLITION PLANS FOR DETAILS.

4.014 REMOVE CERAMIC TILE FINISHES: FLOOR, BASE, AND FULL-HEIGHT WAINSCOT AT WET WALLS IN ITS ENTIRETY. REMOVE GYP CEILING, TYP.

4.015 ABATE POSITIVE LEAD BASED PAINT SAMPLES FOUND IN DOOR CASINGS AND BOLLARDS, REFERENCE HAZARDOUS MATERIAL SURVEY

4.016 ABATE ASBESTOS POSITIVE SAMPLES FOUND IN EXTERIOR WINDOW CAULK AND FIRE DOORS AND FRAMES. REFERENCE HAZARDOUS MATERIALS SURVEY

4.017 REMOVE CAGE ELEMENTS AND SUPPORTS. SALVAGE TO GOVERNMENT.

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SHEET CONTENTS
FIRST FLOOR DEMOLITION PLAN

SHEET NO.:
AD101

12/14/2022 9:20:44 AM C:\Revit Local\3141700-181848.01-A-Central-2020_NateDeMaster.rvt

STRUCTURAL DESIGN CRITERIA

1. GOVERNING CODE: UFC 1-200-01 - 8 OCTOBER 2019

2. RISK CATEGORY: III

3. FLOOR LIVE LOAD (1603.1.1)

LIGHT STORAGE:	125 PSF
HANGAR FLOOR:	18k POINT LOAD (A-10 WARTHOG MAIN GEAR)
	250 PSF
OFFICE FLOORS:	50 PSF
CORRIDORS:	100 PSF
SHOPS - ASSEMBLY AND REPAIR:	250 PSF
MEZZANINE:	60 PSF

4. ROOF LIVE LOAD (1603.1.2)

MINIMUM ROOF LIVE LOAD:	20 PSF

5. ROOF SNOW LOAD (1603.1.3)

GROUND SNOW LOAD:	P_g = 25 PSF
FLAT-ROOF SNOW LOAD:	P_f = 20 PSF
SNOW EXPOSURE FACTOR:	C_E = 1.0
SNOW LOAD IMPORTANCE FACTOR:	I_S = 1.1
THERMAL FACTOR:	C_T = 1.0

6. WIND DESIGN DATA (1603.1.4)

ULTIMATE WIND SPEED (3-SECOND GUST):	V_{ULT} = 116 MPH
NOMINAL WIND SPEED (3-SECOND GUST):	V_{ASD} = 90 MPH
WIND EXPOSURE:	CATEGORY C
INTERNAL PRESSURE COEFFICIENT:	GCPI = +/- 0.18 UNO GCPI = +/- 0.55 AT HANGAR

7. EARTHQUAKE DESIGN DATA (1603.1.5)

IMPORTANCE FACTOR:	I_E = 1.25
MAPPED, MCE, 5% DAMPED, SPECTRAL ACCELERATIONS:	
AT SHORT PERIODS:	S_S = 0.092G
AT A PERIOD OF 1 SECOND:	S_1 = 0.043G
SITE CLASS:	E
DESIGN EARTHQUAKE SPECTRAL ACCELERATIONS	
AT SHORT PERIODS:	S_{DS} = 0.147 G
AT A PERIOD OF 1 SECOND:	S_{D1} = 0.120 G
SEISMIC DESIGN CATEGORY:	SDC = B
BASIC SEISMIC-FORCE-RESISTING-SYSTEM:	SFRS = B.18 - ORDINARY REINFORCED SHEAR WALLS H. STEEL SYSTEMS NOT SPECIFICALLY DETAILED FOR SEISMIC
DESIGN BASE SHEAR:	Vs =0.092W KIPS
SEISMIC RESPONSE COEFFICIENTS:	C_S = 0.092
RESPONSE MODIFICATION FACTOR:	R = 2.0
ANALYSIS PROCEDURE:	EQUIVALENT LATERAL FORCE

8. GEOTECHNICAL DESIGN DATA (1603.1.6)

NET ALLOWABLE SOIL BEARING PRESSURE	2000 PSF AT STRIP FOOTINGS 2500 PSF AT ISOLATED FOOTINGS

THE FOUNDATIONS HAVE BEEN DESIGNED TO THE REQUIREMENTS SET FORTH IN THE FOLLOWING DOCUMENT:

REPORT ON GEOTECHNICAL INVESTIGATION: ADAL FUEL CELL AND CORROSION CONTROL BUILDING 154 SELFRIDGE AIR NATIONAL GUARD BASE BY SOMAT ENGINEERING DATED APRIL 27, 2020.

REFERENCE SECTION 003132 - GEOTECHNICAL DATA

FURTHERMORE, IT HAS BEEN PRESUMED THAT THE CONTRACTOR WILL EXECUTE ITS RECOMMENDATIONS TO THE FULLEST EXTENT POSSIBLE.

9. FLOOD DESIGN DATA (1603.1.7)

BUILDING IS NOT LOCATED IN FLOOD HAZARD AREA; THEREFORE FLOOD DESIGN DATA IS NOT REQUIRED

10. SPECIAL LOADS (1603.1.8)

SPECIAL LOADING CONDITIONS ARE NOT APPLICABLE TO THE DESIGN OF THIS BUILDING; THEREFORE SPECIAL LOADS ARE NOT REQUIRED.

11. PHOTOVOLTAIC PANEL SYSTEM LOADS (1603.1.8.1)

PANEL SYSTEM:	NO ALLOWANCE

12. ROOF RAIN LOAD DATA (1603.1.9)

RAIN INTENSITY:	i = 2.80 IN/HR

GENERAL NOTES

G-1. FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO START OF CONSTRUCTION - RESOLVE ANY DISCREPANCY WITH THE CONTRACTING OFFICER.
DO NOT SCALE DRAWINGS!!!!

G-2. FOR CLARITY, ALL EXTERIOR SLABS AND SIDEWALKS MAY NOT BE SHOWN. FOR EXACT DIMENSIONS, LOCATIONS, JOINTS AND SCORE LINES, SEE ARCHITECTURAL AND/OR CIVIL DRAWINGS.

G-3. VERIFY ALL SIZES, WEIGHTS AND LOCATIONS OF MECHANICAL AND ELECTRICAL EQUIPMENT, ROOF PENETRATIONS, DUCTS, ETC. WITH MECHANICAL AND ELECTRICAL CONTRACTORS AND FIELD CONDITIONS.

G-4. DETAILS MARKED "TYPICAL" MAY OR MAY NOT BE CUT ON PLANS, BUT SHALL APPLY UNLESS NOTED OTHERWISE.

G-5. STRUCTURAL SYSTEM IS DESIGNED TO WORK AS A COMPLETED SYSTEM, ANY SHORING OR BRACING NECESSARY DURING CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.

G-6. SEE ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING PLANS FOR SLEEVES, INSERTS, ETC. NOT SHOWN ON STRUCTURAL PLANS.

G-7. NO PIPES OR SLEEVES FOR MECHANICAL TRADES SHALL PASS THROUGH STRUCTURAL MEMBERS WITHOUT APPROVAL OF THE CONTRACTING OFFICER.

G-8. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL SITE SAFETY AND ALL ACCIDENTS WHICH RESULT IN DEATH, PERSONAL INJURY, OR DAMAGE TO PROPERTY ARISING OUT OF OR IN CONNECTION WITH THE PERFORMANCE OF THE WORK.

G-9. CONTRACTOR SHALL POST LIVE LOADS PER SECTION 106.1 OF THE GOVERNING CODE.

G-10. SECTIONS, DETAILS, AND NOTES SHOWN ON THE DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR CONDITIONS ELSEWHERE, UNLESS OTHERWISE SHOWN.

DELEGATED DESIGN SUBMITTALS

DOCUMENTS FOR DELEGATED DESIGN SUBMITTAL ITEMS SHALL BE REVIEWED BY THE CONTRACTING OFFICER WHO SHALL FORWARD THEM TO THE BUILDING OFFICIAL WITH A NOTATION INDICATING THAT THEY HAVE BEEN REVIEWED AND ARE IN GENERAL CONFORMANCE WITH THE DESIGN OF THE BUILDING.

DS-1. ANCHORAGE AND BRACING REQUIREMENTS FOR MECHANICAL, HVAC, PLUMBING AND ELECTRICAL EQUIPMENT INCLUDING FLOOR AND ROOF SUPPORTED EQUIPMENT.

DS-2. FALL PROTECTION SYSTEM: CEILING MOUNTED MONORAIL ANCHOR TRACK TYPE SYSTEM.

DS-3. PIPE AND TUBE RAILINGS.

DS-4. FIRE WATER TANK.

SHOP DRAWINGS

SD-1. SHOP DRAWINGS SHALL BE SUBMITTED FOR STRUCTURAL ITEMS AS REQUIRED BY THE SPECIFICATIONS. CONSTRUCTION DOCUMENTS SHALL NOT BE REPRODUCED FOR USE AS SHOP DRAWINGS.

SD-2. THE GENERAL CONTRACTOR SHALL REVIEW ALL SHOP DRAWINGS AND PRODUCT DATA FOR CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS PRIOR TO SUBMITTAL. REVIEWED SUBMITTALS SHALL BE STAMPED BY THE CONTRACTOR. ANY SHOP DRAWING OR PRODUCT DATA NOT REVIEWED AND STAMPED BY THE GENERAL CONTRACTOR WILL BE REJECTED. GENERAL CONTRACTOR SHALL CLOUD OR FLAG ALL ITEMS NOT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND SHALL VERIFY ALL DIMENSIONS.

SD-3. ANY CHANGES, SUBSTITUTIONS OR DEVIATIONS FROM THE ORIGINAL CONTRACT DRAWINGS SHALL BE CLOUDED BY THE MANUFACTURER OR FABRICATOR. ANY CHANGES, SUBSTITUTIONS, OR DEVIATIONS WHICH ARE CLOUDED OR FLAGGED BY SUBMITTING PARTIES SHALL NOT BE CONSIDERED APPROVED AFTER THE CONTRACTING OFFICER REVIEW, UNLESS SPECIFICALLY NOTED ACCORDINGLY BY THE CONTRACTING OFFICER.

SD-4. THE APPROVED SHOP DRAWINGS DO NOT REPLACE THE ORIGINAL CONTRACT DRAWINGS. ITEMS OMITTED OR SHOWN INCORRECTLY ARE NOT TO BE CONSIDERED CHANGES TO THE ORIGINAL CONTRACT DRAWINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ITEMS OMITTED OR SHOWN INCORRECTLY ARE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DRAWINGS.

SD-5. SHOP DRAWING REVIEW IS INTENDED ONLY FOR GENERAL CONFORMANCE TO THE DESIGN CONCEPT AND CONSTRUCTION DOCUMENTS.

SD-6. SHOP DRAWINGS WILL BE RETURNED FOR RESUBMITTAL IF MAJOR ERRORS ARE FOUND DURING REVIEW.

SD-7. ALLOW A MINIMUM OF (10) WORKING DAYS FOR REVIEW OF SHOP DRAWINGS BY THE CONTRACTING OFFICER.

STEEL BAR JOISTS

MATERIAL PROPERTIES (U.N.O)
COMPLY WITH SJI'S "SPECIFICATIONS" FOR WEB AND STEEL-ANGLE CHORD MEMBERS.

J-1. BAR JOISTS SHALL BE DESIGNED TO RESIST FORCES INDICATED ON DRAWINGS AND SPECIFICATIONS.

J-2. TYPICAL BAR JOISTS ARE NOT DESIGNED FOR CONCENTRATED LOADS. PLACE LOADS AT PANEL POINTS OR WELD ADDITIONAL DOUBLE ANGLE MEMBERS ONE EACH SIDE FROM POINT OF CONCENTRATED LOAD TO THE NEAREST PANEL POINT ON THE OPPOSITE CHORD.

J-3. ALL FIELD MODIFICATIONS OR REPAIRS TO THE JOIST, OR JOIST GIRDERS, SHALL BE APPROVED BY THE JOIST MANUFACTURER IN WRITING. THIS LETTER SHALL BE FORWARDED TO THE CONTRACTING OFFICER.

J-4. CUTTING & DRILLING OF CHORD OR WEB MEMBERS IN BAR JOISTS, OR JOIST GIRDERS, IS NOT PERMITTED.

J-5. ALL BRIDGING SHALL BE EQUALLY SPACED, UNLESS NOTED OTHERWISE, BY JOIST MANUFACTURER.

J-6. CONTRACTOR(S) SHALL PROVIDE MEANS FOR ADEQUATE DISTRIBUTION OF CONSTRUCTION LOADS SO THAT CARRYING CAPACITY OF ANY BAR JOIST, JOIST GIRDER, OR OTHER STRUCTURAL MEMBER IS NOT EXCEEDED.

J-7. JOIST SHALL BE CONSIDERED AS UNSTABLE DURING ERECTION. UNDER NO CIRCUMSTANCES ARE CONSTRUCTION LOADS OF ANY DESCRIPTION TO BE PLACED ON UNBRIDGED JOISTS. THE APPLICATION OF CONSTRUCTION LOADS ON UNBRIDGED JOISTS IS IN DIRECT VIOLATION OF O.S.H.A. REGULATIONS.

J-8. WHERE X-BRIDGING INTERFERES WITH MECHANICAL PIPING OR DUCTWORK, UTILIZE HORIZONTAL BRIDGING AS DIRECTED BY JOIST MANUFACTURER.

J-9. ALL BRIDGING SHALL BE PER SJI AND AS REQUIRED FOR DESIGN LOADS.

J-10. PROVIDE JOIST WITH UPLIFT CAPACITY AS REQUIRED BY THE BUILDING CODE AND THE STRUCTURAL DESIGN CRITERIA.

METAL DECK

MATERIAL PROPERTIES (U.N.O)
ROOF DECK: GALVANIZED, Fy = 50 KSI
COMPOSITE DECK: GALVANIZED, Fy = 50 KSI

MD-1.SEE PLAN FOR DEPTH AND GAUGE.

MD-2.METAL DECKING SHALL BE CONTINUOUS OVER 3 SPANS AND HAVE JOINTS OVER SUPPORTING MEMBERS, UNLESS INDICATED OTHERWISE.

MD-3.BUTTON PUNCHING ROOF DECK IS NOT PERMITTED. REFERENCE DRAWINGS FOR ROOF DECK ATTACHMENT REQUIREMENTS. STRUCTURAL DIAPHRAGM ACTION IS PROVIDED BY THE ROOF DECK AND ITS ATTACHMENT.

MD-4.ALL MISCELLANEOUS OPENINGS IN METAL ROOF DECK ARE TO BE FRAMED BY L5x3x3/8 ANGLES. LONG LEG OF ANGLES SHALL BE VERTICAL. ANGLES SHALL BE WELDED TO THE TOP CHORD/FLANGE OF ROOF FRAMING AND EACH OTHER, UNLESS INDICATED OTHERWISE.

MD-4.CONTRACTOR IS RESPONSIBLE FOR PROVIDING POUR STOPS AT EDGES OF METAL DECK PER SDI POUR STOP SELECTION TABLE/RECOMMENDATIONS OR BENT PLATE POUR STOPS AS REQUIRED TO FORM THE SLAB EDGE.

COLD FORMED STEEL FRAMING NOTES

CF-1. COLD FORMED STEEL WORK SHALL CONFORM TO THE 2016 EDITION (INCLUDING ALL APPLICABLE SUPPLEMENTS AND STANDARDS) OF AISI'S "NORTH AMERICAN SPECIFICATION OF FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS"

CF-2. REFER TO SPECIFICATIONS FOR COLD FORMED METAL FRAMING MATERIAL PROPERTIES AND OTHER GENERAL REQUIREMENTS. COLD FORMED STEEL SHALL BE GALVANIZED G-60 U.N.O.

CF-3. STUD, TRACK, AND OTHER APPLICABLE ROLLED SHAPES SHALL CONFORM TO THE NOMENCLATURE AND DIMENSIONS SET FORTH BY THE STEEL STUD MANUFACTURER'S ASSOCIATION (SSMA). REFER TO SSMA'S "PRODUCT TECHNICAL INFORMATION" CATALOG AND ICC ER 4943P FOR MINIMUM SECTION PROPERTIES AND DIMENSIONS.

CF-4. SCREWS FOR ATTACHING COLD FORMED STEEL TO COLD FORMED STEEL SHALL BE CORROSION RESISTANT, SELF DRILLING, SELF TAPPING, #8 OR #10 AS INDICATED, PAN OR HEX HEAD, WITH LENGTH, POINT STYLE AND INSTALLATION METHOD IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. PROVIDE 3/4" MINIMUM SPACING BETWEEN SCREWS AND 3/4" MINIMUM EDGE DISTANCE U.N.O.

CF-5. ALL CONNECTIONS SHALL HAVE AT LEAST (2) #8 SCREWS U.N.O.

CF-6. FASTENERS FROM COLD FORMED STEEL TO STRUCTURAL STEEL OR CONCRETE SHALL BE 0.157" DIAMETER POWDER DRIVEN FASTENERS "SHOT PINS" UNLESS OTHERWISE NOTED. USE HILTI "X-U" FASTENERS WITH 1" EMBEDMENT INTO CONCRETE WITH WASHERS PER MANUFACTURER, U.N.O. SIZE LENGTH OF SHOT PINS AS REQUIRED BY MANUFACTURER'S ICC ES REPORT FOR ATTACHMENT TO STRUCTURAL STEEL. MANUFACTURER'S EDGE DISTANCE AND SPACING REQUIREMENTS SHALL BE MET AND VERIFIED BY THE CONTRACTOR IN THE FIELD.

CF-7. WALL TRACKS AND ACCESSORIES SHALL BE THE SAME GAUGE AND WIDTH AS THE STUDS, U.N.O.

CF-8. PROVIDE SUFFICIENT STUDS AND BLOCKING/BACKING AT ALL GRAB BARS AND WALL HUNG EQUIPMENT, MONITORS, CABINETS, TOILET ACCESSORIES, ETC.

POST-INSTALLED ANCHORS

PA-1. POST-INSTALLED ANCHORS BASIS OF DESIGNS UNLESS INDICATED OTHERWISE;

A. EXPANSION ANCHORS		
	CONCRETE BASE MATERIAL	- HILTI KWIK BOLT-TZ OR APPROVED EQUAL
	MASONRY BASE MATERIAL	- HILTI KWIK BOLT-3 OR APPROVED EQUAL
B. CONCRETE SCREW ANCHORS		
	CONCRETE BASE MATERIAL	- SIMPSON TITEN-HD OR APPROVED EQUAL
	MASONRY BASE MATERIAL	- SIMPSON TITEN-HD OR APPROVED EQUAL
C. EPOXY ANCHORS		
	CONCRETE BASE MATERIAL	- HILTI HIT-HY 200-R OR APPROVED EQUAL
	MASONRY BASE MATERIAL	- HILTI HIT-HY 270 OR APPROVED EQUAL
	REBAR	- HILTI HIT-RE 500 V3 OR APPROVED EQUAL
D. SLEEVE ANCHORS		
	MASONRY BASE MATERIAL	- HILTI HLC-HX OR APPROVED EQUAL
E. FLUSH ANCHOR (DROP-IN)		
	TYPICAL	- HILTI HDI OR APPROVED EQUAL
	PRECAST	- HILTI HDI-P OR APPROVED EQUAL

MASONRY NOTES

MATERIAL PROPERTIES (U.N.O.)

COMPRESSIVE STRENGTH	- Fm = 2000 PSI
	- Fcu = 2000 PSI
MASONRY REINFORCEMENT	- Fy = 60 KSI (A615 GR 60)
MORTAR	- TYPE S (ASTM C270)
GROUT AT 28-DAYS	- 2500 PSI (ASTM C476)

M-1. PROVIDE HOT AND COLD WEATHER PROCEDURES AND TEMPORARY MOISTURE PROTECTION IN ACCORDANCE WITH ACI RECOMMENDATIONS AND PROJECT SPECIFICATIONS.

M-2. MASONRY SHALL BE PLACED IN ONE-HALF RUNNING BOND U.N.O.

M-3. HOLLOW MASONRY UNITS SHALL BE LAID WITH FULL HEAD JOINTS AND FULL BED JOINTS OF THE FACE SHELLS AND UNDER WEBS WHERE THE ADJACENT CELLS ARE TO BE FILLED WITH GROUT AND AT THE BOTTOM COURSE.

M-4. WHERE MASONRY IS APPLIED ADJACENT TO STEEL MEMBERS (BEAMS AND COLUMNS) PROVIDE ANCHORING DEVICES PER SPECIFICATIONS.

M-5. REFER TO ARCHITECTURAL PLANS AND DOOR/FRAME SCHEDULES FOR LINTEL ROUGH OPENING LOCATIONS, SIZES, AND ELEVATIONS.

M-6. ALL MASONRY WALLS ARE TO HAVE 9 GAUGE HORIZONTAL JOINT REINFORCEMENT WHICH DOES NOT EXCEED 16 INCHES ON CENTER VERTICALLY.

M-7. ALL LAPS SHALL BE 48 BAR DIAMETERS UNLESS INDICATED OTHERWISE.

M-8. GROUT SOLID ALL JAMBS IN ALL MASONRY WALLS FULL HEIGHT TO UNDERSIDE OF LINTEL. EXTEND GROUTED JAMB FROM FACE OF MASONRY OPENING AT LEAST 24" (A MINIMUM OF 3 CELLS). AT OTHER BEAM BEARING LOCATIONS, GROUT SOLID A MINIMUM 24"x24" AREA BENEATH THE BEARING PLATE, UNLESS INDICATED OTHERWISE.

M-9. PROVIDE CORNER SPLICE BARS FOR ALL BOND BEAMS OCCURRING AT CORNERS OR WALL INTERSECTIONS. SPLICE BAR TO BE THE SAME SIZE AS BARS IN THE BOND BEAM.

M-10. ALL NON-STRUCTURAL MASONRY WALLS SHALL BE REINFORCED WITH A MINIMUM #5 VERTICAL BARS AT 48" O.C. WITH THAT CORE GROUTED AND HORIZONTAL JOINT REINFORCEMENT AT 16" O.C. THE BOTTOM TWO COURSES SHALL BE GROUTED SOLID. PROVIDE A CONTINUOUS BOND BEAM AT TOP OF WALL WITH (2) #5 BARS CONTINUOUS, GROUT BOND BEAM SOLID. PROVIDE #5 DOWEL AT 48" O.C., INTO FOOTINGS.

M-11. USE SLEEVE ANCHORS IN NON-STRUCTURAL MASONRY WALL PARTITIONS, UNLESS INDICATED OTHERWISE.

M-12. REFER TO STRUCTURAL AND/OR ARCHITECTURAL DRAWINGS FOR CONTROL JOINT LOCATIONS. WHERE MASONRY CONTROL JOINT LOCATIONS ARE NOT INDICATED, PROVIDE THEM AT 25' MAXIMUM CENTERS; SUBMIT MASONRY CONTROL JOINT LAYOUT TO THE CONTRACTING OFFICER FOR APPROVAL.

M-13. PROVIDE HORIZONTAL BOND BEAMS (DIAPHRAGM CHORDS) WITH (2) #5 BARS CONTINUOUS, BENEATH FLOOR/ROOF MEMBER BEARING ELEVATIONS AND AT DECK EDGE.

M-14. PROVIDE 10 GAGE BENT SLIP JOINT PLATES EACH SIDE OF THE TOP OF ALL NON- STRUCTURAL MASONRY WALLS. ATTACH TO UNDERSIDE OF METAL ROOF DECK OR STRUCTURAL STEEL. SEE ARCHITECTURAL DRAWINGS FOR NON-STRUCTURAL MASONRY WALL LOCATIONS, MAINTAIN 1" (MINIMUM) GAP BETWEEN TOP OF MASONRY WALL AND BOTTOM OF STRUCTURE. DO NOT ATTACH PLATES TO MASONRY WALL, UNLESS INDICATED OTHERWISE.

M-15. LINTELS ARE REQUIRED IN NON-BEARING MASONRY WALLS WITH OPENINGS GREATER THAN 12". PROVIDE SINGLE COURSE BOND BEAM, LINTEL MARK L19 PER DRAWINGS AT LOCATIONS REQUIRED. COORDINATE LOCATIONS WITH ARCHITECTURAL AND MECHANICAL DESIGN AND SHOP DRAWINGS. NOT ALL NON-BEARING LINTELS ARE SHOWN ON STRUCTURAL DRAWINGS.

STRUCTURAL STEEL NOTES

MATERIAL PROPERTIES (U.N.O.)

W-SHAPES	- Fy = 50 KSI (A992 OR A572 Gr 50)
C-SHAPES & ANGLES	- Fy = 36 KSI (A36)
PLATES & BARS	- Fy = 36 KSI (A36)
RECTANGULAR HSS	- Fy = 46 KSI (A500 Gr B)
ROUND HSS	- Fy = 42 KSI (A500 Gr B)
PIPE	- Fy = 35 KSI (A53 Gr B)
RODS	- Fy = 36 KSI (A36)

S-1. STEEL BEAMS WITH RESIDUAL CAMBER RESULTING FROM MILL FABRICATION OR ROLLING SHALL BE SHOP FABRICATED AND ERECTED SUCH THAT THIS RESIDUAL CAMBER COUNTERACTS GRAVITY LOAD DEFLECTION.

S-2. ALL BOLTED CONNECTIONS SHALL UTILIZE 3/4 INCH DIAMETER A325 BOLTS TIGHTENED TO THE SNUG-TIGHT CONDITION. THE SNUG-TIGHT CONDITION IS DEFINED BY THE RCSC'S "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", UNLESS INDICATED OTHERWISE.

S-3. STEEL CONNECTIONS NOT DETAILED ON THE PLANS ARE TO BE THE FABRICATOR'S STANDARD AND ARE TO BE SELECTED AND DESIGNED IN ACCORDANCE WITH AISC ASD SPECIFICATIONS, TYPE 2 FRAMING CONNECTIONS, FOR THE REACTIONS INDICATED.

MINIMUM NO. BOLTS PER CONNECTION
n = 2 FOR MEMBERS 10 INCHES DEEP OR LESS
n = 3 FOR MEMBERS 12 TO 15 INCHES DEEP
n = 4 FOR MEMBERS 16 INCHES DEEP
n = 5 FOR MEMBERS 18 INCHES DEEP
n = 6 FOR MEMBERS 21 INCHES DEEP
n = 7 FOR MEMBERS 24 TO 27 INCHES DEEP
n = 8 FOR MEMBERS 30 INCHES DEEP
n = 9 FOR MEMBERS 33 INCHES DEEP
n = 10 FOR MEMBERS 36 INCHES DEEP

S-4. THE MINIMUM CONNECTION PLATE/ANGLE THICKNESS SHALL BE 5/16", THE MINIMUM WELD 1/4", AND THE MINIMUM DESIGN LOAD ON ANY CONNECTION 10 KIPS, UNLESS INDICATED OTHERWISE.

S-5. ALL CONNECTIONS TO PIPE AND TUBE COLUMNS SHALL BE THROUGH PLATE CONNECTIONS UNLESS OTHERWISE INDICATED.

S-6. ALL ANCHOR BOLTS ARE TO BE 3/4" INCH DIAMETER F1554 Gr. 36 THREADED RODS UNLESS INDICATED OTHERWISE.

S-7. POST INSTALLED ANCHORS ARE TO BE ADHESIVE ANCHORS. INSTALL ANCHORS WITH EMBEDMENT DEPTHS INDICATED, UNLESS INDICATED OTHERWISE.

S-8. STUD ANCHORS ARE TO BE NELSON STUDS OR APPROVED EQUAL (ASTM A108).

S-9. BEAM AND LINTEL PLATES SHALL BE FULLY GROUTED WITH A MINIMUM 1/2" NON-SHRINK GROUT.

S-10. ALL WELDING OF NEW STEEL IS TO BE WITH E70XX ELECTRODES, U.N.O. WELDING SHALL BE IN ACCORDANCE WITH THE LATEST AWS SPECIFICATIONS BY CERTIFIED WELDERS.

S-11. WHEN FIELD WELDING TO EXISTING STEEL, ADJUST WELDING PROCEDURES AS REQUIRED TO BE COMPATIBLE WITH THE NEW AND EXISTING STEEL.

S-12. THE CONTRACTOR SHALL FURNISH AND INSTALL MISCELLANEOUS STEEL (CURBS, HANGERS, BRACING, ETC.) AS INDICATED AND AS NECESSARY PER ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS.

S-13. ALL EXTERIOR MASONRY SHELF ANGLES, LINTEL BEAMS, AND LINTEL PLATES SHALL BE HOT DIPPED GALVANIZED ACCORDING TO ASTM A123.

EARTHWORK NOTES

EW-1. REFERENCE REPORT ON GEOTECHNICAL INVESTIGATION FOR DEFINITION OF MATERIALS AND COMPACTION REQUIREMENTS.

EW-2. REFERENCE REPORT ON GEOTECHNICAL INVESTIGATION FOR EXCAVATION AND CONTROL OF SURFACE WATER AND GROUND WATER..

EW-3. UNLESS NOTED OTHERWISE, THE CONTRACTOR SHALL RETAIN AN INDEPENDENT, QUALIFIED GEOTECHNICAL ENGINEERING FIRM/TESTING AGENCY TO IDENTIFY AREAS OF POOR SOILS, TO MONITOR PROPER SUBGRADE PREPARATIONS AND TO OVERSEE AND TEST THE PLACEMENT OF COMPACTED FILL MATERIAL.

EW-4. ALL SUBTERRANEAN STRUCTURES, UTILITIES, PIPING, ETC. IN THE AREA OF EXCAVATIONS SHALL BE LOCATED AND MARKED BY CONTRACTOR PRIOR TO EARTH REMOVAL WORK. CONTRACTOR SHALL MAINTAIN MARKERS UNTIL EXCAVATION ACTIVITIES HAVE CEASED.
IF UNDERGROUND UTILITY CONFLICTS ARE DISCOVERED BEFORE OR ENCOUNTERED DURING EXCAVATION, NOTIFY THE CONTRACTING OFFICER IMMEDIATELY.

EW-5. BEFORE PLACING FOOTINGS, FOUNDATIONS OR SLAB-ON-GRADE, THE SUB-GRADE SHALL BE PREPARED AND INSPECTED AS REQUIRED BY THE SPECIFICATIONS.

EW-6. DO NOT BACKFILL OR FILL SOIL MATERIAL ON SURFACES THAT ARE MUDDY, FROZEN, OR CONTAIN FROST AND/OR ICE.

EW-7. PLACE BACKFILL AND FILL SOIL MATERIALS EVENLY ON ALL SIDES OF STRUCTURES TO REQUIRED ELEVATIONS AND UNIFORMLY ALONG THE FULL LENGTH OF EACH STRUCTURE.

FOUNDATION NOTES

F-1. FOOTING SUBGRADES SHALL BE CLEAN AND FREE OF DEBRIS, STANDING WATER, AND LOOSE SOIL.

F-2. ALL COLUMN FOOTINGS ARE TO BE CENTERED UNDER COLUMN CENTERLINES, UNLESS INDICATED OTHERWISE.

F-3. THE FOUNDATION CONTRACTOR SHALL FULLY REVIEW UNDER-GROUND PLUMBING DRAWINGS AND SHALL COORDINATE WITH THE UNDER-GROUND PLUMBING CONTRACTOR TO DEPRESS FOOTINGS AND PROVIDE PIPE SLEEVES THROUGH FOUNDATION WALLS AS NECESSARY TO ACCOMMODATE PLUMBING LINES OR TRAPS WHICH PENETRATE CONCRETE FOOTINGS OR FOUNDATIONS.

F-4. PROVIDE PVC SLEEVES THROUGH FOUNDATION WALLS/FOOTINGS FOR PIPE, CONDUIT, AND CABLE PENETRATIONS, INCLUDING ELECTRICAL GROUNDING SYSTEM CABLES. SEE APPROPRIATE DRAWINGS FOR LOCATIONS/SIZES. PLACE SLEEVES IN LOCATIONS TO AVOID DISPLACING REINFORCING STEEL.

F-5. REFER TO ELECTRICAL DRAWING SITE LIGHTING FOR POLE BASES. SUPPLIED AND INSTALLED BY GENERAL CONTRACTOR.

F-6. COORDINATE WITH ARCHITECTURAL AND CIVIL DRAWINGS FOR MISCELLANEOUS FOUNDATIONS NOT SHOWN ON STRUCTURAL DRAWINGS.

F-7. CONTROL JOINTS IN THE CAST-IN-PLACE CONCRETE FOUNDATION WALLS SHALL BE PLACED AT SPACING NOT TO EXCEED 20' O.C. OR AS LOCATED PER DRAWINGS AND SHOULD ALIGN WITH MASONRY CONTROL JOINTS WHERE APPLICABLE. SEE DETAIL SHEETS FOR CONTROL JOINT DETAILS. PROVIDE VERTICAL "V" GROOVE AT ALL CONSTRUCTION AND CONTROL JOINTS. CONTRACTOR SHALL SUBMIT PLANS OF JOINT LOCATIONS FOR APPROVAL.

F-8. A LEAN CONCRETE MUD SLAB 2" TO 3" THICK SHALL BE USED IN THE FOOTING EXCAVATION IF THE BOTTOM OF THE EXCAVATION TENDS TO BECOME MUDDY AND SOFT DUE TO CONSTRUCTION ACTIVITY. LEAN CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2000 PSI.

F-9. COORDINATE GROUNDING REQUIREMENTS FOR FOUNDATION/FOOTING REINFORCING STEEL WITH ELECTRICAL DRAWINGS. COORDINATE INSTALLATION OF GROUNDING WIRES/EQUIPMENT WITH ELECTRICAL CONTRACTOR PRIOR TO CASTING CONCRETE. REFER TO NOTE CR-11 FOR ADDITIONAL INFORMATION.

F-10. SEE TYPICAL SLAB-ON-GRADE DETAILS FOR SLAB AND SUB-BASE REQUIREMENTS. THESE WILL BE TYPICAL THROUGHOUT UNLESS NOTED OTHERWISE.

CONCRETE AND REINFORCING STEEL NOTES

MATERIAL PROPERTIES (U.N.O.)

COMPRESSIVE STRENGTH	- f'c = 4000 PSI UNO
	- f'c = 5000 PSI AT EXTERIOR FLATWORK
CONCRETE REINFORCEMENT	- Fy = 60 KSI (A615 GR 60)

CR-1. PROVIDE HOT/COLD WEATHER PROCEDURES AND PROTECTION IN ACCORDANCE WITH ACI RECOMMENDATIONS AND PROJECT SPECIFICATIONS.

CR-2. ALL CONCRETE DESIGN AND CONSTRUCTION SHALL CONFORM WITH THE LOCAL BUILDING CODE REQUIREMENTS AND THOSE OF THE FOLLOWING STANDARDS (LATEST EDITION):

"ACI 318, BUILDING CODE REQUIREMENTS FOR REINFORCED CONC."
"ACI 315, DETAILS AND DETAILING OF CONCRETE REINFORCEMENT"
"ACI 301, SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BLDGS."
"ACI 307, RECOMMENDED PRACTICE FOR CONCRETE FORM WORK"

CR-3. REINFORCING SHALL BE DETAILED IN ACCORDANCE WITH ACI 315.

CR-4. ALL REINFORCEMENT BARS SHALL BE FABRICATED IN ACCORDANCE WITH THE LATEST CRSI MANUAL OF STANDARD PRACTICE AND SHALL BE CLEAN AND FREE OF GREASE AND SCALING RUST.

CR-5. SEE SECTION 033000 OF SPECIFICATIONS FOR INFORMATION REGARDING CONCRETE MIX DESIGN, TESTING, MATERIALS, AND ADMIXTURES.

CR-6. CONCRETE REINFORCEMENT PROTECTION/CLEAR COVER, U.N.O.:

FOOTINGS:	
BOTTOM & SIDES	3"
TOP	2"
WALLS:	
EXTERIOR EXPOSURE	2"
INTERIOR EXPOSURE	1"
BEAMS/COLUMNS:	
OVER TIES OR STIRRUPS	1 1/2"
ELEVATED SLABS:	1"

CR-7. ALL BAR LAPS SHALL CONFORM TO ACI 318-14, PARAGRAPH 25.5.1, CLASS "B" SPLICE CRITERIA. USE TOP BAR LAP LENGTHS FOR TOP BARS IN SLABS AND BEAMS OVER 12" DEEP.

CR-8. LAP LENGTH SHALL BE SPECIFICALLY NOTED ON SHOP DRAWINGS WHERE MORE THAN ONE BAR MAKES UP A CONTINUOUS STRING.

CR-9. HORIZONTAL BARS SHALL BE DETAILED TO SHOW THE DISTANCE FROM AT LEAST ONE END OF THE BAR TO THE NEAREST BUILDING GRID LINE OR WALL.

CR-10. CONTINUOUS TOP AND BOTTOM BARS, WHEN SHOWN IN TRANSVERSE SECTION ONLY, SHALL BE LAPPED AS FOLLOWS:

TOP BARS NEAR MID-SPANS; BOTTOM BARS DIRECTLY OVER SUPPORTS, U.N.O.

CR-11. PROVIDE ONE (1) HOOKED REINFORCING BAR IN CONCRETE FOOTING TO SERVE AS A "CONCRETE ENCASED ELECTRODE" IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE. COORDINATE WITH ELECTRICAL CONTRACTOR FOR EXACT LOCATION. HOOKED REINFORCING BAR SHALL CONFORM TO THE FOLLOWING:
A. UNCOATED, LOW-ALLOY STEEL, CONFORMING TO ASTM A706.
B. BAR SIZE NUMBER 4 HOOKED AT ONE END

TABLE 4: MASONRY MINIMUM SPECIAL INSPECTION REQUIREMENTS

INSPECTION TASK	FREQUENCY (A) LEVEL 1	LEVEL 2	LEVEL 3	COMMENTS	CODE / STANDARD REF. (TMS 402 / 602 -16 UNO)
AS MASONRY CONSTRUCTION BEGINS, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE:					
PROPORTIONS OF SITE-PREPARED MORTAR	NR	P	P		TMS 602 ART. 2.1, 2.6 A, 2.6 C
GRADE AND SIZE OF PRESTRESSING TENDONS AND ANCHORAGES	NR	P	P		TMS 602 ART. 2.4 B, 2.4 H
GRADE , TYPE AND SIZE OF REINFORCEMENT, CONNECTORS, ANCHOR BOLTS, AND PRESTRESSING TENDONS AND ANCHORAGES.	NR	P	P		TMS 602 ART. 3.4, 3.6 A
PROPERTIES OF THIN-BED MORTAR FOR AAC MASONRY	NR	C(B) /P(C)	C		TMS 602 ART. 2.1 C.1
SAMPLE PANEL CONSTRUCTION	NR	P	C		TMS 602 ART. 1.6 D
PRIOR TO GROUTING, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE:					
GROUT SPACE	NR	P	C		TMS 602 ART. 3.2 D, 3.2 F
PLACEMENT OF REINFORCEMENT, CONNECTORS, AND ANCHOR BOLTS	NR	P	C		TMS 402 SEC. 6.1, 6.3.1, 6.3.6, 6.3.7 / TMS 602 ART. 3.2 E, 3.4
PROPORTIONS OF SITE-PREPARED GROUT	NR	P	P		TMS 602 ART. 2.6 B, 2.4 G.1.b
DURING CONSTRUCTION, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE:					
MATERIALS AND PROCEDURES WITH THE APPROVED SUBMITTALS	NR	P	P		TMS 602 ART. 1.5
PLACEMENT OF MASONRY UNITS AND MORTAR JOINT CONSTRUCTION	NR	P	P		TMS 602 ART. 3.3 B
SIZE AND LOCATION OF STRUCTURAL MEMBERS	NR	P	P		TMS 602 ART. 3.3 F
TYPE, SIZE, AND LOCATION OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES, OR OTHER CONSTRUCTION.	NR	P	C		TMS 402 SEC. 1.1.1 E, 6.2.1, 6.3.1
WELDING OF REINFORCEMENT	NR	C	C		TMS 402 SEC. 6.1.6.1.2
PREPARATION, CONSTRUCTION, AND PROTECTION OF MASONRY DURING COLD WEATHER (TEMPERATURE BELOW 40ûF (4.40C) OR HOT WEATHER (TEMPERATURE ABOVE 900F (32.20C)	NR	P	P		TMS 602 ART. 1.8 C, 1.8 D
PLACEMENT OF GROUT	NR	C	C		TMS 602 ART. 3.5, 3.6 C
PLACEMENT OF AAC MASONRY UNITS AND CONSTRUCTION OF THIN-BED MORTAR JOINTS	NR	C(B) /P(C)	C		TMS 602 ART. 3.3 B.9, 3.3 F.1.b
OBSERVE PREPARTION OF GROUT SPECIMENS, MORTAR SPECIMENS, AND/OR PRISMS.	NR	P	C		TMS 602 ART. 1.4 B.2.a.3, 1.4 B.2.b.3, 1.4 B.2.c.3, 1.4 B.3, 1.4 B.4

TABLE NOTES:

A. FREQUENCY REFERS TO THE FREQUENCY OF INSPECTION, WHICH MAY BE CONTINUOUS DURING THE LISTED TASK OR PERIODICALLY DURING THE LISTED TASK, AS DEFINED IN THE TABLE. NR = NOT REQUIRED, P = PERIODIC, C = CONTINUOUS

B. REFER TO SPECIFICATIONS FOR TESTING REQUIREMENTS AND ADDITIONAL QUALITY ASSURANCE REQUIREMENTS.

TABLE 5: STEEL DECK SPECIAL INSPECTION AND TESTING

STRUCTURAL STEEL / STEEL ELEMENT ITEM	INSPECTION (A) OCI	QAI (SIA)	TESTING	COMMENTS	CODE / STANDARD REF. (2017 ANSI / SDI - QA/QC STANDARD FOR INSTALLATION OF STEEL DECK UNO)
INSPECTION TASKS PRIOR TO DECK PLACEMENT					
VERIFY COMPLIANCE OF MATERIALS (DECK AND ALL DECK ACCESSORIES) WITH CONSTRUCTION DOCUMENTS, INCLUDING PROFILES, MATERIAL PROPERTIES, AND BASE METAL THICKNESS	P	P			
DOCUMENT ACCEPTANCE OR REJECTION OF DECK AND DECK ACCESSORIES	P	P			
INSPECTION TASKS AFTER DECK PLACEMENT					
VERIFY COMPLIANCE OF DECK AND ALL DECK ACCESSORIES INSTALLATION WITH CONSTRUCTION DOCUMENTS	P	P			
VERIFY COMPLIANCE OF DECK MATERIALS ARE REPRESENTED BY THE MILL CERTIFICATIONS THAT COMPLY WITH THE CONSTRUCTION DOCUMENTS.	-	P			
DOCUMENT ACCEPTANCE OR REJECTION OF INSTALLATION OF DECK AND DECK ACCESSORIES	P	P			
INSPECTION TASKS PRIOR TO WELDING					
WELDING PROCEDURE SPECIFICATIONS (WPS) AVAILABLE	O	O			
MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE	O	O			
MATERIAL IDENTIFICATION (TYPE / GRADE)	O	O			
CHECK WELDING EQUIPMENT	O	O			
INSPECTION TASKS DURING WELDING					
USE OF QUALIFIED WELDERS	O	O			
CONTROL AND HANDLING OF WELDING AND CONSUMABLES (PACKAGING, EXPOSURE CONTROL)	O	O			
NO WELDING OVER CRACKED TACK WELDS	O	O			
ENVIRONMENTAL CONDITIONS (WIND SPEED WITHIN LIMITS, MOISTURE AND TEMPERATURE)	O	O			
WPS FOLLOWED: WELDING EQUIPMENT SETTINGS, TRAVEL SPEED, SELECTED WELDING MATERIALS, SHIELDING GAS (TYPE, FLOW RATE), PREHEAT, INTERPASS TEMPERATURE	O	O			
INSPECTION TASKS AFTER WELDING					
VERIFY SIZE AND LOCATION OF WELDS, INCLUDING SUPPORT, SIDELAP, AND PERIMETER WELDS	P	P			
WELDS MEET VISUAL ACCEPTANCE CRITERIA: CRACK PROHIBITION, WELD/BASE METAL FUSION, CRATER CROSS SECTION, WELD PROFILES, WELD SIZE, UNDERCUT, POROSITY	P	P			
VERIFY REPAIR ACTIVITIES	P	P			
DOCUMENT ACCEPTANCE OR REJECTION OF WELDS	P	P			
INSPECTION TASKS PRIOR TO MECHANICAL FASTENING					
MANUFACTURER INSTALLATION INSTRUCTIONS ARE AVAILABLE FOR MECHANICAL FASTENERS	O	O			
PROPER TOOLS ARE AVAILABLE FOR FASTENERS INSTALLATION	O	O			
PROPER STORAGE FOR MECHANICAL FASTENERS	O	O			
INSPECTION TASKS DURING MECHANICAL FASTENING					
FASTENERS ARE POSITIONED AS REQUIRED	O	O			
FASTENERS ARE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS	O	O			
INSPECTION TASKS AFTER MECHANICAL FASTENING					
CHECKING SPACING, TYPE, AND INSTALLATION OF SUPPORT FASTENERS	P	P			
CHECK SPACING, TYPE, AND INSTALLATION OF SIDELAP FASTENERS	P	P			
CHECK SPACING, TYPE, AND INSTALLATION OF PERIMETER FASTENERS	P	P			
VERIFY REPAIR ACTIVITIES	P	P			
DOCUMENTS ACCEPTANCE OR REJECTION OF MECHANICAL FASTENERS	P	P			
INSPECTION TASKS FOR SEISMIC RESISTANCE					
FOR STRUCTURES IN SEISMIC DESIGN CATEGORY C, D, E, OR F, INSPECT DIAPHRAGMS THAT ARE PART OF THE SEISMIC LOAD RESISTING SYSTEM	O	O			1705.11.2, 1705.11.3, 1705.12.3 / AWS D1.3

TABLE NOTES:

A. OBSERVE SHALL MEAN TO INSPECT THESE ITEMS ON AN INTERMITTENT BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS. FREQUENCY OF OBSERVATIONS SHALL BE ADEQUATE TO CONFIRM THE WORK HAS BEEN PERFORMED IN ACCORDANCE WITH THE APPLICABLE DOCUMENTS. IN THE EVENT THAT OBSERVATIONS DETERMINE THAT MATERIALS AND/OR WORKMANSHIP ARE NOT INCONFORMANCE WITH THE APPLICABLE DOCUMENTS, ADDITIONAL INSPECTIONS SHALL BE PERFORMED TO DETERMINE THE EXTENT OF NON-CONFORMANCE. PERFORM SHALL MEAN TO PERFORM THESE TASKS PRIOR TO FINAL ACCEPTANCE FOR EACH ITEM OR ELEMENT. O = OBSERVE, P = PERFORM

B. REFER TO SPECIFICATIONS FOR TESTING REQUIREMENTS AND ADDITIONAL QUALITY ASSURANCE REQUIREMENTS.

TABLE 1: SPECIAL INSPECTION AND TESTING

SOILS	SPECIAL INSPECTION CONTIN-UOUS	PERI-ODIC	TESTING (SEE SPECS)	COMMENTS	CODE / STANDARD REF. (IBC 2018 UNO)
VERIFICATION OF MATERIALS BELOW FOOTINGS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY		X	X	BY PROJECT GEOTECHNICAL ENGINEER	TABLE 1705.6 (1)
VERIFICATION THAT OVER-EXCAVATION EXTENDS TO PROPER DEPTH, HAS REACHED PROPER MATERIAL, AND HAS EXTENDED TO PROPER HORIZONTAL EXTENTS		X	X	BY PROJECT GEOTECHNICAL ENGINEER	TABLE 1705.6 (2)
CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS		X	X	BY PROJECT GEOTECHNICAL ENGINEER	TABLE 1705.6 (3)
VERIFICATION OF USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X		X	BY PROJECT GEOTECHNICAL ENGINEER	TABLE 1705.6 (4)
PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVATION OF SUBGRADE AT BOTTOM OF OVER-EXCAVATION, AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY		X	X	BY PROJECT GEOTECHNICAL ENGINEER	TABLE 1705.6 (5)
VERIFICATION THAT FOOTING EXCAVATION EXTENDS TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL		X	X	BY PROJECT GEOTECHNICAL ENGINEER	TABLE 1705.6 (2)
VERIFICATION THAT UNDERSLAB BASE MATERIALS HAVE BEEN PROPERLY PLACED AND COMPACTED	X		X	BY PROJECT GEOTECHNICAL ENGINEER	TABLE 1705.6 (4)
CONCRETE REINFORCEMENT	**SPECIAL INSPECTION CONTIN-UOUS**	**PERI-ODIC**	**TESTING (SEE SPECS)**	**COMMENTS**	**CODE / STANDARD REF. (IBC 2018 UNO)**
INSPECTION OF REINFORCING STEEL AND PLACEMENT		X			TABLE 1705.3 (1), 1908.4 / ACI 318: CH 20, 25.2-25.3, 26.6.1-26.6.3
VERIFICATION OF A706 STEEL FOR WELDED REINFORCEMENT		X		CONFIRM WITH MILL CERTIFICATE	TABLE 1705.3 (2) / AWS D1.4 / ACI 318 26.6.4
REINFORCING BAR WELDING: A) VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706		X		CONFIRM WITH MILL CERTIFICATE	TABLE 1705.3 (2) / AWS D1.4 / ACI 318 26.6.4
B) INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16 IN.		X			
C) INSPECT ALL OTHER WELDS	X				
SHEAR REINFORCEMENT (STIRRUPS, TIES, SPIRALS)	X				ACI 318: CH20, 25.2, 25.3, 25.7
CONCRETE	**SPECIAL INSPECTION CONTIN-UOUS**	**PERI-ODIC**	**TESTING (SEE SPECS)**	**COMMENTS**	**CODE / STANDARD REF. (IBC 2018 UNO)**
PRE-PLACEMENT INSPECTION OF CAST-IN-PLACE ANCHORS AND EMBEDS		X		COORDINATE WITH STEEL INSPECTION REQUIREMENTS	TABLE 1705.3 (3) / ACI 318: 17.8.2, 20.5, 20.7, 26.7, 26.8
PRE-PLACEMENT INSPECTION OF FORMWORK FOR SHAPE, LOCATION, DIMENSIONS		X			TABLE 1705.3 (12) / ACI 318: 26.11.1.2(b)
PLACEMENT – VERIFICATION OF REQUIRED DESIGN MIX		X		VERIFY PRIOR TO DEPOSITING. NOTE ADDITIVES (ADMIXTURES, WATER, ETC) ADDED PRIOR TO PLACEMENT	TABLE 1705.3 (5), 1904.1, 1904.2, 1908.2, 1908.3 / ACI 318: CH.19, 26.4.3, 26.4.4
PLACEMENT -TESTING FOR SLUMP, AIR CONTENT, TEMPERATURE AT TIME WHEN STRENGTH SAMPLES ARE MADE	X		X		TABLE 1705.3 (6), 1908.10 / ASTM C172, ASTM C31 / ACI 318: 26.4, 26.5, 26.12
INSPECTION OF CONCRETE PLACEMENT FOR PROPER APPLICATION / CONSOLIDATION	X				TABLE 1705.3 (7), 1908.6, 1908.7, 1908.8 / ACI 318: 26.5
COMPRESSIVE STRENGTH TESTING			X		TABLE 1705.3 (6), 1908.10 / ACI 318: 26.12.1.1
INSPECTION OF FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES		X			TABLE 1705.3 (8), 1908.9 / ACI 318: 26.5.3-26.5.5
VERIFICATION OF PROTECTION FROM THE ADVERSE EFFECTS OF WEATHER, HEATING EQUIPMENT, WELDING AND OTHER POTENTIALLY HARMFUL CONDITIONS.		X			ACI 318, ACI 305, ACI 306
VERIFICATION OF IN-SITU CONCRETE STRENGTH PRIOR TO REMOVAL OF SHORES OR FORMS FROM BEAMS AND STRUCTURAL SLABS.		X		NOT REQUIRED AT FOOTINGS, SLABS ON GRADE OR OTHER GROUND SUPPORTED CONCRETE	TABLE 1705.3 (11) / ACI 318 26.11.2
INSPECTION AND TESTING OF CONCRETE ON COMPOSITE METAL DECK OR FORM DECK	FOLLOW ALL REQUIREMENTS LISTED FOR CAST-IN-PLACE CONCRETE. FOR COMPOSITE DECK COORDINATE WITH STEEL SPECIAL INSPECTION AND TESTING REQUIREMENTS				TABLE 1705.3 / AISC 360, AISC 341
CONCRETE POST-INSTALLED ANCHORS	**SPECIAL INSPECTION CONTIN-UOUS**	**PERI-ODIC**	**TESTING (SEE SPECS)**	**COMMENTS**	**CODE / STANDARD REF. (IBC 2018 UNO)**
INSPECTION OF POST-INSTALLED MECHANICAL ANCHORS; VERIFICATION OF APPROVED RESEARCH REPORT ACI 355.2 PREQUALIFIED		X		INSPECT IN ACCORDANCE WITH APPROVED RESEARCH REPORT	TABLE 1705.3 (3) / ACI 318 3.2.2, 17.8, 26.7, 26.13
INSPECTION OF POST-INSTALLED ADHESIVE ANCHORS (INCLUDING ANCHORS W/ SUSTAINED TENSION AND UPWARDLY INCLINED ANCHORS); VERIFICATION OF INSTALLER CERTIFICATION; VERIFICATION OF APPROVED RESEARCH REPORT ACI 355.2 PREQUALIFIED	X			INSPECT IN ACCORDANCE WITH APPROVED RESEARCH REPORT (CONTINUOUS - DO NOT LOWER INSPECTION FREQUENCY)	TABLE 1705.3 (4) / ACI 318 3.2.2, 17.8, 26.7, 26.13
OPEN-WEB JOISTS AND JOIST GIRDERS	**SPECIAL INSPECTION CONTIN-UOUS**	**PERI-ODIC**	**TESTING (SEE SPECS)**	**COMMENTS**	**CODE / STANDARD REF. (IBC 2018 UNO)**
INSTALLATION OF OPEN WEB JOISTS AND JOIST GIRDERS - END CONNECTIONS - WELDING OR BOLTED		X			TABLE 1705.2.3
BRIDGING - HORIZONTAL OR DIAGONAL		X			TABLE 1705.2.3

TABLE NOTES:

A. REFER TO SPECIFICATIONS FOR TESTING REQUIREMENTS AND ADDITIONAL QUALITY ASSURANCE REQUIREMENTS.

B. WORK PERFORMED ON THE PREMISES OF A FABRICATOR APPROVED BY THE BUILDING OFFICIAL PER SECTION 1704.2.5 OF CHAPTER 17 OF THE 2018 INTERNATIONAL BUILDING CODE NEED NOT BE TESTED AND INSPECTED PER THE TABLE ABOVE. THE FABRICATOR SHALL SUBMIT A CERTIFICATE OF COMPLIANCE THAT THE WORK HAS BEEN PERFORMED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS TO THE BUILDING OFFICIAL AND THE ARCHITECT AND ENGINEER OF RECORD.

TABLE 3: MASONRY MINIMUM VERIFICATION REQUIREMENTS

MINIMUM VERIFICATION	REQUIRED FOR QUALITY ASSURANCE (A) LEVEL 1	LEVEL 2	LEVEL 3	COMMENTS	CODE / STANDARD REF. (TMS 402 / 602 -16 UNO)
PRIOR TO CONSTRUCTION, VERIFICATION OF COMPLIANCE OF SUBMITTALS.	R	R	R		TMS 602 ART. 1.5
PRIOR TO CONSTRUCTION, VERIFICATION OF F'M AND F'ACC, EXCEPT WHERE SPECIFICALLY EXEMPTED BY THE CODE.	NR	R	R		TMS 602 ART. 1.4 B
DURING CONSTRUCTION, VERIFICATION OF SLUMP FLOW AND VISUAL STABILITY INDEX (VSI) WHEN SELF-CONSOLIDATING GROUT IS DELIVERED TO THE PROJECT SITE.	NR	R	R		TMS 602 ART. 1.5 & 1.6.3
DURING CONSTRUCTION, VERIFICATION OF F'M AND F'ACC FOR EVERY 5,000 SQ.FT. (465 SQ. M).	NR	NR	R		TMS 602 ART. 1.4 B
DURING CONSTRUCTION, VERIFICATION OF PROPORTIONS OF MATERIALS AS DELIVERED TO THE PROJECT SITE FOR PREMIXED OR PREBLENDED MORTER, PRESTRESSING GROUT AND GROUT OTHER THAN SELF-CONSOLIDATING GROUT.	NR	NR	R		TMS 602 ART. 1.4 B

TABLE NOTES:

A. R = REQUIRED, NR = NOT REQUIRED

STATEMENT OF SPECIAL INSPECTION AND TESTING

TI-1. THE CONTRACTOR SHALL RETAIN THE SERVICES OF ONE OR MORE APPROVED AGENCIES TO PROVIDE SPECIAL INSPECTIONS AND TESTS DURING CONSTRUCTION ON THE TYPES OF WORK SPECIFIED IN SECTION 1705 AND IDENTIFY THE APPROVED AGENCIES TO THE AHJ. THESE SPECIAL INSPECTIONS AND TESTS ARE IN ADDITION TO THE INSPECTIONS BY THE CONTRACTOR THAT ARE IDENTIFIED IN SECTION 110.

TI-2. THE SIA SHALL BE INDEPENDENT FROM THE CONTRACTOR RESPONSIBLE FOR THE WORK BEING INSPECTED. SPECIAL INSPECTION AND TESTING SHALL BE DONE BY APPROVED, QUALIFIED PERSONNEL SATISFACTORY TO THE AUTHORITY HAVING JURISDICTION.

TI-3. REFER TO PROJECT SPECIFICATIONS FOR COST RESPONSIBILITY OF SPECIAL INSPECTION AND TESTING.

TI-4. SPECIAL INSPECTION AND TESTING DOES NOT REPLACE CODE-REQUIRED INSPECTIONS OR STRUCTURAL OBSERVATIONS.

TI-5. CONTRACTOR'S RESPONSIBILITY:

A. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT ALL STRUCTURAL WORK FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY INSPECTION PROVIDED BY OTHERS DOES NOT RELIEVE THE CONTRACTOR OF THIS RESPONSIBILITY. ANY DEVIATIONS FROM THE CONTRACT DOCUMENTS THAT ARE FOUND AT A LATER DATE AND ARE DECLARED TO BE SIGNIFICANT BY THE CONTRACTING OFFICER SHALL BE CORRECTED BY THE CONTRACTOR WITHOUT COST OR ANY DELAY TO THE PROJECT SCHEDULE.

B. THE CONTRACTOR SHALL PROVIDE THE SIA ACCESS TO ALL PLACES WHERE THE WORK IS BEING PERFORMED. A MINIMUM OF 24 HOURS NOTIFICATION SHALL BE GIVEN TO THE SIA AND DESIGN PROFESSIONAL PRIOR TO THE COMMENCEMENT OF WORK REQUIRING TESTING OR INSPECTION. THE WORK FOR WHICH SPECIAL INSPECTION IS REQUIRED SHALL REMAIN ACCESSIBLE AND EXPOSED FOR SPECIAL INSPECTION PURPOSES UNTIL COMPLETION OF THE REQUIRED SPECIAL INSPECTIONS.

C. TEMPORARY CONSTRUCTION AND SITE SAFETY ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE SIA IS NOT INSPECTING FOR O.S.H.A. COMPLIANCE OR REQUIRED TO INSPECT TEMPORARY CONSTRUCTION, SUCH AS TEMPORARY BRACING OR SHORING.

D. EACH CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A MAIN WIND OR SEISMIC FORCE RESISTING SYSTEM OR COMPONENT LISTED IN THE STATEMENT OF SPECIAL INSPECTIONS SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THECONTRACTING OFFICER PRIOR TO THE COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT. THE CONTRACTOR'S STATEMENT OF RESPONSIBILITY SHALL CONTAIN ACKNOWLEDGEMENT OF AWARENESS OF THE SPECIAL REQUIREMENTS CONTAINED IN THE STATEMENT OF SPECIAL INSPECTION.

E. STRUCTURAL STEEL: THE CONTRACTOR AND SUBCONTRACTOR(S) RESPONSIBLE FOR ERECTION AND FABRICATION SHALL BE RESPONSIBLE FOR QUALITY CONTROL INSPECTORS (QCI) IN ACCORDANCE WITH AISC 360 AND AISC 341. REFER TO STRUCTURAL STEEL TESTING AND INSPECTION NOTES.

TI-6. THE SIA IS NOT AUTHORIZED TO DIRECT OR APPROVE ANY CHANGES FROM THE CONTRACT DOCUMENTS. IF THE CONTRACTOR WISHES TO QUESTION THE SIA'S INTERPRETATION OF THE CONTRACT DOCUMENTS, HE MAY DO SO WITH THE CONTRACTING OFFICER ASSISTED BY THE DESIGN PROFESSIONAL.

TI-7. THE SIA IS NOT AUTHORIZED TO STOP OR DELAY THE WORK. IF THE CONTRACTOR ELECTS TO CONTINUE WITH A CERTAIN PORTION OF WORK AFTER BEING NOTIFIED BY THE SIA THAT SUCH WORK IS NOT IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS, THE CONTRACTOR DOES SO AT THEIR OWN RISK AND MAY BE REQUIRED TO CORRECT THE WORK AT A LATER DATE.

TI-8. THESE NOTES AND THE PROJECT SPECIFICATIONS TYPICALLY INDICATE THE FREQUENCY OF TESTING AND SPECIAL INSPECTIONS. WHERE THE FREQUENCY IS NOT INDICATED, THE SIA SHALL SUBMIT A PROPOSAL OF SPECIAL INSPECTION AND TESTING INTERVALS TO THE CONTRACTING OFFICER.

TI-9. THE SIA SHALL ISSUE ONGOING REPORTS OF INSPECTIONS AND TESTS TO THE CONTRACTING OFFICER.

TI-10. THE SIA SHALL KEEP REPORTS OF EACH INSPECTION AND TESTING ACTIVITY. REPORTS SHALL INDICATE WHETHER THE WORK WAS IN COMPLIANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS. DEFICIENCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE AUTHORITY HAVING JURISDICTION (BUILDING OFFICIAL) AND DESIGN PROFESSIONAL PRIOR TO THE COMPLETION OF THAT PHASE OF THE WORK.

TI-11. THE SIA SHALL PREPARE AND SUBMIT A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS AND CORRECTION OF ANY DISCREPANCIES NOTED IN THE INSPECTIONS SHALL BE SUBMITTED AT A POINT IN TIME AGREED UPON PRIOR TO THE START OF WORK BY THE APPLICANT AND THE BUILDING OFFICIAL.

TI-12. FABRICATOR SPECIAL INSPECTIONS: UNLESS OTHERWISE APPROVED, SPECIAL INSPECTIONS SHALL BE PERFORMED FOR WORK AT FABRICATION SHOPS. SPECIAL INSPECTIONS AT THE FABRICATION SHOP BY THE SIA COULD BE WAIVED BY THE CONTRACTING OFFICER IF THE FABRICATION SHOP IS REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION IN ACCORDANCE WITH CODE (1704.2.5.2). APPROVAL SHALL BE EVALUATED BY THE SIA AND ESTABLISHED WITH THE CONTRACTING OFFICER PRIOR TO FABRICATION. THE FABRICATOR SHALL SUBMIT A CERTIFICATE OF COMPLIANCE TO THE CONTRACTING OFFICER IN ACCORDANCE WITH CODE (1704.5.2) STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS. THE CONTRACTING OFFICER AND SIA RESERVE THE RIGHT TO INSPECT THE WORK AT THE FABRICATION SHOP REGARDLESS OF FABRICATOR QUALIFICATIONS / CERTIFICATIONS.

TI-13. STRUCTURAL SPECIAL INSPECTION AND TESTING BY THE SIA SHALL INCLUDE SCOPE LISTED IN TABLE 1. WHERE PROJECT GEOTECHNICAL ENGINEER IS INDICATED, THE ENGINEER RESPONSIBLE FOR THE SOILS REPORT RELIED ON FOR DESIGN, OR HIS DESIGNEE, SHALL PERFORM THE INSPECTIONS AND TESTING.

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ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: JJF
DRAWN BY: ACT
CHECKED BY: WBB
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SHEET CONTENTS
STATEMENT OF SPECIAL INSPECTIONS AND NOTES

SHEET NO.:
S-005

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TABLE 2: STRUCTURAL STEEL SPECIAL INSPECTION AND TESTING

STRUCTURAL STEEL / STEEL ELEMENT ITEM	INSPECTION (A) QCI	INSPECTION (A) QAI (SIA)	TESTING	COMMENTS	CODE / STANDARD REF. (AISC 360-16 UNO)
FABRICATED STEEL TO VERIFY COMPLIANCE WITH SHOP DRAWINGS	P	O			N5.8
ERECTED STEEL FRAME TO VERIFY COMPLIANCE WITH THE DETAILS SHOWN ON ERECTION DRAWINGS INCLUDING BRACES, STIFFENERS, MEMBER LOCATIONS, AND JOINT DETAILS	P	O			N5.8
PLACEMENT OF ANCHOR RODS AND OTHER EMBEDMENTS SUPPORTING STRUCTURAL STEEL, FOR COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS (DIAMETER, GRADE, TYPE, LENGTH, EMBEDMENT DEPTH)	O	P D			N5.8
FABRICATIONS OR ERECTED STEEL FRAME, FOR COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS	O	P D			N5.8
INSPECTION TASKS PRIOR TO WELDING					
WELDER QUALIFICATION RECORDS AND CONTINUITY RECORDS	P	O			TABLE N5.4-1
WELDING PROCEDURE SPECIFICATIONS (WPS) AVAILABLE	P	P			TABLE N5.4-1
MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES	P	P			TABLE N5.4-1
MATERIAL IDENTIFICATION (TYPE/GRADE)	O	O			TABLE N5.4-1 / AISC 341 TABLE J6.1
WELDER IDENTIFICATION SYSTEM	O	O		THE FABRICATOR OR ERECTOR, AS APPLICABLE, SHALL MAINTAIN A SYSTEM BY WHICH A WELDER WHO HAS WELDED A JOINT OR MEMBER CAN BE IDENTIFIED.	TABLE N5.4-1 / AISC 341 TABLE J6.1
GROOVE WELD FIT-UP: JOINT GEOMETRY, JOINT PREPARATIONS, DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL), CLEANLINESS (CONDITION OF STEEL SURFACES), TACKING (TACK WELD QUALITY AND LOCATION), BACKING TYPE AND FIT (IF APPLICABLE)	P	O		**SEE AISC 341 TABLE J6.1 FOR TRANSITIONING FROM PERFORM TO OBSERVE -DAILY - AT SFRS ELEMENTS. (FOR NON-SFRS, ONLY OBSERVE IS REQUIRED FOR QC)	TABLE N5.4-1 / AISC 341 TABLE J6.1
CJP GROOVE WELD FIT-UP OF HSS T-, Y- AND K-JOINTS WITHOUT BACKING: JOINT GEOMETRY, JOINT PREPARATIONS, DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL), CLEANLINESS (CONDITION OF STEEL SURFACES), TACKING (TACK WELD QUALITY AND LOCATION)	P	O		**SEE AISC 341 TABLE J6.1 FOR TRANSITIONING FROM PERFORM TO OBSERVE -DAILY - AT SFRS ELEMENTS. (FOR NON-SFRS, ONLY OBSERVE IS REQUIRED FOR QC)	TABLE N5.4-1
CONFIGURATION AND FINISH OF ACCESS HOLES	O	O			TABLE N5.4-1 / AISC 341 TABLE J6.1
FILLET WELD FIT-UP: DIMENSIONS (ALIGNMENT, GAPS AT ROOT), CLEANLINESS (CONDITION OF STEEL SURFACES), TACKING (TACK WELD QUALITY AND LOCATION)	O	O		**SEE AISC 341 TABLE J6-1 FOR TRANSITIONING FROM PERFORM TO OBSERVE – DAILY - AT SFRS ELEMENTS. (FOR NON-SFRS, ONLY OBSERVE IS REQUIRED FOR QC)	TABLE N5.4-1 / AISC 341 TABLE J6.1
CHECK WELDING EQUIPMENT	O	-			TABLE N5.4-1
INSPECTION TASKS DURING TO WELDING					
USE OF QUALIFIED WELDERS	O	O			AISC 341 TABLE J6.2
CONTROL AND HANDLING OF WELDING AND CONSUMABLES (PACKAGING, EXPOSURE CONTROL)	O	O			TABLE N5.4-2 / AISC 341 TABLE J6.2
NO WELDING OVER CRACKED TACK WELDS	O	O			TABLE N5.4-2 / AISC 341 TABLE J6.2
ENVIRONMENTAL CONDITIONS (WIND SPEED WITHIN LIMITS, PRECIPITATION AND TEMPERATURE)	O	O			TABLE N5.4-2 / AISC 341 TABLE J6.2
WPS FOLLOWED: WELDING EQUIPMENT SETTINGS, TRAVEL SPEED, SELECTED WELDING MATERIALS, SHIELDING GAS TYPE, FLOW RATE, PREHEAT APPLIED, INTERPASS TEMPERATURE MAINTAINED (MIN/MAX), PROPER POSITION (F, V, H, OH)	O	O			TABLE N5.4-2 / AISC 341 TABLE J6.2
WELDING TECHNIQUES: INTERPASS AND FINAL CLEANING, EACH PASS WITHIN PROFILE LIMITATIONS, EACH PASS MEETS QUALITY REQUIREMENTS	O	O			TABLE N5.4-2 / AISC 341 TABLE J6.2
PLACEMENT AND INSTALLATION OF STEEL HEADED STUD ANCHORS, VERIFY CORRECT WELDING PROCEDURES FOR WELDING ON DECK, WHERE APPLICABLE	P	P			TABLE N5.4-2
INSPECTION TASKS AFTER TO WELDING					
WELDS CLEANED	O	O			TABLE N5.4-3 / AISC 341 TABLE J6.3
SIZE, LENGTH AND LOCATION OF WELDS	P	P			TABLE N5.4-3 / AISC 341 TABLE J6.3
WELDS MEET VISUAL ACCEPTANCE CRITERIA: CRACK PROHIBITION, WELD/BASE METAL FUSION, CRATER CROSS SECTION, WELD PROFILES, WELD SIZE, UNDERCUT, POROSITY	P D	P D			TABLE N5.4-3 / AISC 341 TABLE J6.3
ARC STRIKES	P	P			TABLE N5.4-3
K-AREA	P D	P D	MT (SIA)	**MT WHERE WELDING OF DOUBLER PLATES, CONTINUITY PLATES, AND STIFFENER PLATES HAS BEEN PERFORMED IN THE K-AREA, TEST/INSPECT THE WEB K-AREA FOR CRACKS WITHIN 3" OF THE WELD. THE INSPECTION SHALL BE PERFORMED NO SOONER THAN 48 HOURS FOLLOWING THE COMPLETION OF WELDING.	TABLE N5.4-3 / AISC 341 TABLE J6.3
PLACEMENT OF REINFORCING OR CONTOURING FILLET WELDS (IF REQUIRED)	P D	P D		REQUIRED FOR ELEMENTS OF THE SFRS ONLY	AISC 341 TABLE J6.3
WELD ACCESS HOLES IN ROLLED HEAVY SHAPES AND BUILT-UP HEAVY SECTIONS	P	P		AFTER ROLLING HEAVY SHAPES AND BUILT-UP HEAVY SHAPES ARE WELDED, VISUALLY INSPEC THE WELD ACCESS HOLE FOR CRACKS.	TABLE N5.4-3
BACKING REMOVED AND WELD TABS REMOVED AND FINISHED, AND FILLET WELDS ADDED (IF REQUIRED)	P D	P D			TABLE N5.4-3 / AISC 341 TABLE J6.3
REPAIR ACTIVITIES	P	P D			TABLE N5.4-3 / AISC 341 TABLE J6.3
DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	P	P			TABLE N5.4-3
CJP GROOVE WELD NDT: 100% UT ALL CJP GROOVE WELDED JOINTS			P (SIA)	UT NOT REQUIRED FOR MATERIAL 1/4" THICK OR LESS	AISC 360-16 N5.5B
NO PROHIBITED WELDS HAVE BEEN ADDED WITH APPROVAL OF THE EOR	O	O			TABLE N5.4-3
BEAM TO COLUMN CJP GROOVE WELD NDT: 25% MT			P (SIA)	IN ADDITION TO UT, WELD DISCONTINUITIES SHALL BE ACCEPTED OR REJECTED ON THE BASIS OF AWS D1.1/D1.1M TABLE 6.2	AISC 341 J6.2A
COLUMN SPLICE AND COLUMN TO BASE PLATE PJP GROOVE WELD NDT: 100% UT			P (SIA)	IN ADDITION TO UT, WELD DISCONTINUITIES LOCATED WITHIN THE GROOVE WELD THROAT SHALL BE ACCPETED OR REJECTED ON THE BASIS OF CRITERIA OF AWS D1.1/D1.1M Table 6.2. THE RATE OF UT IS PERMITTED TO BE REDUCED IN ACCORDANCE WITH SECTION J6.2G.	AISC 341 J6.2B
BASE METAL NDT FOR LAMELLAR TEARING AN LAMINATIONS: 100% UT TESTED FOR DISCONTINUITIES BEHIND AND ADJACENT TO FUSION LINE			P (SIA)	APPLIES ONLY AT "T" AND CORNER JOINTS WHERE CONNECTED MATERIAL > 3/4" CONNECTED WITH A CJP GROOVE WELD TO BASE METAL > 1 1/2". BASE METAL DISCONTINUITIES SHALL BE ACCEPTED OR REJECTED ON THE BASIS OF AWS D1.1/D1.1M TABLE 6.2.	AISC 341 J6.2C
BEAM COPE AND ACCESS HOLE NDT: 100% MT OR PT			P (SIA)	APPLIES ONLY AT THERMALLY CUT SURFACES AT WELDED CONNECTIONS FOR MEMBERS WITH FLANGES OR WEBS THICKER THAN 1 1/2"	AISC 341 J6.2D

TABLE 2: STRUCTURAL STEEL SPECIAL INSPECTION AND TESTING (CONT.)

STRUCTURAL STEEL / STEEL ELEMENT ITEM	INSPECTION (A) QCI	INSPECTION (A) QAI (SIA)	TESTING	COMMENTS	CODE / STANDARD REF. (AISC 360-16 UNO)
INSPECTION TASKS PRIOR TO BOLTING					
MANUFACTURER'S CERTIFICATIONS FOR FASTENER MATERIALS	O	P			TABLE N5.6-1
FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS	O	O			TABLE N5.6-1
PROPER FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE, BOLT LENGTH IF THREADS ARE TO BE EXCLUDED FROM THE SHEAR PLANE)	O	O			TABLE N5.6-1 / AISC 341 TABLE J7.1
PROPER BOLTING PROCEDURE SELECTED FOR THE JOINT DETAIL	O	O			TABLE N5.6-1 / AISC 341 TABLE J7.1
CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, MEET APPLICABLE REQUIREMENTS.	O	O			TABLE N5.6-1 / AISC 341 TABLE J7.1
PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHODS USED.	P D	O D	BY QCI		TABLE N5.6-1 / AISC 341 TABLE J7.1
PROPER STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS AND OTHER FASTENER COMPONENTS	O	O			TABLE N5.6-1 / AISC 341 TABLE J7.1
INSPECTION TASKS DURING TO BOLTING					
FASTENER ASSEMBLIES, OF SUITABLE CONDITION, PLACED IN ALL HOLES AND WASHERS (IF REQUIRED) ARE POSITIONED AS REQUIRED.	O	O			TABLE N5.6-2 / AISC 341 TABLE J7.2
JOINT BROUGHT TO THE SNUG-TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION	O	O			TABLE N5.6-2 / AISC 341 TABLE J7.2
FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FROM ROTATING	O	O			TABLE N5.6-2 / AISC 341 TABLE J7.2
FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH RCSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES.	O	O			TABLE N5.6-2 / AISC 341 TABLE J7.2
INSPECTION TASKS AFTER TO BOLTING					
DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS	P D	P D			TABLE N5.6-3 / AISC 341 TABLE J7.3
RBS REQUIREMENTS, IF APPLICABLE: CONTOUR AND FINISH, DIMENSIONAL TOLERANCES	P D	P D			AISC 341 TABLE J8.1
PROTECTED ZONE OF SFRS – NO HOLES AND UNAPPROVED ATTACHMENTS MADE BY FABRICATOR OR ERECTOR, AS APPLICABLE	P D	P D			AISC 341 TABLE J8.1

TABLE NOTES:

A. OBSERVE SHALL MEAN TO INSPECT THESE ITEMS ON AN INTERMITTENT BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS. FREQUENCY OF OBSERVATIONS SHALL BE ADEQUATE TO CONFIRM THE WORK HAS BEEN PERFORMED IN ACCORDANCE WITH THE APPLICABLE DOCUMENTS. IN THE EVENT THAT OBSERVATIONS DETERMINE THAT MATERIALS AND/OR WORKMANSHIP ARE NOT INCONFORMANCE WITH THE APPLICABLE DOCUMENTS, ADDITIONAL INSPECTIONS SHALL BE PERFORMED TO DETERMINE THE EXTENT OF NON-CONFORMANCE. PERFORM SHALL MEAN TO PERFORM THESE TASKS PRIOR TO FINAL ACCEPTANCE FOR EACH ITEM OR ELEMENT. DOCUMENT SHALL MEAN TO PREPARE REPORTS INDICATING THAT THE WORK HAS BEEN PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. WORK NOT IN COMPLIANCE WITH THE CONTRACT DOCUMENTS AND WHETHER THE NONCOMPLIANCE HAS BEEN SATISFACTORY REPAIRED SHALL BE NOTED IN THE INSPECTION REPORT. O = OBSERVE, P = PERFORM, D = DOCUMENT

B. REFER TO SPECIFICATIONS FOR TESTING REQUIREMENTS AND ADDITIONAL QUALITY ASSURANCE REQUIREMENTS.

STRUCTURAL STEEL SPECIAL INSPECTION AND TESTING

SSTI-1. REFER TO "STATEMENT OF SPECIAL INSPECTION AND TESTING" FOR GENERAL SPECIAL INSPECTION AND TESTING REQUIREMENTS.

SSTI-2. STEEL ELEMENTS SIMILAR TO STRUCTURAL STEEL SHALL BE TREATED AS STRUCTURAL STEEL FOR PURPOSES OF SPECIAL INSPECTION AND TESTING. SUCH ITEMS INCLUDE BUT ARE NOT LIMITED TO: STAIRS, SHEAR STUDS, BASE PLATES NOT PART OF STRUCTURAL FRAME, EMBEDDED STEEL PARTS, ARCHITECTURAL COMPONENTS, MISCELLANEOUS METAL FABRICATIONS, BEARING PLATES, AND CATWALKS.

CONTRACTOR QCI AND QAI (SIA) SHALL HAVE A CLEAR UNDERSTANDING OF THE SCOPE AND EXTENT OF THE SEISMIC FORCE RESISTING SYSTEM (SFRS) INCLUDING ITEMS SUCH AS BRACED FRAMES, MOMENT FRAMES, DIAPHRAGM CHORDS, COLLECTORS, ASSOCIATED CONNECTIONS, ASSOCIATED FOUNDATIONS AND ANCHORAGE, FOR THE PURPOSE OF APPLYING SFRS-SPECIFIC REQUIREMENTS TO THE PROJECT.

SSTI-3. NON-DESTRUCTIVE TESTING (NDT), INCLUDING ULTRASONIC TESTING (UT), MAGNETIC PARTICLE TESTING (MT), PENETRANT TESTING (PT) AND RADIOGRAPHIC TESTING (RT), WHERE REQUIRED, SHALL BE PERFORMED BY THE CONTRACTING OFFICER SIA IN ACCORDANCE WITH AWS D1.1. DOCUMENT ALL NDT IN ACCORDANCE WITH AISC 360 CHAPTER N AND AISC 341 CHAPTER J.

SSTI-4. FOR STRUCTURAL STEEL, SPECIAL INSPECTION AND TESTING SHALL INCLUDE SCOPE LISTED IN TABLE 2. GENERALLY DOCUMENT SCOPE AND CONCLUSIONS OF INSPECTIONS PERFORMED EVEN IF "D" (DOCUMENT) IS NOT LISTED IN THE TABLE. ABSENCE OF A "D" IN THE TABLE 2 DOES NOT WAIVE GENERAL DOCUMENTATION REQUIREMENTS.

TABLE 2 NOTES:

A. ** INDICATES REQUIREMENTS ARE APPLICABLE FOR ELEMENTS OF THE SFRS ONLY

B. DEFINITIONS FOR USE WITH THIS TABLE:

DOCUMENT (D):
INSPECTOR TO PREPARE REPORTS INDICATING THAT THE WORK HAS BEEN PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. FOR SHOP FABRICATION, THE REPORT SHALL INDICATE THE PIECE MARK OF THE PIECE INSPECTED. FOR FIELD WORK, THE REPORT SHALL INDICATE THE REFERENCE GRID LINES AND FLOOR/ELEVATION INSPECTED. NON-COMPLIANT WORK SHALL BE NOTED IN THE INSPECTION REPORT.

NON-DESTRUCTIVE TESTING (NDT) TERMS:
ULTRASONIC TESTING (UT),
MAGNETIC PARTICLE TESTING (MT),
PENETRANT TESTING (PT),
RADIOGRAPHIC TESTING (RT)

OBSERVE (O):
OBSERVE THESE ITEMS ON A RANDOM BASIS FOR ELEMENTS NOT PART OF THE SFRS. WHERE MARKED WITH AN " O" " THE OBSERVATIONS FOR ELEMENTS OF THE SFRS SHALL BE MADE ON A RANDOM, DAILY BASIS IN ACCORDANCE WITH AISC 341. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS.

PERFORM (P):
PERFORM INSPECTION FOR EACH JOINT OR MEMBER. WHERE MARKED WITH A " P" " THE INSPECTIONS SHALL BE PERFORMED PRIOR TO THE FINAL ACCEPTANCE FOR EACH JOINT OR MEMBER IN ACCORDANCE WITH AISC 341.

QUALITY ASSURANCE INSPECTOR (QAI):
THE CONTRACTING OFFICER's SIA

QUALITY CONTROL INSPECTOR (QCI):
THE FABRICATOR'S QC INSPECTOR FOR SHOP FABRICATION OR ERECTOR'S FIELD QC INSPECTOR FOR FIELD WORK. QCI SHALL BE PROVIDED BY THE CONTRACTOR SHOULD QCI NOT BE PROVIDED BY FABRICATOR AND ERECTOR.

C. REFER TO SPECIFICATIONS FOR TESTING REQUIREMENTS AND ADDITIONAL QUALITY ASSURANCE REQUIREMENTS.

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ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: JJF
DRAWN BY: ACT
CHECKED BY: WBB
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SHEET CONTENTS
STRUCTURAL STEEL SPECIAL INSPECTIONS AND NOTES

SHEET NO.:
S-006

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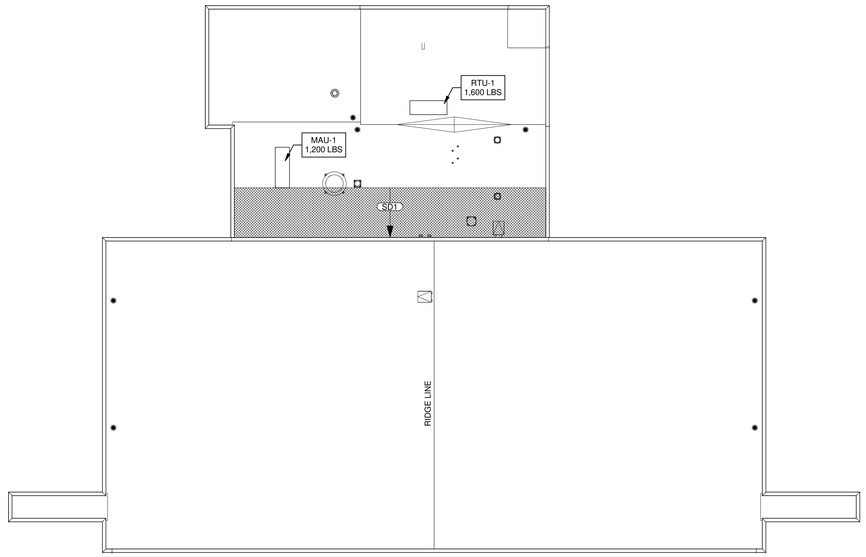
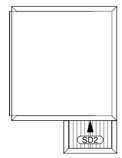


N 1 **B154 STRUCTURAL LOADING PLAN**
1/16" = 1'-0"

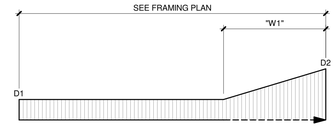


N 2 **B158 STRUCTURAL LOADING PLAN**
1/16" = 1'-0"

STRUCTURAL LOADING PLAN GENERAL NOTES

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS, AND SYMBOLOGY.
4. INDICATED DRIFT LOADS INCLUDE FLAT-ROOF SNOW LOAD. FLAT-ROOF SNOW LOAD, PER SHEET S-001, SHALL BE APPLIED TO ROOF STRUCTURE WHERE DRIFT LOADS ARE NOT INDICATED. A SEPARATE SNOW-LOAD CASE SHALL BE CONSIDERED WHERE THE MINIMUM UNIFORM FLAT-ROOF SNOW LOAD IS APPLIED TO THE ENTIRE ROOF STRUCTURE WITHOUT ANY DRIFT LOADING, SEE S-001.
5. NOT ALL EQUIPMENT LOADS MAY BE CAPTURED ON THIS PLAN, IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE ALL ROOF SUPPORTED EQUIPMENT AND PIPING.
6. INDICATED LOCATIONS OF EQUIPMENT ARE PROVIDED FOR REFERENCE AND TO LOCATE REQUIRED SUPPORT FRAMING. VERIFY EXACT SIZES AND LOCATIONS WITH EQUIPMENT SUPPLIER AND OTHER TRADES PRIOR TO FABRICATION.
7. WEIGHTS OF EQUIPMENT PROVIDED ARE SELF WEIGHT AND DO NOT INCLUDE HANGERS, CURBS, ETC. VERFIY WEIGHTS WITH EQUIPMENT SUPPLIER AND OTHER TRADES PRIOR TO FABRICATION.

SNOW DRIFT LOADING DIAGRAM



SNOW DRIFT LOADING VARIABLES

Mark	D1	D2	W1
SD1	22 PSF	75 PSF	13'-0"
SD2	22 PSF	50 PSF	7'-0"

STRUCTURAL KEYED NOTES LIST

3.011 CUT AND REMOVE EXISTING CONCRETE FOUNDATION WALL AS REQUIRED FOR INSTALLATION OF NEW DOOR. REMOVE FOUNDATION WALL A MINIMUM OF 8" BELOW EXISTING ADJACENT FINISHED FLOOR ELEVATION. REFER TO DETAILS 8/S-511 OR 12/S-511.

3.021 CUT AND REMOVE EXISTING CONCRETE SLAB ON GRADE AS SHOWN. COORDINATE WITH ALL TRADES FOR REQUIRED EXTENTS. THICKNESS AND SQUARE FOOTAGE SHOWN FOR REFERENCE, FIELD VERIFY.

3.022 CUT AND REMOVE EXISTING CONCRETE EQUIPMENT PAD AS SHOWN, LEAVING FLOOR STRUCTURE INTACT. THICKNESS AND SQUARE FOOTAGE SHOWN FOR REFERENCE, FIELD VERIFY.

3.023 AT NEW COLUMNS: DEMOLISH EXISTING MASONRY (PRESUME 24" MINIMUM WIDTH) FROM UNDERSIDE OF STEEL BEAM, TO TOP OF EXISTING CONCRETE FOUNDATION WALL AT +100'-0".

3.031 REMOVE INDICATED PORTION OF EXISTING MASONRY WALL FROM CONCRETE FLOOR SLAB TO BOTTOM SIDE OF STRUCTURE ABOVE. VERIFY REMOVAL EXTENTS AND LOCATION WITH ARCHITECTURAL DRAWINGS PRIOR TO CONSTRUCTION.

3.101 #5 X 2'-0" DOWEL INTO EXISTING CONCRETE FOUNDATION WALL. MATCH SPACING OF HORIZONTAL WALL REINFORCEMENT AND INSTALL MID-THICKNESS OF NEW WALL. DRILL AND EPOXY 6" INTO EXISTING CONCRETE FOUNDATION WALL. REFER TO DETAIL 21/S-501. REFER TO SHEET S-601 FOR FOUNDATION WALL SCHEDULE.

3.102 #5 X 2'-0" DOWEL INTO EXISTING CONCRETE FOOTING. MATCH FOOTING REINFORCEMENT AND INSTALL MID-DEPTH OF EXISTING. DRILL AND EPOXY 6" INTO EXISTING CONCRETE FOOTING. REFER TO SHEET S-601 FOR CONCRETE STRIP FOOTING SCHEDULE. REFER TO DETAIL 21/S-501.

3.103 #5 X 2'-0" DOWEL INTO EXISTING CONCRETE FOUNDATION WALL. MATCH FOOTING REINFORCEMENT AND INSTALL MID-DEPTH OF NEW CONCRETE FOOTING. DRILL AND EPOXY 6" INTO EXISTING CONCRETE FOOTING. REFER TO SHEET S-601 FOR CONCRETE STRIP FOOTING SCHEDULE.

3.104 EXISTING 24" DIAMETER CONCRETE DRILLED PIER, TYPICAL OF 4 LOCATIONS.

3.201 INTERIOR EQUIPMENT PADS, REFER TO DETAIL 3/S-511. REFER TO MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR EQUIPMENT REQUIRING PADS. PAD SHALL EXTEND 4" MINIMUM PAST LIMIT OF EQUIPMENT FOOTPRINT. COORDINATE WITH EQUIPMENT SUPPLIER AND IN-FIELD CONDITIONS FOR FINAL SIZE AND LOCATION OF PADS.

3.203 PATCH EXISTING SLAB REMOVAL AREA. MATCH EXISTING SLAB THICKNESS AND SLOPE. REINFORCE PER SLAB ASSEMBLY. DOWEL TO EXISTING SLAB PER DETAIL 2/S-511.

3.204 EXISTING 6" CONCRETE SLAB ON GRADE WITH 6X6 - W6.5XW6.5 WWF REINFORCEMENT.

STRUCTURAL KEYED NOTES LIST

3.205 EXTERIOR CONCRETE STOOP SLAB AT EXISTING CONCRETE FOUNDATION, REFER TO DETAIL 6/S-501. UNLESS INDICATED ON ARCHITECTURAL AND/OR CIVIL DRAWINGS, SLAB TO RECEIVE BROOM FINISH. ALIGN CONTROL JOINTS IN SLAB WITH CIVIL JOINTING.

3.206 6" DIAMETER EXTERIOR BOLLARD WITH 1'-6" DIAMETER FOUNDATION TYPICAL, REFER TO DETAILS 15/S-511 AND 16/S-511.

3.207 THICKEN SLAB ADJACENT TO EXISTING FOUNDATION AND PROVIDE REINFORCEMENT, SIMILAR TO DETAIL 10/S-511.

3.301 PROVIDE SW08H MASONRY WALL OVER AND ABOVE EXISTING MASONRY WALL UP TO METAL ROOF DECK.

3.302 REMOVE EVERY OTHER BLOCK WITHIN THICKNESS OF EXISTING MASONRY WALL TO TOOTH-IN NEW WALL INTO EXISTING AT INTERSECTION. MASONRY LINTEL TO EXTEND INTO THICKNESS OF EXISTING.

3.303 MASONRY INFILL WITHIN EXISTING OPENING, MATCH EXISTING MASONRY WALL WIDTH. REFER TO DETAIL 9/S-521.

3.304 ROOF ACCESS LADDER, RAILING AND CAGE, REFER TO ARCHITECTURAL DRAWINGS. ATTACHMENT TO STRUCTURE BY MANUFACTURER.

3.305 PROVIDE 12" X 20 GAUGE X CONTINUOUS GALVANIZED FLAT PLATE. ATTACH NEW DECK TO EXISTING WITH #10 SCREWS AT 6" OC END SIDE.

3.501 CEILING CONSTRUCTION SHALL BE 3-1/2" LIGHTWEIGHT CONCRETE TOPPING ON 1-1/2"X20 GA COMPOSITE DECK (5" TOTAL). INSTALL OVER A MINIMUM OF THREE SPANS. REINFORCE SLAB WITH FLAT SHEETS OF WWF 6X6-W2.1XW2.1 LOCATED AND CHAIR 1" FROM TOP OF SLAB. REFER TO DETAIL 1/S-541.

3.502 NEW STEEL BAR GRATING SHALL CONFORM TO THE FOLLOWING;
- 1" DEEP X 3/16" BEARING BARS
- 19-W-4 PROFILE

3.601 ROOF DIAPHRAGM SHALL CONFORM TO THE FOLLOWING:
- METAL DECK - 1 1/2" TYPE B 20 GAUGE ROOF DECK
- SUPPORT FASTENING - #10 SCREWS AT 36/4
- PERIMETER FASTENING - #10 SCREWS AT 6" OC
- SIDELAP FASTENING - #10 SCREWS AT 24" OC MAXIMUM PER SPAN

3.602 1200S200-97 MEZZANINE JOISTS, PROVIDE TOP AND BOTTOM FLANGE BRACING AT 48"OC MAXIMUM.

3.604 ADDITIONAL FRAMING WHERE MECHANICAL EQUIPMENT PENETRATES EXISTING ROOF. REFER TO DETAIL 13/S-541 VERIFY SIZE AND LOCATION WITH EQUIPMENT SUPPLIER PRIOR TO FABRICATION.

3.605 EXISTING BUILT-UP BRIDGE CRANE RAIL TO REMAIN. SUPPORTED AT COLUMN CANTILEVERS, EACH END.

3.606 EXISTING BRIDGE CRANE TO REMAIN.

3.607 APPROXIMATE LOCATION OF ROOF JOIST BRIDGING. CONTRACTOR TO COORDINATE UTILITIES WITHIN JOIST SPACE TO AVOID CONFLICT.

STRUCTURAL KEYED NOTES LIST

3.609 BEAM TO BEAM CONNECTION PER TYPICAL SINGLE PLATE SHEAR FRAMING CONNECTION, DETAIL 21/S-541. BEAM TO COLUMN CONNECTION PER DETAIL 20. USE WELDED OPTION IF COLUMN LACK CLEARANCES REQUIRED FOR BOLTED.

3.630 DELEGATED DESIGN: DROPPED HANGER FOR FALL PROTECTION SYSTEM BY FALL PROTECTION PE, ATTACHED TO NEW WIDE FLANGE STRUT. EXISTING STRUCTURE REINFORCED FOR LIVE LOAD IN HANGAR PER ANSI/ASSE Z359.6.

3.631 DELEGATED DESIGN: CONNECTION FOR FALL PROTECTION SYSTEM BY FALL PROTECTION PE, ATTACHED TO BOTTOM CHORD OF EXISTING ROOF TRUSS. ALL EXISTING AVAILABLE STRUCTURAL DRAWINGS WILL BE PROVIDED UPON CONTRACTOR REQUEST TO AID IN FABRICATION OF NEW WORK. FALL PROTECTION CONNECTION POINTS SHALL BE COORDINATED WITH EXISTING JOIST GIRDER. MOVE CONNECTIONS POINTS +/- 1'-0" SO AS TO MISS GIRDER WEB MEMBER CONNECTIONS TO GIRDER BOTTOM CHORD.

3.632 DELEGATED DESIGN: FALL PROTECTION CEILING MOUNTED MONORAIL ANCHOR TRACK TYPE SYSTEM. PROVIDE PERSONAL ENERGY ABSORBER (PEA) AND/OR SELF-RETRACTING LIFELINE (SRL) WITH A 900 LB MAXIMUM ARRESTING FORCE. PROVIDE SINGLE TRACK FOR THREE WORKERS (3 ATTACHED LIFELINES) TO BE DESIGNED BY FALL PROTECTION PE. REFER TO SPECIFICATION SECTION 10 26 40 FOR ADDITIONAL REQUIREMENTS.

3.633 CONTRACTOR SHALL FIELD LOCATE EXISTING TRUSS VERTICALS. CONTRACTOR SHALL ADJUST BEAM LOCATIONS +/-1'-0" ON SHOP DRAWINGS TO MISS EXISTING TRUSS WEB MEMBERS. TYPICAL ALL FALL PROTECTION SUPPORT BEAMS.

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED:
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: JJF
DRAWN BY: ACT
CHECKED BY: WBB
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SHEET CONTENTS
STRUCTURAL LOADING PLAN

SHEET NO.:
S-010

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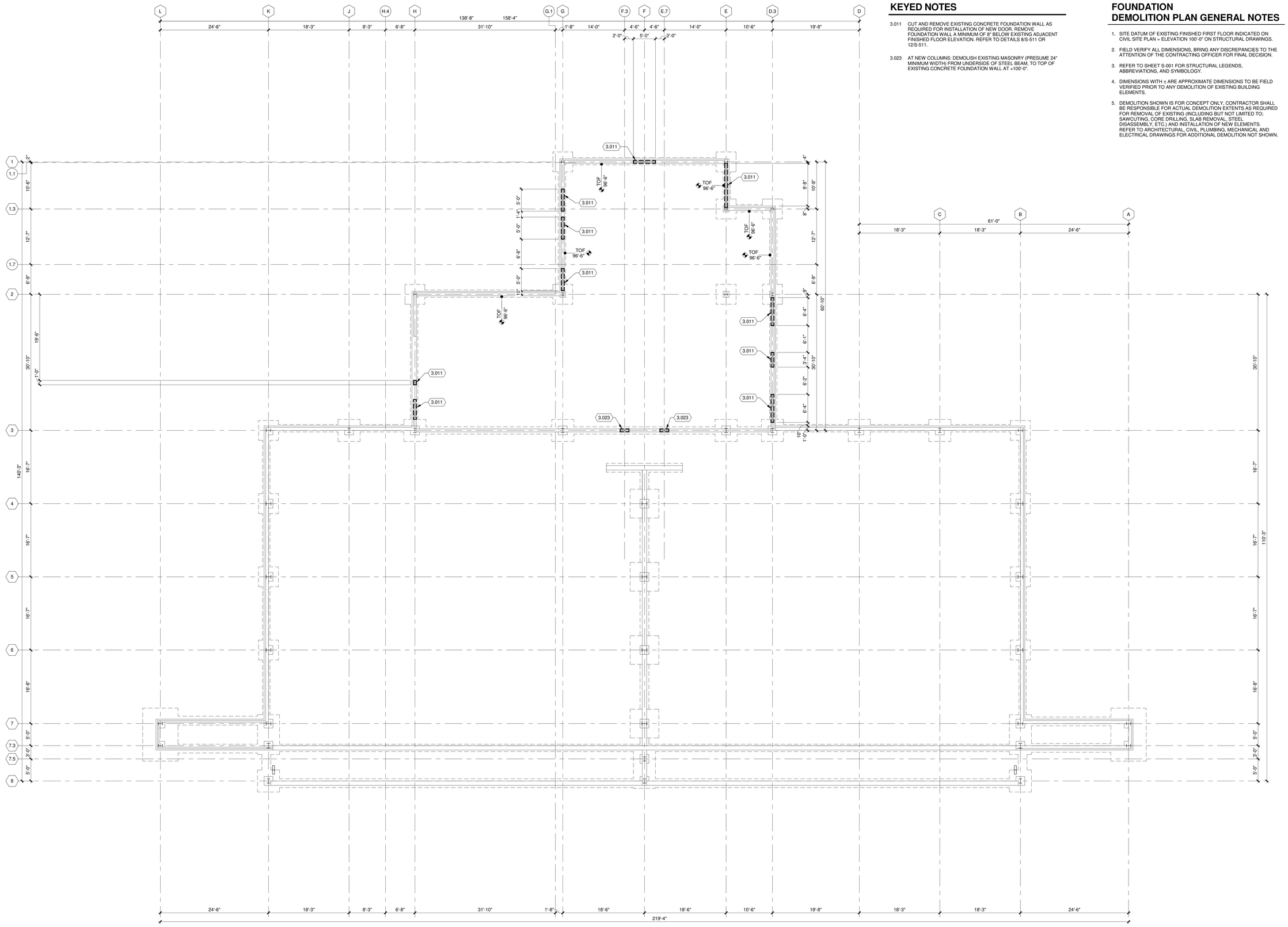

KEYED NOTES

3.011 CUT AND REMOVE EXISTING CONCRETE FOUNDATION WALL AS REQUIRED FOR INSTALLATION OF NEW DOOR. REMOVE FOUNDATION WALL A MINIMUM OF 8" BELOW EXISTING ADJACENT FINISHED FLOOR ELEVATION. REFER TO DETAILS 8/S-511 OR 12/S-511.

3.023 AT NEW COLUMNS: DEMOLISH EXISTING MASONRY (PRESUME 24" MINIMUM WIDTH) FROM UNDERSIDE OF STEEL BEAM, TO TOP OF EXISTING CONCRETE FOUNDATION WALL AT +100'-0".

FOUNDATION DEMOLITION PLAN GENERAL NOTES

1. SITE DATUM OF EXISTING FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS, AND SYMBOLOGY.
4. DIMENSIONS WITH ± ARE APPROXIMATE DIMENSIONS TO BE FIELD VERIFIED PRIOR TO ANY DEMOLITION OF EXISTING BUILDING ELEMENTS.
5. DEMOLITION SHOWN IS FOR CONCEPT ONLY, CONTRACTOR SHALL BE RESPONSIBLE FOR ACTUAL DEMOLITION EXTENTS AS REQUIRED FOR REMOVAL OF EXISTING (INCLUDING BUT NOT LIMITED TO; SAWCUTING, CORE DRILLING, SLAB REMOVAL, STEEL DISASSEMBLY, ETC.) AND INSTALLATION OF NEW ELEMENTS. REFER TO ARCHITECTURAL, CIVIL, PLUMBING, MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION NOT SHOWN.

N 1 **FOUNDATION DEMOLITION PLAN**
1/8" = 1'-0"

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

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12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: JJF
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SHEET CONTENTS
FOUNDATION DEMOLITION PLAN

SHEET NO.:
SD101

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KEYED NOTES

3.021 CUT AND REMOVE EXISTING CONCRETE SLAB ON GRADE AS SHOWN. COORDINATE WITH ALL TRADES FOR REQUIRED EXTENTS, THICKNESS AND SQUARE FOOTAGE SHOWN FOR REFERENCE, FIELD VERIFY.

3.022 CUT AND REMOVE EXISTING CONCRETE EQUIPMENT PAD AS SHOWN, LEAVING FLOOR STRUCTURE INTACT. THICKNESS AND SQUARE FOOTAGE SHOWN FOR REFERENCE, FIELD VERIFY.

FLATWORK DEMOLITION PLAN GENERAL NOTES

1. SITE DATUM OF EXISTING FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS, AND SYMBOLOGY.
4. DIMENSIONS WITH ± ARE APPROXIMATE DIMENSIONS TO BE FIELD VERIFIED PRIOR TO ANY DEMOLITION OF EXISTING BUILDING ELEMENTS.
5. DEMOLITION SHOWN IS FOR CONCEPT ONLY, CONTRACTOR SHALL BE RESPONSIBLE FOR ACTUAL DEMOLITION EXTENTS AS REQUIRED FOR REMOVAL OF EXISTING (INCLUDING BUT NOT LIMITED TO; SAWCUTING, CORE DRILLING, SLAB REMOVAL, STEEL DISASSEMBLY, ETC.) AND INSTALLATION OF NEW ELEMENTS. REFER TO ARCHITECTURAL, CIVIL, PLUMBING, MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION NOT SHOWN.
6. REMOVE ANY EXISTING FALL PROTECTION BEAMS AND HANGARS.

N 1 **FLATWORK DEMOLITION PLAN**
1/8" = 1'-0"

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HARRISON TWP, MICHIGAN

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HEF MOD

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DESIGNED BY: JJF
DRAWN BY: ACT
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SHEET CONTENTS
FLATWORK
DEMOLITION PLAN

SHEET NO.:
SD111

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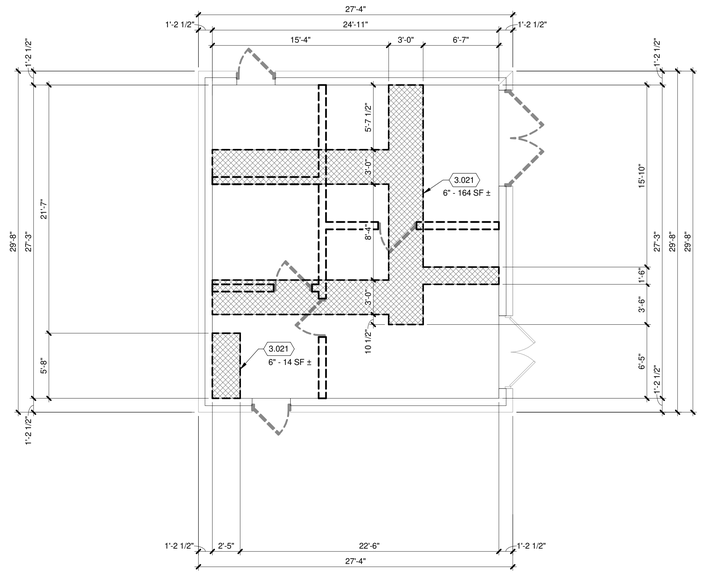
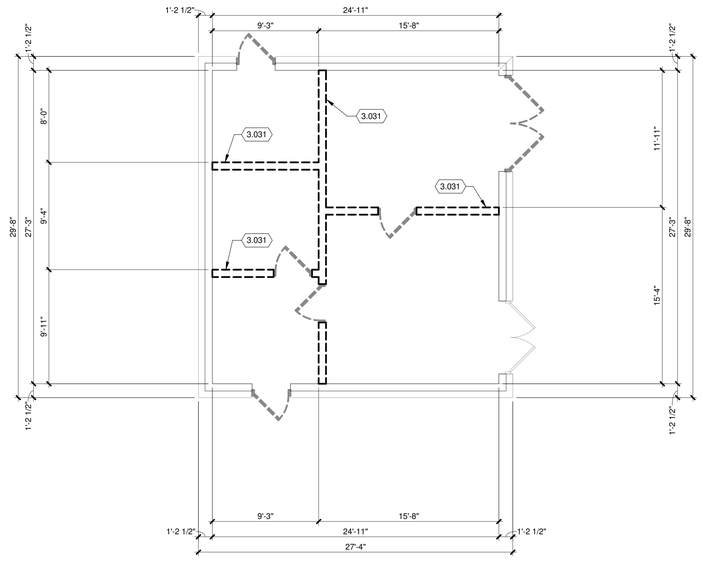


N 1 **B158 FLATWORK DEMOLITION PLAN**
3/16" = 1'-0"

FLATWORK DEMOLITION PLAN GENERAL NOTES

1. SITE DATUM OF EXISTING FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS, AND SYMBOLOGY.
4. DIMENSIONS WITH ± ARE APPROXIMATE DIMENSIONS TO BE FIELD VERIFIED PRIOR TO ANY DEMOLITION OF EXISTING BUILDING ELEMENTS.
5. DEMOLITION SHOWN IS FOR CONCEPT ONLY, CONTRACTOR SHALL BE RESPONSIBLE FOR ACTUAL DEMOLITION EXTENTS AS REQUIRED FOR REMOVAL OF EXISTING (INCLUDING BUT NOT LIMITED TO; SAWCUTING, CORE DRILLING, SLAB REMOVAL, STEEL DISASSEMBLY, ETC.) AND INSTALLATION OF NEW ELEMENTS.



N 2 **B158 STRUCTURAL WALL DEMOLITION PLAN**
3/16" = 1'-0"

STRUCTURAL WALL DEMOLITION PLAN GENERAL NOTES

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS AND SYMBOLOGY.

KEYED NOTES

3.021 CUT AND REMOVE EXISTING CONCRETE SLAB ON GRADE AS SHOWN. COORDINATE WITH ALL TRADES FOR REQUIRED EXTENTS. THICKNESS AND SQUARE FOOTAGE SHOWN FOR REFERENCE, FIELD VERIFY.

3.031 REMOVE INDICATED PORTION OF EXISTING MASONRY WALL FROM CONCRETE FLOOR SLAB TO BOTTOM SIDE OF STRUCTURE ABOVE. VERIFY REMOVAL EXTENTS AND LOCATION WITH ARCHITECTURAL DRAWINGS PRIOR TO CONSTRUCTION.

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SHEET CONTENTS
B158 ENLARGED STRUCTURAL DEMOLITION PLANS

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SD401

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KEYED NOTES

3.101 #5 X 2'-0" DOWEL INTO EXISTING CONCRETE FOUNDATION WALL. MATCH SPACING OF HORIZONTAL WALL REINFORCEMENT AND INSTALL MID-THICKNESS OF NEW WALL. DRILL AND EPOXY 6" INTO EXISTING CONCRETE FOUNDATION WALL. REFER TO DETAIL 21/S-501. REFER TO SHEET S-601 FOR FOUNDATION WALL SCHEDULE.

3.102 #5 X 2'-0" DOWEL INTO EXISTING CONCRETE FOOTING. MATCH FOOTING REINFORCEMENT AND INSTALL MID-DEPTH OF EXISTING. DRILL AND EPOXY 6" INTO EXISTING CONCRETE FOOTING. REFER TO SHEET S-601 FOR CONCRETE STRIP FOOTING SCHEDULE. REFER TO DETAIL 21/S-501.

3.103 #5 X 2'-0" DOWEL INTO EXISTING CONCRETE FOUNDATION WALL. MATCH FOOTING REINFORCEMENT AND INSTALL MID-DEPTH OF NEW CONCRETE FOOTING. DRILL AND EPOXY 6" INTO EXISTING CONCRETE FOOTING. REFER TO SHEET S-601 FOR CONCRETE STRIP FOOTING SCHEDULE.

FOUNDATION PLAN GENERAL NOTES

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2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS, AND SYMBOLOGY.
4. REFER TO SHEET S-501 FOR TYPICAL DETAILS NOT REFERENCED ON THIS SHEET.
5. REFER TO SHEET S-601 FOR STRUCTURAL SCHEDULES.
6. TOP OF FOOTING ELEVATION = 96'-6" UNLESS NOTED OTHERWISE.
7. TOP OF FOUNDATION LEDGE ELEVATION = 99'-10" UNLESS NOTED OTHERWISE.
8. TOP OF PIER ELEVATION = 99'-10" UNLESS NOTED OTHERWISE.
9. TOP OF FOUNDATION WALL ELEVATION = 100'-6" UNLESS NOTED OTHERWISE.
10. STRIP FOOTINGS SHALL BE CENTERED UNDER FOUNDATION AND/OR MASONRY WALLS UNLESS NOTED OTHERWISE.

N 1 **FOUNDATION PLAN**
1/8" = 1'-0"

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ANG NO.: VGLZ162323
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DATE: December 16, 2022
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SHEET CONTENTS
FOUNDATION PLAN

SHEET NO.:
S-101

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KEYED NOTES

3.103 #5 X 2'-0" DOWEL INTO EXISTING CONCRETE FOUNDATION WALL. MATCH FOOTING REINFORCEMENT AND INSTALL MID-DEPTH OF NEW CONCRETE FOOTING. DRILL AND EPOXY 6" INTO EXISTING CONCRETE FOOTING. REFER TO SHEET S-601 FOR CONCRETE STRIP FOOTING SCHEDULE.

3.203 PATCH EXISTING SLAB REMOVAL AREA. MATCH EXISTING SLAB THICKNESS AND SLOPE. REINFORCE PER SLAB ASSEMBLY. DOWEL TO EXISTING SLAB PER DETAIL 2/S-511.

3.205 EXTERIOR CONCRETE STOOP SLAB AT EXISTING CONCRETE FOUNDATION, REFER TO DETAIL 6/S-501, UNLESS INDICATED ON ARCHITECTURAL AND/OR CIVIL DRAWINGS, SLAB TO RECEIVE BROOM FINISH. ALIGN CONTROL JOINTS IN SLAB WITH CIVIL JOINTING.

3.206 6" DIAMETER EXTERIOR BOLLARD WITH 1'-6" DIAMETER FOUNDATION TYPICAL, REFER TO DETAILS 15/S-511 AND 16/S-511.

3.207 THICKEN SLAB ADJACENT TO EXISTING FOUNDATION AND PROVIDE REINFORCEMENT, SIMILAR TO DETAIL 10/S-511.

FLATWORK PLAN GENERAL NOTES

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS, AND SYMBOLOGY.
4. REFER TO SHEET S-511 FOR TYPICAL DETAILS NOT REFERENCED ON THIS SHEET.
5. REFER TO DETAIL 1/S-511 FOR STRUCTURAL SLAB TYPES.
6. REFER TO SHEET S-601 FOR STRUCTURAL SCHEDULES.
7. FLOAT AND TROWEL FLOOR SLABS PER REQUIREMENTS OF ARCH. FLOOR FINISH SYSTEM.
8. (2) DASHED LINES = = = INDICATE (2) ADDITIONAL #4 BARS (5'-0" LONG) DIAGONAL 6" FROM CORNER IN SLAB, 2" CLEAR FROM TOP OF SLAB.
9. REFER TO DETAILS 12/S-521 AND 13/S-521 FOR NEW MASONRY AT EXISTING INTERSECTIONS. TYPICALLY PROVIDE STEEL ANGLE CONNECTIONS TO EXISTING INTERSECTIONS THROUGHOUT.
10. CJ = CONCRETE SLAB CONTROL JOINT (ALSO KNOWN AS SAWCUT JOINT).
    TJ = CONCRETE SLAB TOOLED JOINT

    AT ALL CJ LOCATIONS, DETAIL 5/S-511 CONCRETE SLAB CONSTRUCTION, JOINT MAY BE SUBSTITUTED BASED ON CONTRACTOR SEQUENCING. REFER TO SHEET S-511 FOR DETAILS.

N 1 FIRST FLOOR FLATWORK PLAN
1/8" = 1'-0"

TETRA TECH Mead & Hunt
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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
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SHEET CONTENTS
FIRST FLOOR
FLATWORK PLAN

SHEET NO.:
S-111

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KEYED NOTES

3.301 PROVIDE SW08H MASONRY WALL OVER AND ABOVE EXISTING MASONRY WALL UP TO METAL ROOF DECK.

3.302 REMOVE EVERY OTHER BLOCK WITHIN THICKNESS OF EXISTING MASONRY WALL TO TOOTH-IN NEW WALL INTO EXISTING AT INTERSECTION. MASONRY LINTEL TO EXTEND INTO THICKNESS OF EXISTING.

STRUCTURAL WALL PLAN GENERAL NOTES

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS AND SYMBOLOGY.
4. REFER TO SHEET S-521 FOR TYPICAL DETAILS NOT REFERENCED ON THIS SHEET.
5. REFER TO SHEET S-601 FOR STRUCTURAL SCHEDULES.
6. ALL 8" (NOMINAL) MASONRY WALLS SHALL BE SW08 UNLESS NOTED OR DETAILED OTHERWISE.
7. GROUT ALL MASONRY SOLID BELOW ELEVATION 100'-6".
8. ALL MASONRY WALL REINFORCEMENT SHALL BE FULL HEIGHT UNLESS NOTED OR DETAILED OTHERWISE.
9. STRUCTURAL WALL TYPES SHALL REMAIN CONTINUOUS ACROSS LINTELS AND MASONRY CONTROL JOINTS (MCJ), UNLESS NOTED OR DETAILED OTHERWISE.
10. PROVIDE L19 LINTEL AT ALL MASONRY OPENINGS (NOT INDICATED EXCEEDING 1'-0" (4'-0" MAX) IN WIDTH. COORDINATE WITH ALL OTHER DISCIPLINES FOR LOCATION AND SIZE OF SUCH PENETRATIONS.
11. COORDINATE REQUIRED WALL PENETRATIONS WITH ALL OTHER DISCIPLINES TO AVOID PENETRATION OF STRUCTURAL MEMBERS AT LINTELS, TOP OF WALL, AND ANY OTHER STRUCTURAL ELEMENTS IN THE FIELD OF THE MASONRY WALL. NOTIFY CONTRACTING OFFICER PRIOR TO PENETRATION OF ANY STRUCTURAL MEMBERS INCLUDING, BUT NOT LIMITED TO, BOND BEAMS AND PORTIONS OF FULLY GROUTED MASONRY WALLS.
12. CONTROL JOINTS IN MASONRY SHALL NOT BE LOCATED CLOSER THAN 2'-0" TO THE EDGE OF MASONRY OPENINGS, UNLESS NOTED OTHERWISE.
13. CONTROL JOINTS IN CONCRETE MASONRY WALL MAY OR MAY NOT ALIGN WITH CONTROL JOINTS IN VENEER. REFER TO ARCHITECTURAL PLANS AND ELEVATIONS FOR CONTROL JOINTS IN VENEER.
14. REFER TO DETAILS 7/S-521 AND 9/S-521 FOR NEW MASONRY AT EXISTING, TYPICALLY TOOTH INTO EXISTING AND PROVIDE JAMB REINFORCEMENT AT OPENINGS.
15. REFER TO DETAIL 10/S-521 FOR MASONRY PARTITION TOP OF WALL CONNECTION. ALL PARTITIONS TO BE FULL HEIGHT UNLESS SPECIFICALLY NOTED OTHERWISE. REFER TO DETAIL 21/S-521 FOR CLOSURE PLATES REQUIRED AT CONFLICTS WITH STRUCTURE ABOVE.

N 1 FIRST FLOOR STRUCTURAL WALL PLAN
1/8" = 1'-0"

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SHEET CONTENTS
FIRST FLOOR WALL PLAN

SHEET NO.:
S-121

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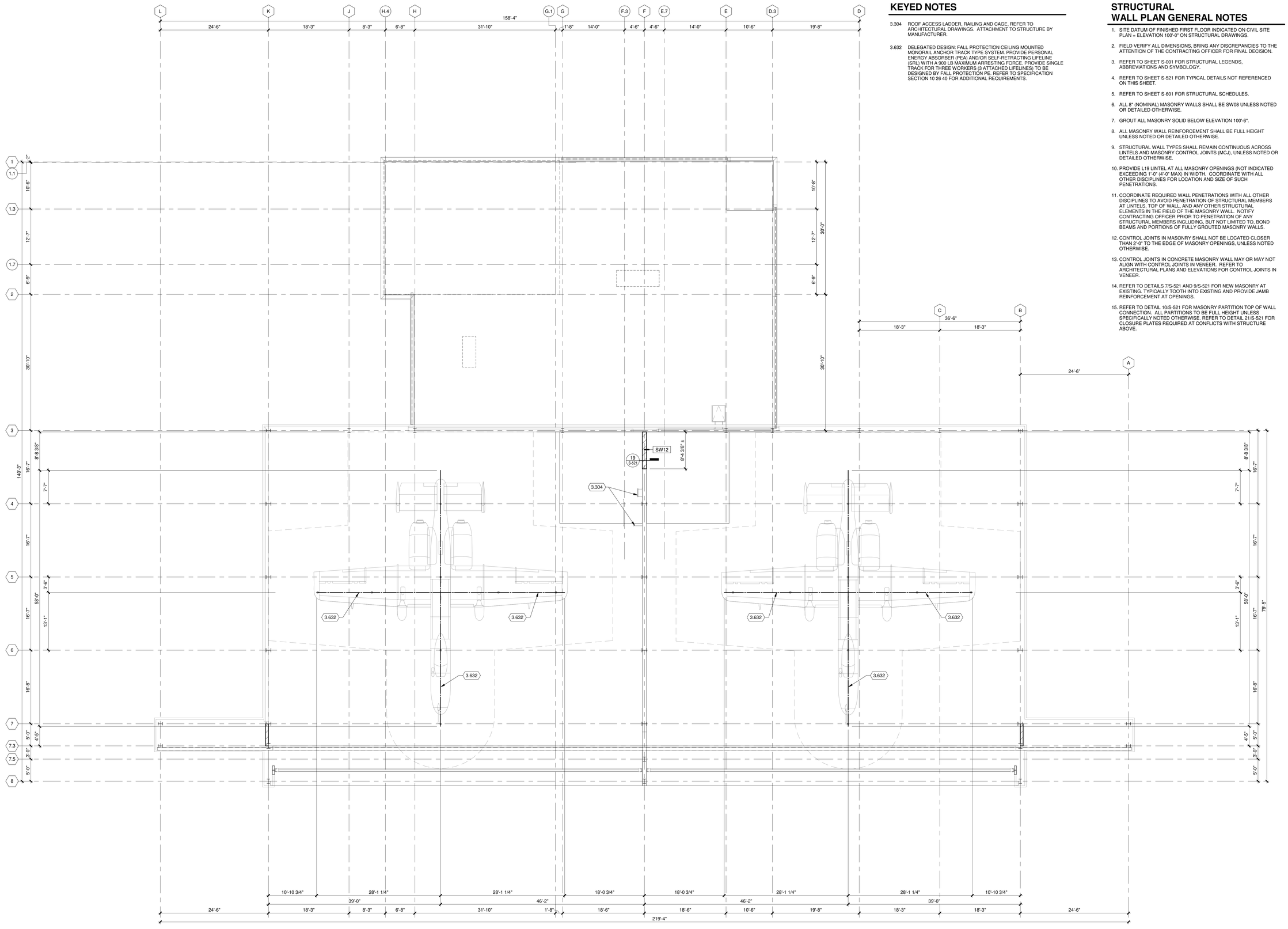
KEYED NOTES

3.304 ROOF ACCESS LADDER, RAILING AND CAGE, REFER TO ARCHITECTURAL DRAWINGS. ATTACHMENT TO STRUCTURE BY MANUFACTURER.

3.632 DELEGATED DESIGN: FALL PROTECTION CEILING MOUNTED MONORAIL ANCHOR TRACK TYPE SYSTEM. PROVIDE PERSONAL ENERGY ABSORBER (PEA) AND/OR SELF-RETRACTING LIFELINE (SRL) WITH A 900 LB MAXIMUM ARRESTING FORCE. PROVIDE SINGLE TRACK FOR THREE WORKERS (3 ATTACHED LIFELINES) TO BE DESIGNED BY FALL PROTECTION PE. REFER TO SPECIFICATION SECTION 10 26 40 FOR ADDITIONAL REQUIREMENTS.

STRUCTURAL WALL PLAN GENERAL NOTES

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS AND SYMBOLOGY.
4. REFER TO SHEET S-521 FOR TYPICAL DETAILS NOT REFERENCED ON THIS SHEET.
5. REFER TO SHEET S-601 FOR STRUCTURAL SCHEDULES.
6. ALL 8" (NOMINAL) MASONRY WALLS SHALL BE SW08 UNLESS NOTED OR DETAILED OTHERWISE.
7. GROUT ALL MASONRY SOLID BELOW ELEVATION 100'-6".
8. ALL MASONRY WALL REINFORCEMENT SHALL BE FULL HEIGHT UNLESS NOTED OR DETAILED OTHERWISE.
9. STRUCTURAL WALL TYPES SHALL REMAIN CONTINUOUS ACROSS LINTELS AND MASONRY CONTROL JOINTS (MCJ), UNLESS NOTED OR DETAILED OTHERWISE.
10. PROVIDE L19 LINTEL AT ALL MASONRY OPENINGS (NOT INDICATED EXCEEDING 1'-0" (4'-0" MAX) IN WIDTH. COORDINATE WITH ALL OTHER DISCIPLINES FOR LOCATION AND SIZE OF SUCH PENETRATIONS.
11. COORDINATE REQUIRED WALL PENETRATIONS WITH ALL OTHER DISCIPLINES TO AVOID PENETRATION OF STRUCTURAL MEMBERS AT LINTELS, TOP OF WALL, AND ANY OTHER STRUCTURAL ELEMENTS IN THE FIELD OF THE MASONRY WALL. NOTIFY CONTRACTING OFFICER PRIOR TO PENETRATION OF ANY STRUCTURAL MEMBERS INCLUDING, BUT NOT LIMITED TO, BOND BEAMS AND PORTIONS OF FULLY GROUTED MASONRY WALLS.
12. CONTROL JOINTS IN MASONRY SHALL NOT BE LOCATED CLOSER THAN 2'-0" TO THE EDGE OF MASONRY OPENINGS, UNLESS NOTED OTHERWISE.
13. CONTROL JOINTS IN CONCRETE MASONRY WALL MAY OR MAY NOT ALIGN WITH CONTROL JOINTS IN VENEER. REFER TO ARCHITECTURAL PLANS AND ELEVATIONS FOR CONTROL JOINTS IN VENEER.
14. REFER TO DETAILS 7/S-521 AND 9/S-521 FOR NEW MASONRY AT EXISTING. TYPICALLY TOOTH INTO EXISTING AND PROVIDE JAMB REINFORCEMENT AT OPENINGS.
15. REFER TO DETAIL 10/S-521 FOR MASONRY PARTITION TOP OF WALL CONNECTION. ALL PARTITIONS TO BE FULL HEIGHT UNLESS SPECIFICALLY NOTED OTHERWISE. REFER TO DETAIL 21/S-521 FOR CLOSURE PLATES REQUIRED AT CONFLICTS WITH STRUCTURE ABOVE.



N 1 **STRUCTURAL WALL PLAN**
1/8" = 1'-0"

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HARRISON TWP, MICHIGAN

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SHEET CONTENTS
STRUCTURAL WALL PLAN

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S-122

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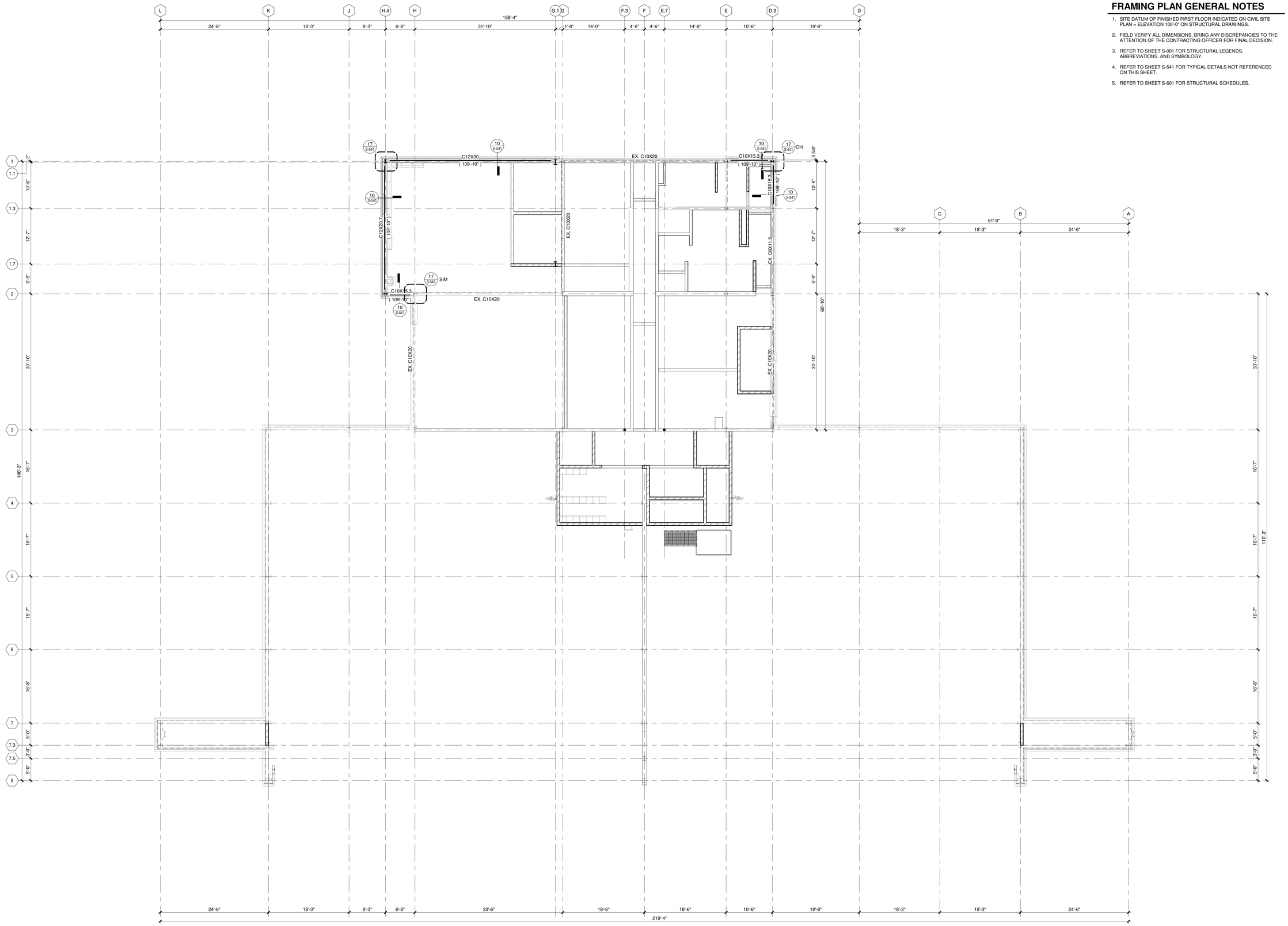
FRAMING PLAN GENERAL NOTES

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS, AND SYMBOLOGY.
4. REFER TO SHEET S-541 FOR TYPICAL DETAILS NOT REFERENCED ON THIS SHEET.
5. REFER TO SHEET S-601 FOR STRUCTURAL SCHEDULES.



N 1 **FIRST FLOOR GIRT FRAMING PLAN**
1/8" = 1'-0"

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28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

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SHEET CONTENTS:
FIRST FLOOR GIRT FRAMING PLAN

SHEET NO.:
S-141

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KEYED NOTES

3.304 ROOF ACCESS LADDER, RAILING AND CAGE, REFER TO ARCHITECTURAL DRAWINGS. ATTACHMENT TO STRUCTURE BY MANUFACTURER.

3.305 PROVIDE 12" X 20 GAUGE X CONTINUOUS GALVANIZED FLAT PLATE. ATTACH NEW DECK TO EXISTING WITH #10 SCREWS AT 6" OC END SIDE.

3.501 CEILING CONSTRUCTION SHALL BE 3-1/2" LIGHTWEIGHT CONCRETE TOPPING ON 1-1/2"X20 GA COMPOSITE DECK (5" TOTAL). INSTALL OVER A MINIMUM OF THREE SPANS. REINFORCE SLAB WITH FLAT SHEETS OF WWF 6X6-W2.1XW2.1 LOCATED AND CHAIR 1" FROM TOP OF SLAB. REFER TO DETAIL 1/S-541.

3.601 ROOF DIAPHRAGM SHALL CONFORM TO THE FOLLOWING:
- METAL DECK - 1 1/2" TYPE B 20 GAUGE ROOF DECK
- SUPPORT FASTENING - #10 SCREWS AT 36/4
- PERIMETER FASTENING - #10 SCREWS AT 6" OC
- SIDELAP FASTENING - #10 SCREWS AT 24" OC MAXIMUM PER SPAN

3.602 1200S200-97 MEZZANINE JOISTS, PROVIDE TOP AND BOTTOM FLANGE BRACING AT 48"OC MAXIMUM.

3.604 ADDITIONAL FRAMING WHERE MECHANICAL EQUIPMENT PENETRATES EXISTING ROOF. REFER TO DETAIL 13/S-541 VERIFY SIZE AND LOCATION WITH EQUIPMENT SUPPLIER PRIOR TO FABRICATION.

3.605 EXISTING BUILT-UP BRIDGE CRANE RAIL TO REMAIN. SUPPORTED AT COLUMN CANTILEVERS, EACH END.

3.606 EXISTING BRIDGE CRANE TO REMAIN.

3.607 APPROXIMATE LOCATION OF ROOF JOIST BRIDGING. CONTRACTOR TO COORDINATE UTILITIES WITHIN JOIST SPACE TO AVOID CONFLICT.

3.609 BEAM TO BEAM CONNECTION PER TYPICAL SINGLE PLATE SHEAR FRAMING CONNECTION, DETAIL 21/S-541. BEAM TO COLUMN CONNECTION PER DETAIL 20. USE WELDED OPTION IF COLUMN LACK CLEARANCES REQUIRED FOR BOLTED.

FRAMING PLAN GENERAL NOTES

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS, AND SYMBOLOGY.
4. REFER TO SHEET S-010 FOR ROOF LOADING PLAN AND SPECIAL JOIST LOADING REQUIREMENTS.
5. REFER TO SHEET S-541 FOR TYPICAL DETAILS NOT REFERENCED ON THIS SHEET.
6. REFER TO SHEET S-601 FOR STRUCTURAL SCHEDULES.
7. MINIMUM JOIST BEARING LENGTH REQUIREMENTS ARE AS FOLLOWS UNLESS NOTED OR DETAILED OTHERWISE:
   A. AT MASONRY WALLS
      - "K" SERIES - MIN. 4"
   B. AT STEEL BEAMS
      - "K" SERIES - MIN. 2 1/2"

N 1 **LOW ROOF FRAMING PLAN**
1/8" = 1'-0"

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HARRISON TWP, MICHIGAN

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SHEET CONTENTS
LOW ROOF FRAMING PLAN

SHEET NO.:
S-151

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KEYED NOTES

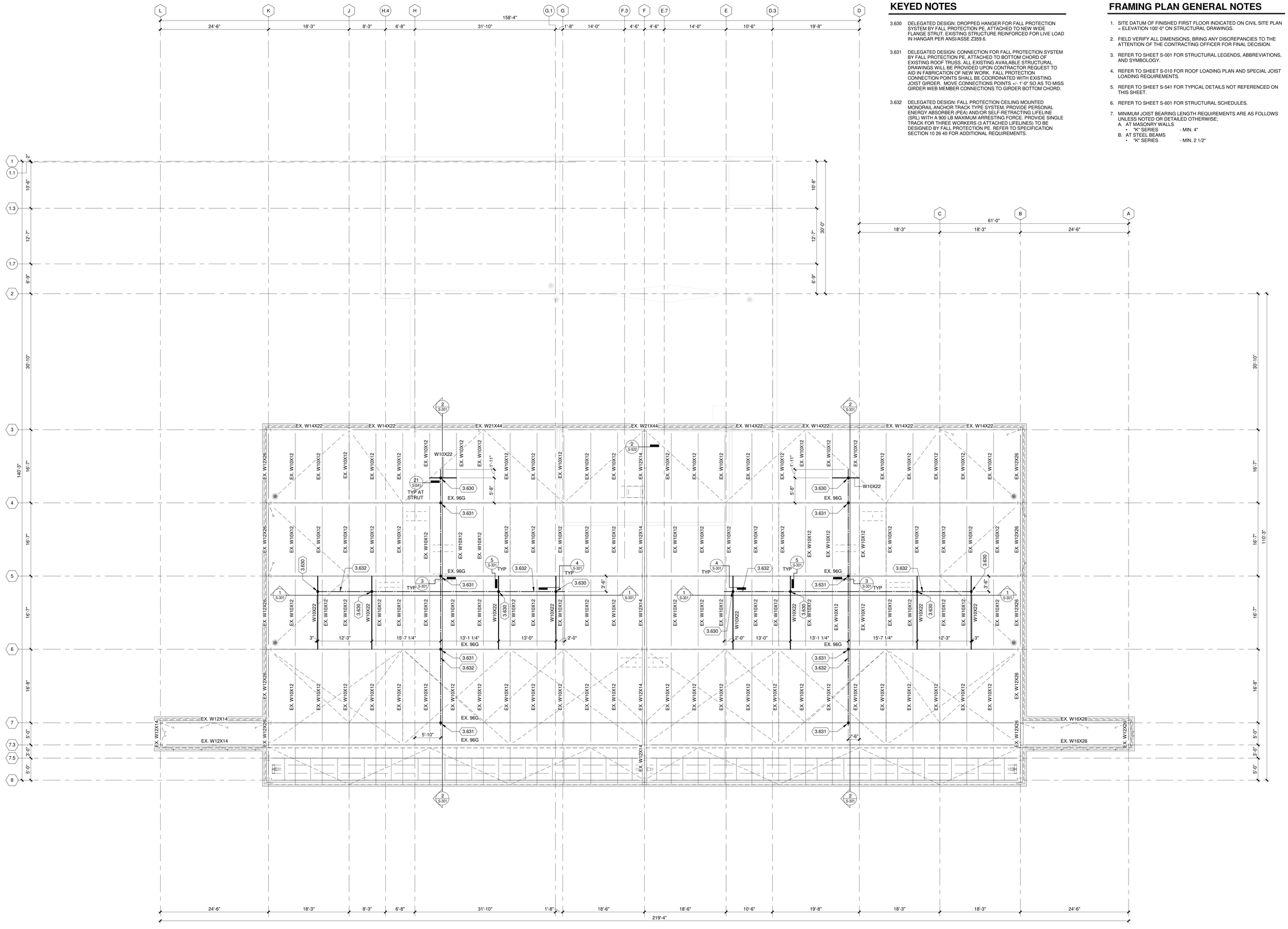
3.630 DELEGATED DESIGN: DROPPED HANGER FOR FALL PROTECTION SYSTEM BY FALL PROTECTION PE, ATTACHED TO NEW WIDE FLANGE STRUT. EXISTING STRUCTURE REINFORCED FOR LIVE LOAD IN HANGAR PER ANSI/ASSE Z359.6.

3.631 DELEGATED DESIGN: CONNECTION FOR FALL PROTECTION SYSTEM BY FALL PROTECTION PE, ATTACHED TO BOTTOM CHORD OF EXISTING ROOF TRUSS. ALL EXISTING AVAILABLE STRUCTURAL DRAWINGS WILL BE PROVIDED UPON CONTRACTOR REQUEST TO AID IN FABRICATION OF NEW WORK. FALL PROTECTION CONNECTION POINTS SHALL BE COORDINATED WITH EXISTING JOIST GIRDER. MOVE CONNECTIONS POINTS +/- 1'-0" SO AS TO MISS GIRDER WEB MEMBER CONNECTIONS TO GIRDER BOTTOM CHORD.

3.632 DELEGATED DESIGN: FALL PROTECTION CEILING MOUNTED MONORAIL ANCHOR TRACK TYPE SYSTEM. PROVIDE PERSONAL ENERGY ABSORBER (PEA) AND/OR SELF-RETRACTING LIFELINE (SRL) WITH A 900 LB MAXIMUM ARRESTING FORCE. PROVIDE SINGLE TRACK FOR THREE WORKERS (3 ATTACHED LIFELINES) TO BE DESIGNED BY FALL PROTECTION PE. REFER TO SPECIFICATION SECTION 10 26 40 FOR ADDITIONAL REQUIREMENTS.

FRAMING PLAN GENERAL NOTES

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS, AND SYMBOLOGY.
4. REFER TO SHEET S-010 FOR ROOF LOADING PLAN AND SPECIAL JOIST LOADING REQUIREMENTS.
5. REFER TO SHEET S-541 FOR TYPICAL DETAILS NOT REFERENCED ON THIS SHEET.
6. REFER TO SHEET S-601 FOR STRUCTURAL SCHEDULES.
7. MINIMUM JOIST BEARING LENGTH REQUIREMENTS ARE AS FOLLOWS UNLESS NOTED OR DETAILED OTHERWISE:
   A. AT MASONRY WALLS
      - "K" SERIES - MIN. 4"
   B. AT STEEL BEAMS
      - "K" SERIES - MIN. 2 1/2"



N 1 **HIGH ROOF FRAMING PLAN**
1/8" = 1'-0"

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SHEET CONTENTS
HIGH ROOF
FRAMING PLAN

SHEET NO.:
S-152

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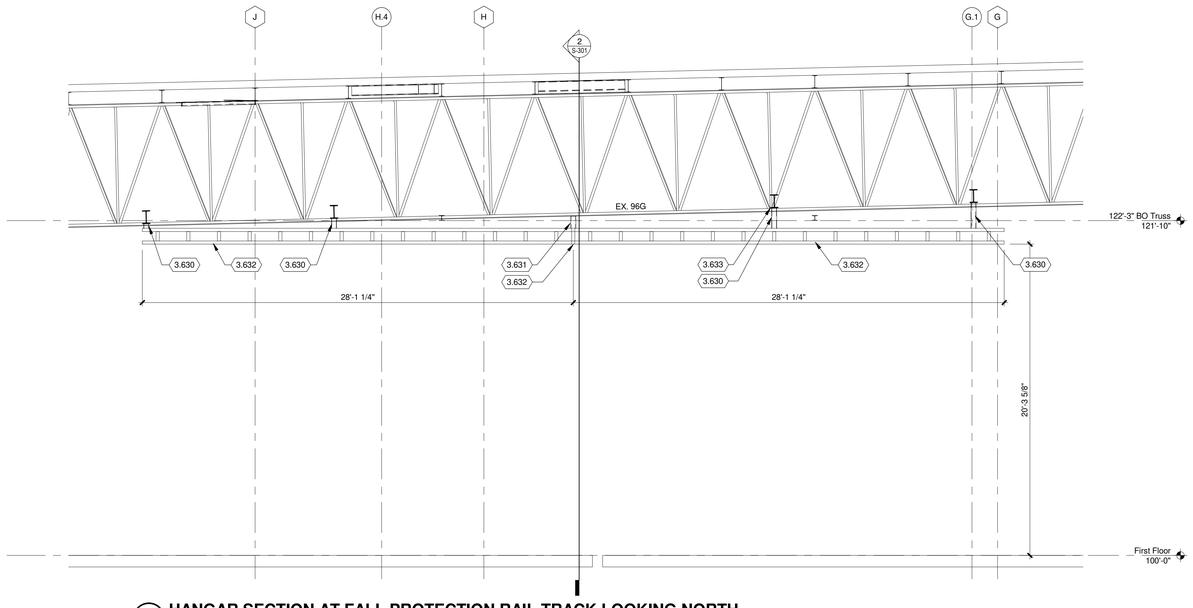
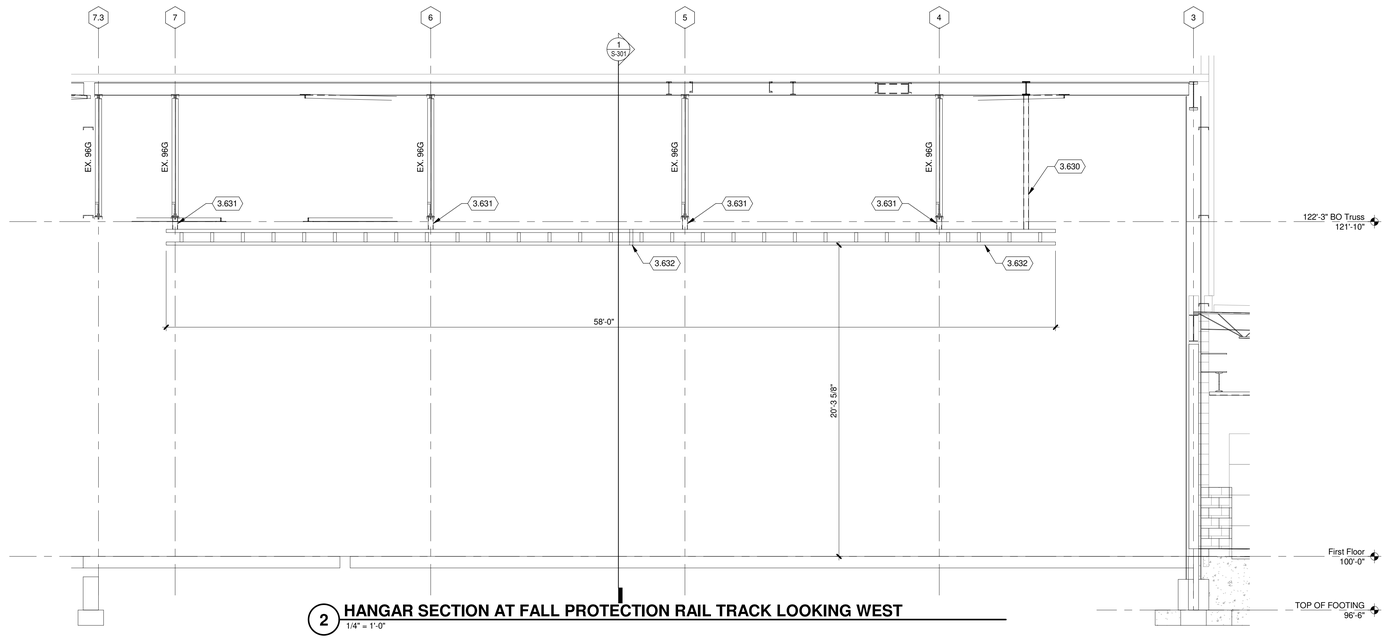


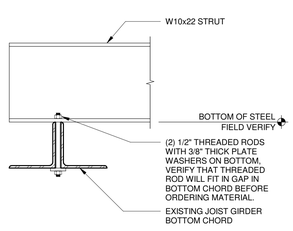
1 HANGAR SECTION AT FALL PROTECTION RAIL TRACK LOOKING NORTH

1/4" = 1'-0"



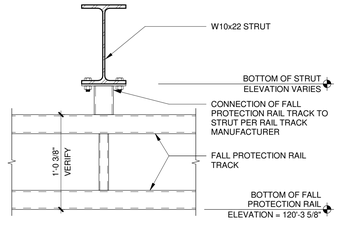
2 HANGAR SECTION AT FALL PROTECTION RAIL TRACK LOOKING WEST

1/4" = 1'-0"



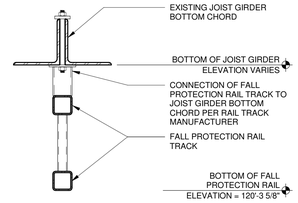
5 STRUT CONNECTION TO EXISTING JOIST GIRDER

1 1/2" = 1'-0"



4 FALL PROTECTION CONNECTION TO W10x22 STRUT

1 1/2" = 1'-0"



3 FALL PROTECTION CONNECTION TO EXISTING JOIST GIRDER

1 1/2" = 1'-0"

KEYED NOTES

3.630 DELEGATED DESIGN: DROPPED HANGER FOR FALL PROTECTION SYSTEM BY FALL PROTECTION PE, ATTACHED TO NEW WIDE FLANGE STRUT. EXISTING STRUCTURE REINFORCED FOR LIVE LOAD IN HANGAR PER ANSI/ASSE Z359.6.

3.631 DELEGATED DESIGN: CONNECTION FOR FALL PROTECTION SYSTEM BY FALL PROTECTION PE, ATTACHED TO BOTTOM CHORD OF EXISTING ROOF TRUSS. ALL EXISTING AVAILABLE STRUCTURAL DRAWINGS WILL BE PROVIDED UPON CONTRACTOR REQUEST TO AID IN FABRICATION OF NEW WORK. FALL PROTECTION CONNECTION POINTS SHALL BE COORDINATED WITH EXISTING JOIST GIRDER. MOVE CONNECTIONS POINTS +/- 1'-0" SO AS TO MISS GIRDER WEB MEMBER CONNECTIONS TO GIRDER BOTTOM CHORD.

3.632 DELEGATED DESIGN: FALL PROTECTION CEILING MOUNTED MONORAIL ANCHOR TRACK TYPE SYSTEM. PROVIDE PERSONAL ENERGY ABSORBER (PEA) AND/OR SELF-RETRACTING LIFELINE (SRL) WITH A 900 LB MAXIMUM ARRESTING FORCE. PROVIDE SINGLE TRACK FOR THREE WORKERS (3 ATTACHED LIFELINES) TO BE DESIGNED BY FALL PROTECTION PE. REFER TO SPECIFICATION SECTION 10 26 40 FOR ADDITIONAL REQUIREMENTS.

3.633 CONTRACTOR SHALL FIELD LOCATE EXISTING TRUSS VERTICALS. CONTRACTOR SHALL ADJUST BEAM LOCATIONS +/-1'-0" ON SHOP DRAWINGS TO MISS EXISTING TRUSS WEB MEMBERS. TYPICAL ALL FALL PROTECTION SUPPORT BEAMS.

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SHEET CONTENTS
SECTIONS

SHEET NO.:
S-301

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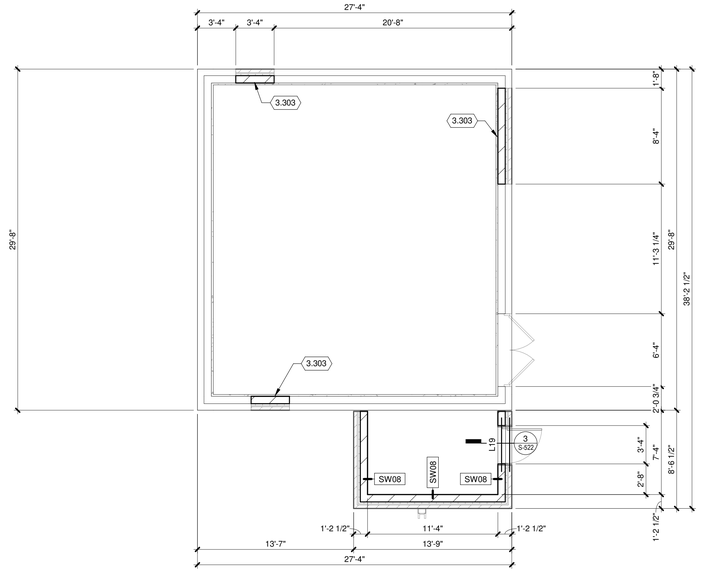
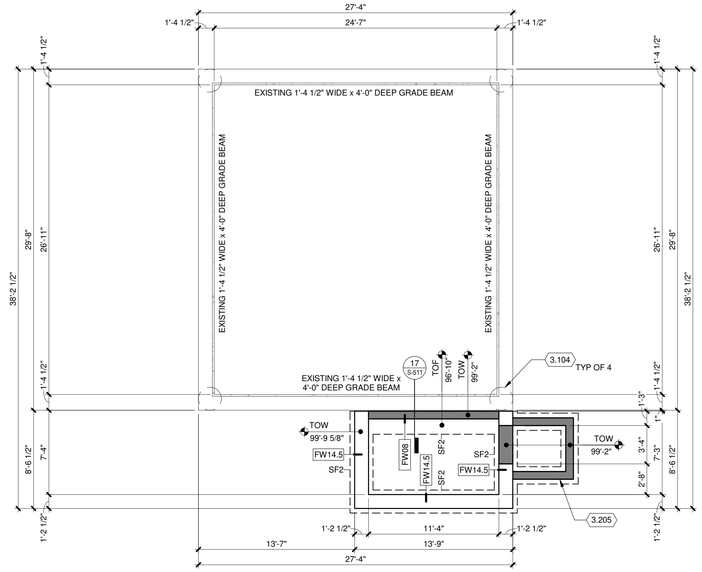


N 3 **B158 STRUCTURAL WALL PLAN**
3/16" = 1'-0"

STRUCTURAL WALL PLAN GENERAL NOTES

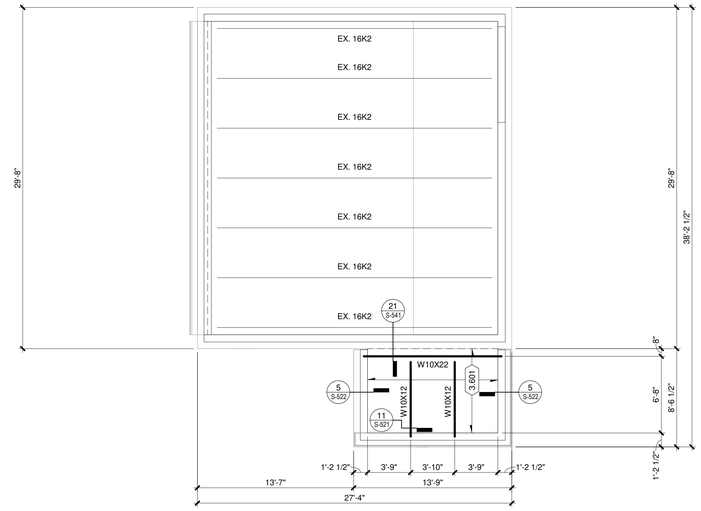
1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS AND SYMBOLOGY.
4. REFER TO SHEET S-521 FOR TYPICAL DETAILS NOT REFERENCED ON THIS SHEET.
5. REFER TO SHEET S-601 FOR STRUCTURAL SCHEDULES.
6. ALL 8" (NOMINAL) MASONRY WALLS SHALL BE SW08 UNLESS NOTED OR DETAILED OTHERWISE.
7. GROUT ALL MASONRY SOLID BELOW ELEVATION 100'-0".
8. ALL MASONRY WALL REINFORCEMENT SHALL BE FULL HEIGHT UNLESS NOTED OR DETAILED OTHERWISE.
9. STRUCTURAL WALL TYPES SHALL REMAIN CONTINUOUS ACROSS LINTELS AND MASONRY CONTROL JOINTS (MCJ), UNLESS NOTED OR DETAILED OTHERWISE.
10. PROVIDE L19 LINTEL AT ALL MASONRY OPENINGS (NOT INDICATED EXCEEDING 1'-0" (4'-0" MAX) IN WIDTH. COORDINATE WITH ALL OTHER DISCIPLINES FOR LOCATION AND SIZE OF SUCH PENETRATIONS.
11. COORDINATE REQUIRED WALL PENETRATIONS WITH ALL OTHER DISCIPLINES TO AVOID PENETRATION OF STRUCTURAL MEMBERS AT LINTELS, TOP OF WALL, AND ANY OTHER STRUCTURAL ELEMENTS IN THE FIELD OF THE MASONRY WALL. NOTIFY CONTRACTING OFFICER PRIOR TO PENETRATION OF ANY STRUCTURAL MEMBERS INCLUDING, BUT NOT LIMITED TO, BOND BEAMS AND PORTIONS OF FULLY GROUTED MASONRY WALLS.
12. CONTROL JOINTS IN MASONRY SHALL NOT BE LOCATED CLOSER THAN 2'-0" TO THE EDGE OF MASONRY OPENINGS, UNLESS NOTED OTHERWISE.
13. CONTROL JOINTS IN CONCRETE MASONRY WALL MAY OR MAY NOT ALIGN WITH CONTROL JOINTS IN VENEER. REFER TO ARCHITECTURAL PLANS AND ELEVATIONS FOR CONTROL JOINTS IN VENEER.



N 1 **B158 FOUNDATION PLAN**
3/16" = 1'-0"

FOUNDATION PLAN GENERAL NOTES

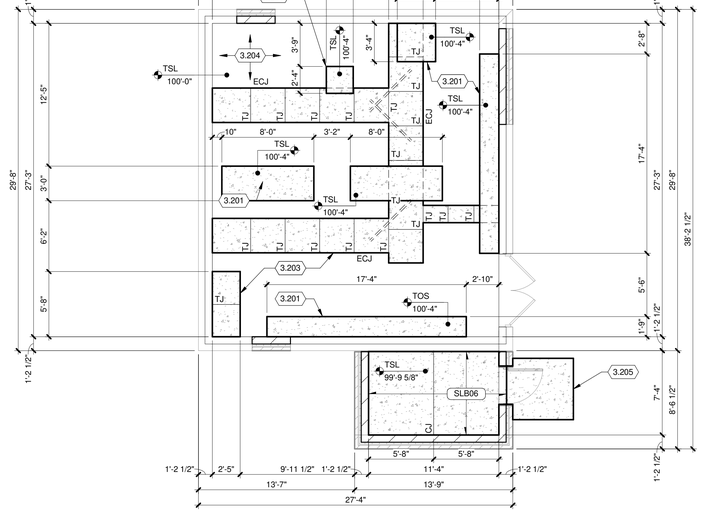
1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS, AND SYMBOLOGY.
4. REFER TO SHEET S-501 FOR TYPICAL DETAILS NOT REFERENCED ON THIS SHEET.
5. REFER TO SHEET S-601 FOR STRUCTURAL SCHEDULES.
6. TOP OF FOOTING ELEVATION = 95'-10" UNLESS NOTED OTHERWISE.
7. TOP OF FOUNDATION WALL ELEVATION = 99'-10" UNLESS NOTED OTHERWISE.
8. STRIP FOOTINGS SHALL BE CENTERED UNDER FOUNDATION AND/OR MASONRY WALLS UNLESS NOTED OTHERWISE.



N 4 **B158 ROOF FRAMING PLAN**
3/16" = 1'-0"

ROOF FRAMING PLAN GENERAL NOTES

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS, AND SYMBOLOGY.
4. REFER TO SHEET S-010 FOR ROOF LOADING PLAN AND SPECIAL JOIST LOADING REQUIREMENTS.
5. REFER TO SHEET S-521 FOR TYPICAL DETAILS NOT REFERENCED ON THIS SHEET.
6. REFER TO SHEET S-601 FOR STRUCTURAL SCHEDULES.



N 2 **B158 FLATWORK PLAN**
3/16" = 1'-0"

FLATWORK PLAN GENERAL NOTES

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS, AND SYMBOLOGY.
4. REFER TO SHEET S-511 FOR TYPICAL DETAILS NOT REFERENCED ON THIS SHEET.
5. REFER TO DETAIL 1/S-511 FOR STRUCTURAL SLAB TYPES.
6. FLOAT AND TROWEL FLOOR SLABS PER REQUIREMENTS OF ARCHITECTURAL FLOOR FINISH SYSTEM.
7. (2) DASHED LINES = = = INDICATE (2) ADDITIONAL #4 BARS (5'-0" LONG) DIAGONAL 6" FROM CORNER IN SLAB, 2" CLEAR FROM TOP OF SLAB.

KEYED NOTES

3.104 EXISTING 24" DIAMETER CONCRETE DRILLED PIER, TYPICAL OF 4 LOCATIONS.

3.201 INTERIOR EQUIPMENT PADS, REFER TO DETAIL 3/S-511. REFER TO MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR EQUIPMENT REQUIRING PADS. PAD SHALL EXTEND 4" MINIMUM PAST LIMIT OF EQUIPMENT FOOTPRINT. COORDINATE WITH EQUIPMENT SUPPLIER AND IN-FIELD CONDITIONS FOR FINAL SIZE AND LOCATION OF PADS.

3.203 PATCH EXISTING SLAB REMOVAL AREA. MATCH EXISTING SLAB THICKNESS AND SLOPE. REINFORCE PER SLAB ASSEMBLY. DOWEL TO EXISTING SLAB PER DETAIL 2/S-511.

3.204 EXISTING 6" CONCRETE SLAB ON GRADE WITH 6X6 - W6.5XW6.5 WWF REINFORCEMENT.

3.205 EXTERIOR CONCRETE STOOP SLAB AT EXISTING CONCRETE FOUNDATION, REFER TO DETAIL 6/S-501, UNLESS INDICATED ON ARCHITECTURAL AND/OR CIVIL DRAWINGS, SLAB TO RECEIVE BROOM FINISH. ALIGN CONTROL JOINTS IN SLAB WITH CIVIL JOINTING.

3.303 MASONRY INFILL WITHIN EXISTING OPENING, MATCH EXISTING MASONRY WALL WIDTH. REFER TO DETAIL 9/S-521.

3.601 ROOF DIAPHRAGM SHALL CONFORM TO THE FOLLOWING:
- METAL DECK - 1 1/2" TYPE B 20 GAUGE ROOF DECK
- SUPPORT FASTENING - #10 SCREWS AT 36/4
- PERIMETER FASTENING - #10 SCREWS AT 6" OC
- SIDELAP FASTENING - #10 SCREWS AT 24" OC MAXIMUM PER SPAN

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED:
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: JJF
DRAWN BY: ACT
CHECKED BY: WBB
DO NOT SCALE DRAWINGS

SHEET CONTENTS
B158 ENLARGED STRUCTURAL PLANS

SHEET NO.:
S-401

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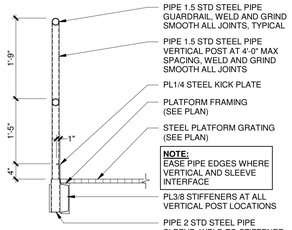
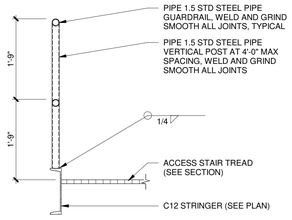
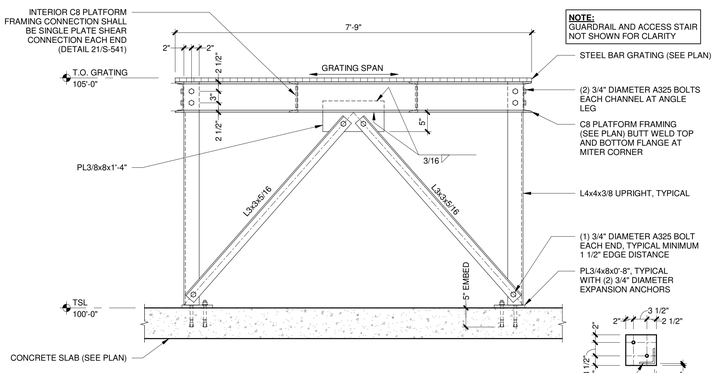


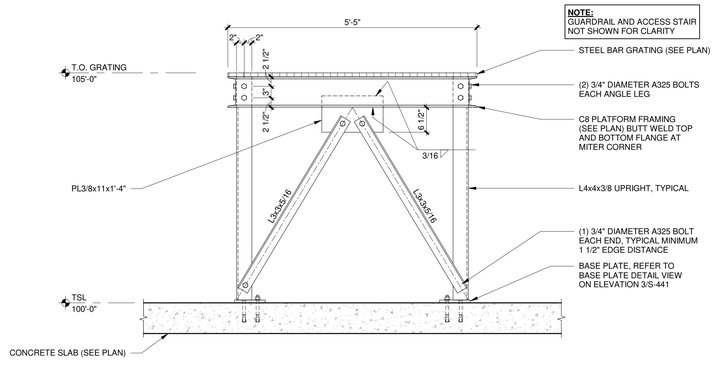
6 ACCESS PLATFORM GUARD RAIL
3/4" = 1'-0"



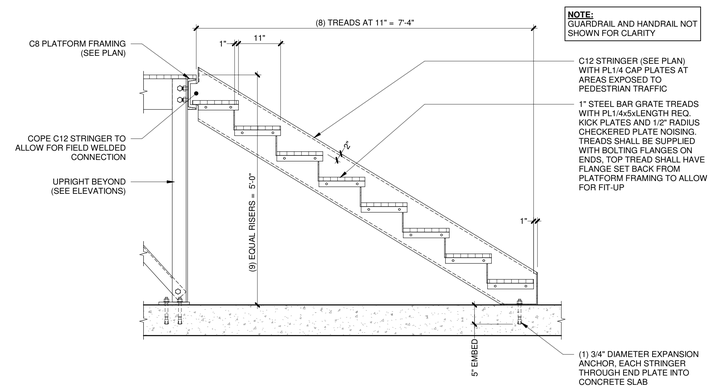
7 STAIR GUARD RAIL
3/4" = 1'-0"



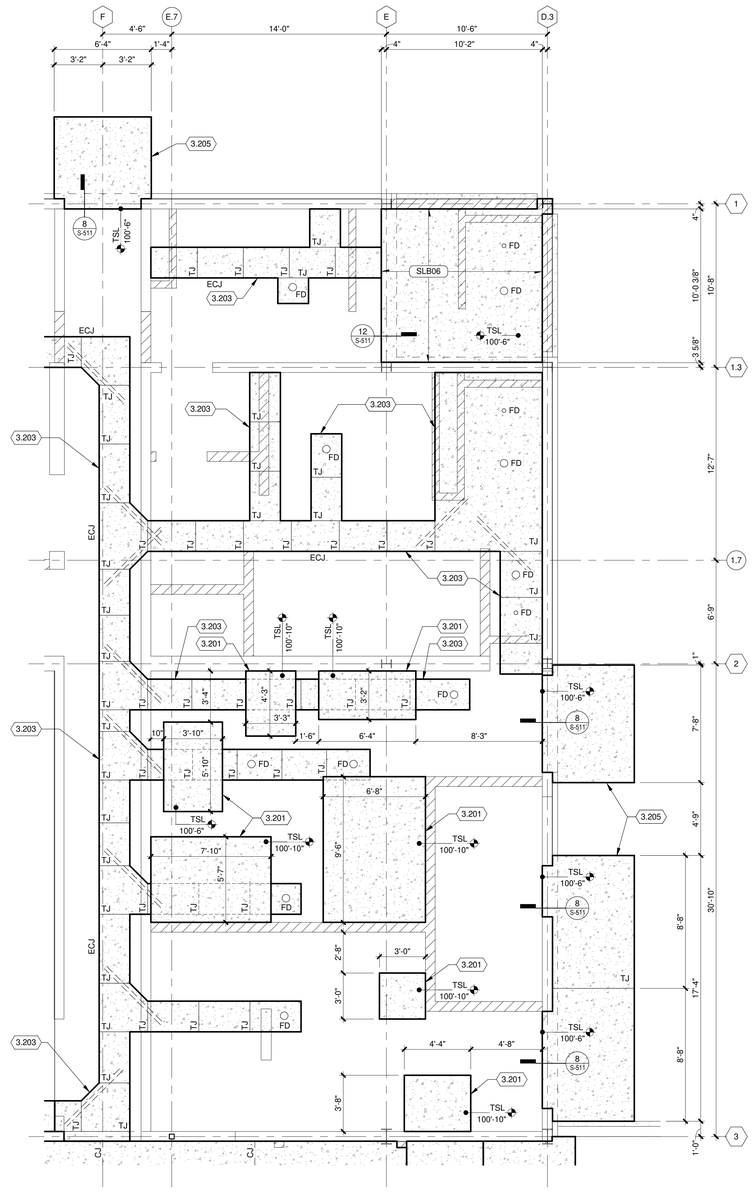
3 GENERATOR ACCESS PLATFORM ELEVATION
3/4" = 1'-0"



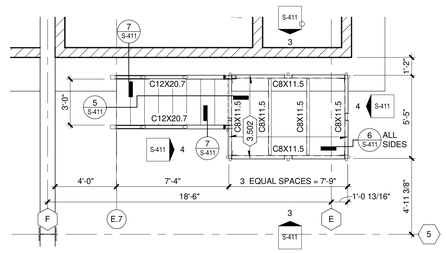
4 GENERATOR ACCESS PLATFORM ELEVATION
3/4" = 1'-0"



5 GENERATOR ACCESS PLATFORM STAIR SECTION
3/4" = 1'-0"



N 1 ENLARGED FIRST FLOOR FLATWORK PLAN
1/4" = 1'-0"



N 2 ENLARGED FRAMING PLAN - GENERATOR ACCESS PLATFORM
1/4" = 1'-0"

FLATWORK PLAN GENERAL NOTES

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS, AND SYMBOLOGY.
4. REFER TO SHEET S-511 FOR TYPICAL DETAILS NOT REFERENCED ON THIS SHEET.
5. REFER TO DETAIL 1/S-511 FOR STRUCTURAL SLAB TYPES.
6. REFER TO SHEET S-601 FOR STRUCTURAL SCHEDULES.
7. FLOAT AND TROWEL FLOOR SLABS PER REQUIREMENTS OF ARCH. FLOOR FINISH SYSTEM.
8. (2) DASHED LINES = = = INDICATE (2) ADDITIONAL #4 BARS (5'-0" LONG) DIAGONAL 6" FROM CORNER IN SLAB, 2" CLEAR FROM TOP OF SLAB.
9. REFER TO DETAILS 12/S-521 AND 13/S-521 FOR NEW MASONRY AT EXISTING INTERSECTIONS. TYPICALLY PROVIDE STEEL ANGLE CONNECTIONS TO EXISTING INTERSECTIONS THROUGHOUT.
10. CJ = CONCRETE SLAB CONTROL JOINT (ALSO KNOWN AS SAWCUT JOINT).
    TJ = CONCRETE SLAB TOOLED JOINT

    AT ALL CJ LOCATIONS, DETAIL 5/S-511 CONCRETE SLAB CONSTRUCTION, JOINT MAY BE SUBSTITUTED BASED ON CONTRACTOR SEQUENCING. REFER TO SHEET S-511 FOR DETAILS.

KEYED NOTES

3.201 INTERIOR EQUIPMENT PADS, REFER TO DETAIL 3/S-511. REFER TO MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR EQUIPMENT REQUIRING PADS. PAD SHALL EXTEND 4" MINIMUM PAST LIMIT OF EQUIPMENT FOOTPRINT. COORDINATE WITH EQUIPMENT SUPPLIER AND IN-FIELD CONDITIONS FOR FINAL SIZE AND LOCATION OF PADS.

3.203 PATCH EXISTING SLAB REMOVAL AREA. MATCH EXISTING SLAB THICKNESS AND SLOPE. REINFORCE PER SLAB ASSEMBLY. DOWEL TO EXISTING SLAB PER DETAIL 2/S-511.

3.205 EXTERIOR CONCRETE STOOP SLAB AT EXISTING CONCRETE FOUNDATION, REFER TO DETAIL 6/S-501. UNLESS INDICATED ON ARCHITECTURAL AND/OR CIVIL DRAWINGS, SLAB TO RECEIVE BROOM FINISH. ALIGN CONTROL JOINTS IN SLAB WITH CIVIL JOINTING.

3.502 NEW STEEL BAR GRATING SHALL CONFORM TO THE FOLLOWING;
- 1" DEEP X 3/16" BEARING BARS
- 19-W-4 PROFILE

GENERATOR ACCESS PLATFORM GENERAL NOTES

1. SITE DATUM OF FINISHED FIRST FLOOR INDICATED ON CIVIL SITE PLAN = ELEVATION 100'-0" ON STRUCTURAL DRAWINGS.
2. FIELD VERIFY ALL DIMENSIONS, BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONTRACTING OFFICER FOR FINAL DECISION.
3. REFER TO SHEET S-001 FOR STRUCTURAL LEGENDS, ABBREVIATIONS AND SYMBOLOGY.
4. ALL STEEL SHALL BE PAINTED.
5. BAR GRATING SHALL BE FULLY BANDED AND PAINTED.
6. PLATFORM GUARDRAIL SHALL BE REMOVABLE TO ALLOW LOADING AND UNLOADING OF 400 HZ GENERATOR WITH FORKLIFT.

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: JJF
DRAWN BY: ACT
CHECKED BY: WBB
DO NOT SCALE DRAWINGS

SHEET CONTENTS
ENLARGED STRUCTURAL PLANS

SHEET NO.:
S-411

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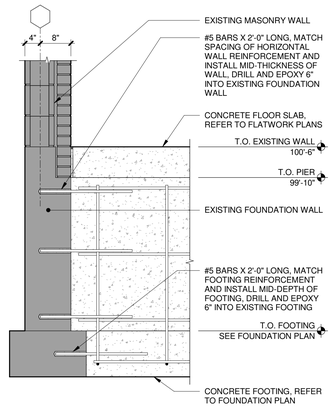
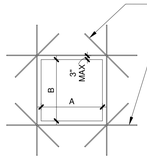
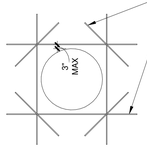


NEW WALL AT EXISTING FOUNDATION WALL
21 3/4" = 1'-0"



NOTES:
1. APPLIES TO ALL OPENINGS WHERE 'A' OR 'B' IS GREATER THAN OR EQUAL TO CAST IN PLACE CONCRETE THICKNESS.
2. VERIFY SIZE AND LOCATION OF OPENINGS WITH TRADE OR SUB-CONTRACTOR REQUIRING OPENINGS.

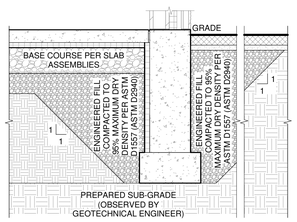
TYPICAL RECTANGULAR OPENING IN CAST IN PLACE CONCRETE



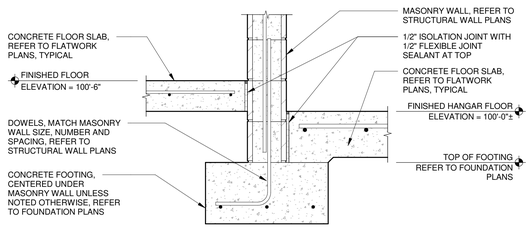
NOTES:
1. APPLIES TO ALL HOLES WHERE DIAMETER IS GREATER THAN OR EQUAL TO CAST IN PLACE CONCRETE THICKNESS.
2. VERIFY SIZE AND LOCATION OF OPENINGS WITH TRADE OR SUB-CONTRACTOR REQUIRING OPENINGS.
3. 2'-0" MAXIMUM OPENING UNLESS NOTED OTHERWISE.

TYPICAL CIRCULAR OPENING IN CAST IN PLACE CONCRETE

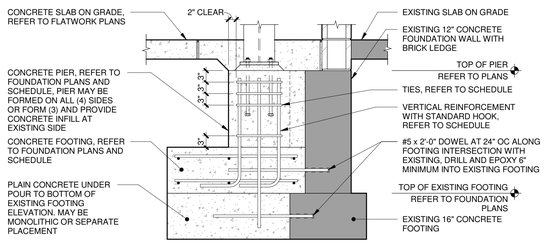
TYPICAL CONCRETE PENETRATION REINFORCEMENT
22 1/4" = 1'-0"



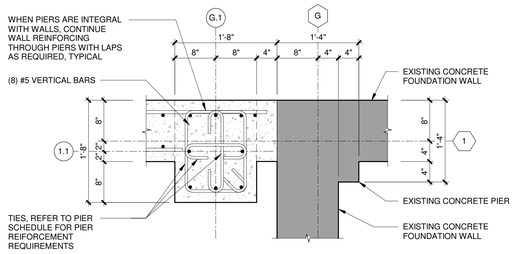
TYPICAL BACKFILL REQUIREMENTS AT EXTERIOR FOUNDATION
23 1/2" = 1'-0"



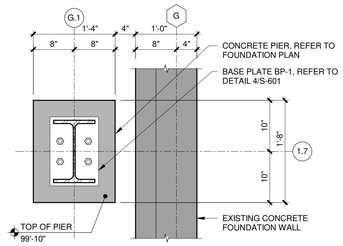
MASONRY WALL AT FOOTING
16 1" = 1'-0"



PIER FOUNDATION AT EXISTING
17 3/4" = 1'-0"

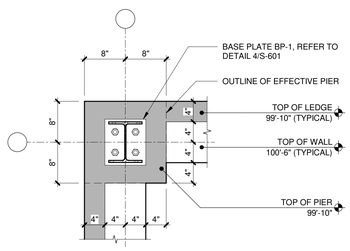


PIER P20 REINFORCEMENT
18 1" = 1'-0"



TOP OF PIER PLAN
14 1" = 1'-0"

PIER P16 REINFORCEMENT
20 1" = 1'-0"

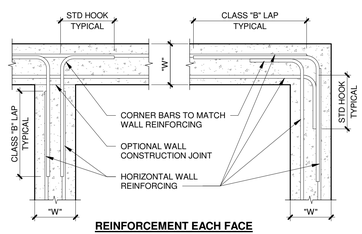


TOP OF PIER PLAN
15 1" = 1'-0"

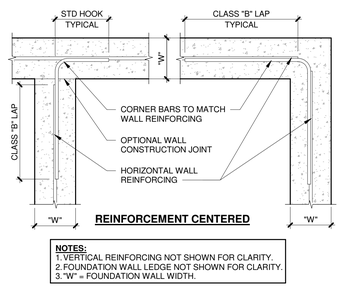
TYPICAL STOOP SECTION
11 1/2" = 1'-0"

TOP OF PIER PLAN
13 1" = 1'-0"

TYPICAL STOOP SECTION AT EXISTING
12 1/2" = 1'-0"



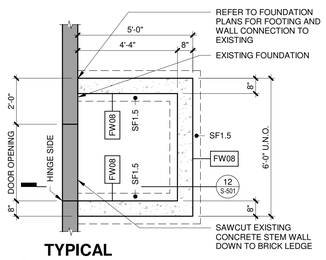
REINFORCEMENT EACH FACE



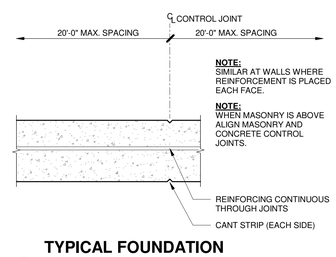
REINFORCEMENT CENTERED

NOTES:
1. VERTICAL REINFORCING NOT SHOWN FOR CLARITY.
2. FOUNDATION WALL LEDGE NOT SHOWN FOR CLARITY.
3. "W" = FOUNDATION WALL WIDTH.

TYPICAL FOUNDATION WALL INTERSECTIONS
10 1" = 1'-0"



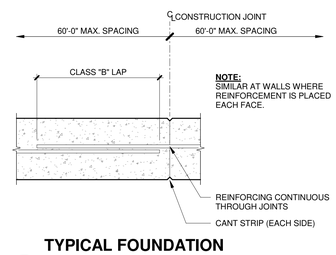
TYPICAL STOOP PLAN VIEW
5 3/8" = 1'-0"



NOTE:
SIMILAR AT WALLS WHERE REINFORCEMENT IS PLACED EACH FACE.

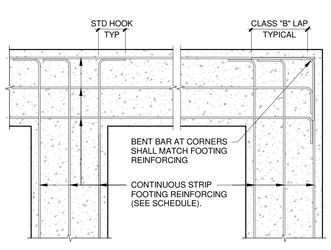
NOTE:
WHEN MASONRY IS ABOVE ALIGN MASONRY AND CONCRETE CONTROL JOINTS.

TYPICAL FOUNDATION WALL CONTROL JOINT
7 1" = 1'-0"

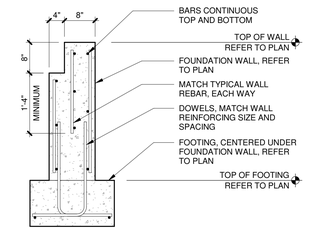


NOTE:
SIMILAR AT WALLS WHERE REINFORCEMENT IS PLACED EACH FACE.

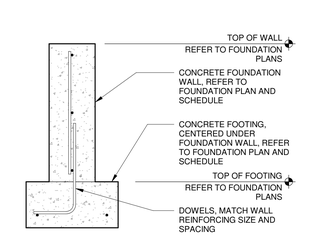
TYPICAL FOUNDATION WALL CONSTRUCTION JOINT
8 1" = 1'-0"



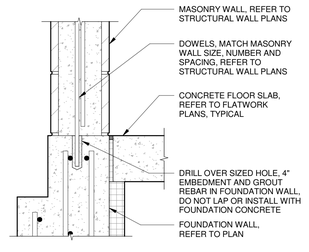
TYPICAL FOOTING INTERSECTIONS
9 1/2" = 1'-0"



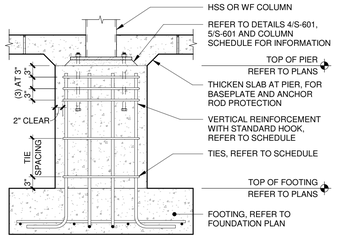
FOUNDATION WALL AT FOOTING
1 3/4" = 1'-0"



FOUNDATION WALL AT FOOTING
2 3/4" = 1'-0"



MASONRY WALL BASE CONNECTION
3 1 1/2" = 1'-0"



TYPICAL PIER SECTION
4 3/4" = 1'-0"

TETRA TECH
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Ann Arbor, MI 48108
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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

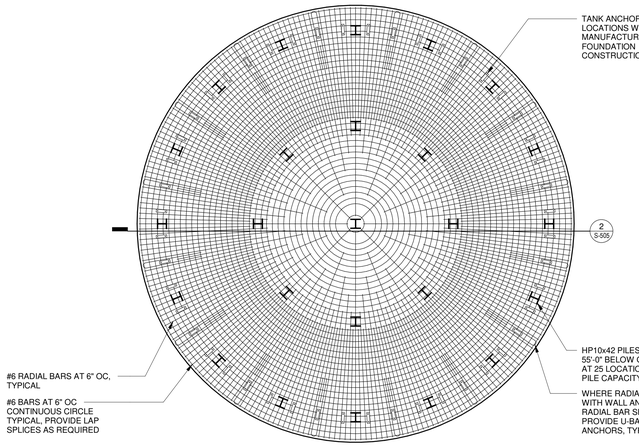
ISSUED:
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: JJF
DRAWN BY: ACT
CHECKED BY: WBB
DO NOT SCALE DRAWINGS.

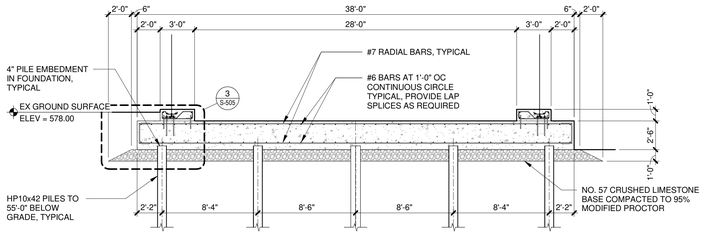
SHEET CONTENTS
FOUNDATION DETAILS

SHEET NO.:
S-501

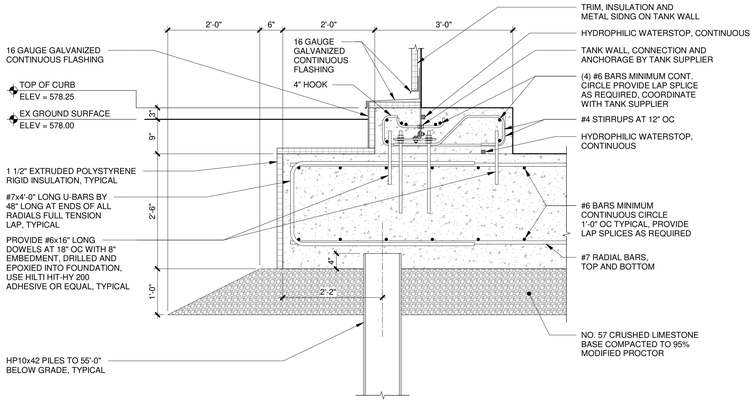
12/12/2022 2:12:37 PM C:\Revit Local\3141700-181848.01-S-Central-2020_arne.thompson@meadhunt.com.rvt



1 FIRE PROTECTION WATER TANK FOUNDATION PLAN
3/16" = 1'-0"



2 FIRE PROTECTION WATER TANK FOUNDATION SECTION
3/16" = 1'-0"



3 FIRE PROTECTION WATER TANK FOUNDATION EDGE SECTION
3/4" = 1'-0"

TANK FOUNDATION STRUCTURAL DESIGN CRITERIA

1. GOVERNING CODE:

   DESIGN CRITERIA PER S-001 EXCEPT AS NOTED BELOW

2. SNOW LOADS

GROUND SNOW LOAD:	P_G = 25 PSF
FLAT-ROOF SNOW LOAD:	P_F = 20 PSF
SLOPED ROOF SNOW LOAD:	P_S = 22 PSF
SNOW EXPOSURE FACTOR:	C_E = 1.0
SNOW LOAD IMPORTANCE FACTOR:	I_S = 1.1
THERMAL FACTOR:	C_T = 1.1

5. WIND DESIGN DATA

   REFER TO SHEET S-001

6. EARTHQUAKE DESIGN DATA

BASIC SEISMIC-FORCE-RESISTING-SYSTEM:	SFRS = H.	STEEL SYSTEMS NOT SPECIFICALLY DETAILED FOR SEISMIC
DESIGN BASE SHEAR:	V =156 KIPS	
RESPONSE MODIFICATION FACTOR:	R = 3.0	
ANALYSIS PROCEDURE:	EQUIVALENT LATERAL FORCE	

TANK FOUNDATION GENERAL NOTES

1. FOUNDATION DESIGN IS BASED ON AQUASTORE GLASS-FUSED-TO-STEEL BOLTED TANK AND BASED ON THE FOLLOWING INFORMATION. IF ANY OF THIS INFORMATION IS NOT ACCURATE, PLEASE INFORM THE CONTRACTNG OFFICER IMMEDIATELY.
   A. CAPACITY 300,000 GALLONS
   B. TANK INSIDE DIAMETER IS 33.57'
   C. HEIGHT OF TANK SIDEWALL IS 46.75'
   D. MAXIMUM WATER LEVEL IS 46 FEET
2. REMOVE ALL TOPSOIL AND DEBRIS FROM SITE. EXCAVATE TO FIRM, UNDISTURBED SUBGRADE. PROOF ROLL THE SUBGRADE IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER USING A LOADED DUMP TRUCK. WHERE NECESSARY, COMPACT THE SUBGRADE TO 95% OF MODIFIED PROCTOR (ASTM D1557) USING A VIBRATORY ROLLER.
3. CONSTRUCT AN AGGREGATE BASE USING 12 INCHES OF NO. 57 COMPACTED CRUSHED LIMESTONE. THE BASE SHALL CONSIST OF TWO 6-INCH COURSES, COMPACTED TO 95% OF MODIFIED PROCTOR (ASTM D1557). THE TOP OF THE AGGREGATE BASE SHALL BE AT LEAST ONE FOOT LARGER IN DIAMETER THAN THE TANK FOUNDATION. SLOPE THE SIDES OF THE AGGREGATE BASE AT 2 HORIZONTAL UNITS TO 1 VERTICAL UNIT.
4. COMPLY WITH ACI 301-16 SPECIFICATIONS FOR STRUCTURAL CONCRETE UNLESS NOTED OTHERWISE.
5. CORROSION INHIBITING ADDMIXTURE SHALL BE USED IN ALL CONCRETE USED FOR FIRE PROTECTION WATER TANK FOUNDATIONS.
6. TOP SURFACE OF CONCRETE MAT FOUNDATION SHALL RECEIVE A FLOAT FINISH.
7. COORDINATE SLOPE AND/OR LEVELNESS REQUIREMENTS WITH THE TANK SUPPLIER.
8. PROVIDE REPAIR AND PATCHING OF DEFECTS IN ACCORDANCE WITH ACI 301-16.
9. CONSTRUCTION JOINTS AND CONTROL JOINTS NOT ALLOWED. CONCRETE PLACEMENT SHALL BE MONOLITHIC WITH NO JOINTS OF ANY KIND. CONTRACTOR SHALL SUBMIT CONCRETE PLACEMENT PLAN. PLACEMENT PLAN SHALL INCLUDE TRUCKING TIMING, PLACEMENT EQUIPMENT AND PLANNED CREW SIZE.
10. FINISHED GRADE WILL BE BELOW TOP OF FOUNDATION MAT.
11. CONTRACTOR SHALL COORDINATE PIPE PENETRATIONS THROUGH FOUNDATION MAT WITH REINFORCING STEEL. PIPE PENETRATIONS SHALL BE SURROUNDED BY (3) #5 TIES SPACED 9 INCHES ON CENTER.
12. ALL CHAIRS, STANDS, SUPPORTS, FORM TIES, ETC. PLACED WITHIN 2-INCHES OF THE CONCRETE SURFACE SHALL BE NON-METALLIC OR COATED WITH EPOXY TO PREVENT SURFACE SPALLING AND PROPAGATION OF CORROSION TO THE REINFORCEMENT.

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phone: 810-956-9300

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP., MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.:	VGLZ162323
M&H NO.:	3141700-181848.01
DATE:	December 16, 2022
DESIGNED BY:	WBB
DRAWN BY:	ACT
CHECKED BY:	BMB

DO NOT SCALE DRAWINGS.

SHEET CONTENTS
FIRE PROTECTION WATER TANK FOUNDATION DETAILS

SHEET NO.:
S-505

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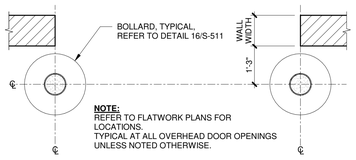
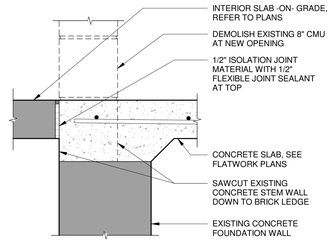
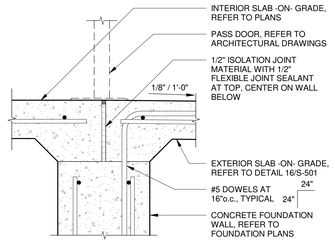


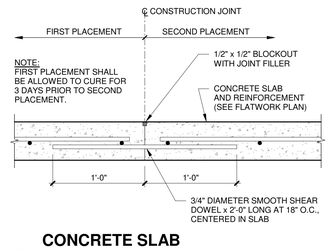
15 BOLLARD LOCATION PLAN
1/2" = 1'-0"



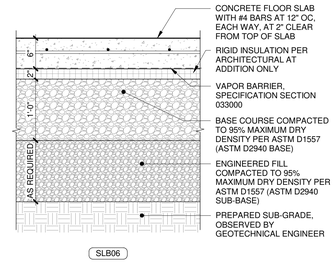
12 SLAB OVERRUN AT OLD EXTERIOR
1 1/2" = 1'-0"

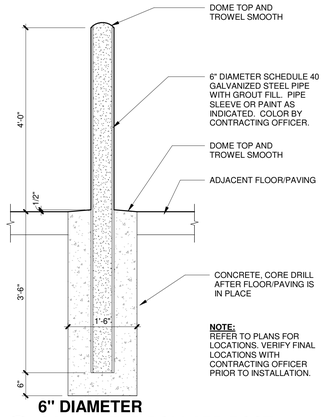


7 SLAB AT PASS DOOR
1 1/2" = 1'-0"

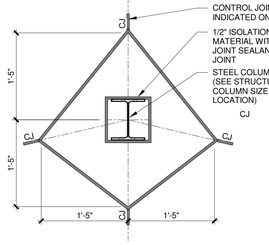


4 CONCRETE SLAB CONSTRUCTION JOINT (TYPICAL)
1 1/2" = 1'-0"

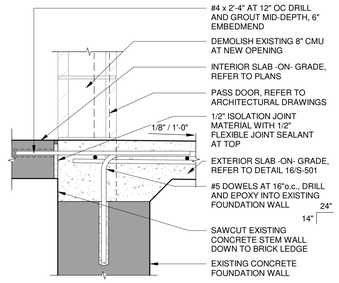




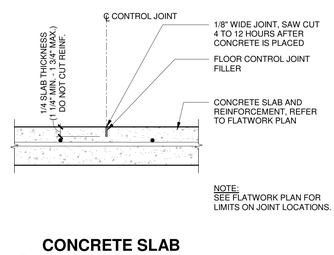
16 6" DIAMETER GALVANIZED BOLLARD POST
3/4" = 1'-0"



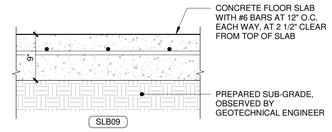
INTERIOR COLUMNS



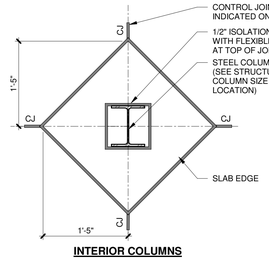
8 SLAB AT PASS DOOR
1 1/2" = 1'-0"



5 CONCRETE SLAB CONTROL JOINT "CJ" (TYPICAL)
1 1/2" = 1'-0"



1 STRUCTURAL SLAB TYPES
1" = 1'-0"



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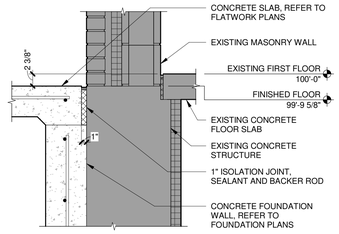
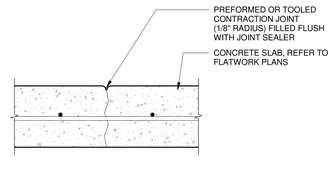
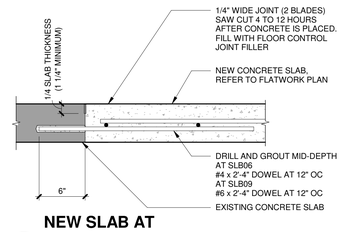


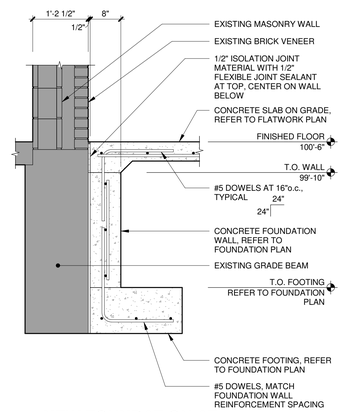
9 CONCRETE SLAB AT EXISTING WALL
1" = 1'-0"



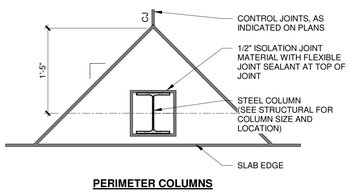
6 CONCRETE SLAB TOOLED JOINT "TJ" (TYPICAL)
3" = 1'-0"



2 NEW SLAB AT EXISTING CONTROL JOINT "ECJ"
1 1/2" = 1'-0"

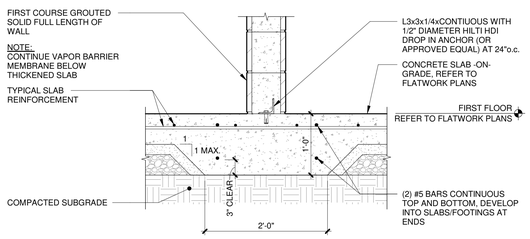


17 NEW FOUNDATION AT EXISTING FOUNDATION WALL
3/4" = 1'-0"

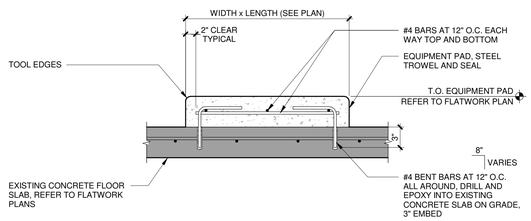


PERIMETER COLUMNS

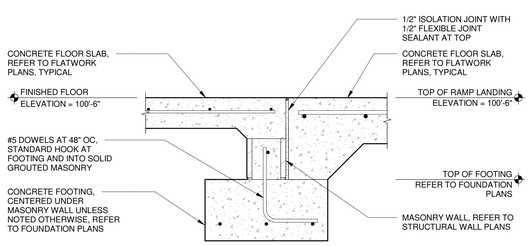
13 SLAB JOINTS AT ISOLATED COLUMN
1" = 1'-0"



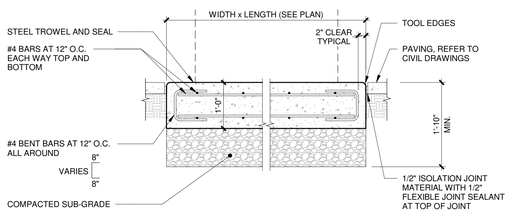
10 THICKENED SLAB SECTION
1" = 1'-0"



3 EQUIPMENT PADS
1" = 1'-0"



14 SLAB AT PASS DOOR
1" = 1'-0"



11 EXTERIOR EQUIPMENT PADS
3/4" = 1'-0"

TETRA TECH
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Ann Arbor, MI 48108
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ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.:	VGLZ162323
M&H NO.:	3141700-181848.01
DATE:	December 16, 2022
DESIGNED BY:	JJF
DRAWN BY:	ACT
CHECKED BY:	WBB

DO NOT SCALE DRAWINGS

SHEET CONTENTS
FLATWORK DETAILS

SHEET NO.:
S-511

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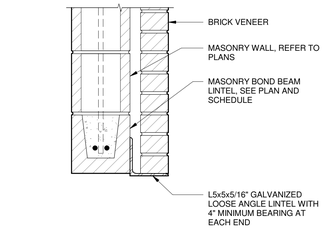
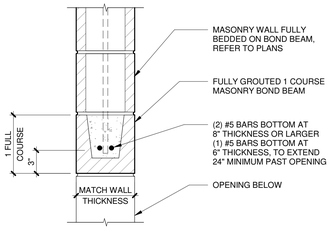
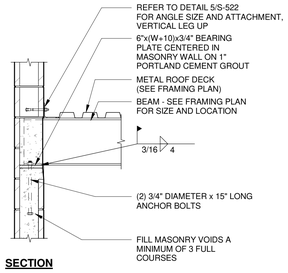


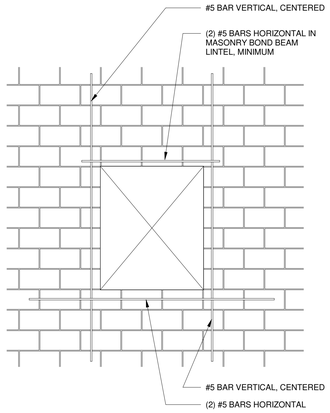
20 LOOSE ANGLE LINTEL AT B158
1 1/2" = 1'-0"



15 BOND BEAM LINTEL L19
1 1/2" = 1'-0"

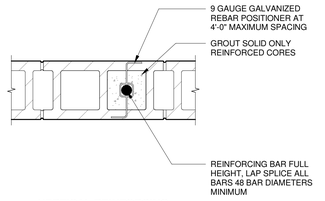


SECTION



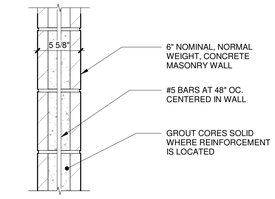
NOTE:
IN ADDITION TO OPENINGS SHOWN ON THE DRAWINGS, MASONRY AND STEEL WORK SHALL INCLUDE PROVIDING MASONRY WALL OPENINGS AND ASSOCIATED LINTELS REQUIRED FOR MECHANICAL/ELECTRICAL EQUIPMENT (OTHER THAN INDIVIDUAL PIPE PENETRATIONS FIELD DRILLED BY THE APPROPRIATE TRADES DURING THEIR WORK), INCLUDING COORDINATING WITH OTHER TRADES, GENERAL CONTRACTOR, CONTRACTING OFFICER, AND FINAL MECHANICAL AND ELECTRICAL DRAWINGS TO VERIFY EXACT SIZES AND LOCATIONS OF ALL SUCH OPENINGS AS WORK PROGRESSES. FINAL SIZES MAY NOT BE AVAILABLE UNTIL EQUIPMENT SHOP DRAWINGS ARE RECEIVED FROM SUCCESSFUL BIDDERS. ALL PARTIES SHOULD BE PREPARED TO PLAN AND COOPERATE ACCORDINGLY TO AVOID UNNECESSARY DELAYS IN THE WORK.

8 TYPICAL MASONRY OPENING REINFORCEMENT
1/2" = 1'-0"



VERTICAL REINFORCING

3 TYPICAL BAR PLACEMENT IN MASONRY CORE
1 1/2" = 1'-0"



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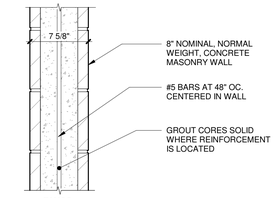

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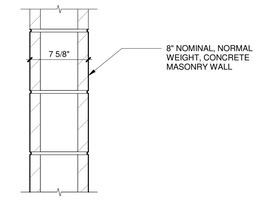

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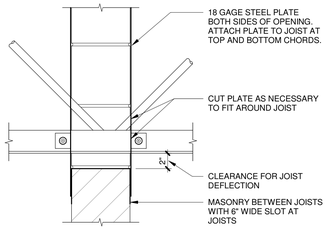
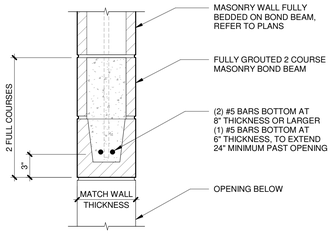
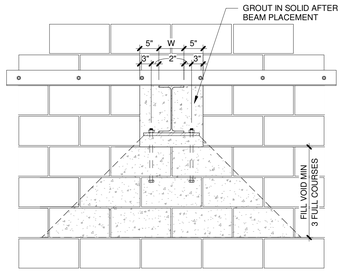


SECTION

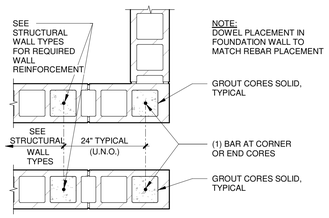


16 BOND BEAM LINTEL L20
1 1/2" = 1'-0"

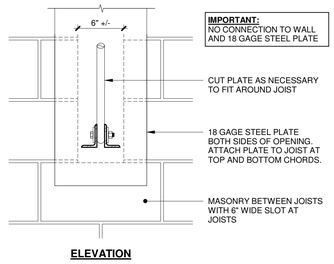


ELEVATION

11 STEEL BEAM BEARING ON MASONRY
3/4" = 1'-0"

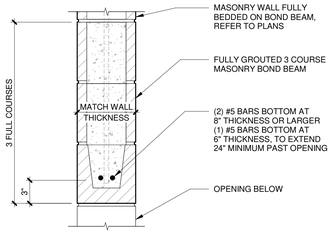


4 TYPICAL REBAR PLACEMENT IN MASONRY WALL
1" = 1'-0"

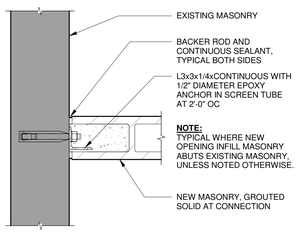


ELEVATION

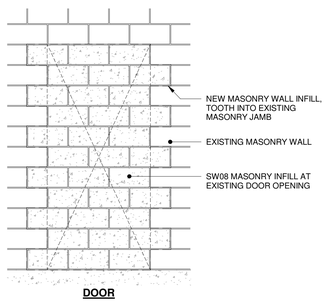
21 JOIST DEFLECTION PROVISIONS AT NON-LOAD BEARING MASONRY
1 1/2" = 1'-0"



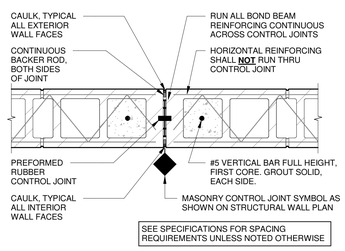
17 BOND BEAM LINTEL L21
1 1/2" = 1'-0"



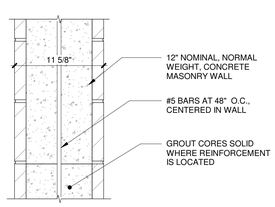
12 NEW MASONRY TO OLD AT INTERSECTION
1 1/2" = 1'-0"



DOOR

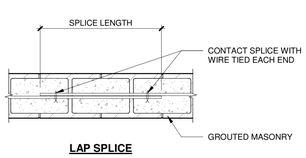


5 TYPICAL MASONRY CONTROL JOINT
1 1/2" = 1'-0"



SW12

1 STRUCTURAL WALL TYPES
1 1/2" = 1'-0"

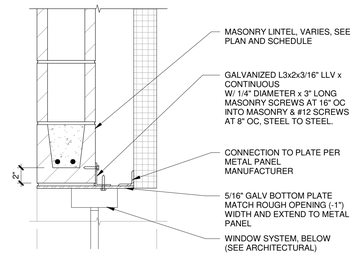


LAP SPLICE

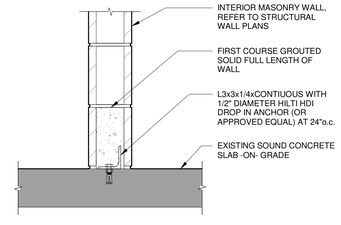
MASONRY REINFORCING DEVELOPMENT AND LAP SPLICE SCHEDULE			
SIZE	DEVELOPMENT OR SPLICE LENGTH (1d)	SIZE	DEVELOPMENT OR SPLICE LENGTH (1d)
#3	16"	#7	63"
#4	26"	#8	72"
#5	40"	#9	82"
#6	54"		

NOTES:
1. THIS DETAIL SHALL BE USED WHERE REBAR SPLICE LENGTHS AND DEVELOPMENTS ARE NOT SPECIFICALLY DETAILED/DIMENSIONED IN THE DRAWINGS.
2. LAP SPLICE LENGTHS GIVEN ARE APPLICABLE FOR NORMAL WEIGHT GROUTED CMU WITH A MINIMUM STRENGTH (f'm) OF 1500 PSI.
3. MASONRY REINFORCEMENT DEVELOPMENT LENGTH IS THE SAME AS SPLICE LENGTH, TYPICAL.
4. WHERE BARS OF DIFFERENT SIZE ARE LAP SPLICED, SPLICE LENGTH SHALL BE THE SPLICE LENGTH OF LARGER BAR.
5. SEE CONCRETE REINFORCING DETAILS FOR BAR BENDS AND STANDARD HOOK DIMENSIONS.

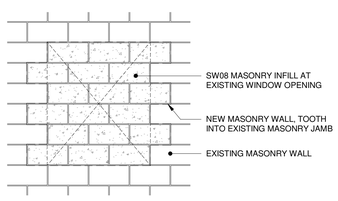
22 MASONRY REINFORCEMENT SPLICES AND DEVELOPMENT LENGTHS
3/4" = 1'-0"



18 EXTERIOR LINTEL PLATE
1 1/2" = 1'-0"

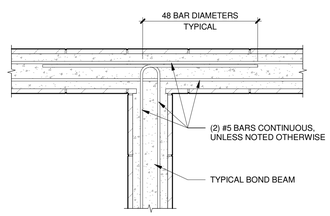


13 TYPICAL INTERIOR MASONRY WALL BASE CONNECTION
1 1/2" = 1'-0"

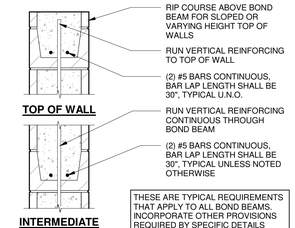


WINDOW

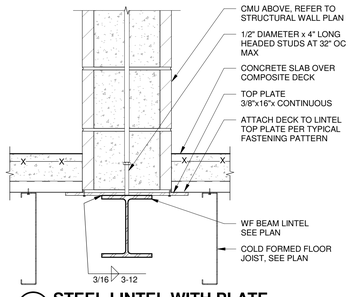
9 TYPICAL MASONRY WALL INFILL
1/2" = 1'-0"



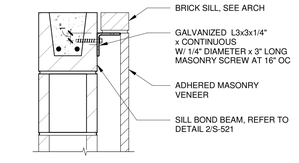
6 TYPICAL MASONRY BOND BEAM INTERSECTION
3/4" = 1'-0"



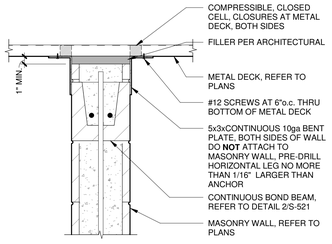
2 TYPICAL MASONRY BOND BEAM
1" = 1'-0"



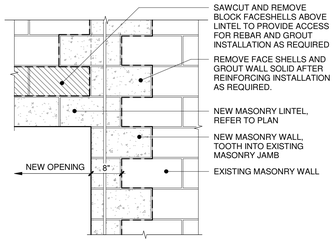
19 STEEL LINTEL WITH PLATE
1 1/2" = 1'-0"



14 SILL ANGLE AT ADHERED MASONRY
1 1/2" = 1'-0"



10 TYPICAL NON-LOAD BEARING MASONRY WALL TOP CONNECTION
1 1/2" = 1'-0"



7 NEW MASONRY LINTEL AT EXISTING MASONRY WALL
3/4" = 1'-0"

TETRA TECH
Mead & Hunt
Joint Venture with
Mason&Hanger
710 Avis Drive, Suite 100,
Ann Arbor, MI 48108
phone: 810-956-9300

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WE STAND READY

MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: JJF
DRAWN BY: ACT
CHECKED BY: WBB
DO NOT SCALE DRAWINGS

SHEET CONTENTS
WALL DETAILS

SHEET NO.:
S-521

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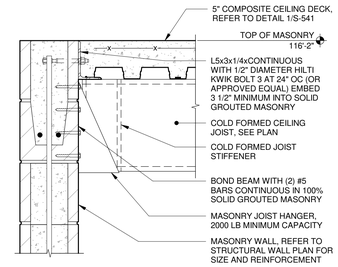
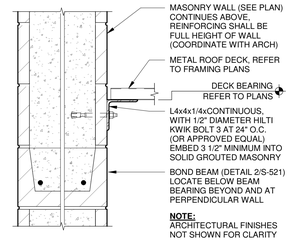
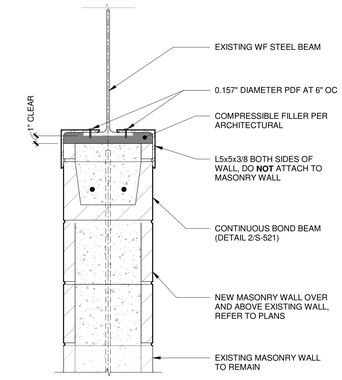


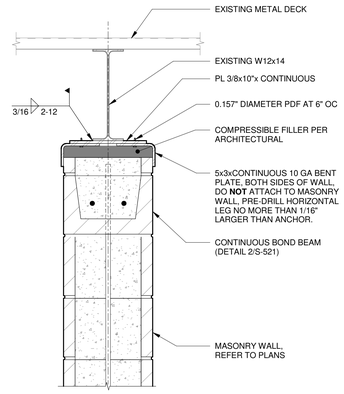
4 JOIST BEARING AT MASONRY WALL
1 1/2" = 1'-0"



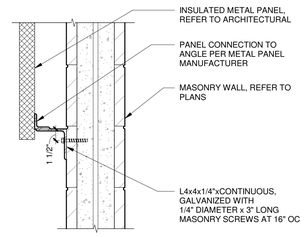
5 DECK BEARING AT MASONRY WALL
1 1/2" = 1'-0"



NON-LOAD BEARING MASONRY WALL TOP CONNECTION
1 1/2" = 1'-0"



NON-LOAD BEARING MASONRY WALL TOP CONNECTION
1 1/2" = 1'-0"



METAL WALL PANEL SUPPORT ANGLE
1 1/2" = 1'-0"

TETRA TECH
Mead & Hunt
Joint Venture with
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710 Avis Drive, Suite 100,
Ann Arbor, MI 48108
phone: 810-956-9300

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WE STAND READY

MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
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DRAWN BY: ACT
CHECKED BY: WBB
DO NOT SCALE DRAWINGS

SHEET CONTENTS
WALL DETAILS

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S-522

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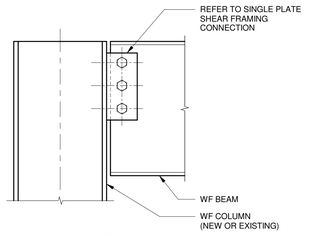
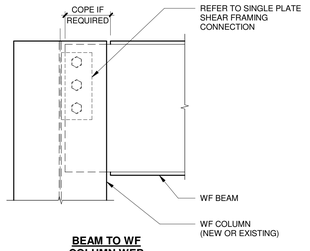
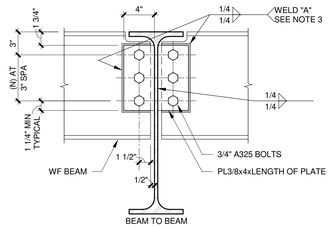


BEAM TO WF COLUMN FLANGE



BEAM TO WF COLUMN WEB

20 BEAM-COLUMN SINGLE PLATE CONNECTION
1 1/2" = 1'-0"

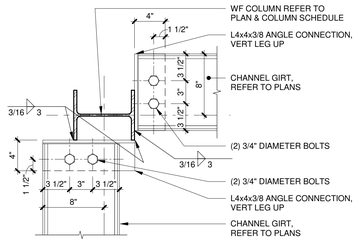


SINGLE PLATE SHEAR CONNECTION		
NOMINAL BEAM DEPTH, INCHES	**ROWS OF BOLTS (N)**	**LENGTH OF PLATE**
W36	10	29 1/2"
W33	9	26 1/2"
W30	8	23 1/2"
W24 - W27	7	20 1/2"
W21	6	17 1/2"
W18	5	14 1/2"
W16	4	11 1/2"
W12 - W14	3	8 1/2"
W8 - W10	2	5 1/2"

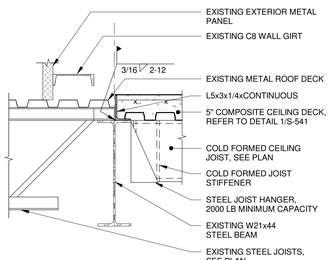
SINGLE PLATE SHEAR CONNECTION NOTES

1. ALL FRAMING CONNECTIONS SHALL CONFORM TO SCHEDULE UNLESS DETAILED OR NOTED OTHERWISE.
2. STANDARD HOLES OR HORIZONTAL SHORT SLOT HOLES MAY BE UTILIZED AT CONTRACTORS OPTION IN EITHER THE CONNECTION ANGLE OR THE FRAMING MEMBERS.
3. WELD "A" MAY BE USED IN LIEU OF "A" SIDE BOLTS AT CONTRACTORS OPTION. WELD SHALL BE ON ALL 3 SIDES.
4. FOR MISS-ALIGNED BOLT HOLES, PROVIDE FIELD WELDS. NOTIFY THE CONTRACTING OFFICER OF LOCATIONS USING FIELD WELDED CONNECTION.
5. REFER TO TYPICAL COPING DETAIL 1/S-601 FOR CONNECTIONS WHERE COPING IS REQUIRED

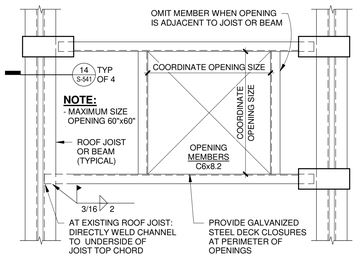
21 TYPICAL SINGLE PLATE SHEAR FRAMING CONNECTION
1 1/2" = 1'-0"



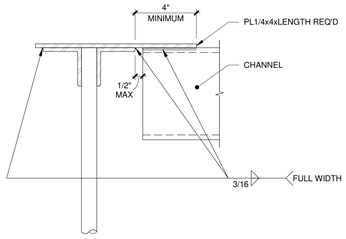
17 GIRT CONNECTION TO COLUMN
1 1/2" = 1'-0"



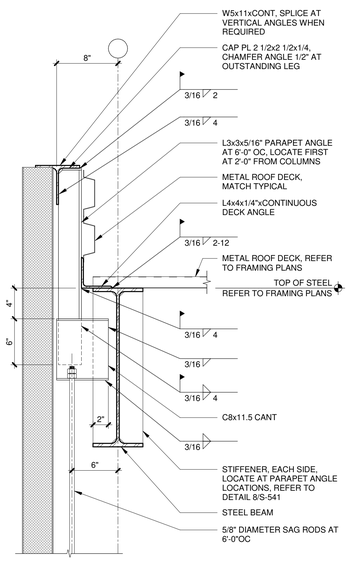
18 JOIST BEARING AT WF BEAM
1" = 1'-0"



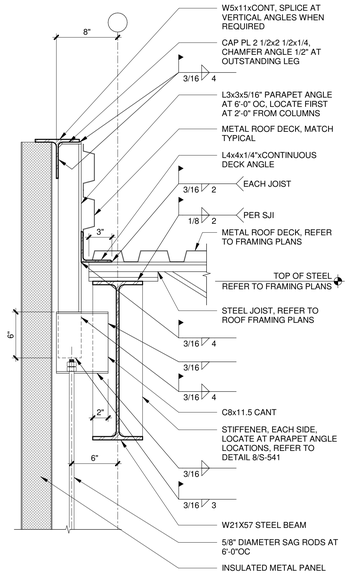
13 TYPICAL FRAMED ROOF OPENING
1" = 1'-0"



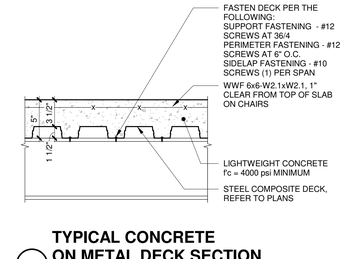
14 CHANNEL TO JOIST CONNECTION - NEW
3" = 1'-0"



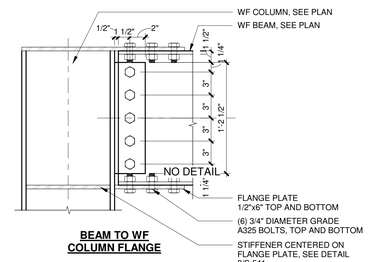
9 PARAPET FRAMING AT ROOF DECK BEARING
1 1/2" = 1'-0"



6 PARAPET FRAMING AT JOIST BEARING
1 1/2" = 1'-0"

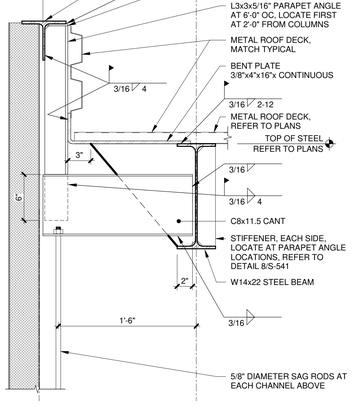


1 TYPICAL CONCRETE ON METAL DECK SECTION
1 1/2" = 1'-0"

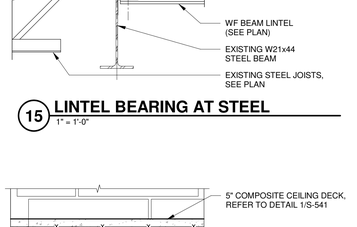


BEAM TO WF COLUMN FLANGE

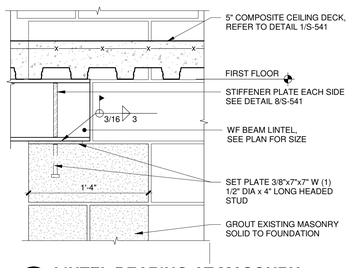
2 BEAM-COLUMN MOMENT CONNECTION
1 1/2" = 1'-0"



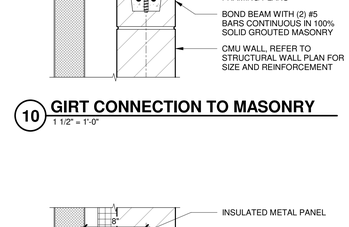
19 PARAPET FRAMING AT LARGE OFFSET
1 1/2" = 1'-0"



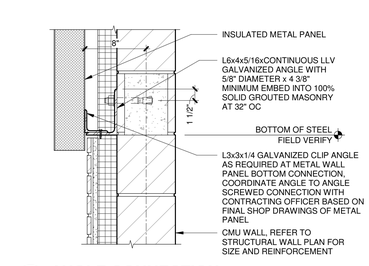
15 LINTEL BEARING AT STEEL
1" = 1'-0"



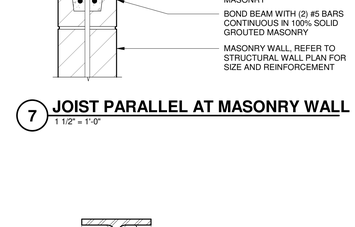
16 LINTEL BEARING AT MASONRY
1 1/2" = 1'-0"



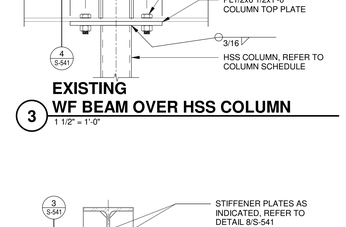
10 GIRT CONNECTION TO MASONRY
1 1/2" = 1'-0"



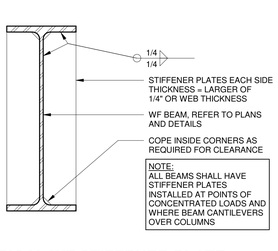
11 ANGLE CONNECTION
1 1/2" = 1'-0"



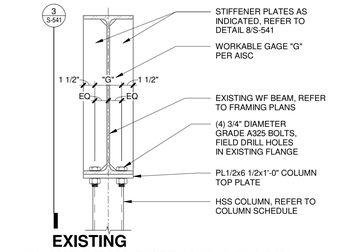
7 JOIST PARALLEL AT MASONRY WALL
1 1/2" = 1'-0"



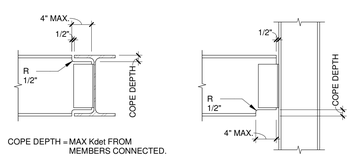
3 EXISTING WF BEAM OVER HSS COLUMN
1 1/2" = 1'-0"



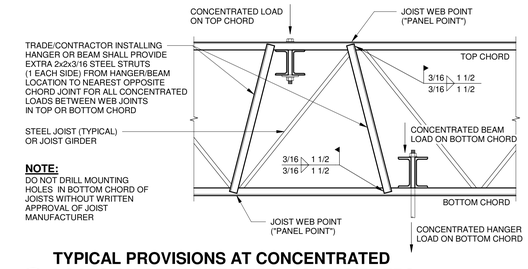
8 TYPICAL WF STIFFENER PLATE
1 1/2" = 1'-0"



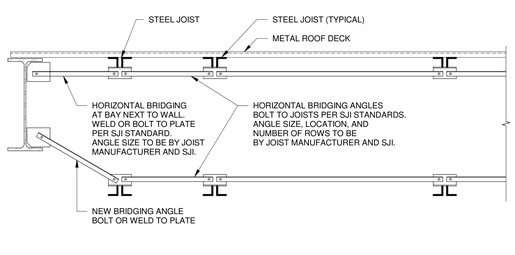
4 EXISTING WF BEAM OVER HSS COLUMN
1 1/2" = 1'-0"



22 TYPICAL COPING DETAIL
1" = 1'-0"



12 TYPICAL PROVISIONS AT CONCENTRATED LOADS ON OPEN WEB STEEL JOIST/GIRDERS
3/4" = 1'-0"



5 HORIZONTAL JOIST BRIDGING AT WF BEAM
3/4" = 1'-0"

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MICHIGAN AIR NATIONAL GUARD ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

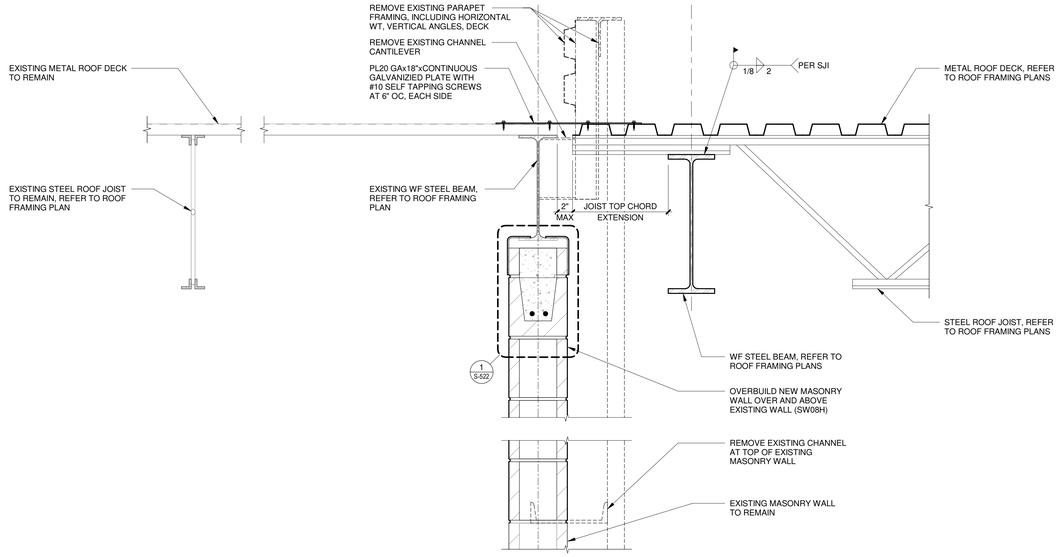
ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: JJF
DRAWN BY: ACT
CHECKED BY: WBB
DO NOT SCALE DRAWINGS

SHEET CONTENTS
FRAMING DETAILS

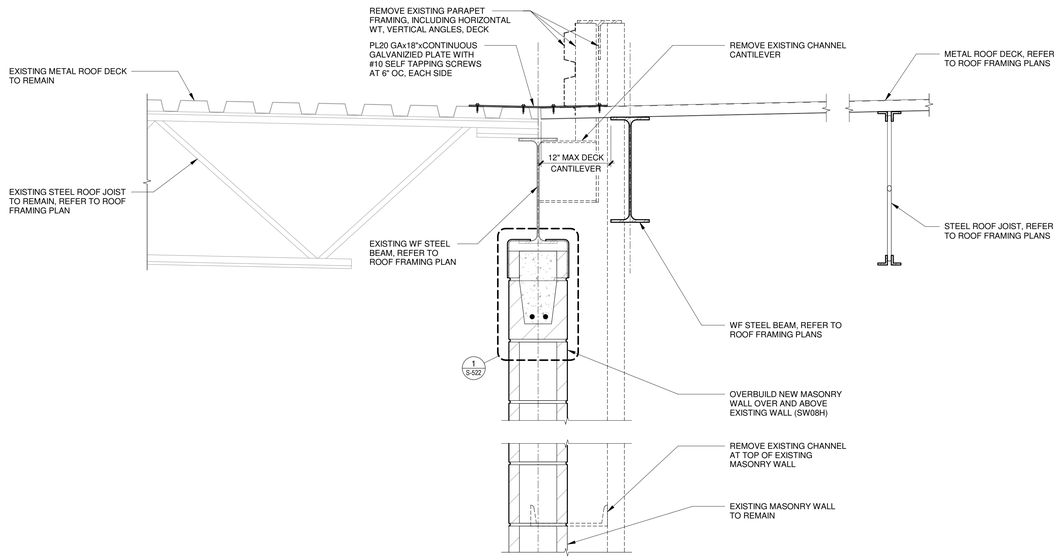
SHEET NO.:
S-541

12/12/2022 2:12:45 PM C:\Revit Local\3141700-181848.01-S-Central-2020_anne.thompson@meadhunt.com.rvt



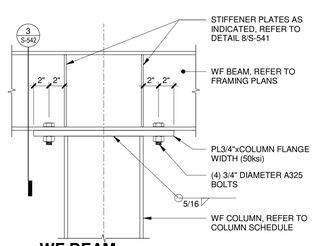
1 NEW ROOF JOIST BEARING AT EXISTING

1 1/2" = 1'-0"



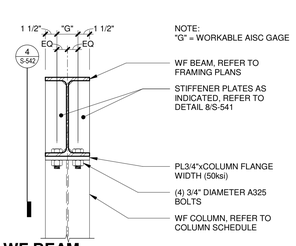
2 NEW ROOF JOIST PARALELL AT EXISTING

1 1/2" = 1'-0"



WF BEAM- WF COLUMN CONNECTION

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



WF BEAM- WF COLUMN CONNECTION

3 1 1/2" = 1'-0"

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

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HARRISON TWP, MICHIGAN

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SHEET CONTENTS
FRAMING DETAILS

SHEET NO.:
S-542

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STRUCTURAL COLUMN SCHEDULE

COLUMN LOCATION	COLUMN SIZE	BASE PLATE		ANCHOR BOLTS SIZE AND EMBED	REMARKS
		DETAIL	THICKNESS		
D.3-1	W8X24	4/S-601	3/4"	(4) 3/4" - 12"	
E.7-3	HSS4X4X1/4	5/S-601	3/4"	(4) 1/2" - 6"	EPOXY ANCHORS & GRADE 36 RODS
F.3-3	HSS4X4X1/4	5/S-601	3/4"	(4) 1/2" - 6"	EPOXY ANCHORS & GRADE 36 RODS
G.1-1.1	W12X50	4/S-601	3/4"	(4) 3/4" - 12"	
G.1-1.7	W12X50	4/S-601	3/4"	(4) 3/4" - 12"	
H.4-1	W8X24	4/S-601	3/4"	(4) 3/4" - 12"	
H.4-2	W8X24	4/S-601	3/4"	(4) 3/4" - 12"	

LINTEL SCHEDULE

MARK	DESCRIPTION	BEARING	DETAIL	REMARKS
L19	1 COURSE BOND BEAM WITH (2) #5 AT BOTTOM	8" E.E.	15/S-521	
L20	2 COURSE BOND BEAM WITH (2) #5 AT BOTTOM	8" E.E.	16/S-521	
L21	3 COURSE BOND BEAM WITH (2) #5 AT BOTTOM	8" E.E.	17/S-521	

LINTEL SCHEDULE GENERAL NOTES

1. SEE DETAIL 18/S-521 FOR TYPICAL EXTERIOR LINTEL PLATES REQUIRED AT EXTERIOR LINTELS.

CONCRETE STRIP FOOTING SCHEDULE

MARK	SIZE		TOP REINFORCEMENT		BOTTOM REINFORCEMENT		REMARKS
	WIDTH "W"	HEIGHT "H"	LONG.	TRANS.	LONG.	TRANS.	
SF1.5	1'-6"	1'-0"			(2) #5		
SF2	2'-0"	1'-0"			(3) #5		

CONCRETE STRIP FOOTING SCHEDULE NOTES

1. SEE NOTE SHEET S-001 FOR BEARING SOILS PREPARATION REQUIREMENTS.
2. SEE 9/S-501 FOR TYPICAL FOOTING INTERSECTION REINFORCING.
3. EMBED DOWELS INTO FOOTING, 3" CLEAR COVER FROM BOTTOM OF FOOTING.

CONCRETE SPREAD FOOTING SCHEDULE

MARK	SIZE			BOTTOM REINFORCEMENT		TOP REINFORCEMENT		REMARKS
	WIDTH	LENGTH	THICKNESS	LONG.	TRANS.	LONG.	TRANS.	
F3	3'-0"	3'-0"	1'-0"	(3) #5	(3) #5			
F4	4'-8"	4'-8"	1'-0"	(4) #5	(4) #5			
F6	4'-0"	6'-0"	1'-0"	(4) #5	(6) #5	(4) #5	(6) #5	

CONCRETE SPREAD FOOTING SCHEDULE GENERAL NOTES

1. SEE NOTE SHEET S-001 FOR BEARING SOILS PREPARATION REQUIREMENTS.

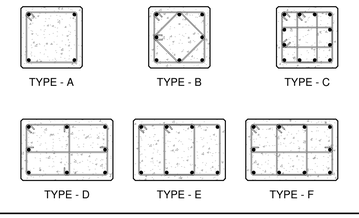
CONCRETE PIER SCHEDULE

MARK	SIZE	VERTICAL REINFORCEMENT	TIES		REMARKS
			TYPE	# AND SPACING	
P16	16x16	(8) #6	TYPE-B	#3 AT 12"O.C.	
P20	20x16	(8) #6	TYPE-D	#3 AT 12"O.C.	

CONCRETE PIER SCHEDULE GENERAL NOTES

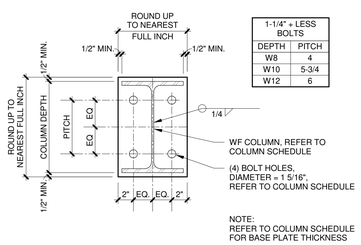
1. SEE FOUNDATION PLANS FOR TOP OF PIER ELEVATIONS.
2. REFERENCE TYPICAL TIE DETAILS FOR CROSS-TIE REQUIREMENTS.
3. WHEN PIERS ARE INTEGRAL WITH WALLS, PIER DIMENSIONS ARE INDICATED FOR THE PURPOSE OF DIMENSIONING PIER TIES, SETTING VERTICAL REINFORCING, DEFINING EXTENT OF TOP OF PIER RECESS OR PROJECTION FROM TOP OF WALL. CENTER PIER REINFORCING CAGE BELOW COLUMN AND ORIENT LONG DIMENSION OF PIER WITH AXIS OF WALL UNLESS NOTED OR DETAILED OTHERWISE. CONTINUE WALL REINFORCING THROUGH PIERS WITH LAPS AS REQUIRED.
4. SEE DETAIL 4/S-501 FOR TYPICAL PIER CONSTRUCTION.

TYPICAL TIE DETAILS



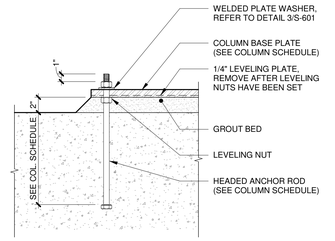
FOUNDATION WALL SCHEDULE

MARK	WIDTH	REINFORCEMENT		REMARKS
		HORIZONTAL	VERTICAL	
FW08	8"	#5 BARS @ 18"o.c., CENTERED	#5 BARS @ 18"o.c., CENTERED	
FW12	1'-0"	#5 BARS @ 18"o.c., EACH FACE	#5 BARS @ 18"o.c., EACH FACE	
FW14.5	1'-2 1/2"	#5 BARS @ 18"o.c., EACH FACE	#5 BARS @ 18"o.c., EACH FACE	

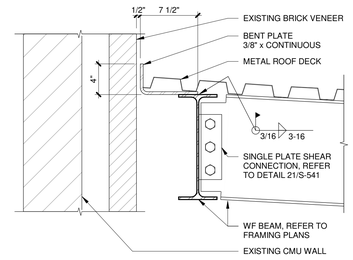


1-1/4" = LESS BOLTS	
DEPTH	PITCH
W8	4
W10	5-3/4
W12	6

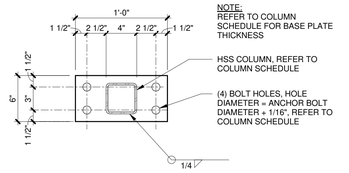
4 WF COLUMN BASE PLATE BP-1
1 1/2" = 1'-0"



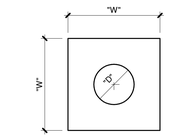
2 BASE PLATE ANCHORAGE
1 1/2" = 1'-0"



1 BENT PLATE AT EXISTING
1 1/2" = 1'-0"



5 HSS COLUMN BASE PLATE BP-2
1 1/2" = 1'-0"



ANCHOR ROD DIA.	MAX. HOLE DIA. ("D")	MIN. WASHER SIZE ("W")	MIN. WASHER THICKNESS	MIN. WELD REQUIRED
3/4"	13/16"	2"	1/4"	1/4"
7/8"	15/16"	2 1/2"	5/16"	1/4"
1"	1 1/16"	3"	3/8"	5/16"
1 1/4"	1 5/16"	3"	1/2"	3/8"

3 WELDED WASHER
6" = 1'-0"

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SHEET CONTENTS
SCHEDULES

SHEET NO.:
S-601

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FIRE PROTECTION SYMBOLS

- HYDRAULIC REFERENCE NODE
- OS&Y VALVE WITH TAMPER SWITCH
- ISOLATION VALVE
- CHECK VALVE
- WATERFLOW SWITCH
- PRESSURE REDUCING VALVE
- POST INDICATOR VALVE
- SP — WET PIPE SYSTEM
- [X'-X"] — PIPE ELEVATION AFF
- FIRE DEPARTMENT CONNECTION
- PIPE CONTINUATION
- DIRECTION OF FLOW

FIRE ALARM/ MNS SYMBOLS

- FMCP — FIRE ALARM/ MASS NOTIFICATION CONTROL PANEL
- RA — REMOTE ANNUNCIATOR PANEL
- FIRE ALARM/ MNS STROBE - WALL MOUNT
  -XX DENOTES CANDELA RATING
- C — FIRE ALARM/ MNS STROBE - CEILING MOUNT
  -XX DENOTES CANDELA RATING
  -WP DENOTES WEATHERPROOF
- SPEAKER - WALL MOUNT
  -WP DENOTES WEATHERPROOF
- H — HORN - WALL MOUNT
- XX C — FIRE ALARM/COMBINATION SPEAKER /STROBE - CEILING MOUNT
  -XX DENOTES CANDELA RATING
- S — FIRE ALARM/ MNS SPEAKER - CEILING MOUNT
  -WP DENOTES WEATHERPROOF
- SMOKE DETECTOR - PHOTOELECTRIC
- CO — CARBON MONOXIDE DETECTOR
- D — DUCT SMOKE DETECTOR
- F — FIRE ALARM MANUAL PULL STATION
- M — ADDRESSABLE INITIATING DEVICE MODULE
- C — ADDRESSABLE CONTROL (RELAY) MODULE
- PRESSURE SWITCH
- WATERFLOW SWITCH
- TAMPER SWITCH
- EXTERIOR FIRE ALARM BELL
- TVSS — TRANSIENT VOLTAGE SURGE SUPPRESSOR
- RTS — REMOTE TEST STATION
- LOC — LOCAL OPERATING CONSOLE
- RT — RADIO TRANSMITTER
- ANTENNA
- RPS — REMOTE POWER SUPPLY
- T — TEMPERATURE SENSOR
- K — KNOX BOX
- TEXT — TEXT SIGN
- DET-TRONICS X3301 MULTISPECTRUM IR OPTICAL FLAME DETECTOR
- RSFACU — RELEASING SERVICE FIRE ALARM CONTROL UNIT

FIRE PROTECTION GENERAL NOTES

1. FIRE PROTECTION SYSTEMS SHALL COMPLY WITH PROJECT SPECIFICATIONS, UFC 3-600-01, UFC 4-211-01, ETL 15-01-03, NFPA 13, NFPA 20, NFPA 24, AND ALL APPLICABLE CODES AND STANDARDS.
2. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE A GENERAL ARRANGEMENT OF WORK. GENERAL DESIGN CONCEPTS INDICATED MUST BE FOLLOWED OR BETTERED. THE BID SHALL INCLUDE OFFSETS, ADDITIONAL PIPING, VALVES, AND FIRE PROTECTION EQUIPMENT AS REQUIRED TO MEET CONSTRUCTION CONDITIONS FOR PROPER OPERATION. DEVELOP AND SUBMIT COORDINATION DRAWINGS.
3. PIPING WILL NOT BE SHOWN FOR THE SPRINKLER SYSTEM. THE CONTRACTOR SHALL PROVIDE FINAL ROUTING FOR ALL PIPING AND SHALL PROVIDE SHOP DRAWINGS THAT INCLUDE: EXACT DIMENSIONED ROUTING OF ALL PIPE, PIPE SIZES, DIMENSIONED TIE-IN LOCATIONS AT EXISTING PIPING, AND FIRE RATED CONSTRUCTION PENETRATIONS DETAILS. THE CONTRACTOR SHALL AVOID INTERFERENCES WITH OTHER PIPING, EQUIPMENT, CODE REQUIRED CLEARANCES, AND THE WORK OF OTHER DISCIPLINES. FIELD ROUTED LIQUID-FILLED PIPING SHALL NOT BE ROUTED ABOVE ELECTRICAL OR ELECTRONIC EQUIPMENT.
4. INSTALLING CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS AND LICENSES.
5. DESIGN AND INSTALLATION SUBJECT TO FINAL INSPECTION AND APPROVAL BY CONTRACTING OFFICER.
6. CUTTING OF STRUCTURAL AND/OR ARCHITECTURAL MEMBERS SHALL BE DONE ONLY WITH THE WRITTEN APPROVAL OF THE CONTRACTING OFFICER.
7. FIRE STOP ALL PENETRATIONS OF SMOKE/FIRE WALLS, RATED WALLS, CEILINGS, FLOOR, ROOFS, ETC. FLASH AND COUNTERFLASH ANY ROOF PENETRATIONS.
8. METHOD OF HANGING PIPES, HEADERS, AND BRANCHLINES SHALL BE IN ACCORDANCE WITH NFPA 13.
9. ALL VALVES FOR FIRE SERVICE SHALL BE LISTED BY THE UNDERWRITER'S LABORATORIES, INC. AND/OR THE FACTORY MUTUAL LABORATORIES. VALVES SHALL BE FACTORY MARKED "UL" AND/OR "FM" OR EQUIVALENT.
10. ALL NORMALLY OPEN VALVES ON THE FIRE PROTECTION SYSTEM SHALL BE ELECTRICALLY SUPERVISED AND SHALL BE THE RESPONSIBILITY OF THE FIRE SPRINKLER CONTRACTOR.
11. PROVIDE A PERMANENTLY ATTACHED HYDRAULIC NAME PLATE STATING THE REQUIRED DESIGN CRITERIA FOR EACH HYDRAULICALLY DESIGNED SYSTEM IN ACCORDANCE WITH NFPA 13.
12. ONLY NEW MATERIALS SHALL BE USED IN THE INSTALLATION OF THESE SYSTEMS.
13. ALL SUPPORTS SHALL BE ATTACHED TO THE BUILDING'S STRUCTURAL FRAME IN ACCORDANCE WITH NFPA 13.
14. INSTALL EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
15. ROD STIFFERNER REQUIRED FOR ALL-THREAD ROD HANGERS OVER 6' IN LENGTH.
16. INSTALL UNIONS IN PIPES 2" AND SMALLER, ADJACENT TO EACH VALVE. UNIONS ARE NOT REQUIRED ON FLANGED DEVICES OR IN PIPING INSTALLATIONS USING GROOVED MECHANICAL COUPLINGS.
17. SAFEGUARDING DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH ARMY CORPS OF ENGINEERING MANUAL (EM), EM-385-1-1, SAFETY AND HEALTH REQUIREMENTS MANUAL AND NFPA 241. CONTRACTOR SHALL COORDINATE SPECIFIC PLAN FOR FIRE PROTECTION DURING CONSTRUCTION WITH THE CONTRACTING OFFICER.
18. SPRINKLERS INSTALLED IN HIGH HEAT AREAS, INCLUDING BUT NOT LIMITED TO, ATTIC SPACES, OR IN CLOSE PROXIMITY TO UNIT HEATERS, SHALL HAVE A TEMPERATURE CLASSIFICATION IN ACCORDANCE WITH NFPA 13.
19. EQUIPMENT SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 36" ACCESS TO AND IN FRONT OF ALL EQUIPMENT AND 6" BEHIND THE EQUIPMENT.
20. PROVIDE SPRINKLER PROTECTION IN COMBUSTIBLE CONCEALED LOCATIONS IN ACCORDANCE WITH NFPA 13.
21. ALL SPRINKLER PIPING SHALL BE SCHEDULE 40 BLACK STEEL.
22. SEE SHEAR WALLS PLANS IN STRUCTURAL DRAWINGS FOR SHEAR WALL LOCATIONS AND RESTRICTIONS ON PENETRATIONS.

FIRE ALARM/MNS GENERAL NOTES

1. FIRE ALARM/MASS NOTIFICATION SYSTEMS SHALL COMPLY WITH UFC 3-600-01, UFC 4-021-01, UFC 4-211-01, ETL 15-01-03, NFPA 70, NFPA 72, AND PROJECT SPECIFICATIONS. NOTE THAT THE FIRE PUMP HOUSE WILL NOT BE PROVIDED WITH MASS NOTIFICATION.
2. PENETRATIONS IN FIRE RATED ASSEMBLIES SHALL BE FIRE-STOPPED WITH LISTED MATERIALS/ ASSEMBLIES IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
3. FIRE SUPPRESSION SYSTEM WATERFLOW AND CONTROL VALVE SUPERVISORY SWITCHES SHALL BE MONITORED BY THE BUILDING FIRE ALARM/ MASS NOTIFICATION SYSTEM.
4. THE FIRE ALARM CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF SYSTEM REQUIREMENTS WITH ALL CONDITIONS OF THE BUILDING AND SITE INCLUDING, BUT NOT LIMITED TO, BLIND SPACES, SHELVING, LIGHTS, HVAC GRILLES AND DIFFUSERS, PIPING, DUCT WORK, DOORS, WINDOWS, EQUIPMENT PLATFORMS, WALLS (FIRE RATED AND NON FIRE RATED), BEAMS, JOISTS, COLUMNS, HVAC EQUIPMENT, ELECTRICAL PANELS AND EQUIPMENT, CEILINGS, AREAS WITHOUT CEILINGS, WALL CONSTRUCTION, FLOORS AND ALL CONSTRUCTION, EQUIPMENT AND BUILDING APPURTENANCES.
5. THE FIRE ALARM CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING, DOCUMENTING, AND CERTIFYING REQUISITE INSPECTION AND TESTS IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS FOR ALL FIRE ALARM EQUIPMENT FURNISHED UNDER THIS PROJECT. AFTER COMPLETING THE TESTING, THE CONTRACTOR SHALL DEMONSTRATE FULL OPERATIONAL CAPABILITY OF THE FIRE ALARM/ MASS NOTIFICATION SYSTEM, AS WELL AS FULL COMPLIANCE WITH ALL DESIGN DOCUMENTS, CODES AND STANDARDS.
6. CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS MATERIAL FOR A COMPLETE INSTALLATION.
7. EACH CONVENTIONAL FIRE ALARM DEVICE MUST HAVE ITS OWN MONITOR MODULE.
8. ALL CONDUCTORS SHALL BE INSTALLED IN METALLIC CONDUITS.
9. ALL FIRE ALARM MODULES LOCATED WITHIN 15' OF A SPRINKLER/STANDPIPE SYSTEM RISER SHALL BE WEATHERPROOF WITH LIQUID TIGHT CONDUIT.
10. ALL CONDUIT FROM ANY FIRE ALARM DEVICE CONNECTED TO A DEVICE THAT MAY BE IN CONTACT WITH WATER SHALL BE LIQUID TIGHT. THIS INCLUDES, BUT IS NOT LIMITED TO, WATERFLOW SWITCHES, PRESSURE SWITCHES & TAMPER SWITCHES.
11. TELECOMMUNICATIONS CONDUIT SHALL BE INSTALLED IN ACCORDANCE WITH DIVISION 27 OF THE PROJECT SPECIFICATIONS.
12. PROVIDE A LABEL ON THE EXTERIOR OF EACH FIRE ALARM DEVICE THAT MATCHES THE DEVICE NUMBER (ADDRESS) AT THE FMCP. DEVICE ID NUMBERS SHALL BE VISIBLE FROM THE FLOOR TO THE MAXIMUM EXTENT PRACTICAL. MONITOR MODULES & CONTROL/RELAY MODULES SHALL ALSO BE LABELED AS TO WHAT THEY CONTROL.
13. ALL WIRING, CONDUIT, AND DEVICES LOCATED IN HAZARDOUS ATMOSPHERES, AS DEFINED BY NFPA 70, SHALL BE EXPLOSION PROOF. REFER TO THE ELECTRICAL PLANS FOR LOCATIONS.

FIRE PROTECTION ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
ATS	AUTOMATIC TRANSFER SWITCH
CD	CANDELA
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
CHKV	CHECK VALVE
CHEM	CHEMICAL
CLDIP	CEMENT LINED DUCTILE IRON PIPE
CP	CONTROL PANEL
DB	DECIBEL
FA	FIRE ALARM
FAB	FIRE ALARM BELL
FACP	FIRE ALARM CONTROL PANEL
FDC	FIRE DEPARTMENT CONNECTION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FM	FACTORY MUTUAL
FO	FIBER OPTIC
FOTM	FIBER OPTIC TRANSCEIVER MODULE
FPC	FIRE PUMP CONTROLLER
FS	FLOW SWITCH
FSD	FIRE SEPARATION DISTANCE
GFGI	GOVERNMENT FURNISHED GOVERNMENT INSTALLED
IAW	IN ACCORDANCE WITH
IBC	INTERNATIONAL BUILDING CODE
MFG	MANUFACTURER
MNS	MASS NOTIFICATION SYSTEM
NAC	NOTIFICATION APPLIANCE CIRCUIT
NC	NORMALLY CLOSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
OS&Y	OUTSIDE STEM AND YOKE
P	PUMP
PIV	POST INDICATOR VALVE
PRV	PRESSURE REDUCING VALVE
RCV	RISER CHECK VALVE
RSFAC	RELEASING SERVICE FIRE ALARM CONTROL UNIT
SB	SOUNDER BASE
SCH	SCHEDULE
SD	PHOTOELECTRIC SMOKE DETECTOR
SLC	SIGNALING LINE CIRCUIT
T	TANK
TBD	TO BE DETERMINED
TS	TAMPER SWITCH
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
UFC	UNIFIED FACILITIES CRITERIA
UL	UNDERWRITER'S LABORATORIES
UON	UNLESS OTHERWISE NOTED
USAF	UNITED STATES AIR FORCE
V	VALVE
VFD	VARIABLE FREQUENCY DRIVE
WP	WEATHERPROOF
ZCA	ZONE CONTROL ASSEMBLY

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-184848.01
DATE: December 16, 2022
DESIGNED BY: RAB
DRAWN BY: RAB
CHECKED BY: RDV
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SHEET CONTENTS
FIRE PROTECTION LEGEND AND SYMBOLS

SHEET NO.:
F-001

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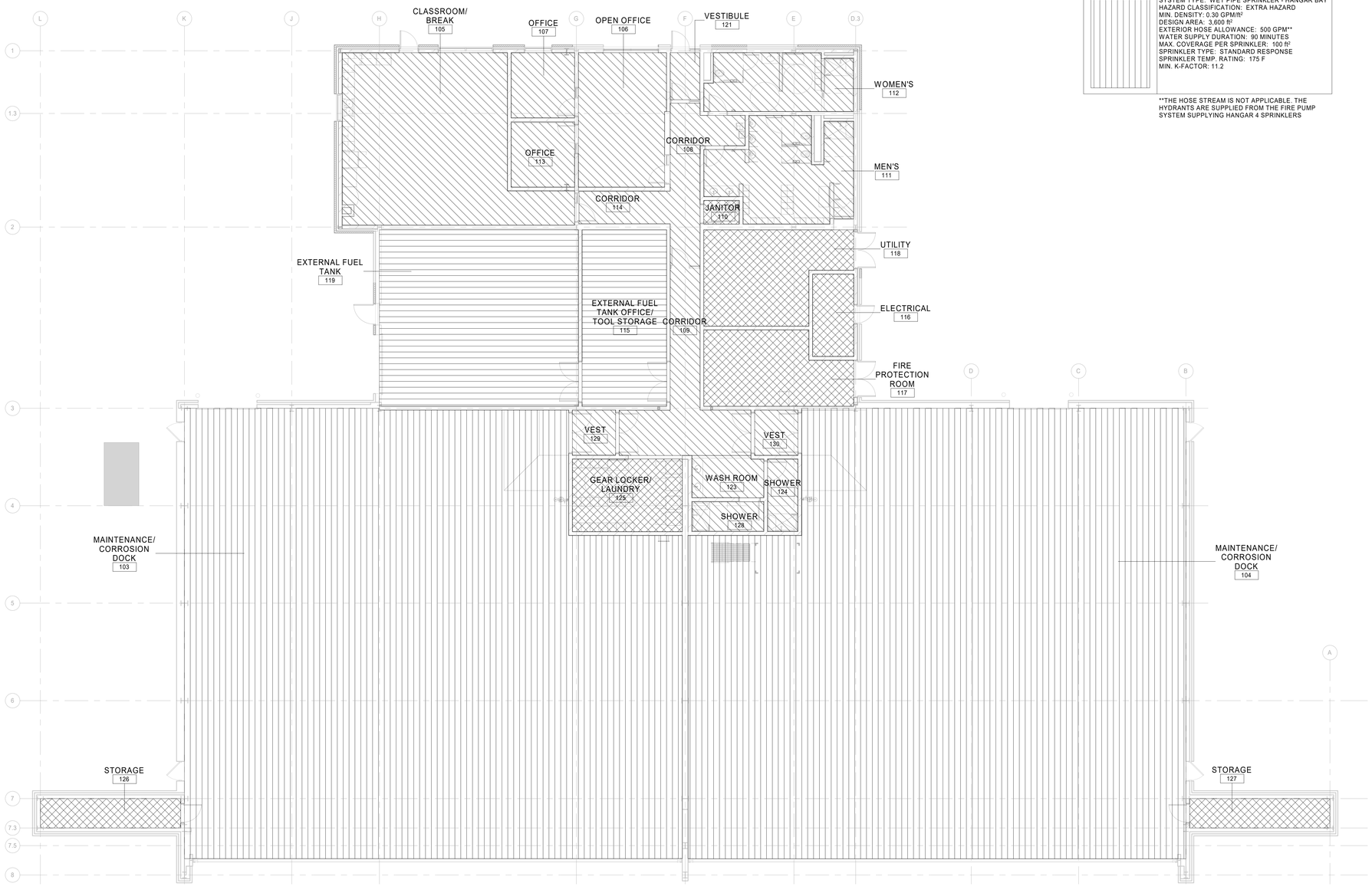

HAZARD CLASSIFICATIONS

	SYSTEM TYPE: WET PIPE SPRINKLER HAZARD CLASSIFICATION: LIGHT HAZARD MIN. DENSITY: 0.1 GPM/ft² DESIGN AREA: 1500 ft² EXTERIOR HOSE ALLOWANCE: 250 GPM** WATER SUPPLY DURATION: 60 MINUTES MAX. COVERAGE PER SPRINKLER: 225 ft² SPRINKLER TYPE: QUICK RESPONSE MIN. K-FACTOR: 5.6
	SYSTEM TYPE: WET PIPE SPRINKLER HAZARD CLASSIFICATION: ORDINARY HAZARD MIN. DENSITY: 0.2 GPM/ft² DESIGN AREA: 2500 ft² EXTERIOR HOSE ALLOWANCE: 250 GPM** WATER SUPPLY DURATION: 60 MINUTES MAX. COVERAGE PER SPRINKLER: 130 ft² SPRINKLER TYPE: QUICK RESPONSE MIN. K-FACTOR: 8.0
	WET PIPE SPRINKLER HAZARD CATEGORY: MISCELLANEOUS STORAGE COMMODITY: CLASS IV TYPE OF STORAGE: SHELF ≤ 12 FEET HIGH DENSITY: 0.30 GPM/SF AREA: 2,500 SF EXTERIOR HOSE ALLOWANCE: 500 GPM MAX. COVERAGE PER SPRINKLER: 100 SF SPRINKLER TYPE: STANDARD RESPONSE K-FACTOR: 11.2
	SYSTEM TYPE: WET PIPE SPRINKLER - HANGAR BAY HAZARD CLASSIFICATION: EXTRA HAZARD MIN. DENSITY: 0.30 GPM/ft² DESIGN AREA: 3,600 ft² EXTERIOR HOSE ALLOWANCE: 500 GPM** WATER SUPPLY DURATION: 90 MINUTES MAX. COVERAGE PER SPRINKLER: 100 ft² SPRINKLER TYPE: STANDARD RESPONSE SPRINKLER TEMP. RATING: 175 F MIN. K-FACTOR: 11.2

**THE HOSE STREAM IS NOT APPLICABLE. THE HYDRANTS ARE SUPPLIED FROM THE FIRE PUMP SYSTEM SUPPLYING HANGAR 4 SPRINKLERS

GENERAL NOTES

A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.

B. THE BUILDING SHALL BE PROVIDED WITH AN AUTOMATIC SPRINKLER SYSTEM THROUGHOUT IN ACCORDANCE WITH NFPA 13, UFC 3-600-01, & UFC 4-211-01. SPRINKLER CONTRACTOR SHALL BE RESPONSIBLE FOR SPRINKLER AND PIPING LAYOUTS IN ACCORDANCE WITH NFPA 13.

N 1 **HAZARD CLASSIFICATION PLAN**
1/8" = 1'-0"

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SHEET CONTENTS
HAZARD CLASSIFICATION PLAN

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F-101

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GENERAL NOTES

A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.

B. THE BUILDING SHALL BE PROVIDED WITH AN AUTOMATIC SPRINKLER SYSTEM THROUGHOUT IN ACCORDANCE WITH NFPA 13, UFC 3-600-01, & UFC 4-211-01.

C. DESIGN THE SPRINKLER PIPING SUCH THAT THE MAJORITY OR ALL OF THE SYSTEM DRAINS BACK TO THE RISER. MINIMIZE OR ELIMINATE THE REQUIREMENT FOR REMOTE DRAINAGE CONNECTIONS IN THE HANGAR BAY.

D. EQUIPMENT IN THE HANGAR BAY AND ROOMS WITH DOORS TO THE HANGAR BAY SHALL BE RATED FOR CLASS I DIV II OR LOCATED 18" ABOVE FINISHED FLOOR.

E. DEMOLISH ALL EXISTING FIRE PROTECTION EQUIPMENT.

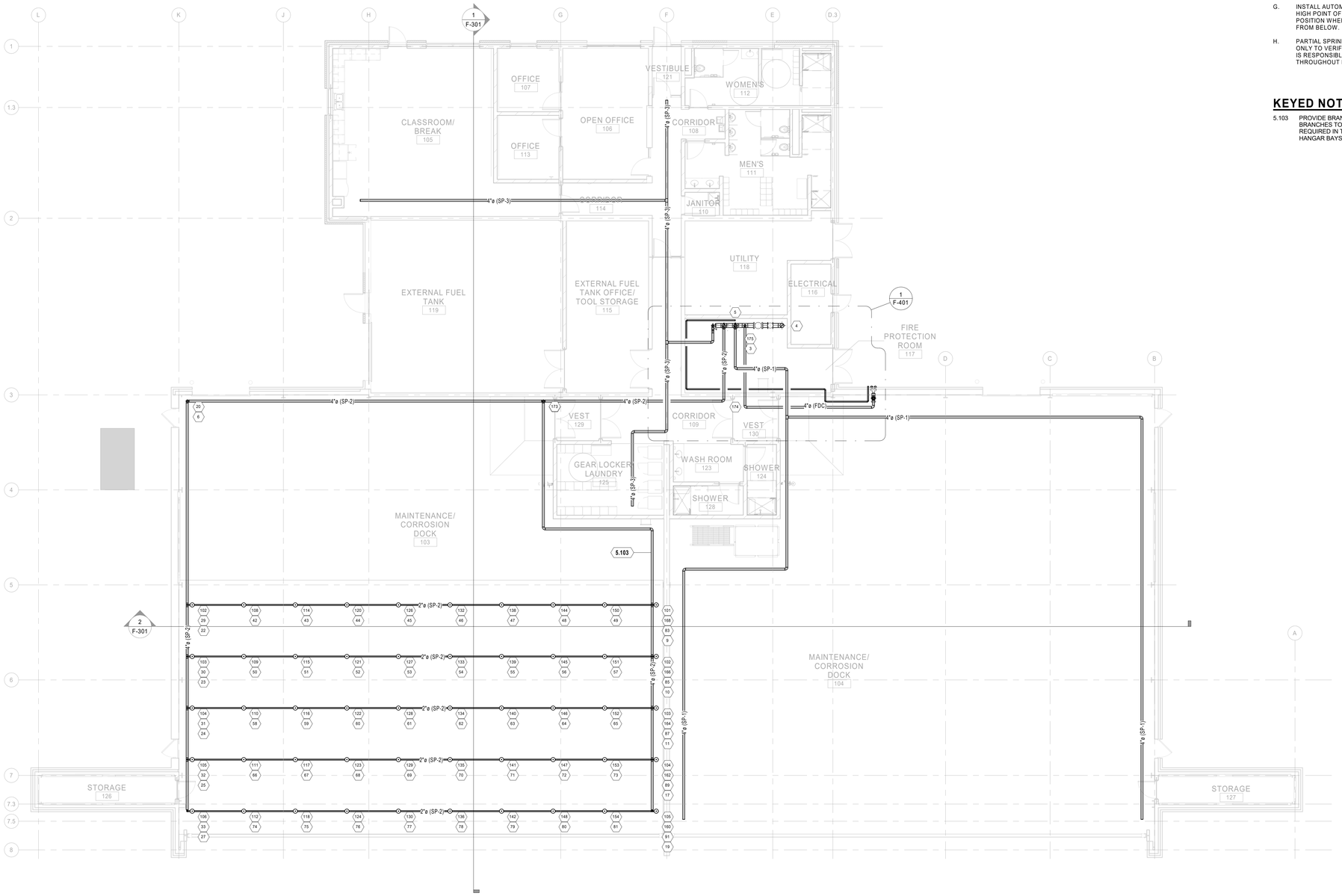
F. PROVIDE SPRINKLER PROTECTION BENEATH OBSTRUCTIONS GREATER THAN 4FT INCLUDING DUCTWORK AND PIPING GROUPINGS.

G. INSTALL AUTOMATIC AIR VENT(S) AT AN ACCESSIBLE HIGH POINT OF EACH SPRINKLER SYSTEM IN A LEVEL POSITION WHERE PRESSURE GAUGE CAN BE VIEWED FROM BELOW.

H. PARTIAL SPRINKLER SYSTEM LAYOUT IS PROVIDED ONLY TO VERIFY HYDRAULIC DEMAND. CONTRACTOR IS RESPONSIBLE FOR COMPLETE SYSTEM DESIGN THROUGHOUT BUILDING.

KEYED NOTES

5.103 PROVIDE BRANCHLINE AT ROOF PEAK TO CONNECT BRANCHES TO REDUCE THE NUMBER OF AIR VENTS REQUIRED IN THE SYSTEM (TYPICAL FOR BOTH HANGAR BAYS).



N 1 **FIRE PROTECTION PLAN**
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SHEET CONTENTS
FIRE PROTECTION PLAN

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F-102

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GENERAL NOTES

A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.

B. DEMOLISH ALL EXISTING FIRE ALARM EQUIPMENT, WIRING, PATHWAYS, AND ASSOCIATED EQUIPMENT.

C. MAINTAIN EXISTING FIRE ALARM EQUIPMENT FULLY OPERATIONAL UNTIL THE NEW EQUIPMENT HAS BEEN TESTED AND ACCEPTED BY THE CONTRACTING OFFICER.

D. LOCATE CONTROL MODULES WITHIN 36" OF CONTROL EQUIPMENT IN ACCORDANCE WITH NFPA 72.

E. DO NOT LOCATE MONITOR AND CONTROL MODULES IN HANGAR BAY.

F. REFER TO MECHANICAL PLANS FOR EXACT LOCATION OF DUCT SMOKE DETECTORS AND HVAC RETURN AIR UNITS OVER 2000 CFM.

G. EQUIPMENT INCLUDING FIRE ALARM DEVICES IN THE HANGAR BAY AND ROOMS WITH DOORS TO THE HANGAR BAY SHALL BE RATED FOR CLASS I DIV II UNLESS LOCATED MORE THAN 18" ABOVE FINISHED FLOOR.

H. THE HANGAR BAY SHALL BE EQUIPPED WITH NEMA 250 TYPE 4 WALL-MOUNTED DEVICES. CONDUIT AND JUNCTION BOXES SHALL BE WATERTIGHT.

I. PROVIDE FIRE ALARM MASS NOTIFICATION CONTROL PANEL COMPATIBLE WITH BASE WIDE SIMPLEX SYSTEM.

J. CONTRACTOR IS RESPONSIBLE FOR OBTAINING FINAL FLAME DETECTOR LAYOUT FROM DET-TRONICS.

KEYED NOTES

5.109 INSTALL FIRE ALARM BELL ABOVE FDC.

5.110 WET-PIPE RISER TAMPER AND FLOW SWITCH.

5.114 SPRINKLER RISER ROOM TEMPERATURE MONITORING.

5.117 DIRECTIONAL LOUDSPEAKERS WITH A MINIMUM SOUNDPOWER OF 90 dBA DIRECTED TOWARDS HANGAR BAY DOOR ONLY.

5.119 PROVIDE DISABLE SWITCH FOR FIRE ALARM NOTIFICATION APPLIANCE TO PREVENT MICROPHONE FEEDBACK DURING TESTING.

5.120 MAIN SYSTEM OS&Y ISOLATION VALVE.

5.125 PROVIDE KNOX BOX WITH TAMPER SWITCH CONNECTED TO THE FIRE ALARM SYSTEM.

5.126 SHUT DOWN HVLS FANS UPON BUILDING ALARM.

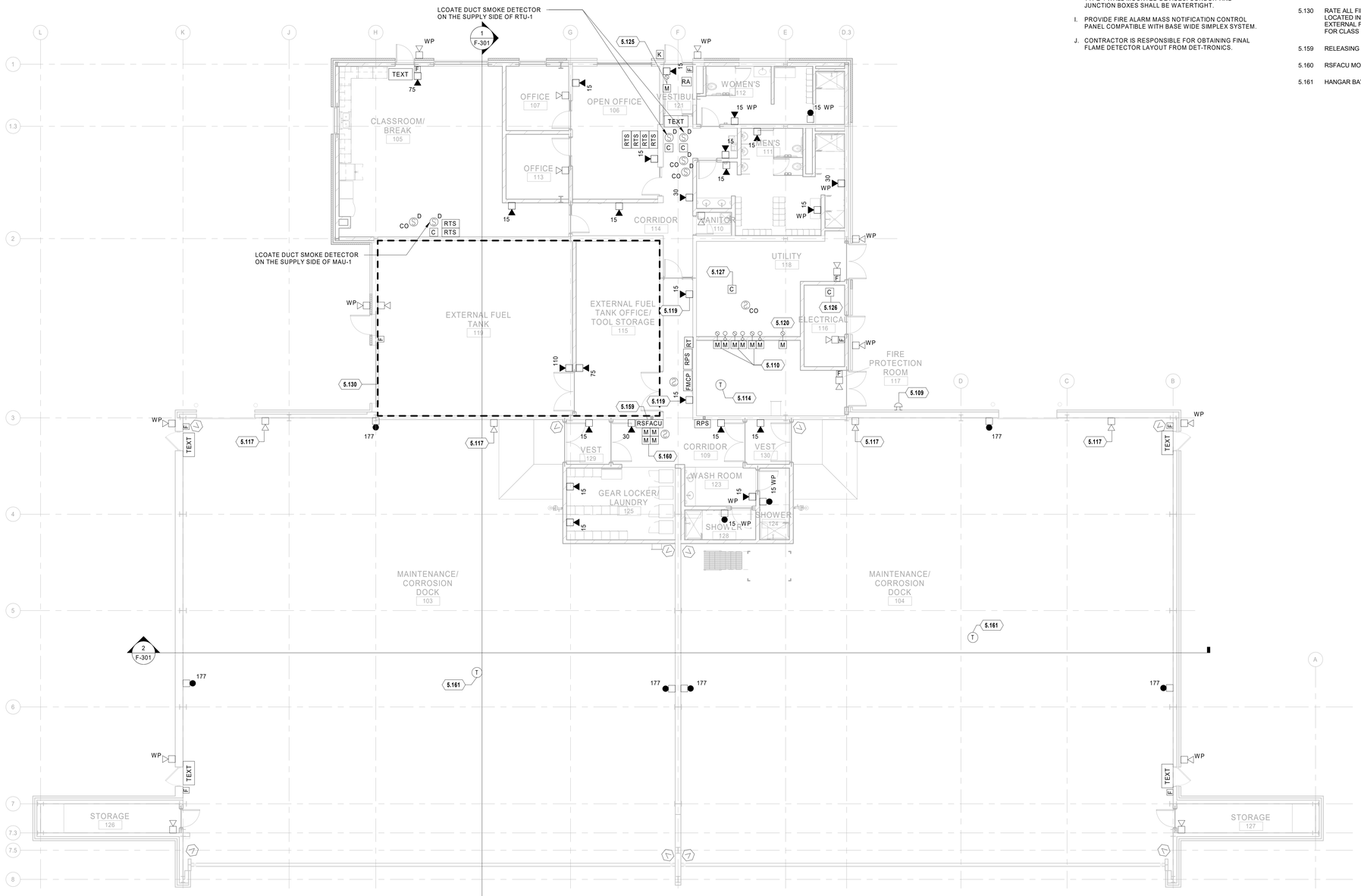
5.127 AUTOMATIC GAS SHUT OFF.

5.130 RATE ALL FIRE ALARM DEVICES AND CONDUIT LOCATED IN EXTERNAL FUEL TANK 119 AND EXTERNAL FUEL TANK OFFICE/ TOOL STORAGE 115 FOR CLASS I DIV II IN ACCORDANCE WITH NFPA 70.

5.159 RELEASING SERVICE FIRE ALARM CONTROL UNIT.

5.160 RSFACU MONITORING MODULES.

5.161 HANGAR BAY TEMPERATURE MONITORING.



N 1 **FIRE ALARM/ MNS PLAN**
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SHEET CONTENTS
FIRE ALARM/ MNS PLAN

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F-103

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PUMP SCHEDULE

PUMP NO.	PUMP TYPE	RATED FLOW (GPM)	RATED PRESSURE (PSI)	RPM	VOLTAGE AND HORSEPOWER	NOTES
FP-1	HORIZONTAL SPLITCASE FIRE PUMP	2500	130	1785	460 V/3/60, 273 HP	PRIMARY FIRE PUMP
FP-2	HORIZONTAL SPLITCASE FIRE PUMP	2500	130	1785	460 V/3/60, 273 HP	BACKUP FIRE PUMP
JP-1	VERTICAL INLINE JOCKEY PUMP	25	140	3500	460 V/3/60, 5 HP	

KEYED NOTES

5.101 FLOW METER.

5.102 FIRE PUMP ON CONCRETE PAD.

5.103 FIRE PUMP DISCHARGE CHECK VALVE.

5.104 TO SITE LOOP SPRINKLER SYSTEMS. REFER TO CIVIL DRAWING SHEET C-104 FOR CONTINUATION.

5.105 SPRINKLER RISER WITH ISOLATION VALVE.

5.106 CHECK VALVE.

5.107 FIRE DEPARTMENT CONNECTION.

5.108 FIRE PUMP CONTROLLER WITH ATS.

5.109 PUMP MAIN ISOLATION VALVE.

5.110 TEST HEADER ISOLATION OS&Y GATE VALVE (NORMALLY CLOSED).

5.111 PUMP SUCTION ISOLATION OS&Y GATE VALVE.

5.112 8 OUTLET TEST HEADER.

5.113 TEST RETURN ISOLATION VALVE (NORMALLU CLOSED (NC)).

5.115 JOCKEY PUMP DISCHARGE OS&Y GATE VALVE.

5.116 RETURN TEST LINE TO FIRE WATER STORAGE TANK.

5.117 FROM FIRE WATER STORAGE TANK. REFER TO CIVIL PLANS FOR CONTINUATION.

5.118 JOCKEY PUMP DISCHARGE CHECK VALVE.

5.119 JOCKEY PUMP CONTROLLER.

5.120 JOCKEY PUMP ON CONCRETE PAD.

5.121 DISCHARGE DRAIN ON CONCRETE SPLASH BLOCK.

5.122 ISOLATION VALVE.

5.123 MIN. 211 GAL. SURGE TANK WITH FLOOR STANDS. CONTRACTOR TO SIZE TANK BASED ON SURGE TANK MANUFACTURER'S CALCULATIONS. BASE CALCULATIONS ON INFORMATION FOR THE FURTHEST HANGAR FROM THE PUMP HOUSE.

GENERAL NOTES

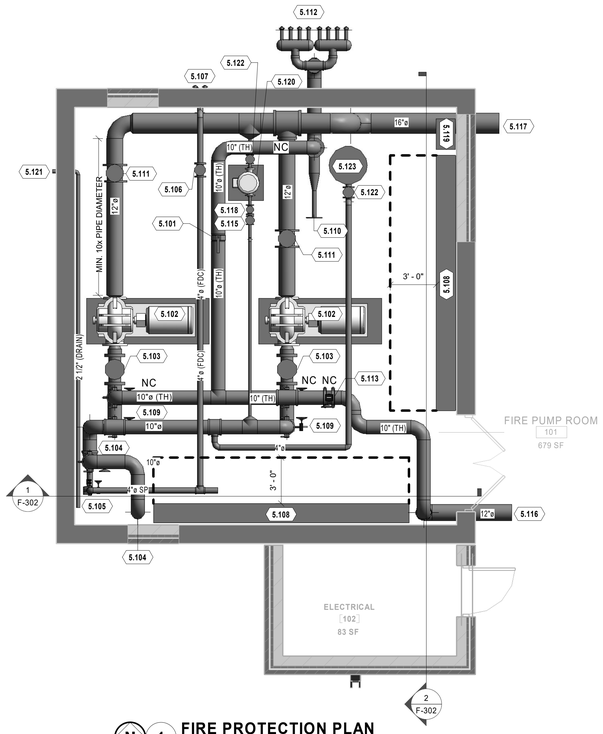
A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.

B. THE BUILDING SHALL BE PROVIDED WITH AN AUTOMATIC SPRINKLER SYSTEM THROUGHOUT IN ACCORDANCE WITH NFPA 13 AND UFC 3-600-01. SPRINKLER CONTRACTOR SHALL BE RESPONSIBLE FOR SPRINKLER LAYOUTS IN ACCORDANCE WITH NFPA 13.

C. DEMOLISH ALL EXISTING FIRE PROTECTION EQUIPMENT.

D. PROVIDE A MINIMUM OF 3 FT CLEARANCE IN FRONT OF ALL EQUIPMENT AND 6 INCHES BEHIND ALL EQUIPMENT.

E. PROVIDE TAMPER SWITCHES ON ALL NORMALLY OPEN VALVES.



N 1 FIRE PROTECTION PLAN
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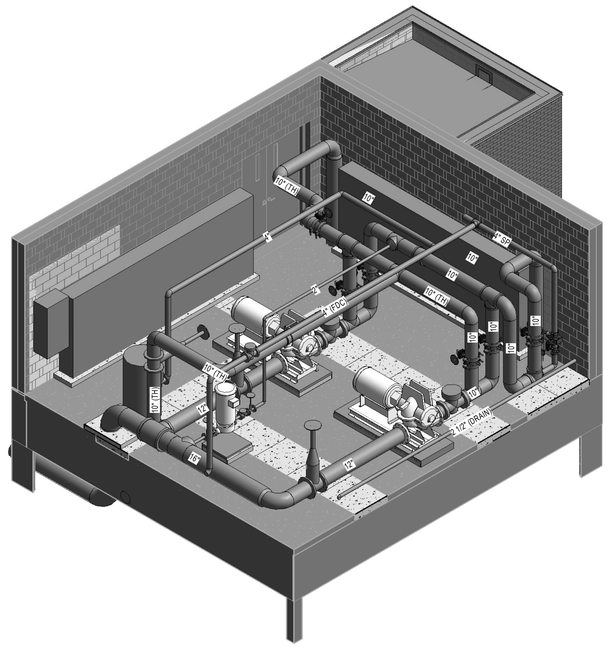
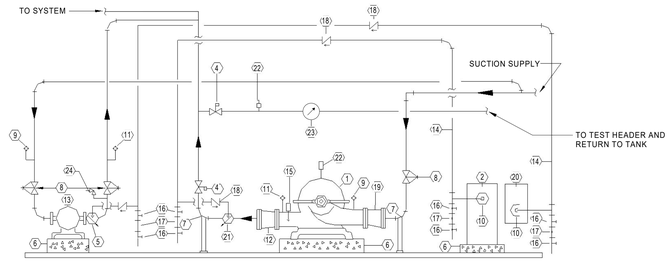


2 FIRE PUMP ISOMETRIC VIEW

FIRE PUMP CONTROLLER SHALL BE UL LISTED FOR:
COMBINATION SERVICE ENTRANCE DISCONNECT SWITCH/ FIRE PUMP CONTROLLER/AUTOMATIC TRANSFER SWITCH, 460 V., 3 PHASE, 4 WIRE GROUNDED NEUTRAL STUD. 100.000A I.C.

FIRE PUMP EQUIPMENT LIST

1. ELECTRIC FIRE PUMP
2. FIRE PUMP CONTROL PANEL
3. AIR RELIEF VALVE
4. ISOLATION VALVE
5. CHECK VALVE WITH 5/16" CONNECTION
6. CONCRETE BASE
7. SUPPORT ELBOW
8. OS & Y GATE VALVE W/ TAMPER SWITCH
9. SUCTION GAUGE
10. PRESSURE SWITCH
11. DISCHARGE GAUGE
12. INCREASER
13. JOCKEY PUMP
14. COPPER PIPE
15. CASING RELIEF VALVE DISCHARGE TO F.D.
16. GLOBE VALVE
17. PLUGGED TEE
18. BRONZE CHECK VALVE W/ ORIFICE IN CLAPPER
19. ECCENTRIC DECREASER
20. JOCKEY PUMP CONTROL PANEL
21. CHECK VALVE
22. AUTOMATIC AIR VENT
23. FLOW METER
24. ADJUSTABLE PRESSURE RELIEF VALVE



3 FIRE PUMP SCHEMATIC
NTS

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SHEET CONTENTS
B158 FIRE PUMP EQUIPMENT PLAN

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F-201

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GENERAL NOTES

A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.

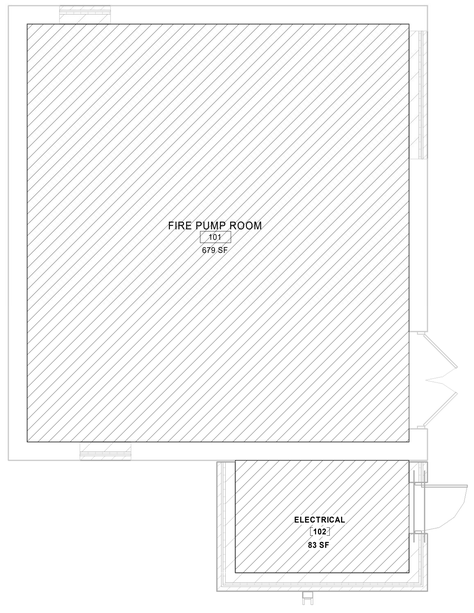
B. THE BUILDING SHALL BE PROVIDED WITH AN AUTOMATIC SPRINKLER SYSTEM THROUGHOUT IN ACCORDANCE WITH NFPA 13 AND UFC 3-600-01. SPRINKLER CONTRACTOR SHALL BE RESPONSIBLE FOR SPRINKLER LAYOUTS IN ACCORDANCE WITH NFPA 13.

C. PROVIDE AUTOMATIC AIR VENT AT SYSTEM HIGH POINT. REFER TO F-501 DETAIL 1.

D. DO NOT RUN PIPING DIRECTLY ABOVE THE FIRE PUMP CONTROLLERS AND ELECTRICAL PANELS.

LEGEND

WET PIPE SPRINKLER
HAZARD CATEGORY: ORDINARY HAZARD
DENSITY: 0.20 GPM/SF
AREA: 2,500 SF
EXTERIOR HOSE ALLOWANCE: 250 GPM
MAX. COVERAGE PER SPRINKLER: 130 SF
SPRINKLER TYPE: QUICK RESPONSE
K-FACTOR: 8.0



N 1 **SPRINKLER HAZARD CLASSIFICATION PLAN**
1/4" = 1'-0"

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B158 SPRINKLER HAZARD CLASSIFICATION PLAN

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KEYED NOTES

5.124 SURGE ARRESTOR TANK TAMPER SWITCH.

5.125 FIRE PUMP SUCTION OS&Y ISOLATION VALVE.

5.126 FIRE PUMP DISCHARGE CHECK VALVE.

5.127 FIRE PUMP CONTROLLER WITH ATS.

5.128 PROVIDE KNOX BOX WITH TAMPER SWITCH CONNECTED TO THE FIRE ALARM SYSTEM.

5.129 PRESSURE MAINTENANCE PUMP TAMPER SWITCHES.

5.130 TEST HEADER ISOLATION VALVE WITH TAMPER SWITCH.

5.131 SPRINKLER RISER FLOW AND TAMPER SWITCH.

5.132 FIRE WATER STORAGE TANK LEVEL LOW.

5.133 FIRE WATER STORAGE TANK LOW TEMPERATURE.

5.134 FIRE WATER STORAGE TAMPER SWITCH.

5.136 ISOLATION VALVE.

5.137 HEAT TRACE PANEL CIRCUIT ENERGIZED.

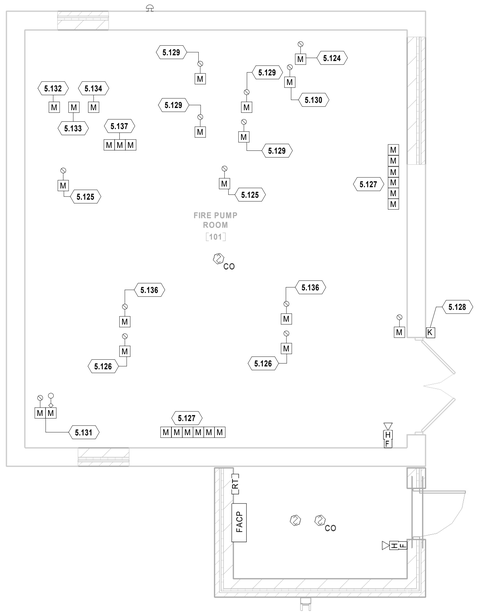
GENERAL NOTES

A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.

B. DEMOLISH ALL EXISTING FIRE ALARM EQUIPMENT, WIRING, PATHWAYS, AND ASSOCIATED EQUIPMENT.

C. REFER TO CIVIL PLANS FOR TANK LOCATION AND DETAILS.

D. PROVIDE FIRE ALARM CONTROL PANEL COMPATIBLE WITH BASE WIDE SIMPLEX SYSTEM.



N 1 **FIRE ALARM PLAN**
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M&H NO.: 3141700-181848.01
DATE: December 16, 2022
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DRAWN BY: RAB
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SHEET CONTENTS
B158 FIRE ALARM PLAN

SHEET NO.:
F-203

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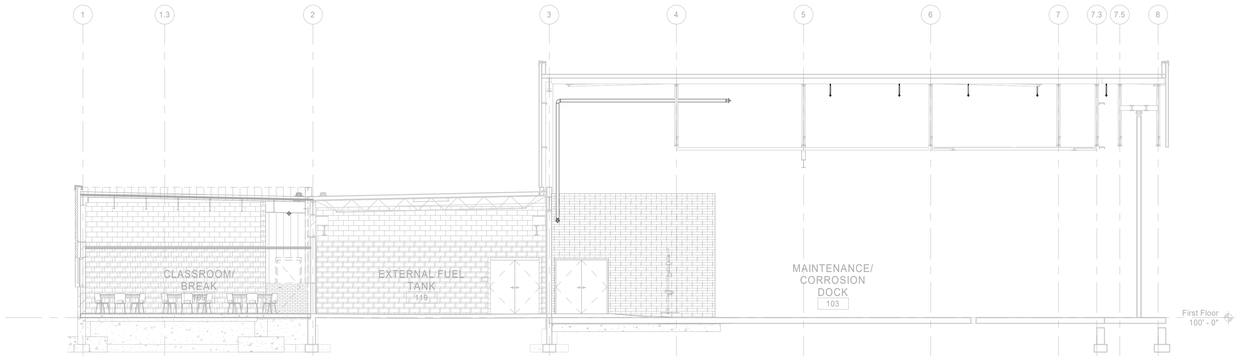
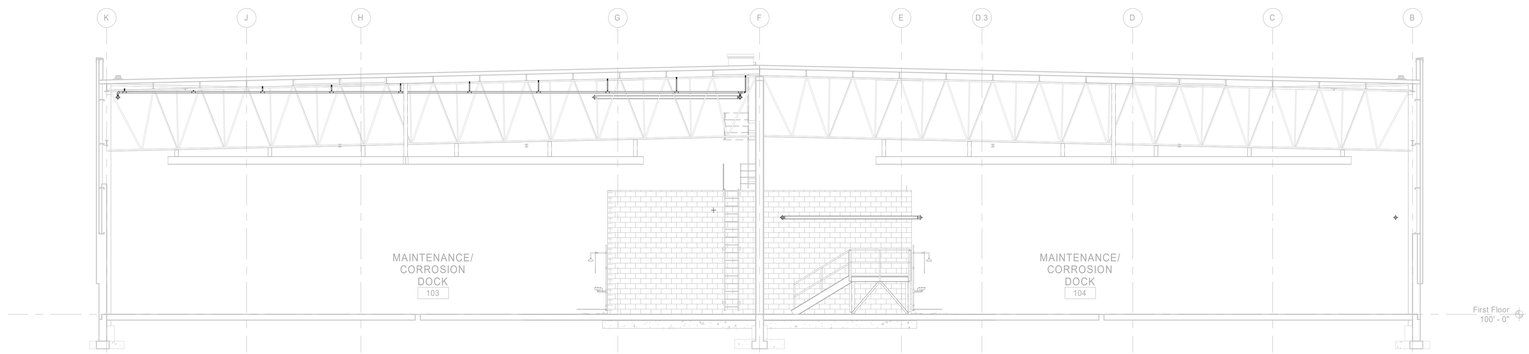
GENERAL PLAN NOTES

A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.

B. ALL FIRE PROTECTION EQUIPMENT SHALL BE INSTALLED SUCH THAT A MINIMUM VERTICAL CLEARANCE OF 10 FEET IS MAINTAINED ABOVE ANY POINT OF THE AIRCRAFT.



1 SECTION 1
1/8" = 1'-0"



2 SECTION 2
1/8" = 1'-0"

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Ann Arbor, MI 48108
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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-184848.01
DATE: December 16, 2022
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SHEET CONTENTS
HANGAR BAY
SECTION VIEW

SHEET NO.:
F-301

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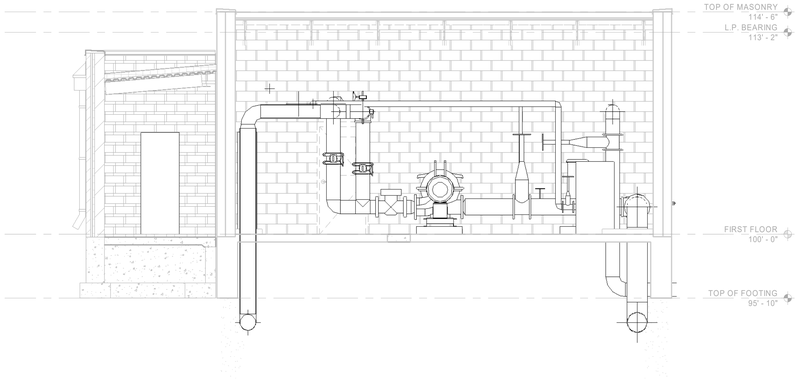
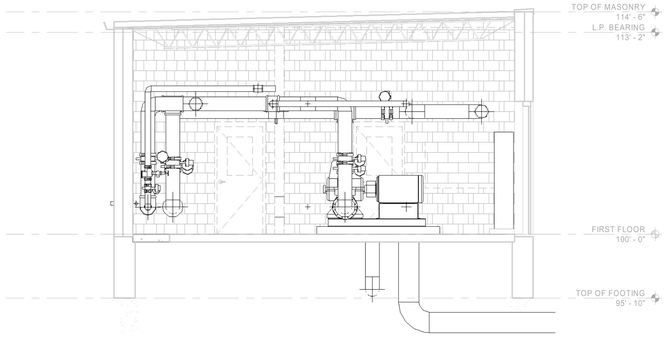
GENERAL PLAN NOTES

A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.



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



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

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

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SHEET CONTENTS
B158 FIRE PROTECTION SECTION VIEW

SHEET NO.:
F-302

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KEYED NOTES

5.132 UNDERGROUND PIPING FROM SITE.

5.133 WET-PIPE RISER AND ISOLATION VALVE.

5.141 FIRE DEPARTMENT CONNECTION (FDC) CHECK VALVE.

5.142 FIRE DEPARTMENT CONNECTION (FDC).

5.144 DRAIN WITH CONCRETE SPLASH BLOCK.

5.145 WORKING CLEARANCE FOR VALVES & EQUIPMENT.

5.150 MAIN SYSTEM OS&Y ISOLATION VALVE.

5.162 CHECK VALVE.

GENERAL NOTES

A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.

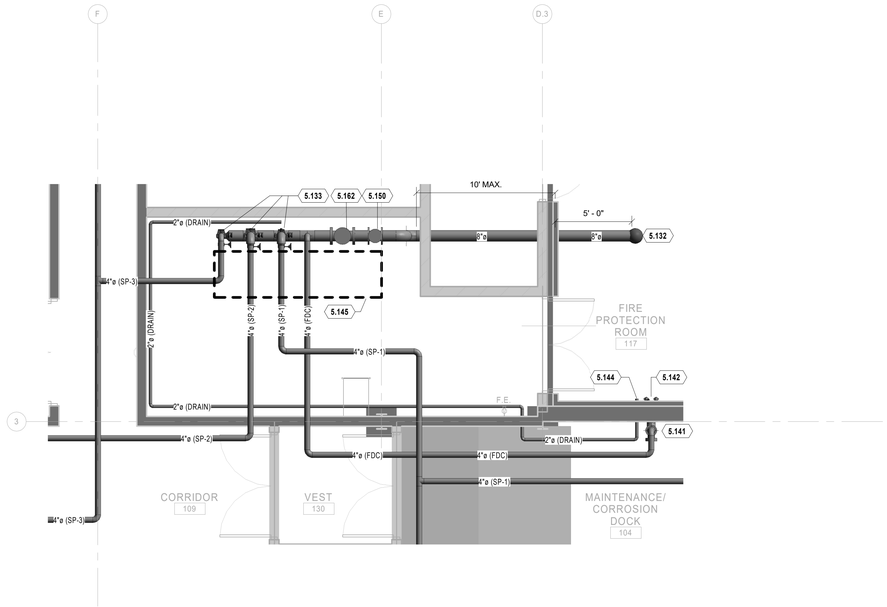
B. THE HANGAR BAY SHALL BE EQUIPPED WITH NEMA 250 TYPE 4 WALL-MOUNTED DEVICES. CONDUIT AND JUNCTION BOXES SHALL BE WATERTIGHT.

C. EQUIPMENT IN THE HANGAR BAY AND ROOMS WITH DOORS TO THE HANGAR BAY SHALL BE RATED FOR CLASS I DIV II OR LOCATED 18" ABOVE FINISHED FLOOR.

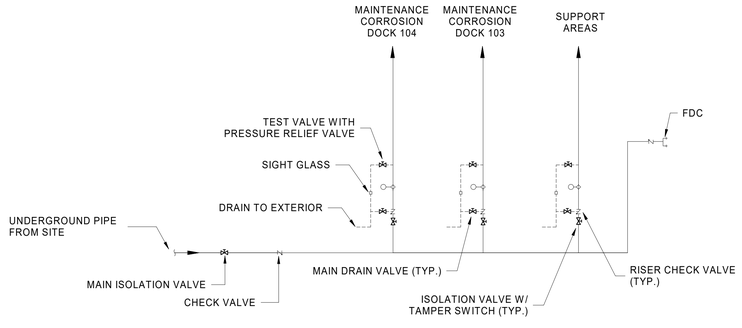
D. PROVIDE A MINIMUM OF 3 FT CLEARANCE IN FRONT OF ALL EQUIPMENT AND 6 INCHES BEHIND ALL EQUIPMENT.

E. NOTE THAT PIPING IS SHOWN FOR GENERAL ARRANGEMENT AND CLARITY. SPRINKLER CONTRACTOR IS RESPONSIBLE FOR COORDINATING FINAL PIPING AND EQUIPMENT LAYOUT.

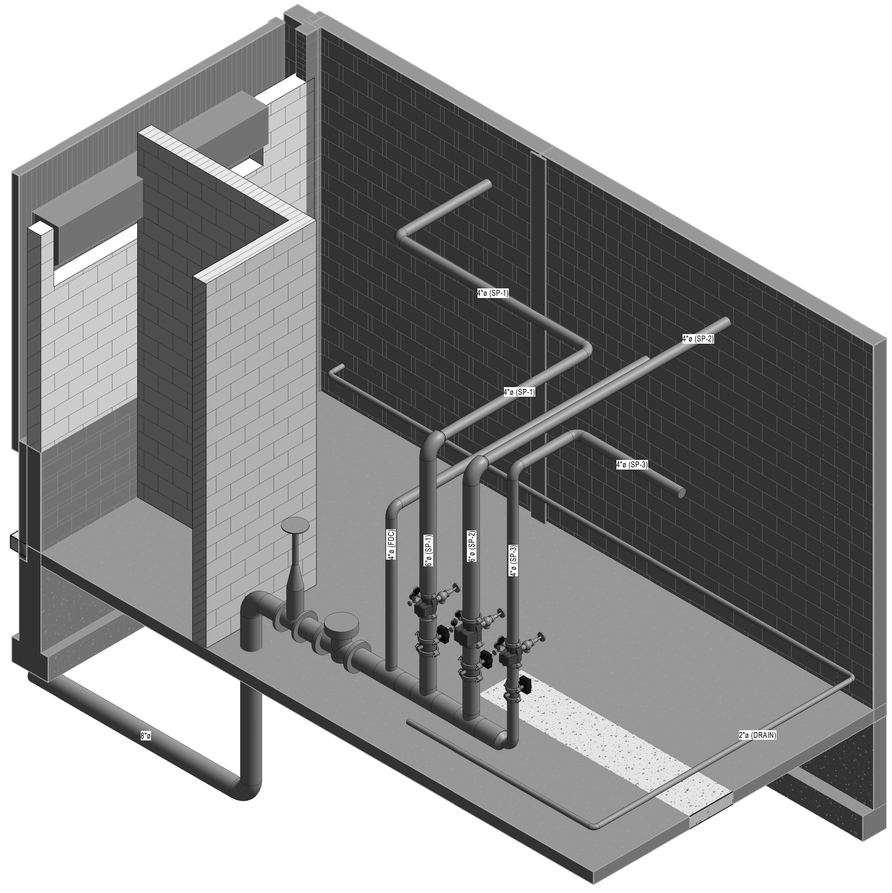
F. ALL VALVES SHALL BE THE SAME SIZE AS THE ASSOCIATED PIPING UNLESS OTHERWISE NOTED.



1 FIRE PROTECTION ROOM ENLARGED PLAN
1/4" = 1'-0"



2 FIRE SUPPRESSION RISER
NTS



3 FIRE PROTECTION ROOM 3-D VIEW

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SHEET CONTENTS
ENLARGED PLANS

SHEET NO.:
F-401

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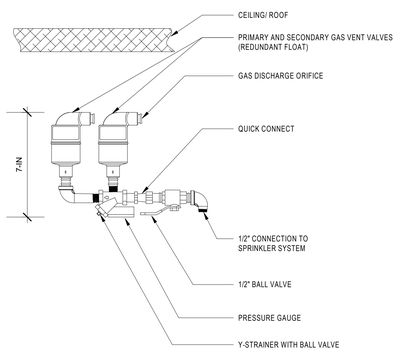
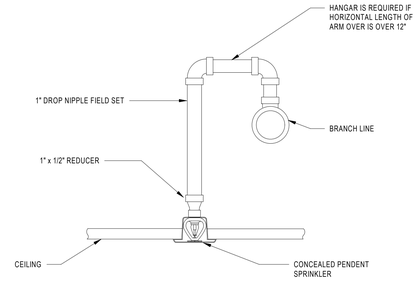
NOTES:

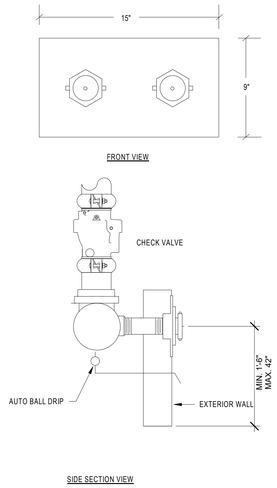
1. INSTALL AT AN ACCESSIBLE HIGH POINT ON SPRINKLER SYSTEM IN A LEVEL POSITION WHERE PRESSURE GAUGE CAN BE VIEWED FROM BELOW.



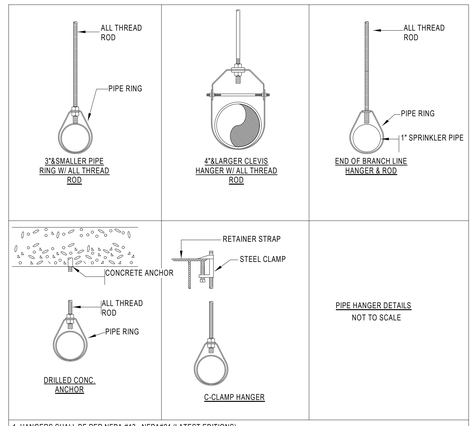
1 AIR VENT
NTS



2 CONCEALED SPRINKLER ARM-OVER
NTS



3 FIRE DEPT. CONNECTION DETAIL
NTS

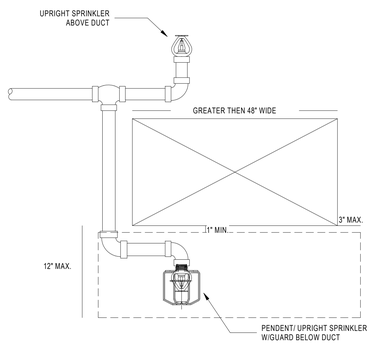


1. HANGERS SHALL BE PER NFPA #13 - NFPA#24 (LATEST EDITIONS).
2. HANGERS DISTANCES/THREADED ROD SIZES/ FASTENER SIZES (SEE CHART BELOW).
3. ALL MATERIALS TO BE ZINC/GALVANIZED

MAXIMUM DISTANCE BETWEEN HANGERS PER NFPA #13

NOMINAL PIPE SIZE	1"	1-¼"	1-½"	2"	2½"	3"	4"	6"
STEEL PIPE SCH.40	12-0	12-0	15-0	15-0	15-0	15-0	15-0	15-0
THREADED ROD DIAMETER	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	1/2"
CONC. ANCHOR DIAMETER	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	1/2"

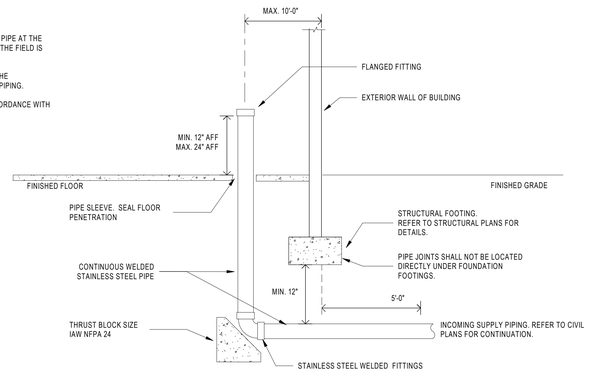
4 PIPE HANGERS
NTS



5 SPRINKLERS ABOVE AND BELOW OBSTRUCTIONS OVER 48" WIDE
NTS

NOTES:

1. WELD AND HYDROSTATICALLY TEST STAINLESS STEEL PIPE AT THE FABRICATION SHOP OR MANUFACTURER. WELDING IN THE FIELD IS NOT PERMITTED.
2. NON-WELDED FITTINGS ARE NOT PERMITTED WITHIN THE CONTINUOUS SECTION OF WELDED STAINLESS STEEL PIPING.
3. PERFORM THE HYDROSTATIC PRESSURE TEST IN ACCORDANCE WITH NFPA 24.



6 UNDERGROUND PIPE ENTRY DETAIL
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28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

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SHEET CONTENTS
FIRE PROTECTION DETAILS

SHEET NO.:
F-501

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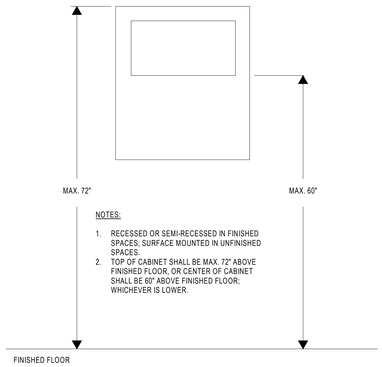
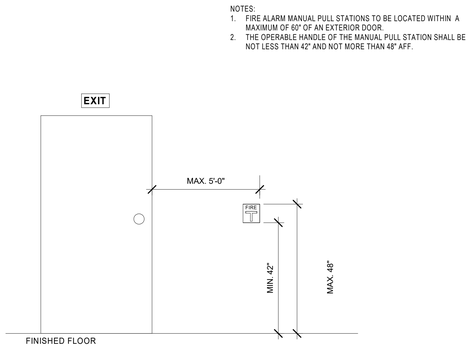
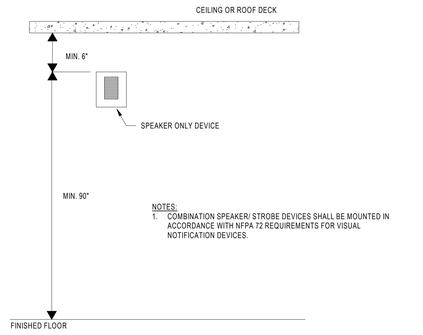


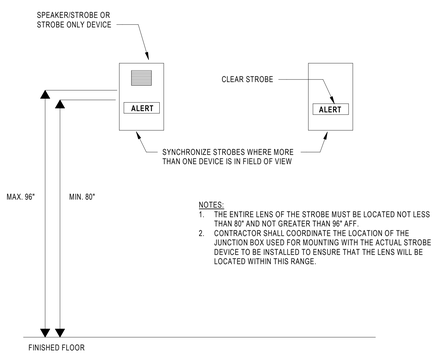
1 FACP/FMCP AND RA MOUNTING HEIGHTS
NTS



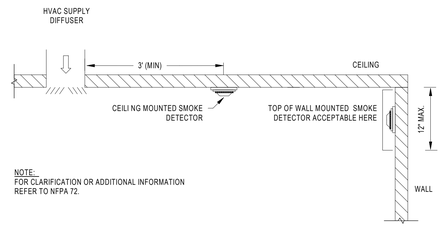
2 FIRE ALARM PULL STATION
NTS



3 FIRE ALARM/MNS SPEAKER MOUNTING DETAIL
NTS



4 FIRE ALARM/MNS STROBE MOUNTING DETAIL
NTS



5 SMOKE DETECTOR MOUNTING DETAIL
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SHEET CONTENTS
FIRE ALARM/ MNS DETAILS

SHEET NO.:
F-502

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RSFACU GENERAL NOTES

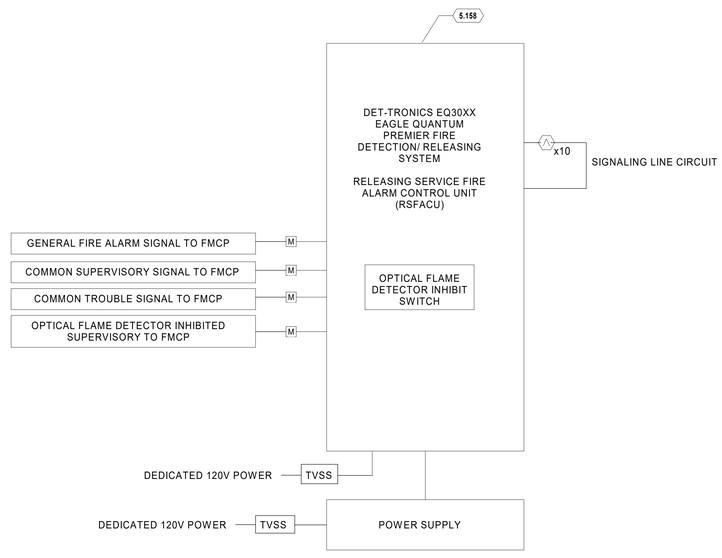
A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.

RELEASING SERVICE FIRE ALARM CONTROL UNIT (RSFACU)

DET-TRONICS EAGLE QUANTUM PREMIER FIRE DETECTION/ RELEASING SYSTEM

	ANNUNCIATION AT RSFACU			NOTIFICATION		
	AUDIO-VISUAL ALARM INDICATION	AUDIO-VISUAL SUPERVISORY INDICATION	AUDIO-VISUAL TROUBLE INDICATION	GENERAL FIRE ALARM SIGNAL TO FMCP & RECIEVING STATION	COMMON FIRE ALARM SUPERVISORY SIGNAL TO FMCP AND RECEIVING STATION	OPTICAL FLAME DETECTOR INHIBITED SUPERVISORY SIGNAL TO FMCP & RECEIVING STATION
ALARM SIGNALS						
SINGLE OPTICAL FLAME DETECTOR	●			●		
SUPERVISORY SIGNALS						
COMMON SUPERVISORY		●			●	
OPTICAL FLAME DETECTOR INHIBIT SWITCH		●				●
TROUBLE SIGNALS						
COMMON TROUBLE			●			

1 RSFACU SYSTEM MATRIX
NTS



2 RSFACU SYSTEM RISER DIAGRAM
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SHEET CONTENTS
RSFACU
FUNCTIONAL MATRIX

SHEET NO.:
F-601

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FIRE ALARM/MNS GENERAL NOTES

A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.

	ANNUNCIATION AT FMCP					TRANSMIT SIGNALS TO RECEIVING STATION					AUXILIARY FUNCTIONS						NOTIFICATION/ EVACUATION SIGNALS						
ALARM SIGNALS	AUDIO-VISUAL FIRE ALARM INDICATION	AUDIO-V/ISUALCOMMON SUPERVISORY INDICATION	AUDIO-V/ISUAL COMMON TROUBLE INDICATION	AUDIO-V/ISUAL SUPERVISORY INDICATION FOR FA OVERRIDE BY MNS	CARBON MONOXIDE DETECETOR ACTIVATION	CARBON MONOXIDE ALARM SIGNAL	FIRE ALARM SIGNAL BY DEVICE TYPE	COMMON FIRE ALARM SUPERVISORY SIGNAL	COMMON FIRE ALARM TROUBLE SIGNAL	SUPERVISORY SIGNAL FOR FA OVERRIDE BY MNS	SHUT DOWN ASSOCIATED FAN(S)	SHUT DOWN HVLS FANS IN HANGAR BAY	SHUT OFF GAS IN HANGAR	TEMPORARILY OVERRIDE THE FIRE ALARM AUDIBLE MESSAGE	CLOSE ASSOCIATED FIRE/SMOKE DAMPER	TRANSMIT ALARM SIGNAL TO BMS	INITIATE GENERAL FIRE ALARM/MNS AUDIBLE/VISIBLE NOTIFICATION APPLIANCES	INITIATE FIRE ALARM SPEAKERS ONLY	INITIATE TEXT SIGNS	ACTIVATE EXTERIOR WATERFLOW ALARM BELL	INITIATE FIRE CARBON MONOXIDE PRE-RECORDED MESSAGE AND STROBES	ACTIVATE HANGAR BAY FIRE ALARM MESSAGE	ACTIVATE ACTIVE SHOOTER MESSAGE
MANUAL FIRE ALARM PULL STATION	●						●					●				●	●		●				
SMOKE DETECTOR	●						●					●				●	●		●				
WATERFLOW SWITCH	●						●					●				●	●		●	●			
RSFACU ALARM SIGNAL	●											●				●	●		●			●	
CARBON MONOXIDE DETECTOR					●	●										●			●		●		
SUPERVISORY SIGNALS																							
COMMON SUPERVISORY SIGNAL BY DEVICE		●						●															
DUCT SMOKE/CARBON MONOXIDE DETECTOR		●						●			●				●								
RSFACU COMMON SUPERVISORY SIGNAL		●																					
OPTICAL FLAME DETECTION INHIBITED SUPERVISORY FROM RSFACU		●																					
KNOX BOX		●						●															
TEMPERATURE MONITOR		●						●															
FUEL CONTAINMENT TANK 5% OF VOLUME EXCEEDED		●																					
TROUBLE SIGNALS																							
SIGNALING LINE CIRCUIT OPEN			●					●															
SIGNALING LINE CIRCUIT SHORT			●					●															
SIGNALING LINE CIRCUIT GROUND			●					●															
FACP LOW BATTERY VOLTAGE			●					●															
FACP CIRCUIT FAULT			●					●															
FACP SUPERVISED COMPONENT FAILURE			●					●															
FACP AC POWER FAILURE			●					●															
NOTIFICATION APPLIANCE CIRCUIT SHORT			●					●															
MASS NOTIFICATION SYSTEM (MNS) SIGNALS																							
MNS MESSAGE VIA TELEPHONE																●		●					
MNS PRE-RECORDED MESSAGE																●		●					
CONCURRENT FA AND MNS ALARM				●					●				●			●		●					
GENERAL PAGING																	●						
ACTIVE SHOOTER BUTTON ON FMCP OR LOC																		●					●

1 FIRE ALARM FUNCTIONAL MATRIX
NTS

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SHEET CONTENTS
FIRE ALARM FUNCTIONAL MATRIX

SHEET NO.:
F-602

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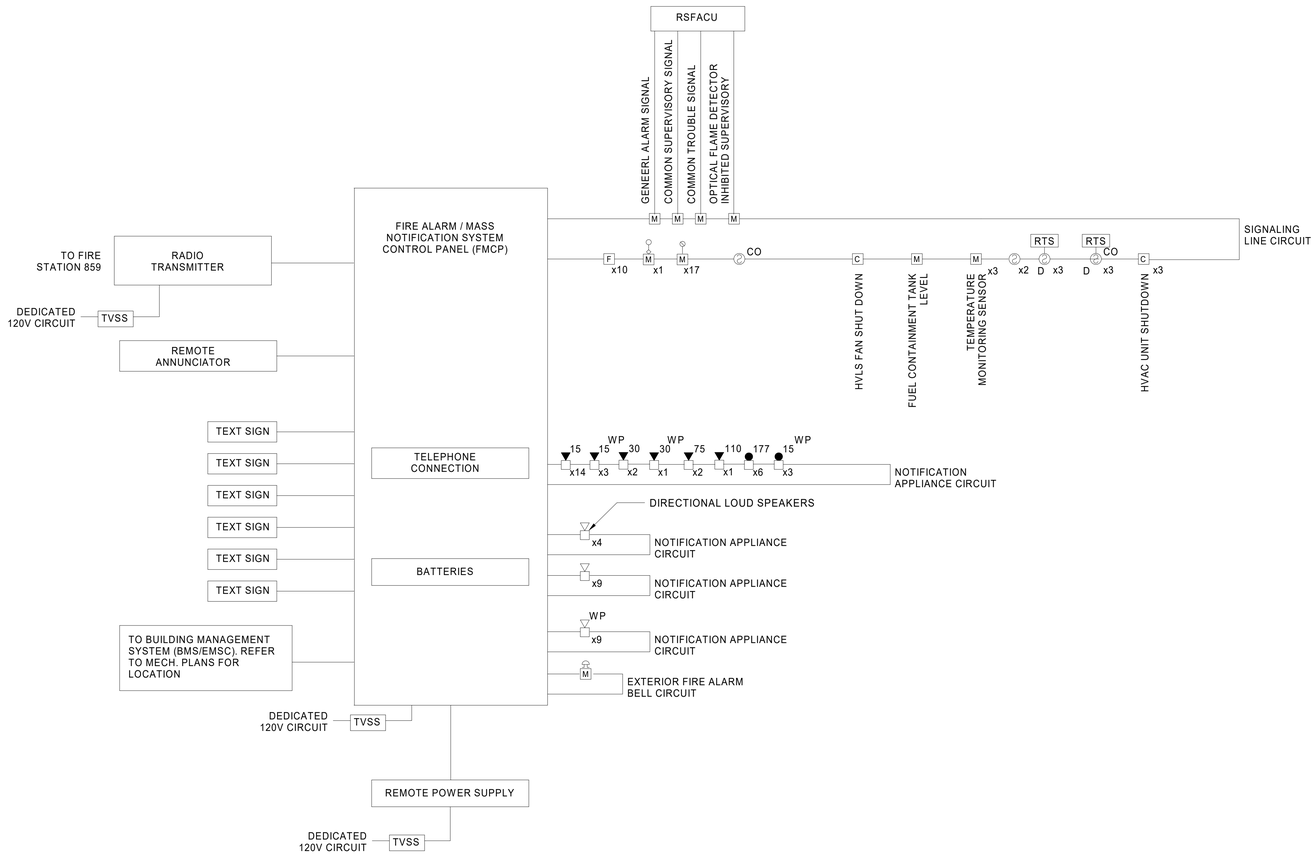
GENERAL NOTES

A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.

B. THE CONTRACTOR SHALL PROVIDE DETAILED POINT TO POINT WIRING DIAGRAMS WITH UNIQUE DEVICE NAMES FOR EACH FIRE ALARM DEVICE.

C. EACH NOTIFICATION APPLIANCE CIRCUIT SHALL INCLUDE A MINIMUM 25% SPARE CAPACITY.

D. ALL TVSS SHALL BE UL 1449 AND UL 1263 LISTED.



1 FIRE ALARM/ MNS RISER DIAGRAM
NTS

FMCP RADIO TRANSMITTER SCHEDULE	
1.	ALARM - MANUAL FIRE ALARM STATION
2.	ALARM - SMOKE DETECTOR
3.	ALARM - WATERFLOW
4.	ALARM - RSFACU ALARM SIGNAL
5.	ALARM - CARBON MONOXIDE
6.	SUPERVISORY - COMMON SUPERVISORY
7.	SUPERVISORY - OPTICAL FLAME DETECTION INHIBITED
8.	TROUBLE - COMMON TROUBLE
9.	TROUBLE - MNS OVERRIDE OF FA SYSTEM
10.	SPARE
11.	SPARE
12.	SPARE
13.	SPARE
14.	SPARE
15.	SPARE
16.	SPARE
17.	SPARE
18.	SPARE
19.	SPARE
20.	SPARE

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

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12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-184848.01
DATE: December 16, 2022
DESIGNED BY: RAB
DRAWN BY: RAB
CHECKED BY: RDV
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SHEET CONTENTS
FIRE ALARM SYSTEM RISER DIAGRAM

SHEET NO.:
F-603

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GENERAL NOTES

A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.

B. REFER TO SHEET F-605 FOR CONTINUATION.

ALARM SIGNALS	ANNUNCIATION AT FACP				TRANSMIT SIGNALS TO RECEIVING STATION				NOTIFICATION/ EVACUATION SIGNALS		
	AUDIO-VISUAL FIRE ALARM INDICATION	AUDIO-VISUALCOMMON SUPERVISORY INDICATION	AUDIO-VISUAL COMMON TROUBLE INDICATION	AUDIO-VISUAL INDICATION CARBON MONOXIDE	CARBON MONOXIDE SIGNAL	FIRE ALARM SIGNAL BY DEVICE TYPE	COMMON FIRE ALARM SUPERVISORY SIGNAL	COMMON FIRE ALARM TROUBLE SIGNAL	INITIATE GENERAL FIRE ALARM AUDIBLE/VISIBLE NOTIFICATION APPLIANCES	ACTIVATE EXTERIOR WATERFLOW ALARM BELL	ACTIVATE DISTINCT CARBON MONOXIDE SIGNAL AND STROBES
MANUAL FIRE ALARM PULL STATION	●					●			●		
SMOKE DETECTOR	●					●			●		
CARBON MONOXIDE DETECTOR				●	●						●
WATERFLOW SWITCH	●					●			●	●	
FIRE PUMP RUNNING	●					●					
SUPERVISORY SIGNALS											
COMMON SUPERVISORY SIGNAL BY DEVICE		●					●				
JOCKEY PUMP RUNNING		●					●				
KNOX BOX		●					●				
WATER TANK LEVEL LOW		●					●				
WATER TANK LOW TEMPERATURE		●					●				
VALVE SUPERVISORY		●					●				
TROUBLE SIGNALS											
SIGNALING LINE CIRCUIT OPEN			●					●			
SIGNALING LINE CIRCUIT SHORT			●					●			
SIGNALING LINE CIRCUIT GROUND			●					●			
FACP LOW BATTERY VOLTAGE			●					●			
FACP CIRCUIT FAULT			●					●			
FACP SUPERVISED COMPONENT FAILURE			●					●			
FACP AC POWER FAILURE			●					●			
NOTIFICATION APPLIANCE CIRCUIT SHORT			●					●			
PUMP CONTROLLER LOSS OF PHASE			●					●			
PUMP CONTROLLER PHASE REVERSAL			●					●			
ATS ALTERNATE SOURCE CIRCUIT BREAKER OPEN			●					●			
ATS CONTROLLER CONNECTED TO ALTERNATE SOURCE			●					●			
JOCKEY PUMP AC FAILURE			●					●			
HEAT TRACE SYSTEM TROUBLE			●					●			

FACP RADIO TRANSMITTER SCHEDULE	
1.	ALARM - MANUAL FIRE ALARM STATION
2.	ALARM - SMOKE DETECTOR
3.	ALARM - WATERFLOW
4.	ALARM - FIRE PUMP RUNNING
5.	ALARM - CARBON MONOXIDE DETECTOR
6.	SUPERVISORY - COMMON SUPERVISORY
7.	TROUBLE - COMMON TROUBLE
8.	SPARE
9.	SPARE
10.	SPARE
11.	SPARE
12.	SPARE
13.	SPARE
14.	SPARE
15.	SPARE
16.	SPARE
17.	SPARE
18.	SPARE
19.	SPARE
20.	SPARE

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SHEET CONTENTS
B158 FIRE ALARM FUNCTIONAL MATRIX

SHEET NO.:
F-604

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GENERAL NOTES

A. FOR FIRE PROTECTION GENERAL NOTES, LEGEND, & ABBREVIATIONS, SEE SHEET F-001.

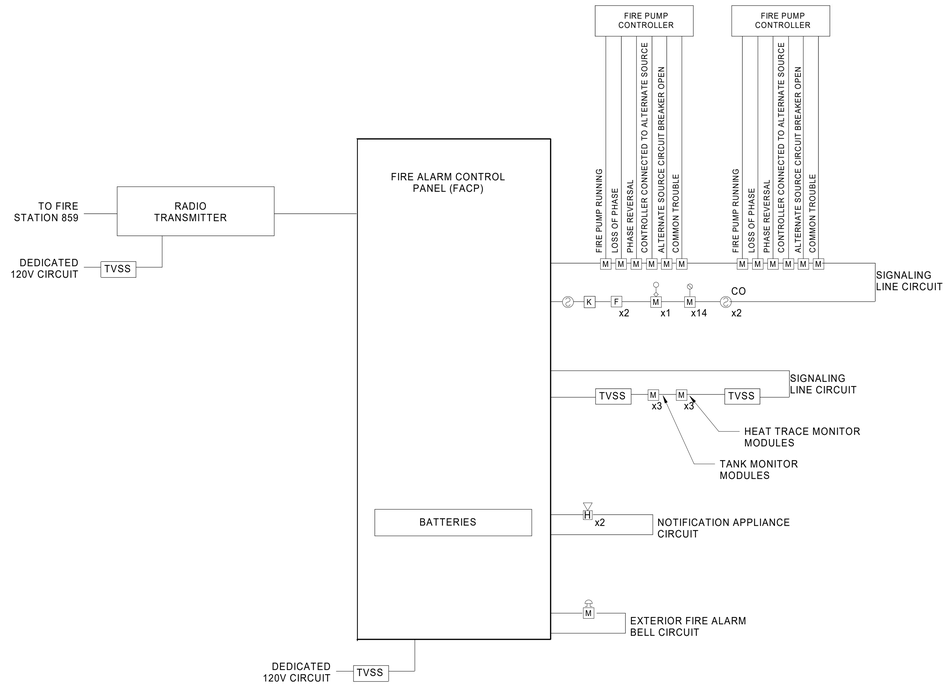
B. ACTUAL NUMBER OF DEVICES PER NOTIFICATION APPLIANCE CIRCUIT SHALL BE DETERMINED BY THE FIRE ALARM CONTRACTOR'S DETAILED VOLTAGE AND BATTERY DROP CALCULATIONS.

C. THE CONTRACTOR SHALL PROVIDE DETAILED POINT TO POINT WIRING DIAGRAMS WITH UNIQUE DEVICE NAMES FOR EACH FIRE ALARM DEVICE.

D. EACH NOTIFICATION APPLIANCE CIRCUIT SHALL INCLUDE A MINIMUM 25% SPARE CAPACITY.

E. ALL TVSS SHALL BE UL 1449 AND UL 1263 LISTED.

F. PROVIDE FIRE ALARM CONTROL PANEL COMPATIBLE WITH BASE WIDE SIMPLEX SYSTEM.



1 FIRE ALARM RISER DIAGRAM
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SHEET CONTENTS
B158 FIRE ALARM SYSTEM RISER DIAGRAM

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PLUMBING LEGEND

- SANITARY SEWER PIPING
- COLD WATER PIPING
- HOT WATER PIPING
- HOT WATER RECIRCULATION PIPING
- VENT PIPING
- STORM PIPING
- HIDDEN / UNDERGROUND PIPING
- NATURAL GAS PIPING

- VENT THROUGH ROOF
- CLEAN OUT, EXPOSED
- CLEAN OUT
- DOUBLE YARD CLEANOUT
- FLOOR DRAIN
- TPL — TRAP PRIMER LINE
- HB — HOSE BIBB W/INTEGRAL VACUUM BREAKER (INTERIOR SURFACE)
- WH — WALL HYDRANT W/INTEGRAL VACUUM BREAKER (EXTERIOR SURFACE)
- PIPE CAP
- PIPE CONNECTION, BOTTOM
- PIPE CONNECTION, TOP
- PIPE ELBOW, TURNED UP
- PIPE ELBOW, TURNED DOWN
- PIPE TEE
- ANCHOR, INTERMEDIATE
- BUTTERFLY VALVE
- GATE VALVE
- BALL VALVE
- CHECK VALVE
- STRAINER VALVE
- STRAINER (BLOW-OFF)
- GAS COCK/GAS STOP
- THERMOMETER
- BALANCING VALVE
- THERMOSTATIC MIXING VALVE
- SOLENOID VALVE
- RELIEF VALVE
- WATER HAMMER ARRESTER/SHOCK ABSORBER
- UNION
- PUMP (SCHEMATIC)
- W — WATER METER
- BFP — BACK FLOW PREVENTER
- M — GAS METER
- PRESSURE REGULATING VALVE

NOTES:

1. THIS LEGEND IS FOR REFERENCE ONLY
2. ALL SYMBOLS WHICH APPEAR WITHIN THE LEGEND MAY NOT APPLY TO THIS PROJECT.

PLUMBING ABBREVIATIONS

(E)	EXISTING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
APPROX	APPROXIMATE
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BV	BALANCING VALVE
BWV	BACKWATER VALVE
CA	COMPRESSED AIR
CAP	CAPACITY
CBA	COMPRESSED BREATHING AIR
CO	CLEAN OUT
COMP	AIR COMPRESSOR
COND	CONDENSATE
CONN	CONNECTION
CONT	CONTINUATION
D	DRAIN
DCW	DOMESTIC COLD WATER
DEG	DEGREES
DEMO	DEMOLITION
DIA	DIAMETER
DN	DOWN
DS	DOWNSPOUT
DWG	DRAWING
DYCO	DOUBLE YARD CLEANOUT
EA	EACH
EEW	EMERGENCY EYE/FACE WASH
ENT	ENTERING
ESS	EMERGENCY SAFETY SHOWER
ET	EXPANSION TANK
F	FAHRENHEIT
FCO	FLOOR CLEAN OUT
FD	FLOOR DRAIN
FH	FIRE HYDRANT
FM	FLOW METER
FPH	FREEZE PROOF HYDRANT
FPM	FEET PER MINUTE
GAL	GALLONS
GD	GARBAGE DISPOSAL
GM	GAS METER
GPM	GALLONS PER MINUTE
GWH	GAS WATER HEATER
HB	HOSE BIBB
HD	HEAD
HO	HUB OUTLET
HP	HORSEPOWER
HR	HOSE REEL
HW	HOT WATER
HWR	HOT WATER RETURN
ID	INSIDE DIAMETER/DIMENSION
IE	INVERT ELEVATION
IMVB	ICE MAKER VALVE BOX
IN	INCH
IW	INDUSTRIAL WASTE
IWH	INSTANTANEOUS WATER HEATER
LAV	LAVATORY
M	METER
MAX	MAXIMUM
MEZZ	MEZZANINE
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
N/A	NOT APPLICABLE
NG	NATURAL GAS
NPW	NON-POTABLE WATER
NTS	NOT TO SCALE
OD	OUTSIDE DIAMETER
OWS	OIL WATER SEPARATOR
PCV	PRESSURE CONTROL VALVE
PD	PRESSURE DROP
PG	PRESSURE GAUGE
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
PW	POTABLE WATER
R	RADIUS
RD	ROOF DRAIN
RP	RECIRCULATION PUMP
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
RPM	REVOLUTIONS PER MINUTE
SAN	SANITARY SEWER PIPING
SK	SINK
SP	SUMP PUMP
SPEC	SPECIFICATION
SR	SOLVENT RETURN
SS	SOLVENT SUPPLY
ST	STORM
STD	STANDARD
SW	SERVICE WATER
TBD	TO BE DETERMINED
TCV	TEMPERING VALVE
TD	TRENCH DRAIN
TEMP	TEMPERATURE
TMV	THERMOSTATIC MIXING VALVE
TP	TRAP PRIMER
TW	TEPID WATER
TYP	TYPICAL
UR	URINAL
V	VENT
VIF	VERIFY IN FIELD
VS	VENT STACK
VTR	VENT THRU ROOF
WB	WASHER BOX
WC	WATER CLOSET
WCO	WALL CLEAN OUT
WG	WATER GAUGE
WHA	WATER HAMMER ARRESTOR
WHW	WASH HOT WATER
WPD	WATER PRESSURE DROP
YCO	YARD CLEANOUT
Ø	DIAMETER

GENERAL PLUMBING NOTES

1. ALL EQUIPMENT AND PIPING SHALL BE INSTALLED IN COMPLIANCE WITH THE LATEST APPLICABLE EDITION OF THE INTERNATIONAL PLUMBING CODE AS AMENDED BY UFC 3-420-01, BASE-OWNED UTILITIES, AND NFPA 54.
2. ALL INTERIOR FLOOR DRAINS AND OPEN RECEPTACLES WITH TRAPS SHALL BE PROTECTED BY A TRAP PRIMER (SEE SPECIFICATIONS AND PLANS FOR LOCATION AND TYPE.) PROVIDE 1/2" SLOPED LINE TO FLOOR DRAIN. SEE DETAILS SHEET.
3. WATER LINES SHALL NOT BE ROUTED ABOVE ANY ELECTRICAL ROOM OR ELECTRICAL PANELS OR COMMINICATION ROOMS.
4. THE CONTRACTOR SHALL EXAMINE ALL CONTRACT DOCUMENTS AND IS REQUIRED TO DO ALL WORK WHICH IS SHOWN ON THE DRAWINGS, STATED IN THE SPECIFICATIONS, OR REASONABLY IMPLIED AS NECESSARY TO COMPLETE THEIR DIVISION OF WORK FOR THIS PROJECT REGARDLESS OF WHERE IN THE CONTRACT DOCUMENTS THE WORK IS REPRESENTED. CONTRACTOR SHALL COORDINATE WORK WITH ALL OTHER TRADES. ALL OTHER TRADE DOCUMENTS ARE TO BE CONSIDERED PART OF THIS CONTRACTORS DOCUMENTS WITH RESPECT TO COORDINATION OF WORK BETWEEN TRADES OF WORK.
5. PROVIDE ACCESS PANELS FOR ALL VALVES, SHOCK ABSORBERS AND TRAP PRIMERS CONCEALED. REFER TO SPECIFICATION 08 31 00.
6. CONTRACTOR SHALL VERIFY ALL FIELD CONDITIONS AND DIMENSIONS BEFORE CONSTRUCTION BEGINS, INCLUDING SEWER, DRAIN, AND CONDUIT INV. ELEV. CONTACT CONTRACTING OFFICER SHOULD DISCREPANCIES OCCUR.
7. ABBREVIATIONS AND SYMBOLS INDICATED HERE AND NOT USED IN THE CONTRACT DOCUMENTS DO NOT APPLY TO THIS PROJECT. ADDITIONAL ABBREVIATIONS MAY BE INDICATED IN THE CONTRACT DOCUMENTS.
8. THESE DRAWINGS ARE DIAGRAMMATIC, THEY MAY NOT SHOW ALL PHYSICAL ARRANGEMENTS, OFFSETS, BENDS, OR ELBOWS WHICH MAY BE REQUIRED FOR PROPER INSTALLATION OF VARIOUS MATERIALS, EQUIPMENT, AND PIPING SYSTEMS IN ALLOTTED SPACES. EXAMINE THESE AND OTHER AVAILABLE DRAWINGS TO DETERMINE SPACE LIMITATIONS AND INTERFERENCES. MAKE ANY MINOR CHANGES IN LOCATIONS OF EQUIPMENT AND PIPING FROM THAT SHOWN ON DRAWINGS AND FOR ALL PHYSICAL DETAILS REQUIRED FOR INSTALLATION. COST FOR ADAPTING WORK TO JOB SITE CONDITIONS SHALL NOT BE CONSIDERED AS BASIS OF AN EXTRA COST TO CONTRACT.
9. CONTRACTORS ARE FREE TO USE ANY PRODUCT WHICH MEETS THE GOVERNMENT'S MINIMUM REQUIREMENTS AND NOT IN CONFLICT WITH OTHER CONTRACT PROVISIONS. UNLESS INDICATED OTHERWISE ON THE PLANS OR SPECIFICATIONS (E.G. SOLE-SOURCE), ALL LISTED MANUFACTURERS ARE THE BASIS OF DESIGN. FOR THESE BASIS OF DESIGN PRODUCTS, OTHER MANUFACTURERS MAY BE SUBSTITUTED AS LONG AS THE STANDARD OF QUALITY AND CHARACTERISTICS OF THE SUBSTITUTED MANUFACTURER MEET OR EXCEED THE STANDARD OF QUALITY AND CHARACTERISTICS OF THE BASIS OF DESIGN.

SYMBOLS AND TAGS

- SK - # — FIXTURE TAG
- LIMIT OF DEMOLITION
- CONNECT TO EXISTING
- # — KEYED NOTE
- 3/4"ø HW — PIPE SIZE AND SYSTEM TAG
- SIM / 1 / A-101 — BUILDING SECTION SYMBOL
- SIM / 1 / A-101 — WALL SECTION SYMBOL
- 1 / A-101 — DETAIL SYMBOL
- 1 / A-101 — ENLARGED PLAN SYMBOL
- 4.XXX — KEYED NOTE IDENTIFICATION
- ROOM NAME / 000 — ROOM NAME AND NUMBER
- FD ☒ — FLOOR DRAIN
- A100 — EXISTING GRID LINES
- A100 — NEW GRID LINES
- XXX / X' - X" — LEVEL OR SPOT ELEVATIONS

AREA OUT OF SCOPE

AREA OF DEMOLITION

NATURAL GAS NOTES

1. ALL NEW EXPOSED GAS PIPING SHALL BE PRIMED AND PAINTED. ALL NEW GAS PIPING WITHIN FINISHED SPACES SHALL BE PAINTED YELLOW AND LABELED IN ACCORDANCE WITH APPLICABLE CODE. ALL EXISTING UNPAINTED GAS PIPING IS TO REMAIN UNPAINTED.
2. COORDINATE NEW METER LOCATION FOR BUILDING WITH LOCAL UTILITIES.
3. ALL GAS PIPING SHALL BE LABELED AT BEGINNING, ALL ENDS, AND AT 6' INTERVALS DESIGNATING GAS & PRESSURE. LABELS SHALL BE PER SPECIFICATIONS.
4. PROVIDE/INSTALL THROUGH WALL PIPE PENETRATIONS AS REQUIRED WHERE PIPE ENTERS BUILDING. SLEEVE AND SEAL.
5. THIS CONTRACTOR SHALL CONNECT GAS PIPING AT A TOTAL BUILDING DEMAND OF 3,806 CFH AND REGULATE TO 0.5 PSI.
6. REFER TO SPECIFICATION 23 11 20 FOR FACILITY GAS PIPING.

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SHEET CONTENTS
NOTES, SYMBOLS & ABBREVIATIONS

SHEET NO.:
P-001

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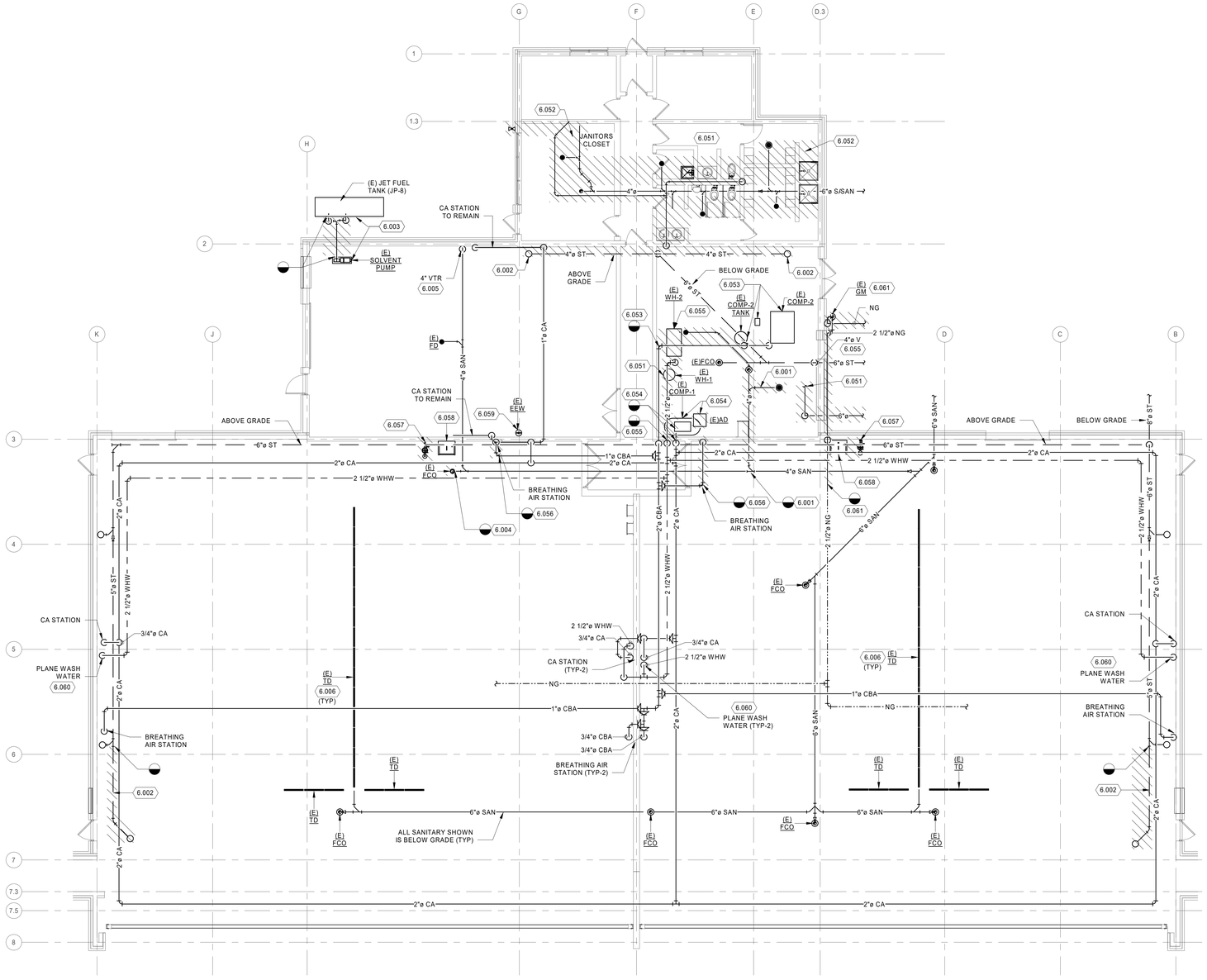

N 1 **PLUMBING DEMOLITION PLAN**
1/8" = 1'-0"

GENERAL NOTES

1. REFER TO GENERAL NOTES ON SHEET P-001.
2. REFER TO ARCHITECTURAL FOR PHASING REQUIREMENTS.
3. PREPARATION OF THESE CONSTRUCTION DRAWINGS IS BASED ON EXISTING AS-BUILTS AND FIELD INVESTIGATIONS OF AS-BUILT CONDITIONS. AS A RESULT, EXISTING CONDITIONS HAVE NOT BEEN THOROUGHLY VERIFIED AND REASONABLE ASSUMPTIONS HAVE BEEN MADE WITH RESPECT TO THE CONCEALED OR OTHERWISE INACCESSIBLE PORTIONS OF THE EXISTING CONSTRUCTION AND ITS SYSTEMS. AS SUCH, DEPICTION OF THE WORK TO BE PERFORMED ARE CONCEPTUAL IN NATURE AND WILL BE SUBJECT TO ADJUSTMENTS IN THE FIELD. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS INCLUDING BUT NOT LIMITED TO: SIZES & LOCATIONS OF ALL EQUIPMENT, UTILITIES, PIPING, AND CONTROLS AS IT PERTAINS TO THE EXECUTION OF NEW WORK. CONTRACTOR SHALL IDENTIFY ANY DISCREPANCIES AND REPORT INFORMATION TO THE ARCHITECT/ENGINEER AND OWNER IN WRITING FOR REVIEW AND ADJUSTMENTS.
4. COORDINATE SAW CUTTING AND REMOVAL OF FLOOR WITH DEMOLITION CONTRACTOR.

KEYED NOTES

6.001 DISCONNECT AND REMOVE FLOOR DRAIN FIXTURES WITHIN MECHANICAL ROOM. REMOVE SANITARY PIPING TO BELOW SLAB AND CAP. SANITARY LINE SHALL BE ABANDONED IN PLACE AND NOT REUSED FOR NEW DRAINAGE. CUT AND CAP WYE FITTING AT MAIN. IF PIPE IS EXPOSED DURING NEW CONSTRUCTION, REMOVE PIPING AND CAP OR FILL ANY OPEN ENDS.

6.002 ALL ABOVE GRADE PVC STORM PIPING SHALL BE REPLACED WITH HUBLESS CAST IRON PIPE. CONTRACTOR SHALL FIELD VERIFY EXACT LENGTH OF PVC SECTIONS AND PROVIDE UNIT PRICING PER FOOT BASIS (BASE BID QUANTITY OF APPROX. 80 FT TOTAL).

6.003 DISCONNECT AND REMOVE 2" FUEL AND VENT PIPING FROM 600 GAL EXTERNAL FUEL TANK AND PUMP. DRAIN SYSTEM COMPLETELY PRIOR TO REMOVAL AND SAFELY/LEGALLY DISPOSE OF FUEL. TANK SHALL BE RELOCATED AND PUMP SHALL REMAIN IN PLACE. REFER TO CIVIL FOR RELOCATION OF TANK. SEE MODIFICATION PLANS FOR NEW PIPE ROUTING.

6.004 DISCONNECT AND REMOVE FLOOR CLEANOUT. CLEANOUT SHALL BE REPLACED TO ACCOMMODATE NEW FLOOR SLOPING. SEE MODIFICATION PLANS.

6.005 VENT THRU ROOF TO REMAIN.

6.006 TRENCH DRAINS AND SANITARY WITHIN HANGAR BAYS TO REMAIN.

6.051 DISCONNECT AND REMOVE ALL DOMESTIC WATER PIPING (COLD, HOT, AND RECIRCULATION) BACK TO 6" MAIN SERVICE ENTERING THE BUILDING. SEE CIVIL AND FIRE PROTECTION FOR FURTHER WATER SERVICE REQUIREMENTS. A NEW WATER SERVICE SHALL BE PROVIDED, SEE MODIFICATION PLANS. REMOVE ASSOCIATED 50 GAL WATER HEATER, EXPANSION TANK, RECIRC PUMP, BACKFLOW PREVENTERS, VALVES, ACCESSORIES, HANGERS AND SUPPORTS.

6.052 DISCONNECT AND REMOVE ALL PLUMBING FIXTURES WITHIN THE JANITORS CLOSET AND RESTROOM AREAS. REMOVE ALL DOMESTIC WATER PIPING AND ASSOCIATED ACCESSORIES, VALVES, HOSE BIBBS, HANGERS AND SUPPORTS. REMOVE ALL VENT AND SANITARY PIPING TO BELOW SLAB AND CAP. EXISTING UNDERGROUND SANITARY MAINS SHALL REMAIN AND BE REUSED WHERE POSSIBLE. REFER TO MODIFICATION PLAN FOR EXTENT OF REUSE AND NEW PIPING.

6.053 COMPRESSED BREATHING AIR COMPRESSOR, PURIFIER, RECEIVER TANK, DRYER, ALL FILTERS, CO MONITOR, AND MOTORIZED VALVES SHALL BE RELOCATED TO NEW UTILITY ROOM. SEE MODIFICATION PLAN. DISCONNECT AND REMOVE PIPING AT COMPRESSOR SYSTEM TO LIMIT OF DEMOLITION AND PROVIDE NEW TO RECONNECT AT NEW LOCATION. ALL REMAINING BREATHING COMPRESSED AIR PIPING THROUGHOUT THE BUILDING SHALL REMAIN.

6.054 TOOL AIR COMPRESSOR SHALL BE RELOCATED TO NEW UTILITY ROOM. DISCONNECT AND REMOVE AIR DRYER, FILTERS, ACCESSORIES, HANGERS & SUPPORTS. NEW DRYER AND FILTERS SHALL BE PROVIDED. DISCONNECT AND REMOVE COMPRESSED AIR PIPING TO LIMIT OF DEMOLITION. ALL OTHER PIPING SHALL REMAIN.

6.055 DISCONNECT AND REMOVE AIRCRAFT WASH-DOWN WATER HEATER. DISCONNECT AND REMOVE PIPING TO LIMIT OF DEMOLITION. HIGH BAY PIPING IN HANGARS SHALL REMAIN AND BE RECONNECTED TO NEW WATER HEATER. SEE MODIFICATION PLANS.

6.056 DISCONNECT AND REMOVE COMPRESSED AIR PIPING BACK TO MAIN AND CAP. BREATHING AIR STATION SHALL BE RELOCATED. REFER TO MODIFICATION PLANS.

6.057 DISCONNECT AND REMOVE EMERGENCY SHOWER FIXTURE, ACCESSORIES, AND ALL ASSOCIATED PIPING.

6.058 EXISTING SCRUB SINK (INCLUDING P-TRAP, FAUCET, AND CONTROLS) SHALL BE RELOCATED. TEMPORARILY DISCONNECT AND STORE UNTIL NEW CONSTRUCTION. REMOVE ALL ASSOCIATED PIPING.

6.059 EMERGENCY EYEWASH SHALL BE RELOCATED. DISCONNECT AND REMOVE ASSOCIATED PIPING AND ACCESSORIES. SEE MODIFICATION PLANS FOR RELOCATION.

6.060 DISCONNECT AND REMOVE PLANE WASH WATER HOSE, HOSE REEL, AND FITTINGS UP TO 2-1/2" SUPPLY PIPE AND TEMPORARILY CAP. NEW HOSE CONNECTION SHALL BE PROVIDED. SEE MODIFICATION PLANS.

6.061 DISCONNECT AND REMOVE NATURAL GAS PIPING UP TO LIMIT OF DEMOLITION. PIPING SERVING EXISTING EQUIPMENT TO REMAIN IN HANGAR BAYS SHALL REMAIN AND BE RECONNECTED. DISCONNECT AND REMOVE METER, REGULATOR, VALVES, ACCESSORIES, HANGERS & SUPPORTS. NEW METER AND REGULATOR SHALL BE PROVIDED AND RELOCATED. TEMPORARILY CAP OPEN ENDED PIPING UNTIL NEW WORK IS PERFORMED. REFER TO CIVIL FOR NEW GAS SERVICE AND COORDINATE SERVICE WITH CONSUMERS ENERGY.

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M&H NO.: 3141700-181848.01
DATE: December 16, 2022
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SHEET CONTENTS
PLUMBING
DEMOLITION PLAN

SHEET NO.:
PD101

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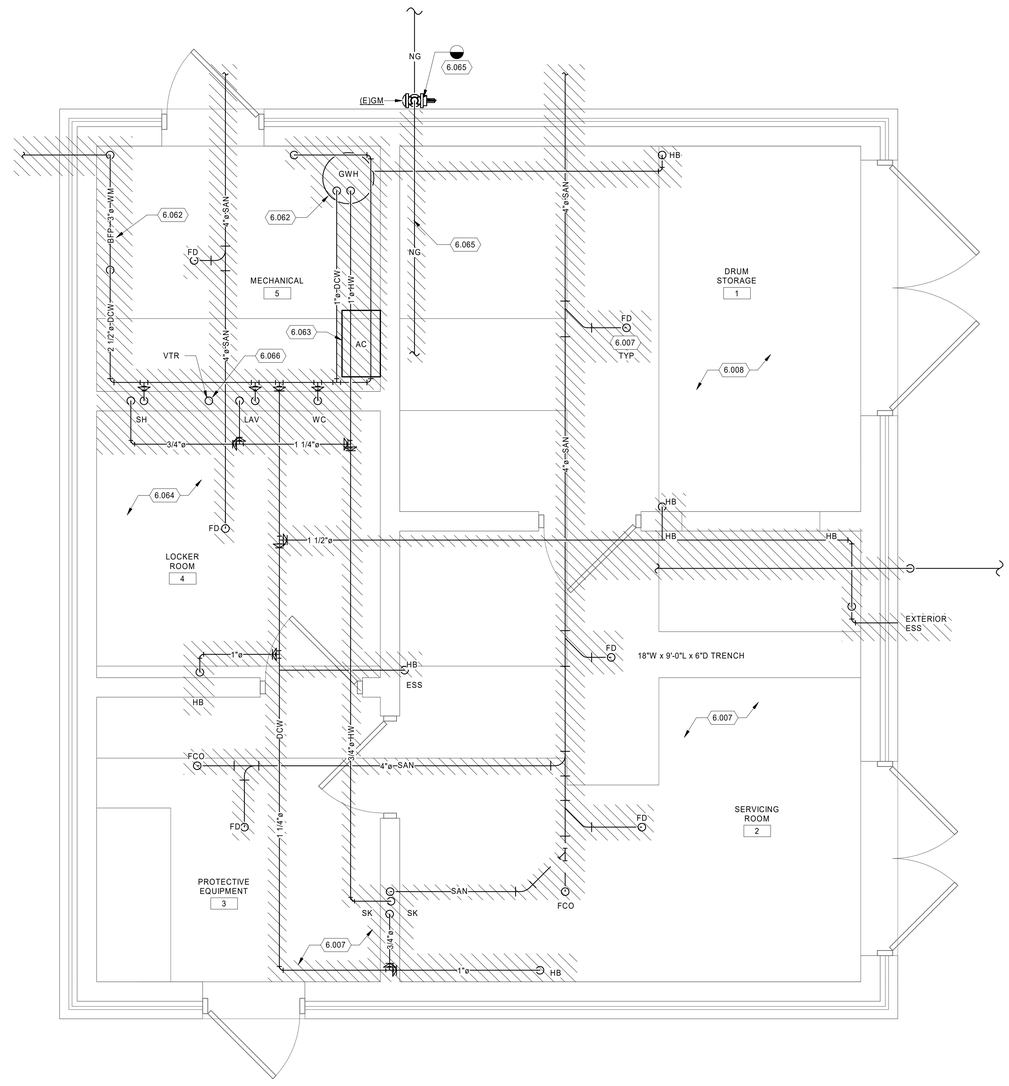

N 1 **B158 PLUMBING DEMOLITION PLAN**
1/2" = 1'-0"

GENERAL NOTES

1. REFER TO GENERAL NOTES ON SHEET P-001.
2. PREPARATION OF THESE CONSTRUCTION DRAWINGS IS BASED ON EXISTING AS-BUILTS AND FIELD INVESTIGATIONS OF AS-BUILT CONDITIONS. AS A RESULT, EXISTING CONDITIONS HAVE NOT BEEN THOROUGHLY VERIFIED AND REASONABLE ASSUMPTIONS HAVE BEEN MADE WITH RESPECT TO THE CONCEALED OR OTHERWISE INACCESSIBLE PORTIONS OF THE EXISTING CONSTRUCTION AND ITS SYSTEMS. AS SUCH, DEPICTION OF THE WORK TO BE PERFORMED ARE CONCEPTUAL IN NATURE AND WILL BE SUBJECT TO ADJUSTMENTS IN THE FIELD. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS INCLUDING BUT NOT LIMITED TO: SIZES & LOCATIONS OF ALL EQUIPMENT, UTILITIES, PIPING, AND CONTROLS AS IT PERTAINS TO THE EXECUTION OF NEW WORK. CONTRACTOR SHALL IDENTIFY ANY DISCREPANCIES AND REPORT INFORMATION TO THE ARCHITECT/ENGINEER AND OWNER IN WRITING FOR REVIEW AND ADJUSTMENTS.
3. COORDINATE SAW CUTTING AND REMOVAL OF FLOOR WITH DEMOLITION CONTRACTOR.

KEYED NOTES

6.007 DISCONNECT AND REMOVE ALL SANITARY WASTE AND VENT PIPING INCLUDING ALL ASSOCIATED DRAINS, CLEANOUTS, ACCESSORIES, HANGERS AND SUPPORTS. SANITARY SHALL BE REMOVED TO BELOW SLAB AND CAPPED. WHERE PIPING IS EXPOSED DURING NEW CONSTRUCTION, REMOVE AND CAP OR FILL ANY OPEN ENDS.

6.008 DISCONNECT AND REMOVE ALL INTERIOR & EXTERIOR EMERGENCY PLUMBING FIXTURES HOSE BIBBS, WASH SINKS, AND ALL ASSOCIATED PIPING, ACCESSORIES, VALVES, HANGERS AND SUPPORTS. SANITARY PIPING SHALL BE REMOVED TO BELOW FLOOR SLAB AND CAPPED.

6.062 DISCONNECT AND REMOVE ALL DOMESTIC WATER PIPING BACK TO 3" MAIN SERVICE ENTERING THE BUILDING. REFER TO CIVIL FOR REMOVAL OF SERVICE. A NEW WATER SERVICE SHALL BE PROVIDED, SEE MODIFICATION PLANS. REMOVE ASSOCIATED GAS WATER HEATER, BACKFLOW PREVENTER, METER, VALVES, ACCESSORIES, HANGERS AND SUPPORTS.

6.063 DISCONNECT AND REMOVE ALL COMPRESSED AIR PIPING INCLUDING ASSOCIATED AIR COMPRESSOR, DRYER, FILTERS, ACCESSORIES, VALVES, HANGERS AND SUPPORTS.

6.064 DISCONNECT AND REMOVE ALL RESTROOM FIXTURES INCLUDING, BUT NOT LIMITED TO, LAVATORY, SHOWER, WATER CLOSET, FLOOR DRAINS, HOSE BIBBS, AND ALL ASSOCIATED PIPING, ACCESSORIES, VALVES, HANGERS AND SUPPORTS. SANITARY PIPING SHALL BE REMOVED TO BELOW FLOOR SLAB AND CAPPED.

6.065 DISCONNECT AND REMOVE NATURAL GAS PIPING, VALVES, ACCESSORIES, HANGERS & SUPPORTS UP TO LIMIT OF DEMOLITION. METER & REGULATOR SHALL REMAIN.

6.066 DISCONNECT AND REMOVE ALL VENTS THRU ROOF. ONE OPENING SHALL REMAIN AND BE REUSED FOR NEW VENT PIPING. V.I.F. PATCH ALL OTHER ROOF OPENINGS TO MATCH EXISTING MATERIAL OR PER ARCHITECTURAL DETAILS.

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
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SHEET CONTENTS
B158 PLUMBING DEMOLITION PLAN

SHEET NO.:
PD102

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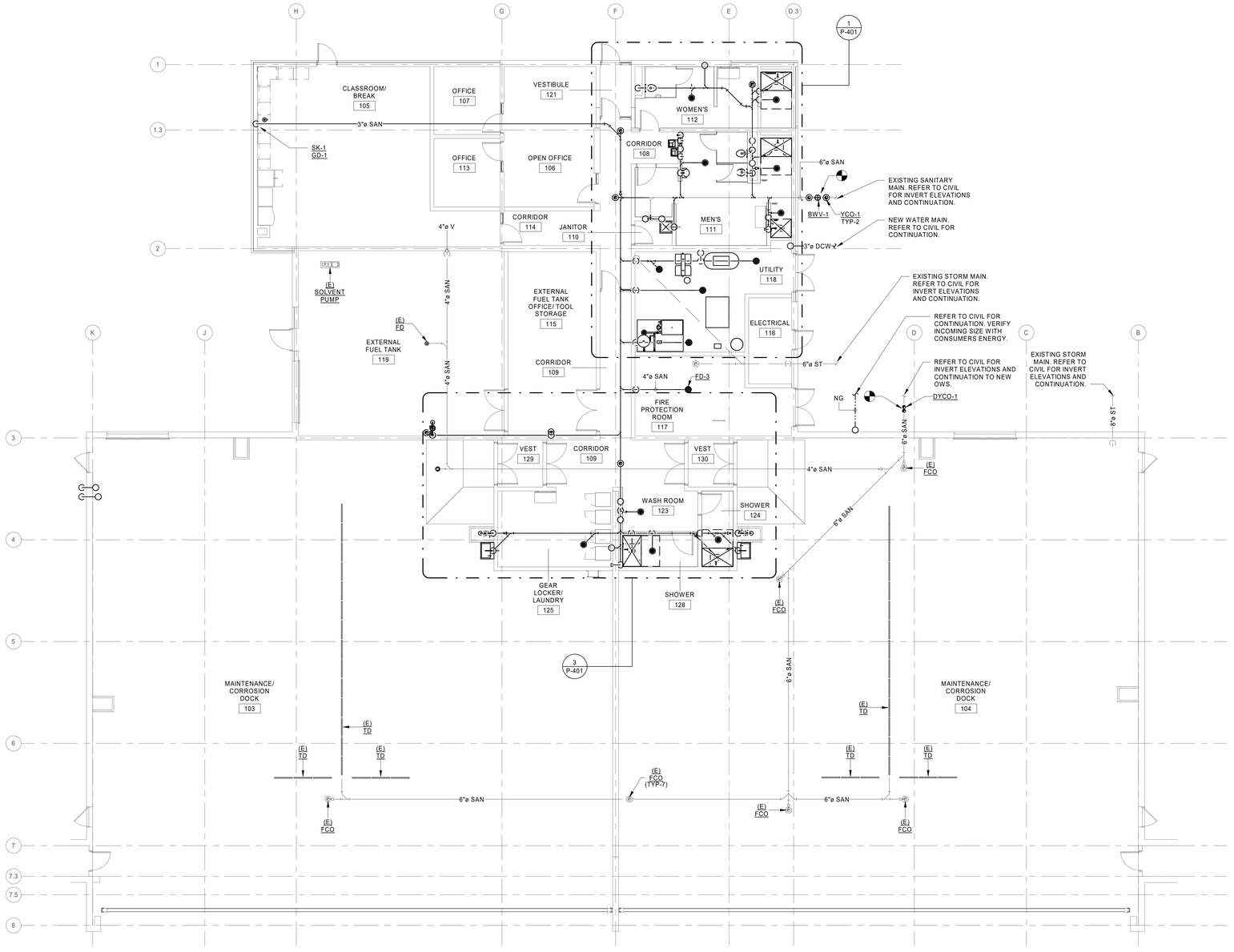
GENERAL NOTES

1. REFER TO GENERAL NOTES ON SHEET P-001.
2. REFER TO ENLARGED VIEW CALLOUTS ON PLANS FOR MORE DETAIL.
3. EQUIPMENT IN UTILITY 118 SHALL BE PROVIDED WITH 4" HOUSEKEEPING PADS. REFER TO STRUCTURAL FOR PAD DETAILS. PADS SHALL BE 6" LARGER ON ALL SIDES OF EQUIPMENT.



N 1 **UNDERGROUND FLOOR PLAN**
1/8" = 1'-0"

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SHEET CONTENTS
UNDERGROUND FLOOR PLAN

SHEET NO.:
P-098

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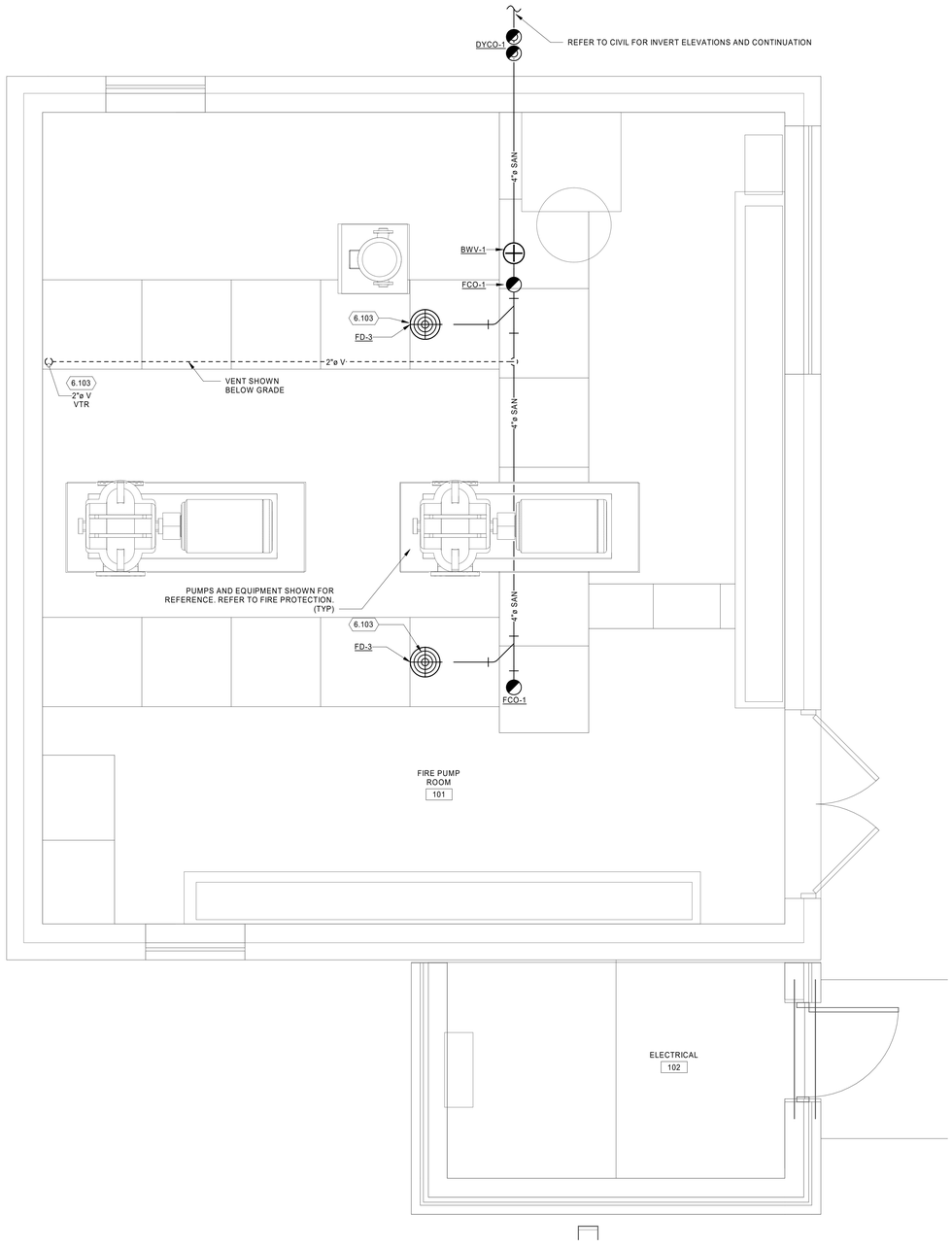
GENERAL NOTES

1. REFER TO GENERAL NOTES ON SHEET P-001.

KEYED NOTES

6.103 PROVIDE NEW SANITARY SERVICE FOR FLOOR DRAINAGE. FLOOR DRAINS SHALL BE PROVIDED WITH 4" DEEP-SEAL TRAPS AND TRAP SEALS. VENT DRAINAGE TO EXTERIOR WALL, ROUTE TIGHT TO WALL, THROUGH EXISTING VENT THRU ROOF OPENING. VERIFY LOCATION IN FIELD.



N 1 **B158 UNDERGROUND FLOOR PLAN**
1/2" = 1'-0"

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SHEET CONTENTS
B158
UNDERGROUND
FLOOR PLAN

SHEET NO.:
P-099

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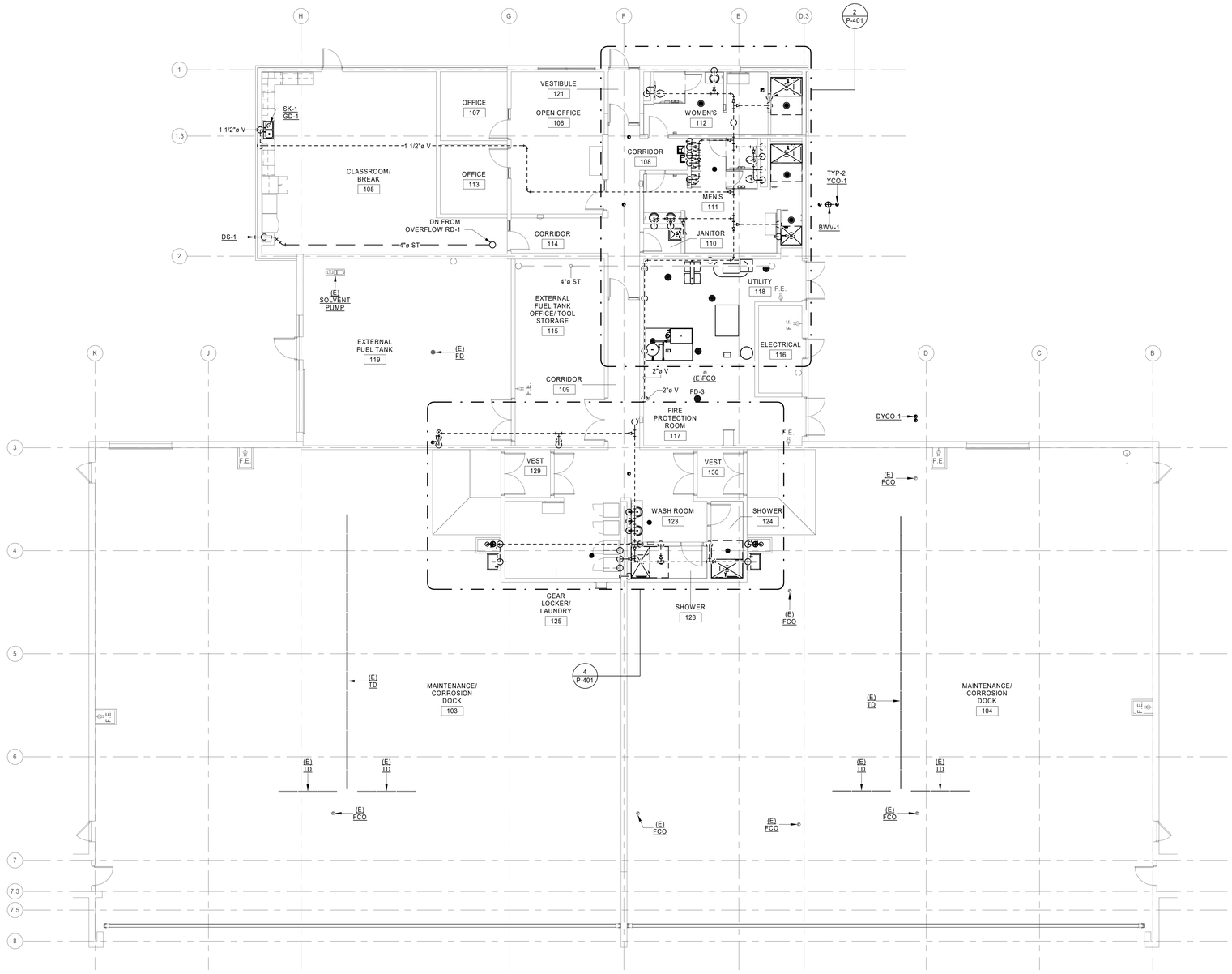
GENERAL NOTES

1. REFER TO GENERAL NOTES ON SHEET P-001.
2. REFER TO ENLARGED VIEW CALLOUTS ON PLANS FOR MORE DETAIL.
3. EQUIPMENT IN UTILITY 118 SHALL BE PROVIDED WITH 4" HOUSEKEEPING PADS. REFER TO STRUCTURAL FOR PAD DETAILS. PADS SHALL BE 6" LARGER ON ALL SIDES OF EQUIPMENT.



N 1 **DRAIN & VENT FLOOR PLAN**
1/8" = 1'-0"

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SHEET CONTENTS
DRAIN & VENT PLAN

SHEET NO.:
P-101

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GENERAL NOTES

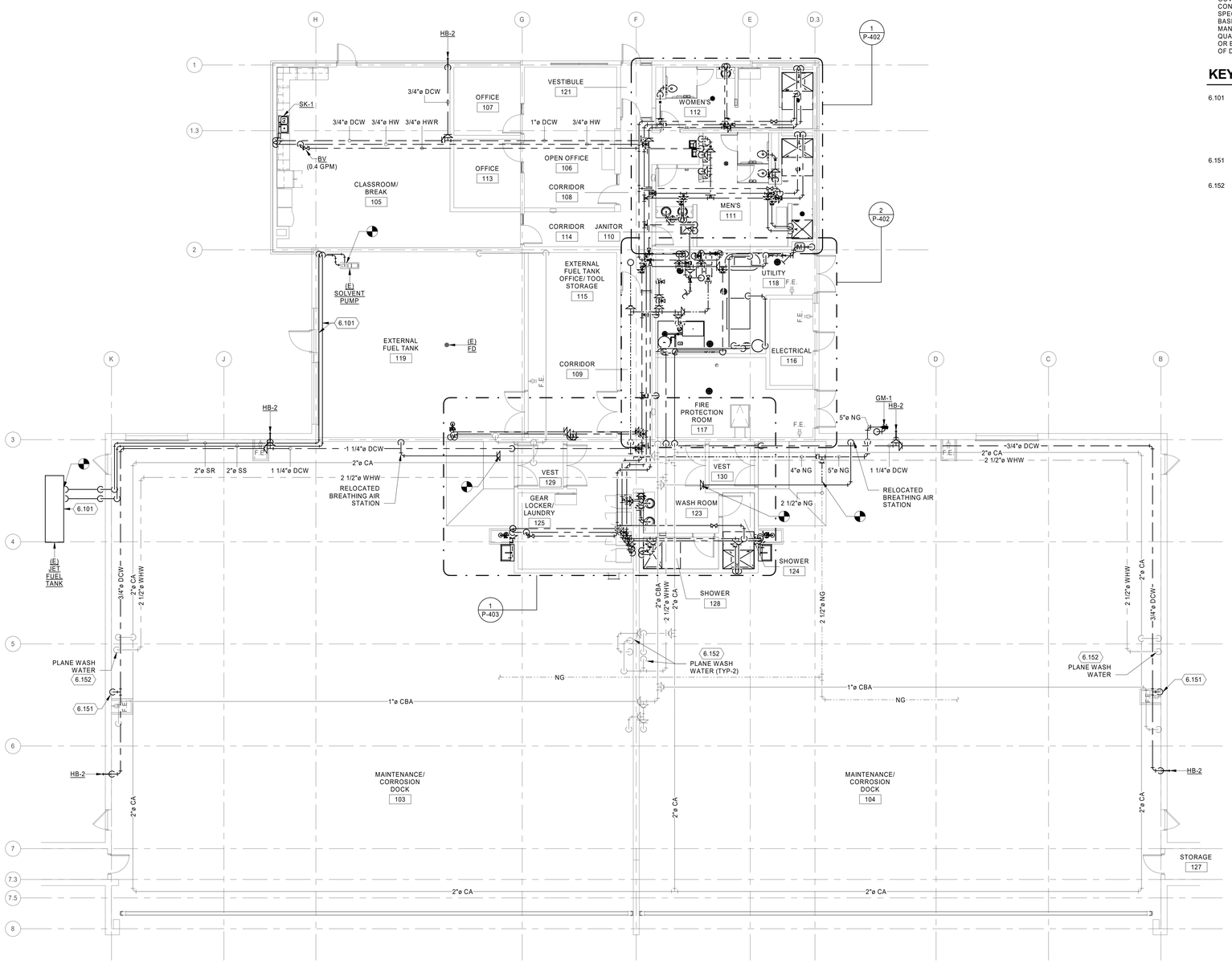
1. REFER TO GENERAL NOTES ON SHEET P-001.
2. REFER TO ENLARGED VIEW CALLOUTS ON PLANS FOR MORE DETAIL.
3. DOMESTIC WATER PIPE SIZES ARE BASED ON A MINIMUM WORKING PRESSURE OF 42 PSIG AT A FLOW RATE OF 92 GPM AT THE LOCATION WHERE THE MAIN SERVICE ENTERS THE BUILDING.
4. EQUIPMENT IN UTILITY 118 SHALL BE PROVIDED WITH HOUSEKEEPING PADS. REFER TO STRUCTURAL FOR PAD DETAILS. PADS SHALL BE 6" LARGER ON ALL SIDES OF EQUIPMENT.
5. CONTRACTORS ARE FREE TO USE ANY PRODUCT WHICH MEETS THE GOVERNMENT'S MINIMUM REQUIREMENTS AND NOT IN CONFLICT WITH OTHER CONTRACT PROVISIONS. UNLESS INDICATED OTHERWISE ON THE PLANS OR SPECIFICATIONS (E.G. SOLE-SOURCE), ALL LISTED MANUFACTURERS ARE THE BASIS OF DESIGN. FOR THESE BASIS OF DESIGN PRODUCTS, OTHER MANUFACTURERS MAY BE SUBSTITUTED AS LONG AS THE STANDARD OF QUALITY AND CHARACTERISTICS OF THE SUBSTITUTED MANUFACTURER MEET OR EXCEED THE STANDARD OF QUALITY AND CHARACTERISTICS OF THE BASIS OF DESIGN.

KEYED NOTES

6.101 ROUTE NEW FUEL AND VENT PIPING TO/FROM EXISTING PUMP AND TANK. ROUTE EXTERIOR PIPING MIN 30" BELOW GRADE IN PVC SLEEVE WITH INSULATION. PROVIDE FLEXIBLE CONNECTION BETWEEN TANK AND PIPING THAT ALLOWS 1" FOR TANK SETTLEMENT. PIPING SHALL BE ROUTED AGAINST WALLS AND ABOVE DOOR OPENINGS (APPROX 9'-8" - 10'-6" AFF). REFER TO CIVIL FOR EXACT FUEL TANK LOCATION. TANK SHOWN FOR REFERENCE. REFER TO SPECIFICATION 33 56 10.

6.151 CONNECT NEW WATER SUPPLY TO EXISTING HUMIDIFIERS. PROVIDE A DUAL CHECK VALVE FOR BACKFLOW PROTECTION PRIOR TO CONNECTION.

6.152 PROVIDE NEW WASH WATER HOSE CONNECTION, HOSE AND REEL (AKRON BRASS MODEL 1702 OR SIMILAR). CONNECT TO EXISTING 2-1/2" PIPE.



N 1 **SUPPLY FLOOR PLAN**
1/8" = 1'-0"

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SHEET CONTENTS
SUPPLY PLAN

SHEET NO.:
P-131

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GENERAL NOTES

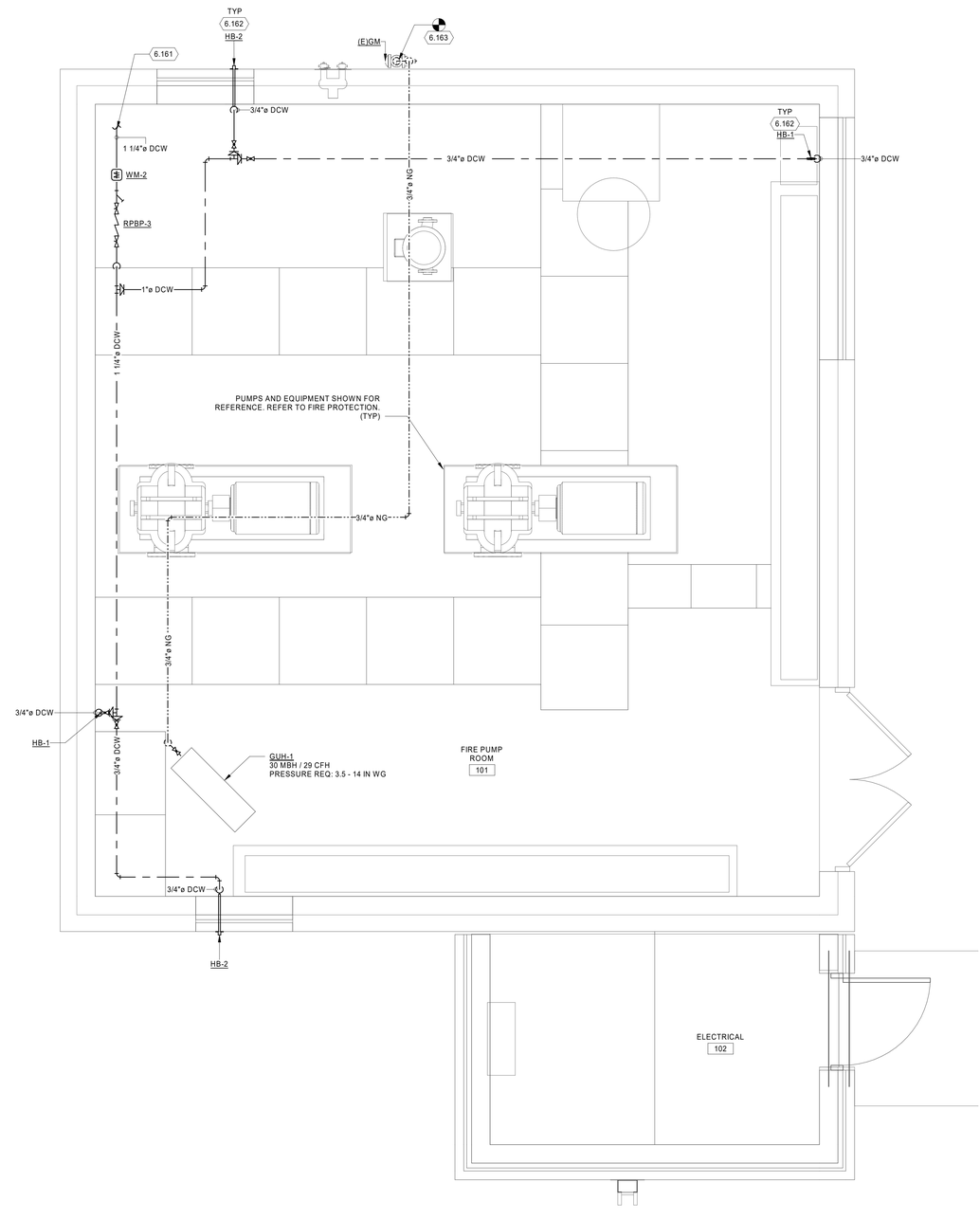
1. REFER TO GENERAL NOTES ON SHEET P-001.
2. WATER PIPE SIZES ARE BASED ON A MINIMUM WORKING PRESSURE OF 42 PSIG AT A FLOW RATE OF 12 GPM AT THE LOCATION WHERE THE MAIN SERVICE ENTERS THE BUILDING.

KEYED NOTES

6.161 CONNECT DOMESTIC WATER, METER AND BACKFLOW PREVENTER TO NEW INCOMING WATER SERVICE. COORDINATE SERVICE LOCATION WITH CIVIL AND FIRE PROTECTION DRAWINGS.

6.162 PROVIDE WALL MOUNTED HOSE BIBBS IN GENERAL LOCATIONS SHOWN, SHIFT AS NECESSARY TO ACCOMMODATE OTHER EQUIPMENT. SEE DETAIL ON SHEET P-501 FOR HOSE BIBB MOUNTING HEIGHTS. EXTERIOR HOSE BIBBS SHALL BE FROST-PROOF AND RECESSED IN WALL BOX.

6.163 SET NATURAL GAS SUPPLY FOR TOTAL LOAD OF 30 MBH / 29 CFH @ 0.5 PSI.



N 1 **B158 SUPPLY PLAN**
1/2" = 1'-0"

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SHEET CONTENTS
B158 SUPPLY PLAN

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P-132

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GENERAL NOTES

1. REFER TO GENERAL NOTES ON SHEET P-001.
2. REFER TO ENLARGED VIEW CALLOUTS ON PLANS FOR MORE DETAIL.
3. DOMESTIC WATER PIPE SIZES ARE BASED ON A MINIMUM WORKING PRESSURE OF 42 PSIG AT A FLOW RATE OF 92 GPM AT THE LOCATION WHERE THE MAIN SERVICE ENTERS THE BUILDING.
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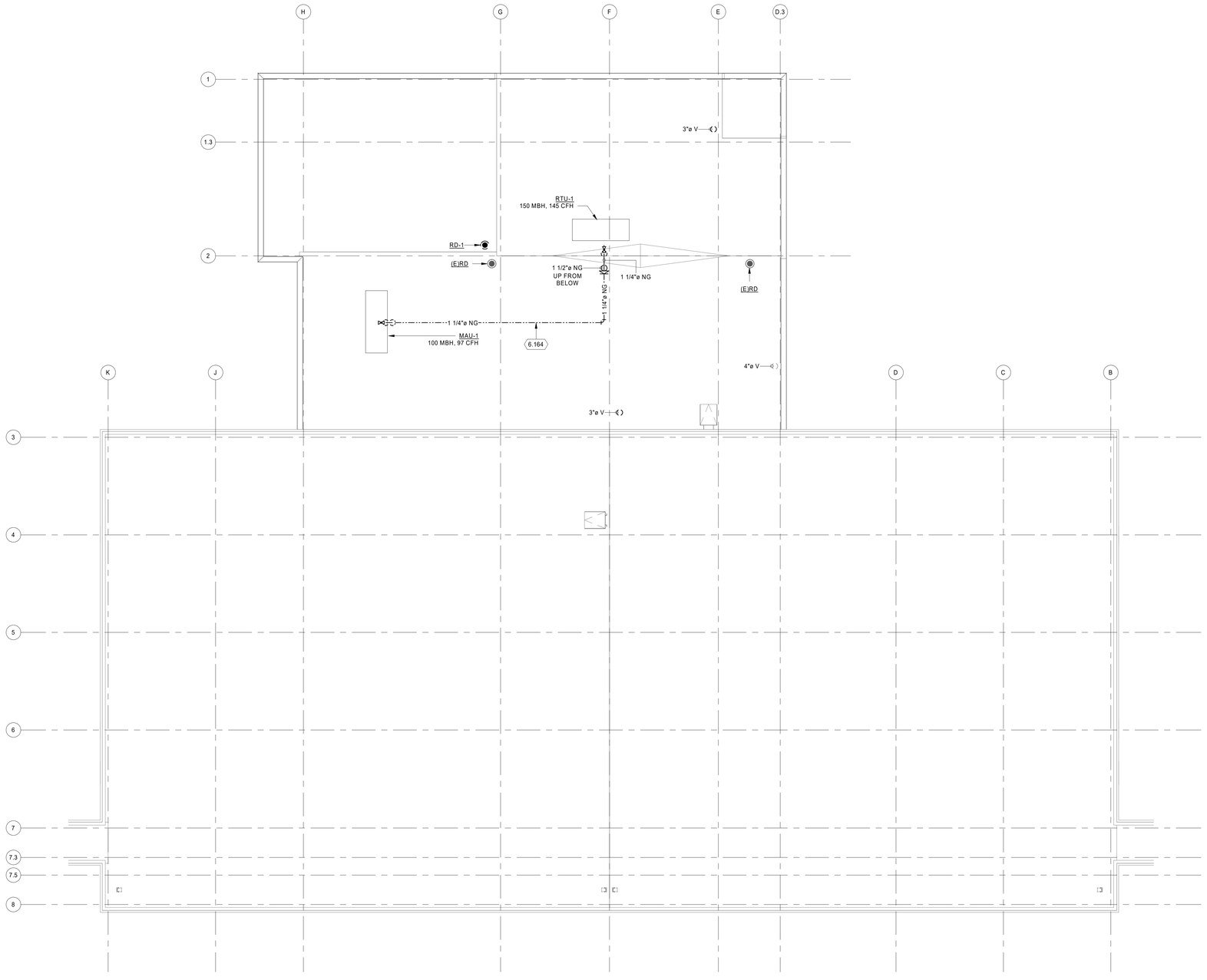
KEYED NOTES

6.164 SUPPORT NG PIPING ON ROOF USING DURABLOCK ROOF SUPPORTS OR SIMILAR.



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

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SHEET CONTENTS
ROOF PLAN

SHEET NO.:
P-133

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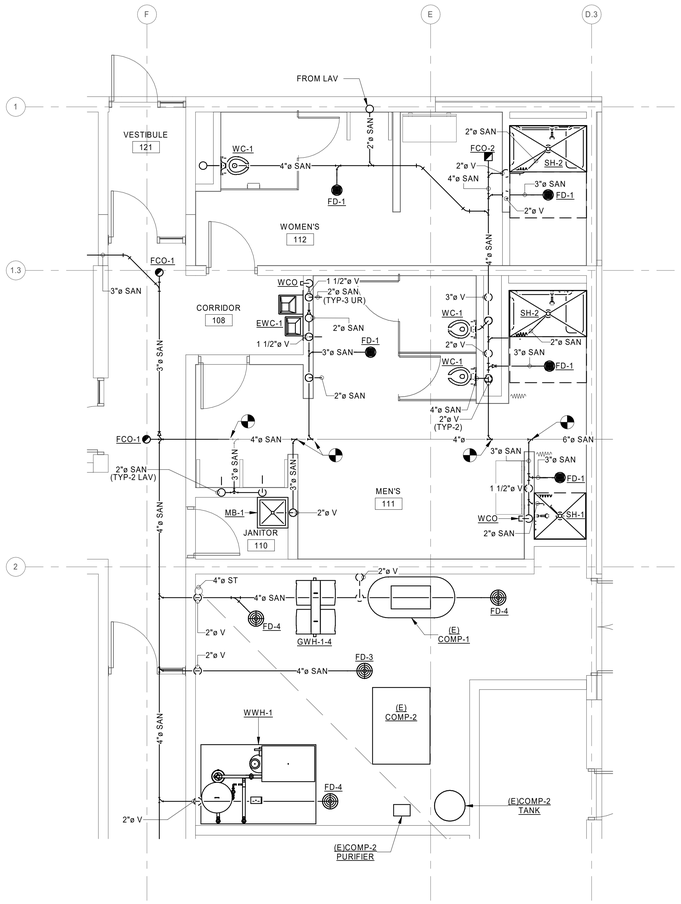
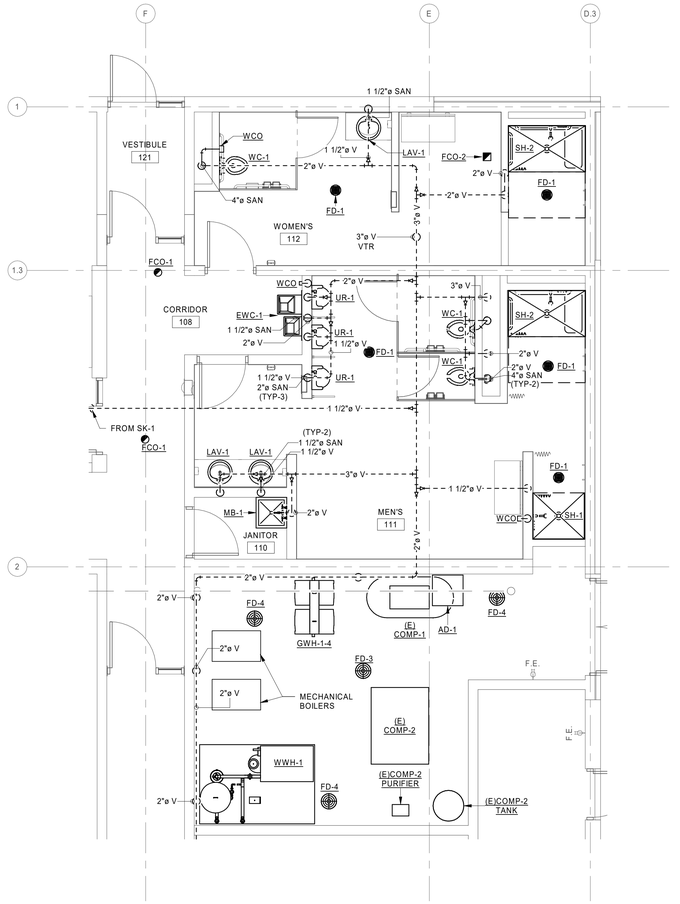


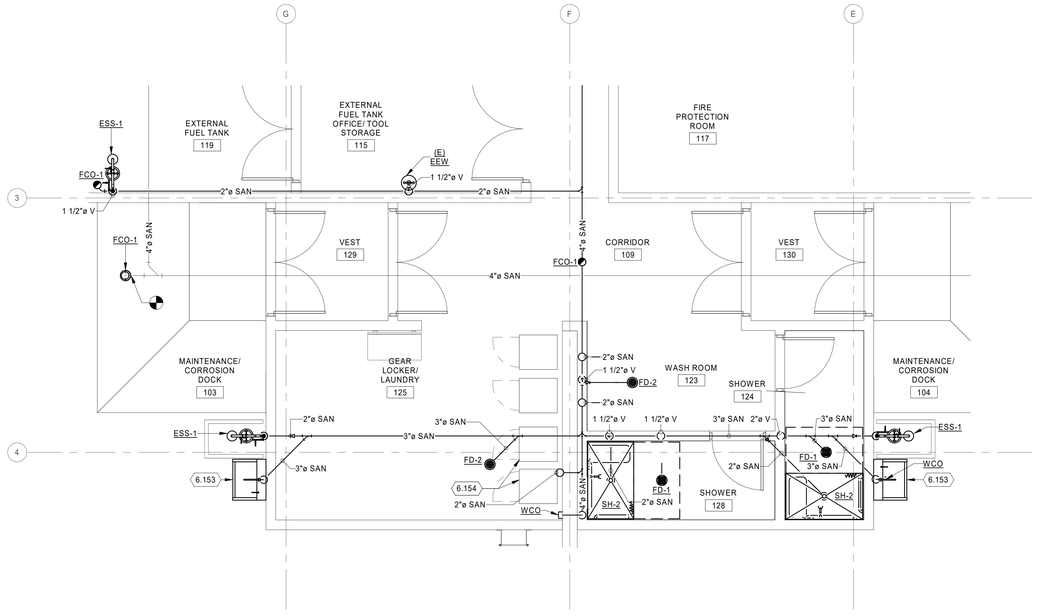
N 1 UNDERGROUND FLOOR PLAN - ENLARGED RESTROOMS

1/4" = 1'-0"



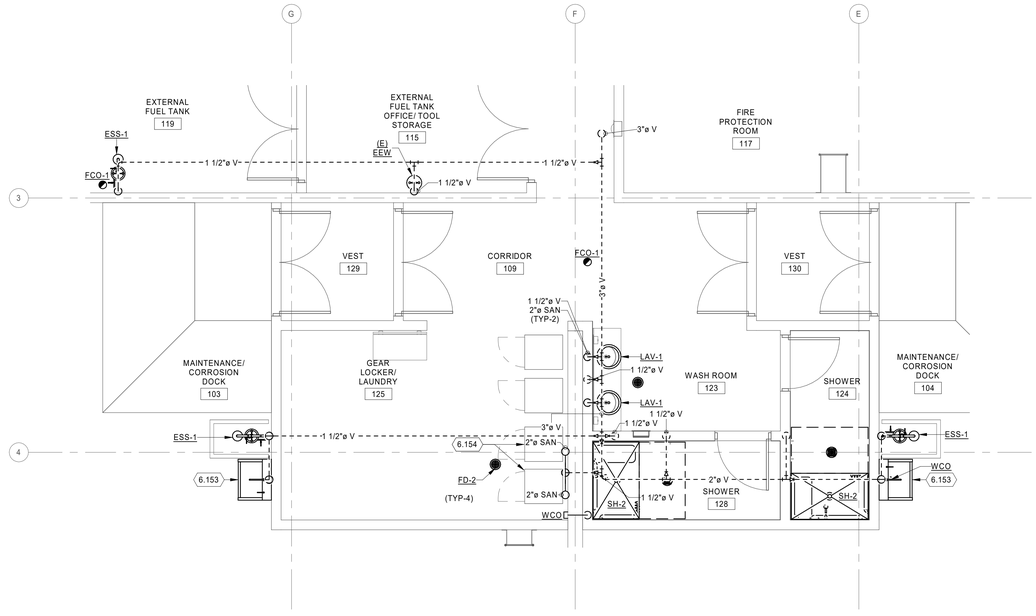
N 2 DRAIN & VENT PLAN - ENLARGED RESTROOMS

1/4" = 1'-0"



N 3 UNDERGROUND FLOOR PLAN - ENLARGED SHOWER ROOMS

1/4" = 1'-0"



N 4 DRAIN & VENT PLAN - ENLARGED SHOWER ROOMS

1/4" = 1'-0"

GENERAL NOTES

1. REFER TO GENERAL NOTES ON SHEET P-001.
2. REFER TO ENLARGED VIEW CALLOUTS ON PLANS FOR MORE DETAIL.
3. EQUIPMENT IN UTILITY 118 SHALL BE PROVIDED WITH 4" HOUSEKEEPING PADS. REFER TO STRUCTURAL FOR PAD DETAILS. PADS SHALL BE 6" LARGER ON ALL SIDES OF EQUIPMENT.

KEYED NOTES

6.153 RELOCATE EXISTING SCRUB SINK. PROVIDE NEW PIPING AS SHOWN.

6.154 PROVIDE WALL BOX (SIOUX CHIEF 696 OR SIMILAR) FOR EACH WASHERS SUPPLY AND DRAINAGE PIPING. PIPING SHALL BE SURFACE MOUNTED.

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

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12/16/22 TYPE B3 FINAL HEF MOD

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SHEET CONTENTS
ENLARGED PLUMBING PLANS - SHEET 1 OF 3

SHEET NO.:
P-401

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GENERAL NOTES

1. REFER TO GENERAL NOTES ON SHEET P-001.
2. REFER TO ENLARGED VIEW CALLOUTS ON PLANS FOR MORE DETAIL.
3. DOMESTIC WATER PIPE SIZES ARE BASED ON A MINIMUM WORKING PRESSURE OF 42 PSIG AT A FLOW RATE OF 92 GPM AT THE LOCATION WHERE THE MAIN SERVICE ENTERS THE BUILDING.
4. EQUIPMENT IN UTILITY 118 SHALL BE PROVIDED WITH HOUSEKEEPING PADS. REFER TO STRUCTURAL FOR PAD DETAILS. PADS SHALL BE 6" LARGER ON ALL SIDES OF EQUIPMENT.

KEYED NOTES

6.102 COMMON VENT TANKLESS RACK SYSTEM PER MANUFACTURER INSTALLATION REQUIREMENTS. VENTS SHALL PENETRATE THROUGH ROOF AND BE PROVIDED WITH BIRD SCREENS. COORDINATE ROOF PENETRATIONS WITH ARCHITECTURAL DETAILS.

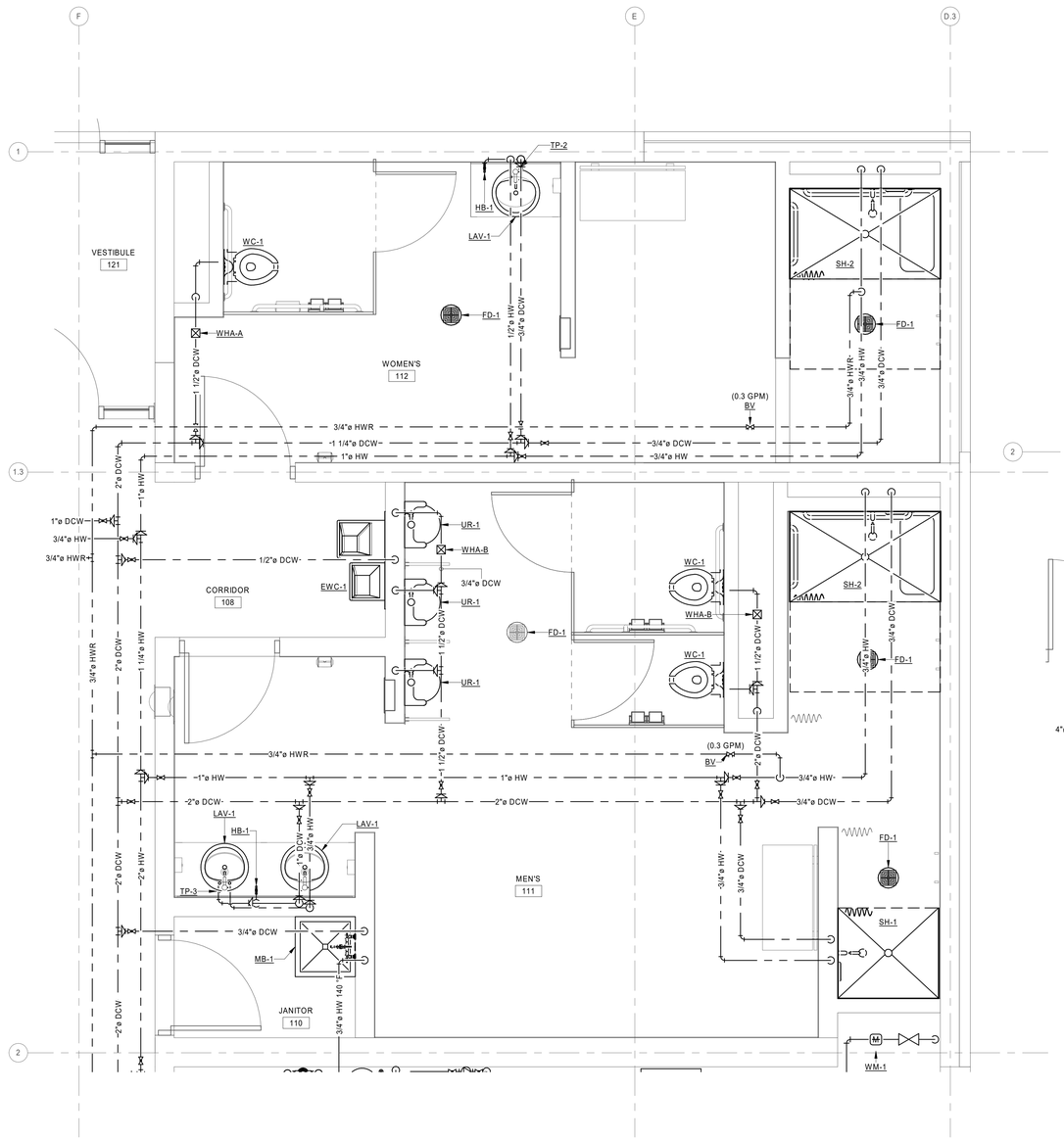
6.155 ALL EQUIPMENT WITHIN MECHANICAL ROOM SHALL BE MOUNTED ON 4" HOUSEKEEPING PAD THAT IS 6" LARGER THAN EQUIPMENT ON ALL SIDES. INSTALL LARGER FOOTPRINT PADS FOR EQUIPMENT IN CLOSE PROXIMITY. REFER TO STRUCTURAL FOR PAD DETAILS. TYPICAL.

6.156 REINSTALL TOOL AIR COMPRESSOR. PROVIDE NEW AIR DRYER AND FILTERS AND INSTALL PER DETAIL ON P-501. MOUNT AIR DRYER (AD-1) ON WALL ABOVE COMPRESSOR, MIN 6'-0" AFF. PROVIDE STEEL WALL SUPPORTS FOR MIN WEIGHT OF 300 LBS. CONNECT NEW PIPING TO EXISTING.

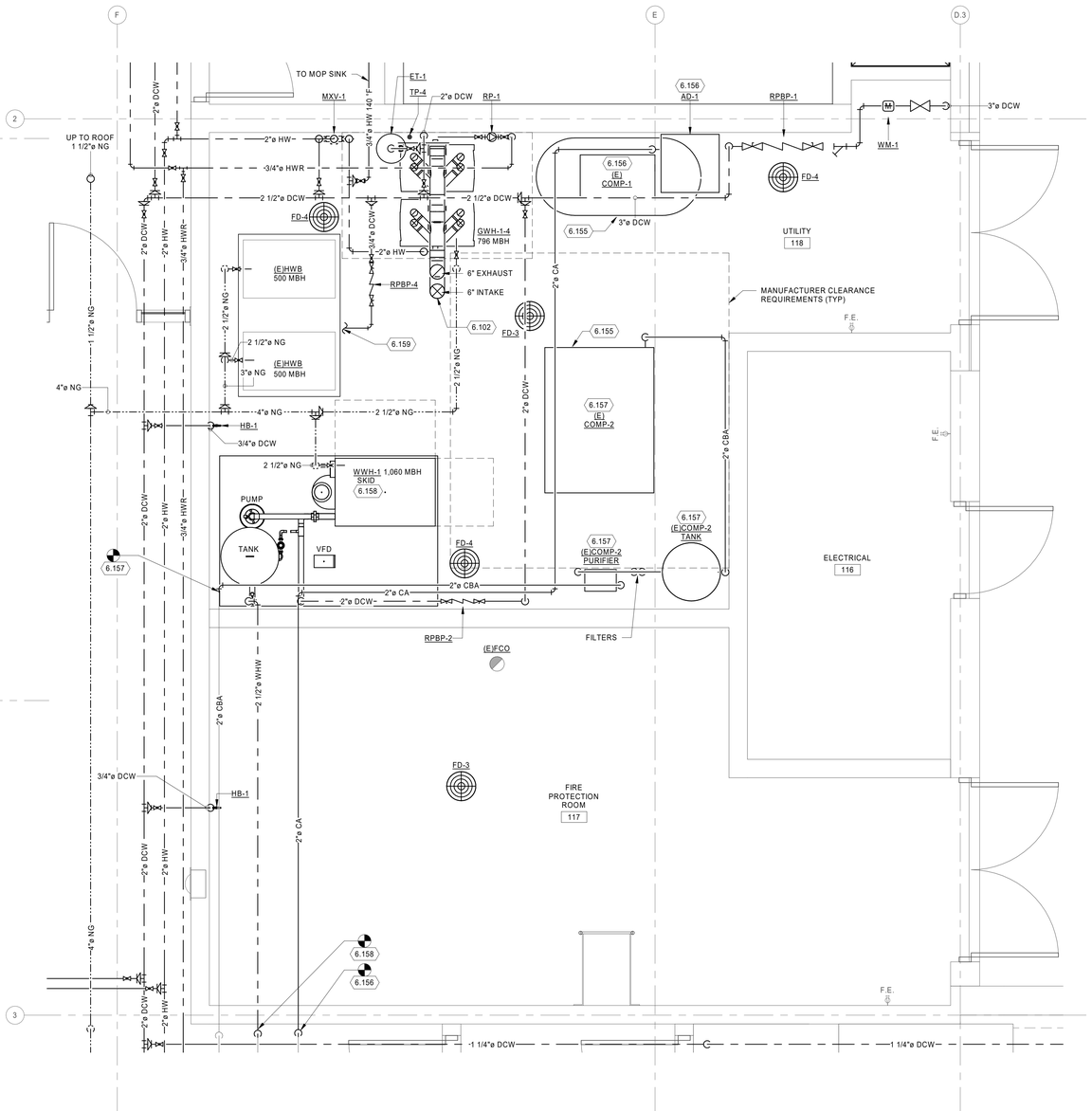
6.157 REINSTALL BREATHING COMPRESSED AIR SYSTEM INCLUDING COMPRESSOR, PURIFIER, RECEIVER TANK, DRYER, ALL FILTERS, CO MONITOR, AND MOTORIZED VALVES. INSTALL PER MANUFACTURER INSTALLATION REQUIREMENTS. CONNECT NEW PIPING TO EXISTING.

6.158 WASH WATER HEATER SYSTEM SHALL BE PROVIDED ON FULLY ASSEMBLED SKID-MOUNTED EQUIPMENT PACKAGE. SEE SCHEDULES FOR MORE DETAIL. MOUNT SKID ON HOUSEKEEPING PAD. CONNECT NEW PIPING TO EXISTING.

6.159 PROVIDE BOILER MAKEUP WATER WITH RPBP AND PRV. COORDINATE WITH MECHANICAL.



N 1 **SUPPLY PLAN - ENLARGED RESTROOMS**
1/2" = 1'-0"



N 2 **SUPPLY PLAN - ENLARGED UTILITY ROOM**
1/2" = 1'-0"

TETRA TECH Mead & Hunt
Joint Venture with
Mason & Hanger
710 Avis Drive, Suite 100,
Ann Arbor, MI 48108
phone: 810-956-9300

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
MBH NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: AMD
DRAWN BY: JRO
CHECKED BY: RMM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
ENLARGED PLUMBING PLANS - SHEET 2 OF 3

SHEET NO.:
P-402

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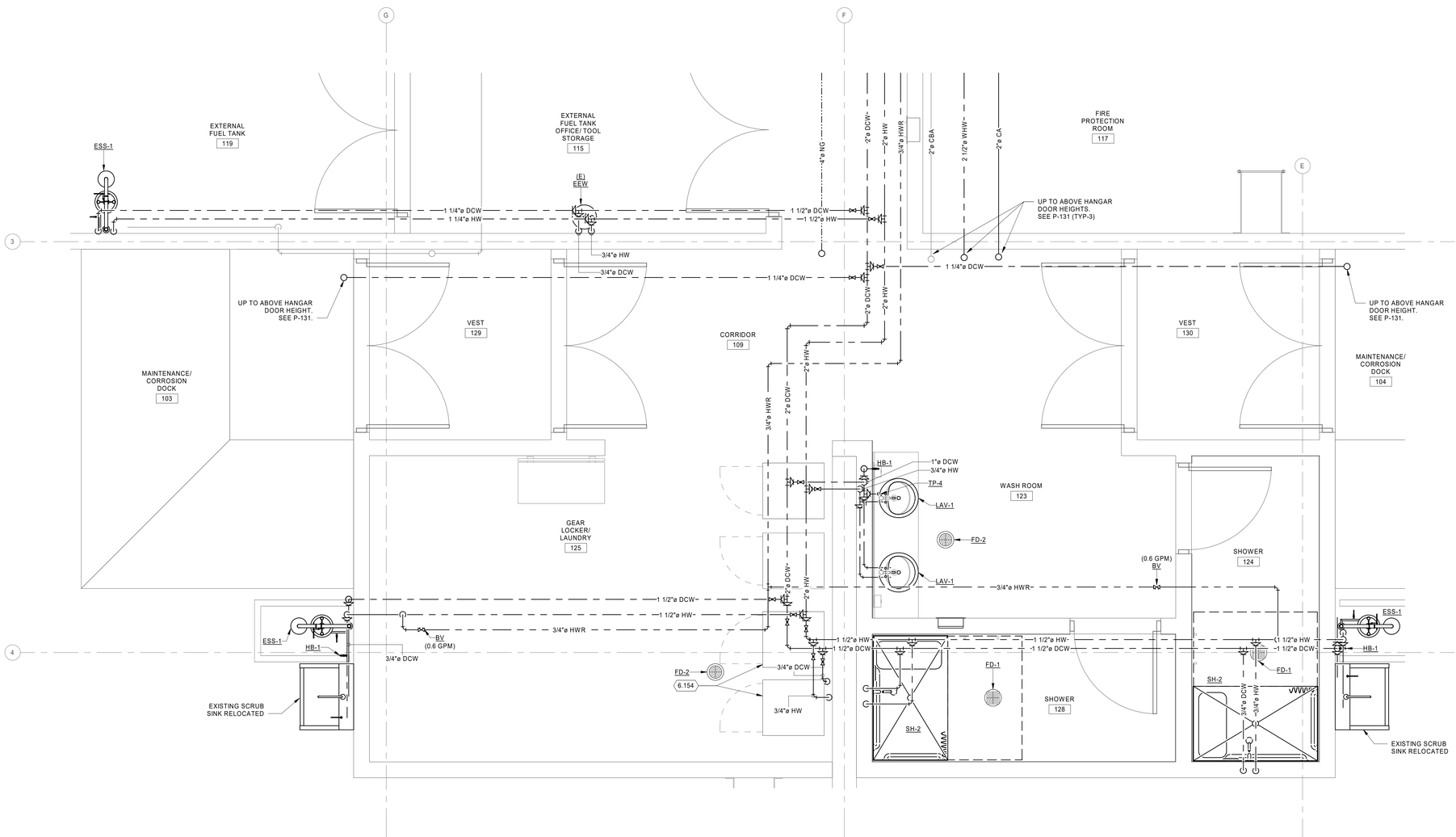
GENERAL NOTES

1. REFER TO GENERAL NOTES ON SHEET P-001.
2. REFER TO ENLARGED VIEW CALLOUTS ON PLANS FOR MORE DETAIL.
3. DOMESTIC WATER PIPE SIZES ARE BASED ON A MINIMUM WORKING PRESSURE OF 42 PSIG AT A FLOW RATE OF 92 GPM AT THE LOCATION WHERE THE MAIN SERVICE ENTERS THE BUILDING.
4. EQUIPMENT IN UTILITY 118 SHALL BE PROVIDED WITH HOUSEKEEPING PADS. REFER TO STRUCTURAL FOR PAD DETAILS. PADS SHALL BE 6" LARGER ON ALL SIDES OF EQUIPMENT.

KEYED NOTES

6.154 PROVIDE WALL BOX (SIOUX CHIEF 696 OR SIMILAR) FOR EACH WASHERS SUPPLY AND DRAINAGE PIPING. PIPING SHALL BE SURFACE MOUNTED.



1 SUPPLY FLOOR PLAN - ENLARGED SHOWER ROOMS

1/2" = 1'-0"

TETRA TECH
Mead & Hunt
Joint Venture with
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710 Avis Drive, Suite 100,
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SHEET CONTENTS
ENLARGED PLUMBING PLANS - SHEET 3 OF 3

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P-403

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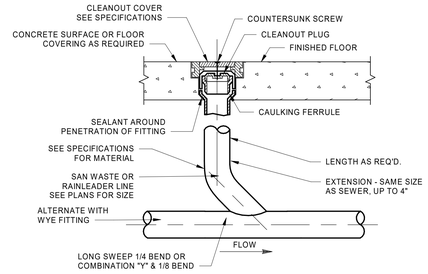
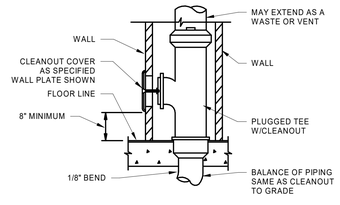
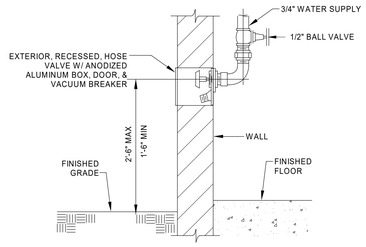


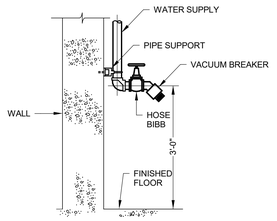
1 FLOOR CLEANOUT DETAIL
N.T.S.



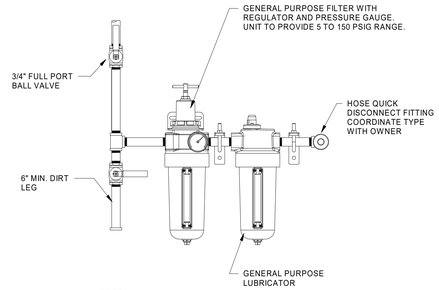
2 WALL CLEANOUT DETAIL
N.T.S.



3 EXTERIOR HOSE BIBB DETAIL
N.T.S.

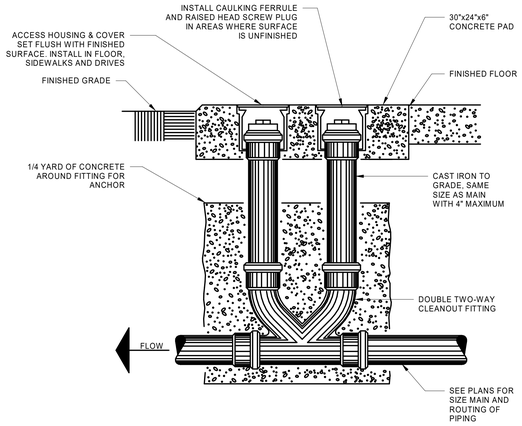


4 INTERIOR HOSE BIBB DETAIL
N.T.S.

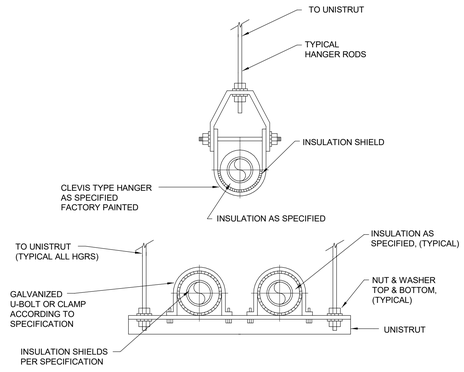


NOTE:
1. ARRANGEMENT MAY MIRROR IN SOME LOCATIONS.
2. DROPS SHALL BE 20 SCFM W/ PRESSURE REGULATOR.
3. PROVIDE TWO (2) SEPARATE VALVE AND QUICK-DISCONNECT ASSEMBLIES, ONE (1) PNEUMATIC TOOL FILTER, LUBRICATOR, AND HOSE REEL AT EACH DROP LOCATION WITHIN WORK BAYS

5 COMPRESSED AIR DROP DETAIL
N.T.S.



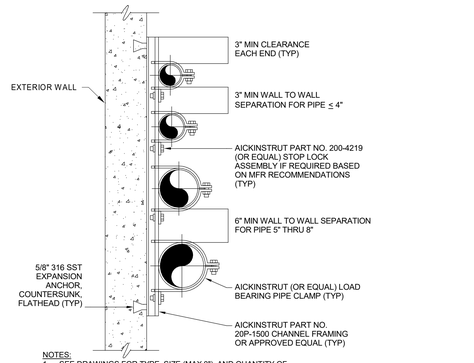
6 DOUBLE YARD CLEANOUT DETAIL
N.T.S.



7 PIPE HANGERS - CLEVIS/TRAPEZE
N.T.S.

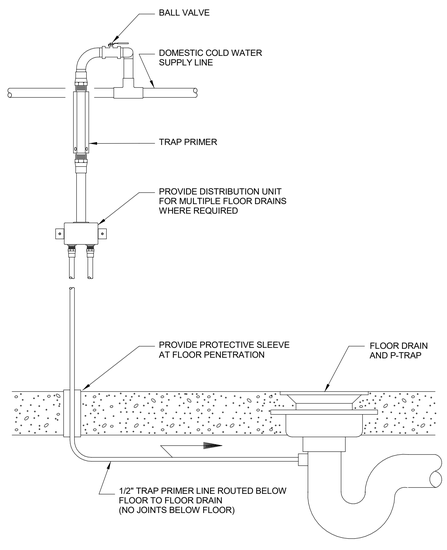
PIPE HANGER SUPPORT AND SPACING

PIPE SIZE (INCHES)	ROD SIZE (INCHES)	STEEL PIPE (FEET)	COPPER PIPE (FEET)
1" AND SMALLER	3/8"	8'	6'
1-1/4" TO 1-1/2"	3/8"	10'	8'
2"	3/8"	10'	8'
2-1/2" TO 3-1/2"	1/2"	12'	12'
4" TO 5"	5/8"	16'	14'
6"	3/4"	16'	16'
8" TO 12"	7/8"	20'	20'
14" TO 18"	1"	20'	20'
20" AND OVER	1-1/4"	20'	20'



NOTES:
1. SEE DRAWINGS FOR TYPE, SIZE (MAX 8"), AND QUANTITY OF SUPPORTED PIPES.
2. ALL FRAMING AND PIPE SUPPORT MATERIALS SHALL 316 SST (UNISTRUT OR EQUAL FOR EXTERIOR).
3. SCHEDULE 80 PVC SLEEVE HALL BE PROVIDED AT PIPE SUPPORTS FOR INSULATED PIPE OR DOUBLE WALL CONTAINMENT PIPE.

8 PIPE WALL MOUNTING DETAIL
N.T.S.



9 TRAP PRIMER DETAIL
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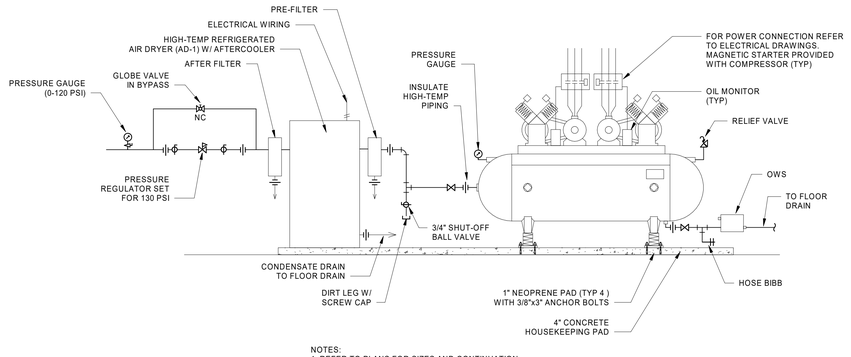
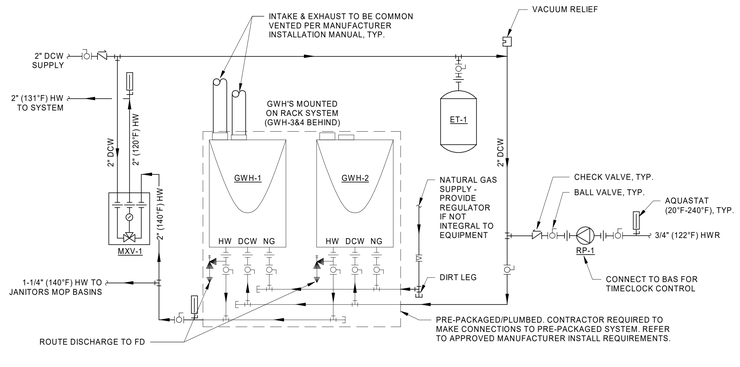


NOTES:
1. REFER TO PLANS FOR SIZES AND CONTINUATION.

10 TYPICAL AIR COMPRESSOR DETAIL
N.T.S.



11 INSTANTANEOUS WATER HEATER RACK SYSTEM DIAGRAM (GWH-1-4)
N.T.S.

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P-501

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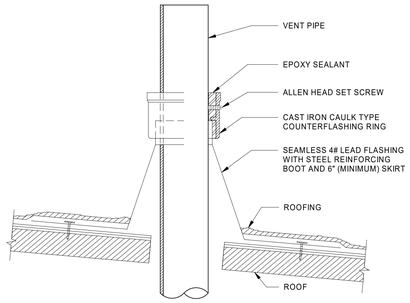
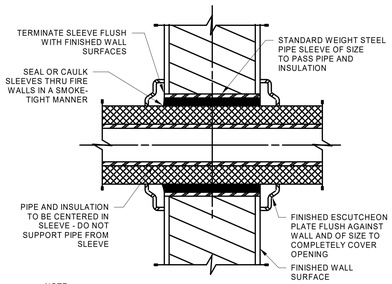


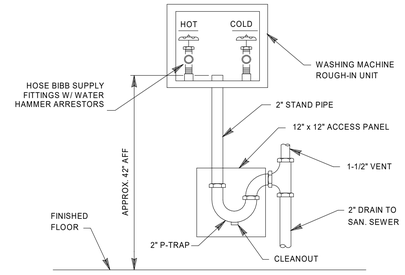
NOTES:
1. REFER ARCHITECTURAL PLANS AND ROOFING SYSTEM FOR ADDITIONAL REQUIREMENTS.
2. VENT SHALL EXTEND THROUGH FLASHING AND TERMINATE VERTICALLY NOT LESS THAN SIX INCHES ABOVE THE ROOF NOR LESS THAN ONE FOOT FROM A VERTICAL SURFACE. WHERE LOCATED IN FREEZING CLIMATES THE VENT SHALL TERMINATE NOT LESS THAN TEN INCHES ABOVE ROOF, OR IN ACCORDANCE WITH LOCAL AHJ.
3. VENT SHALL TERMINATE NOT LESS THAN TEN FEET FROM, OR NOT LESS THAN THREE FEET ABOVE AN OPERABLE WINDOW, DOOR, OPENING, AIR INTAKE, OR VENT SHAFT, OR NOT LESS THAN THREE FEET IN EVERY DIRECTION FROM A LOT LINE, ALLEY OR STREET.

1 VENT THRU ROOF DETAIL
N.T.S.

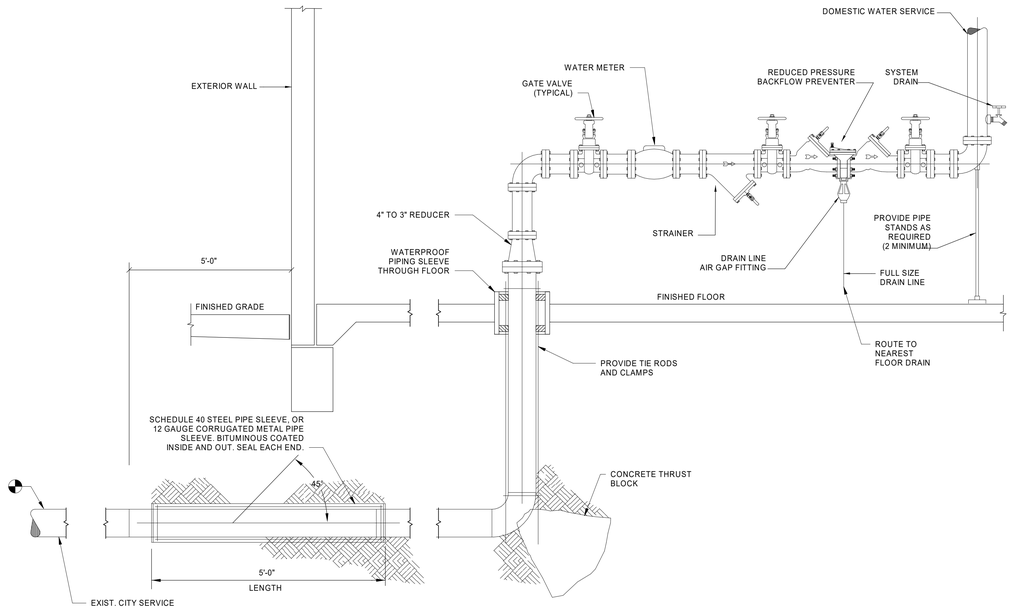


NOTE:
PROVIDE UL RATED ASSEMBLIES FOR ALL WALLS WITH FIRE RATINGS.

2 WALL PIPE PENETRATION DETAIL
N.T.S.



3 WASHING MACHINE HOOK-UP DETAIL
N.T.S.



4 DOMESTIC WATER SERVICE ENTRANCE DETAIL
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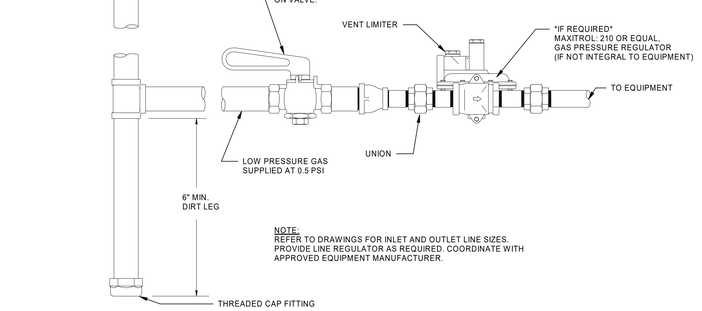
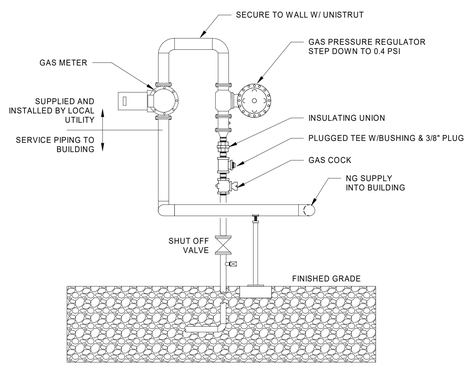


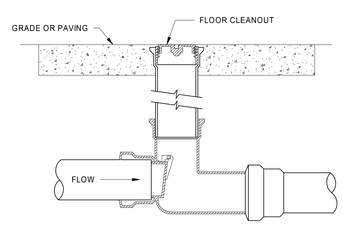
NOTE:
REFER TO DRAWINGS FOR INLET AND OUTLET LINE SIZES. PROVIDE LINE REGULATOR AS REQUIRED. COORDINATE WITH APPROVED EQUIPMENT MANUFACTURER.

5 TYPICAL GAS CONNECTION TO EQUIPMENT
N.T.S.



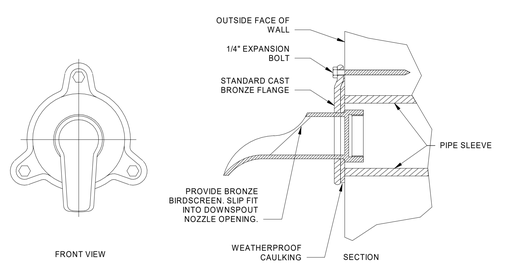
NOTES:
1. REFER TO PLANS FOR SIZING AND CONTINUATION.

6 GAS SERVICE ENTRANCE DETAIL
N.T.S.



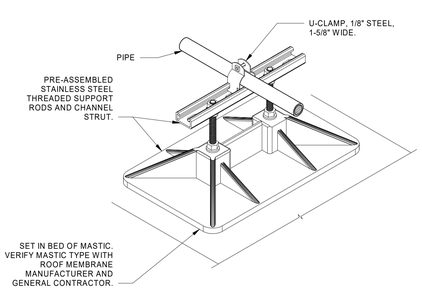
NOTES:
1. REFER TO PLANS FOR SIZES AND CONTINUATIONS.

7 BACKWATER VALVE
N.T.S.



NOTES:
1. REFER TO ARCHITECTURAL FOR BUILDING WALL CONSTRUCTION
2. CAST BRONZE OVERFLOW NOZZLE.

8 DOWNSPOUT NOZZLE
N.T.S.



NOTES:
1. SUPPORT PIPE EVERY 6' OC (MAXIMUM) AND AT EACH ELBOW.

9 PIPE ROOF SUPPORT DETAIL
N.T.S.

TETRA TECH
Mead & Hunt
Joint Venture with
Mason & Hanger
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Ann Arbor, MI 48108
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P-502

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GENERAL NOTES

1. CONTRACTORS ARE FREE TO USE ANY PRODUCT WHICH MEETS THE GOVERNMENT'S MINIMUM REQUIREMENTS AND NOT IN CONFLICT WITH OTHER CONTRACT PROVISIONS. UNLESS INDICATED OTHERWISE ON THE PLANS OR SPECIFICATIONS (E.G. SOLE-SOURCE), ALL LISTED MANUFACTURERS ARE THE BASIS OF DESIGN. FOR THESE BASIS OF DESIGN PRODUCTS, OTHER MANUFACTURERS MAY BE SUBSTITUTED AS LONG AS THE STANDARD OF QUALITY AND CHARACTERISTICS OF THE SUBSTITUTED MANUFACTURER MEET OR EXCEED THE STANDARD OF QUALITY AND CHARACTERISTICS OF THE BASIS OF DESIGN.

TANKLESS WATER HEATER SCHEDULE

TAG	DESCRIPTION	SUPPLY TEMPERATURE(°F)	TEMPERATURE RISE (°F)	FLOW @ TEMP. RISE (GPM)	TOTAL INPUT	GAS PRESSURE		FLUE SIZE	ELECTRICAL			ENERGY FACTOR	MANUFACTURER	MODEL	NOTES
						MIN	MAX	(EACH)	V	PH	HZ				
GWH-1-4	TANKLESS RACK SYSTEM	140	100	15.2	796,000 Btu/h	4.0 in-wg	10.5 in-wg	3"	120 V	1	60 Hz	0.95	A.O. SMITH	ACI-CRS-44B2B-N	1

NOTES:

1. 4 TOTAL HEATERS ON RACK SYSTEM. PROVIDE WITH COMMON VENTING AND NEUTRALIZER KIT FOR CONDENSATE DRAINAGE. MINIMUM ACTIVATION FLOWRATE: 0.5 GPM.

WASH WATER HEATER SCHEDULE

TAG	DESCRIPTION	SUPPLY TEMPERATURE (°F)	TEMPERATURE RISE (°F)	FLOW @ TEMP. RISE (GPM)	TOTAL INPUT (BTUH)	GAS PRESSURE MIN/MAX (IN-WG)	FLUE SIZE (IN)	VOLTS / PH / HZ	MANUFACTURER	MODEL	NOTES
WWH-1	WASH WATER HEATER	140	100	20.4	1,060,000	4.0 / 14.0	6	120 / 1 / 60	AERCO	INN 1060N	1

NOTES:

1. PROVIDE WITH BELL & GOSSETT EXPANSION TANK (PTA-80V) AND E-SH 1"X2"-7.5 HP PUMP W/ DANFOSS VFD. EQUIPMENT SHALL BE PROVIDED AS PART OF A FULLY ASSEMBLED SKID MOUNTED PACKAGE (MODEL FDS-479) AS PROVIDED BY RL DEPPMANN OR ENGINEER APPROVED EQUAL. PROVIDE ABILITY FOR BMS TO MONITOR ON/OFF STATUS OF SYSTEM.

EXPANSION TANK SCHEDULE

TAG	DESCRIPTION	SERVICE	SYSTEM VOLUME (GAL)	TANK VOLUME (GAL)	ACCEPTANCE VOLUME (GAL)	MAX PRESSURE (PSI)	SYSTEM PRESSURE (PSI)	MANUFACTURER	MODEL	NOTES
ET-1	ASME THERMAL EXPANSION TANK	DOMESTIC WATER	100.0	6.4	3.2	150	5	AMTROL	ST-12C	-

PUMP SCHEDULE

TAG	DESCRIPTION	FLOW (GPM)	HEAD (FT)	HP (W)	RPM	VOLTS / PH / HZ	MANUFACTURER	MODEL	NOTES
RP-1	HWR RECIRCULATION PUMP	3	10	92	2940	115 / 1 / 60	BELL & GOSSETT	NBF-22	1

NOTES:

1. PROVIDE WITH AQUASTAT. SEE CONTROLS DIAGRAM FOR SEQUENCE OF OPERATION.

PLUMBING FIXTURE SCHEDULE

TAG	DESCRIPTION	CONNECTION SIZE (IN)				MANUFACTURER	MODEL	NOTES
		DCW	HW	WASTE	VENT			
BWV-1	BACKWATER VALVE W/ EXTENSION FITTING	-	-	SEE PLANS	-	JAY R SMITH	7022	-
DYCO/YCO-1	YARD CLEANOUT	-	-	4	-	JAY R SMITH	4103S-PB	-
EEW-1	EMERGENCY EYEWASH	3/4	3/4	1-1/2	1-1/2	HAWS	7261-7271	8
ESS-1	EMERGENCY SHOWER AND EYE/FACE WASH	1-1/4	1-1/4	1-1/2	1-1/2	HAWS	8300-8309	1
EWC-1	ELECTRIC WATER COOLER	1/2	-	1-1/2	1-1/2	ELKAY	LZSTL8WSSK	-
FCO-1	ROUND FLOOR CLEANOUT	-	-	SEE PLANS	-	JAY R SMITH	4023S-F-C-PB	-
FCO-2	SQUARE FLOOR CLEANOUT	-	-	SEE PLANS	-	JAY R SMITH	4040S-F-C-PB	-
FD-1	6" X 6" SQUARE FLOOR DRAIN	-	-	3	-	JAY R SMITH	2005Y-0306-H-P050-HP-NB	-
FD-2	6" ROUND FLOOR DRAIN	-	-	3	-	JAY R SMITH	2005Y-0306-H-P050-HP-WHDG-SS	-
FD-3	12" ROUND FLOOR DRAIN	-	-	4	-	JAY R SMITH	2240Y-0412-P050-NB	-
FD-4	12" ROUND FLOOR DRAIN WITH INTEGRAL FUNNEL	-	-	4	-	JAY R SMITH	3755T-0412-NB	-
HB-1	INTERIOR HOSE BIBB	3/4	-	-	-	WOODFORD	24CH	-
HB-2	EXTERIOR FROST-PROOF HOSE BIBB	3/4	-	-	-	WOODFORD	B65BR	-
LAV-1	LAVATORY (0.5 GPM)	1/2	1/2	1-1/2	1-1/2	SEE NOTES	SEE NOTES	2
MB-1	TERRAZO MOP BASIN	3/4	3/4	3	1-1/2	FIAT PRODUCTS	TSB3010	9
RD-1	OVERFLOW ROOF DRAIN	-	-	4	-	JAY R SMITH	1045	-
SH-1	SHOWER (1.75 GPM)	3/4	3/4	2	1-1/2	BESTBATH SYSTEMS	LCS4238CP	3
SH-2	SHOWER ROLL IN W/ SEAT (2.5 GPM)	3/4	3/4	2	1-1/2	BESTBATH SYSTEMS	XES6337E1B	4
SK-1	CLASSROOM BREAK SINK (1.5 GPM)	1/2	1/2	1-1/2	1-1/2	SEE NOTES	SEE NOTES	5
TP-#	TRAP PRIMER	1/2	-	-	-	ZURN	Z1022-XL	10
UR-1	URINAL, WALL-MOUNTED (0.125 GPF)	3/4	-	2	1-1/2	AMERICAN STANDARD	6042.001EC	6
WC-1	WATER CLOSET, WALL - MOUNTED (1.28 GPF)	1-1/2	-	4	2	AMERICAN STANDARD	3351.101	7
WCO-1	WALL CLEANOUT	-	-	SEE PLANS	-	JAY R SMITH	4553S	-

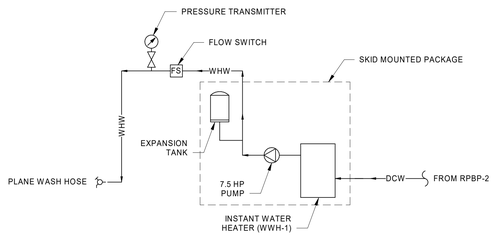
NOTES:

1. ESS-1 ACCESSORIES:
   - THERMOSTATIC MIXING VALVE: HAWS 9202E
   - AUDIBLE & VISUAL EMERGENCY ALARM SYSTEM: HAWS 9001
   - CURTAIN: HAWS 9037
   - AUDIBLE & VISUAL EMERGENCY ALARM SYSTEM (FOR FUEL TANK ROOM): HAWS 9001 EXP
2. LAV-1 ACCESSORIES:
   - FAUCET: SLOAN EAF-225 (0.5 GPM)
   - HARD WIRED ELECTRIC SENSOR FAUCET W/ MECH. OVERRIDE*
   - MIXING VALVE: WATTS LFMMV FOR 120 DEG F-105 DEG F MIXING
   - STRAINER: DELTA 33T260
   - P-TRAP: PROFLO - PFPTB109 (WITH INTEGRAL CLEANOUT)
   - LAVATORY TO BE INTEGRAL TO COUNTERTOP. SEE ARCHITECTURAL.
3. SH-1 ACCESSORIES:
   - BEST BATH SYSTEMS - T-SHAPED RUBBER WATERSTOPPER KIT, THERMOSTATIC MIXING VALVE, & SOAP DISH
   - SHOWER, VALVE, & TRIM KIT: DELTA - T13H132 (1.75 GPM)
   - BEST BATH SYSTEMS - FLANGE TRIM KIT
4. SH-2 ACCESSORIES:
   - BEST BATH SYSTEMS - T-SHAPED RUBBER WATERSTOPPER KIT, CMU FLANGE, GRAB BARS, FOLDING SEAT, THERMOSTATIC MIXING VALVE, & SOAP DISH
   - HAND SHOWER, VALVE, & TRIM KIT: DELTA - T17TH335 (2.5 GPM)
   - BEST BATH SYSTEMS - FLANGE TRIM KIT
5. SK-1 ACCESSORIES:
   - GARBAGE DISPOSAL (GD-1)
   - FAUCET: ELKAY LKD2423BHC (1.5 GPM)
   - MIXING VALVE: WATTS LFMMV FOR 120 DEG F-105 DEG F MIXING
   - STRAINER: PROFLO - PFPTB109 (WITH INTEGRAL CLEANOUT)
   - P-TRAP: PROFLO - PF1432SS
   - SINK TO BE SOLID SURFACE INTEGRAL TO COUNTERTOP. SEE ARCHITECTURAL.
6. UR-1 ACCESSORIES (REFER TO ARCHITECTURAL FOR MOUNTING HEIGHTS):
   - FLUSH VALVE: SLOAN ECOS 186 HW-0.125-OR-HW
   - HARD WIRED ELECTRIC SENSOR FLUSH VALVE W/ MECH. OVERRIDE*
7. WC-1 ACCESSORIES (REFER TO ARCHITECTURAL FOR MOUNTING HEIGHTS):
   - FLUSH VALVE: SLOAN ECOS 111-1.28-HW
   - HARD WIRED ELECTRIC SENSOR FLUSH VALVE W/ MECH. OVERRIDE*
   - SEAT: AMERICAN STANDARD - 5901.100SS WITH EVERCLEAN SURFACE AND SELF SUSTAINING HINGE
   - WALL CARRIER: MIFAB - MC-10-HDX (COORDINATE TYPE AND ORIENTATION OF CARRIER PER AREA AND DRAINAGE REQUIREMENTS. MODEL INDICATED FOR REFERENCE.)
8. EEW-1 ACCESSORIES:
   - THERMOSTATIC MIXING VALVE: HAWS 9202E
   - AUDIBLE & VISUAL EMERGENCY ALARM SYSTEM: HAWS 9001
   - AUDIBLE & VISUAL EMERGENCY ALARM SYSTEM (FOR FUEL TANK ROOM): HAWS 9001 EXP
9. MB-1 ACCESSORIES:
   - STAINLESS STEEL WALL GUARDS: FIAT MSG
   - HOSE AND HOSE BRACKET: 832AA
   - FAUCET: ELKAY LK940BP07L2H
10. TP-# - REPRESENTS # OF FLOOR DRAINS SERVED. PROVIDE WITH OUTLET DISTRIBUTION UNIT.

*ALL FAUCETS AND FLUSH VALVES INDICATED TO BE HARDWIRED SHALL BE PROVIDED WITH AC POWER KIT TO ALLOW DIRECT POWER INSTALLATION. THE CONTRACTOR MAY DAISY CHAIN MULTIPLE FIXTURES FROM ONE AC TRANSFORMER IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. COORDINATE INSTALLATION WITH ELECTRICAL CONTRACTOR.

PLUMBING ACCESSORY SCHEDULE

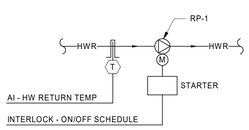
TAG	DESCRIPTION	CONNECTIONS	ELECTRICAL	MANUFACTURER	MODEL	NOTES
DS-1	DOWNSPOUT NOZZLE	4" ST	N/A	JAY R SMITH	D1770	PROVIDE BIRD SCREEN
GD-1	GARBAGE DISPOSAL	1-1/2" SAN	120V, 1/2HP	INSINKERATOR	BADGER 5	-
MXV-1	PRIMARY MIXING VALVE	2" DOMESTIC	N/A	WATTS	LFMM435	140 DEG F - 120 DEG F
WHA-#	WATER HAMMER ARRESTOR	-	N/A	ZURN	Z1700	# REPRESENTS SIZE



SEQUENCE OF OPERATION:

- PUMP SOFT START TRIGGERED BY FLOW SWITCH.
- PUMP VFD ADJUSTS TO MAINTAIN 110 PSI ON PRESSURE TRANSMITTER.
- PUMP HAS MAX FLOW RATE SETTING OF 45 GPM.
- WHEN FLOW SWITCH SHOWS 0 FLOW, PUMP SHUT-OFF TIMER BEGINS. PUMP SHUTS DOWN AFTER 30 SECONDS (ADJUSTABLE).

1 WASH WATER HEATER CONTROL SCHEMATIC
N.T.S.



SEQUENCE OF OPERATION:

START/STOP PUMP VIA LINE-VOLTAGE RELAY WHEN:
- ONE (OR MORE) INSTANTANEOUS HEATER IS ACTIVE
- WATER RETURN TEMPERATURE FALLS BELOW 105°F (ADJ.)
  - HEATER SHALL ENGAGE WHEN PUMP IS ACTIVE

PUMP ON/OFF STATUS & RETURN TEMPERATURE STATUS SHALL BE MONITORED AT BUILDING MANAGEMENT SYSTEM.

2 HOT WATER RECIRCULATING PUMP CONTROL SCHEMATIC
N.T.S.

BACKFLOW PREVENTER SCHEDULE

TAG	DESCRIPTION	SIZE	FLOW	MAXIMUM OPERATING PRESSURE	MAX INLET TEMPERATURE	PRESSURE LOSS AT RATED FLOW	MANUFACTURER	MODEL	NOTES
RPBP-1	REDUCED PRESSURE ZONE ASSEMBLY	3"	92 GPM	175 psi	140 °F	12 psi	WATTS	LF009NRS	DOMESTIC SERVICE
RPBP-2	REDUCED PRESSURE ZONE ASSEMBLY	2"	45 GPM	175 psi	180 °F	13 psi	WATTS	LF009M2QT	WASH WATER SERVICE
RPBP-3	REDUCED PRESSURE ZONE ASSEMBLY	1 1/4"	12 GPM	175 psi	180 °F	12 psi	WATTS	LF009M2QT	B158
RPBP-4	REDUCED PRESSURE ZONE ASSEMBLY	3/4"	6 GPM	175 psi	180 °F	14 psi	WATTS	LF009M2QT	BOILER MAKEUP

NOTES:

1. PROVIDE WITH AIR GAP ON DRAIN OUTLET. TYPICAL ALL.

WATER METER SCHEDULE

TAG	DESCRIPTION	SIZE	TYPICAL OPERATING RANGE (GPM)	MAXIMUM WORKING PRESSURE (PSI)	MANUFACTURER	MODEL	NOTES
WM-1	B154 WATER METER	2"	2 - 160	150	ELSTER	C700	1
WM-2	B158 WATER METER	1"	1 - 50	150	ELSTER	C700	1

NOTES:

1. PROVIDE WITH C/F DIGITAL PULSE OUTPUT AND ADVANCED METER READING SYSTEM.

AIR DRYER SCHEDULE

TAG	DESCRIPTION	CFM @ 100 PSIG	MAX PSIG	REFRIGERANT	POWER CONSUMPTION (KW)	VOLTS / PH / HZ	WEIGHT (LBS)	MANUFACTURER	MODEL	NOTES
AD-1	REFRIGERATED AIR DRYER	100	232	R404A	1.7	115 / 1 / 60	231	QUINCY	QRHT100	1

NOTES:

1. AIR DRYER TO BE PAIRED WITH EXISTING 15 HP (QUINCY QE-20) AIR COMPRESSOR & RECEIVER TANK. PROVIDE WITH PRE-FILTER DCNT125 AND AFTER-FILTER CSNT125. MOUNT DRYER ON WALL ABOVE COMPRESSOR.

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16, 2022
DESIGNED BY: AMD
DRAWN BY: JRO
CHECKED BY: RMM
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SHEET CONTENTS
SCHEDULES

SHEET NO.:
P-601

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GENERAL NOTES

1. REFER TO GENERAL NOTES ON SHEET P-001.
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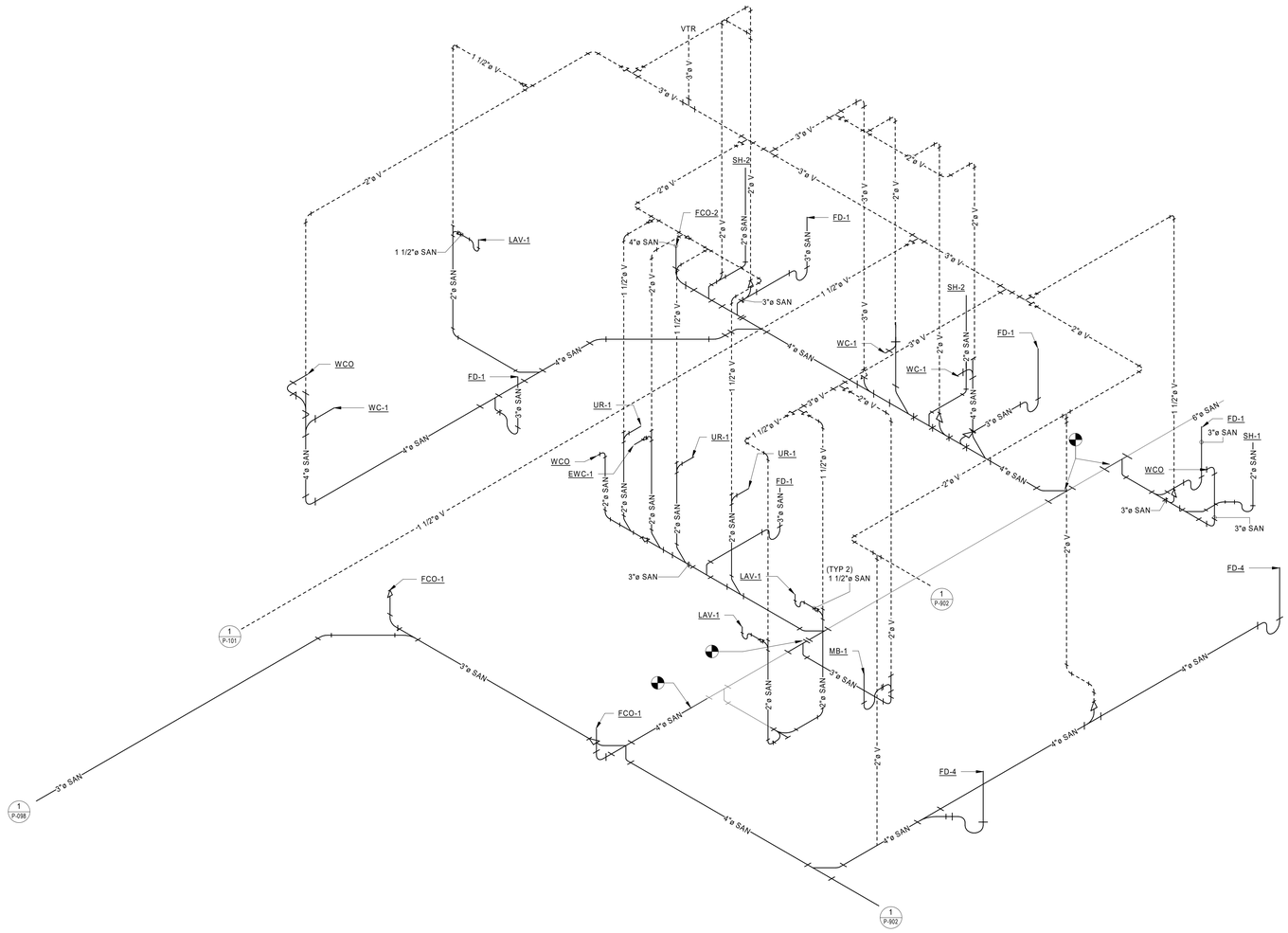

1 DRAIN & VENT ISOMETRIC - RESTROOMS

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SHEET CONTENTS
DRAIN & VENT ISOMETRICS - SHEET 1 OF 2

SHEET NO.:
P-901

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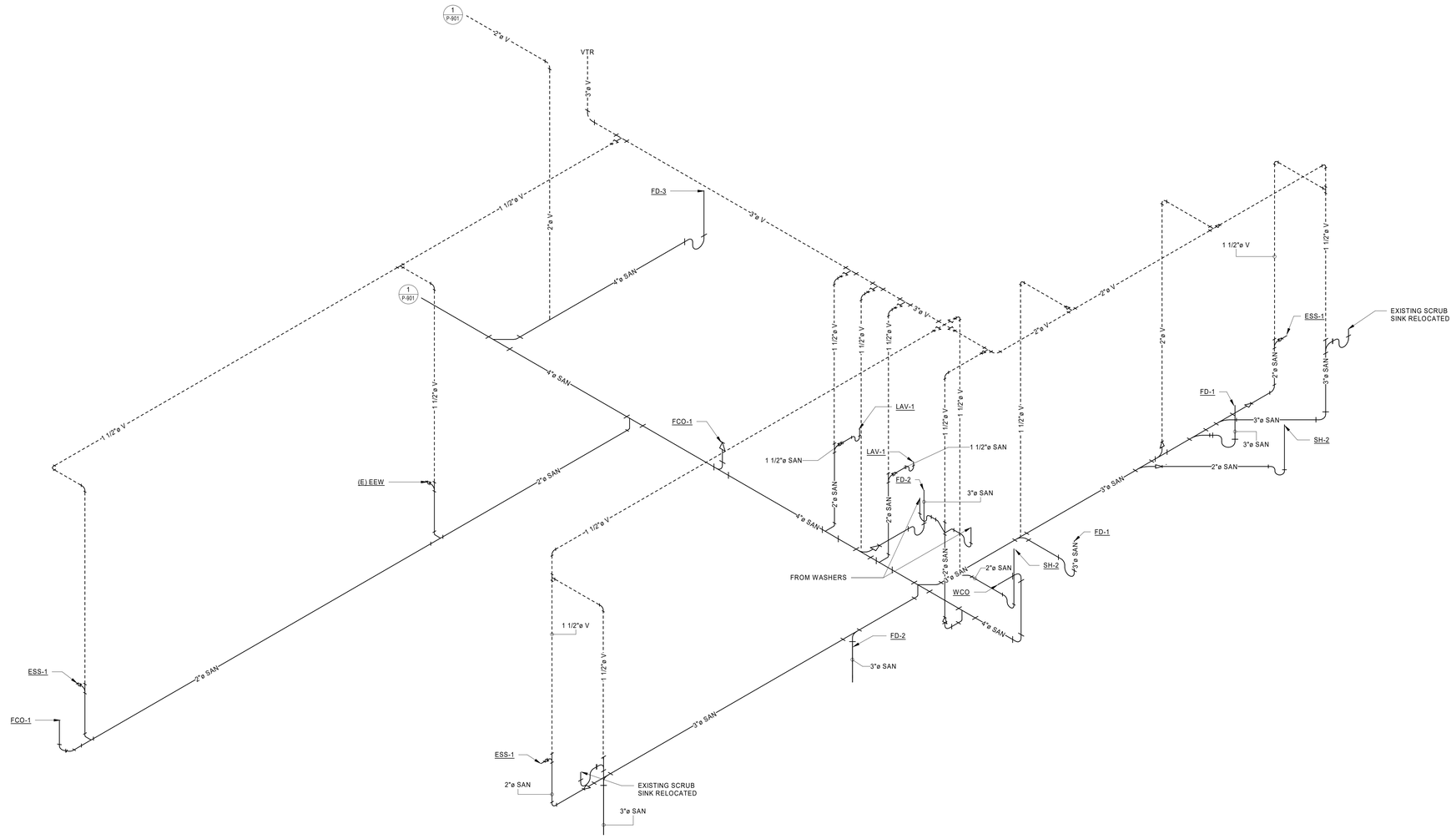
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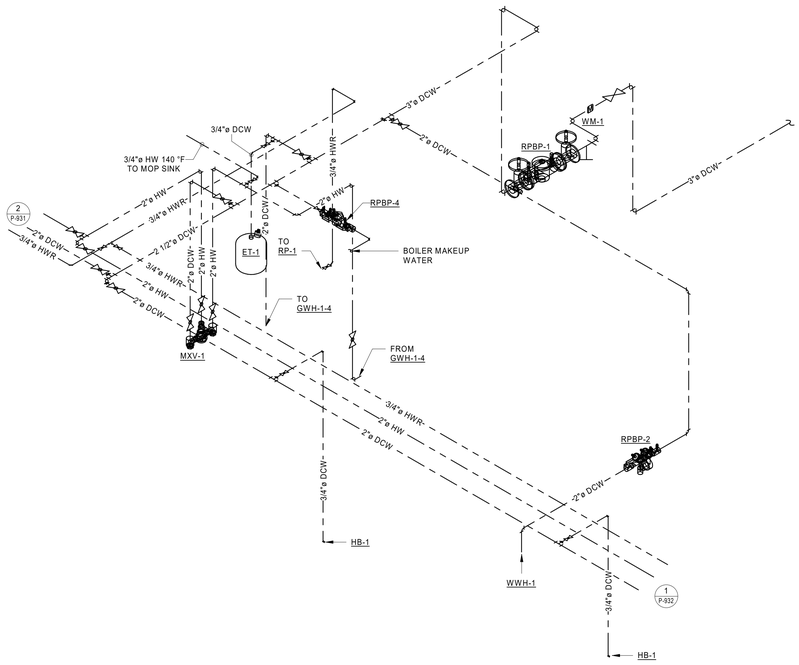
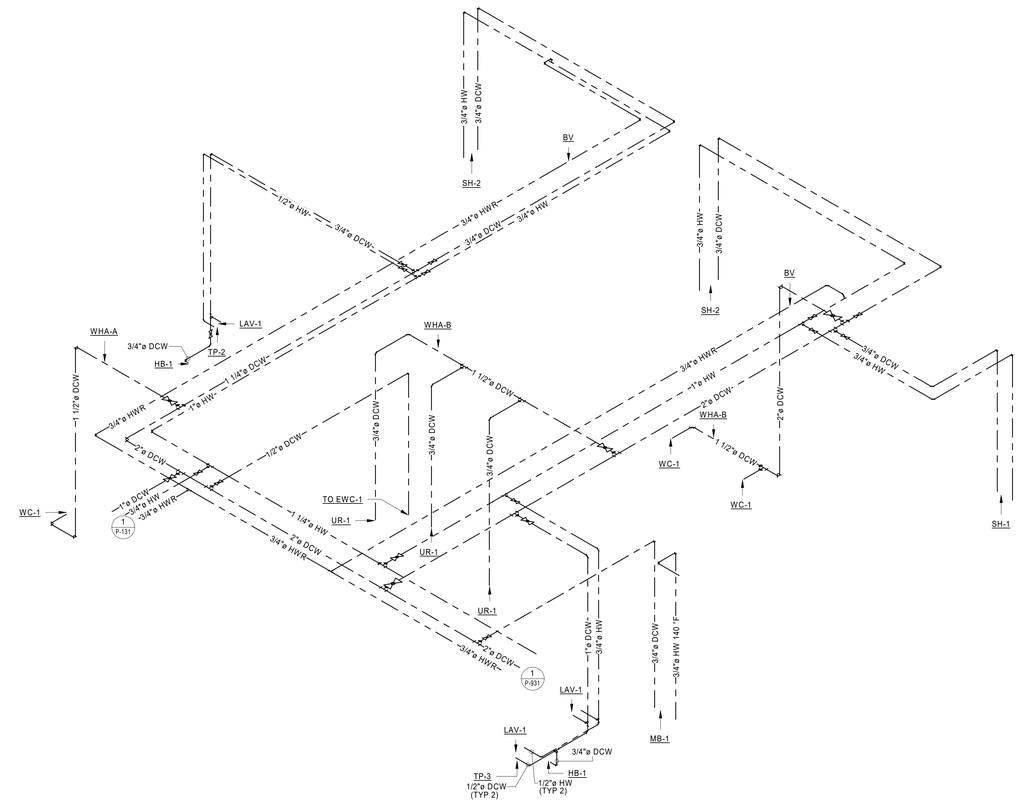


1 **DOMESTIC WATER ISOMETRIC - MECH ROOM**



2 **DOMESTIC WATER ISOMETRIC - RESTROOMS**

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

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HARRISON TWP, MICHIGAN

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SHEET CONTENTS
SUPPLY ISOMETRICS - SHEET 1 OF 3

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P-931

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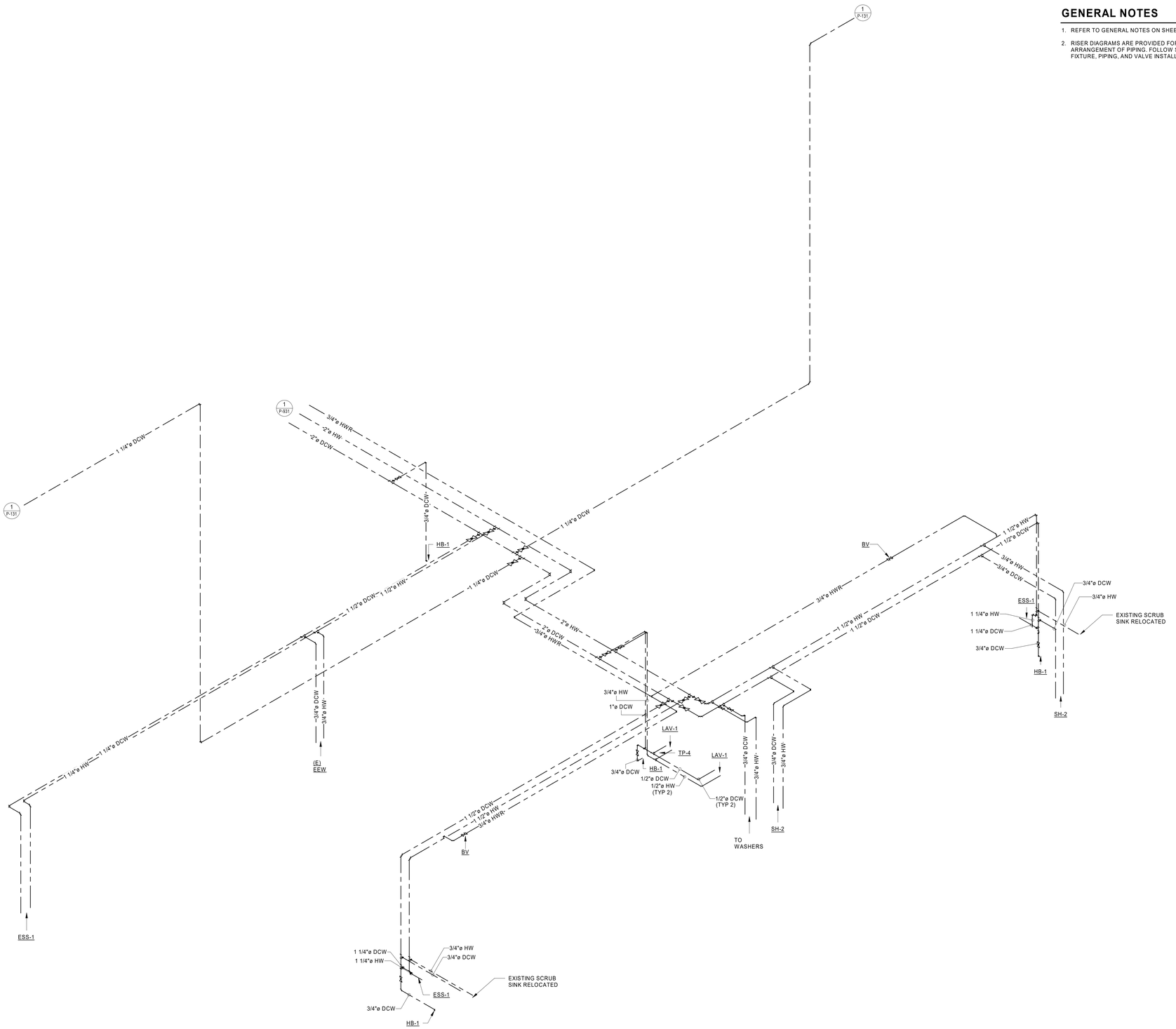

1 DOMESTIC WATER ISOMETRIC - WASH ROOM

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SHEET CONTENTS
SUPPLY ISOMETRICS - SHEET 2 OF 3

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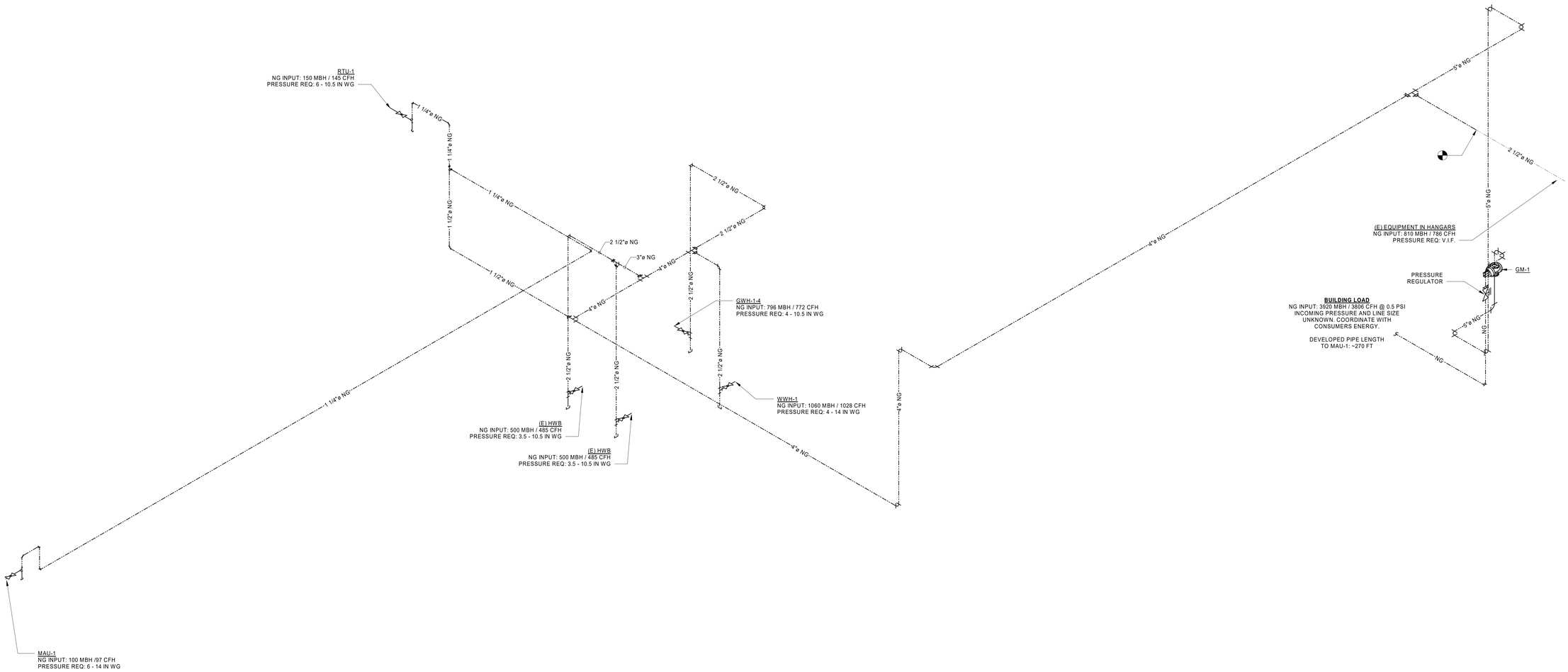

1 **NATURAL GAS ISOMETRIC**

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SUPPLY ISOMETRICS
- SHEET 3 OF 3

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HVAC SYMBOLS

- AIRFLOW (SUPPLY/OUTSIDE AIR)
- AIRFLOW (RETURN/EXHAUST)
- DG — DOOR GRILLE
- SUPPLY OR OUTDOOR AIR
- RETURN OR TRANSFER
- EXHAUST
- SUPPLY DUCT TURNED AWAY
- SUPPLY DUCT TURNED TOWARD
- 12x12 — RECTANGLE DUCT SIZE (FIRST FIGURE IS SIDE SHOWN)
- 12ø — ROUND DUCT (RIGID)
- 12/12ø — OVAL DUCT (FIRST FIGURE IS SIDE SHOWN)
- S — SMOKE DETECTOR
- DUCT (FLEXIBLE ROUND)
- TURNING VANES
- TRANSITION (SQUARE-TO-ROUND)
- SECURITY BARS
- BD — BACKDRAFT DAMPER
- VOLUME DAMPER
- AD / FD — FIRE DAMPER & ACCESS DOOR
- AD / SD — SMOKE DAMPER & ACCESS DOOR
- AD / FSD — COMBINATION FIRE/SMOKE DAMPER & ACCESS DOOR
- MOD — MOTOR OPERATED CONTROL DAMPER
- AP — CEILING MOUNTED ACCESS PANEL
- A / 100 — AIR OUTLET/INLET TYPE (CFM)
- ARMS-X — AIR FLOW MEASURING STATION

MECHANICAL PIPING

- A — COMPRESSED AIR
- BFW — BOILER FEED WATER
- BSD — BOILER SURFACE BLOW DOWN
- BBD — BOILER BOTTOM BLOW DOWN
- CF — CHEMICAL FEED
- CHWS — CHILLED WATER SUPPLY
- CHWR — CHILLED WATER RETURN
- CWS — CONDENSER WATER SUPPLY
- CWR — CONDENSER WATER RETURN
- CD — CONDENSATE DRAIN
- GWS — GLYCOL WATER SUPPLY
- GWR — GLYCOL WATER RETURN
- HPCR — HIGH PRESSURE CONDENSATE RETURN
- HPS — HIGH PRESSURE STEAM
- HWS — HOT WATER SUPPLY
- HWR — HOT WATER RETURN
- IWS — ICE WATER SUPPLY
- IWR — ICE WATER RETURN
- LP — LIQUID PETROLEUM
- LPS — LOW PRESSURE STEAM
- LPCR — LOW PRESSURE CONDENSATE RETURN
- MPS — MEDIUM PRESSURE STEAM
- MPCR — MEDIUM PRESSURE CONDENSATE RETURN
- G — NATURAL GAS
- PCR — PUMPED CONDENSATE RETURN
- RL — REFRIGERANT LIQUID
- RS — REFRIGERANT SUCTION
- RHG — REFRIGERANT HOT GAS
- SV — STEAM RELIEF VENT
- TWS — TOWER WATER SUPPLY
- TWR — TOWER WATER RETURN
- VAC — VACUUM

PIPING SYMBOLS

- PIPE TURNED TOWARD
- PIPE TURNED AWAY
- PIPE TEE TURNED AWAY
- PIPE TEE TURNED TOWARD
- FLEXIBLE CONNECTOR
- UNION
- FLANGES
- REDUCER (CONCENTRIC)
- REDUCER (ECCENTRIC)
- PIPE CAP/CLEAN OUT
- PIPE PLUG
- FLUID FLOW DIRECTION
- PG — PIPE GUIDE
- PA — PIPE ANCHOR
- PITCH — PIPE PITCH DIRECTION
- PRESSURE GAUGE
- THERMOMETER
- WATER HAMMER ARRESTOR
- AV — AIR VENT (AUTO)
- MV — AIR VENT (MANUAL)
- AUTOMATIC CONTROL VALVE (2-WAY)
- AUTOMATIC CONTROL VALVE (3-WAY)
- BALL VALVE
- BALANCING VALVE
- BUTTERFLY VALVE
- BACKFLOW PREVENTION VALVE
- CHECK VALVE
- EQUIPMENT DRAIN VALVE
- FILTER
- FLOW MEASUREMENT STATION
- GATE VALVE
- GAUGE CONNECTION (TEST PLUG)
- GLOBE ANGLE VALVE
- GLOBE VALVE
- ISOLATION/SHUT-OFF/MANUAL VALVE
- PLUG VALVE
- PRESSURE REDUCING VALVE
- PRESSURE REGULATING VALVE
- RELIEF VALVE
- STEAM TRAP
- SOLENOID VALVE ONE-WAY (ELECTRIC)
- STRAINER
- STRAINER WITH BLOW OFF VALVE AND NIPPLE
- VACUUM BREAKER
- PUMP
- FS — FLOW SENSOR
- LS — LEVEL SENSOR
- PS — PRESSURE SENSOR
- TS — TEMPERATURE SENSOR

GENERAL SYMBOLS

- CO — CARBON MONOXIDE (CO) SENSOR
- CO2 — CARBON DIOXIDE (CO2) SENSOR
- DP — DIFFERENTIAL PRESSURE SENSOR
- NO2 — NITROGEN DIOXIDE (NO2) SENSOR
- RS — ROOM SENSOR
- SP — STATIC PRESSURE SENSOR
- H — HUMIDISTAT
- TS — TEMPERATURE SENSOR
- T — THERMOSTAT
- T — INSULATED BASE THERMOSTAT
- $ — SWITCH
- NEW CONNECTION TO EXISTING
- EXISTING TO REMAIN
- EXISTING TO BE REMOVED
- NEW TO BE INSTALLED

GENERAL MECHANICAL NOTES

1. THE MECHANICAL CONTRACTOR SHALL EXAMINE ALL CONTRACT DOCUMENTS AND IS REQUIRED TO DO ALL WORK WHICH IS SHOWN ON THE DRAWINGS, STATED IN THE SPECIFICATIONS, OR REASONABLY IMPLIED AS NECESSARY TO COMPLETE THEIR DIVISION OF WORK FOR THIS PROJECT REGARDLESS OF WHERE IN THE CONTRACT DOCUMENTS THE WORK IS REPRESENTED. MECHANICAL CONTRACTOR TO COORDINATE WORK WITH ALL OTHER TRADES. ALL OTHER TRADE DOCUMENTS ARE TO BE CONSIDERED PART OF THIS CONTRACTORS DOCUMENTS WITH RESPECT TO COORDINATION OF WORK BETWEEN TRADES OF WORK.
2. ABBREVIATIONS AND SYMBOLS INDICATED HERE AND NOT USED IN THE CONTRACT DOCUMENTS DO NOT APPLY TO THIS PROJECT. ADDITIONAL ABBREVIATIONS MAY BE INDICATED IN THE CONTRACT DOCUMENTS.
3. THESE DRAWINGS ARE DESIGN DRAWINGS AND ARE DIAGRAMMATIC, THEY MAY NOT SHOW ALL PHYSICAL ARRANGEMENTS, OFFSETS, BENDS, OR ELBOWS WHICH MAY BE REQUIRED FOR PROPER INSTALLATION OF VARIOUS MATERIALS, EQUIPMENT, PIPING AND DUCTWORK SYSTEMS IN ALLOTTED SPACES. EXAMINE THESE AND OTHER AVAILABLE DRAWINGS TO DETERMINE SPACE LIMITATIONS AND INTERFERENCES. MAKE ANY MINOR CHANGES IN LOCATIONS OF EQUIPMENT, PIPING, AND DUCTWORK FROM THAT SHOWN ON DRAWINGS AND FOR ALL PHYSICAL DETAILS REQUIRED FOR INSTALLATION. COST FOR ADAPTING WORK TO JOB SITE CONDITIONS SHALL NOT BE CONSIDERED AS BASIS OF AN EXTRA COST TO CONTRACT.
4. ELEVATION OF PIPING AND DUCTWORK INDICATED ON THESE DRAWINGS ARE TO BE USED AS GUIDELINES TO ASSIST WITH INSTALLATIONS. MINOR CHANGES TO THESE ELEVATIONS MAY BE NECESSARY TO ELIMINATE UNFORESEEN INTERFERENCES. ANY CHANGE IN ELEVATION SHALL BE APPROVED PRIOR TO CHANGE.
5. ANY AND ALL INFORMATION SHOWN ON THESE DRAWINGS WITH RESPECT TO EXISTING STRUCTURES, UTILITIES, AND MECHANICAL SYSTEMS, IS AS EXACT AS COULD BE SECURED. THE INFORMATION IS NOT WARRANTED NOR GUARANTEED ACCURATE, FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO PROCEEDING WITH WORK.
6. ACCURATE AND LEGIBLE AS-BUILT DRAWING MARKUPS SHALL BE MAINTAINED AT THE JOB SITE, AND BE SUBMITTED PRIOR TO FINAL PAYMENT FOR THE CREATION OF FINAL RECORD DRAWINGS.
7. ALL NEW AND EXISTING ROOFING SYSTEMS SHALL BE PROTECTED FROM DAMAGE DURING CONSTRUCTION ACTIVITIES.
8. TEMPORARILY PATCH ALL ROOF OPENINGS WATERTIGHT UNTIL FINAL CLOSURE CAN BE MADE.
9. VERIFY ALL EQUIPMENT LOCATIONS AND PIPE AND DUCT ROUTING WITH OWNER PRIOR TO INSTALLATION.
10. SEQUENCE OF WORK AND/OR PLACE OF COMMENCEMENT OF WORK SHALL BE APPROVED PRIOR TO WORK BEING STARTED. SCHEDULED SHUTDOWNS SHALL BE CLOSELY COORDINATED WITH EXISTING OPERATIONS.
11. MAINTAIN 3'-0" CLEAR HORIZONTALLY IN FRONT OF ALL ELECTRICAL EQUIPMENT.
12. COORDINATE POWER REQUIREMENTS FOR ALL POWER TO MECHANICAL EQUIPMENT INCLUDING CONTROL SYSTEM WITH ELECTRICAL CONTRACTOR AND INSURE ALL COSTS ASSOCIATED WITH SUCH ARE INCLUDED IN THE PROJECT BID COST. PROVIDE ELECTRICAL POWER, TRANSFORMERS, RELAYS, ETC. AS NECESSARY TO ALL HVAC AND MECHANICAL CONTROLS.
13. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES ON ALL EQUIPMENT.

ABBREVIATIONS

A	AMPS
AB	AIR BLOWLOWN
ABI	ALTERNATE BID ITEM
AC	DUCTLESS SPLIT SYSTEM
ACC	AIR COOLED CONDENSER
ACCU	AIR COOLED CONDENSING UNIT
ACH	AIR COOLED CHILLER
ACOMP	AIR COMPRESSOR
ACU	AIR CONDITIONING UNIT
ACV	AUTOMATIC CONTROL VALVE
AD	AIR DROP
AF	AIR FILTER OR AIR FOIL
AFC	AFTER COOLER
AFF	ABOVE FINISHED FLOOR
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AL	ALUMINUM
AMD	AIR MIXING DEVICE
ANG	AIR NATIONAL GUARD
APPROX	APPROXIMATELY
AS	AIR SEPARATOR
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AT	AIR TERMINAL
AWC	ABSORPTION CHILLER
BAS	BUILDING AUTOMATION SYSTEM
BC	BOOSTER COIL
BE	BOILER EXHAUST
BHP	BRAKE HORSEPOWER
BHR	CONTINUOUS BLOWDOWN HEAT RECOVERY SYSTEM
BI	BACKWARD INCLINED
BI	BOILER INTAKE
BPD	BACKFLOW PREVENTION DEVICE
BRS	BRASS
BRZ/BZ	BRONZE
BS	BLACK (MILD) STEEL
BSB	BRANCH SELECTOR BOX
BT	BUFFER TANK
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
BW	BUTTWELD
C	CONVECTOR
CA	COMBUSTION AIR
CAD	COMPRESSED AIR DRYER
CAF	COMPRESSED AIR FILTER
CC	COOLING COIL OR CONTROLS CONTRACTOR
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CI	CAST IRON
COMP	COMPRESSOR
COND	CONDENSATE
COR	CONTRACTING OFFICER'S REPRESENTATIVE
CRAC	COMPUTER ROOM AIR CONDITIONING UNIT
CRP	CONDENSATE RETURN PUMP
CS	CENTRIFUGAL SEPARATOR
CT	COOLING TOWER
CTCLG	CLOSE TO CEILING
CTCLM	CLOSE TO COLUMN
CTW	CLOSE TO WALL
CU	COPPER
CUH	CABINET UNIT HEATER
DAC	DOOR AIR CURTAIN
DBA	DECIBELS, BAND A
DC	DUST COLLECTOR
DCVA	DOUBLE CHECK VALVE ASSEMBLY BPD
DDC	DIRECT DIGITAL CONTROL
DDH	DESICCANT DEHUMIDIFIER
DEMO	DEMOLISH
DF	DESTRATIFICATION FAN
DFD	DIVISION OF FACILITIES DEVELOPMENT
DIA	DIAMETER
DIM	DIMENSION
DISCH	DISCHARGE
DMPR	DAMPER
DN	DOWN
DOD	DEPARTMENT OF DEFENSE
DRC	DRY COOLER
DWG	DRAWING
DX	DIRECT EXPANSION
E	EXISTING
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EBH	ELECTRIC BASEBOARD HEATER
EC	EVAPORATIVE COOLER OR ELECTRICAL CONTRACTOR
EDH	ELECTRIC DUCT HEATER
EF	EXHAUST FAN
EFF	EFFICIENCY
EFT	ENTERING FLUID TEMPERATURE
EG	EXHAUST GRILLE
EGLY	ETHYLENE GLYCOL
EHC	ELECTRIC HEATING COIL
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRIC
EOM	END OF MAIN
EPDM	ETHYLENE PROPYLENE DIENE MONOMER
ERV	AIR-TO-AIR HEAT EXCHANGER
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
ETR	EXISTING TO REMAIN
EWH	ELECTRIC WALL HEATER
EWT	ENTERING WATER TEMPERATURE
°F	FAHRENHEIT
FAF	FORCED AIR FURNACE
FC	FLUID COOLER
FCU	FAN COIL UNIT
FE	FUME EXTRACTOR
FLA	FULL LOAD AMPS
FLR	FLOOR
FM	FLOW METER
FOP	FUEL OIL PUMP
FPM	FEET PER MINUTE
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FLASH TANK OR FEET
FTC	FINNED TUBE CONVECTOR
FTWC	FEET WATER COLUMN PRESSURE
GA	GAUGE
GAL	GALLON
GC	GENERAL CONTRACTOR
GFT	GLYCOL FILL TANK
GPM	GALLONS PER MINUTE
GS	GALVANIZED STEEL
H	HEIGHT
HB	HUMIDIFICATION BOILER
HC	HEATING COIL
HD	HEAD (FT)
HDB	HYDROSTATIC DESIGN BASIS
HP	HEAT PUMP OR HORSEPOWER
HPC	ERV HEAT PUMP COIL
HR	HOSE REEL
HRW	ROTARY AIR-TO-AIR EXCHANGER
HUM	HUMIDIFIER
HWB	HOT WATER BOILER
HX	FLUID HEAT EXCHANGER
HZ	HERTZ
IAW	IN ACCORDANCE WITH
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IFGC	INTERNATIONAL FUEL GAS CODE
IH	INTAKE HOOD
IN	INCH
INHG	INCHES MERCURY PRESSURE
INWC	INCHES WATER COLUMN PRESSURE
IR	INFRARED HEATER
KH	KITCHEN HOOD
KW	KILOWATT
L	LOUVER OR LENGTH
LAT	LEAVING AIR TEMPERATURE
LB	POUNDS
LD	LINEAR DIFFUSER
LFT	LEAVING FLUID TEMPERATURE
LPG	LIQUIFIED PETROLEUM GAS
LS	LEVEL SWITCH
LWT	LEAVING WATER TEMPERATURE
MADP	MAXIMUM ALLOWABLE DIFFERENTIAL PRESSURE
MAU	MAKE-UP AIR UNIT
MAWP	MAXIMUM ALLOWABLE WORKING PRESSURE
MAX	MAXIMUM
MBH	THOUSANDS BTU'S PER HOUR
MC	MECHANICAL CONTRACTOR OR MECHANICAL COUPLING
MCA	MINIMUM CIRCUIT AMPACITY
MCC	MOTOR CONTROL CENTER
MFR	MANUFACTURER
MIN	MINIMUM
MMBH	MILLION BTU PER HOUR
MOCP	MINIMUM OVER CURRENT PROTECTION
MSS	MANUFACTURERS STANDARDIZATION SOCIETY
MTL	MATERIAL
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NH	NO-HUB
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NPSH	NET POSITIVE SUCTION HEAD
NPSHA	NPSH AVAILABLE
NPSHR	NPSH REQUIRED
OA	OUTSIDE AIR
OC	ON CENTER
OD	OUTSIDE DIAMETER
OED	OPEN ENDED DUCT
P	HYDRONIC PUMP OR PRESSURE
PC	PLUMBING CONTRACTOR
PCP	PRESSURE POWERED CONDENSATE PUMP
PD	PRESSURE DROP/DIFFERENTIAL
PG	PROPYLENE GLYCOL
PH	PHASE
PPH	POUND PER HOUR
PROP	PROPELLER
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	PSI ABSOLUTE
PSID	PSI DIFFERENTIAL
PSIG	PSI GAGE
PTAC	PACKAGED TERMINAL AIR CONDITIONER
PTHP	PACKAGED TERMINAL HEAT PUMP
PVC	POLYVINYL CHLORIDE
RA	RETURN AIR
RCP	RADIANT CEILING PANEL
RDH	REFRIGERATED DEHUMIDIFIER
RG	RETURN GRILLE
RH	RELIEF HOOD
RPM	REVOLUTIONS PER MINUTE
RTD	RESISTIVE THERMAL DEVICE
RTU	ROOF TOP UNIT
RZ	RADIANT FLOOR HEATING ZONE
SA	SUPPLY AIR
SAD	SOUND ATTENUATING DEVICE
SB	SECURITY BARRIER
SCFM	STANDARD CFM
SCH	SCHEDULE
SD	SLOT DIFFUSER/SOLDER
SF	STEAM FILTER OR SUPPLY FAN
SG	SUPPLY GRILLE
SHT	SHEET
SMLS	SEAMLESS
SMS	SNOW MELTING SYSTEM DISTRIBUTION MANIFOLD
SP	STATIC PRESSURE
SPEC	SPECIFICATIONS
SQ	SQUARE
SRV	SAFETY RELIEF VALVE
SS	STAINLESS STEEL
ST	STEAM TRAP
STD	STANDARD
STL	STEEL
SV	SOLVENT WELD
SW	SOCKET WELD
T	TEMPERATURE
TA	TRANSFER AIR
TCP	TEMPERATURE CONTROL PANEL
TDH	TOTAL DEVELOPED HEAD
TDS	TOTAL DISSOLVED SOLIDS
TEMP	TEMPERATURE
TG	TRANSFER GRILLE
TH	THREADED
TMC	TECHNOLOGY MANAGEMENT CENTER
TMV	THERMOSTATIC MIXING VALVE
TONR	TONS COOLING
TYP	TYPICAL
UC	UNIT COOLER
UFC	UNIFIED FACILITIES CRITERIA
UGD	UNDERGROUND
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UTR	UP THRU ROOF
UV	UNIT VENTILATOR OR ULTRAVIOLET
V	VOLTS
VA	VENT AIR
VER	VEHICLE EXHAUST REEL
VFD	VARIABLE FREQUENCY DRIVE
VI	VIBRATION ISOLATORS
VLV	VALVE
VRF	VARIABLE REFRIGERANT FLOW
W	WATTS OR WIDTH
WC	WATER COLUMN
WCC	WATER COOLED CONDENSER
WCH	WATER COOLED CHILLER
WF	WATER FILTER
WIV	WATER INLET VALVE
WHA	WATER HAMMER ARRESTOR

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

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12/16/22 TYPE B3 FINAL
HEF MOD

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M&H NO.: 3141700-181848.01
DATE: September 16 2022
DESIGNED BY: AMT
DRAWN BY: RJH
CHECKED BY: AK
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SHEET CONTENTS
NOTES, SYMBOLS AND ABBREVIATIONS

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M-001

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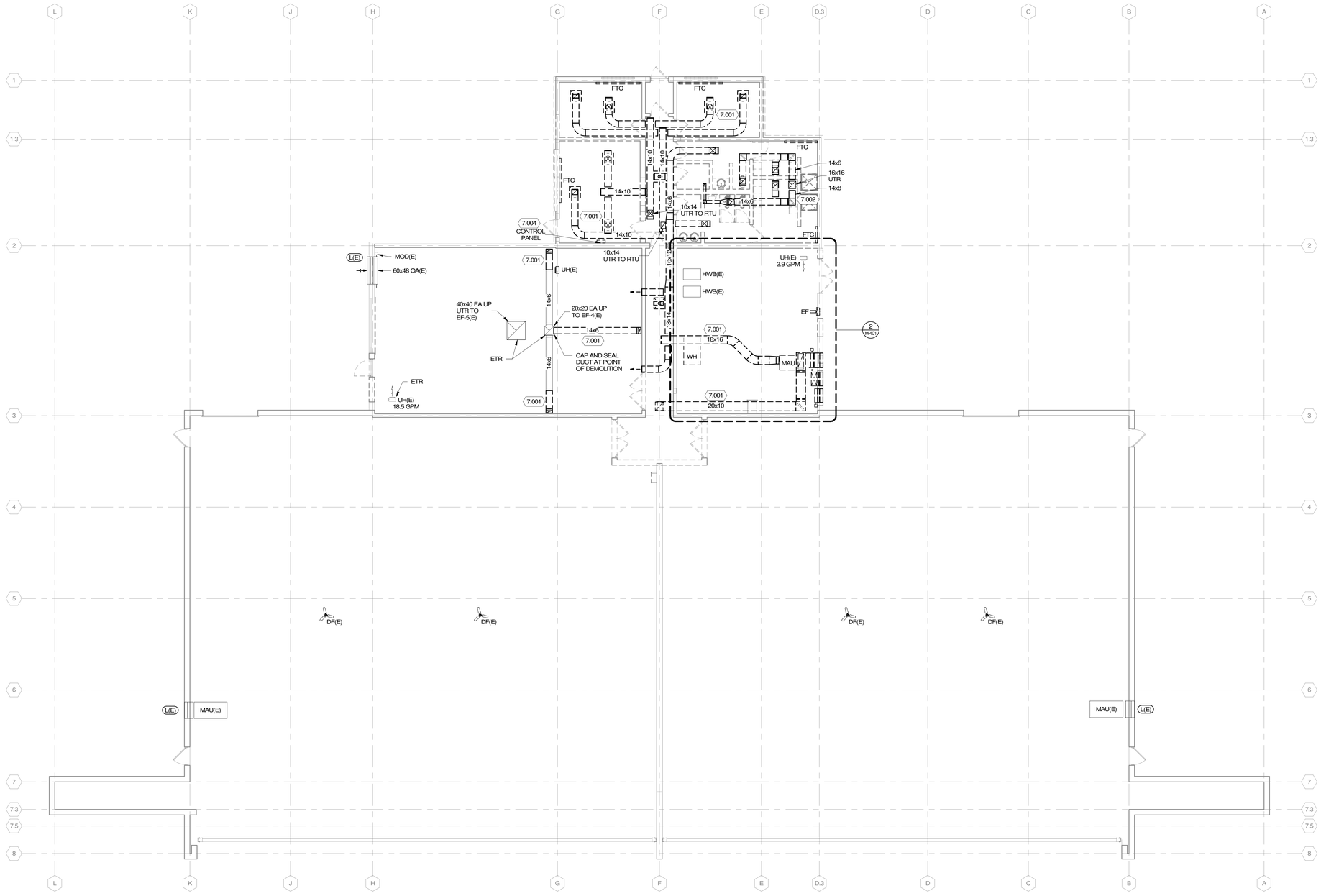

FIRST FLOOR HVAC DEMOLITION PLAN

1/8" = 1'-0"

GENERAL HVAC DEMOLITION NOTES

1. COMPLETELY DEMOLISH ALL EXISTING DUCTWORK AS SHOWN WITH BOLD DASHED LINES, INCLUDING ALL ABANDONED AND UNUSED ACCESSORIES, INSULATION, HANGER SUPPORTS, ETC. FOR REMAINING DUCT SYSTEM. PLUG OR CAP ALL OPENINGS CREATED BY DUCT DEMOLITION. TEST DUCTWORK AS SPECIFIED, AND INSULATE OR PAINT SAME AS NEW WORK. PATCH EXISTING WALLS, ROOFS, CEILINGS, AND FLOORS DISTURBED BY DEMOLITION TO ORIGINAL CONDITION.
2. COMPLETELY DEMOLISH ALL EXISTING EQUIPMENT AS SHOWN WITH BOLD DASHED LINES, INCLUDING ALL ABANDONED AND UNUSED ACCESSORIES, INSULATION, HANGERS, SUPPORTS, BASES, CONTROLS, ETC. PATCH EXISTING WALLS, ROOFS, CEILINGS, AND FLOORS DISTURBED BY DEMOLITION TO ORIGINAL CONDITION.
3. DELIVER INDICATED EQUIPMENT TO OWNER'S DESIGNATED STORAGE SPACE ON SITE. PLUG OR CAP ALL EQUIPMENT OPENINGS TO PREVENT DIRT AND MOISTURE FROM ENTERING EQUIPMENT.
4. REINSTALL INDICATED EQUIPMENT, SAME AS NEW WORK, IN NEW LOCATION WHERE INDICATED. COMPLETELY CLEAN AND RESTORE EQUIPMENT TO GOOD OPERATING CONDITION.
5. INSTALL TEMPORARY COVERS OVER EXISTING EXTERIOR ENVELOPE OPENINGS CREATED BY REMOVED EQUIPMENT/DUCT. COVER SHALL BE WATERTIGHT, AND MEET OSHA AND OWNER REQUIREMENTS. COMPLETELY REMOVE TEMPORARY COVER WHEN OPENINGS ARE PATCHED TO FINAL CONDITION. REPAIR ANY DAMAGE TO EXISTING BUILDING COMPONENTS CAUSED BY TEMPORARY COVER.
6. WHERE BRANCH DUCTWORK IS SHOWN TO BE DEMOLISHED BACK TO THE MAIN DUCT AND THE EXISTING MAIN DUCT OPENING IS NOT TO BE RE-LISED, CAP AND SEAL THE MAIN DUCT BRANCH OPENING AIRTIGHT.
7. REFER TO SPECIFICATION SECTION 23 05 15 FOR REQUIREMENTS RELATED TO REPORTING REFRIGERANTS AND RELATED EQUIPMENT ADDED, REPAIRED, REPLACED, OR DECOMMISIONED.

KEYED NOTES

7.001 DEMO EXISTING DUCTWORK, GRILLES, AND ASSOCIATED CONTROLS AS SHOWN BOLD AND DASHED.

7.002 DEMO EXISTING EXHAUST FAN ON ROOF. ASSOCIATED EXHAUST DUCTWORK, AND CONTROLS AS SHOWN BOLD AND DASHED.

7.004 DEMO EXISTING RTU ON ROOF, ALL ASSOCIATED DUCTWORK, AND CONTROLS AS SHOWN BOLD AND DASHED.

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SHEET CONTENTS
FIRST FLOOR HVAC DEMOLITION PLAN

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MD101

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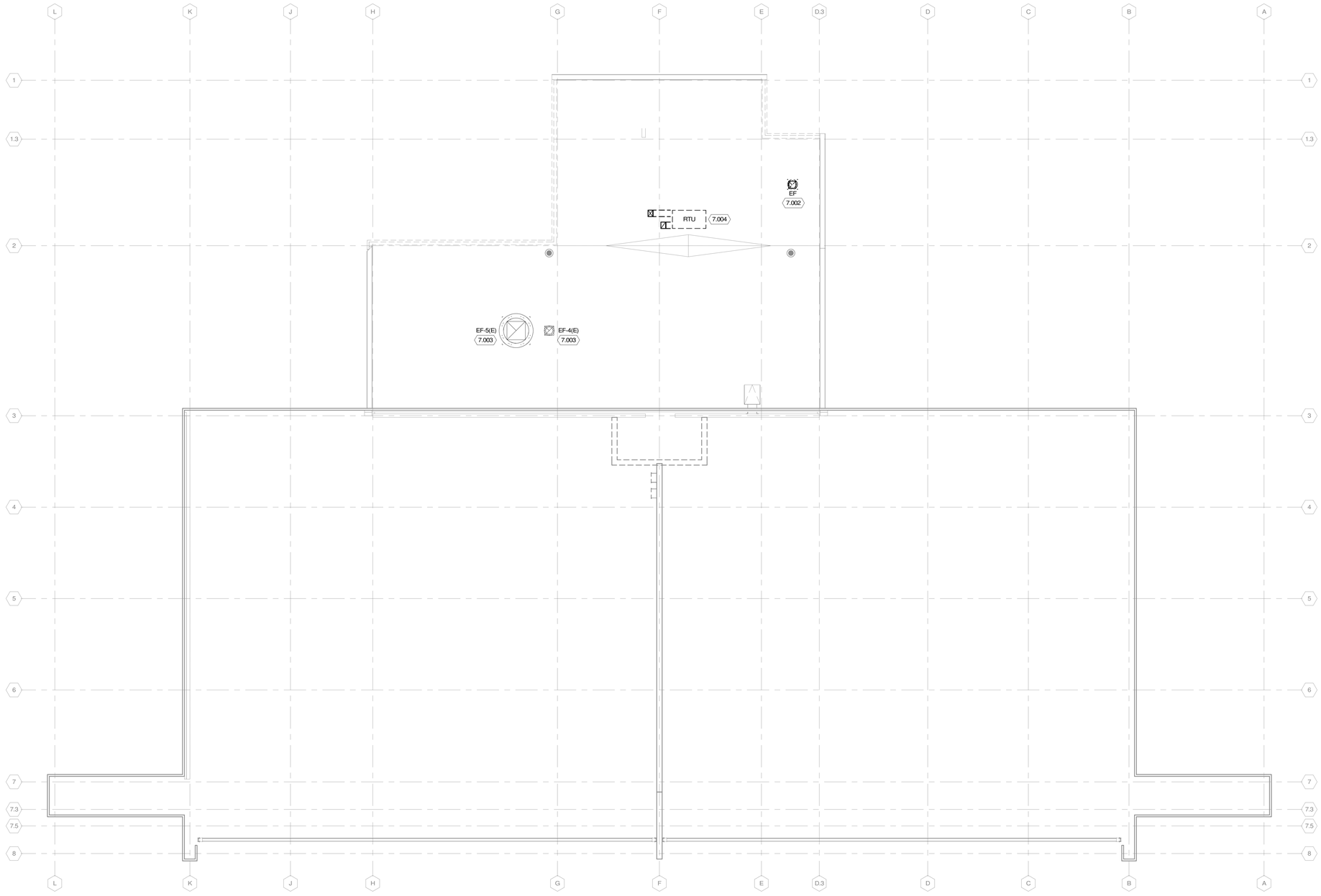

ROOF HVAC DEMOLITION PLAN
1/8" = 1'-0"

GENERAL HVAC DEMOLITION NOTES

1. COMPLETELY DEMOLISH ALL EXISTING DUCTWORK AS SHOWN WITH BOLD DASHED LINES, INCLUDING ALL ABANDONED AND UNUSED ACCESSORIES, INSULATION, HANGER SUPPORTS, ETC. FOR REMAINING DUCT SYSTEM. PLUG OR CAP ALL OPENINGS CREATED BY DUCT DEMOLITION. TEST DUCTWORK AS SPECIFIED, AND INSULATE OR PAINT SAME AS NEW WORK. PATCH EXISTING WALLS, ROOFS, CEILINGS, AND FLOORS DISTURBED BY DEMOLITION TO ORIGINAL CONDITION.
2. COMPLETELY DEMOLISH ALL EXISTING EQUIPMENT AS SHOWN WITH BOLD DASHED LINES, INCLUDING ALL ABANDONED AND UNUSED ACCESSORIES, INSULATION, HANGERS, SUPPORTS, BASES, CONTROLS, ETC. PATCH EXISTING WALLS, ROOFS, CEILINGS, AND FLOORS DISTURBED BY DEMOLITION TO ORIGINAL CONDITION.
3. DELIVER INDICATED EQUIPMENT TO OWNER'S DESIGNATED STORAGE SPACE ON SITE. PLUG OR CAP ALL EQUIPMENT OPENINGS TO PREVENT DIRT AND MOISTURE FROM ENTERING EQUIPMENT.
4. REINSTALL INDICATED EQUIPMENT, SAME AS NEW WORK, IN NEW LOCATION WHERE INDICATED. COMPLETELY CLEAN AND RESTORE EQUIPMENT TO GOOD OPERATING CONDITION.
5. INSTALL TEMPORARY COVERS OVER EXISTING EXTERIOR ENVELOPE OPENINGS CREATED BY REMOVED EQUIPMENT/DUCT. COVER SHALL BE WATERTIGHT, AND MEET OSHA AND OWNER REQUIREMENTS. COMPLETELY REMOVE TEMPORARY COVER WHEN OPENINGS ARE PATCHED TO FINAL CONDITION. REPAIR ANY DAMAGE TO EXISTING BUILDING COMPONENTS CAUSED BY TEMPORARY COVER.
6. WHERE BRANCH DUCTWORK IS SHOWN TO BE DEMOLISHED BACK TO THE MAIN DUCT AND THE EXISTING MAIN DUCT OPENING IS NOT TO BE RE-USED, CAP AND SEAL THE MAIN DUCT BRANCH OPENING AIRTIGHT.
7. REFER TO SPECIFICATION SECTION 23 05 15 FOR REQUIREMENTS RELATED TO REPORTING REFRIGERANTS AND RELATED EQUIPMENT ADDED, REPAIRED, REPLACED, OR DECOMMISIONED.

KEYED NOTES

7.002 DEMO EXISTING EXHAUST FAN ON ROOF, ASSOCIATED EXHAUST DUCTWORK, AND CONTROLS AS SHOWN BOLD AND DASHED.

7.003 EXISTING TO REMAIN.

7.004 DEMO EXISTING RTU ON ROOF, ALL ASSOCIATED DUCTWORK, AND CONTROLS AS SHOWN BOLD AND DASHED.

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SHEET CONTENTS
ROOF HVAC
DEMOLITION PLAN

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MD102

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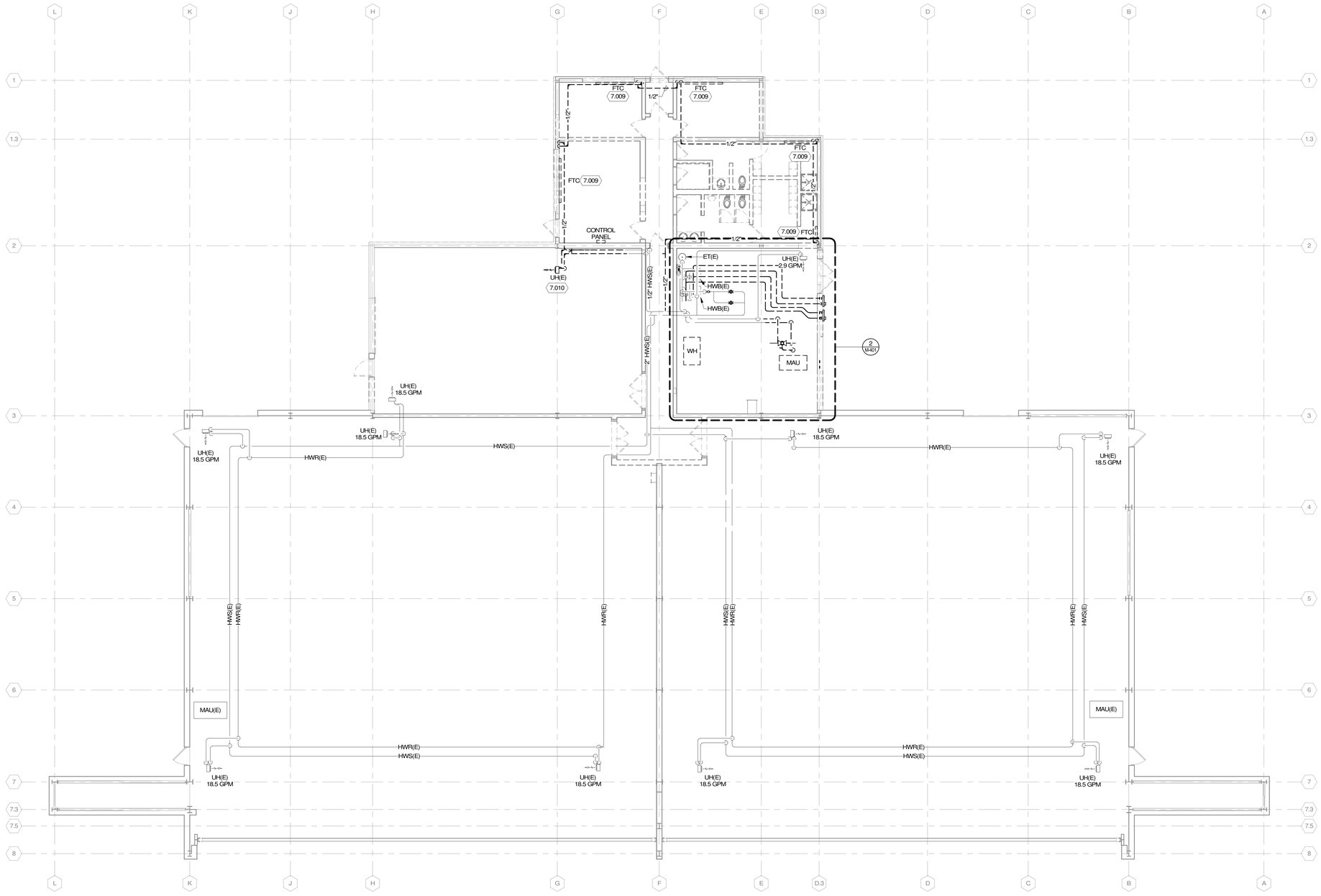

FIRST FLOOR PIPING DEMOLITION PLAN

1/8" = 1'-0"

GENERAL PIPING DEMOLITION NOTES

1. COMPLETELY DEMOLISH ALL INDICATED EXISTING PIPING SHOWN WITH BOLD DASHED LINES, INCLUDING ALL ABANDONED AND UNUSED PIPING, VALVES, INSULATION, HANGERS, SUPPORTS, ETC. FOR REMAINING PIPING SYSTEMS. PLUG OR CAP ALL OPENINGS CREATED BY PIPING DEMOLITION. TEST PIPING SYSTEMS AS SPECIFIED, AND INSULATE OR PAINT SAME AS NEW WORK. PATCH EXISTING WALLS, ROOFS, CEILINGS, AND FLOORS DISTURBED BY DEMOLITION TO ORIGINAL CONDITION.
2. COMPLETELY DEMOLISH ALL EXISTING EQUIPMENT SHOWN WITH BOLD DASHED LINES, INCLUDING ALL ABANDONED AND UNUSED PIPING, VALVES, INSULATION, HANGERS, SUPPORTS, BASES, CONTROLS, ETC. PATCH EXISTING WALLS, ROOFS, CEILINGS, AND FLOORS DISTURBED BY DEMOLITION TO ORIGINAL CONDITION.
3. DELIVER INDICATED EQUIPMENT TO OWNER'S DESIGNATED STORAGE SPACE ON SITE. PLUG OR CAP ALL EQUIPMENT OPENINGS TO PREVENT DIRT AND MOISTURE FROM ENTERING EQUIPMENT.
4. WHERE PIPES ARE REMOVED AND NOT RE-CONNECTED, REMOVE PIPE BACK TO NEXT BRANCH THAT IS TO REMAIN. INSTALL CAPS OR PLUGS ON OPENINGS. PRIME, PAINT, AND INSULATE DISTURBED PIPE SAME AS SPECIFIED FOR NEW WORK.
5. REINSTALL INDICATED EQUIPMENT, SAME AS NEW WORK, IN NEW LOCATION WHERE INDICATED. COMPLETELY CLEAN AND RESTORE EQUIPMENT TO GOOD OPERATING CONDITION.
6. ABANDON IN PLACE UNDERGROUND PIPES SHOWN ON DRAWINGS AS PHANTOM.
7. WHERE PIPES ARE ROUTED INSIDE CMU WALLS, PIPE MAY BE ABANDONED PIPE IN PLACE. REMOVE PIPE TO 1" INSIDE WALL AT BOTH ENDS.
8. WHERE PIPES PASS THROUGH FLOOR SLABS, SAW-CUT SLAB AND REMOVE CONCRETE TO MINIMUM EXTENT NECESSARY TO GAIN ACCESS BELOW SLAB. REMOVE PIPE DOWN TO HORIZONTAL PIPING BELOW FLOOR. SEAL AND CAP ABANDONED PIPE ENDS.
9. COORDINATE WITH ARCHITECTURAL AND STRUCTURAL TRADES. PATCH EXISTING ROOFS, WALLS, AND FLOORS DISTURBED BY DEMOLITION. RESTORE TO MATCH CONDITION OF ORIGINAL SURROUNDING SURFACES.

KEYED NOTES

7.009 DEMO EXISTING FINNED TUBE CONVECTOR, ALL ASSOCIATED PIPING, AND CONTROLS AS SHOWN BOLD AND DASHED.

7.010 RELOCATE EXISTING UNIT HEATER TO MAKE ROOM FOR NEW WALL.

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SHEET CONTENTS
FIRST FLOOR PIPING DEMOLITION PLAN

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MD131

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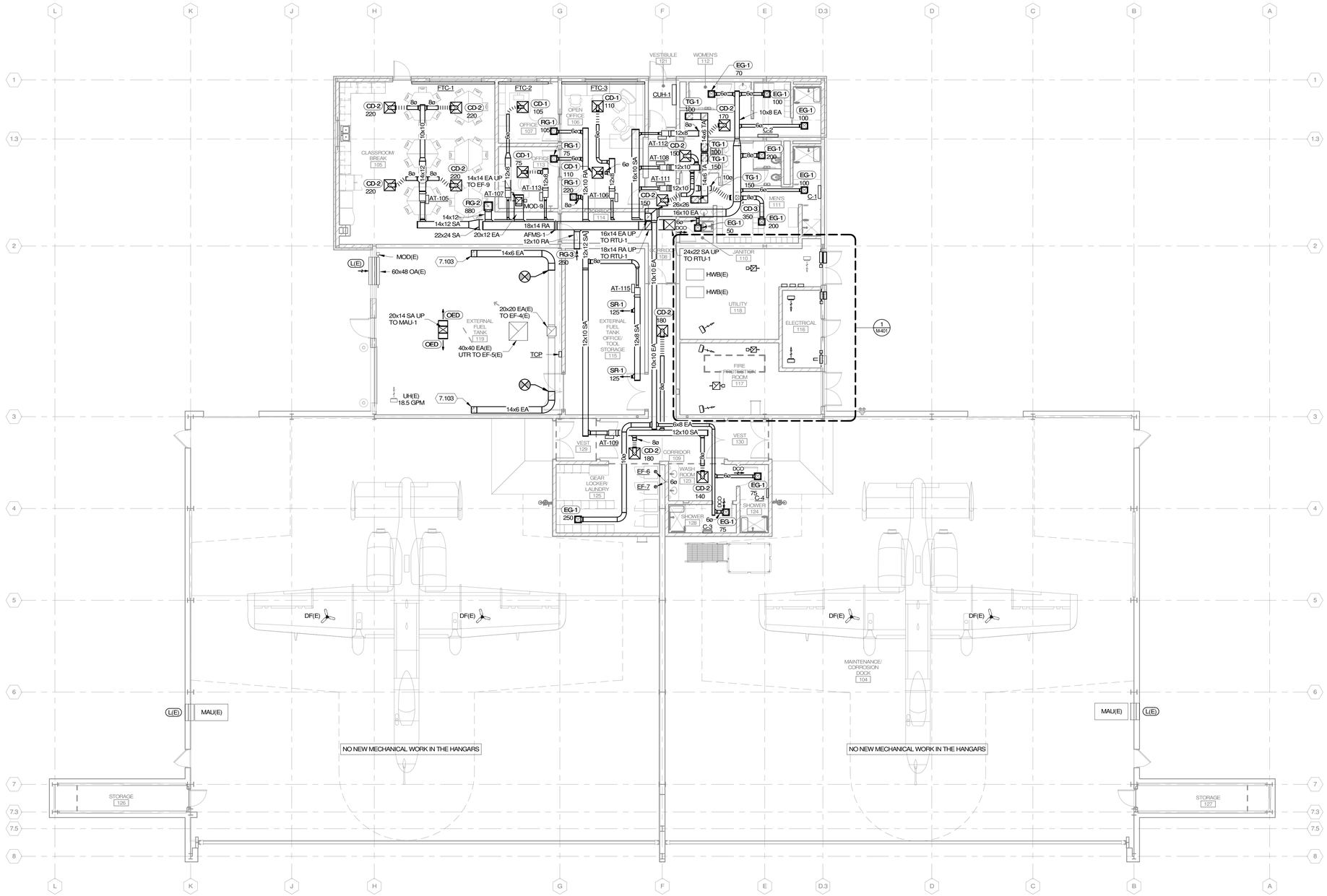

GENERAL HVAC NOTES

1. INLET DUCT SIZE TO AIR TERMINAL DEVICES SHALL BE SAME AS INLET SIZE UNLESS OTHERWISE NOTED. IF RUNOUT TO AIR TERMINAL BOX IS GREATER THAN 6 FEET IN LENGTH, SIZE RUNOUT ONE EVEN INCREMENT SIZE LARGER (MINIMUM 2" LARGER) UNLESS OTHERWISE NOTED TO WITHIN 3 FEET OF BOX BEFORE REDUCING TO BOX INLET SIZE.
2. DUCTWORK DOWNSTREAM OF AIR TERMINAL BOXES TO BE INTERNALLY LINED FOR A MINIMUM OF 6'-0" FOR SOUND ATTENUATION. OUTLET DUCT SIZES TO MATCH AIR TERMINAL BOX OUTLET UNLESS NOTED OTHERWISE.
3. PROVIDE MANUAL BALANCE DAMPER AT EACH DIFFUSER, GRILLE, AND BRANCH TAKE-OFF IN ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK EXCEPT KITCHEN GREASE EXHAUST DUCT. LOCATE BALANCE DAMPER AS CLOSE TO BRANCH TAKE-OFF AS POSSIBLE.
4. DUCT SIZE TO DIFFUSERS, REGISTERS, AND GRILLES SHALL BE SAME AS NECK SIZE UNLESS NOTED OR DETAILED OTHERWISE.
5. COORDINATE DIFFUSER, REGISTER, AND GRILLE LOCATIONS WITH REFLECTED CEILING PLAN.
6. PROVIDE FLEXIBLE DUCTWORK FOR FINAL CONNECTIONS TO SUPPLY AIR DIFFUSERS UNLESS NOTED OTHERWISE ON DRAWINGS OR IN SPECIFICATIONS. FLEXIBLE DUCT SIZE SHALL BE SAME AS NECK SIZE OF DIFFUSER AND SHALL NOT EXCEED 5 FEET IN LENGTH.
7. REFER TO SPECIFICATION SECTION 23 05 15 FOR REQUIREMENTS RELATED TO REPORTING REFRIGERANTS AND RELATED EQUIPMENT ADDED, REPAIRED, REPLACED, OR DECOMMISSIONED.

KEYED NOTES

7.103 EXHAUST DUCTWORK TO EXTEND DOWN TO 18 IN AFF WITH 1/2" X 1/2" BIRDSCREEN AT BOTTOM OF DUCT.

N 1 **FIRST FLOOR HVAC PLAN**
1/8" = 1'-0"

TETRA TECH Mead & Hunt
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Mason & Hanger
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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
MH NO.: 3141700-181848.01
DATE: September 16 2022
DESIGNED BY: AMT
DRAWN BY: RJH
CHECKED BY: AK
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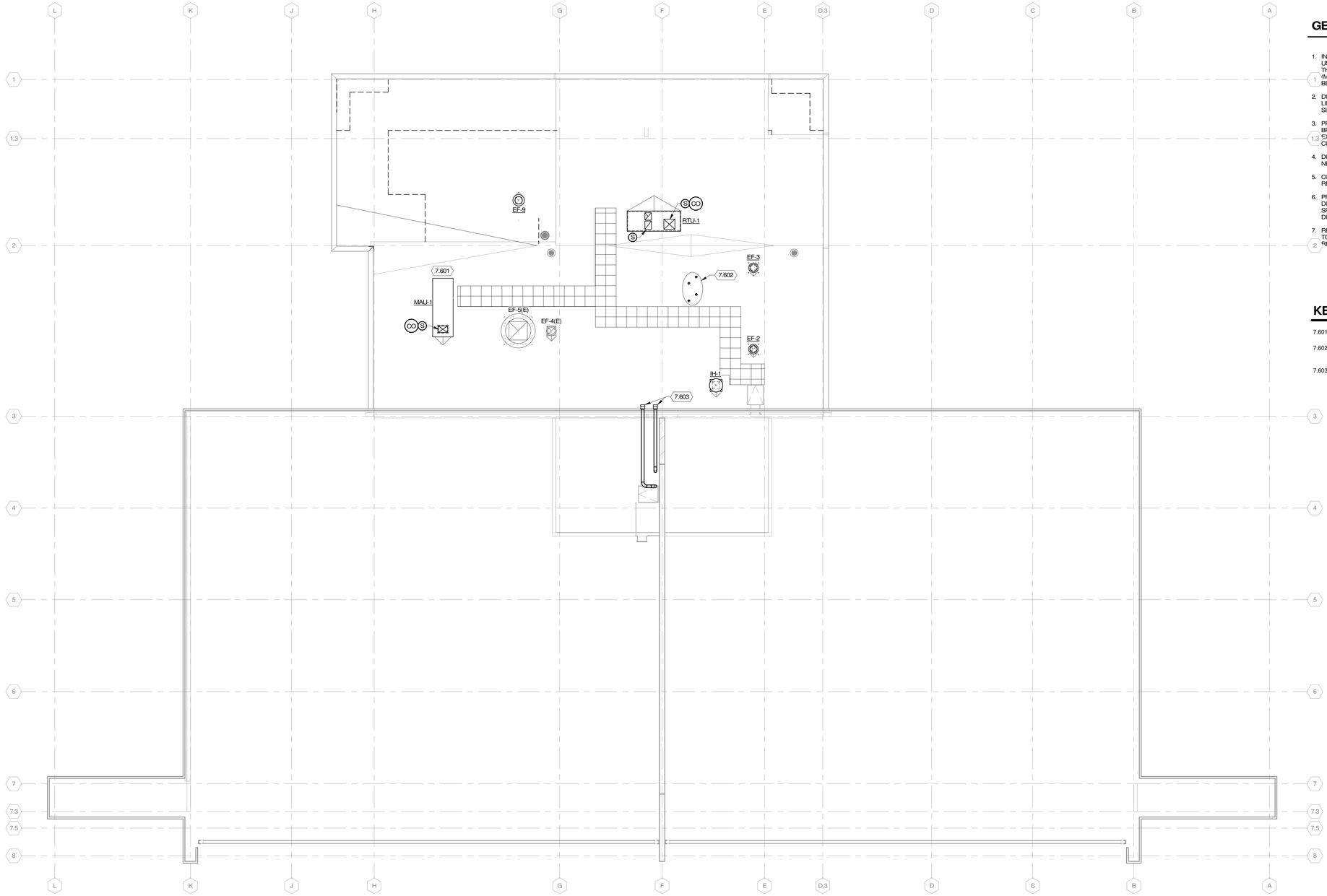
SHEET CONTENTS
FIRST FLOOR HVAC PLAN

SHEET NO.:
M-101

12/14/2022 10:47:05 AM C:\Revit Local\3141700-181848.01-M-Central-2020_NateDeMaster.rvt



ROOF HVAC PLAN
1/8" = 1'-0"

GENERAL HVAC NOTES

1. INLET DUCT SIZE TO AIR TERMINAL DEVICES SHALL BE SAME AS INLET SIZE UNLESS OTHERWISE NOTED. IF RUNOUT TO AIR TERMINAL BOX IS GREATER THAN 6 FEET IN LENGTH, SIZE RUNOUT ONE EVEN INCREMENT SIZE LARGER (MINIMUM 2" LARGER) UNLESS OTHERWISE NOTED TO WITHIN 3 FEET OF BOX BEFORE REDUCING TO BOX INLET SIZE.
2. DUCTWORK DOWNSTREAM OF AIR TERMINAL BOXES TO BE INTERNALLY LINED FOR A MINIMUM OF 6'-0" FOR SOUND ATTENUATION. OUTLET DUCT SIZES TO MATCH AIR TERMINAL BOX OUTLET UNLESS NOTED OTHERWISE.
3. PROVIDE MANUAL BALANCE DAMPER AT EACH DIFFUSER, GRILLE, AND BRANCH TAKE-OFF IN ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK EXCEPT KITCHEN GREASE EXHAUST DUCT. LOCATE BALANCE DAMPER AS CLOSE TO BRANCH TAKE-OFF AS POSSIBLE.
4. DUCT SIZE TO DIFFUSERS, REGISTERS, AND GRILLES SHALL BE SAME AS NECK SIZE UNLESS NOTED OR DETAILED OTHERWISE.
5. COORDINATE DIFFUSER, REGISTER, AND GRILLE LOCATIONS WITH REFLECTED CEILING PLAN.
6. PROVIDE FLEXIBLE DUCTWORK FOR FINAL CONNECTIONS TO SUPPLY AIR DIFFUSERS UNLESS NOTED OTHERWISE ON DRAWINGS OR IN SPECIFICATIONS. FLEXIBLE DUCT SIZE SHALL BE SAME AS NECK SIZE OF DIFFUSER AND SHALL NOT EXCEED 5 FEET IN LENGTH.
7. REFER TO SPECIFICATION SECTION 23 05 15 FOR REQUIREMENTS RELATED TO REPORTING REFRIGERANTS AND RELATED EQUIPMENT ADDED, REPAIRED, REPLACED, OR DECOMMISIONED.

KEYED NOTES

7.601 INTAKE FROM MAU TO BE AT A MINIMUM OF 10 FT FROM EXHAUST FAN.

7.602 TERMINATE BOILER INTAKE/EXHAUST PER MANUFACTURER'S INSTRUCTIONS AND PER LOCAL CODE.

7.603 ROUTE DRYER VENT THRU SIDEWALL OF THE HANGAR ABOVE THE ROOFLINE OF THE OFFICE AREA AND TERMINATE WITH A WALL CAP.

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: September 16 2022
DESIGNED BY: AMT
DRAWN BY: RJH
CHECKED BY: AK
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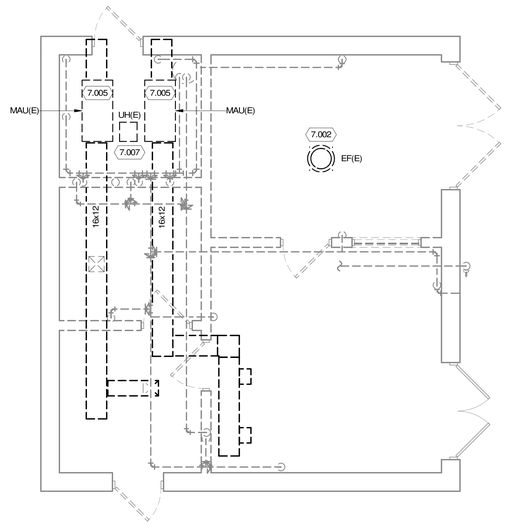
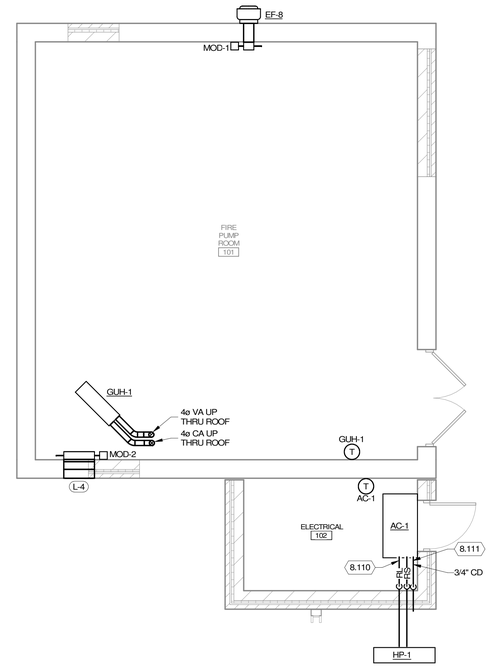
SHEET CONTENTS
ROOF HVAC PLAN

SHEET NO.:
M-102

12/14/2022 10:47:06 AM C:\Revit Local\3141700-181848.01-M-Central-2020_NateDieMaster.rvt



N 2 **FIRST FLOOR B158 HVAC DEMOLITION PLAN**
1/4" = 1'-0"



N 1 **FIRST FLOOR B158 HVAC PLAN**
1/4" = 1'-0"

GENERAL HVAC DEMOLITION NOTES

1. COMPLETELY DEMOLISH ALL EXISTING DUCTWORK AS SHOWN WITH BOLD DASHED LINES, INCLUDING ALL ABANDONED AND UNUSED ACCESSORIES, INSULATION, HANGER SUPPORTS, ETC. FOR REMAINING DUCT SYSTEM. PLUG OR CAP ALL OPENINGS CREATED BY DUCT DEMOLITION. TEST DUCTWORK AS SPECIFIED, AND INSULATE OR PAINT SAME AS NEW WORK. PATCH EXISTING WALLS, ROOFS, CEILINGS, AND FLOORS DISTURBED BY DEMOLITION TO ORIGINAL CONDITION.
2. COMPLETELY DEMOLISH ALL EXISTING EQUIPMENT AS SHOWN WITH BOLD DASHED LINES, INCLUDING ALL ABANDONED AND UNUSED ACCESSORIES, INSULATION, HANGERS, SUPPORTS, BASES, CONTROLS, ETC. PATCH EXISTING WALLS, ROOFS, CEILINGS, AND FLOORS DISTURBED BY DEMOLITION TO ORIGINAL CONDITION.
3. DELIVER INDICATED EQUIPMENT TO OWNER'S DESIGNATED STORAGE SPACE ON SITE. PLUG OR CAP ALL EQUIPMENT OPENINGS TO PREVENT DIRT AND MOISTURE FROM ENTERING EQUIPMENT.
4. REINSTALL INDICATED EQUIPMENT, SAME AS NEW WORK, IN NEW LOCATION WHERE INDICATED. COMPLETELY CLEAN AND RESTORE EQUIPMENT TO GOOD OPERATING CONDITION.
5. INSTALL TEMPORARY COVERS OVER EXISTING EXTERIOR ENVELOPE OPENINGS CREATED BY REMOVED EQUIPMENT/DUCT. COVER SHALL BE WATERTIGHT, AND MEET OSHA AND OWNER REQUIREMENTS. COMPLETELY REMOVE TEMPORARY COVER WHEN OPENINGS ARE PATCHED TO FINAL CONDITION. REPAIR ANY DAMAGE TO EXISTING BUILDING COMPONENTS CAUSED BY TEMPORARY COVER.
6. WHERE BRANCH DUCTWORK IS SHOWN TO BE DEMOLISHED BACK TO THE MAIN DUCT AND THE EXISTING MAIN DUCT OPENING IS NOT TO BE RE-USED, CAP AND SEAL THE MAIN DUCT BRANCH OPENING AIRTIGHT.
7. REFER TO SPECIFICATION SECTION 23 05 15 FOR REQUIREMENTS RELATED TO REPORTING REFRIGERANTS AND RELATED EQUIPMENT ADDED, REPAIRED, REPLACED, OR DECOMMISSIONED.

GENERAL HVAC NOTES

1. INLET DUCT SIZE TO AIR TERMINAL DEVICES SHALL BE SAME AS INLET SIZE UNLESS OTHERWISE NOTED. IF RUNOUT TO AIR TERMINAL BOX IS GREATER THAN 6 FEET IN LENGTH, SIZE RUNOUT ONE EVEN INCREMENT SIZE LARGER (MINIMUM 2" LARGER) UNLESS OTHERWISE NOTED TO WITHIN 3 FEET OF BOX BEFORE REDUCING TO BOX INLET SIZE.
2. DUCTWORK DOWNSTREAM OF AIR TERMINAL BOXES TO BE INTERNALLY LINED FOR A MINIMUM OF 6'-0" FOR SOUND ATTENUATION. OUTLET DUCT SIZES TO MATCH AIR TERMINAL BOX OUTLET UNLESS NOTED OTHERWISE.
3. PROVIDE MANUAL BALANCE DAMPER AT EACH DIFFUSER, GRILLE, AND BRANCH TAKE-OFF IN ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK EXCEPT KITCHEN GREASE EXHAUST DUCT. LOCATE BALANCE DAMPER AS CLOSE TO BRANCH TAKE-OFF AS POSSIBLE.
4. DUCT SIZE TO DIFFUSERS, REGISTERS, AND GRILLES SHALL BE SAME AS NECK SIZE UNLESS NOTED OR DETAILED OTHERWISE.
5. COORDINATE DIFFUSER, REGISTER, AND GRILLE LOCATIONS WITH REFLECTED CEILING PLAN.
6. PROVIDE FLEXIBLE DUCTWORK FOR FINAL CONNECTIONS TO SUPPLY AIR DIFFUSERS UNLESS NOTED OTHERWISE ON DRAWINGS OR IN SPECIFICATIONS. FLEXIBLE DUCT SIZE SHALL BE SAME AS NECK SIZE OF DIFFUSER AND SHALL NOT EXCEED 5 FEET IN LENGTH.
7. PROVIDE PLENUM RATED INSULATION AND WIRING IN RETURN AIR CEILING PLENUM. MATERIALS WITHIN PLENUMS SHALL BE NON-COMBUSTIBLE OR SHALL HAVE A FLAME AND SMOKE SPREAD INDEX OF NOT MORE THAN 25/50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

KEYED NOTES

7.002 DEMO EXISTING EXHAUST FAN ON ROOF, ASSOCIATED EXHAUST DUCTWORK, AND CONTROLS AS SHOWN BOLD AND DASHED.

7.005 DEMO EXISTING MAU, ALL ASSOCIATED DUCTWORK, AND CONTROLS AS SHOWN BOLD AND DASHED.

7.007 DEMO EXISTING UNIT HEATER, ALL ASSOCIATED PIPING, AND CONTROLS AS SHOWN BOLD AND DASHED.

8.110 ROUTE AND SIZE REFRIGERATION PIPING PER MANUFACTURER'S INSTRUCTIONS.

8.111 COORDINATE ROUTING OF PIPING WITH ELECTRICAL SUCH THAT NO PIPING RUNS ABOVE ANY ELECTRICAL EQUIPMENT.

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: September 16 2022
DESIGNED BY: AMT
DRAWN BY: RJH
CHECKED BY: AK
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SHEET CONTENTS
FIRE PUMP BUILDING 158 HVAC PLANS

SHEET NO.:
M-103

12/14/2022 10:54:20 AM C:\Revit Local\3141700-181848.01-M-FP-Central-2020_NateDeMaster.rvt

GENERAL PIPING NOTES

1. PIPING RUNOUTS TO ALL EQUIPMENT TO BE 3/4"" UNLESS NOTED OTHERWISE.
2. WELD-O-LETS AND THREAD-O-LETS MAY BE USED FOR BRANCH TAKE-OFFS UP TO ONE-HALF THE DIAMETER OF THE MAIN.
3. INSTALL DIELECTRIC FITTINGS WHERE PIPING OF DIFFERENT MATERIALS IS JOINED.
4. INSTALL PIPING FREE OF SAGS AND BENDS.
5. LOCATE ALL VALVES FOR EASY ACCESS. INSTALL VALVES WITH STEM UP OR HORIZONTAL.
6. INSTALL DRAIN VALVES AT ALL LOW POINTS IN PIPING SYSTEM AND ELSEWHERE AS REQUIRED FOR SYSTEM DRAINAGE. INSTALL MANUAL AIR VENTS AT ALL HIGH POINTS IN PIPING, AT HEAT-TRANSFER COILS, AND ELSEWHERE AS REQUIRED FOR SYSTEM AIR VENTING.

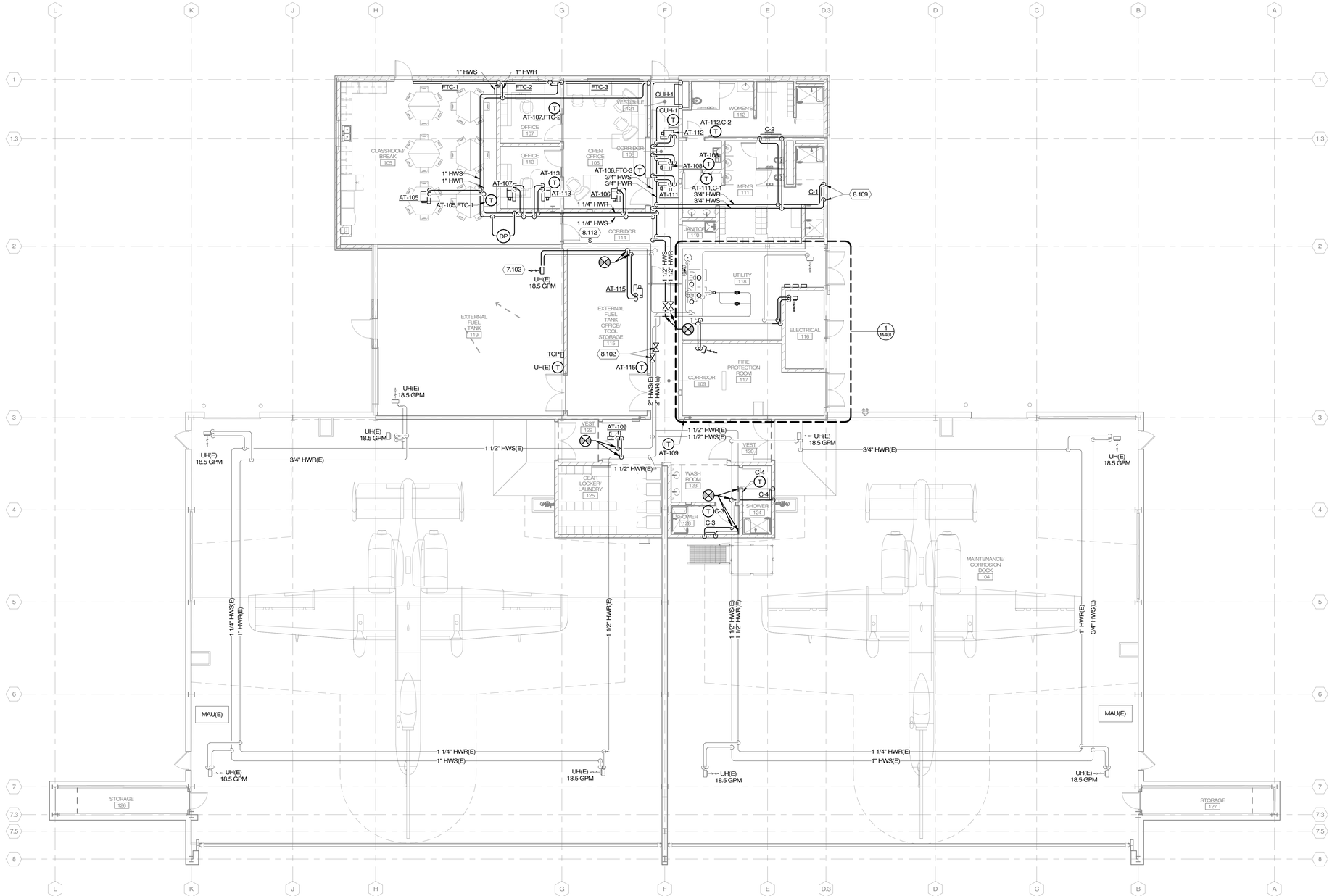
KEYED NOTES

7.102 RELOCATED EXISTING UNIT HEATER.

8.102 INSTALL ISOLATION VALVES IN EXISTING PIPING.

8.109 PIPING IS EXPOSED ON THE WALL WITH SS JACKET.

8.112 MECHANICAL VENTILATION EMERGENCY KILL SWITCH WITH PROTECTIVE COVER



N 1 **FIRST FLOOR PIPING PLAN**
1/8" = 1'-0"

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SHEET CONTENTS
FIRST FLOOR PIPING PLAN

SHEET NO.:
M-131

12/14/2022 10:47:08 AM C:\Revit Local\3141700-181848.01-M-Central-2020_NateDhkMaster.rvt

GENERAL HVAC DEMOLITION NOTES

1. COMPLETELY DEMOLISH ALL EXISTING DUCTWORK AS SHOWN WITH BOLD DASHED LINES, INCLUDING ALL ABANDONED AND UNUSED ACCESSORIES, INSULATION, HANGER SUPPORTS, ETC. FOR REMAINING DUCT SYSTEM. PLUG OR CAP ALL OPENINGS CREATED BY DUCT DEMOLITION. TEST DUCTWORK AS SPECIFIED, AND INSULATE OR PAINT SAME AS NEW WORK. PATCH EXISTING WALLS, ROOFS, CEILINGS, AND FLOORS DISTURBED BY DEMOLITION TO ORIGINAL CONDITION.
2. COMPLETELY DEMOLISH ALL EXISTING EQUIPMENT AS SHOWN WITH BOLD DASHED LINES, INCLUDING ALL ABANDONED AND UNUSED ACCESSORIES, INSULATION, HANGERS, SUPPORTS, BASES, CONTROLS, ETC. PATCH EXISTING WALLS, ROOFS, CEILINGS, AND FLOORS DISTURBED BY DEMOLITION TO ORIGINAL CONDITION.
3. DELIVER INDICATED EQUIPMENT TO OWNER'S DESIGNATED STORAGE SPACE ON SITE, PLUG OR CAP ALL EQUIPMENT OPENINGS TO PREVENT DIRT AND MOISTURE FROM ENTERING EQUIPMENT.
4. REINSTALL INDICATED EQUIPMENT, SAME AS NEW WORK, IN NEW LOCATION WHERE INDICATED. COMPLETELY CLEAN AND RESTORE EQUIPMENT TO GOOD OPERATING CONDITION.
5. INSTALL TEMPORARY COVERS OVER EXISTING EXTERIOR ENVELOPE OPENINGS CREATED BY REMOVED EQUIPMENT/DUCT. COVER SHALL BE WATERTIGHT, AND MEET OSHA AND OWNER REQUIREMENTS. COMPLETELY REMOVE TEMPORARY COVER WHEN OPENINGS ARE PATCHED TO FINAL CONDITION. REPAIR ANY DAMAGE TO EXISTING BUILDING COMPONENTS CAUSED BY TEMPORARY COVER.
6. WHERE BRANCH DUCTWORK IS SHOWN TO BE DEMOLISHED BACK TO THE MAIN DUCT AND THE EXISTING MAIN DUCT OPENING IS NOT TO BE RE-USED, CAP AND SEAL THE MAIN DUCT BRANCH OPENING AIRTIGHT.
7. REFER TO SPECIFICATION SECTION 23 05 15 FOR REQUIREMENTS RELATED TO REPORTING REFRIGERANTS AND RELATED EQUIPMENT ADDED, REPAIRED, REPLACED, OR DECOMMISIONED.

GENERAL PIPING DEMOLITION NOTES

1. COMPLETELY DEMOLISH ALL INDICATED EXISTING PIPING SHOWN WITH BOLD DASHED LINES, INCLUDING ALL ABANDONED AND UNUSED PIPING, VALVES, INSULATION, HANGERS, SUPPORTS, ETC. FOR REMAINING PIPING SYSTEMS. PLUG OR CAP ALL OPENINGS CREATED BY PIPING DEMOLITION. TEST PIPING SYSTEMS AS SPECIFIED, AND INSULATE OR PAINT SAME AS NEW WORK. PATCH EXISTING WALLS, ROOFS, CEILINGS, AND FLOORS DISTURBED BY DEMOLITION TO ORIGINAL CONDITION.
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3. DELIVER INDICATED EQUIPMENT TO OWNER'S DESIGNATED STORAGE SPACE ON SITE, PLUG OR CAP ALL EQUIPMENT OPENINGS TO PREVENT DIRT AND MOISTURE FROM ENTERING EQUIPMENT.
4. WHERE PIPES ARE REMOVED AND NOT RE-CONNECTED, REMOVE PIPE BACK TO NEXT BRANCH THAT IS TO REMAIN. INSTALL CAPS OR PLUGS ON OPENINGS. PRIME, PAINT, AND INSULATE DISTURBED PIPE SAME AS SPECIFIED FOR NEW WORK.
5. REINSTALL INDICATED EQUIPMENT, SAME AS NEW WORK, IN NEW LOCATION WHERE INDICATED. COMPLETELY CLEAN AND RESTORE EQUIPMENT TO GOOD OPERATING CONDITION.
6. ABANDON IN PLACE UNDERGROUND PIPES SHOWN ON DRAWINGS AS PHANTOM.
7. WHERE PIPES ARE ROUTED INSIDE CMU WALLS, PIPE MAY BE ABANDONED PIPE IN PLACE. REMOVE PIPE TO 1" INSIDE WALL AT BOTH ENDS.
8. WHERE PIPES PASS THROUGH FLOOR SLABS, SAW-CUT SLAB AND REMOVE CONCRETE TO MINIMUM EXTENT NECESSARY TO GAIN ACCESS BELOW SLAB. REMOVE PIPE DOWN TO HORIZONTAL PIPING BELOW FLOOR. SEAL AND CAP ABANDONED PIPE ENDS.
9. COORDINATE WITH ARCHITECTURAL AND STRUCTURAL TRADES. PATCH EXISTING ROOFS, WALLS, AND FLOORS DISTURBED BY DEMOLITION. RESTORE TO MATCH CONDITION OF ORIGINAL SURROUNDING SURFACES.

GENERAL HVAC NOTES

1. INLET DUCT SIZE TO AIR TERMINAL DEVICES SHALL BE SAME AS INLET SIZE UNLESS OTHERWISE NOTED. IF RUNOUT TO AIR TERMINAL BOX IS GREATER THAN 6 FEET IN LENGTH, SIZE RUNOUT ONE EVEN INCREMENT SIZE LARGER (MINIMUM 2" LARGER) UNLESS OTHERWISE NOTED TO WITHIN 3 FEET OF BOX BEFORE REDUCING TO BOX INLET SIZE.
2. DUCTWORK DOWNSTREAM OF AIR TERMINAL BOXES TO BE INTERNALLY LINED FOR A MINIMUM OF 6'-0" FOR SOUND ATTENUATION. OUTLET DUCT SIZES TO MATCH AIR TERMINAL BOX OUTLET UNLESS NOTED OTHERWISE.
3. PROVIDE MANUAL BALANCE DAMPER AT EACH DIFFUSER, GRILLE, AND BRANCH TAKE-OFF IN ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK EXCEPT KITCHEN GREASE EXHAUST DUCT. LOCATE BALANCE DAMPER AS CLOSE TO BRANCH TAKE-OFF AS POSSIBLE.
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GENERAL PIPING NOTES

1. PIPING RUNOUTS TO ALL EQUIPMENT TO BE 3/4"" UNLESS NOTED OTHERWISE.
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3. INSTALL DIELECTRIC FITTINGS WHERE PIPING OF DIFFERENT MATERIALS IS JOINED.
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KEYED NOTES

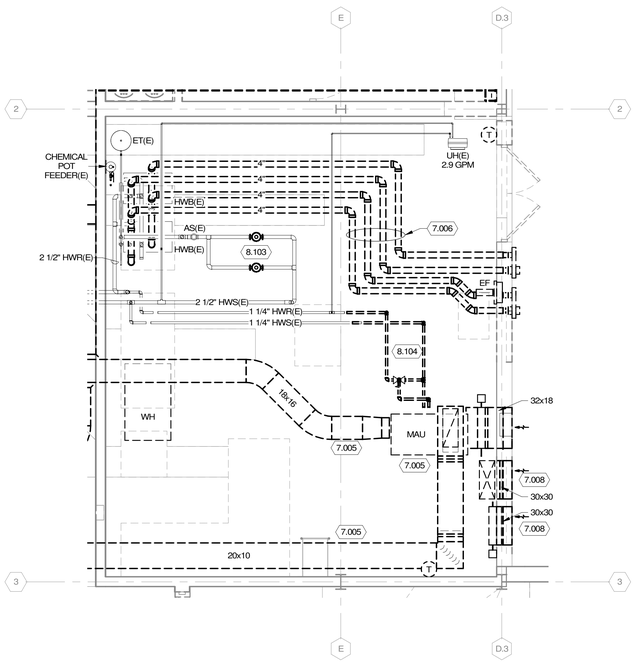
7.005 DEMO EXISTING MAU, ALL ASSOCIATED DUCTWORK, AND CONTROLS AS SHOWN BOLD AND DASHED.

7.006 DEMO BOILER EXHAUST/INTAKE PIPING AS SHOWN BOLD AND DASHED.

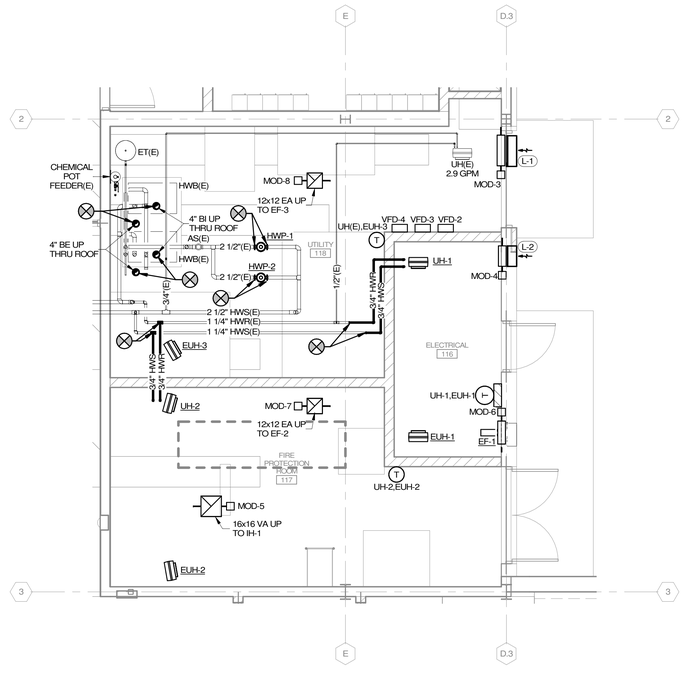
7.008 DEMO EXISTING LOUVERS AND ASSOCIATED DUCTWORK.

8.103 DEMO EXISTING PUMPS.

8.104 DEMO EXISTING PIPING SERVING MAU.



N 2 ENLARGED UTILITY AREA MECHANICAL DEMOLITION PLAN
1/4" = 1'-0"



N 1 ENLARGED UTILITY AREA MECHANICAL PLAN
1/4" = 1'-0"

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
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DRAWN BY: RJH
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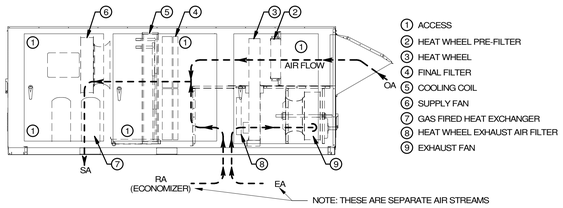
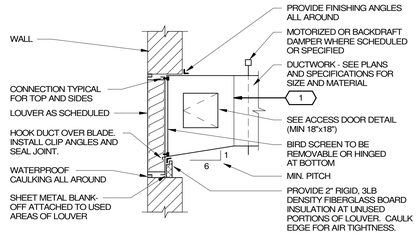
SHEET CONTENTS
ENLARGED PLANS AND SECTIONS

SHEET NO.:
M-401

12/14/2022 10:47:10 AM C:\Revit Local\3141700-181848.01-M-Central-2020_NateDeMaster.rvt



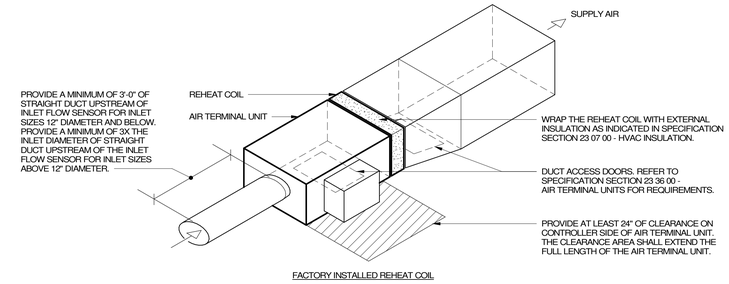
13 ENERGY RECOVERY RTU COMPONENT VIEW
NO SCALE



KEYED NOTES:

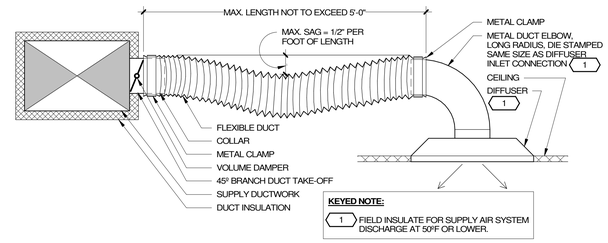
1 USE PVC COATED METALIC DUCT FOR BOTTOM OF OUTSIDE AIR INTAKE DUCT FROM LOUVER TO THIS POINT.

9 DUCT CONNECTION TO LOUVER
NO SCALE



FACTORY INSTALLED REHEAT COIL

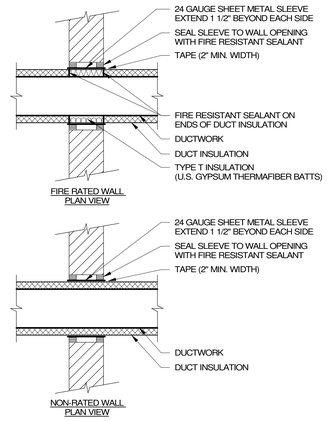
1 SUPPLY AIR TERMINAL UNIT WITH REHEAT COIL
NO SCALE



KEYED NOTE:

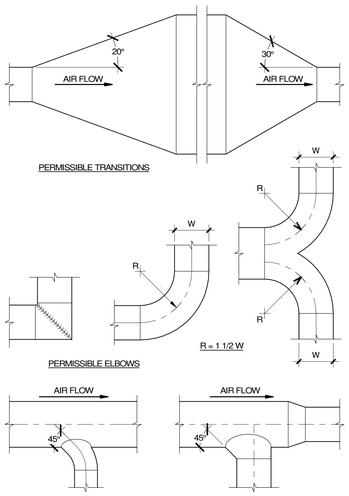
1 FIELD INSULATE FOR SUPPLY AIR SYSTEM DISCHARGE AT 50°F OR LOWER.

2 FLEXIBLE DUCT TO CEILING DIFFUSER
NO SCALE

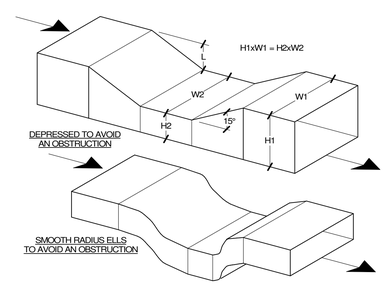


NOTE:
THIS DETAIL APPLIES ONLY FOR INSULATED DUCTS REQUIRING CONTINUOUS INSULATION THROUGH WALL, AND DUCTS NOT REQUIRING FIRE DAMPERS.

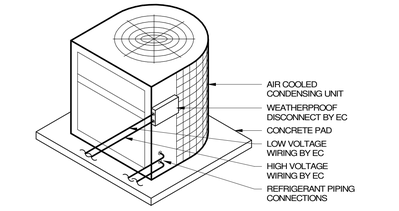
14 DUCT PENETRATION THROUGH INTERIOR WALL
NO SCALE



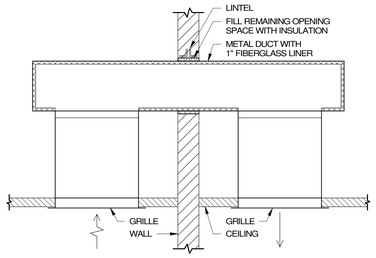
10 TYPICAL DUCT TRANSITIONS
NO SCALE



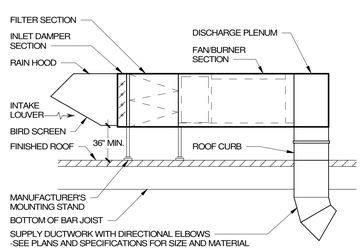
4 TYPICAL DUCT OFFSET
NO SCALE



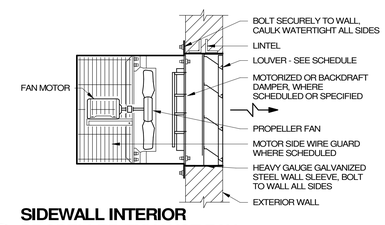
3 PAD MOUNTED CONDENSING UNIT
NO SCALE



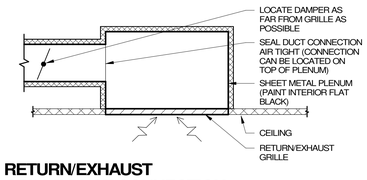
15 TRANSFER DUCT WITH BOTTOM CONNECTION
NO SCALE



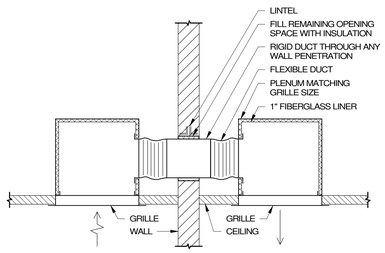
11 ROOF MOUNTED MAKEUP AIR UNIT (MAU) ELEVATION
NO SCALE



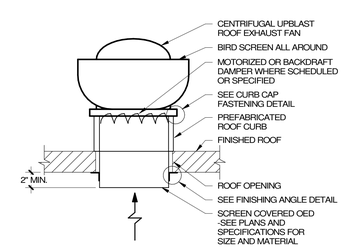
SIDEWALL INTERIOR PROPELLER EXHAUST FAN
6
NO SCALE



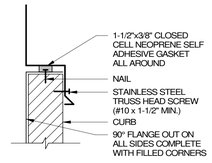
RETURN/EXHAUST GRILLE DUCT CONNECTION
5
NO SCALE



12 TRANSFER DUCT WITH SIDE CONNECTION
NO SCALE



8 UPBLAST ROOF EXHAUST FAN
NO SCALE



7 CURB CAP FASTENING
NO SCALE

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WE STAND READY

MICHIGAN AIR NATIONAL GUARD ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

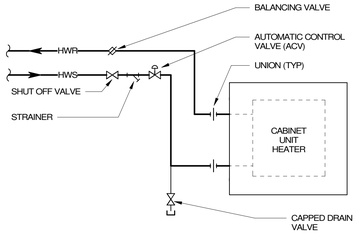
ANG NO.:	VGLZ162323
M&H NO.:	3141700-181848.01
DATE:	September 16 2022
DESIGNED BY:	AMT
DRAWN BY:	FJH
CHECKED BY:	AK

DO NOT SCALE DRAWINGS.

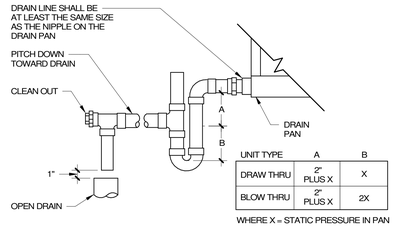
SHEET CONTENTS
HVAC DETAILS

SHEET NO.:
M-501

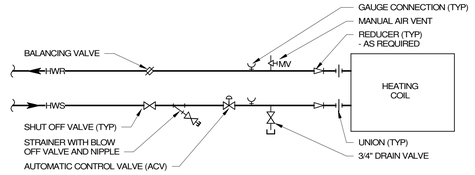
12/14/2022 10:47:11 AM C:\Revit Local\3141700-181848.01-M-Central-2020_NateDoMaster.rvt



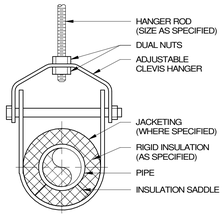
9 CABINET UNIT HEATER PIPING
NO SCALE



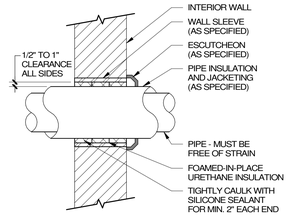
5 CONDENSATE DRAIN TRAP
NO SCALE



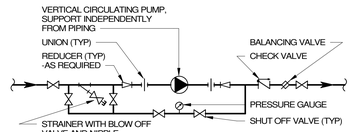
1 HOT WATER REHEAT COIL PIPING
NO SCALE



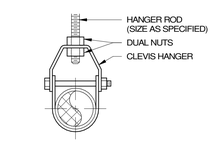
10 ADJUSTABLE CLEVIS HANGER - INSULATED PIPE
NO SCALE



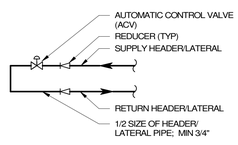
6 NON-RATED INTERIOR WALL INSULATED PIPE PENETRATION
NO SCALE



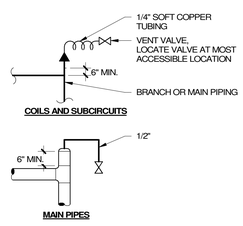
2 IN-LINE CIRCULATING PUMP PIPING (WITH STRAINER)
NO SCALE



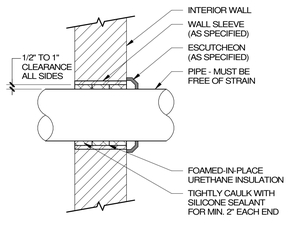
11 ADJUSTABLE CLEVIS HANGER
NO SCALE



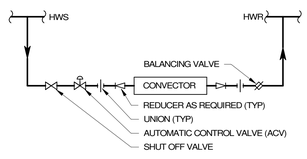
7 END OF LOOP WITH BALANCING VALVE BYPASS PIPING
NO SCALE



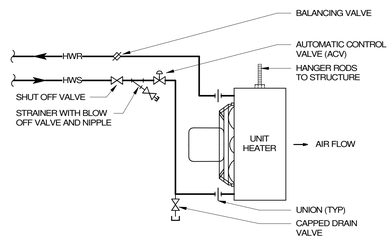
3 AIR VENT PIPING
NO SCALE



12 NON-RATED INTERIOR WALL PIPE PENETRATION
NO SCALE



8 HOT WATER FIN TUBE CONVECTOR PIPING
NO SCALE



4 HOT WATER UNIT HEATER PIPING WITH TEMPERATURE CONTROL AND ACV
NO SCALE

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WE STAND READY

MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: September 16 2022
DESIGNED BY: AMT
DRAWN BY: RJH
CHECKED BY: AK
DO NOT SCALE DRAWINGS.

SHEET CONTENTS
PIPING DETAILS

SHEET NO.:
M-511

12/14/2022 10:47:11 AM C:\Revit Local\3141700-181848.01-M-Central-2020_NateDeMaster.rvt

GENERAL MECHANICAL NOTES

1. CONTRACTORS ARE FREE TO USE ANY PRODUCT WHICH MEETS THE GOVERNMENT'S MINIMUM REQUIREMENTS AND NOT IN CONFLICT WITH OTHER CONTRACT PROVISIONS. UNLESS INDICATED OTHERWISE, ON THE PLANS OR SPECIFICATIONS (E.G. SOLE-SOURCE), ALL LISTED MANUFACTURERS ARE THE BASIS OF DESIGN. FOR THESE BASIS OF DESIGN PRODUCTS, OTHER MANUFACTURERS MAY BE SUBMITTED AS LONG AS THE STANDARD OF QUALITY AND CHARICTERISTICS OF THE SUBMITTED MANUFACTURER MEET OR EXCEED THE STANDARD OF QUALITY AND CHARACTERISTICS OF THE BASIS OF DESIGN.

MAKE-UP AIR UNIT (MAU) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	TYPE	FIRE TYPE	AIR FLOW (CFM)			SUPPLY FAN			MIN. INLET TEMP. (°F)	HEATER					COOLING COIL TAG	FILTER TYPE	ELECTRICAL			(2) INTERLOCK WITH	(4) ACCESSORIES	(3) MTG. HEIGHT (FT)	WEIGHT (LB)	LOCATION	REMARKS
				HIGH SPEED SUPPLY	LOW SPEED SUPPLY	(1) MIN. OUTDOOR	ESP (IN WC)	MOTOR ENCL. TYPE	MOTOR POWER (HP)		INPUT (MBH)	OUTPUT (MBH)	HX MAT.	STAGES	VENT TYPE			VOLTS/PH	MCA	MOP						
MAU-1	GREENHECK, IGX-P109-H-12-MF	O,H	IF	1,000	1,000	1000	0.5	XPL	1/4	-10	100	80	SS	MOD, 25%	SC	-	2T	480/3	1.5	15.0	-	1,2,3,4,6,7,10,13	ROOF	1200	ROOF	

TYPE		FIRE TYPE		MOTOR ENCLOSURE TYPE		HEAT EXCHANGER MATERIAL		HEATER STAGES		VENT TYPE		FILTER TYPE		ACCESSORIES			
I	INDOOR	DF	DIRECT	ODP	OPEN DRIP PROOF	AS	ALUMINIZED STEEL	1	1-STAGE	G	GRAVITY	1W	1" WASHABLE	1	INTAKE HOOD	8	THERMOSTAT
O	OUTDOOR	IF	INDIRECT	TEFC	TOTALLY ENCLOSED, FAN COOLED	SS	STAINLESS STEEL	2	2-STAGE	FD	FORCED DRAFT	2W	2" WASHABLE	2	36" ROOF CURB	9	UNIT-MOUNTED CONTROL PANEL
V	VERTICAL			XPL	EXPLOSION PROOF			3	3-STAGE	SC	SEALED COMBUSTION	1T	1" THROWAWAY	3	DISCONNECT SWITCH	10	REMOTE CONTROL PANEL
H	HORIZONTAL							4	4-STAGE			2T	2" THROWAWAY	4	INLET DAMPER	11	7-DAY TIME CLOCK
								MOD, XX	MODULATING TO XX%					5	RETURN AIR DAMPER	12	24-HOUR TIME CLOCK
														6	FREEZESTAT	13	DDC INTERFACE
														7	CLOGGED FILTER SWITCH	14	DISCHARGE GRILLE

REMARKS:
(1) AT HIGH SPEED.
(2) SEE SEQUENCE OF OPERATION FOR DETAILS.
(3) MOUNTING HEIGHT SHALL BE FROM FINISHED FLOOR TO BOTTOM OF UNIT.
(4) SEE SPECIFICATION FOR OTHER ACCESSORIES.

ROOFTOP AIR HANDLING UNIT (RTU) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	TYPE	AIR FLOW (CFM)			SUPPLY FAN						EXHAUST FAN						ELECTRICAL			(1) ACCESSORIES
			SUPPLY	OUTDOOR	MINIMUM	FAN TYPE	ESP (IN WC)	TSP (IN WC)	HP	BHP	SPEED (RPM)	FAN TYPE	AIR FLOW (CFM)	ESP (IN WC)	TSP (IN WC)	HP	BHP	SPEED (RPM)	(VOLTS/PH)	MCA	MOCP (A)	
RTU-1	AAON, RN-008-3-0-FB09-3KB	PR,IF,O,D	2,770	1,220	1690	P	1.75	3.03	3.00	2.34	1991	P	1220	0.50	1.02	1.00	0.42	1623	480/3	25	35	1,2,4,5,7,8,9,10,11,12

MARK	FUEL FIRED UNITS					MTG. HEIGHT (FT)	PRE-FILTER MARK	FINAL-FILTER MARK	HEAT WHEEL MARK	HEATING COIL MARK	COOLING COIL MARK	AMB. TEMP. (°F)	WEIGHT (LB)	LOCATION	UNIT SECTIONS IN DIRECTION OF AIR FLOW	REMARKS
	FUEL TYPE	INPUT (MBH)	OUTPUT (MBH)	EAT (°F)	LAT (°F)											
RTU-1	NG	150	120	61.0	139.3	ROOF	AF-1A	AF-1B	HRW-1	-	CC-1	95	1600	ROOF	WH>F>D>ER>EC>F>CC>SF>B F>ER>D>EF	2,3,4,5,6,7,8

TYPE				ACCESSORIES				SECTION TYPES			
CS	CENTRAL STATION	I	INDOOR	1	INTAKE HOOD	7	DRY BULB ECONOMIZER	RF	RETURN FAN	HC	HEATING COIL	SF	SUPPLY FAN
PR	PACKAGED ROOFTOP	O	OUTDOOR	2	INLET DAMPER	8	DISCONNECT SWITCH	EC	ECONOMIZER	AC	ACCESS	DP	DISCHARGE PLENUM
C	CUSTOM	D	DOWNFLOW	3	DISCHARGE DAMPER	9	15A GFI CONVENIENCE OUTLET	MB	MIXING BOX	H	HUMIDIFIER	WH	WEATHER HOOD
IF	INDIRECT FIRED	H	HORIZONTAL	4	18" HIGH ROOF CURB	10	SUPPLY AIR SMOKE DETECTOR	AB	AIR BLENDER	CC	COOLING COIL	D	DAMPER
DF	DIRECT FIRED	U	UPFLOW	5	DOUBLE WALL	11	RETURN AIR SMOKE DETECTOR	BL	BLANK	ML	MOISTURE ELIMINATOR	B	BURNER
				6	COIL GUARDS	12	SUPPLY AIR CO SENSOR	F	FILTER	ER	ENERGY RECOVERY		

FAN TYPE	
AF	AIR FOIL
BI	BACKWARD INCLINED
FC	FORWARD CURVED
P	PLENUM/PLUG

REMARKS:
(1) SEE SPECIFICATION SECTIONS 23 30 00 (CUSTOM RTU) OR 23 54 16.00 10 (MAU) FOR ANY ADDITIONAL ACCESSORIES.
(2) PROVIDE DAMPER BYPASS AROUND HEAT RECOVERY WHEEL FOR OPERATION DURING ECONOMIZER.
(3) RETURN AIR AND EXHAUST AIR STREAMS ARE TOTALLY INDEPENDENT OF EACH OTHER. SEE DRAWING SCHEMATIC IN DRAWING DETAILS.
(4) UNIT TO HAVE A MINIMUM OF ONE OF THE COMPRESSORS AS A DIGITAL SCROLL TYPE.
(5) ALSO SEE SPECIFICATION SECTION 23 09 93 (SEQUENCES OF OPERATION FOR HVAC) AND CONTROL SCHEMATIC SHEETS (M-800) FOR ADDITIONAL UNIT CONTROL FUNCTIONS.
(6) UNIT TO INCLUDE VFD'S FOR BOTH SUPPLY AND EXHAUST FAN MOTORS. MOTORS TO BE PREMIUM EFFICIENCY.
(7) PROVIDE UNIT WITH AIR FLOW MEASURING OF OUTSIDE AIR.
(8) SEE HEAT PUMP AND CONDENSING UNIT SCHEDULE FOR INFORMATION CONCERNING THE CONDENSER SECTION OF THE ROOFTOP UNIT.

VARIABLE FREQUENCY DRIVE (VFD) SCHEDULE

MARK	MODEL, MANUFACTURER NUMBER	SERVES	MOTOR (HP)	VOLTS / PHASE	ENCLOSURE	ACCESSORIES		LOCATION	REMARKS
						INTEGRAL DISCONNECT	MANUAL BYPASS		
VFD-1	-	RTU-1 SF	3	480/3	NEMA-1	YES	NO	RTU-1	(1)
VFD-1A	-	RTU-1 EF	1	480/3	NEMA-1	YES	NO	RTU-1	(1)
VFD-2	-	HWP-1	7 1/2	480/3	NEMA-1	YES	NO	118	
VFD-3	-	HWP-2	7 1/2	480/3	NEMA-1	YES	NO	118	
VFD-4	-	EF-9	1/2	115/1	NEMA-1	YES	NO	118	

REMARKS:
(1) VFD IS PROVIDED INTEGRAL TO RTU AND FACTORY INSTALLED BY THE MANUFACTURER.

EXHAUST FAN (EF) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	FAN TYPE	AIR FLOW RATE (CFM)	ESP (IN WC)	MOTOR			FAN SPEED (RPM)	DRIVE TYPE	ELECTRICAL (VOLTS/PH)	(2) MTG. HEIGHT (FT)	MAXIMUM SOUND			(1) INTERLOCK WITH	OPENING (IN)		ACCESSORIES	LOCATION	REMARKS
					HP	BHP	TYPE					(3) (DB)	(4) SONES	INSTALL. TYPE		LENGTH	WIDTH			
EF-1	GREENHECK, AER-E20C-605-VG	9	200	0.35	1/10	.05	ODP	935	DIRECT	120/1	8	57.0	7.8	A	T-STAT	17 7/8	17 7/8	2,4,8,9,10	116	8
EF-2	GREENHECK, CUE-090-VG	5	500	0.35	1/10	.06	ODP	1398	DIRECT	120/1	ROOF	51.0	6.2	C	T-STAT	11 7/8	11 7/8	2,8,9,11,14,20	117 ROOF	8
EF-3	GREENHECK, CUE-090-VG	5	500	0.35	1/10	.06	ODP	1398	DIRECT	120/1	ROOF	51.0	6.2	C	T-STAT	11 7/8	11 7/8	2,8,9,11,14,20	118 ROOF	8
EF-4	-	5	1,100	0.35	1/15	.02	XPL	-	DIRECT	120/1	ROOF	-	-	C	MAU-1	-	-	-	119 ROOF	5,7
EF-5	-	5	10,000	0.35	1/4	.21	XPL	-	BELT	120/1	ROOF	-	-	C	MAU-1	-	-	-	119 ROOF	5,7
EF-6	LINT LASSO, F-6	2	300						DIRECT	120/1	5			D	DRYER			-	125	6, 10
EF-7	LINT LASSO, F-6	2	300						DIRECT	120/1	5			D	DRYER			-	125	6, 10
EF-8	GREENHECK, CUE-095-VG	5	700	0.35	1/6	.1	ODP	1486	DIRECT	120/1	8	55.0	7.7	C	T-STAT	11 7/8	11 7/8	2,8,9,11,14	B158	8
EF-9	GREENHECK, CUE-121-VG	5	1,475	0.50	1/2	7/25	ODP	1473	DIRECT	120/1	ROOF	65.0	13.6	C	RTU-1	14	14	2,8,9,11,14,20	113 ROOF	8,9

FAN TYPE				MOTOR TYPE		INSTALLATION TYPE	
CENTRIFUGAL		AXIAL					
1	SIDEWALL	8	ROOFTOP DOWNBLAST	ODP	OPEN DRIP PROOF	A	FREE INLET, FREE OUTLET
2	INLINE	9	SIDEWALL PROPELLER	TEFC	TOTALLY ENCLOSED FAN COOLED	B	FREE INLET, DUCTED OUTLET
3	UTILITY	10	TUBE AXIAL	XPL	EXPLOSION PROOF	C	DUCTED INLET, FREE OUTLET
4	CABINET	11	VANE AXIAL	INV	INVERTER DUTY	D	DUCTED INLET, DUCTED OUTLET
5	ROOFTOP UPBLAST	12	MIXED FLOW	TEAO	TOTALLY ENCLOSED AIR OVER		
6	ROOFTOP DOWNBLAST	13	ROOFTOP FRP UPBLAST				
7	ROOFTOP FILTERED SUPPLY						

ACCESSORIES					
1	GRAVITY BACKDRAFT DAMPER	11	OUTLET WIRE GUARD	21	HOODED WALL CAP
2	MOTORIZED BACKDRAFT DAMPER	12	INLET FILTER GUARD	22	HOODED ROOF CAP
3	WEATHERHOOD	13	MOTOR COVER	23	HINGED ROOF CURB
4	WALL COLLAR	14	HOUSING INSULATION	24	INLET GRILLE
5	MOTOR WIRE GUARD	15	BELT (OSHA) WIRE GUARD	25	BASE MOUNTED VIBRATION ISOLATORS
6	MOTOR (OSHA) WIRE GUARD	16	INLET BELL	26	DUCT ADAPTOR
7	SHUTTER GUARD	17	INLET/OUTLET FLANGES	27	HANGING SPRING ISOLATORS
8	FAN SPEED CONTROLLER	18	INLET VANE DAMPER	28	HANGING NEOPRENE ISOLATORS
9	NON-FUSED DISCONNECT SWITCH	19	EXTENDED LUBE LINES	29	FACTORY INSULATED ANGLED FILTER BOX
10	INLET WIRE GUARD	20	18" MFR. ROOF CURB	30	ELECTRICALLY COMMUTATED MOTOR (ECM)

REMARKS:
(1) SEE SPECIFICATION SECTION 230993 - HVAC SEQUENCE OF OPERATION.
(2) MOUNTING HEIGHT IS FROM FINISHED FLOOR LEVEL OF INDICATED ROOM, TO TOP OF FAN OR WALL OPENING.
(3) SOUND POWER LEVEL RATING PER AMCA 301.
(4) LOUDNESS VALUES AT 5 FT IN A HEMISPHERICAL FREE FIELD PER AMCA 301.
(5) EXPLOSION PROOF, AMCA CONSTRUCTION.
(6) DRYER BOOSTER FAN AND LINT COLLECTOR. VERIFY SIZING WITH FINAL DRYER SELECTION.
(7) EXISTING FAN SCHEDULED FOR REFERENCE
(8) PROVIDE PREMIUM RATED MOTOR.
(9) PROVIDE VFD RATED MOTOR.
(10) PROVIDE CONTROL INTERLOCK WITH ASSOCIATED CLOTHES DRYER.

AIR FILTER (AF) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	TYPE	AIR FLOW RATE (CFM)	PRESSURE DROP (IN WG)		FAN TSP & AIR BALANCE PD (IN WG)	MIN. EFF. (%)	MERV RATING	MEDIA LENGTH (IN)	SERVES	LOCATION	REMARKS
				INITIAL	FINAL							
AF-1A	-	PRE	2,770	0.2	0.6	0.5	30	8	2	RTU-1	ROOF	
AF-1B	-	FINAL	2,770	0.4	1.0	0.8	85	13	4	RTU-1	ROOF	
AF-2	-	PRE	1,600	0.2	0.6	0.5	30	8	2	MAU-1	ROOF	

REMARKS:
(1)

AIR FLOW MEASURING STATION (AFMS) SCHEDULE

MARK	MANUFACTURER, MODEL	DIMENSION (IN)	AIRFLOW RANGE (CFM)	VELOCITY RANGE (FPM)	(3) SENSORS (NO)	MAX PRESS. DROP (IN WG)	HONEYCOMB AIR STRAIGHTENER	SENSOR ACCURACY	TEMPERATURE RANGE (F)	SERVES	REMARKS
AFMS-1	EBTRON, GOLD SERIES	18x14	0-1475	100-2000	PER MFGR	0.1	NO	5%	-20 TO 140	EF-9	(1)(2)

REMARKS:
(1) DUCT MOUNTED MULTI-PROBE VELOCITY PRESSURE PITOT AIR FLOW STATION. REFER TO SPECIFICATION SECTION 230900 - 'INSTRUMENTATION AND CONTROL FOR HVAC'.
(2) PROVIDE AN AIR FLOW STATION TO MEASURE THE OUTDOOR AIR CFM FOR EACH AIR HANDLING UNIT.
(3) ALL DUCT AND OUTSIDE AIR OPENING DIMENSIONS TO BE FIELD VERIFIED TO DETERMINE SENSOR LENGTH, SPACING AND TUBE QUANTITIES.

COOLING COIL (CC) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	TYPE	AIR FLOW (CFM)	PD (IN WC)	COIL (2)				CAPACITY (MBH)		EAT (°F)		LAT (°F)		MEDIA				EWT (°F)	LWT (°F)	EQUIPMENT SERVED	LOCATION	REMARKS
					FACE VEL. (FPM)	FACE AREA (FT²)	ROWS	FINS PER INCH	TOTAL	SENS.	DB	WB	DB	WB	TYPE	FLOW RATE		PRESSURE					
																(LB/H)	(GPM)	ENTER (PSI)	DROP (FT)				
CC-1	(1)	COOLING	2,770	0.39	330	8.50	6	14	95.5	74.6	77.9	64.6	52.5	52.4	R-410A	-	-	-	-	-	-	RTU-1	RTU-1	

REMARKS:
(1) BY SAME MANUFACTURER OF AIR HANDLING UNIT.
(2) COOLING COIL INLET CONDITIONS TAKE INTO ACCOUNT CONDITIONS LEAVING THE ENERGY RECOVERY WHEEL.

DAMPER (D) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	TYPE	SIZE (IN)		AIR FLOW (CFM)	MAX. PD (IN WC)	CONTROL TYPE	ACTUATOR TYPE	CONSTRUCTION MATERIAL	(1) INTERLOCK WITH	SERVING	LOCATION	REMARKS
			WIDTH	DEPTH									
MOD-1	GREENHECK, VCD-23	M-OB	14	14	585	0.1	TP	EL	GAL.	EF-8	EF-8	B158	
MOD-2	GREENHECK, VCD-23	M-OB	14	14	585	0.1	TP	EL	GAL.	EF-8	L-4	B158	
MOD-3	GREENHECK, VCD-24	M-OB	24	18	500	0.1	TP	EL	GAL.	EF-3	L-1	118	
MOD-4	GREENHECK, VCD-25	M-OB	18	12	200	0.1	TP	EL	GAL.	EF-1	L-2	116	
MOD-5	GREENHECK, VCD-26	M-OB	16	16	500	0.1	TP	EL	GAL.	EF-2	IH-1	117	
MOD-6	GREENHECK, VCD-27	M-OB	18	12	200	0.1	TP	EL	GAL.	EF-1	EF-1	116	
MOD-7	GREENHECK, VCD-28	M-OB	12	12	500	0.1	TP	EL	GAL.	EF-2	EF-2	117	
MOD-8	GREENHECK, VCD-29	M-OB	12	12	500	0.1	TP	EL	GAL.	EF-3	EF-3	118	
MOD-9	GREENHECK, VCD-29	M-OB	14	14	1475	0.1	TP	EL	GAL.	EF-9	EF-9	114	

TYPE				CONTROL TYPE		ACTUATOR TYPE	
M-PB	MOTOR OPERATED PARALLEL BLADE	G-PB	GRAVITY OPERATED PARALLEL BLADE	MOD	MODULATING	PN	PNEUMATIC
M-OB	MOTOR OPERATED OPPOSED BLADE	M-BF	MOTOR OPERATED BUTTERFLY	TP	TWO POSITION	EL	ELECTRIC

REMARKS:
(1) SEE SPECIFICATION SECTION 230993 - HVAC SEQUENCE OF OPERATIONS.

ROTARY AIR-TO-AIR EXCHANGERS (HRW) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	SYSTEM	SUPPLY AIR		EXHAUST AIR		SUMMER CONDITIONS						WINTER CONDITIONS						MOTOR		LOCATION	REMARKS
							SUPPLY AIR				EXHAUST AIR		SUPPLY AIR				EXHAUST AIR					
							EAT		LAT		EAT		EAT		LAT		EAT					
			FLOW RATE (CFM)	PD (IN WC)	FLOW RATE (CFM)	PD (IN WC)	DB (°F)	WB (°F)	DB (°F)	WB (°F)	DB (°F)	WB (°F)	DB (°F)	WB (°F)	DB (°F)	WB (°F)	DB (°F)	WB (°F)	POWER (HP)	VOLT / PHASE		
HRW-1	-	RTU-1	1220	0.42	1220	0.42	95.0	75.0	81.5	67.1	75.0	62.5	-15.0	-15.0	43.6	35.2	70.0	50.0	(2)		RTU-1	1,3

REMARKS:
(1) PROVIDE 30% EFFICIENT FILTERS ON BOTH INLETS TO THE ENERGY RECOVERY WHEEL.
(2) ENERGY RECOVERY WHEEL MOTOR IS PART OF TOTAL RTU ELECTRICAL REQUIREMENT FOUND ON THE RTU SCHEDULE.
(3) FURNISH ENERGY RECOVERY WHEEL MOTOR WITH FACTORY PROVIDED VFD.

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WE STAND READY

MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: September 16 2022
DESIGNED BY: AMT
DRAWN BY: RJH
CHECKED BY: AK
DO NOT SCALE DRAWINGS

SHEET CONTENTS
HVAC SCHEDULES

SHEET NO.:
M-601

12/14/2022 10:47:12 AM C:\Revit Local\3141700-181848.01-M-Central-2020_NateDeMaster.rvt

GENERAL MECHANICAL NOTES

1. CONTRACTORS ARE FREE TO USE ANY PRODUCT WHICH MEETS THE GOVERNMENT'S MINIMUM REQUIREMENTS AND NOT IN CONFLICT WITH OTHER CONTRACT PROVISIONS. UNLESS INDICATED OTHERWISE, ON THE PLANS OR SPECIFICATIONS (E.G. SOLE-SOURCE), ALL LISTED MANUFACTURERS ARE THE BASIS OF DESIGN. FOR THESE BASIS OF DESIGN PRODUCTS, OTHER MANUFACTURERS MAY BE SUBMITTED AS LONG AS THE STANDARD OF QUALITY AND CHARICTERISTICS OF THE SUBMITTED MANUFACTURER MEET OR EXCEED THE STANDARD OF QUALITY AND CHARACTERISTICS OF THE BASIS OF DESIGN.

DUCTLESS SPLIT SYSTEM (AC) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	UNIT TYPE	AIR FLOW (CFM)		AMBIENT TEMP. (°F)		COOLING					HEATING				ELECTRICAL				UNIT DIMENSIONS (IN)			ACCESSORIES	MTG. HEIGHT (FT)	ASSOCIATED CONDENSING UNIT	WEIGHT (LB)	LOCATION	REMARKS
			SUPPLY	OUTDOOR	MINIMUM	MAXIMUM	TYPE	EAT (°F) DB	EAT (°F) WB	CAPACITY (MBH) TOTAL	CAPACITY (MBH) SENS.	TYPE	EAT (°F)	CAP. (MBH)	STAGES	VOLTS/PH	MCA	MOCP (A)	HEATER (KW)	LENGTH	WIDTH	HEIGHT						
AC-1	MITSUBISHI, PCA-A24KA7	SU	600	0	55	95	DX	70	55	24	17.5	DX	65	20	-	240/1	1	(1)	-	50	27	9	2,4,8,9,13,14,19	8	HP-1	75	102	

UNIT TYPE		ACCESSORIES					
R	RECESSED	1	POWERED OA VENT & DAMPER	6	WALL SLEEVE	11	LEVELING LEGS	16	FUSE HOLDER
SR	SEMI-RECESSED	2	REMOTE/WALL THERMOSTAT	7	ARCHITECTURAL OUTDOOR GRILLE	12	ADJOINING ROOM DUCT TRANSITION	17	HYDRONIC HEAT
W	WALL SURFACE	3	REMOTE TEMPERATURE SENSOR	8	CONDENSER BAFFLES	13	HARD WIRE JUNCTION BOX	18	HYDRONIC CONTROL VALVE
C	CEILING	4	CONDENSATE REMOVAL PUMP	9	CONDENSATE DRAIN	14	DISCONNECT SWITCH	19	FILTER
SU	SUSPENDED	5	SUB-BASE	10	KEY LOCK CONTROL COVER	15	CIRCUIT BREAKER		

REMARKS:
(1) SINGLE POINT ELECTRICAL CONNECTION AT OUTDOOR UNIT.

AIR BALANCE SCHEDULE

ROOM	SUPPLY AIR (CFM)	RETURN AIR (CFM)	EXHAUST AIR (CFM)	TRANSFER AIR (CFM)	TRANSFER AIR (IN/OUT)	REMARKS
105	880	880	0	0	-	
106	220	220	0	0	-	
107	105	105	0	0	-	
108/114	300	0	0	300	OUT	
109	360	0	0	260	OUT	
110	0	0	50	50	IN	
111	150	0	300	150	IN	
112	100	0	200	100	IN	
113	75	75	0	0	-	
115	250	250	0	0	-	
121	0	0	0	0	-	
123	140	0	0	140	OUT	
124	0	0	75	75	IN	
125	0	0	250	250	IN	
128	0	0	75	75	IN	
129	0	0	0	0	-	
130	0	0	0	0	-	

HEAT PUMP (HP) AND CONDENSING UNIT SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	NOM. CAP. (TON)	MIN. EER	MIN. SEER	REF. TYPE	SST (°F)	HOT GAS BYPASS	NO. OF STAGES	AMB. AIR TEMP. (°F) MINIMUM	AMB. AIR TEMP. (°F) MAXIMUM	COMPRESSORS QTY.	COMPRESSORS TYPE	ELECTRICAL VOLTS	ELECTRICAL PHASE	ELECTRICAL MCA	ELECTRICAL MOCP	(2) MAX. SOUND (DB)	MATCHING EQUIPMENT COOLING COIL	WEIGHT (LB)	LOCATION	REMARKS
HP-1	MITSUBISHI, PUZ-HA24NHA1	2	-	18.5	R-410A	45	NO	1	-10	105	1	ROTARY	240	1	18.0	25.0	50	AC-1	165	ON GRADE	1
RTU-1	DAIKIN, RN-008-3	7.5	11.3	-	R-410A	45	NO	1	20	105	1	SCROLL	SEE RTU SCHEDULE				-	CC-1	-	RTU-1	3

COMPRESSOR TYPE	
RCP	RECIPROCATING
SCR	SCROLL
SCW	SCREW

REMARKS:
(1) MANUFACTURER SHALL SIZE REFRIGERANT PIPING, VALVES, AND ACCESSORIES FOR PROPER OPERATION OF SYSTEM.
(2) PER ARI STANDARD 320 "SOUND RATING OF LARGE OUTDOOR REFRIGERATING AND AIR-CONDITIONING EQUIPMENT".
(3) UNIT TO HAVE A MINIMUM OF ONE OF THE COMPRESSORS AS A DIGITAL SCROLL TYPE.

SUPPLY AIR TERMINAL (AT) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	AHU	TYPE	AIR FLOW (CFM) MAX.	AIR FLOW (CFM) MIN.	AIR FLOW (CFM) HEATING	MAX. (1) PRESS. DROP (IN WG)	INLET SIZE (IN)	(2) HOT WATER REHEAT COIL CAP. (BTUH)	EAT (°F)	LAT (°F)	EWT (°F)	LWT (°F)	FLOW (GPM)	PD (FT)	OUTLET SIZE (IN)	SERVES	ACCESSORIES	REMARKS
AT-105	TITUS, DESV	1	1, 3	880	265	265	0.75	10	18,680	55	120	160	130	1.2	5	14x12	105	3,7	3,4,5
AT-106	TITUS, DESV	1	1, 3	220	70	70	0.75	5	4,909	55	120	160	130	0.5	5	12x8	106	3,7	3,4,5
AT-107	TITUS, DESV	1	1, 3	105	35	35	0.75	4	2,417	55	119	160	130	0.5	5	12x8	107	3,7	3,4,5
AT-108	TITUS, DESV	1	1, 3	300	300	300	0.75	6	8,720	55	82	160	130	0.6	5	12x8	108,114	3,7	3,4,5
AT-109	TITUS, DESV	1	1, 3	500	500	500	0.75	8	11,939	55	77	160	130	0.8	5	12x10	109,123	3,7	3,4,5
AT-111	TITUS, DESV	1	1, 3	350	350	350	0.75	6	11,461	55	85	160	130	0.8	5	12x8	111	3,7	3,4,5
AT-112	TITUS, DESV	1	1, 3	170	100	100	0.75	4	6,590	55	116	160	130	0.5	5	12x8	112	3,7	3,4,5
AT-113	TITUS, DESV	1	1, 3	75	25	25	0.75	4	688	55	80	160	130	0.5	5	12x8	113	3,7	3,4,5
AT-115	TITUS, DESV	1	1, 3	250	75	75	0.75	5	3,372	55	96	160	130	0.5	5	12x8	115	3,7	3,4,5

TYPE				ACCESSORIES					
1	PRESSURE INDEPENDENT	5	SERIES FAN POWERED	1	ELECTRIC HEAT	5	2-WAY TWO-POSITION VALVE BY TCC	9	FACTORY MTD TRANSFORMER
2	PRESSURE DEPENDENT	6	PARALLEL FAN POWERED	2	FUSE	6	3-WAY TWO-POSITION VALVE BY TCC	10	FACTORY MTD DISCONNECT SWITCH
3	SINGLE DUCT	7	BYPASS	3	DDC CONTROLS BY TCC	7	2-WAY PROPORTIONAL VALVE BY TCC		
4	DUAL DUCT			4	PNEUMATIC CONTROLS	8	3-WAY PROPORTIONAL VALVE BY TCC		

REMARKS:
(1) EXTERNAL STATIC PRESSURE BASED ON MAXIMUM AIR FLOW RATE
(2) HEATING CAPACITY OF REHEAT COIL BASED ON HEATING AIR FLOW RATE UNLESS OTHERWISE NOTED
(3) INSTALL MINIMUM 6 LINEAL FEET OF DUCT LINER ON DISCHARGE SIDE OF AIR TERMINAL BOX.
(4) ALL PIPING RUNOUTS TO AT BOXES TO BE 3/4" U.N.O.
(5) INLET DUCT TO BE SAME SIZE AS AT BOX INLET SIZE U.N.O.

LOUVER (L) SCHEDULE (1)

MARK	MANUFACTURER, MODEL NUMBER	APPLICATION	LOUVER TYPE	MTG. SYSTEM	MAX. INLET VEL. (FT/MIN.)	CAPACITY AIR FLOW (CFM)	CAPACITY PD (IN WC)	DAMPER TYPE	(3)(4) SIZE (IN) HEIGHT	(3)(4) SIZE (IN) WIDTH	(3)(4) SIZE (IN) DEPTH	FINISH	MATERIAL	ACCESSORIES	(2) MTG. HEIGHT (IN)	LOCATION	REMARKS
L-1	GREENHECK, ESD-603	1	3	1	500	500	0.1	N	18	24	6	FP	ALUMINUM	1,3	144	118	
L-2	GREENHECK, ESD-603	1	3	1	500	200	0.1	N	12	18	6	FP	ALUMINUM	1,3	144	116	
L-3	GREENHECK, ESD-603	1	3	1	500	500	0.1	N	18	24	6	FP	ALUMINUM	1,3	144	117	
L-4	GREENHECK, ESD-603	1	3	1	500	700	0.1	N	18	24	6	FP	ALUMINUM	1,3	72	B158	
L-4	GREENHECK, ESD-603	2	3	1	750	700	0.1	N	18	24	6	FP	ALUMINUM	1,3	72	B158	

APPLICATION		LOUVER TYPE		MOUNTING SYSTEM		DAMPER TYPE		FINISH		ACCESSORIES	
1	INTAKE	1	BRICK VENT	1	PLASTER/MASONRY WALL	N	NONE	M	MILL	1	BIRD SCREEN
2	EXHAUST	2	THIN LINE EXTRUDED	2	EXPOSED DUCTWORK	BF	BUTTERFLY	W	MANUFACTURER STANDARD WHITE	2	INSECT SCREEN
3	RELIEF	3	DRAINABLE BLADE	3	METAL PANEL WALL	G	GRAVITY	S	MANUFACTURER SPECIAL COLOR	3	FLANGED FRAME
		4	STATIONARY EXTRUDED	4	ROOF	MP	MOTORIZED PNEUM.	O	OTHER (SEE SPECIFICATIONS)	4	SILL EXTENSIONS
		5	ADJUSTABLE EXTRUDED	5	EXTERIOR STUD WALL	ME	MOTORIZED ELECTRIC	AA	ANODIZED ALUMINUM	5	FILTER RACK
		6	WIND-DRIVEN RAIN			OB	OPPOSED BLADE	FP	FACTORY PRIMED FOR FIELD PAINTING		
						PB	PARALLEL BLADE				
						LL	LOW LEAKAGE, INSUL.				

REMARKS:
(1) LOUVERS ARE SCHEDULED FOR REFERENCE ONLY. LOUVERS ARE SPECIFIED AS PART OF DIVISION 08.
(2) APPROXIMATE, SEE ARCHITECTURAL PLANS FOR EXACT MOUNTING HEIGHT AND LOCATION.
(3) LISTED SIZE IS BASED ON 50% FREE AREA. SELECT FINAL LOUVER SIZE BASED ON MANUFACTURER'S DATA FOR VELOCITY AND PRESSURE DROP. COORDINATE FINAL DIMENSIONS WITH GENERAL CONTRACTOR.
(4) PROVIDE BLANK-OFF PANELS FOR UNUSED PORTIONS OF LOUVER, SEE PLANS FOR DUCT CONNECTIONS, INSULATE SAME AS OUTDOOR AIR DUCTWORK.

HVAC DUCT SCHEDULE

SYSTEM		DUCT MATERIAL TYPE	DUCT MATERIAL REFERENCE STANDARD	DUCT MATERIAL FINISH	PRESS. CLASS (IN WC)	SEAL CLASS	LEAKAGE CLASS RECT.	LEAKAGE CLASS ROUND	COMMENTS
SUPPLY AIR	DUCT CONNECTED TO CONSTANT VOLUME AIR HANDLING UNITS	G90 GALV.	ASTM A 653	MILL PHOSPHATIZED	3	A	12	6	
	DUCT CONNECTED TO VARIABLE AIR VOLUME AIR HANDLING UNITS	G90 GALV.	ASTM A 653	MILL PHOSPHATIZED	3	A	12	6	
	DUCT CONNECTED TO OTHER FAN POWERED EQUIPMENT	G90 GALV.	ASTM A 653	MILL PHOSPHATIZED	3	A	12	6	
	DUCT WITHIN 6 FT DOWNSTREAM OF AIR TERMINAL BOXES	FIBROUS GLASS DUCT LINER	ASTM C 1070	ANTIMICROBIAL	3	A	12	6	1" THICK, PROVIDE EROSION RESISTANT COATING (7)
RETURN AIR	DUCT CONNECTED TO AIR HANDLING UNITS	G90 GALV.	ASTM A 653	MILL PHOSPHATIZED	3	A	12	6	
	DUCT CONNECTED TO OTHER FAN POWERED EQUIPMENT	G90 GALV.	ASTM A 653	MILL PHOSPHATIZED	3	A	12	6	
EXHAUST AIR	DUCT CONNECTED TO EXHAUST FANS	G90 GALV.	ASTM A 653	MILL PHOSPHATIZED	3	A	12	6	
	DUCT CONNECTED TO AIR HANDLING UNITS	G90 GALV.	ASTM A 653	MILL PHOSPHATIZED	3	A	12	6	
	DUCT CONNECTED TO FANS EXHAUSTING HIGH HUMIDITY AIR - CONCEALED	ALUMINUM, ALLOY 3003H-14	ASTM B 209	MILL	3	A	12	6	SEAL LIQUID-TIGHT, SLOPE TOWARD GRILLE.
	EXPLOSION-PROOF FAN SYSTEM - EXPOSED TO VIEW	ALUMINUM, ALLOY 3003H-14	ASTM B 209	BRIGHT	3	A	12	6	
	EXPLOSION-PROOF FAN SYSTEM - CONCEALED	ALUMINUM, ALLOY 3003H-14	ASTM B 209	MILL	3	A	12	6	
	DRYER EXHAUST	ALUMINUM, ALLOY 3003H-14	ASTM B 209	MILL	3	A	12	6	
TRANSFER DUCTS		G90 GALV.	ASTM A 653	MILL PHOSPHATIZED	1	B	12	6	1/2" THICK ACCOUSTICAL LINER.

FITTINGS

RECTANGULAR DUCT ELBOWS (COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-2, "RECTANGULAR ELBOWS.")
RADIUS TYPE RE 1 WITH MINIMUM 1.5 RADIUS-TO-DIAMETER RATIO.
RADIUS TYPE RE 3 WITH MINIMUM 1.0 RADIUS-TO-DIAMETER RATIO AND TWO VANES.
MITERED TYPE RE 2 WITH VANES COMPLYING WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-3, "VANES AND VANE RUNNERS," AND FIGURE 2-4, "VANE SUPPORT IN ELBOWS."

ROUND DUCT ELBOWS (COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-3, "ROUND DUCT ELBOWS.")
RADIUS TO DIAMETER RATIO: 1.5
ROUND ELBOWS, 12 INCHES AND SMALLER IN DIAMETER: STAMPED OR PLEATED
ROUND ELBOWS, 14 INCHES AND LARGER IN DIAMETER: WELDED

RECTANGULAR BRANCH DUCT CONFIGURATION (COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-6, "BRANCH CONNECTIONS.")
RECTANGULAR MAIN TO RECTANGULAR BRANCH: 45° ENTRY
RECTANGULAR MAIN TO ROUND BRANCH: SPIN IN

ROUND BRANCH DUCT CONFIGURATION (COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-4, "90 DEGREE TEES AND LATERALS," AND FIGURE 3-5, "CONICAL TEES." SADDLE TAPS ARE PERMITTED IN EXISTING DUCT)
VELOCITY 1500 FT/MIN AND LOWER: CONICAL TAP
VELOCITY GREATER THAN 1500 FT/MIN: 45° LATERAL

REMARKS:
(1) PROVIDE PAINT GRIP TYPE DUCT WHERE DUCT IS EXPOSED AND INDICATED TO BE PAINTED.
(2) INSTALL DUCT ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" UNLESS OTHERWISE INDICATED.
(3) INTERMEDIATE REINFORCEMENT MATERIAL SHALL MATCH DUCT MATERIAL.
(4) SUPPLY AIR DUCTS PASSING THROUGH UNCONDITIONED OR OUTDOOR SPACES SHALL BE SEAL CLASS A (ASHRAE 90.1 - 2007).
(5) RETURN AIR DUCTS PASSING THROUGH OUTDOOR SPACES SHALL BE SEAL CLASS A (ASHRAE 90.1 - 2007).
(6) SHEET METAL MATERIALS SHALL BE FREE OF PITTING, SEAM MARKS, ROLLER MARKS, STAINS, DISCOLORATIONS, AND OTHER IMPERFECTIONS.
(7) LINED DUCTWORK MUST STILL BE WRAPPED TO MEET TOTAL INSULATING VALUE PER INSULATION SPECIFICATION AND SCHEDULE.

HVAC DUCT INSULATION SCHEDULE

INDOOR OR OUTDOOR	CONCEALED OR EXPOSED	DUCT SHAPE	DUCT SERVICE	INSULATION TYPE	INSULATION THICKNESS (IN)	JACKETING TYPE	REMARKS
INDOOR	CONCEALED	SQUARE	SUPPLY AIR	D1, D2	1 1/2	J1	-
			RETURN AIR	-	-	-	-
			EXHAUST AIR	D1, D2	1	J1	(1)
		ROUND	SUPPLY AIR	D1	1 1/2	J1	-
			RETURN AIR	-	-	-	-
			EXHAUST AIR	D1	1	J1	(1)
	EXPOSED	SQUARE	SUPPLY AIR	D2	1 1/2	J1	(2)
			RETURN AIR	-	-	-	-
			EXHAUST AIR	D2	1	J1	(1)
		ROUND	SUPPLY AIR	D1	1 1/2	J1	(2)
			RETURN AIR	-	-	-	-
			EXHAUST AIR	D1	1	J1	(1)

INSULATION TYPE		JACKETING TYPE	
D1	MINERAL FIBER BLANKET (ASTM C 553 TYPE II) (ASTM C 1290 TYPE III)	J1	FACTORY APPLIED FSK
	AVAIL. MFR'S: CERTAINTEED CORP; DUCT WRAP	J2	FACTORY APPLIED FSP
	JOHNS MANVILLE; MICROLITE.		
	KNAUF INSULATION; DUCT WRAP		
	OWENS CORNING; ALL-SERVICE DUCT WRAP		
D2	MINERAL FIBER BOARD (ASTM C 612 TYPE 1A OR 1B)		
	AVAIL. MFR'S: CERTAINTEED CORP.; COMMERCIAL BOARD.		
	JOHNS MANVILLE; 800 SERIES SPIN-GLAS		
	KNAUF INSULATION; INSULATION BOARD.		
	OWENS CORNING; FIBERGLAS 700 SERIES.		

REMARKS:
(1) EXHAUST DUCT ONLY NEEDS TO BE INSULATED FROM THE DAMPER TO THE OUTSIDE WALL OR ROOF.
(2) EXPOSED DUCT WITHIN A SPACE CONDITIONED SIMILARILY TO THE SPACE THE SUPPLY DUCT SERVES DOES NOT REQUIRE INSULATION.

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: September 16 2022
DESIGNED BY: AMT
DRAWN BY: RJH
CHECKED BY: AK
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SHEET CONTENTS
HVAC SCHEDULES

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M-602

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GENERAL MECHANICAL NOTES

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AIR OUTLET AND INLET SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	APPLICATION	(1) MAX AIRFLOW (CFM)	OUTLET / INLET	TYPE	MOUNTING SYSTEM	(2) DAMPER	(3) FACE SIZE (IN)	NECK SIZE (IN)	(4) MAX NOISE LEVEL (NC)	PATTERN	MAX SP (IN WG)	FINISH	MATERIAL	(5) MOUNTING HEIGHT (IN)	ACCESSORIES	LOCATION	REMARKS
CD-1	TITUS, TMS	SUPPLY	110	1	9	1	NONE	24x24	6	24	4-WAY	0.1	W	STEEL	CEILING	24x24 LAY-IN PANEL		(8)
CD-2	TITUS, TMS	SUPPLY	225	1	9	1	NONE	24x24	8	24	4-WAY	0.1	W	STEEL	CEILING	24x24 LAY-IN PANEL		(8)
CD-3	TITUS, TMS	SUPPLY	400	1	9	1	NONE	24x24	10	24	4-WAY	0.1	W	STEEL	CEILING	24x24 LAY-IN PANEL		(8)
SR-1	TITUS, 272RS	SUPPLY	155	3	2			9x9	6x6	20	-	0.1	W	STEEL				(6)
RG-1	TITUS, 50F	RETURN	575	3	8	1	NONE	15x15	12x12	20	-	0.1	W	ALUMINUM	CEILING	24x24 LAY-IN PANEL		
RG-2	TITUS, 50F	RETURN	975	3	8	1	NONE	19x19	16x16	20	-	0.1	W	ALUMINUM	CEILING	24x24 LAY-IN PANEL		
RG-3	TITUS, 23RL	RETURN	250	3	3		NONE	14x12	12x10	20	-	0.1	W	STEEL				(7)
EG-1	TITUS, 50F	RETURN	575	3	8	1	NONE	15x15	12x12	20	-	0.1	W	ALUMINUM	CEILING	24x24 LAY-IN PANEL		
EG-2	TITUS, 23RL	EXHAUST	365	3	3		NONE	16x16	14x14	20	-	0.1	W	STEEL				(7)
TG-1	TITUS, 50F	TRANSFER	265	3	8	1	NONE	15x15	12x12	15	-	0.05	W	ALUMINUM	CEILING	24x24 LAY-IN PANEL		

OUTLET/INLET		TYPE				MOUNTING SYSTEM		DAMPER		FINISH	
1	DIFFUSER	1	SINGLE DEFLECTION	9	LOUVERED	1	T-BAR CEILING	N	NONE	M	MILL
2	REGISTER	2	DOUBLE DEFLECTION	10	HOODED	2	PLASTER/CONCRETE CEILING	BF	BUTTERFLY	W	MFR. STANDARD WHITE
3	GRILLE	3	FIXED BLADE	11	DOOR TRANSFER	3	PLASTER/MASONRY WALL	G	GRAVITY	S	MFR. SPECIAL COLOR
4	LOUVER	4	PERFORATED	12	BRICK	4	EXPOSED DUCTWORK	MP	MOTORIZED PNEUMATIC	A	ANODIZED ALUMINUM
5	PENTHOUSE	5	LINEAR	13	PUNKAH	5	METAL PANEL WALL	ME	MOTORIZED ELECTRIC	P	PRIME COAT (FINAL COAT BY GC)
6	VENT	6	PLENUM SLOT	14	LAMINAR	6	FLOOR	OB	OPPOSED BLADE	O	OTHER (SEE SPECIFICATIONS)
		7	PLAQUE	15	DRUM	7	ROOF	PB	PARALLEL BLADE		
		8	EGGCRATE			8	EXTERIOR STUD WALL	LL	LOW LEAKAGE, INSUL.		

REMARKS:

(1) SEE PLANS FOR ACTUAL INDIVIDUAL AIR QUANTITIES OF EACH DEVICE.
(2) IF DAMPER IS SCHEDULED 'NONE', EACH SUPPLY, RETURN, AND EXHAUST DEVICE TO HAVE A BALANCE DAMPER IN THE DUCT BRANCH TAKE-OFF UNLESS AN ASSOCIATED VAV BOX SERVES A SINGLE DEVICE.
(3) BORDER TYPES SHALL BE COMPATIBLE WITH CEILING OR WALL TYPES WHERE AIR DEVICE IS LOCATED. REFER TO ARCHITECTURAL PLANS AND ALL OTHER TRADES.
(4) ALL GRILLES AND DIFFUSERS SHALL NOT EXCEED NOISE CRITERIA LISTED (BASED ON 10 DB ROOM ATTENUATION) AND AT THE SCHEDULED MAXIMUM STATIC PRESSURE DROP.
(5) MOUNTING HEIGHT SHALL BE FROM FINISHED FLOOR TO BOTTOM OF OPENING.
(6) INDIVIDUALLY ADJUSTABLE AIRFOIL BLADE WITH 3/4" SPACING. FRONT BLADES PARALLEL TO THE SHORT DIMENSION. INITIALLY SET BLADES FOR APPROXIMATELY 30 DEGREE THROW.
(7) AIRFOIL BLADES PARALLEL TO THE LONG DIMENSION WITH FIXED 45 DEGREE DEFLECTION AND 3/4" SPACING.
(8) INSULATE THE TOP OF THE DIFFUSER WHEN THE SUPPLY AIR TEMPERATURE IS 50 DEGREES OR LESS.

INTAKE (IH) HOOD SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	INTAKE/ RELIEF	HOOD TYPE	MAX. INLET VEL. (FT/MIN.)	CAPACITY		NECK SIZE (IN)		HOOD SIZE (IN)		NO. OF TIERS	HEIGHT (IN)		DAMPER	SYSTEM SERVED	WEIGHT W/CURB (LB)	LOCATION	REMARKS
					AIR FLOW (CFM)	PD (IN WC)	LENGTH	WIDTH	LENGTH	WIDTH		CURB	HOOD W/CURB					
IH-1	GREENHECK, GRSI-16	INTAKE	1	400	500	0.03	16.0	16.0	29	29	1	24	36.75	MOD-5	-	16	117	

HOOD TYPE		DAMPER			
1	DOMED	G	GRAVITY	PB	PARALLEL BLADE
2	LOUVERED	M	MOTORIZED	OB	OPPOSED BLADE
3	HOODED				

REMARKS:

(1)

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
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SHEET CONTENTS
HVAC SCHEDULES

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GENERAL MECHANICAL NOTES

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UNIT HEATER (UH) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	TYPE	CAPACITY (MBH)	AIR FLOW (CFM)	AIR FLOW HOR. or VER.	AIR THROW (FT)	MOTOR (HP)	ELECTRICAL (VOLTS/PH)	EAT (°F)	LAT (°F)	STEAM		WATER				FUEL FIRED				ACCESSORIES	(1) MTG. HEIGHT (FT)	WEIGHT (LB)	LOCATION	REMARKS
											PRESS. (PSI)	COND. (LB/H)	FLOW (GPM)	PD (FT)	EWT (°F)	LWT (°F)	FUEL TYPE	INPUT (MBH)	OUTPUT (MBH)	VENT TYPE					
UH-1	STERLING, HS-36	HYD	18.7	550	HOR.	28	25 WATT	115/1	60	91	-	-	1.2		160	130	-	-	-	-	5,7,8	10	30	116	
UH-2	STERLING, HS-36	HYD	18.7	550	HOR.	28	25 WATT	115/1	60	91	-	-	1.2		160	130	-	-	-	-	5,7,8	10	30	117	
GUH-1	REZNOR, UDAS-30	GF	24.6	456	HOR.	-	0.06	115/1	60	110	-	-	-	-	-	-	NG	30	25	SC	5,7,8	9	63	B158	

TYPE				VENT TYPE		ACCESSORIES			
HYD	HYDRONIC	XPL	EXPLOSION PROOF	GV	GRAVITY VENT	1	CONCENTRIC VENT ASSEMBLY	5	MANUFACTURER SUPPLIED MOUNTING HARDWARE
STM	STEAM	WD	WASH DOWN	PV	POWER VENT	2	DOWN TURN AIR NOZZLE	6	INTEGRAL THERMOSTAT
GF	GAS-FIRED			SC	SEPARATED COMBUSTION	3	STAINLESS STEEL HEAT EXCHANGER	7	REMOTE THERMOSTAT
EL	ELECTRIC					4	STAINLESS STEEL BURNER	8	DISCONNECT SWITCH

REMARKS:
(1) MOUNTING HEIGHT SHALL BE FROM FINISHED FLOOR TO BOTTOM OF UNIT.

CABINET UNIT HEATER (CUH) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	AIR FLOW (CFM)	EAT (°F)	LAT (°F)	HEATING						ELECTRICAL (VOLTS/PH)	FAN MOTOR		CABINET SIZE (IN)			(1) MOUNTING			INLET LOCATION	OUTLET LOCATION	LOCATION	REMARKS
					MEDIA TYPE	CAPACITY		FLOW RATE		EWT (°F)	LWT (°F)		HP	RPM	D	L	H	HEIGHT (FT)	ORIENT.	TYPE				
						(MBH)	(KW)	(GPM)	(LB/H)															
CUH-1	STERLING, FSI-1055-03	330	60	114	WATER	19.2	-	1.9	-	160	140	120/1	1/15	1,050	9 1/2	43	25	FLOOR	VERT.	FS	FRONT	FRONT	121	2, 3

MOUNTING TYPE	
C	CEILING
SR	SEMI-RECESSED
R	RECESSED
FS	FLOOR STANDING
W	WALL

REMARKS:
(1) MOUNTING HEIGHT IS FROM BOTTOM OF UNIT TO FINISHED FLOOR.
(2) INVERTED AIR FLOW WITH DISCHARGE NEAR FLOOR.
(3) SUBMIT MANUFACTURER'S STANDARD COLOR CHART TO ARCHITECT FOR COLOR SELECTION.

HYDRONIC PUMP (P) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	TYPE	SYSTEM SERVED	MEDIA	FLOW RATE (GPM)	TDH (FT)	MOTOR				IMPELLER DIA. (IN)	PUMP EFF. (%)	FLUID TEMP. (°F)		SIZE (IN)		NPSHA (FT)	SUCTION DIFFUSER (IN)	TRIPLE DUTY VALVE (IN)	MTG. HEIGHT (IN)	WEIGHT (LB)	LOCATION	REMARKS
							HP	BHP	SPEED (RPM)	(VOLTS/ PH)			MAX.	MIN.	SUCT.	DISCH.							
HWP-1	BELL&GOSSETT, E-80	IC	HOT WATER	WATER	80.0	60	7 1/2	2.2	1,471	480/3	9.25	53.7	200	40	2	2	3.4	2 1/2	2 1/2	8	85	118	1,2,4
HWP-2	BELL&GOSSETT, E-80	IC	HOT WATER	WATER	80.0	60	7 1/2	2.2	1,471	480/3	9.25	53.7	200	40	2	2	3.4	2 1/2	2 1/2	8	85	118	1,2,4

TYPE			
IC	IN-LINE CIRCULATOR	SP	SUBMERSIBLE PUMP
VCC	VERTICAL CLOSED COUPLED	VS	VERTICAL SUBMERSIBLE
CCES	CLOSE COUPLED END SUCTION	ES	EFFLUENT SUMP
FMES	FRAME MOUNTED END SUCTION	PMV	PUMPED MIXING VALVE
DS	DOUBLE SUCTION	WRC	WET ROTOR CIRCULATOR

REMARKS:
(1) PROVIDE WITH VFD RATED MOTORS.
(2) PROVIDE WITH MOUNTING HARDWARE TO SUPPORT PUMP.
(3) PROVIDE WITH FULL VOLTAGE CONTACTOR AND MOTOR OVERLOAD PROTECTION.
(4) SEE ELECTRICAL PLANS FOR COMBINATION MOTOR STARTER.

FINNED TUBE CONVECTOR (FTC) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	TOTAL CAP. (BTU/FT)	EAT (°F)	MEDIA TYPE	EMT (°F)	LMT (°F)	MEDIA FLOW RATE		MAX. PD (FT)	ELEMENT				(2) CABINET SIZE (IN)			MTG. TYPE	TOP STYLE	(1) MTG. HEIGHT (IN)	LOCATION	REMARKS
							(GPM)	(LB/H)		SIZE (IN)	FINS/FT	NO. OF ROWS	LENGTH (IN)	DEPTH	LENGTH	HEIGHT					
FTC-1	STERLING JVB-S	705	65	WATER	160	150	3.7	-	0.1	3/4	50	2	156	4-5/8	180	18	W	SL	4	105	(3)
FTC-2	STERLING JVA-S	705	65	WATER	160	150	1.0	-	0.1	3/4	50	1	84	4-5/8	108	10	W	SL	4	107	(3)
FTC-3	STERLING JVA-S	705	65	WATER	160	150	1.8	-	0.1	3/4	50	1	156	4-5/8	180	10	W	SL	4	106	(3)

MOUNTING TYPE		TOP STYLE	
W	WALL	FA	FLAT
F	FLOOR	SL	SLOPED

REMARKS:
(1) MOUNTING HEIGHT IS TO BOTTOM OF CONVECTOR CABINET.
(2) CABINET LENGTH AS SHOWN ON PLANS. PROVIDE ALL REQUIRED ACCESSORIES FOR CONTINUOUS APPEARANCE.
(3) SUBMIT MANUFACTURER'S STANDARD COLOR CHART TO ARCHITECT FOR COLOR SELECTION.

CONVECTOR (C) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	TOTAL CAP. (MBH)	EAT (°F)	MEDIA TYPE	EWT (°F)	LWT (°F)	MEDIA FLOW RATE		CABINET SIZE (IN)			TOP STYPE	MTG. TYPE	(1) MTG. HEIGHT (IN)	(2) FINISH	LOCATION	REMARKS
							(GPM)	(FT HD)	D	L	H						
C-1	STERLING, W-A	2.9	65	WATER	160	140	0.3	0.1	6	28	20	F	W	6	W	111	
C-2	STERLING, W-A	4.8	65	WATER	160	140	0.5	0.1	6	44	20	F	W	6	W	112	
C-3	STERLING, W-A	1.1	65	WATER	160	140	0.1	0.1	4	20	14	F	W	6	W	124	
C-4	STERLING, W-A	1.1	65	WATER	160	140	0.1	0.1	4	20	14	F	W	6	W	128	

MOUNTING TYPE		TOP STYLE		FINISH		MEDIA TYPE	
W	WALL	F	FLAT	W	MFR. STANDARD COLOR	WTR	WATER
F	FLOOR	S	SLOPED	P	PRIME COAT (PAINT BY GC)	XX% EG	XX% ETHYLENE GLYCOL
		R	RECESSED UNIT	S	MFR SPECIAL COLOR	XX% PG	XX% PROPYLENE GLYCOL

REMARKS:
(1) MOUNTING HEIGHT IS TO BOTTOM OF CONVECTOR CABINET.
(2) SUBMIT MANUFACTURER'S STANDARD COLOR CHART TO ARCHITECT FOR COLOR SELECTION.

ELECTRIC UNIT HEATER (EUH) SCHEDULE

MARK	MANUFACTURER, MODEL NUMBER	TYPE	MOUNTING HEIGHT (1) (FT)	CAPACITY		ELECTRICAL		HOUSING DIMENSIONS (IN)			CONTROL	ACCESSORIES	LOCATION	REMARKS
				BTUH	KW	VOLT/PHASE	AMPS	HEIGHT	DEPTH	WIDTH				
EUH-1	BERKO, HUH548SA	1	10	17,060	5.0	480/3	6	12.5	12,375	14	RT	1,5	116	
EUH-2	BERKO, HUH548SA	1	10	17,060	5.0	480/3	6	12.5	12,375	14	RT	1,5	117	
EUH-3	BERKO, HUH548SA	1	10	17,060	5.0	480/3	6	12.5	12,375	14	RT	1,5	118	

TYPE		CONTROL		ACCESSORIES			
1	HORIZONTAL	I	INTEGRAL THERMOSTAT	1	DISCONNECT SWITCH	4	TAMPER PROOF THERMOSTAT
2	VERTICAL	RT	REMOTE THERMOSTAT	2	BLANK AND CORNER SECTIONS	5	RELAY FOR REMOTE THERMOSTAT
				3	THERMOSTAT (NON-TAMPER PROOF)		

REMARKS:
(1) MOUNTING HEIGHT FROM FINISHED FLOOR TO BOTTOM OF UNIT.

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28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

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SHEET CONTENTS
PIPING SCHEDULES

SHEET NO.:
M-611

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MECHANICAL PIPING & VALVE SCHEDULE

SYSTEM MARK	SERVICE	ROOM TYPE	PIPING SIZE (IN)	PIPING: MATERIAL TYPE	WALL THICKNESS	ASME PIPING: STD	ASME PIPING: GRADE	ASME PIPING: TYPE	PRESS. CLASS	FITTING TYPE	ENDS	JOINT TYPE	VALVE: TYPE	CHECK VALVES	PRESS. CLASS	CONNECTION TYPE	BODY MATERIAL	TRIM MATERIAL	VALVE EQUAL TO: [MANUFACTURER, MODEL]	REMARKS
HWS/R	HEATING WATER SUPPLY/RETURN	ALL AREAS	3/4 TO 2	BS	SCH 40	A 53	A or B	E or S	150#	MI	PLAIN	TH	2BV	SWING	125#	THREADED	BRONZE	BRONZE	APOLLO, 77-100	-
-	- (HVAC)		3/4 TO 2	Cu	L	B 88	-	-	-	WCu	PLAIN	SD	2BV	SWING	125#	THREADED	BRONZE	BRONZE	APOLLO, 77-100	-
-	-		2 1/2 OR MORE	BS	SCH 40	A 53	A or B	E or S	150#	WS,WC,FS	BEVELED	BW, FL	OGV	SWING	125#	FLANGED	IRON	BRONZE	CRANE 465 1/2	-
MWS	MAKE UP WATER	ALL AREAS	3/4 TO 2	GS	SCH 40	A 53	A or B	E or S	150#	MI	PLAIN	TH	2BV	SWING	125#	THREADED	BRONZE	BRONZE	APOLLO, 77-100	-
-	-		3/4 TO 2	Cu	L	B 88	-	-	-	WCu	PLAIN	SD	2BV	SWING	125#	THREADED	BRONZE	BRONZE	APOLLO, 77-100	-
CD	HVAC CONDENSATE DRAIN	ALL AREAS	3/4 TO 2	Cu	DMV	B 306	-	-	-	WCu	PLAIN	SD	-	-	-	-	-	-	-	-
RL/RS	REFRIGERANT	ALL AREAS	ALL SIZES	Cu	ACR	B 280	-	-	-	WCu	PLAIN	SD or BZ	-	-	-	-	-	-	-	-

MATERIAL TYPE		JOINT TYPE		FITTING TYPE			ASME PIPING TYPE		VALVE TYPE	
BS	BLACK STEEL	BW	BUTT WELD	CI	CAST IRON (THREADED) (ASME B16.4 FOR IRON, ASME A 351 FOR SS) (FLANGED) (ASME B16.1)	WC	WROUGHT CAST (FLANGES, ASME B16.5)	S	SEAMLESS	1BV	ONE PIECE FULL PORT BALL VALVE
SS	STAINLESS STEEL	SW	SOCKET WELD	MI	MALLEABLE IRON (THREADED) (ASME B16.3)	FS	FORGED STEEL (FLANGES, ASME B16.5)	E	ELECTRIC RESISTANCE WELDED	2BV	TWO PIECE FULL PORT BALL VALVE
GS	GALVANIZED STEEL	TH	THREADED	WS	WROUGHT STEEL (ASTM A 234 FOR STEEL, ASTM A 403 FOR SS)	PS	PVC SOCKET	F	FURNACE BUTT WELDED	3BV	THREE PIECE FULL PORT BALL VALVE
PE	POLYETHYLENE	FL	FLANGED	PE	POLYETHYLENE (ASTM D 2683 (SOCKET) OR ASTM D 3261 (BUTT))	WCu	WROUGHT COPPER (ASME B 16.22)			SBV	STEEL BODY BALL VALVE
CU	COPPER	SF	SOCKET FUSION	WW	WELDED WROUGHT STEEL (ASTM A 774 FOR SS)					NGV	NON-RISING STEM GATE VALVE
PVC	PVC	BF	BUTT FUSION							RGV	RISING STEM GATE VALVE
		SD	SOLDERED							OGV	OSY GATE VALVE
		BZ	BRAZED							BFV	BUTTERFLY VALVE
		SV	SOLVENT WELD							PV	PLUG VALVE

PIPING SYSTEM JOINING MATERIALS

1. PIPE-FLANGE GASKET MATERIALS: SUITABLE FOR CHEMICAL AND THERMAL CONDITIONS OF PIPING SYSTEM CONTENTS.
2. PIPE FLANGE GASKETS: ASME B16.21, NONMETALLIC, FLAT, ASBESTOS-FREE, 1/8IN MAXIMUM THICKNESS UNLESS SPECIFIED OTHERWISE.
   A. FULL-FACE TYPE: FOR FLAT-FACE, CLASS 125, CAST-IRON AND CAST-BRONZE FLANGES.
   B. NARROW-FACE TYPE: FOR RAISED-FACE, CLASS 250, CAST-IRON AND STEEL FLANGES.
3. FLANGE BOLTS AND NUTS: ASME B18.2.1, CARBON STEEL, UNLESS OTHERWISE INDICATED.
4. PLASTIC, PIPE-FLANGE GASKET, BOLTS, AND NUTS: TYPE AND MATERIAL RECOMMENDED BY PIPING SYSTEM MANUFACTURER, UNLESS OTHERWISE INDICATED.
5. SOLDER FILLER METALS: ASTM B 32, LEAD-FREE ALLOYS. INCLUDE WATER-FLUSHABLE FLUX ACCORDING TO ASTM B 813.
6. GENERAL DUTY BRAZING FILLER METALS: AWS A5.8, BCUP SERIES, COPPER-PHOSPHORUS ALLOYS UNLESS OTHERWISE INDICATED.
7. REFRIGERANT PIPING BRAZING FILLER METALS: AWS A5.8, BAG1, SILVER ALLOY UNLESS OTHERWISE INDICATED.
8. WELDING FILLER METALS: AWS D10.12 FOR WELDING MATERIALS APPROPRIATE FOR WALL THICKNESS AND CHEMICAL ANALYSIS OF STEEL PIPE.
9. SOLVENT CEMENTS FOR JOINING PLASTIC PIPING: CPVC PIPING: ASTM F 493, PVC PIPING: ASTM D 2564. INCLUDE PRIMER ACCORDING TO ASTM F 656.

REMARKS:

(1) FITTING MATERIAL SHALL MATCH PIPING MATERIAL (EXCEPTION: MI FITTINGS SHALL BE USED FOR BS PIPING WHERE INDICATED).
(2) PRESS. CLASS LISTED IS MIN. REQUIRED. PROVIDE GREATER PRESS. CLASS VALVE AND PIPE SYSTEM IF PRESS. CLASS INDICATED IS NOT AVAILABLE FOR GIVEN VALVE AND PIPE TYPE.
(3) FLANGES SHALL BE RAISED FACE WITH SPOT FACED BOLT HOLES.
(4) AIR VENT, VACUUM BREAKER, AND SAFETY VALVE PIPING SHALL BE THE SAME AS THE CONNECTED SERVICE PIPING.

MECHANICAL PIPE & EQUIPMENT INSULATION SCHEDULE

MARK	SERVICE	PIPE SIZES (IN)	INDOORS: INSULATION TYPE	INDOORS: THICKNESS (IN)	INDOORS: JACKETING TYPE	OUTDOORS: INSULATION TYPE	OUTDOORS: THICKNESS (IN)	OUTDOORS: JACKETING TYPE	PIPE/EQUIP LABEL (Y/N)	HEAT TRACE	REMARKS
HWS/R	HEATING HOT WATER SUPPLY & RETURN	3/4 TO 1 1/4	I2	1 1/2	-	-	-	-	Y	NONE	-
	(141°F - 200°F)	1 1/2 OR MORE	I2	2	-	-	-	-	Y	NONE	-
RS	REFRIGERANT SUCTION	ALL SIZES	I2 OR I5	1	-	I2	1	J3	N	NONE	-
ET-X	HOT WATER EXPANSION TANK	-	I4 OR I6	1 1/2	J3	-	-	-	Y	NONE	-
AS-X	HOT WATER AIR SEPARATOR	-	I4 OR I6	1 1/2	J3	-	-	-	Y	NONE	-
CD	COOLING COIL CONDENSATE DRAIN	ALL SIZES	I2	1	-	-	-	-	-	NONE	-

INSULATION TYPE

I2	MINERAL FIBER, PRE-FORMED PIPE (ASTM C 547, Type I, Grade A) INCLUDING SSL-ASJ WITH PREFORMED FITTING JACKETS AVAIL. MFR'S: JOHNS MANVILLE: MICRO-LOK KNAUF INSULATION: 1000 PIPE INSULATION OWENS CORNING: FIBERGLAS PIPE INSULATION
I4	RIGID POLYISOCYANURATE (ASTM C 591, TYPE I OR TYPE IV) FABRICATE SHAPES ACCORDING TO ASTM C 450 AND ASTM C 585 INCLUDING SSL-ASJ WITH PREFORMED FITTING JACKETS AVAIL. MFR'S: DOW CHEMICAL COMPANY (THE); TRYMER APACHE PRODUCTS COMPANY; ISO-25
I5	FLEXIBLE ELASTOMERIC (COMPLY WITH ASTM C 534, TYPE I FOR TUBE AND TYPE II FOR SHEET) AVAIL. MFR'S: AEROFLEX USA INC.; AEROCEL ARMACELL LLC; AP ARMAFLEX
I6	MINERAL FIBER PIPE & TANK (ASTM C 1393, TYPE II OR TYPE IIIA CATEGORY 2) INCLUDING ASJ AVAIL. MFR'S: CERTAINTEED CORP.; CRIMPWRAP JOHNS MANVILLE; MICROFLEX KNAUF INSULATION; PIPE AND TANK INSULATION OWENS CORNING; FIBERGLAS PIPE AND TANK INSULATION

JACKETING TYPE (FIELD APPLIED)

J3	ALUMINUM, 0.016" THICK, EMBOSSED, ASTM B 209, ALLOY 3003, 3005, 3105, OR 5005, TEMPER H-14, FACTORY FABRICATED FITTING COVERS AVAIL. MFR'S: CHILDERS PRODUCTS, DIV OF ITW PABCO METALS CORP.; SUREFIT, RPR PRODUCTS, INC.; INSUL-MATE

REMARKS:

TETRA TECH Mead & Hunt
Joint Venture with
Mason & Hanger
710 Avis Drive, Suite 100,
Ann Arbor, MI 48108
phone: 810-956-9300

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: September 16 2022
DESIGNED BY: AMT
DRAWN BY: RJH
CHECKED BY: AK
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SHEET CONTENTS
PIPING SCHEDULES

SHEET NO.:
M-612

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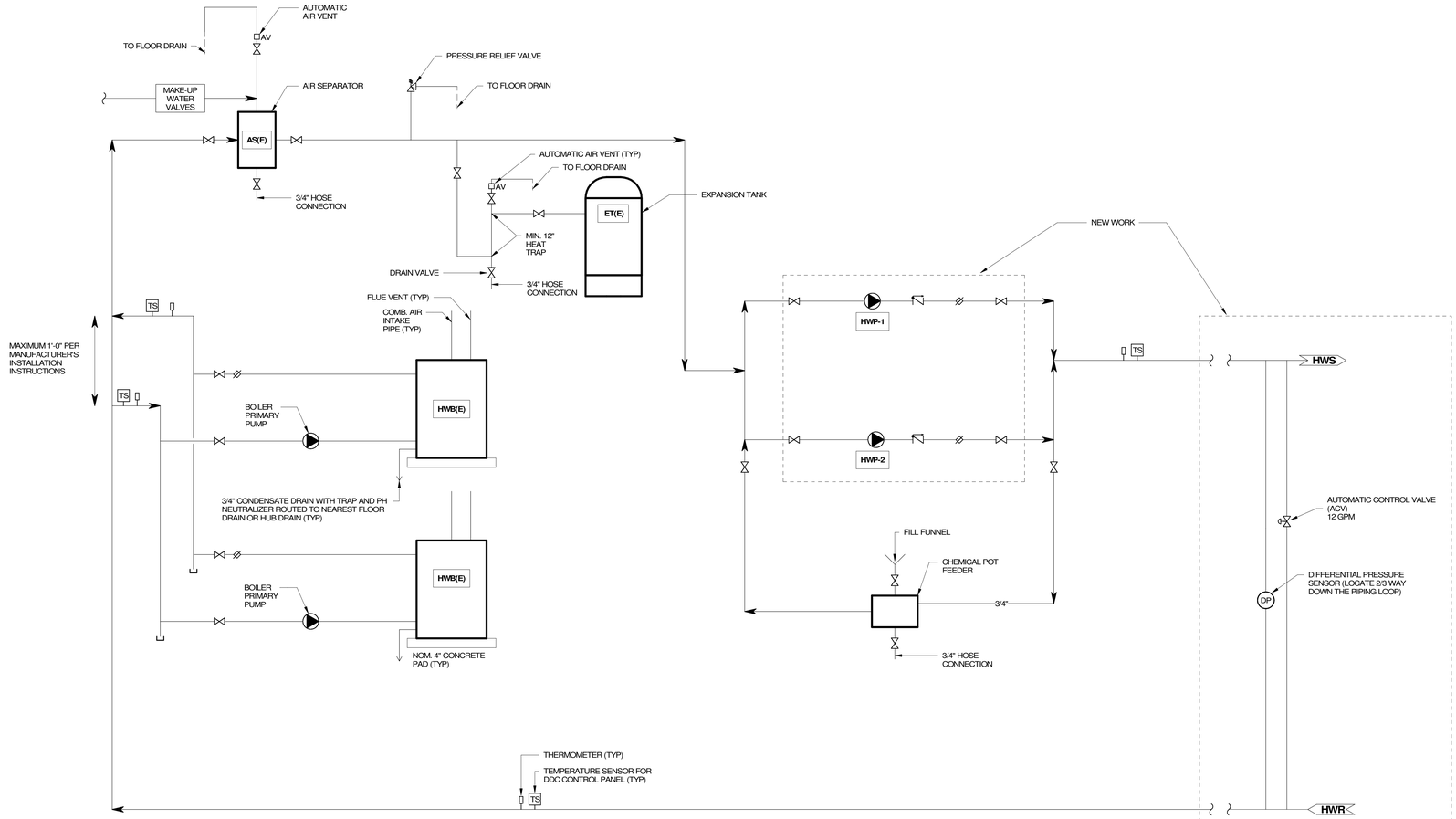

1 HOT WATER FLOW SCHEMATIC - PRIMARY/SECONDARY FLOW
NO SCALE

TETRA TECH
Mead & Hunt
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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: September 16 2022
DESIGNED BY: AMT
DRAWN BY: RJH
CHECKED BY: AK
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SHEET CONTENTS
MECHANICAL SCHEMATICS

SHEET NO.:
M-701

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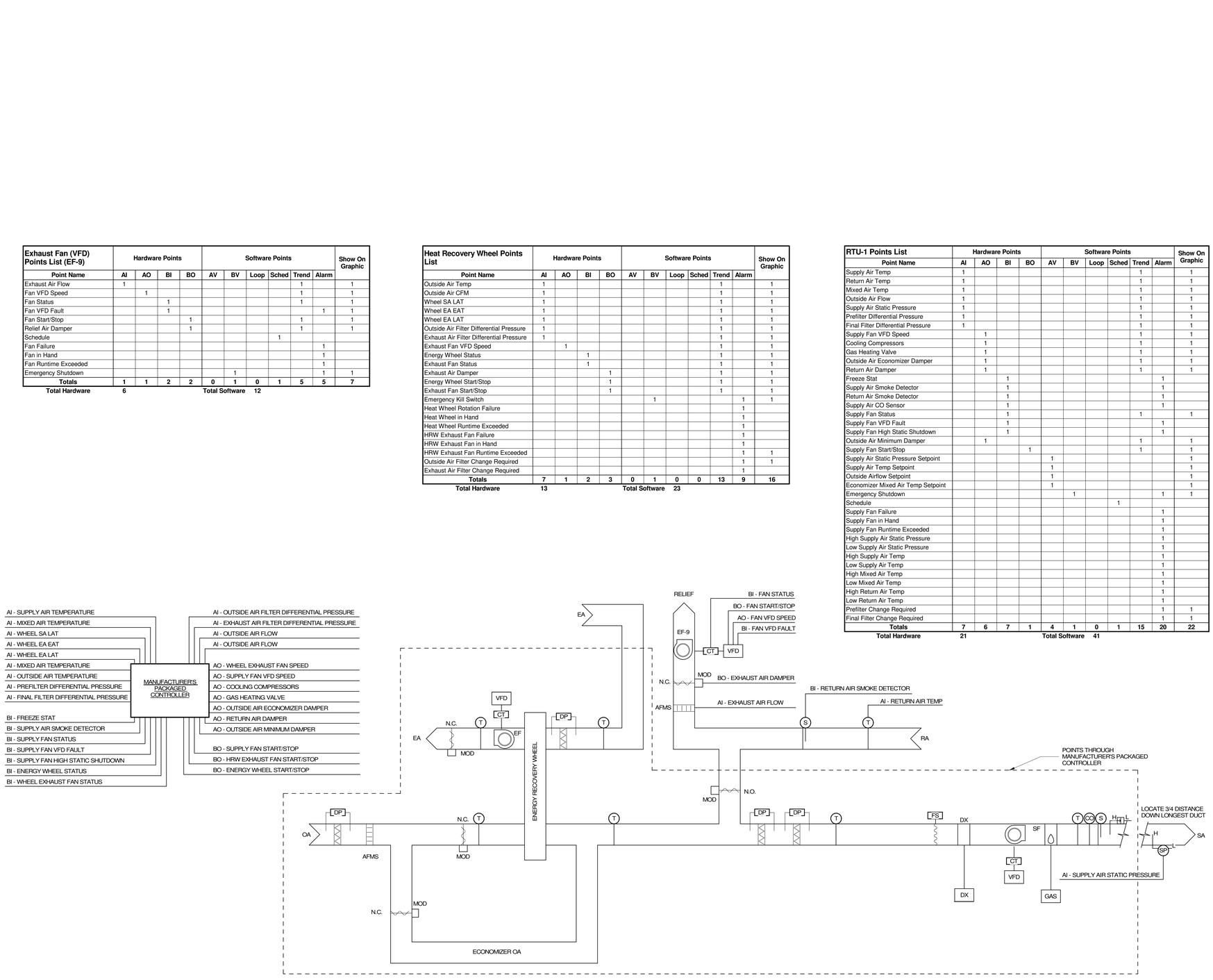
GENERAL NOTES:
1. PROVIDE A MINIMUM OF 15% SPARE I/O CONNECTIONS ON EACH DDC CONTROLLER.

Exhaust Fan (VFD) Points List (EF-9)	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Exhaust Air Flow	1								1		1
Fan VFD Speed		1							1		1
Fan Status			1						1		1
Fan VFD Fault			1							1	1
Fan Start/Stop				1					1		1
Relief Air Damper				1					1		1
Schedule								1			
Fan Failure										1	
Fan in Hand										1	
Fan Runtime Exceeded										1	
Emergency Shutdown						1				1	1
Totals	**1**	**1**	**2**	**2**	**0**	**1**	**0**	**1**	**5**	**5**	**7**
Total Hardware	**6**				**Total Software**		**12**				

Heat Recovery Wheel Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Outside Air Temp	1								1		1
Outside Air CFM	1								1		1
Wheel SA LAT	1								1		1
Wheel EA EAT	1								1		1
Wheel EA LAT	1								1		1
Outside Air Filter Differential Pressure	1								1		1
Exhaust Air Filter Differential Pressure	1								1		1
Exhaust Fan VFD Speed		1							1		1
Energy Wheel Status			1						1		1
Exhaust Fan Status			1						1		1
Exhaust Air Damper				1					1		1
Energy Wheel Start/Stop				1					1		1
Exhaust Fan Start/Stop				1					1		1
Emergency Kill Switch						1				1	1
Heat Wheel Rotation Failure										1	
Heat Wheel in Hand										1	
Heat Wheel Runtime Exceeded										1	
HRW Exhaust Fan Failure										1	
HRW Exhaust Fan in Hand										1	
HRW Exhaust Fan Runtime Exceeded										1	1
Outside Air Filter Change Required										1	1
Exhaust Air Filter Change Required										1	
Totals	**7**	**1**	**2**	**3**	**0**	**1**	**0**	**0**	**13**	**9**	**16**
Total Hardware	**13**				**Total Software**		**23**				

RTU-1 Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Supply Air Temp	1								1		1
Return Air Temp	1								1		1
Mixed Air Temp	1								1		1
Outside Air Flow	1								1		1
Supply Air Static Pressure	1								1		1
Prefilter Differential Pressure	1								1		1
Final Filter Differential Pressure	1								1		1
Supply Fan VFD Speed		1							1		1
Cooling Compressors		1							1		1
Gas Heating Valve		1							1		1
Outside Air Economizer Damper		1							1		1
Return Air Damper		1							1		1
Freeze Stat			1							1	
Supply Air Smoke Detector			1							1	
Return Air Smoke Detector			1							1	
Supply Air CO Sensor			1							1	
Supply Fan Status			1						1		1
Supply Fan VFD Fault			1							1	
Supply Fan High Static Shutdown			1							1	
Outside Air Minimum Damper		1							1		1
Supply Fan Start/Stop				1					1		1
Supply Air Static Pressure Setpoint					1						1
Supply Air Temp Setpoint					1						1
Outside Airflow Setpoint					1						1
Economizer Mixed Air Temp Setpoint					1						1
Emergency Shutdown						1				1	1
Schedule								1			
Supply Fan Failure										1	
Supply Fan in Hand										1	
Supply Fan Runtime Exceeded										1	
High Supply Air Static Pressure										1	
Low Supply Air Static Pressure										1	
High Supply Air Temp										1	
Low Supply Air Temp										1	
High Mixed Air Temp										1	
Low Mixed Air Temp										1	
High Return Air Temp										1	
Low Return Air Temp										1	
Prefilter Change Required										1	1
Final Filter Change Required										1	1
Totals	**7**	**6**	**7**	**1**	**4**	**1**	**0**	**1**	**15**	**20**	**22**
Total Hardware	**21**				**Total Software**		**41**				



1 VARIABLE AIR VOLUME RTU - SUPPLY FAN AND EXHAUST FAN WITH DX COOLING AND GAS HEAT (RTU-1)
NO SCALE

TETRA TECH Mead & Hunt
Joint Venture with
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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ENG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: September 16 2022
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DRAWN BY: RJH
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SHEET CONTENTS
CONTROL SCHEMATICS

SHEET NO.:
M-801

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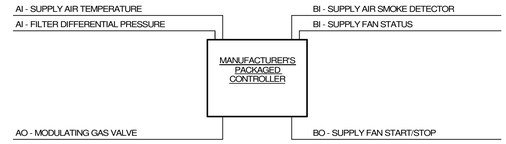
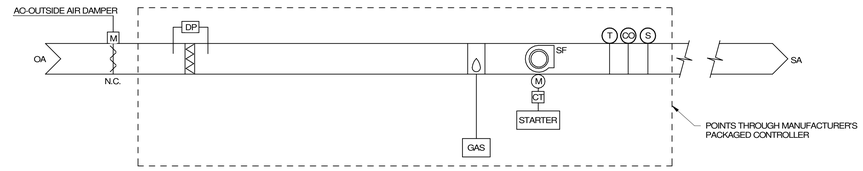
GENERAL NOTES:
1. PROVIDE A MINIMUM OF 15% SPARE I/O CONNECTIONS ON EACH DDC CONTROLLER.

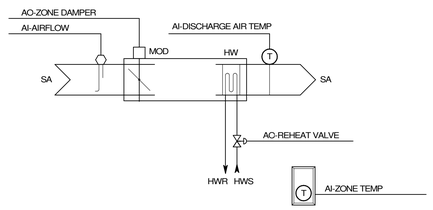
MAU Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Supply Air Temp	1								1		1
Filter Differential Pressure	1								1		1
Outside Air Temp	1								1		1
Modulating Gas Valve		1							1		1
Supply Air Smoke Detector			1							1	
Supply Air CO Detector			1							1	
Supply Fan Status			1						1		1
Supply Fan Start/Stop				1					1		1
Supply Air Temp Setpoint					1						1
Emergency Shutdown						1				1	1
Schedule								1			
Supply Fan Failure										1	
Supply Fan in Hand										1	
Filter Change Required										1	1
Totals	**3**	**1**	**3**	**1**	**1**	**1**	**0**	**1**	**6**	**6**	**9**
Total Hardware	**8**				**Total Software**		**15**				



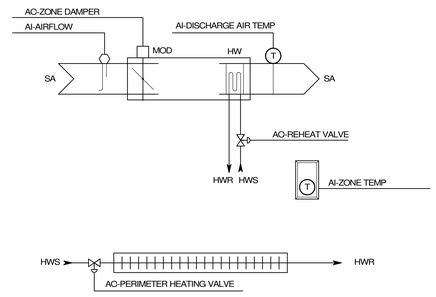


1 INDIRECT-FIRED MAKE-UP AIR UNIT
NO SCALE

VAV Air Terminal Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Zone Temp	1								1		1
Airflow	1								1		1
Discharge Air Temp	1								1		1
Zone Damper		1							1		1
Reheat Valve		1							1		1
Perimeter Heat Valve		1							1		1
Maximum Airflow Setpoint					1				1		1
Minimum Airflow Setpoint					1				1		1
Heating Airflow Setpoint					1				1		1
Heating Mode						1			1		1
Schedule								1			
Heating Setpoint									1		1
Cooling Setpoint									1		1
High Zone Temp										1	
Low Zone Temp										1	
High Discharge Air Temp										1	
Low Discharge Air Temp										1	
Totals	**3**	**3**	**0**	**0**	**3**	**1**	**0**	**1**	**12**	**4**	**12**
Total Hardware	**6**				**Total Software**		**21**				

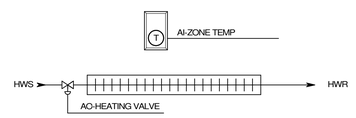


3 VARIABLE AIR VOLUME AIR TERMINAL - HOT WATER REHEAT
NO SCALE



2 VARIABLE AIR VOLUME AIR TERMINAL - HOT WATER REHEAT WITH HOT WATER SUPPLEMENTAL HEAT
NO SCALE

Hot Water Convector Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Zone Temp	1								1		1
Heating Valve		1							1		1
Heating Setpoint					1				1		1
Schedule								1			
Low Zone Temp										1	
Totals	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**3**	**1**	**3**
Total Hardware	**2**				**Total Software**		**6**				



4 HOT WATER CONVECTOR
NO SCALE

TETRA TECH Mead & Hunt
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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED:
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: September 16 2022
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SHEET CONTENTS:
CONTROL SCHEMATICS

SHEET NO.:
M-802

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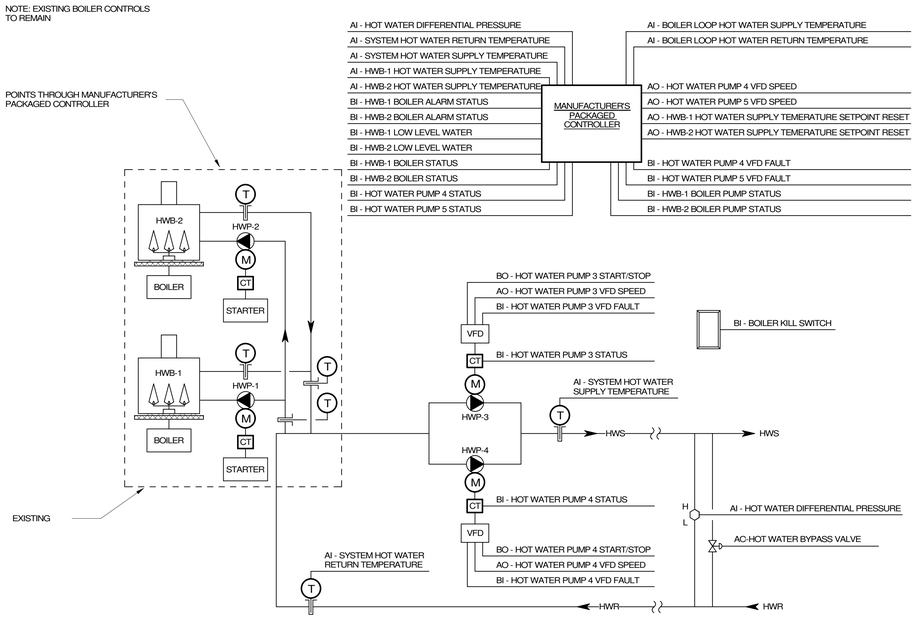
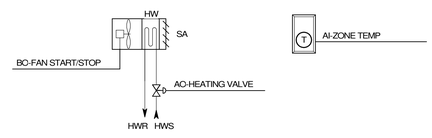
Boiler System Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Boiler 1 Hot Water Supply Temp	1								1		1
Boiler 2 Hot Water Supply Temp	1								1		1
Boiler 1 Firing Rate	1								1		1
Boiler 2 Firing Rate	1								1		1
Hot Water Differential Pressure	1								1		1
Boiler Loop Hot Water Supply Temp	1								1		1
Boiler Loop Hot Water Return Temp	1								1		1
System Hot Water Supply Temp	1								1		1
System Hot Water Return Temp	1								1		1
Boiler Hot Water Supply Temp Setpoint		1									1
Hot Water Pump 3 VFD Speed		1							1		1
Hot Water Pump 4 VFD Speed		1							1		1
Hot Water Bypass Valve		1							1		1
Boiler 1 Status			1						1		1
Boiler 1 Low Level Alarm			1						1		1
Boiler 1 Alarm Status			1						1		1
Boiler 2 Status			1						1		1
Boiler 2 Low Level Alarm			1						1		1
Boiler 2 Alarm Status			1						1		1
Boiler Pump 1 Status			1						1		1
Boiler Pump 2 Status			1						1		1
Hot Water Pump 3 Status			1						1		1
Hot Water Pump 4 Status			1						1		1
Hot Water Pump 3 VFD Fault			1								1
Hot Water Pump 4 VFD Fault			1								1
Boiler Kill Switch			1								1
Boiler Pump 1 Start/Stop				1					1		1
Boiler Pump 2 Start/Stop				1					1		1
Hot Water Pump 3 Start/Stop				1					1		1
Hot Water Pump 4 Start/Stop				1					1		1
Boiler System Enable				1					1		1
Hot Water Boiler 1 Enable				1					1		1
Hot Water Boiler 2 Enable				1					1		1
Outside Air Temperature					1						1
Hot Water Differential Pressure Setpoint					1						1
Boiler 1 Failure										1	
Boiler 1 High Hot Water Supply Temp										1	
Boiler 1 Low Hot Water Supply Temp										1	
Boiler 1 in Hand										1	
Boiler 1 Runtime Exceeded										1	
Boiler Pump 1 Failure										1	
Boiler Pump 1 in Hand										1	
Boiler Pump 1 Runtime Exceeded										1	
Boiler 2 Failure										1	
Boiler 2 High Hot Water Supply Temp										1	
Boiler 2 Low Hot Water Supply Temp										1	
Boiler 2 in Hand										1	
Boiler 2 Runtime Exceeded										1	
Boiler Pump 2 Failure										1	
Boiler Pump 2 in Hand										1	
Boiler Pump 2 Runtime Exceeded										1	
High Hot Water Differential Pressure										1	
Low Hot Water Differential Pressure										1	
High Primary Hot Water Supply Temp										1	
Low Primary Hot Water Supply Temp										1	
High System Hot Water Supply Temp										1	
Low System Hot Water Supply Temp										1	
Hot Water Pump 3 Failure										1	
Hot Water Pump 3 in Hand										1	
Hot Water Pump 3 Runtime Exceeded										1	
Hot Water Pump 4 Failure										1	
Hot Water Pump 4 in Hand										1	
Hot Water Pump 4 Runtime Exceeded										1	
Lead Boiler Failure										1	
Totals	**9**	**4**	**13**	**7**	**2**	**0**	**0**	**0**	**29**	**29**	**35**
Total Hardware	**33**				**Total Software**	**60**					

GENERAL NOTES:
1. PROVIDE A MINIMUM OF 15% SPARE I/O CONNECTIONS ON EACH DDC CONTROLLER.



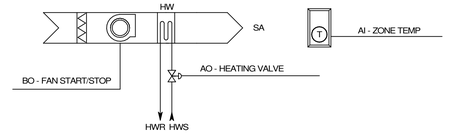
1 MULTIPLE BOILER SYSTEM - CONSTANT PRIMARY/VARIABLE SECONDARY
NO SCALE

Hot Water Unit Heater Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Zone Temp	1								1		1
Heating Valve		1							1		1
Fan Start/Stop				1					1		1
Heating Setpoint					1				1		1
Schedule								1			
Low Zone Temp										1	
Totals	**1**	**1**	**0**	**1**	**1**	**0**	**0**	**1**	**4**	**1**	**4**
Total Hardware	**3**				**Total Software**	**7**					



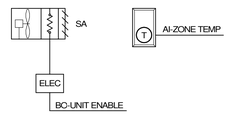
4 HOT WATER UNIT HEATER
NO SCALE

Hot Water Cabinet Unit Heater Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Zone Temp	1								1		1
Heating Valve		1							1		1
Fan Start/Stop				1					1		1
Heating Setpoint					1				1		1
Schedule								1			
Low Zone Temp										1	
Totals	**1**	**1**	**0**	**1**	**1**	**0**	**0**	**1**	**4**	**1**	**4**
Total Hardware	**3**				**Total Software**	**7**					



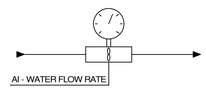
2 HOT WATER CABINET UNIT HEATER
NO SCALE

Elect Unit Heater Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Zone Temperature	1										1
Unit Enable				1							1
Zone Temperature Setpoint					1						1
Totals	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**3**
Total Hardware	**2**				**Total Software**	**1**					



5 ELECTRIC UNIT HEATER
NO SCALE

Water Meter Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Water Flow Rate	1										
Usage Today									1		1
Usage Month-to-Date									1		1
Usage Year-to-Date									1		1
Meter Failure										1	
Totals	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**1**	**3**
Total Hardware	**1**				**Total Software**	**4**					



3 WATER FLOW METER
NO SCALE

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: September 16 2022
DESIGNED BY: AMT
DRAWN BY: RJH
CHECKED BY: AK
DO NOT SCALE DRAWINGS.

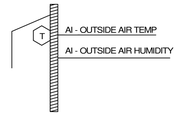
SHEET CONTENTS
CONTROL SCHEMATICS

SHEET NO.:
M-803

12/14/2022 10:47:17 AM C:\Revit Local\3141700-181848.01-M-Central-2020_NateDkMaster.rvt

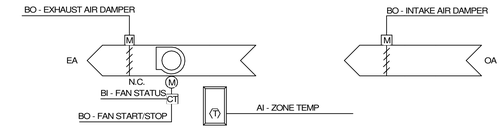
GENERAL NOTES:
1. PROVIDE A MINIMUM OF 15% SPARE I/O CONNECTIONS ON EACH DDC CONTROLLER.

Outside Air Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Outside Air Temperature	1								1		1
Outside Air Humidity	1								1		1
Low Temp Today									1		1
Low Temp Month-to Date									1		1
Low Temp Year-to-Date									1		1
High Temp Today									1		1
High Temp Month-to Date									1		1
High Temp Year-to-Date									1		1
High Humidity Today									1		1
High Humidity Month-to Date									1		1
High Humidity Year-to-Date									1		1
Sensor Failure - Temperature										1	
Sensor Failure - Humidity										1	
Totals	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**2**	**11**
Total Hardware	**2**				**Total Software**	**13**					



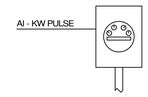
5 OUTSIDE AIR CONDITION
NO SCALE

Exhaust Fan (Cooling) Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Zone Temp	1								1		1
Fan Status			1						1		1
Fan Start/Stop				1					1		1
Exhaust Air Damper				1					1		1
Intake Air Damper				1							1
Temperature Setpoint					1						1
High Zone Temp										1	
Fan Failure										1	
Fan in Hand										1	
Fan Runtime Exceeded										1	
Totals	**1**	**0**	**1**	**3**	**1**	**0**	**0**	**0**	**4**	**4**	**6**
Total Hardware	**5**				**Total Software**	**9**					



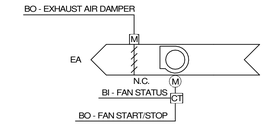
1 EXHAUST FAN (EF-1,2,3,8) - COOLING
NO SCALE

Electric Meter Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
KW Pulse	1										
KWH Usage Today									1		1
MWH Usage Month-to-Date									1		1
MWH Usage Year-to-Date									1		1
Meter Failure										1	
Totals	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**1**	**3**
Total Hardware	**1**				**Total Software**	**4**					



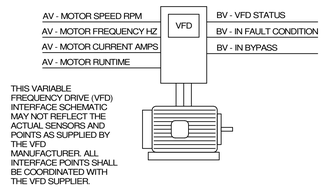
6 ELECTRIC METER
NO SCALE

Exhaust Fan (On/Off) Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Fan Status			1						1		1
Fan Start/Stop				1					1		1
Exhaust Air Damper				1					1		1
Schedule								1			
Fan Failure										1	
Fan in Hand										1	
Fan Runtime Exceeded										1	
Totals	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**1**	**3**	**3**	**3**
Total Hardware	**3**				**Total Software**	**7**					



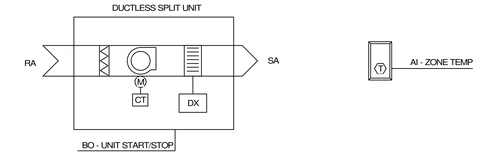
2 EXHAUST FAN (EF-4,5,6,7) - ON/OFF
NO SCALE

VFD Interface Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Motor Speed RPM					1				1		1
Motor Frequency Hertz					1				1		1
Motor Current Amps					1				1		1
Motor Run Time					1						1
VFD Status						1			1		1
In Fault Condition						1			1	1	1
In Bypass (if scheduled)						1			1	1	1
Totals	**0**	**0**	**0**	**0**	**4**	**3**	**0**	**0**	**6**	**2**	**7**
Total Hardware	**0**				**Total Software**	**15**					



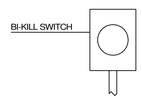
7 VARIABLE FREQUENCY DRIVE INTERFACE
NO SCALE

Ductless Split A/C Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Zone Temp	1								1		1
Unit Start/Stop				1					1		1
Schedule								1			
Cooling Setpoint									1		1
High Zone Temp										1	
Low Zone Temp										1	
Totals	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**3**	**2**	**3**
Total Hardware	**2**				**Total Software**	**6**					



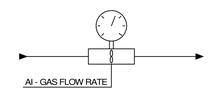
3 DUCTLESS SPLIT AIR CONDITIONER
NO SCALE

Kill Switch Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Emergency Kill Switch			1							1	1
CE BAS Kill Switch Activation						1				1	
Totals	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**
Total Hardware	**1**				**Total Software**	**1**					



8 EMERGENCY VENTILATION KILL SWITCH
NO SCALE

Gas Meter Points List	Hardware Points				Software Points						Show On Graphic
Point Name	AI	AO	BI	BO	AV	BV	Loop	Sched	Trend	Alarm	
Gas Flow Rate	1										
Usage Today									1		1
Usage Month-to-Date									1		1
Usage Year-to-Date									1		1
Meter Failure										1	
Totals	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**1**	**3**
Total Hardware	**1**				**Total Software**	**4**					



4 GAS METER
NO SCALE

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: September 16 2022
DESIGNED BY: AMT
DRAWN BY: RJH
CHECKED BY: AK
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CONTROL SCHEMATICS

SHEET NO.:
M-804

12/14/2022 10:47:18 AM C:\Revit Local\3141700-181848-01-M-Central-2020_NateDixMaster.rvt

ELECTRICAL SYMBOLS

- DUPLEX RECEPTACLE 20A, 125V +30" AFF UON
- WP — DUPLEX RECEPTACLE 20A, 125V +30" AFF UON WITH GROUND FAULT PROTECTION AND WEATHERPROOF WHILE IN USE COVER
- GFI — DUPLEX RECEPTACLE 20A, 125V +30" AFF UON WITH GROUND FAULT PROTECTION
- CH — DUPLEX RECEPTACLE 20A, 125V, ABOVE COUNTER BACKSPLASH
- S — DUPLEX RECEPTACLE 20A, 125V, +30" AFF UON. SWITCHED BY PLUG LOAD CONTROLLER. SEE DETAILS ON E-501.
- SPECIAL PURPOSE RECEPTACLE, +30" AFF UON - WALL MOUNTED, TYPE NOTED ON PLANS
- SPECIAL PURPOSE RECEPTACLE - CEILING MOUNTED, TYPE NOTED ON PLANS
- QUADPLEX RECEPTACLE 20A, 125V, +30" AFF UON
- S — QUADPLEX RECEPTACLE 20A, 125V, +30" AFF UON. TWO OUTLETS SWITCHED BY PLUG LOAD CONTROLLER. SEE DETAILS ON E-501.
- CEILING OR WALL MOUNTED CORD REEL. LENGTH AND QUANTITY OF RECEPTACLES NOTED
- $ — LIGHT SWITCH (WALL MOUNTED +48" AFF) SINGLE POLE 20A 277V
- $LV — LIGHT SWITCH (WALL MOUNTED +48" AFF) LOW VOLTAGE DIGITAL, SEE DETAILS ON E-501
- $Z2 — ZONE CONTROL LIGHT SWITCH (WALL MOUNTED +48"), SEE DETAIL ON E-501
- (M) — VACANCY/OCCUPANCY SENSOR, CEILING MOUNTED. WIRE PER DETAILS ON E-501
- LCU — HANGAR LIGHTING CONTROL UNIT. SEE DETAIL 2/E-501.
- FACP — FIRE ALARM CONTROL PANEL, PROVIDE 120VAC CIRCUIT
- ANN — REMOTE ANNUNCIATOR PANEL
- 3/30/NF NEMA 1 — MOTOR STARTER, COMBINATION TYPE, NON-FUSIBLE, STARTER & DISCONNECT, STARTER RATING
- CB/3/30/25 3R — DISCONNECT SWITCH, CIRCUIT BREAKER, 3/20/25/3R INDICATES 30A FRAME, 3P, 25A TRIP, NEMA 250 TYPE 3R
- 3/30/25 3R — DISCONNECT SWITCH, FUSIBLE 3/30/25/3R INDICATES 30A 3P 25A FUSE, NEMA 250 TYPE 3R
- 3/30/NF 3R — DISCONNECT SWITCH, NON-FUSIBLE 30/3/NF/3R INDICATES 30A 3P, NEMA 250 TYPE 3R
- (X) — MOTOR CONNECTION ('X' HORSE POWER)
- $M — MOTOR RATED SWITCH
- CONTROL SWITCH FOR MOTORS
- PAD MOUNT TRANSFORMER
- T — DRY-TYPE TRANSFORMER
- S — HIGH VOLTAGE SWITCH
- PANELBOARD
- METER
- (MH) — MANHOLE
- (J) — JUNCTION BOX
- (E) — ELECTRICAL CONNECTION TO EQUIPMENT
- (G) — GROUNDING REEL
- GROUND BUS BAR
- GROUND ROD
- GROUND ROD TEST WELL
- R — GROUNDING RECEPTACLE
- GROUNDING CONNECTION
- CLASS I ALUMINUM CONDUCTOR
- —G— BURIED GROUND CONDUCTOR
- —UP— UNDEGROUND ELECTRICAL PRIMARY CONDUCTOR
- —US— UNDEGROUND ELECTRICAL SECONDARY CONDUCTOR
- —UG— UNDEGROUND BRANCH CONDUCTORS OR CONTROL WIRING
- —UC— UNDEGROUND COMMUNICATIONS LINES

ELECTRICAL SYMBOLS (CONTINUED)

- a — RECESSED DOWN LIGHT, CONTROLLED BY SWITCH 'a' IF INDICATED
- a — PENDANT MOUNTED ROUND FIXTURE, CONTROLLED BY SWITCH 'a' IF INDICATED.
- a — LIGHT FIXTURE, SURFACE MOUNT, CONTROLLED BY SWITCH 'a' IF INDICATED.
- a — STRIP LIGHT FIXTURE, CONTROLLED BY SWITCH 'a' IF INDICATED.
- a — RECESSED LIGHT FIXTURE 2X4, CONTROLLED BY SWITCH 'a' IF INDICATED.
- a — SUSPENDED LIGHT FIXTURE, SIZED PER PHYSICAL DIMENSIONS OF FIXTURE, CONTROLLED BY SWITCH 'a' IF INDICATED.
- LIGHT FIXTURE WITH HATCHING INDICATES EMERGENCY BATTERY BACK-UP UNIT, PROVIDE AN UNSWITCHED CONDUCTOR TO EACH EMERGENCY BATTERY PACK.
- WALL MOUNTED LIGHT SEE SCHEDULE FOR TYPE
- EXIT LIGHT SEE SCHEDULE
- WALL MOUNTED EXIT LIGHT SEE SCHEDULE
- P — PHOTOCELL
- C — LIGHTING CONTACTOR
- TELECOMMUNICATIONS BACKBOARD
- TELECOMMUNICATIONS TWO POST RACK
- CONDUIT TURN UP
- CONDUIT TURN DOWN
- CONDUIT STUB-UP AND CAP, TERMINATION
- BRANCH CIRCUIT, UNDERGROUND OR CONCEALED BELOW SLAB.
- BRANCH CIRCUIT, HOMERUN, 3/4"C. 2#12,#12G. MIN. UON
- BRANCH CIRCUIT, CONCEALED ABOVE CEILING OR IN WALL WHERE POSSIBLE, WHERE EXPOSED ROUTE PARALLEL PERPENDICULAR TO STRUCTURE.

LEGEND - PLAN SYMBOLS

- 1 / A-101 — DETAIL SYMBOL
- 1 / A-101 — ENLARGED PLAN SYMBOL
- ROOM NAME / 000 — ROOM NAME AND NUMBER
- A100 — NEW GRID LINES
- XXX / X' - X" — LEVEL OR SPOT ELEVATIONS
- DEMOLITION - AREAS IN HATCHED PATTERN ARE TO BE DEMOLISHED, UON

ELECTRICAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
ANN	ANNUNCIATOR
AWG	AMERICAN WIRE GAUGE
BAS	BUILDING AUTOMATION SYSTEM
C	CONDUIT
CB	CIRCUIT BREAKER
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CH	COUNTER HEIGHT
CKT	CIRCUIT
DISC	DISCONNECT
DN	DOWN
ECU	ENERGY CONTROL UNIT
EF	EXHAUST FAN
EMCS	ENERGY MANAGEMENT AND CONTROL SYSTEM
EMT	ELECTRICAL METALLIC TUBING
EUH	ELECTRIC UNIT HEATER
EX	EXISTING DEVICE TO REMAIN
EXT	EXTERIOR
FACP	FIRE ALARM CONTROL PANEL
FMCP	FIRE ALARM & MASS NOTIFICATION CONTROL PANEL
FPC	FIRE PUMP CONTROL
GFI	GROUND FAULT CURRENT INTERRUPTER
GND	GROUND
HP	HORSEPOWER
HVLS	HIGH VOLUME LOW SPEED
I/O	INPUT/OUTPUT
IAW	IN ACCORDANCE WITH
JPC	JOCKEY PUMP CONTROL
LCU	LIGHTING CONTROL UNIT
LM	LUMEN
LTG	LIGHTING
MCC	MOTOR CONTROL CENTER
MGB	MAIN GROUND BAR
MGE	MOTOR GENERATOR EQUIPMENT
MPZ	MINI POWER ZONE
MTS	MANUAL TRANSFER SWITCH
N/A	NOT APPLICABLE
NEC	NATIONAL ELECTRICAL CODE
NF	NON-FUSED
NO.	NUMBER
NTS	NOT TO SCALE
OSP	OUTSIDE PLANT
OWS	OIL WATER SEPARATOR
PNL	PANEL
RCP	REFLECTED CEILING PLAN
RE	RELOCATED
RECP	RECEPTACLE
RM	ROOM
RO	REVERSE OSMOSIS
SPD	SURGE PROTECTION DEVICE
SSU	SYSTEM SUPPORT UNIT
SWBD	SWITCHBOARD
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
W/	WITH
WKST	WORKSTATION
WP	WEATHERPROOF
XFMR	TRANSFORMER

ELECTRICAL NOTES

1. ALL WORK SHALL BE PERFORMED BY CERTIFIED ELECTRICIANS OR UNDER THE SUPERVISION OF A CERTIFIED ELECTRICIAN. ELECTRICIAN SHALL BE LICENSED IN ACCORDANCE WITH STATE AND LOCAL GOVERNING AUTHORITIES.
2. REFER TO THE APPROPRIATE DRAWING FOR THE EXACT LOCATION OF EQUIPMENT INSTALLED UNDER DIVISIONS OF THE DOCUMENTS WHICH REQUIRE ELECTRICAL SERVICE.
3. FIELD ADJUST THE LIGHT FIXTURE LAYOUT TO CLEAR ANY BEAMS, COLUMNS, PIPING, ETC. THAT MIGHT BE IN THE WAY.
4. VERIFY DOOR SWINGS WITH ARCHITECTURAL PLANS AND MANUFACTURER SHOP DRAWINGS FOR PROPER LOCATION OF SWITCHES.
5. FIXTURE FINISHES SHALL BE COORDINATED WITH CONTRACTING OFFICER PRIOR TO EQUIPMENT PURCHASE.
6. ELECTRICAL WORK SHALL CONFORM TO THE 2020 NEC AS A MINIMUM STANDARD.
7. ALL COVER PLATES SHALL BE STAINLESS STEEL WITH IVORY DEVICES.
8. PROVIDE ELECTRICAL CONNECTION TO ALL MECHANICAL EQUIPMENT AND CONTROLS. WIRE AND CONDUIT SHALL BE BASED ON THE NEC.
9. THE ELECTRICAL CONTRACTOR SHALL BECOME FAMILIAR WITH ALL DISCIPLINE DRAWINGS AND SPECIFICATIONS PRIOR TO THE INSTALLATION OF THE ELECTRICAL SYSTEMS.
10. THE MINIMUM BRANCH CIRCUIT SIZE SHALL BE 3/4"C WITH 3 #12 THHN OR THWN CONDUCTORS FOR SINGLE PHASE LOADS AND 4 #12 FOR THREE PHASE LOADS.
11. PROVIDE GFI PROTECTED RECEPTACLES AT THE FOLLOWING LOCATIONS:
    A. EXTERIOR RECEPTACLES.
    B. RECEPTACLES WITHIN SIX FEET OF A SINK OR WATER SOURCE.
    C. RECEPTACLES IN LATRINES OR SHOWER ROOMS.
12. RECEPTACLE AND SWITCH BOXES SHALL BE ROUGHED IN FLUSH WITH WALL SURFACE, UON.
13. PROVIDE SUPPORTS AS REQUIRED FOR LIGHT FIXTURES, CONDUIT, DISCONNECTS, ETC.
14. ARRANGE LIGHT FIXTURES IN MECHANICAL ROOMS TO PROVIDE MAXIMUM LIGHTING ON FLOOR AND MINIMUM INTERFERENCE WITH MECHANICAL EQUIPMENT AND HEADROOM.
15. EXIT SIGNS SHALL BE CIRCUITED AHEAD OF THE LIGHTING SWITCHES.
16. EMERGENCY LIGHTING FIXTURES SHALL BE PROVIDED WITH AN UNSWITCHED CONDUCTOR TO EACH BATTERY BACK-UP UNIT.
17. PROVIDE JUNCTION BOXES AS INDICATED ON PLANS AND WHERE REQUIRED PER NEC. WHERE NOT SPECIFICALLY INDICATED, SIZE PER NEC ARTICLE 314.
18. DISCONNECT SWITCHES FOR MECHANICAL EQUIPMENT SHALL BE MOUNTED TO THE STRUCTURE, NOT TO THE EQUIPMENT. PROVIDE NECESSARY MOUNTING SUPPORT AS REQUIRED.
19. LABEL POWER AND SWITCH OUTLETS WITH RESPECT TO CIRCUIT BREAKER AND PANEL LOCATION.
20. CONDUITS LEAVING OR ENTERING BUILDING SHALL BE SEALED PER NEC TO PREVENT ENTRANCE OF MOISTURE.
21. VARIABLE FREQUENCY DRIVES SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
22. PROVIDE ARC FLASH HAZARD WARNING LABELS ON ELECTRICAL EQUIPMENT IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 70, ARTICLE 110. LABELS SHALL BE LOCATED SO AS TO BE CLEARLY VISIBLE TO QUALIFIED PERSONS BEFORE EXAMINATION, ADJUSTMENT, SERVICING, OR MAINTENANCE OF EQUIPMENT. LABEL TEMPLATES MAY BE OBTAINED FROM UFC 3-560-01.
23. PROVIDE ALL COMPONENTS, SMALL DETAILS, AND INCIDENTAL WORK NOT SHOWN OR SPECIFIED, BUT WHICH CAN BE INFERRED AS BEING REQUIRED FOR COMPLETE AND SATISFACTORY HIGH QUALITY ELECTRICAL SYSTEM IN ACCORDANCE WITH NFPA, ADA, ANSI, UL AND ANY OTHER CODES HAVING JURISDICTION.
24. WHERE EQUIPMENT OR DEVICES ARE NOTED AS CONNECTING TO THE EMCS/DDC, PROVIDE CABLING TO DDC GATEWAY OR CONTROLLER. COORDINATE PLACEMENT AND CONNECTION TO DDC EQUIPMENT WITH MECHANICAL CONTRACTOR.

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
DESIGNED BY: JKH
DRAWN BY: JKH
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SHEET CONTENTS
LEGEND, ABBREVIATIONS AND NOTES

SHEET NO.:
E-001

12/15/2022 9:10:12 AM C:\Users\jesse.harlan\Documents\3141700-181848.01-E-Central-2020_jesse.harlanEVCLV.rvt

DEMOLITION PLAN GENERAL NOTES

1. SEE SHEET E-001 FOR GENERAL ELECTRICAL NOTES, ABBREVIATIONS, AND SYMBOL LEGEND.
2. SPECIAL CARE SHALL BE TAKEN TO AVOID DAMAGING EXISTING UTILITIES (WATER, SEWER, POWER, GAS, COMMUNICATIONS, ETC.). CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING AND LOCATING ALL EXISTING SITE UTILITIES (OVERHEAD & UNDERGROUND) IN THE AREA OF EXCAVATION AND/OR DRILLING. NO ADDITIONAL COMPENSATION SHALL BE GIVEN FOR REPAIRS REQUIRED FOR ANY INCURRED DAMAGES, WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. SUCH DAMAGES (IF HAPPENED) SHALL BE REPAIRED IMMEDIATELY TO RESUME SERVICES WITH MINIMAL OUTAGES AND AT NO ADDITIONAL COST TO THE GOVERNMENT.
3. REFER TO E-101 FOR EXTENTS OF NEW ELECTRICAL SITE WORK.
4. COORDINATE ALL ELECTRICAL SITE DEMOLITION WITH DEMOLITION WORK SHOWN ON CIVIL DEMO PLAN CD101.

KEYED NOTES:

9.001. DEMOLISH T158 AND PRIMARY DUCT BANK BACK TO EXISTING SWITCH SW1-7. EXISTING DUCT BANK MAY BE ABANDONED WHERE PASSING UNDER FENCED IN LOT LOCATED SOUTH OF T158.

9.002. DEMOLISH TRANSFORMER T154 AND THE ASSOCIATED PRIMARY/SECONDARY DUCT BANK. DEMOLISH PRIMARY DUCT BANK TO EXISTING SWITCH SW1-6. LEAVE 5'-0" OF PRIMARY DUCT STUBBED OUT FROM SW1-6 FOR EXTENSION DURING CONSTRUCTION.

9.003. VERIFY ROUTING IN FIELD AND DEMOLISH ENTIRETY OF SECONDARY DUCT BANK.

9.004. PADMOUNTED SWITCH IS EXISTING TO REMAIN. PROTECT DURING DEMOLITION OF SURROUNDING AREAS.

9.005. DUCT BANK SHOWN AS DEMOLISHED BELOW THIS EXISTING CONCRETE PAVEMENT MAY BE ABANDONED IN PLACE. REMOVE CONDUCTORS AND DEMOLISH DUCT BANK UP TO EDGE OF CONCRETE.

N 1 **ELECTRICAL SITE DEMOLITION PLAN - B154, B158**
1" = 20'-0"

TETRA TECH Mead & Hunt
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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
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SHEET CONTENTS
ELECTRICAL SITE DEMOLITION PLAN

SHEET NO.:
ED101

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DEMOLITION PLAN GENERAL NOTES

1. SEE SHEET E-001 FOR GENERAL ELECTRICAL NOTES, ABBREVIATIONS, AND SYMBOL LEGEND.
2. ALL ELECTRICAL EQUIPMENT, CONNECTIONS, LIGHTING, DEVICES, AND GROUNDING INTERIOR TO THE BUILDING SHALL BE DEMOLISHED, UON. DEMOLISH EXTERIOR EQUIPMENT, LIGHTING, AND DEVICES. PROTECT EXISTING GROUNDING SYSTEM ON BUILDING EXTERIOR AND LPS ON ROOF.
3. LOCATIONS AND QUANTITIES OF EXISTING DEVICES ARE BASED ON FIELD OBSERVATION AND AS-BUILT DOCUMENTS. DEMOLITION DRAWINGS SHOW GENERAL INTENT AND DO NOT SHOW EVERY DEVICE OR DETAIL. PROVIDE DEMOLITION IN ACCORDANCE WITH DESIGN INTENT.

KEYED NOTES:

9.006. CONTRACTOR SHALL REMOVE AND STORE 400HZ GPU FOR LATER REUSE.

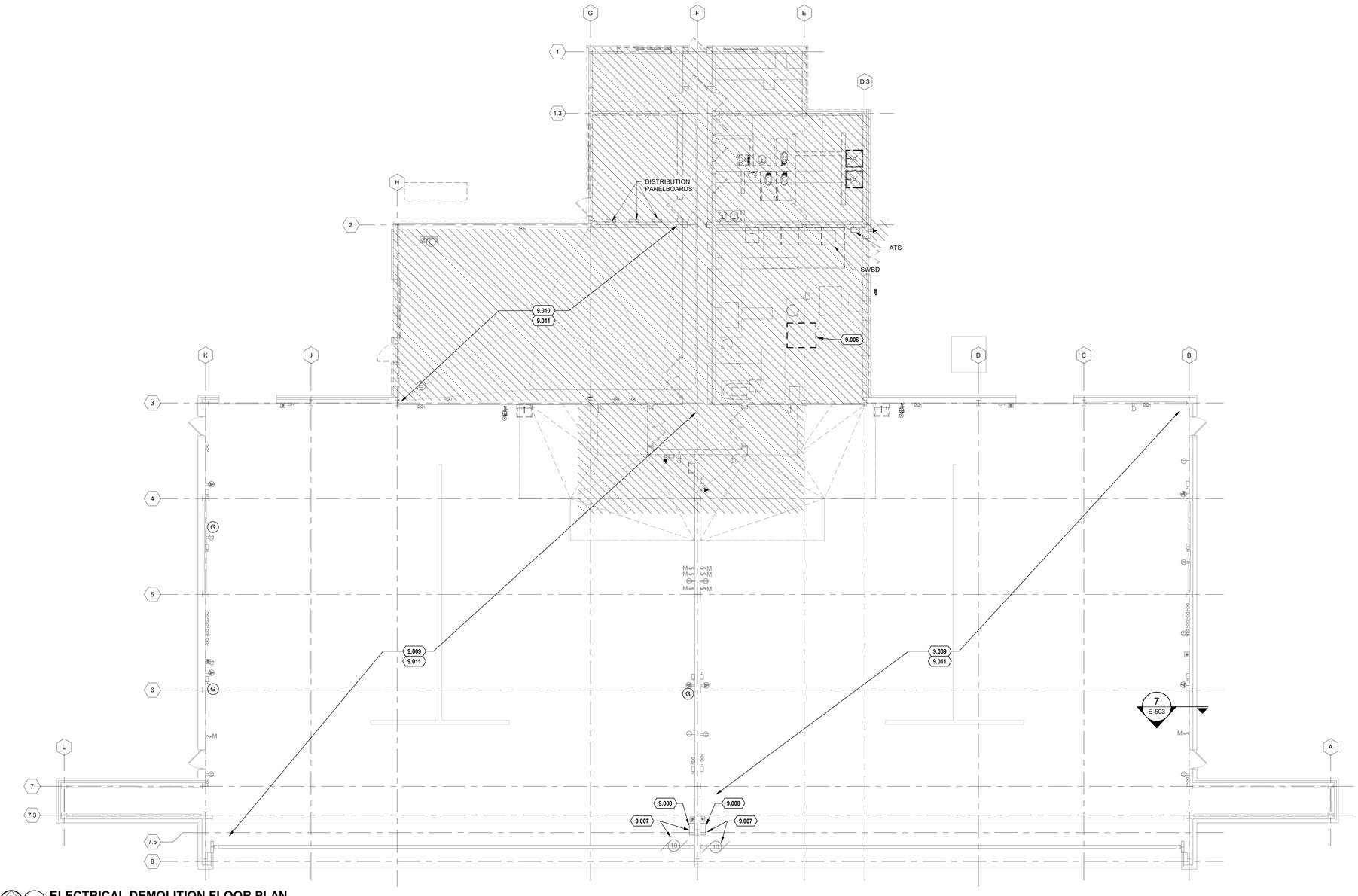
9.007. POWER TO HANGAR DOOR MOTORS AND ASSOCIATED CONTROLS AND INSTRUMENTATION SHALL REMAIN. PROTECT DURING DEMOLITION OF SURROUNDING AREAS.

9.008. CONTROL PANELS FOR OVERHEAD DOORS ARE EXISTING TO REMAIN.

9.009. DISCONNECTS, STARTERS, CONTROL PANELS, BOXES, RACEWAY, FEEDERS, ETC. IN HANGAR DOCKS ARE EXISTING TO REMAIN, UON. PROTECT DURING DEMOLITION OF SURROUNDING AREAS.

9.010. DISCONNECTS, STARTERS, CONTROL PANELS, BOXES, RACEWAY, OR FEEDERS IN FUEL TANK ROOM SERVING EXISTING TO REMAIN MECHANICAL EQUIPMENT SHALL BE DEMOLISHED. REFER TO E-104 FOR REPLACEMENT EQUIPMENT.

9.011. GROUND BARS, GROUND REELS, AND GROUNDING RECEPTACLES LOCATED IN THIS ROOM ARE EXISTING TO REMAIN. PROTECT DURING DEMOLITION OF SURROUNDING AREAS.



N 1 **ELECTRICAL DEMOLITION FLOOR PLAN**
1/8" = 1'-0"

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
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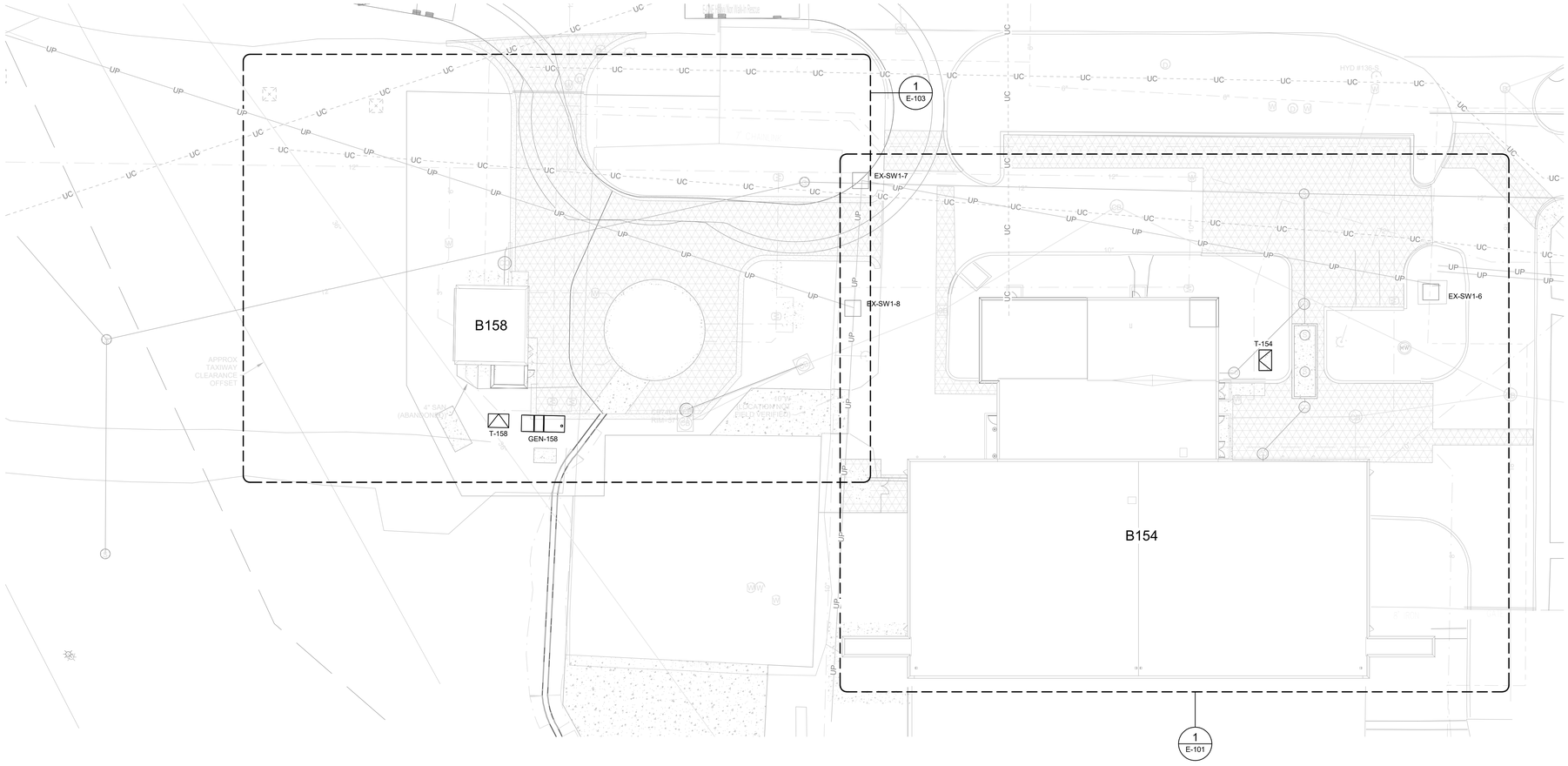
SHEET CONTENTS
ELECTRICAL DEMOLITION FLOOR PLAN

SHEET NO.:
ED102

12/15/2022 9:10:39 AM C:\Users\jesse.harlan\Documents\3141700-181848.01-E-Central-2020_jesse.harlanEVCLV.rvt

SITE PLAN GENERAL NOTES

1. SPECIAL CARE SHALL BE TAKEN TO AVOID DAMAGING EXISTING UTILITIES (WATER, SEWER, POWER, GAS, COMMUNICATIONS, ETC.). CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING AND LOCATING ALL EXISTING SITE UTILITIES (OVERHEAD & UNDERGROUND) IN THE AREA OF EXCAVATION AND/OR DRILLING. NO ADDITIONAL COMPENSATION SHALL BE GIVEN FOR REPAIRS REQUIRED FOR ANY INCIDENTAL DAMAGES, WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. SUCH DAMAGES (IF HAPPENED) SHALL BE REPAIRED IMMEDIATELY TO RESUME SERVICES WITH MINIMAL OUTAGES AND AT NO ADDITIONAL COST TO THE GOVERNMENT.
2. PROVIDE EXCAVATION AS REQUIRED FOR INSTALLATION OF EXTERIOR UNDERGROUND CONDUITS. REPLACE FILL MATERIAL AND COMPACT IN ACCORDANCE WITH CIVIL SPECIFICATIONS.
3. REFER TO ENLARGED SITE PLANS CALLED OUT ON THIS SHEET FOR ADDITIONAL INFORMATION ON PROPOSED UNDERGROUND LINES, EQUIPMENT, ETC.
4. REFER TO C-104 FOR CIVIL UTILITY PLAN.



N 1 **OVERALL ELECTRICAL SITE PLAN - B154, B158**
1" = 20'-0"

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SHEET CONTENTS
OVERALL ELECTRICAL SITE PLAN

SHEET NO.:
E-100

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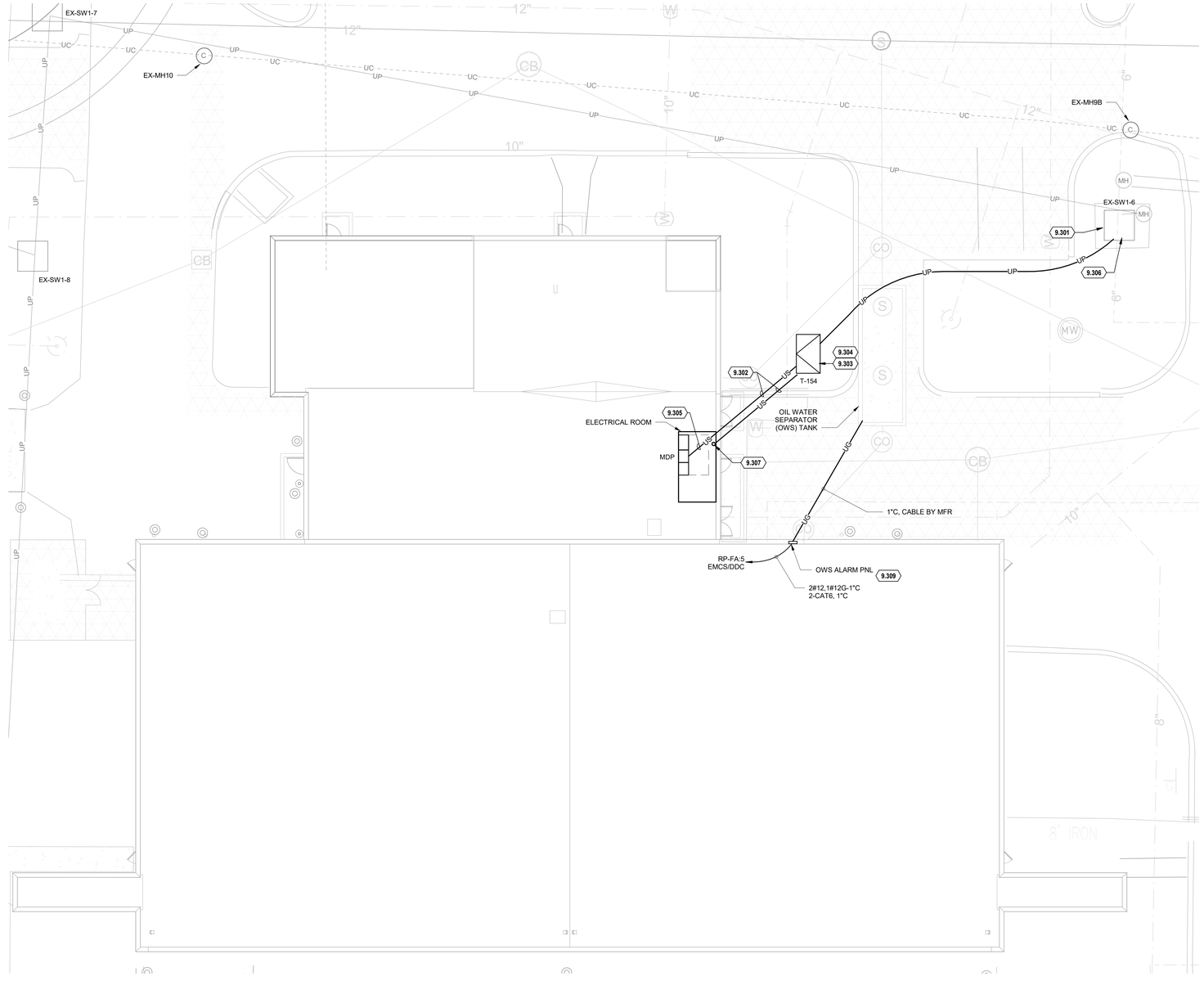

N 1 **ELECTRICAL SITE PLAN - B154**
1" = 10'-0"

SITE PLAN GENERAL NOTES

1. SEE SHEET E-001 FOR GENERAL ELECTRICAL NOTES, ABBREVIATIONS, AND SYMBOLS LEGEND.
2. SPECIAL CARE SHALL BE TAKEN TO AVOID DAMAGING EXISTING UTILITIES (WATER, SEWER, POWER, GAS, COMMUNICATIONS, ETC.). CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING AND LOCATING ALL EXISTING SITE UTILITIES (OVERHEAD & UNDERGROUND) IN THE AREA OF EXCAVATION.
3. PROVIDE EXCAVATION AS REQUIRED FOR INSTALLATION OF EXTERIOR UNDERGROUND CONDUITS. REPLACE FILL MATERIAL AND COMPACT IN ACCORDANCE WITH CIVIL SPECIFICATIONS.
4. PRIMARY DUCT BANK SHALL BE CONCRETE ENCASED UON. SECONDARY DUCT BANK SHALL BE DIRECT BURIED, UNLESS PASSING UNDER PAVEMENT. REFER TO DETAILS ON E-504.
5. REFER TO E-701 FOR QUANTITIES AND SIZES OF DUCT BANK CONDUITS AND CONDUCTORS.
6. MAINTAIN A MINIMUM OF 5'-0" OF SEPARATION BETWEEN LIQUID-FILLED TRANSFORMERS AND BUILDING FACADE. MAINTAIN A MINIMUM OF 10'-0" OF SEPARATION BETWEEN WINDOWS AND LIQUID-FILLED TRANSFORMERS.
7. REFER TO C-104 FOR CIVIL UTILITY PLAN.

KEYED NOTES:

9.301. UTILIZE EXISTING DUCT STUB OUT AND EXTEND PRIMARY DUCT BANK TO T-154.

9.302. AVOID BUILDING FOOTINGS AND FOUNDATION WHEN ROUTING UNDERGROUND SECONDARY DUCT BANK.

9.303. T-154 IS A LIQUID-FILLED, PAD-MOUNTED, MEDIUM VOLTAGE TRANSFORMER. REFER TO DETAILS ON E-504 FOR CONNECTIONS AND PAD INFORMATION. REFER TO E-701 FOR SIZING AND CONFIGURATION.

9.304. STUB OUT 2-5" CONDUITS FROM PRIMARY COMPARTMENT TO 5'-0" NORTH OF THE TRANSFORMER PAD FOR FUTURE LOOP FEED CONNECTION.

9.305. CUT AND PATCH SLAB WHERE TRENCHING IN NEW SERVICE DUCT BANK. AVOID STRUCTURAL FOOTINGS AND OTHER OBSTRUCTIONS WHEN ROUTING DUCT BANK. REFER TO STRUCTURAL DRAWINGS AND DETAILS FOR PATCHING TO EXISTING SLAB.

9.306. SW1-6 IS EXISTING TO REMAIN. PROTECT DURING CONSTRUCTION OF SURROUNDING AREAS.

9.307. DEDICATED ELECTRICAL SERVICE FOR B154 HANGAR DOOR POWER. STUB SERVICE UP WITHIN ELECTRICAL ROOM AND ROUTE REMAINDER OF RUN WITHIN BUILDING. REFER TO E-102 FOR LOCATION OF HANGAR DOOR SERVICE EQUIPMENT.

9.309. OIL WATER SEPARATOR (OWS) TANK ALARM PANEL PROVIDED BY TANK MANUFACTURER. PROVIDE TWO 1"C FROM CONTROL PANEL TO OIL WATER SEPARATOR TANK FOR CONNECTION TO TANK MONITORING INSTRUMENTATION. CABLES TO SENSORS PROVIDED BY MANUFACTURER. COMMUNICATIONS CABLE SHALL BE ROUTED TO THE BUILDING EMCS/DDC.

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
DESIGNED BY: JKH
DRAWN BY: JKH
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SHEET CONTENTS
ELECTRICAL SITE PLAN

SHEET NO.:
E-101

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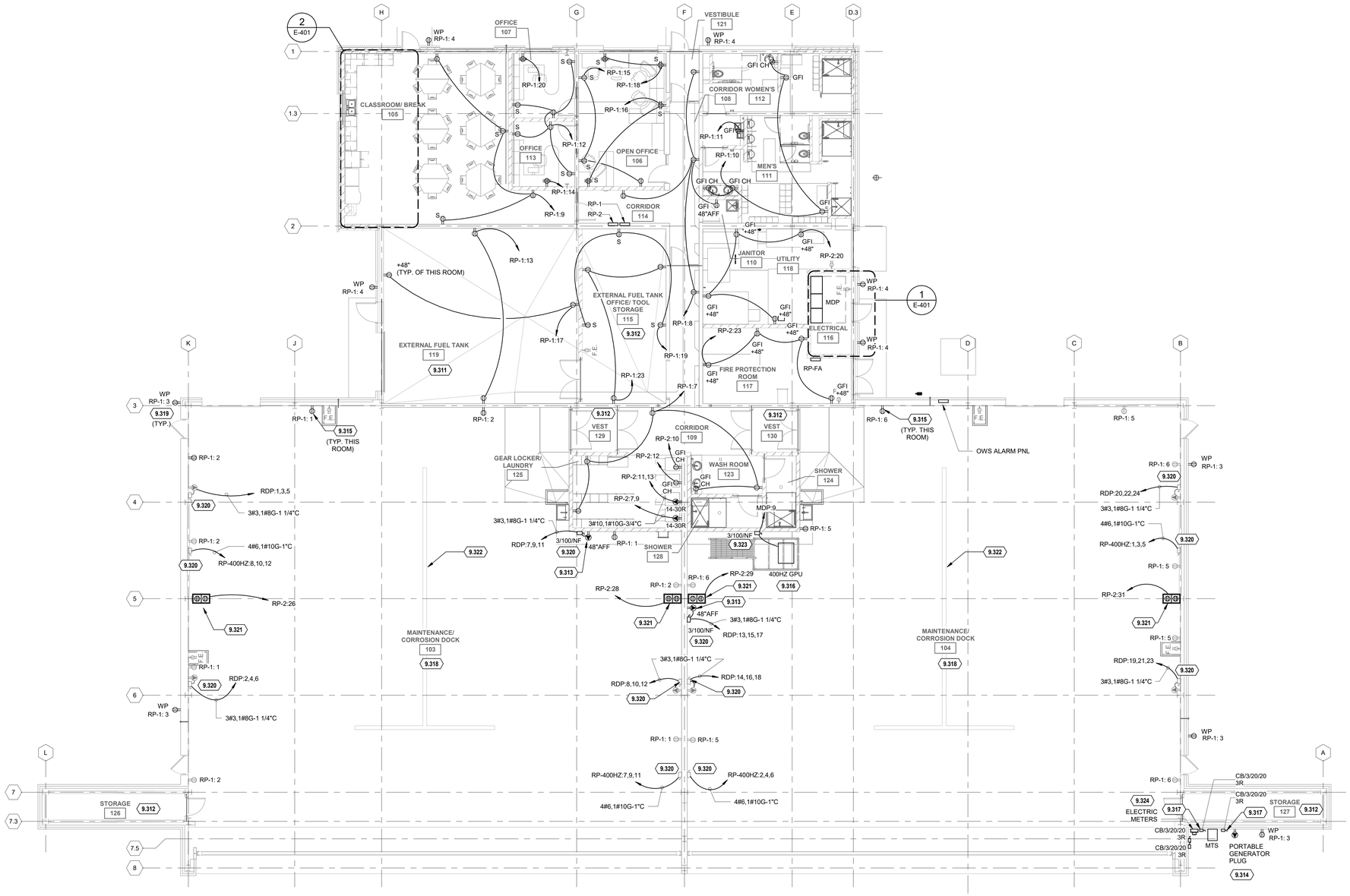

POWER FLOOR PLAN
1/8" = 1'-0"

FLOOR PLAN GENERAL NOTES

1. SEE SHEET E-001 FOR GENERAL ELECTRICAL NOTES, ABBREVIATIONS, AND SYMBOL LEGEND.
2. SEE SHEET E-701 FOR ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION ON ELECTRICAL EQUIPMENT SHOWN ON THIS PLAN.
3. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING INFRASTRUCTURE FOR PULLING OF TELECOMMUNICATIONS CABLING. SEE T-SERIES SHEETS FOR CONDUIT AND CABLE TRAY REQUIREMENTS.
4. SURFACE MOUNTED CONDUITS IN OFFICES SHALL BE ROUTED AS INCONSPICUOUSLY AS FEASIBLE. ONLY ONE VERTICAL RACEWAY SHALL BE ALLOWED IN SPACE WITH ADDITIONAL RACEWAYS ROUTED HORIZONTALLY IN ROOM.
5. SEE E-111 & E-112 FOR POWER CIRCUITS TO EQUIPMENT SPECIFIED BY OTHER CONTRACT DISCIPLINES.
6. REUSE EXISTING CONDUIT AND CONDUCTOR SERVING EXISTING TO REMAIN DEVICES TO THE MAXIMUM EXTENT POSSIBLE. EXTEND AS NEEDED TO NEW DISTRIBUTION EQUIPMENT.
7. ANY ELECTRICAL EQUIPMENT WITHIN A HANGAR SHALL BE IN A NEMA 3R OR WEATHERPROOF ENCLOSURE.

KEYED NOTES:

9.311. SPACE SHALL BE RATED CLASS 1, DIVISION 2 FROM FLOOR TO CEILING. ANY EQUIPMENT OR RECEPTACLES LOCATED HERE SHALL BE RATED FOR USE IN THIS ENVIRONMENT.

9.312. SPACE IS IMMEDIATELY ADJACENT TO HAZARDOUS HANGAR OR OTHER AIRCRAFT MAINTENANCE AREA. SPACE SHALL BE RATED CLASS 1, DIVISION 2 FROM FLOOR UP TO 18" AFF WITHIN 20'-0" OF DOORWAYS INTO THE HANGAR OR MAINTENANCE AREA(S). ANY EQUIPMENT LOCATED BELOW 18" SHALL BE RATED FOR USE IN THIS ENVIRONMENT.

9.313. PROVIDE PIN AND SLEEVE 100A, 3-POLE INTERLOCKING RECEPTACLE. SHALL BE RATED NEMA 4X. MECHANICALLY INTERLOCKED WITH DISCONNECT. MATCH RECEPTACLE CONFIGURATION TO EXISTING TO REMAIN PIN AND SLEEVE OUTLETS LOCATED IN MAINTENANCE DOCK.

9.314. PROVIDE 400AMP POWERTITE PIN AND SLEEVE PLUG, PRODUCT NUMBER AJA40144-400, FOR GENERATOR PLUG IAW SELFRIDGE BASE STANDARDS.

9.315. MATCH HEIGHT OF EXISTING RECEPTACLES. TYPICAL FOR RECEPTACLES IN THIS ROOM. RECEPTACLES SHALL BE RATED FOR USE IN A CLASS 1, DIV. 2 ENVIRONMENT.

9.316. PROVIDE PLATFORM TO MOUNT 400HZ GPU AT LEAST 5'-0" AFF. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION ON PLATFORM.

9.317. SERVICE DISCONNECTING MEANS FOR HANGAR DOOR DEDICATED ELECTRICAL SERVICE. BOND TO BUILDING GROUND RING AS SHOWN ON E-131.

9.318. SPACE SHALL BE RATED CLASS 1, DIVISION 2 FROM FLOOR TO 18" AFF. ANY EQUIPMENT AND INSTALLATION IN THIS AREA SHALL BE SUITABLE FOR THIS CLASSIFIED AREA.

9.319. EXTERIOR RECEPTACLES SHALL BE FED WITH A MINIMUM 2#10, 1#12G-3/4"C TO ACCOUNT FOR VOLTAGE DROP.

9.320. PROVIDE CABLE STORAGE RACK ADJACENT TO DISCONNECT. SHALL ALLOW FOR COILING AND HANGING OF AIRCRAFT POWER CABLE.

9.321. PROVIDE NEMA 4 RATED CABLE REEL MOUNTED 10'-0" AFF. CORD SHALL CONSIST OF 3#12AWG, TYPE SOW CABLE AT MINIMUM. CABLE SHALL BE AT LEAST 50'-0". PROVIDE SIMPLEX 20A, 125V CLASS 1, DIV 2 RATED RECEPTACLE AT END OF CORD. RECEPTACLE TYPE SHALL MATCH OTHER CLASS 1, DIV 2 RATED RECEPTACLES LOCATED IN THIS SPACE.

9.322. TRENCH DRAIN SHALL BE RATED CLASS 1, DIV. 1.

9.323. PRIMARY DISCONNECT FOR 400HZ GPU. SHALL BE ACCESSIBLE FROM TOP OF 400HZ PLATFORM. MOUNT TO PLATFORM RAIL OR WALL 4'-0" ABOVE PLATFORM.

9.324. WALL-MOUNT TWO ELECTRIC METERS IN THIS LOCATION. PROVIDE NEMA 3R OR NEMA 4 ENCLOSURES. REFER TO E-701 FOR ADDITIONAL INFORMATION ON METERS.

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28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
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SHEET CONTENTS
POWER FLOOR PLAN

SHEET NO.:
E-102

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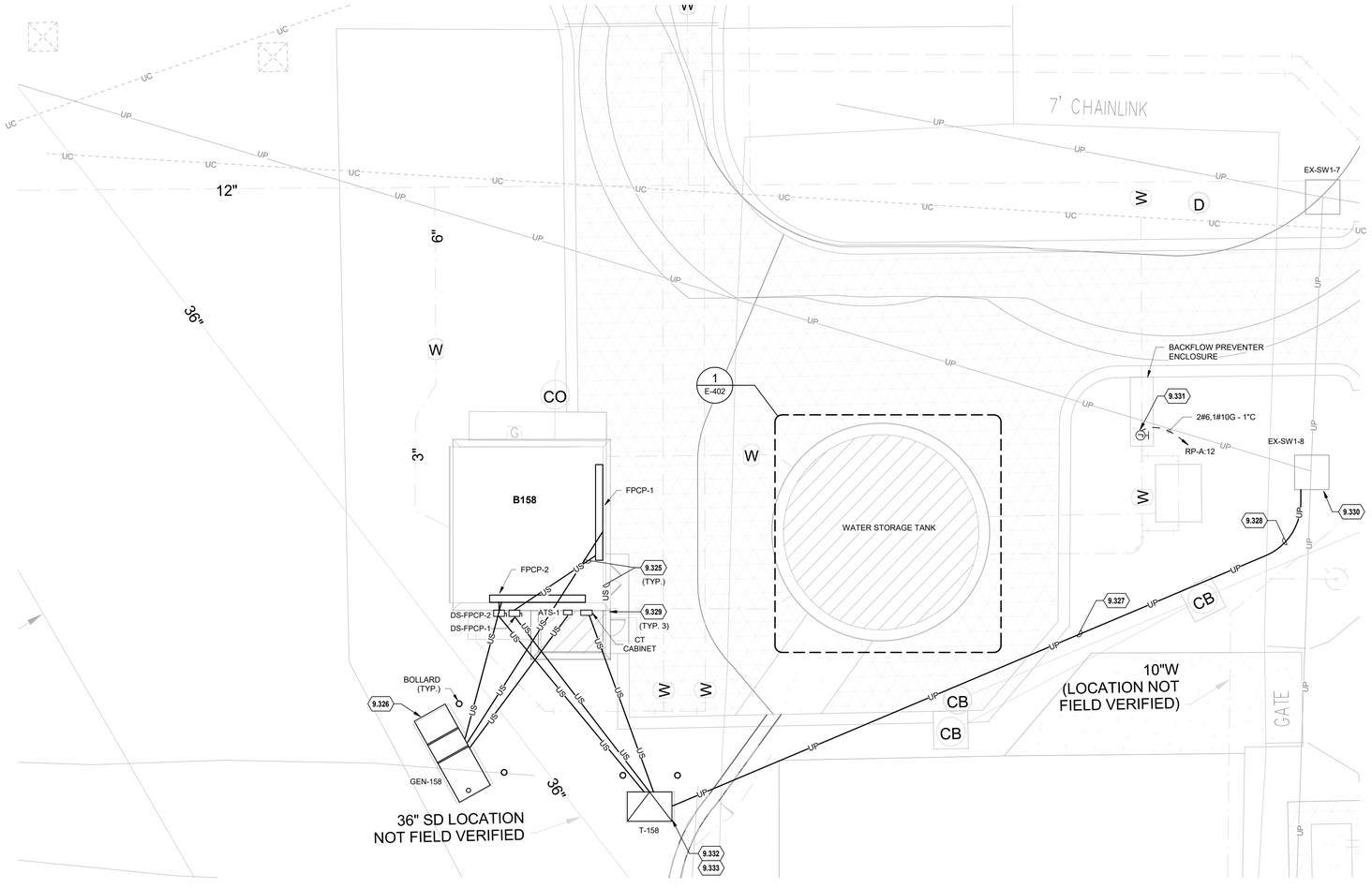

N 1 **ELECTRICAL SITE PLAN - B158**
1" = 10'-0"

SITE PLAN GENERAL NOTES:

1. SEE SHEET E-001 FOR GENERAL ELECTRICAL NOTES, ABBREVIATIONS, AND SYMBOLS LEGEND.
2. SPECIAL CARE SHALL BE TAKEN TO AVOID DAMAGING EXISTING UTILITIES (WATER, SEWER, POWER, GAS, COMMUNICATIONS, ETC.). CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING AND LOCATING ALL EXISTING SITE UTILITIES (OVERHEAD & UNDERGROUND) IN THE AREA OF EXCAVATION.
3. PROVIDE EXCAVATION AS REQUIRED FOR INSTALLATION OF EXTERIOR UNDERGROUND CONDUITS. REPLACE FILL MATERIAL AND COMPACT IN ACCORDANCE WITH CIVIL SPECIFICATIONS.
4. PRIMARY DUCT BANK SHALL BE CONCRETE ENCASED UON. SECONDARY DUCT BANK SHALL BE DIRECT BURIED, UNLESS PASSING UNDER PAVEMENT. REFER TO DETAILS ON E-504.
5. REFER TO E-702 FOR QUANTITIES AND SIZES OF DUCT BANK CONDUITS AND CONDUCTORS.
6. MAINTAIN A MINIMUM OF 5'-0" OF SEPARATION BETWEEN LIQUID-FILLED TRANSFORMERS AND BUILDING OR OTHER EXTERIOR EQUIPMENT.
7. REFER TO C-104 FOR CIVIL UTILITY PLAN.

KEYED NOTES:

9.325. CUT AND PATCH SLAB WHERE TRENCHING IN NEW SERVICE DUCT BANK. AVOID STRUCTURAL FOOTINGS AND OTHER OBSTRUCTIONS WHEN ROUTING DUCT BANK. REFER TO STRUCTURAL DRAWINGS AND DETAILS FOR PATCHING TO EXISTING SLAB.

9.326. DIESEL GENERATOR, 480Y/277-VOLT, 3-PHASE, 4-WIRE WITH WEATHERPROOF ENCLOSURE. DOUBLE-WALL BASE FUEL TANK. REFER TO GENERATOR WIRING DETAIL ON E-504 FOR NECESSARY CONDUITS AND WIRING FOR GENERATOR.

9.327. CUT AND PATCH EXISTING CONCRETE WHEN TRENCHING IN NEW PRIMARY DUCT BANK. REFER TO CIVIL PLANS FOR ADDITIONAL INFORMATION.

9.328. PROVIDE 25'-0" PREMANUFACTURED SWEEPING BEND.

9.329. CORE THROUGH EXISTING FOUNDATION AS NEEDED TO ROUTED NEW SERVICE DUCT BANK BELOW GRADE TO BUILDING.

9.330. UTILIZE EXISTING TO REMAIN PAD-MOUNTED SWITCH FOR CONNECTION TO BASE MEDIUM VOLTAGE DISTRIBUTION. PROTECT DURING CONSTRUCTION OF SURROUNDING AREAS.

9.331. PROVIDE NEMA 4 JUNCTION BOX AT LEAST 18" AFG WITHIN THE ENCLOSURE FOR CONNECTION TO BACKFLOW PRVENTER ENCLOSURE HEATER. HEATER AND THERMOSTAT FURNISHED BY ENCLOSURE MANUFACTURER. INSTALL HEATER IN SLAB AS DIRECTED IN MANUFACTURER INSTALLATION INSTRUCTIONS. INSTALL THERMOSTAT AS DIRECTED IN MANUFACTURER INSTALLATION INSTRUCTIONS. CONDUIT AND FITTINGS SHALL BE WATERTIGHT.

9.332. T-158 IS A LIQUID-FILLED, PAD-MOUNTED, MEDIUM VOLTAGE TRANSFORMER. REFER TO DETIALS ON E-504 FOR CONNECTIONS AND PAD INFORMATION. REFER TO E-702 FOR SIZING AND CONFIGURATION. TRANSFORMER SHALL HAVE AT LEAST 10'-0" OF CLEARANCE IN FRONT.

9.333. STUB OUT 2-5" CONDUITS FROM PRIMARY COMPARTMENT OF THE TRANSFORMER FOR FUTURE LOOP FEED CONNECTION. STUB OUT AT LEAST 5'-0" FROM EDGE OF PAD.

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

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HARRISON TWP, MICHIGAN

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SHEET CONTENTS
B158 ELECTRICAL SITE PLAN

SHEET NO.:
E-103

12/15/2022 9:17:06 AM C:\Users\jesse.harlan\Documents\3141700-181848.01-E-FP-Central-2020_jesse.harlanREVCLV.rvt

DEMOLITION AND FLOOR PLAN GENERAL NOTES:

1. SEE SHEET E-001 FOR GENERAL ELECTRICAL AND DEMOLITION NOTES, ABBREVIATION, AND SYMBOL LEGEND.
2. LOCATIONS AND QUANTITIES OF EXISTING DEVICES ARE BASED ON FIELD OBSERVATION AND AS-BUILT DOCUMENTS. DEMOLITION DRAWINGS SHOW GENERAL INTENT AND DO NOT SHOW EVERY DEVICE OR DETAIL. PROVIDE DEMOLTION IN ACCORDANCE WITH DESIGN INTENT.
3. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING INFRASTRUCTURE FOR PULLING OF TELECOMMUNICATIONS CABLING. SEE T-SERIES SHEETS FOR CONDUIT AND CABLE TRAY REQUIREMENTS.
4. PROVIDE ELECTRICAL CONNECTIONS FOR ALL EQUIPMENT REQUIRING AC POWER CONNECTIONS. SEE MECHANICAL AND PLUMBING SHEETS FOR PRECISE LOCATION OF EQUIPMENT.
5. COORDINATE LOCATIONS OF EQUIPMENT SWITCHES AND STARTERS WITH MECHANICAL AND FIRE PROTECTION PLANS. LOCATE DEVICES IN ACCESSIBLE LOCATIONS PER NFPA 70.
6. REFER TO E-702 FOR FEEDER AND DISCONNECT SIZES WHERE NOT SHOWN ON THIS PLAN.
7. ELECTRICAL EQUIPMENT AND DEVICES ON THE BUILDING EXTERIOR SHALL BE RATED NEMA 3R AT MINIMUM.

KEYED NOTES:

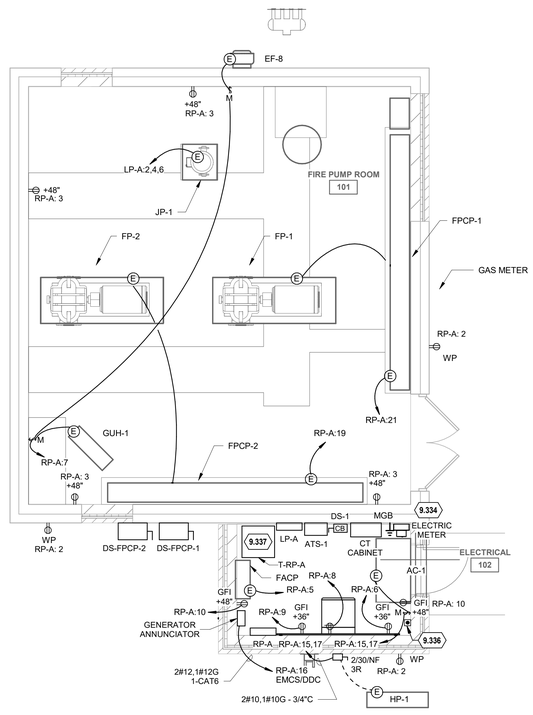
9.334. WALL-MOUNT TWO ELECTRIC METERS IN THIS LOCATION. REFER TO E-702 FOR ADDITIONAL INFORMATION ON METERS.

9.335. DEMOLISH ELECTRICAL EQUIPMENT AND INFRASTRUCTURE IN ITS ENTIRETY. THIS INCLUDES, BUT IS NOT LIMITED TO, PANELS, DISCONNECTS, RECEPTACLES, LIGHT, CONDUIT, BOXES, AND CONDUCTORS.

9.336. GENERATOR EMERGENCY SHUTOFF.

9.337. PROVIDE CHANNEL STRUT PLATFORM TO RAISE TRANSFORMER 30" AFF.

N 1 **ELECTRICAL DEMOLITION PLAN**
1/4" = 1'-0"



N 2 **POWER AND EQUIPMENT PLAN**
1/4" = 1'-0"

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
DESIGNED BY: JKH
DRAWN BY: JKH
CHECKED BY: RSR
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SHEET CONTENTS
B158 DEMOLITION, POWER, AND EQUIPMENT PLAN

SHEET NO.:
E-104

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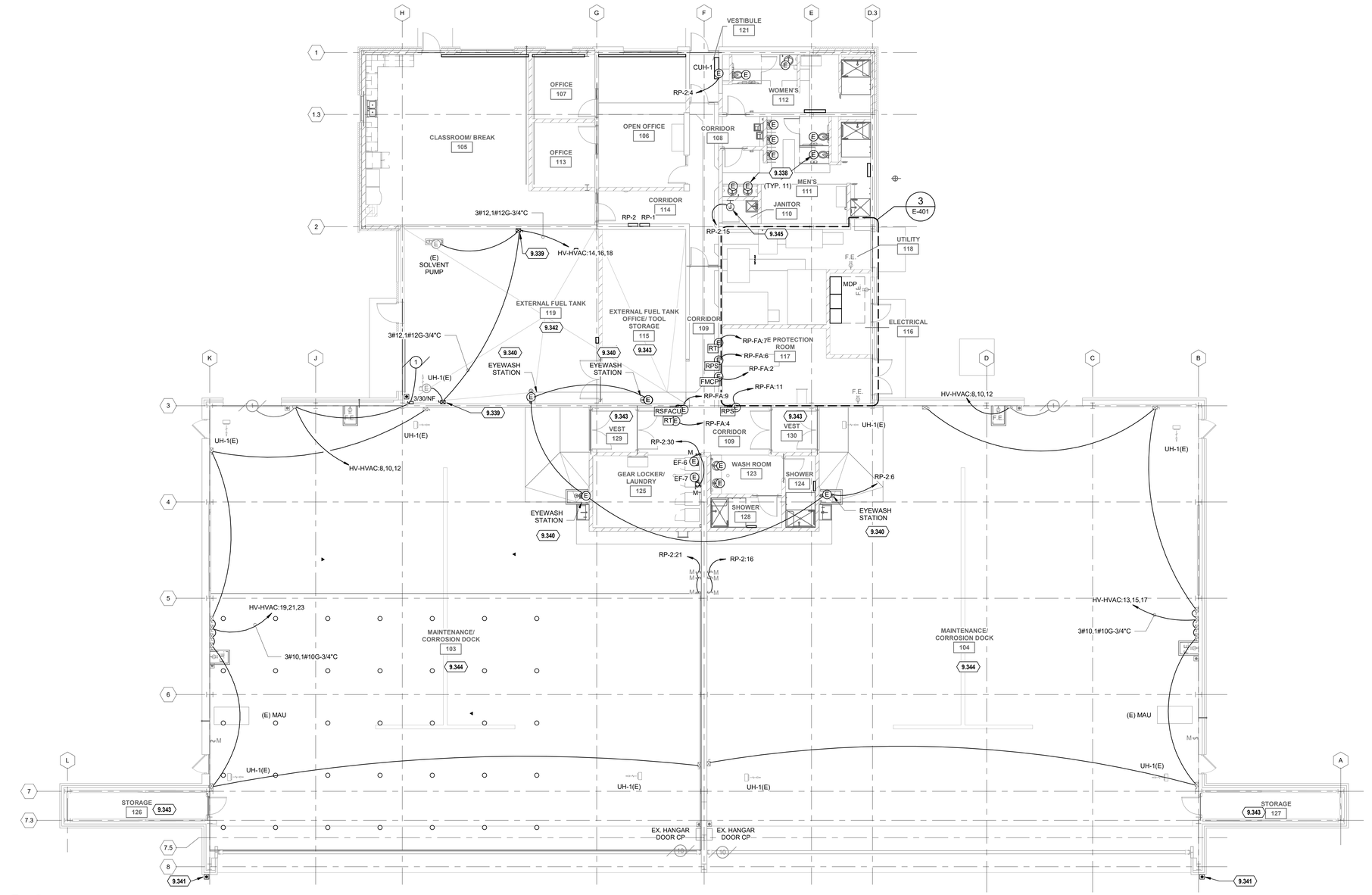

1 EQUIPMENT FLOOR PLAN

1/8" = 1'-0"

FLOOR PLAN GENERAL NOTES

1. SEE SHEET E-001 FOR GENERAL ELECTRICAL NOTES, ABBREVIATIONS, AND SYMBOL LEGEND.
2. PROVIDE ELECTRICAL CONNECTIONS FOR ALL EQUIPMENT REQUIRING AC POWER CONNECTIONS. SEE ARCHITECTURAL, MECHANICAL AND PLUMBING SHEETS FOR PRECISE LOCATION OF EQUIPMENT.
3. REFER TO M-600 AND P-600 SERIES DRAWINGS FOR MECHANICAL AND PLUMBING EQUIPMENT ELECTRICAL INFORMATION AND REQUIREMENTS.
4. REFER TO MECHANICAL, AND PLUMBING SHEETS FOR EQUIPMENT SCHEDULES AND RELATED ELECTRICAL CHARACTERISTICS.
5. REUSE EXISTING CONDUIT AND CONDUCTOR SERVING EXISTING TO REMAIN EQUIPMENT TO THE MAXIMUM EXTENT POSSIBLE. EXTEND AS NEEDED TO NEW DISTRIBUTION EQUIPMENT.
6. ANY ELECTRICAL EQUIPMENT WITHIN A HANGAR SHALL BE IN A NEMA 3R OR WEATHERPROOF ENCLOSURE.
7. ELECTRICAL EQUIPMENT AND DEVICES ON THE BUILDING EXTERIOR SHALL BE RATED NEMA 3R AT MINIMUM.
8. COORDINATE EXACT LOCATIONS OF FIRE PROTECTION SYSTEMS REQUIRING AC POWER WITH FIRE PROTECTION PLANS.

KEYED NOTES:

9.338. PROVIDE LOW-VOLTAGE POWER TO ELECTRIC FLUSH VALVES.

9.339. MOTOR CONTROLLER SHALL BE RATED FOR USE IN CLASS 1, DIVISION 2 AREAS. ASSOCIATED CONDUIT AND RACEWAYS WITHIN THIS ROOM SHALL BE REPLACED WITH EXPLOSION PROOF FITTINGS. CONTROL AND POWER TO ASSOCIATED MECHANICAL EQUIPMENT SHALL REMAIN UNCHANGED AFTER REPLACEMENT. ENSURE OPERATION MATCHES EXISTING CONDITIONS.

9.340. PROVIDE 120V POWER TO EYE WASH STATION. COORDINATE CONNECTION WITH MANUFACTURER INSTALLATION INSTRUCTION.

9.341. KEYED SWITCH FOR FIRE DEPARTMENT HANGAR DOOR CONTROL. REFER TO E-703 FOR CONNECTION TO EXISTING HANGAR DOOR CONTROL PANEL.

9.342. SPACE SHALL BE RATED CLASS 1, DIVISION 2 FROM FLOOR TO CEILING. ANY EQUIPMENT OR RECEPTACLES LOCATED HERE SHALL BE RATED FOR USE IN THIS ENVIRONMENT.

9.343. SPACE IS IMMEDIATELY ADJACENT TO HAZARDOUS HANGAR OR OTHER AIRCRAFT MAINTENANCE AREA. SPACE SHALL BE RATED CLASS 1 DIVISION 2 FROM FLOOR UP TO 18" AFF WITHIN 25'-0" OF DOORWAYS INTO THE HANGAR OR MAINTENANCE AREA(S). ANY EQUIPMENT LOCATED BELOW 18" SHALL BE RATED FOR USE IN THIS ENVIRONMENT.

9.344. SPACE SHALL BE RATED CLASS 1, DIVISION 2 FROM FLOOR UP TO 18" AFF. ANY EQUIPMENT LOCATED BELOW 18" SHALL BE RATED FOR USE IN THIS ENVIRONMENT.

9.345. PROVIDE CONTROL TRANSFORMER FOR ELECTRIC FLUSH VALVES. SIZE TRANSFORMER IS ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. PROVIDE MULTIPLE TRANSFORMERS AS NEEDED.

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HARRISON TWP, MICHIGAN

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SHEET CONTENTS
EQUIPMENT FLOOR PLAN

SHEET NO.:
E-111

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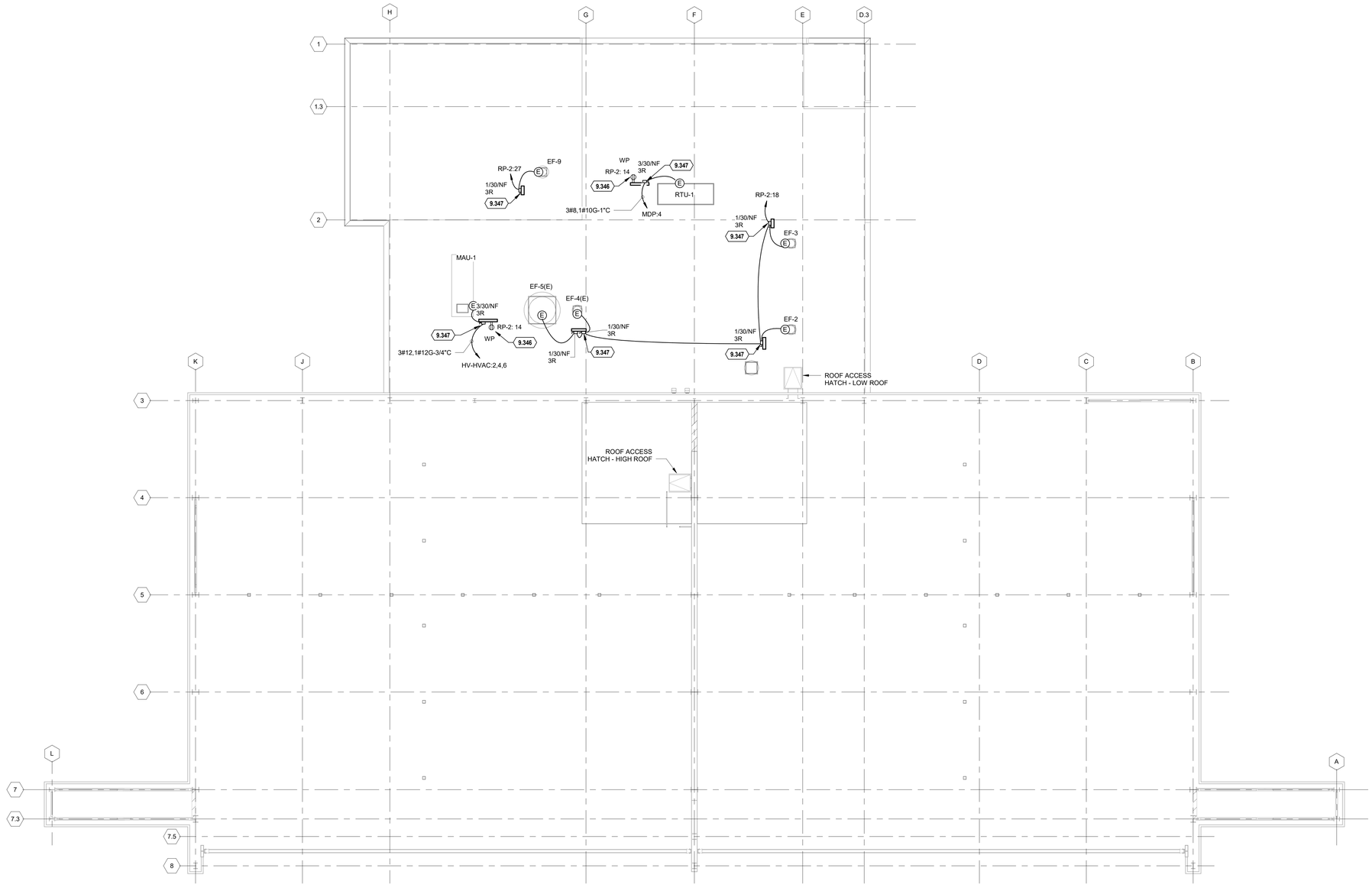

ROOF EQUIPMENT AND POWER PLAN

1/8" = 1'-0"

FLOOR PLAN GENERAL NOTES

1. SEE SHEET E-001 FOR GENERAL ELECTRICAL NOTES, ABBREVIATIONS, AND SYMBOL LEGEND.
2. PROVIDE ELECTRICAL CONNECTIONS FOR ALL EQUIPMENT REQUIRING AC POWER CONNECTIONS. SEE ARCHITECTURAL, MECHANICAL AND PLUMBING SHEETS FOR PRECISE LOCATION OF EQUIPMENT.
3. COORDINATE LOCATIONS OF EQUIPMENT SWITCHES AND STARTERS WITH MECHANICAL CONTRACTOR. LOCATE DEVICES IN ACCESSIBLE LOCATION PER NFPA 70.
4. REFER TO M-600 AND P-600 SERIES DRAWINGS FOR MECHANICAL AND PLUMBING EQUIPMENT ELECTRICAL INFORMATION AND REQUIREMENTS.
5. REFER TO E-701 FOR ELECTRICAL ONE-LINE DIAGRAM.
6. ELECTRICAL EQUIPMENT AND DEVICES ON THE BUILDING EXTERIOR SHALL BE RATED NEMA 3R AT MINIMUM.

KEYED NOTES:

9.346. PROVIDE STRUT MOUNT RECEPTACLE 18" ABOVE ROOF. RECEPTACLE SHALL NOT BE ATTACHED TO MECHANICAL EQUIPMENT.

9.347. PROVIDE STRUT TO MOUNT MECHANICAL EQUIPMENT DISCONNECT SWITCH. DISCONNECT SWITCH SHALL NOT BE ATTACHED TO MECHANICAL EQUIPMENT. DISCONNECT ON STRUT SHALL BE FREE STANDING. STRUT SHALL BE SECURELY ATTACHED TO DECK. REFER TO DETAIL ON E-505 FOR MOUNTING.

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SHEET CONTENTS
ROOF EQUIPMENT AND POWER PLAN

SHEET NO.:
E-112

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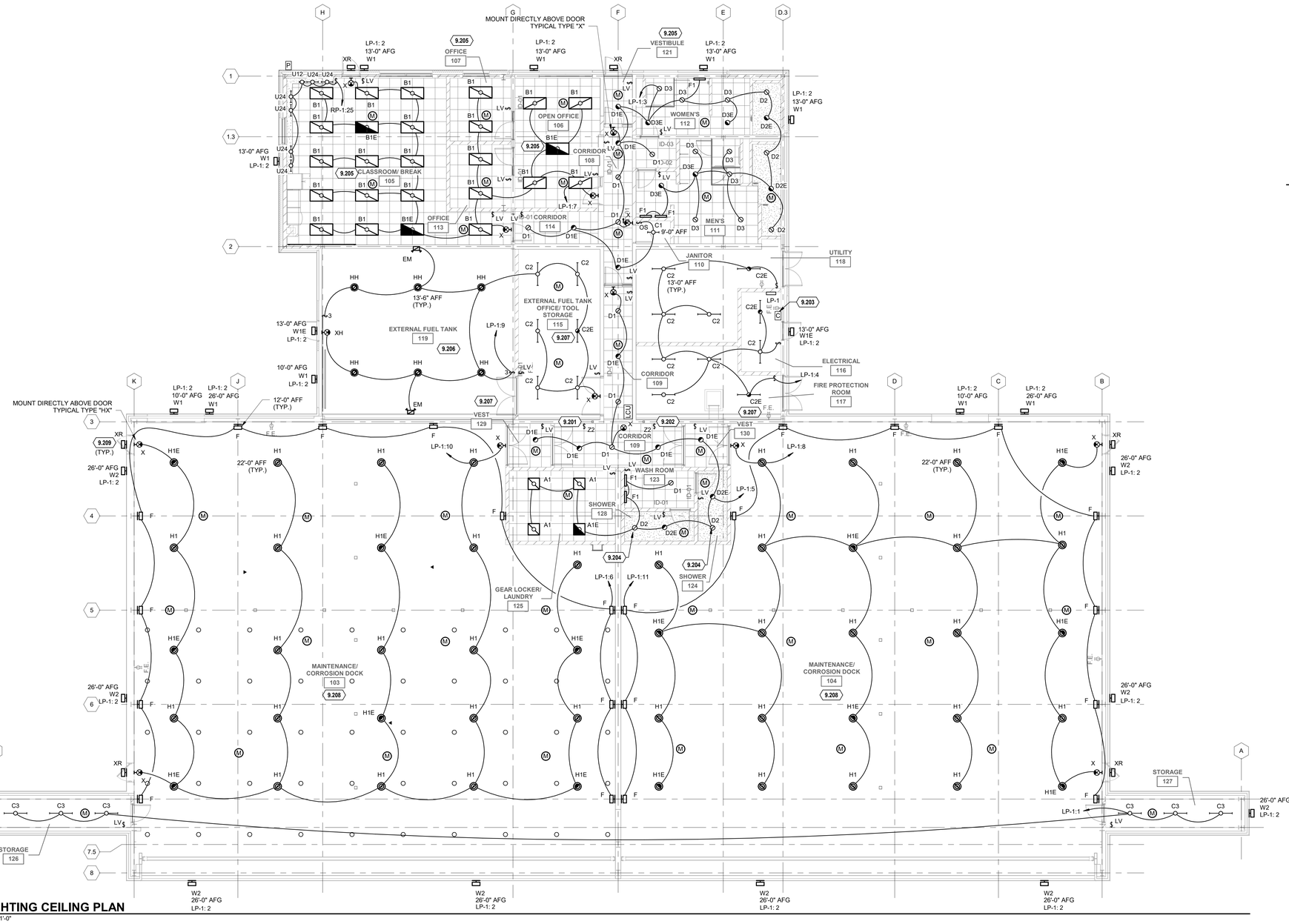

LIGHTING CEILING PLAN

1/8" = 1'-0"

FLOOR PLAN GENERAL NOTES

1. SEE SHEET E-001 FOR GENERAL ELECTRICAL NOTES, ABBREVIATIONS, AND SYMBOL LEGEND.
2. SEE SHEET E-603 FOR LIGHTING FIXTURE SCHEDULE.
3. SEE SHEET E-501 FOR LIGHTING CONTROL DETAILS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING WIRING, CABLING, CONDUIT, AND ANY ANCILLARY EQUIPMENT, INCLUDING PROGRAMMING OF CONTROL SYSTEM REQUIRED FOR LIGHTING CONTROLS. THE INSTALLATION SHALL BE TESTED BY AN AUTHORIZED REPRESENTATIVE OF LIGHTING CONTROL SYSTEM MANUFACTURER AFTER INSTALLATION. THE REPRESENTATIVE SHALL CERTIFY THAT THE LIGHTING CONTROL SYSTEM IS INSTALLED AND TESTED TO HIS FULL SATISFACTION.
4. SEE SHEET E-502 FOR LIGHTING MOUNTING DETAILS.
5. FIELD ADJUST THE LIGHTING FIXTURE LAYOUT TO CLEAR ANY BEAMS, COLUMNS, PIPING, ETC. THAT MIGHT BE IN THE WAY.
6. COORDINATE FIXTURE LAYOUT WITH LOCATION OF MECHANICAL EQUIPMENT. SHIFT FIXTURES UP TO 2' AS NECESSARY TO MAXIMIZE LIGHT ON EQUIPMENT AND WALKING PATHS.
7. OCCUPANCY SENSOR LAYOUT IS DIAGRAMMATIC AND ACTUAL LAYOUT WILL DEPEND UPON SELECTED SENSORS RANGE.
8. EXTERIOR MOUNTED BUILDING LIGHTING SHALL BE HOME RUN TO THE INDICATED CIRCUIT VIA THE LIGHTING CONTACTOR.
9. ANY LIGHTING EQUIPMENT WITHIN A HANGAR SHALL BE IN A NEMA 3R OR WEATHERPROOF ENCLOSURE.

KEYED NOTES:

9.201. WALLSTATION SERVES MAINTENANCE/CORROSION DOCK 103.

9.202. WALLSTATION SERVES MAINTENANCE/CORROSION DOCK 104.

9.203. LIGHTING CONTACTOR SHALL CONTROL EXTERIOR PERIMETER BUILDING LIGHTING. CONTACTOR SHALL HAVE AT LEAST ONE RELAY PER LIGHTING CIRCUIT CONTROLLED. A HAND-OFF-AUTO SWITCH SHALL ALLOW LIGHTS TO BE TURNED OFF, ON, OR BE CONTROLLED BY BUILDING MOUNTED PHOTOCELL. REFER TO EXTERIOR LIGHTING CONTROL WIRING DIAGRAM ON E-501.

9.204. CENTER DOWNLIGHT OVER SHOWER STALL.

9.205. PROVIDE DAYLIGHT SENSORS IN THIS ROOM. INSTALLATION LOCATION SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.

9.206. SPACE SHALL BE RATED CLASS 1, DIVISION 2 FROM FLOOR TO CEILING. ANY LIGHTING FIXTURES OR DEVICES LOCATED HERE SHALL BE RATED FOR USE IN THIS ENVIRONMENT.

9.207. SPACE IS IMMEDIATELY ADJACENT TO HAZARDOUS HANGAR OR OTHER AIRCRAFT MAINTENANCE AREA. SPACE SHALL BE RATED CLASS 1, DIVISION 2 FROM FLOOR UP TO 18" AFF WITHIN 25'-0" OF DOORWAYS INTO THE HANGAR OR MAINTENANCE AREA(S). ANY EQUIPMENT LOCATED BELOW 18" SHALL BE RATED FOR USE IN THIS ENVIRONMENT.

9.208. SPACE SHALL BE RATED CLASS 1, DIVISION 2 FROM FLOOR TO 18" AFF. ANY EQUIPMENT LOCATED BELOW 18" SHALL BE RATED FOR USE IN THIS ENVIRONMENT.

9.209. TYPE "XR" LIGHT FIXTURE SHALL BE POWERED FROM NEAREST INTERIOR EXIT SIGN.

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

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12/16/22 TYPE B3 FINAL HEF MOD

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DRAWN BY: JKH
CHECKED BY: RSR
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SHEET CONTENTS
LIGHTING CEILING PLAN

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E-121

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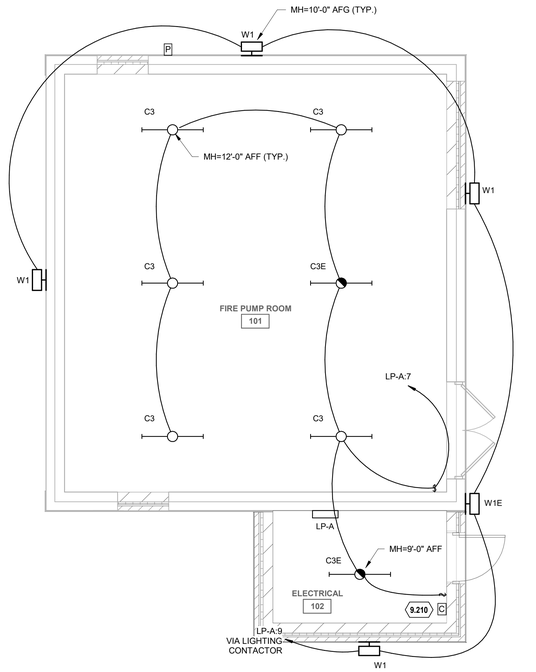
B158 LIGHTING FIXTURE SCHEDULE

TYPE	VOLTAGE	WATTS	LAMP	MOUNTING	HEIGHT	DESCRIPTION
C3	MVOLT	41 W	LED	PENDANT OR SURFACE	AS SHOWN	4' LED STRIPLIGHT FIXTURE. COLD-ROLLED STEEL ENCLOSURE. FROSTED DIFFUSE LENS. UPLIGHT. 120-277V OPERATION. 5000 LUMENS. 3000K. MINIMUM 80 CRI. DAMP LOCATION RATED.
C3E	MVOLT	41 W	LED	PENDANT OR SURFACE	AS SHOWN	4' LED STRIPLIGHT FIXTURE. COLD-ROLLED STEEL ENCLOSURE. FROSTED DIFFUSE LENS. UPLIGHT. 120-277V OPERATION. 5000 LUMENS. 3000K. MINIMUM 80 CRI. DAMP LOCATION RATED. INTEGRAL 10-WATT BACKUP BATTERY CAPABLE OF 90 MINUTES OF CONTINUOUS OPERATION.
W1	MVOLT	12 W	LED	WALL	AS SHOWN	DIE-CAST ALUMINUM ARCHITECTURAL LED WALLPACK. IP65 RATED MINIMUM. 120-277V OPERATION. 3500K. 1500 LUMEN PACKAGE. FULL-CUTOFF.
W1E	MVOLT	12 W	LED	WALL	AS SHOWN	DIE-CAST ALUMINUM ARCHITECTURAL LED WALLPACK. IP65 RATED MINIMUM. 120-277V OPERATION. 3500K. 1500 LUMEN PACKAGE. FULL-CUTOFF. INTEGRAL BATTERY BACKUP CAPABLE OF 90 MINUTES OF CONTINOUS OPERATION. BATTERY RATED FOR COLD WEATHER DOWN TO -20°C.

GENERAL NOTE: LIGHT FIXTURES SHALL HAVE 10-YEAR WARRANTIES.



N 1 **LIGHTING PLAN**
1/4" = 1'-0"

FLOOR PLAN GENERAL NOTES:

1. SEE SHEET E-001 FOR GENERAL ELECTRICAL NOTES, ABBREVIATIONS, AND SYBMOL LEGEND.
2. SEE SHEET E-502 FOR LIGHTING MOUNTING DETAILS.
3. FIELD ADJUST THE LIGHTING FIXTURE LAYOUT TO CLEAR ANY BEAMS, COLUMNS, PIPING, ETC. THAT MIGHT BE IN THE WAY.
4. COORDINATE FIXTURE LAYOUT WITH LOCATION OF MECHANICAL OR FIRE PROTECTION EQUIPMENT. SHIFT FIXTURES UP TO 2' AS NECESSARY TO MAXIMIZE LIGHT ON EQUIPMENT AND WALKING PATHS.
5. DEVICES MOUNTED ON THE BUILDING EXTERIOR SHALL BE AT MINIMUM RATED NEMA 3R.

KEYED NOTES:

9.210. LIGHTING CONTACTOR SHALL CONTROL EXTERIOR PERIMETER BUILDING LIGHTING. CONTACTOR SHALL HAVE AT LEAST ONE RELAY PER LIGHTING CIRCUIT CONTROLLED. A HAND-OFF-AUTO SWITCH SHALL ALLOW LIGHTS TO BE TURNED OFF, ON, OR BE CONTROLLED BY BUILDING MOUNTED PHOTOCELL. REFER TO EXTERIOR LIGHTING CONTROL WIRING DIAGRAM ON E-501.

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SHEET CONTENTS
B158 LIGHTING CEILING PLAN

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E-122

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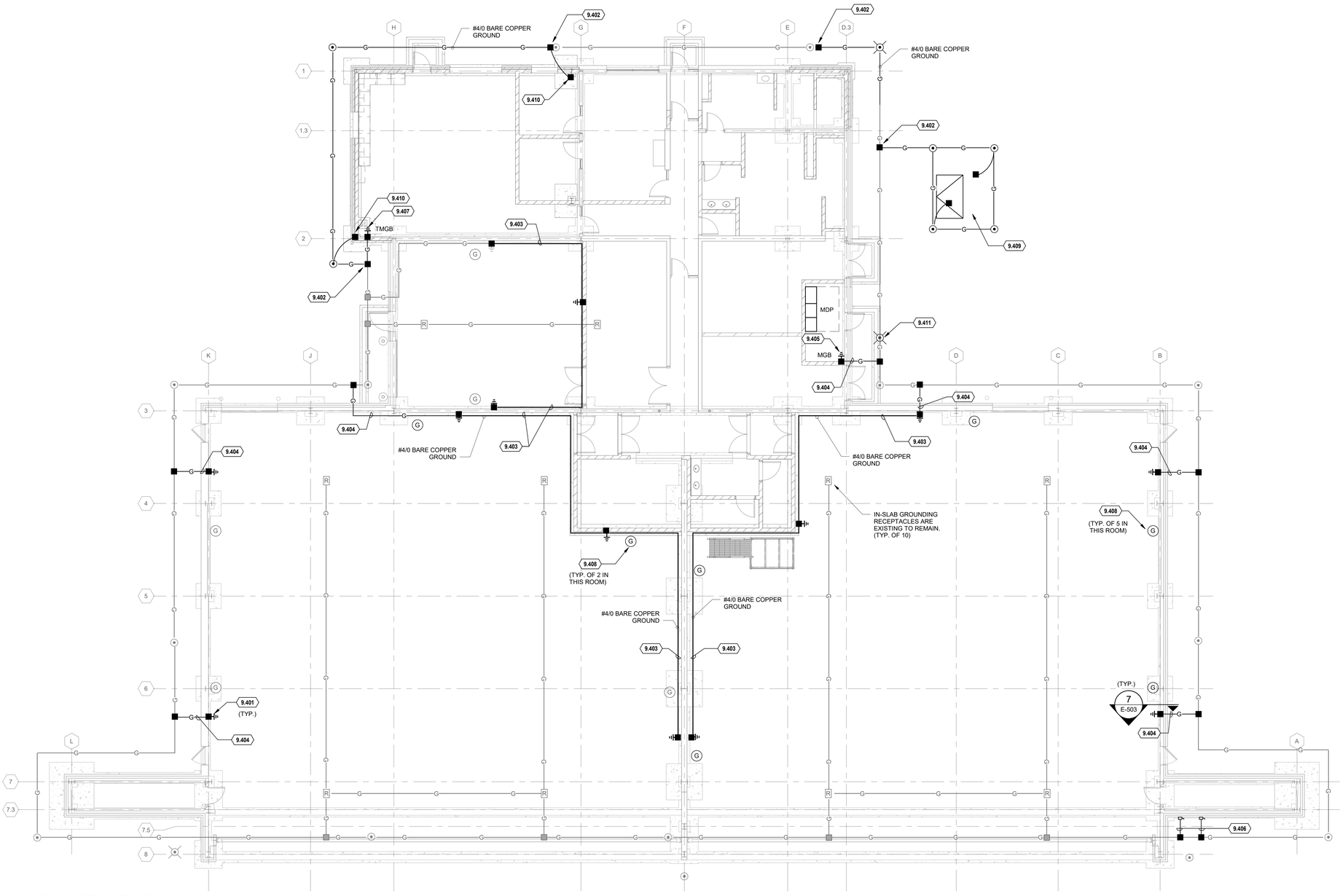

N 1 **GROUNDING PLAN**
1/8" = 1'-0"

FLOOR PLAN GENERAL NOTES

1. WHERE GROUND RODS ARE INDICATED IN CLOSE PROXIMITY, MAINTAIN ONE GROUND ROD LENGTH OF MINIMUM SEPARATION BETWEEN THE GROUND RODS.
2. EXISTING GROUNDING CONDUCTORS, RODS, BARS, ETC. ARE SHOWN IN A LIGHT GREY COLOR. GROUNDING CONDUCTORS, RODS, AND BARS SHOWN IN BLACK ARE NEW.
3. EXISTING GROUNDING COMPONENTS ARE BASED ON AS-BUILT DOCUMENTS AND FIELD OBSERVATIONS. NOT ALL GROUNDING COMPONENTS MAY BE SHOWN AND SOME MAY BE DEGRADED. WHERE EXISTING GROUND RING CONDITION IS NOT SUITABLE FOR EXTENSION, PROVIDE SUPPLMENETAL GROUNDING ELECTRODES TO ENSURE RESISTANCE TO GROUND DOES NOT EXCEED 25 OHMS FOR ELECTRICAL SYSTEMS AND 10 OHMS FOR COMMUNICATIONS SYSTEMS.
4. REFER TO E-701 FOR ELECTRICAL SERVICE EQUIPMENT AND SEPARATELY DERIVED SYSTEMS TO BE BONDED TO GROUND.
5. BELOW GRADE GROUNDING CONNECTIONS SHALL BE EXOTHERMIC.
6. WHERE ROUTING BARE COPPER GROUND CONDUCTORS THROUGH METALLIC CONDUIT, BOND CONDUIT TO CONDUCTOR AT BOTH ENDS.

KEYED NOTES:

9.401. STATIC GROUND BAR. MOUNT 4'-0" AFF.

9.402. BOND EXTENSION OF BUILDING GROUND RING TO EXISTING GROUND RING VIA EXOTHERMIC WELD.

9.403. ROUTE STATIC GROUND CONDUCTOR IN 1" RIGID STEEL CONDUIT.

9.404. ROUTE #4/0 BARE COPPER GROUND BELOW GRADE AND BOND TO EXISTING BUILDING GROUND RING. REFER TO DETAIL 7/E-503.

9.405. MAIN GROUND BAR (MGB) FOR ELECTRICAL DISTRIBUTION EQUIPMENT.

9.406. ROUTE #1/0 BARE COPPER GROUND FROM HANGAR DOOR SERVICE DISCONNECTS TO GROUND RING. PROVIDE RIGID STEEL CONDUIT WHERE EXPOSED ABOVE GRADE.

9.407. TELECOMMUNICATIONS MAIN GROUND BAR (TMGB). SERVES AS GROUNDING POINT FOR TELECOMMUNICATIONS EQUIPMENT.

9.408. RETRACTABLE 50'-0" GROUNDING REEL. WALL MOUNT 20'-0" AFF. PROVIDE #3 BONDING CONDUCTOR FROM GROUND REEL TO NEAREST STATIC GROUNDING BAR.

9.409. PROVIDING GROUNDING AND BONDING FOR PAD MOUNTED TRANSFORMER AS SHOWN ON SHEET E-504.

9.410. BOND GROUND RING TO STRUCTURAL STEEL VIA EXOTHERMIC WELD.

9.411. TEST WELL TO GROUND PORTABLE GENERATOR. LOCATE NEAR GENERATOR RECEPTACLE.

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SHEET CONTENTS
GROUNDING PLAN

SHEET NO.:
E-131

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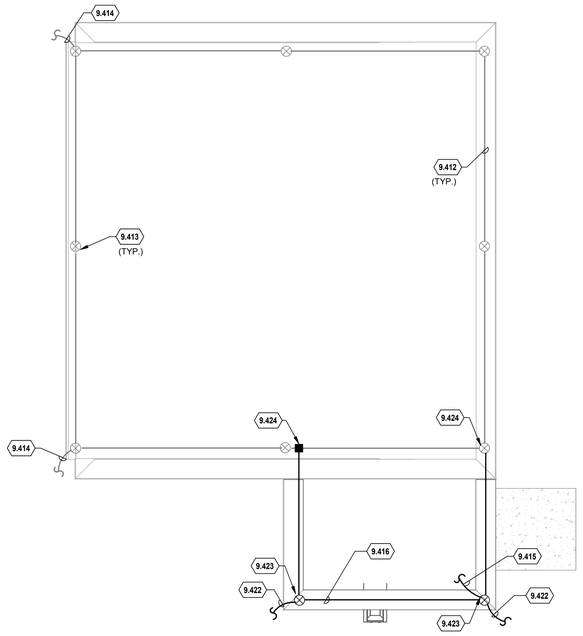
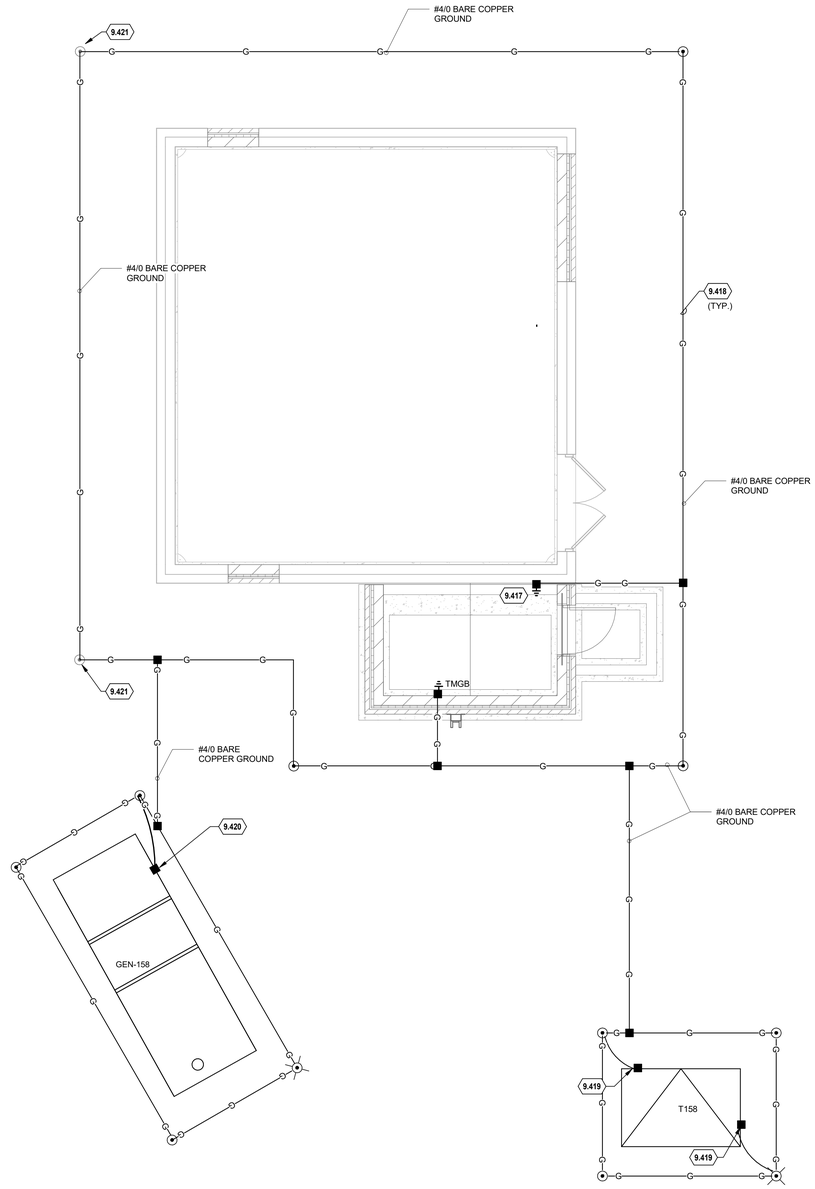


N 1 **LIGHTNING PROTECTION PLAN**
1/4" = 1'-0"



N 2 **GROUNDING PLAN**
1/4" = 1'-0"

FLOOR PLAN GENERAL NOTES:

1. SEE SHEET E-505 FOR DETAILS RELATED TO LIGHTNING PROTECTION.
2. LIGHTNING PROTECTION SYSTEM (LPS) TO BE INSTALLED PER UFC 3-575-01, AFI 32-1065 AND NFPA 780. ALL LATEST EDITION. THE EXISTING LPS IS TO BE TESTED, ACCEPTED AND CERTIFIED BY THE 3RD PARTY REQUIREMENTS OF UFC 3-575-01, SECTION 3-1 AND AFI 32-1065 SECTION 6.1. ADDITIONAL RESPONSIBILITY OF 3RD PARTY TESTING WILL BE TO TEST ALL AIR TERMINALS AND ROOF MOUNTED LPS BONDED ELECTRICAL, MECHANICAL AND STEEL ROOF PENETRATIONS. THIS TESTING WILL BE COMPLETED ON THE ENTIRE FACILITY FOR NEW OR ALTERED LPS, TO INCLUDE EXISTING LPS FOR ADDED OR ALTERED LPS.
3. GROUNDED METAL BODIES WITHIN THE BONDING DISTANCE DETERMINED BY NFPA 780 MUST BE BONDED TO THE SYSTEM IN ACCORDANCE WITH THOSE REQUIREMENTS.
4. PROVIDE LV ARRESTORS AT SERVICE TRANSFORMER.
5. GROUND RING FOR LIGHTNING PROTECTION AND BUILDING GROUND SHALL BE BONDED AT EACH LPS DOWN CONDUCTOR.
6. WHERE GROUND RODS ARE INDICATED IN CLOSE PROXIMITY, MAINTAIN ONE GROUND ROD LENGTH OF MINIMUM SEPARATION BETWEEN THE GROUND RODS.

KEYED NOTES:

9.412. EXISTING CLASS 1 ALUMINUM ROOF CONDUCTOR. PROTECT DURING DEMOLITION AND CONSTRUCTION.

9.413. EXISTING CLASS 1 ALUMINUM AIR TERMINAL. PROTECT DURING DEMOLITION AND CONSTRUCTION.

9.414. EXISTING LPS DOWN CONDUCTOR. PROTECT DURING DEMOLITION AND CONSTRUCTION.

9.415. BOND LIGHTNING PROTECTION SYSTEM TO MAIN ELECTRICAL SERVICE ENTRANCE EQUIPMENT AND FIRE PUMP ELECTRICAL SERVICES.

9.416. CLASS 1 ALUMINUM ROOF CONDUCTOR.

9.417. BOND MGB TO WATER LINE USING #3/0.

9.418. #4/0 GROUND RING. SPACE 5' TO 8' AWAY FROM FOUNDATION AND 30" BELOW GRADE MINIMUM.

9.419. TRANSFORMER SHALL BE BONDED TO GROUND LOOP PER DETAIL 2/E-504.

9.420. BOND GENERATOR SKID, ENCLOSURE AND GROUND BAR TO TRANSFORMER GROUND LOOP PER DETAIL 1/E-504.

9.421. GROUND ROD IS EXISTING AND WAS INSTALLED WITH THE EXISTING LPS. BOND NEW GROUND RING TO EXISTING GROUND ROD VIA EXOTHERMIC WELD.

9.422. DOWN CONDUCTOR, CLASS 1 ALUMINUM CONCEALED AS MUCH AS FEASIBLE.

9.423. 1/2"x12" CLASS 1 ALUMINUM AIR TERMINAL. INSTALL PER ROOF MANUFACTURER RECOMMENDATION TO MAINTAIN WARRANTY.

9.424. BOND LIGHTNING PROTECTION SYSTEM EXTENSION TO EXISTING SYSTEM.

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
DESIGNED BY: JKH
DRAWN BY: JKH
CHECKED BY: RSR
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SHEET CONTENTS
B158 GROUNDING AND LIGHTINING PROTECTION PLAN

SHEET NO.:
E-132

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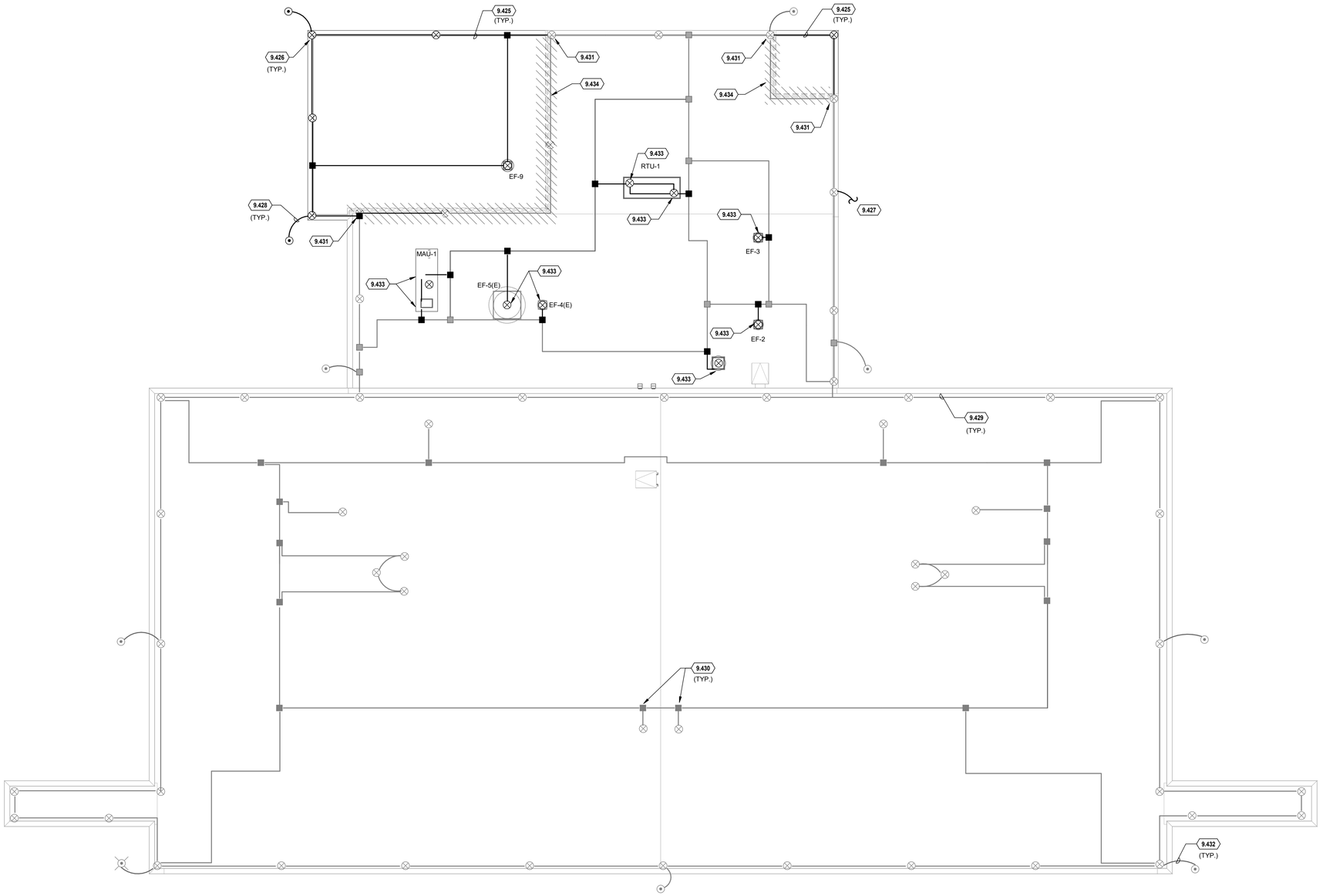

LIGHTNING PROTECTION PLAN

1/8" = 1'-0"

FLOOR PLAN GENERAL NOTES

1. SEE SHEET E-505 FOR DETAILS RELATED TO LIGHTNING PROTECTION.
2. LIGHTNING PROTECTION SYSTEM (LPS) TO BE INSTALLED PER UFC 3-575-01, AFI 32-1065 AND NFPA 780. ALL LATEST EDITION. THE EXISTING LPS IS TO BE TESTED, ACCEPTED AND CERTIFIED BY THE 3RD PARTY REQUIREMENTS OF UFC 3-575-01, SECTION 3-1 AND AFI 32-1065 SECTION 6.1. ADDITIONAL RESPONSIBILITY OF 3RD PARTY TESTING WILL BE TO TEST ALL AIR TERMINALS AND ROOF MOUNTED LPS BONDED ELECTRICAL, MECHANICAL AND STEEL ROOF PENETRATIONS. THIS TESTING WILL BE COMPLETED ON THE ENTIRE FACILITY FOR NEW OR ALTERED LPS, TO INCLUDE EXISTING LPS FOR ADDED OR ALTERED LPS.
3. GROUNDED METAL BODIES WITHIN THE BONDING DISTANCE DETERMINED BY NFPA 780 SHALL BE BONDED TO THE SYSTEM IN ACCORDANCE WITH THOSE REQUIREMENTS.
4. PROVIDE LV ARRESTORS AT SERVICE TRANSFORMER.
5. GROUND RODS FOR LIGHTNING PROTECTION INDICATED FOR REFERENCE ONLY. REFER TO SHEET E-131 FOR ADDITIONAL INFORMATION.
6. CONDUCTORS, CONNECTOR, AIR TERMINALS, AND GROUND RODS SHOWN AS LIGHT GREY REPRESENT EXISTING TO REMAIN LPS ELEMENTS. PROTECT DURING CONSTRUCTION.

KEYED NOTES:

9.425. CLASS 1 ALUMINUM ROOF CONDUCTOR

9.426. 1/2"x1/2" CLASS 1 ALUMINUM AIR TERMINAL.

9.427. BOND LPS TO NEW MAIN ELECTRICAL SERVICE EQUIPMENT.

9.428. DOWN CONDUCTOR, CLASS 1 ALUMINUM CONCEALED AS MUCH AS POSSIBLE. TRANSITION TO CLASS 1 COPPER DOWN CONDUCTOR VIA A BIMETALLIC CONNECTOR.

9.429. EXISTING CLASS 1 ALUMINUM ROOF CONDUCTOR SHOWN IN GREY. PROTECT DURING CONSTRUCTION.

9.430. EXISTING ALUMINUM TO ALUMINUM ROOF CONDUCTOR CONNECTION. PROTECT DURING CONSTRUCTION.

9.431. BOND NEW ALUMINUM ROOF CONDUCTORS TO EXISTING LPS ROOF CONDUCTORS. TIE INTO EXISTING AIR TERMINAL BASE OR REPLACE BASE AS NEEDED TO PROVIDE NECESSARY CONNECTIONS.

9.432. EXISTING DOWN CONDUCTOR FOR LPS. PROTECT DURING CONSTRUCTION.

9.433. MOUNT AIR TERMINALS ON TOP OF ROOF MOUNTED MECHANICAL EQUIPMENT.

9.434. DEMOLISH ANY ROOF CONDUCTORS OR AIR TERMINALS ALONG DEMOLISHED ROOF PARAPET. DO NOT DISTURB LIGHTNING PROTECTION SYSTEM ON EXISTING TO REMAIN PORTIONS OF THE ROOF OR PARAPET.

TETRA TECH Mead & Hunt
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SHEET CONTENTS
LIGHTNING PROTECTION PLAN

SHEET NO.:
E-141

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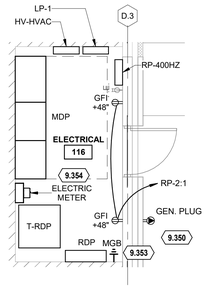
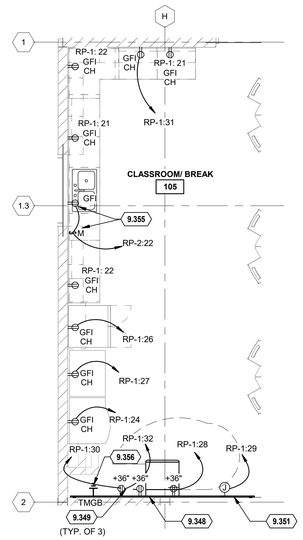


N 1 **ENLARGED ELECTRICAL ROOM**
1/4" = 1'-0"



N 2 **ENLARGED BREAK ROOM POWER PLAN**
1/4" = 1'-0"

FLOOR PLAN GENERAL NOTES

1. SEE SHEET E-001 FOR GENERAL ELECTRICAL NOTES, ABBREVIATIONS, AND SYMBOL LEGEND.
2. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING INFRASTRUCTURE FOR PULLING OF TELECOMMUNICATIONS CABLING. SEE T-SERIES SHEETS FOR CONDUIT AND CABLE TRAY REQUIREMENTS.
3. PROVIDE ELECTRICAL CONNECTIONS FOR EQUIPMENT REQUIRING AC POWER CONNECTIONS. SEE MECHANICAL AND PLUMBING SHEETS FOR PRECISE LOCATION OF EQUIPMENT.
4. COORDINATE LOCATIONS OF EQUIPMENT SWITCHES AND STARTERS WITH MECHANICAL CONTRACTOR. LOCATE DEVICES IN ACCESSIBLE LOCATION PER NFPA 70.
5. REFER TO E-701 FOR SIZES OF ELECTRICAL EQUIPMENT AND FEEDERS.
6. REFER TO M-600 AND P-600 SERIES DRAWINGS FOR MECHANICAL AND PLUMBING EQUIPMENT ELECTRICAL INFORMATION AND REQUIREMENTS.

KEYED NOTES:

9.348. PLYWOOD BACKBOARD. SEE TELECOMUNICATIONS PLAN. MOUNT RECEPTACLES ON BACKBOARD AT 36" AFF.

9.349. MOUNT RECEPTACLE ON PLYWOOD BACKBOARD.

9.350. PROVIDE 400AMP POWERTITE PIN AND SLEEVE PLUG, PRODUCT NUMBER AJA40144-400, FOR GENERATOR PLUG IN ACCORDANCE WITH SELFRIDGE BASE STANDARDS.

9.351. POWER FOR PAGING UNIT.

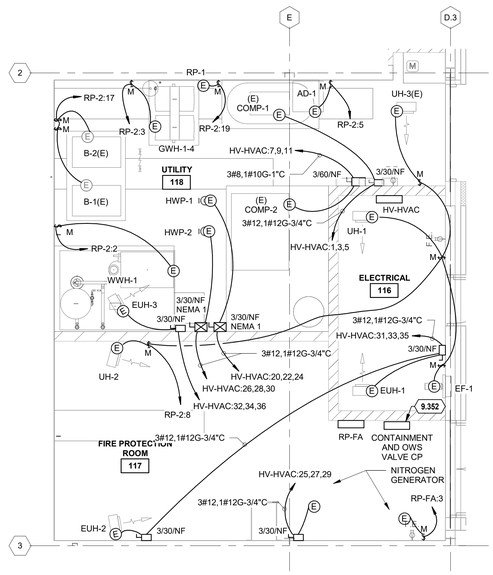
9.352. REFER TO E-703 FOR VALVE CONTROL PANEL WIRING DIAGRAM.

9.353. BOND ELECTRICAL ROOM GROUND BAR (MGB) TO BUILDING GROUNDING ELECTRODE SYSTEM AS SHOWN ON E-131.

9.354. WALL-MOUNT TWO ELECTRIC METERS IN THIS LOCATION. REFER TO E-701 FOR ADDITIONAL INFORMATION ON METERS.

9.355. GARBAGE DISPOSAL RECEPTACLE. PROVIDE MOTOR RATED SWITCH ABOVE BACKSPLASH TO CONTROL DISPOSAL.

9.356. TELECOMMUNICATIONS MAIN GROUND BAR. PROVIDE BONDING PER E-131.



N 3 **ENLARGED UTILITY AND ELECTRICAL ROOM EQUIPMENT PLAN**
1/4" = 1'-0"

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SHEET CONTENTS
ENLARGED ELECTRICAL PLANS

SHEET NO.:
E-401

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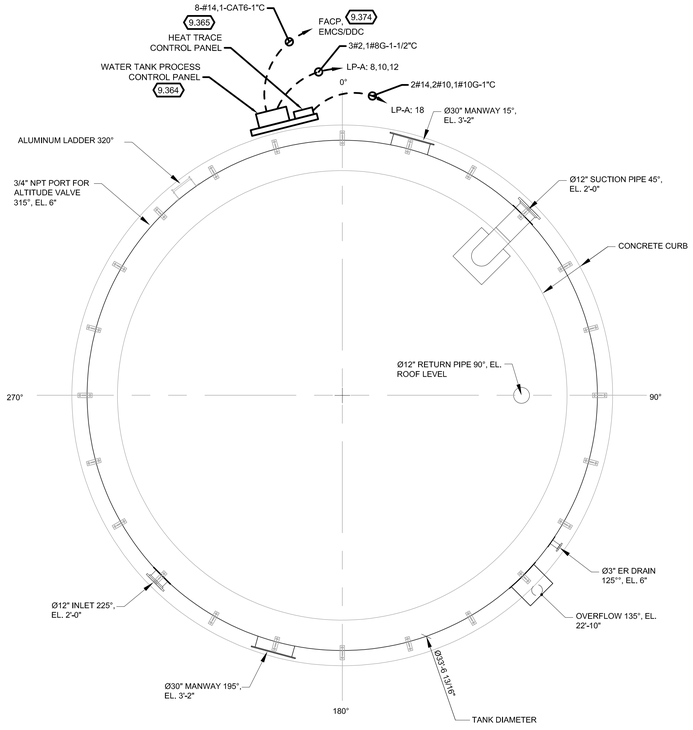
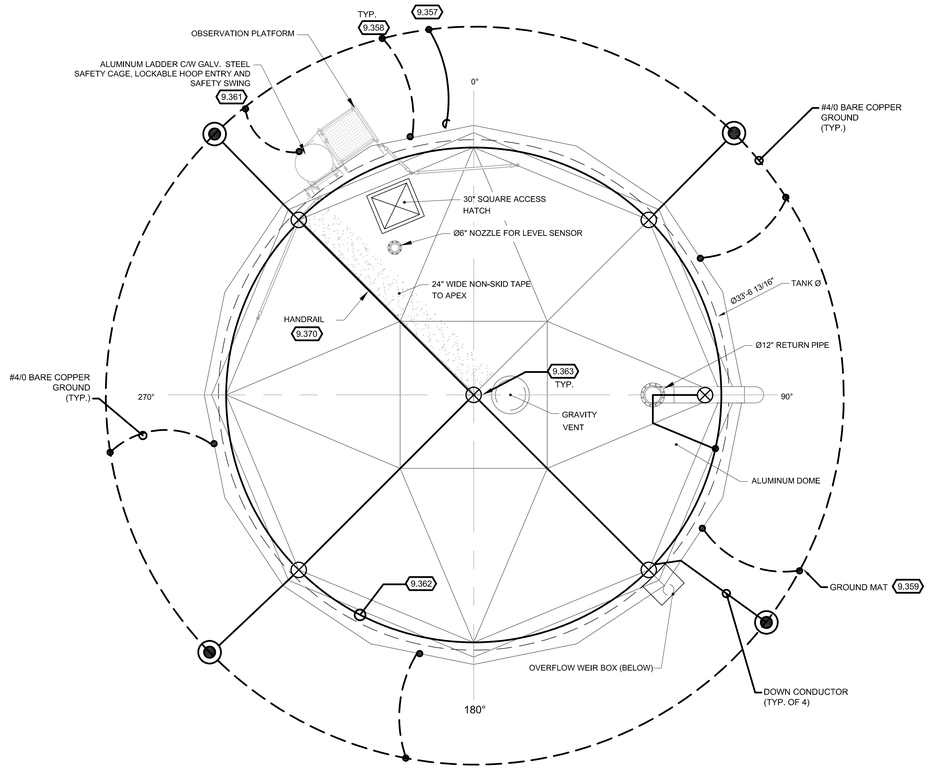


1 TANK ELECTRICAL FLOOR PLAN
NTS



2 TANK ELECTRICAL ROOF PLAN
NTS

WATER TANK GENERAL NOTES:

1. ELECTRICAL SYSTEMS SUPPORTED BY THE TANK SHALL BE COORDINATED WITH THE TANK MANUFACTURER IN ORDER TO PROVIDE ANY NECESSARY SUPPORTS OR FITTINGS NOT SUITABLE FOR FIELD INSTALLATION.
2. CONDUCTORS SHALL BE ROUTED AS INCONSPICUOUSLY AS POSSIBLE.
3. LIGHTNING PROTECTION SYSTEM (LPS) TO BE INSTALLED PER UFC 3-575-01, AFI 32-1065 AND NFPA 780. ALL LATEST EDITION. THE EXISTING LPS IS TO BE TESTED, ACCEPTED AND CERTIFIED BY THE 3RD PARTY REQUIREMENTS OF UFC 3-575-01, SECTION 3-1 AND AFI 32-1065 SECTION 6.1. ADDITIONAL RESPONSIBILITY OF 3RD PARTY TESTING WILL BE TO TEST ALL AIR TERMINALS AND ROOF MOUNTED LPS BONDED ELECTRICAL, MECHANICAL AND STEEL ROOF PENETRATIONS. THIS TESTING WILL BE COMPLETED ON THE ENTIRE TANK LPS.
4. ROUTE DOWN CONDUCTORS WITHIN 1" SCHEDULE 80 PVC CONDUIT.
5. SEE LIGHTNING AIR TERMINAL DETAIL ON SHEET E-505.
6. ANY ELECTRICAL EQUIPMENT OR SYSTEMS NOT PROVIDED BY THE TANK MANUFACTURER SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE.
7. PROVIDE HEAT TRACE FOR ANY EXPOSED ABOVE GRADE WATER PIPING NOT EXPLICITLY SHOWN ON THESE PLANS.

KEYED NOTES:

9.357. BOND EQUIPMENT RACK STRUT TO GROUND MAT.

9.358. BOND TANK STRUCTURAL STEEL TO GROUND MAT. PROVIDE EXOTHERMIC CONNECTIONS TO METAL SUPPORTS.

9.359. GROUND RING. SPACE 5' TO 8' AWAY FROM FOUNDATION AND 30" BELOW GRADE, MINIMUM.

9.360. TANK ELEVATION IS AN EXAMPLE OF TANK LAYOUT. REFERENCE SHEET C-508. TANK IS APPROXIMATELY 33 FEET IN DIAMETER AND APPROXIMATELY 47 FEET TALL. REFER TO SHEETS D-103 AND D-104 FOR DETAILS. COORDINATE EXACT DIMENSIONS AND EQUIPMENT LOCATIONS WITH TANK MANUFACTURER.

9.361. BOND METALLIC LADDER TO GROUND MAT.

9.362. CLASS 1 ALUMINUM ROOF CONDUCTOR.

9.363. 1/2"x12" CLASS 1 ALUMINUM AIR TERMINAL.

9.364. WATER TANK PROCESS CONTROL PANEL. FURNISHED BY TANK MANUFACTURER, INSTALLED BY CONTRACTOR.

9.365. HEAT TRACE CONTROL PANEL SHALL BE SINGLE-PHASE, FUSED AT 20A, AND SHALL PROVIDE INDIVIDUAL CIRCUIT PROTECTION TO EACH HEAT TRACE BRANCH. EACH BRANCH OCPD SHALL BE GFI. PANEL SHALL BE EQUIPPED WITH A SINGLE DISCONNECT TO DISCONNECT ALL HEAT TRACE POWER SIMULTANEOUSLY. ENCLOSURE SHALL BE RATED NEMA 4. PANEL SHALL BE EQUIPPED WITH A HAND-OFF-AUTO SWITCH FOR AUTOMATIC THERMOSTAT CONTROL OR MANUAL CONTROL. MOUNT THERMOSTAT ADJACENT TO PANEL. PROVIDE ALARM OUTPUT IN THE EVENT ANY HEAT TRACE BRANCHES LOSE POWER. ALARM SHALL REPORT TO FIRE ALARM MONITORING MODULE LOCATED IN FIRE PUMP ROOM OF B158. REFER TO FIRE ALARM DRAWINGS FOR PRECISE LOCATIONS. INCREASE CONTROL PANEL OCPD AND FEEDER SIZING AS NEEDED BASED ON MANUFACTURER'S RECOMMENDATIONS.

9.366. HEAT TRACE POWER CONNECTION BOX. UTILIZE PIPE STRAP TO MOUNT TO PIPING BELOW INSULATION.

9.367. 2#12,1#12G-1"C FROM HEAT TRACE CONNECTION BOX TO DISCONNECT MOUNTED ON EQUIPMENT RACK.

9.368. ROUTE SELF-REGULATING HEAT TRACE ALONG INDICATED PIPE, FLANGE, OR JOINT. HEAT TRACE W/FT SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION BASED ON THE THICKNESS OF PIPE INSULATION INSTALLED. TARGET TEMPERATURE SHALL BE 40°F.

9.369. 3#10,1#10G-1"C FROM IMMERSION HEATER TO WATER TANK PROCESS CONTROL PANEL.

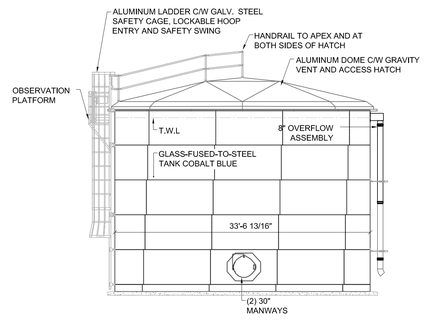
9.370. ROUTE LIGHTNING CONDUCTOR ALONG HANDRAIL OR UTILIZE HANDRAIL AS LIGHTNING CONDUCTOR IF METAL THICKNESS EXCEED 0.064".

9.371. J-BOX ATTACHED TO STAINLESS STEEL CABLE CLAMP ROD. ANCHOR TO PIPE FLANGE. SEE SUBMERSIBLE FLOAT SWITCH DETAIL ON THIS SHEET FOR ADDITIONAL INFORMATION.

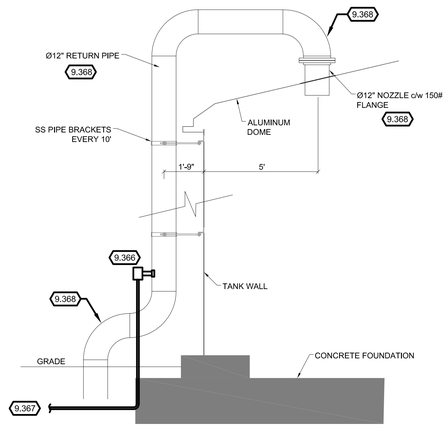
9.372. PROVIDE 1"C FROM LEVEL SENSOR TO PROCESS CONTROL PANEL. SENSOR CABLING FURNISHED BY LEVEL SENSOR MANUFACTURER.

9.373. NOT SHOWN. TEMPERATURE SENSORS ARE FURNISHED AND INSTALLED BY THE TANK MANUFACTURER. CONTRACTOR SHALL PROVIDE RACEWAY AND CABLING FROM SENSORS TO CONTROL PANEL. DO NOT ROUTE CONTROLS CABLE IN SAME RACEWAY AS POWER.

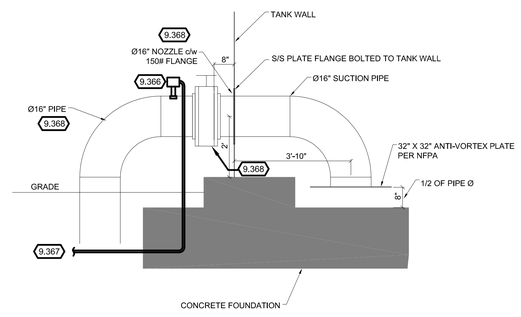
9,374. PROVIDE FOUR (4) DIGITAL OUTPUTS TO FIRE ALARM MONITORING MODULES LOCATED IN THE FIRE PUMP ROOM OF B158. REFER TO FIRE ALARM DRAWINGS FOR PRECISE LOCATIONS. PROVIDE ONE (1) CAT6 CABLE TO EMCS/DDC CONTROLLER.



3 TANK ELEVATION 9.360
NTS



4 EMERGENCY DRAIN HEAT TRACE DETAIL
NTS



5 TANK INSULTATION AND HEATING
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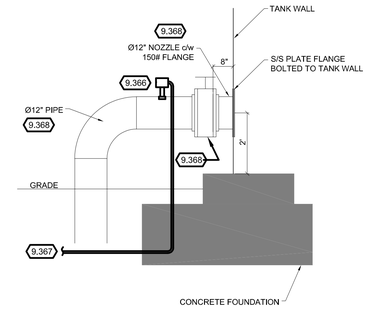

6 TANK INSULTATION AND HEATING
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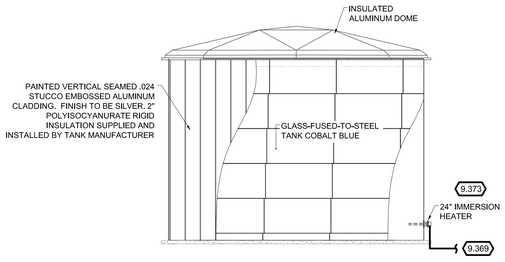

7 IMMERSION HEATER DETAIL
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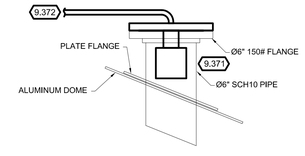

8 LEVEL SENSOR DETAIL
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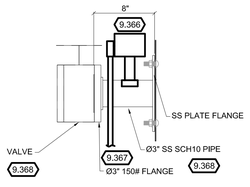

9 EMERGENCY DRAIN HEAT TRACE DETAIL
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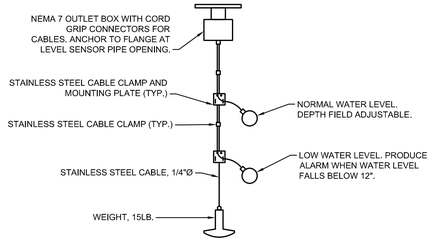

10 SUBMERSIBLE FLOAT SWITCH DETAIL
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SHEET CONTENTS
B158 ENLARGED WATER STORAGE TANK ELECTRICAL PLAN

SHEET NO.
E-402

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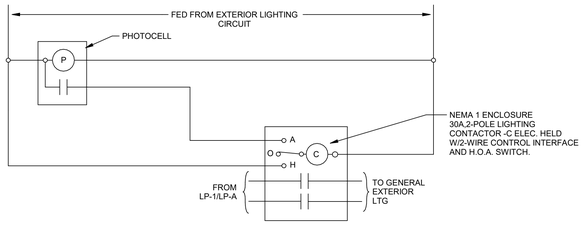

1 EXTERIOR LIGHTING CONTROL DETAIL
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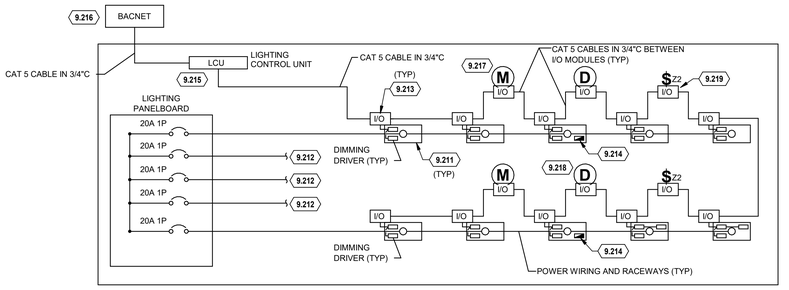


KEYED NOTES:

9.219 I/O MODULE INTEGRAL WITH ZONE CONTROL SWITCHES, OCCUPANCY SENSORS, AND DAYLIGHT SENSORS.

9.211 LED HIGH-BAY FIXTURES WITH DIMMING BALLASTS.

9.212 TO OTHER I/O DEVICES OF HIGH-BAY FIXTURES, PHOTOELECTRIC SENSORS, SWITCHES, ETC.

9.213 I/O MODULE AND CONTROL WIRING TO BE FACTORY INSTALLED OR FIELD INSTALLED PER MANUFACTURER'S RECOMMENDATIONS TO MAINTAIN WARRANTY.

9.214 EMERGENCY BALLAST. CONNECT AHEAD OF SWITCHES, DIMMING BALLASTS, I/0 MODULES, ETC.

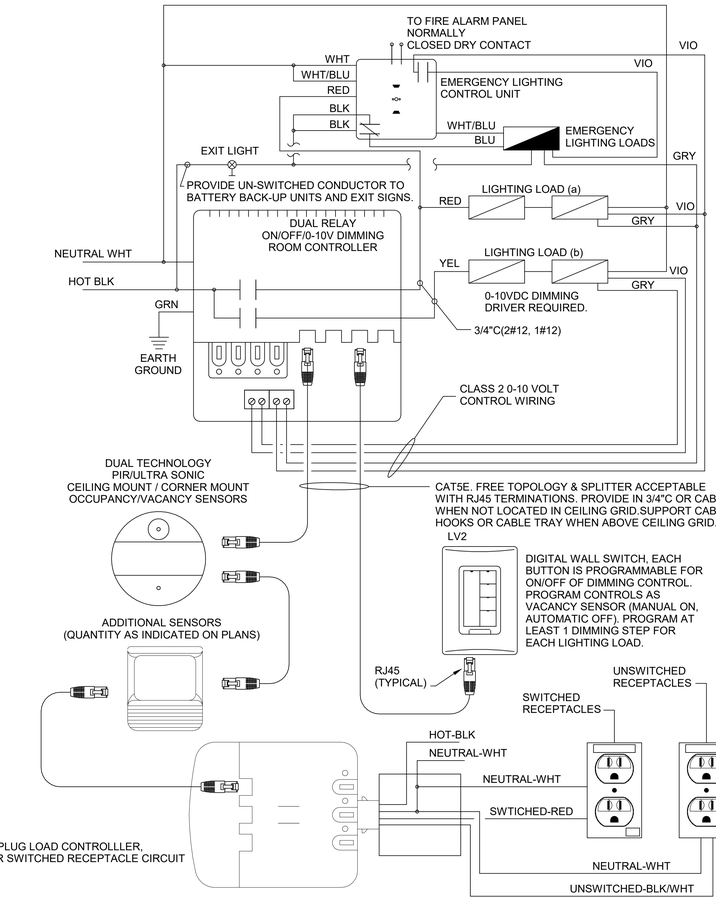
9.215 PROVIDE WALL MOUNTED ELECTRONIC, PROGRAMMABLE LIGHTING CONTROL PANEL THAT COLLECTS, PROCESSES, AND DISTRIBUTES LIGHTING CONTROL INFORMATION TO I/O MODULES, ZONE CONTROLLERS, SCENE CONTROLLERS, AND ANY ADDITIONAL DEVICES INDICATED. SYSTEM SHALL HAVE COMMUNICATIONS CAPABILITY WITH BUILDING DDC.

9.216 PROVIDE BACNET INTERFACE MODULE FOR COMMUNICATION WITH BUILDING DDC.

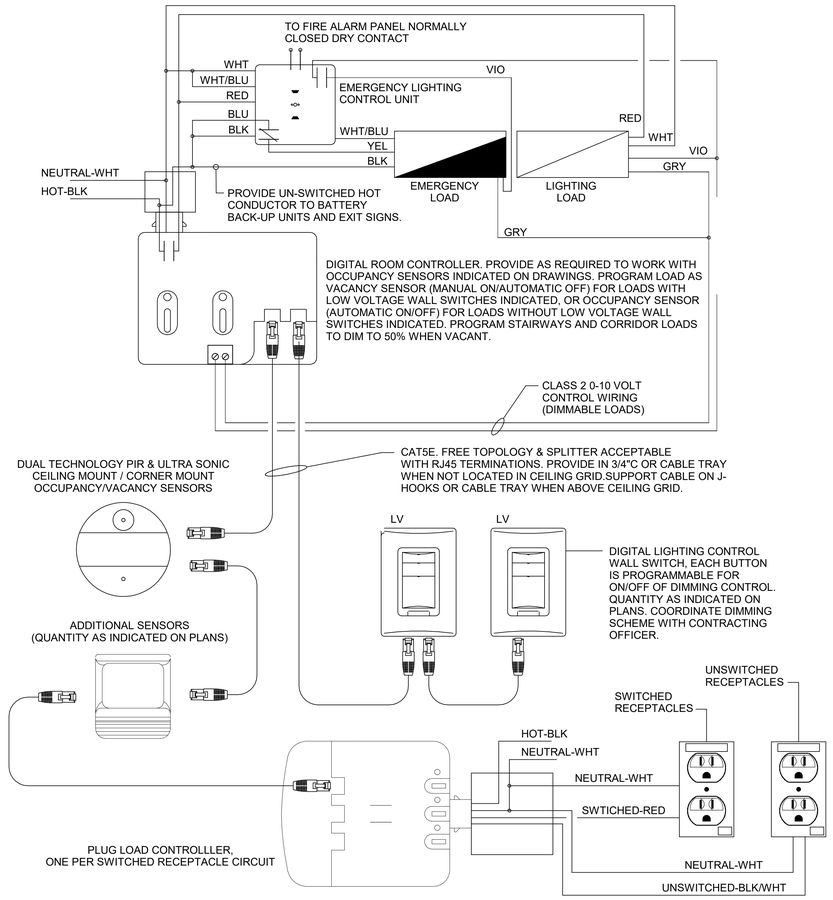
9.217 HIGH-BAY OCCUPANCY SENSOR AS NEEDED TO COVER ENTIRE HANGAR.

9.218 DAYLIGHT SENSORS INSTALLED AS NEEDED TO COVER AREAS WITHIN DAYLIGHTING ZONES IN HANGAR.

2 HIGH BAY LIGHTING CONTROL
NTS



3 CLASSROOM/BREAK ROOM LIGHTING AND PLUG LOAD CONTROLS
NTS



4 TYPICAL LIGHTING & PLUG LOAD CONTROLS
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SHEET CONTENTS
ELECTRICAL DETAILS

SHEET NO.:
E-501

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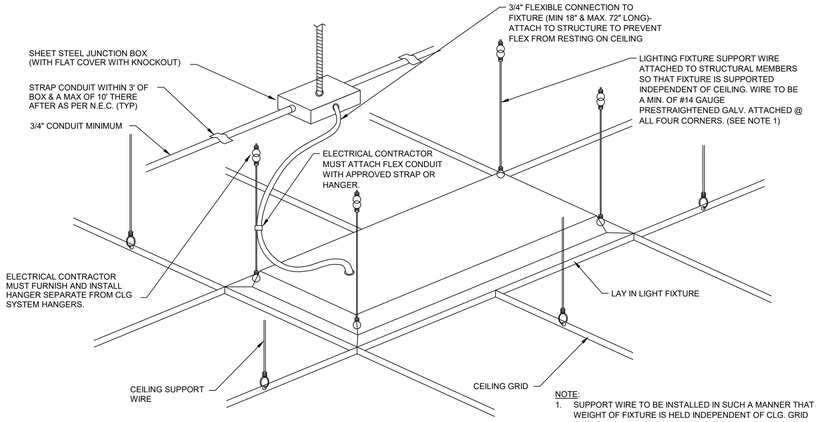
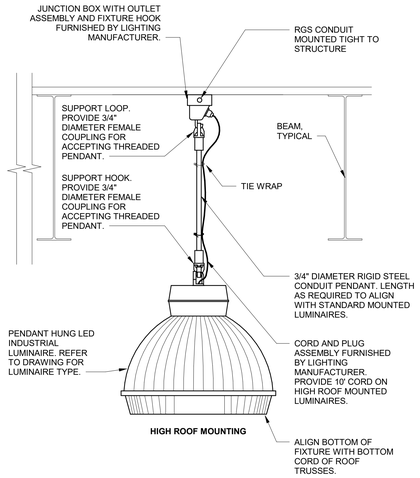
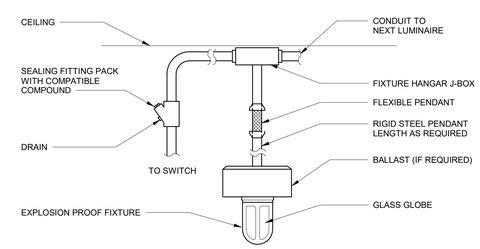


NOTE:
1. SUPPORT WIRE TO BE INSTALLED IN SUCH A MANNER THAT WEIGHT OF FIXTURE IS HELD INDEPENDENT OF CLG. GRID THEREFORE WIRES MUST BE TIGHT WITH NO SLACK.
2. FLEXIBLE CONNECTION FROM FIXTURE TO JUNCTION BOX MUST BE MIN. 18" & MAX. 72" LONG.

1 LAY-IN MOUNTING LED LIGHT
NTS

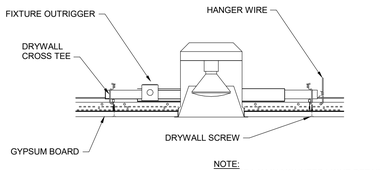


2 LED LOW-BAY LUMINAIRE MOUNTING
NTS



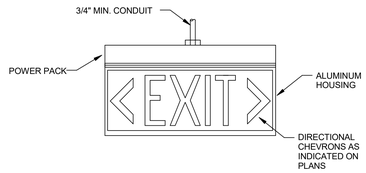
NOTE
1. ALL CONDUIT TO BE RIGID STEEL; ALL FITTINGS TO BE EXPLOSION PROOF.

3 EXPLOSION PROOF LUMINAIRE MOUNTING
NTS

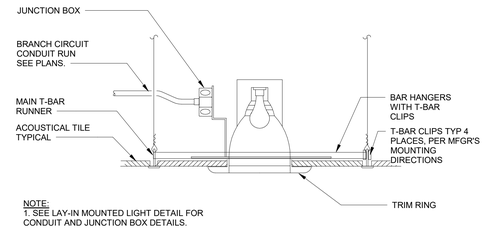


NOTE:
1. SEE LAY-IN MOUNTED LIGHT DETAIL FOR CONDUIT AND JUNCTION BOX DETAILS.

4 RECESSED DOWN LIGHT DETAIL
NTS

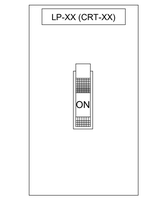


5 EXIT SIGN DETAIL
NTS



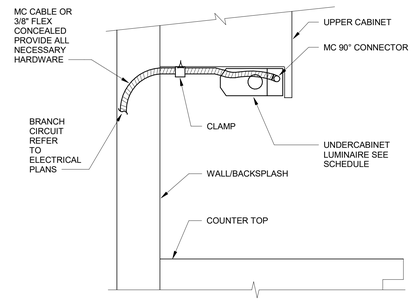
NOTE:
1. SEE LAY-IN MOUNTED LIGHT DETAIL FOR CONDUIT AND JUNCTION BOX DETAILS.

6 RECESSED DOWNLIGHT LAY-IN CEILING MOUNTED
NTS

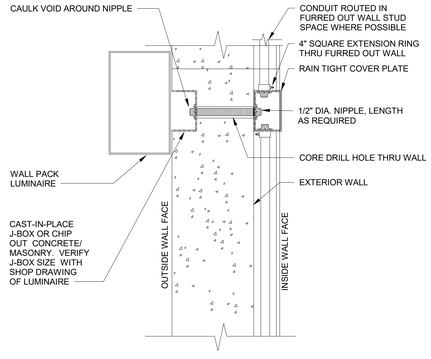


NOTE:
1. BLACK LETTERING ON WHITE BACKGROUND

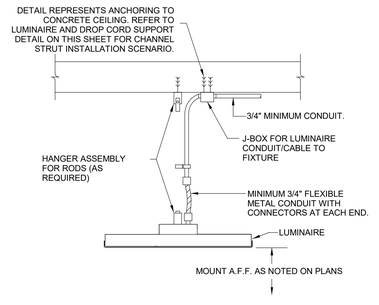
7 LIGHT SWITCH DETAIL
NTS



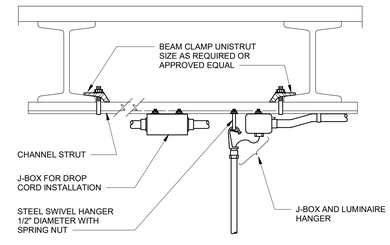
8 UNDER CABINET LUMINAIRE MOUNTING
NTS



9 EXTERIOR WALL MOUNTED LIGHT LUMINAIRE
NTS



10 PENDANT MOUNT LIGHT DETAIL
NTS



11 LUMINAIRE AND DROP CORD SUPPORT DETAIL
NTS

TETRA TECH
Mead & Hunt
Joint Venture with
Mason & Hanger
710 Avis Drive, Suite 100
Ann Arbor, MI 48108
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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.:	VGLZ162323
M&H NO.:	3141700-181848.01
DATE:	December 16 2022
DESIGNED BY:	JKH
DRAWN BY:	JKH
CHECKED BY:	RSR

DO NOT SCALE DRAWINGS

SHEET CONTENTS
ELECTRICAL DETAILS

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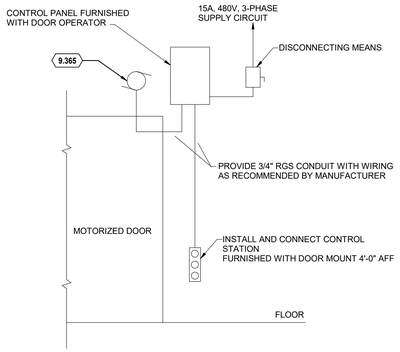
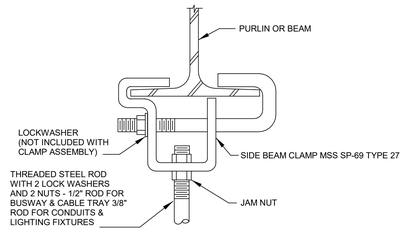


KEYED NOTES:

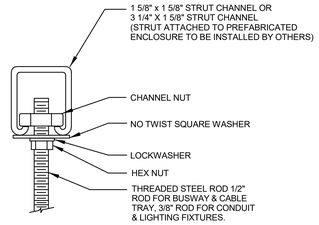
9.365 BASIS OF DESIGN IS FOR A 1 HP, 480 VOLT, THREE PHASE MOTOR. ACTUAL MOTOR PROVIDED SHALL NOT EXCEED 1-1/2 HP, 480 VOLT, THREE PHASE.

1 MOTORIZED DOOR DETAIL
NTS

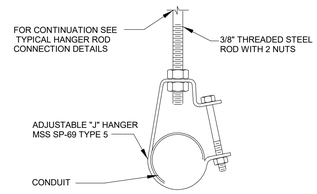


NOTE:
1. MSS SP-69: REFERENCE MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY INC. STANDARD PRACTICE SP-69 2002 EDITION

2 HANGER ROD CONNECTION TO BEAM CLAMP DETAIL
NTS

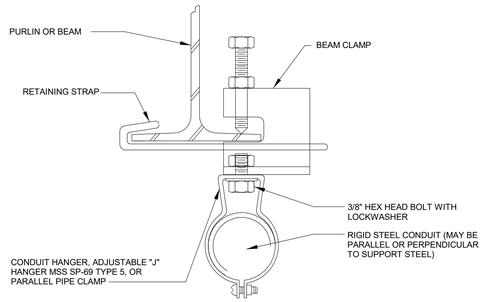


3 HANGER ROD CONNECTION TO STRUT CHANNEL DETAIL
NTS



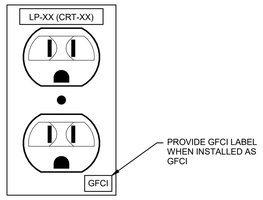
NOTE:
1. MSS SP-69: REFERENCE MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY INC. STANDARD PRACTICE SP-69 2002 EDITION

4 CONDUIT HANGER DETAIL
NTS



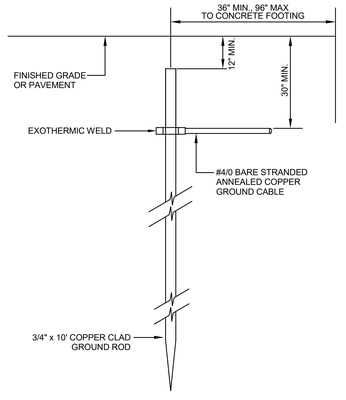
NOTE:
1. SIDE BEAM CLAMP, INVERTED TOP BEAM CLAMP, OR J-BOLT TYPE BEAM CLAMP (WITH LOCKWASHER UNDER NUT INSTEAD OF BOLT HEAD) MAY BE SUBSTITUTED FOR BEAM CLAMP WITH RETAINING STRAP (SEE TYPICAL HANGER ROD CONNECTION DETAILS - SIMILAR.)

5 BEAM CLAMP AND CONDUIT HANGER DETAIL
NTS

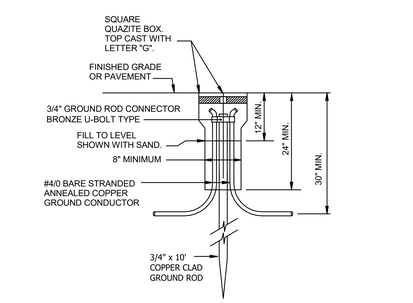


NOTE:
1. BLACK LETTERING ON WHITE BACKGROUND

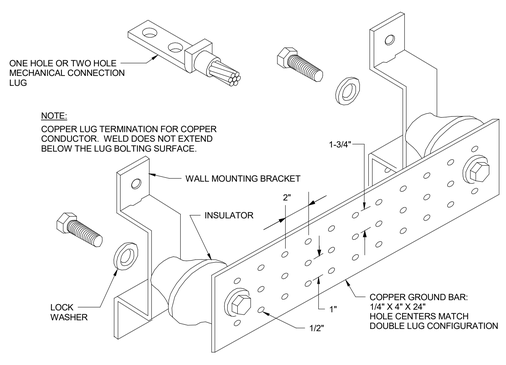
6 RECEPTACLE FACEPLATE DETAIL
NTS



9 GROUND ROD DETAIL
NTS

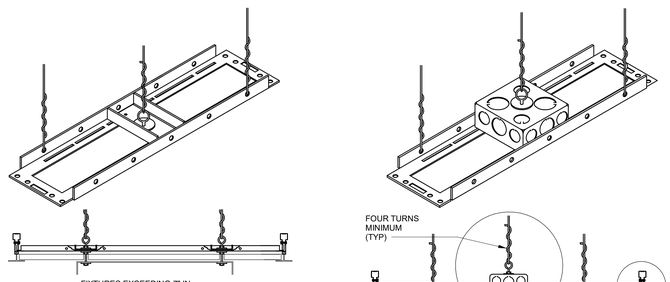


10 GROUND ROD TEST WELL DETAIL
NTS

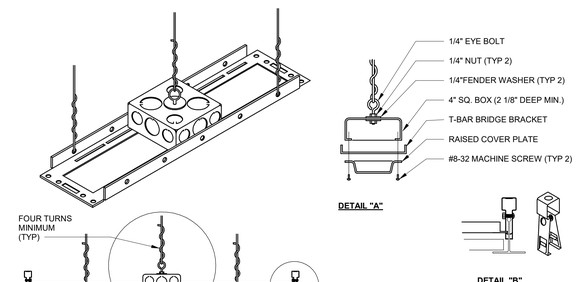


7 STATIC GROUNDING CONDUCTOR BUILDING ENTRY
NTS

8 TYPICAL GROUNDING TERMINAL BUS BAR
NTS



NOTES
A. CONTRACTOR SHALL PROVIDE A T-BAR SUPPORT BRIDGE FOR SURFACE OR PENDANT MOUNTED LIGHTING FUXTURES, EXIT FIXTURES, ELECTRIFIED SIGNAGE, SIGNALING DEVICES, DROP CORD, CEILING MOUNTED OUTLETS ETC..



DETAIL "C"

DETAIL "A"

DETAIL "B"

INSTALLATION INSTRUCTIONS

1. POSITION JUNCTION BOX AND APPROPRIATE RAISED COVER PLATE ("MUD RING") ON T-BAR BRIDGE SUPPORT BRACKET AND TIGHTEN IN PLACE. SEE DETAIL "A".
2. POSITION CROSS SUPPORT BRACKET OF T-BAR BRIDGE SUPPORT BRACKET AND TIGHTEN IN PLACE WITH TWO #8 SELF TAPPING SCREWS. SEE DETAIL "A"
3. SET T-BAR BRIDGE CROSS SUPPORT BRACKET INTO PLACE IN CEILING GRID.
4. INSTALL CODE GAUGE SUPPORT WIRES-MINIMUM 1 WIRE PER BOX OR CROSS SUPPORT AND 2 WIRE FOR SUPPORT BRIDGE. WIRES SHOULD EXTEND VERTICALLY TO STRUCTURE.
5. PROVIDE CUT-OUT IN CEILING TILE AS REQUIRED.
6. INSTALL ACOUSTICAL T-BAR SUPPORT CLIPS AT BOTH ENDS OF BRIDGE SUPPORT BRACKET THROUGH RECTANGULAR SLOTS PROVIDED. SEE DETAIL "B".

11 T-BAR SUPPORT BRIDGE FOR SURFACE MOUNTED DEVICES INSTALLED IN CEILING TILE
NONE

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
DESIGNED BY: JKH
DRAWN BY: JKH
CHECKED BY: RSR
DO NOT SCALE DRAWINGS

SHEET CONTENTS
ELECTRICAL DETAILS

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E-503

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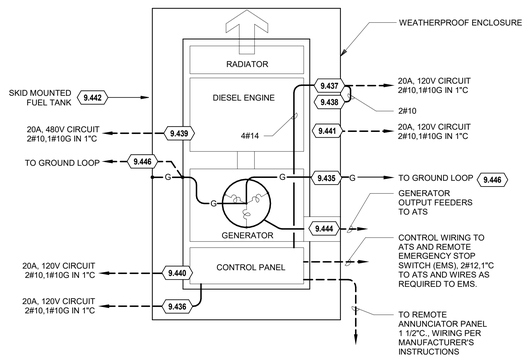


GENERAL NOTES:

1. VERIFY CONDUIT STUB-UP LOCATIONS WITH SHOP DRAWINGS.
2. COMBINE CIRCUITS 9.440 9.441 IN A SINGLE 1" CONDUIT.
3. COMBINE CIRCUITS 9.436 9.437 IN A SINGLE 1" CONDUIT.
4. REFER TO E-702 FOR CIRCUITS SERVING BATTERY CHARGERS, HEATERS, LIGHTING, AND ANY OTHER AUXILIARY GENERATOR SYSTEMS.

KEYED NOTES:

9.435. GROUND LUG.

9.436. JUNCTION BOX FOR DUPLEX OUTLET, 120V DOME LIGHTS, AND TIMER LIGHT SWITCH.

9.437. BATTERY CHARGER WITH WIRING TO CONTROL PANEL AND REMOTE ANNUNCIATOR.

9.438. STARTING BATTERIES.

9.439. JACKET WATER HEATER (SET AT 110 DEGREES F.).

9.440. JUNCTION BOX FOR CONTROL PANEL AND GENERATOR ANTI-CONDENSATION HEATERS.

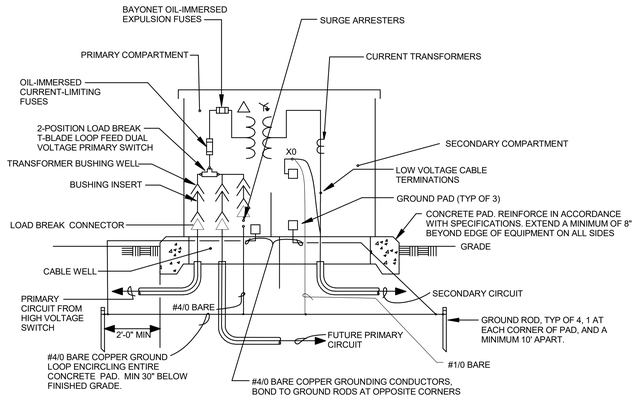
9.441. BATTERY HEATER (50 - 60 DEGREES F. TEMPERATURE RANGE).

9.442. SKID FUEL TANK - TWO LEVEL SENSORS, ONE LEAK SENSOR WIRING

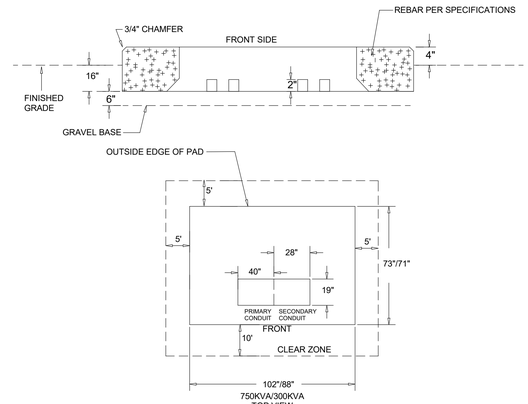
9.443. REFER TO GROUNDING PLAN ON E-132 FOR GENERATOR GROUND LOOP.

9.444. LOAD TERMINATION JUNCTION BOX WITH CIRCUIT BREAKERS FOR EACH SERVICE INDICATED. SEE E-702.

1 OUTDOOR DIESEL GENERATOR SCHEMATIC WIRING INSTALLATION
NTS

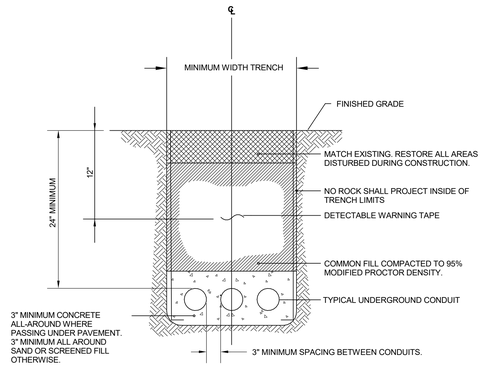


2 PADMOUNT TRANSFORMER DETAIL
NTS

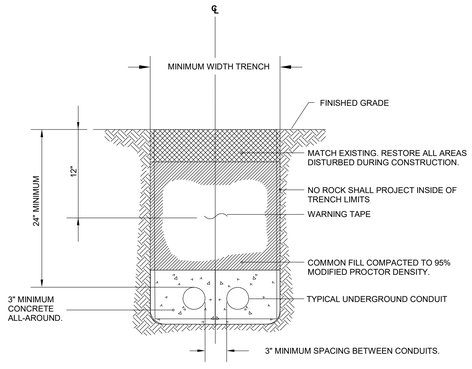


NOTES:
1. SEE E-701 AND E-702 FOR NUMBER AND SIZE OF PRIMARY CONDUITS.
2. NO SECONDARY CABLES MAY BE PULLED UNTIL TRANSFORMER IS PLACED.
3. EXACT PAD DIMENSIONS SHALL BE COORDINATED WITH SELECTED TRANSFORMER DIMENSIONS.

3 TRANSFORMER PAD DETAIL
NTS



4 TRENCHING DETAIL - SECONDARY
NTS



5 TRENCHING DETAIL - PRIMARY
NTS

NOTES:
1. REFER TO E-701 FOR ADDITIONAL INFORMATION ON MDP REQUIREMENTS.
2. DEPTH OF SWITCHBOARD SHALL NOT EXCEED 24".

6 SWITCHBOARD MDP ELEVATION
3/4" = 1'-0"

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ISSUED
12/16/22 TYPE B3 FINAL
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DESIGNED BY: JKH
DRAWN BY: JKH
CHECKED BY: RSR
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SHEET CONTENTS
ELECTRICAL DETAILS

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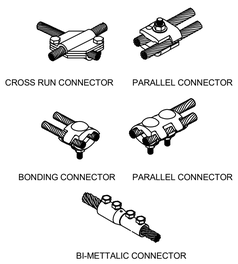
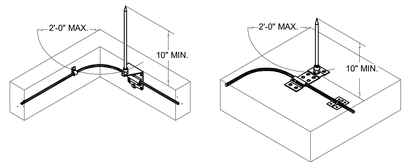
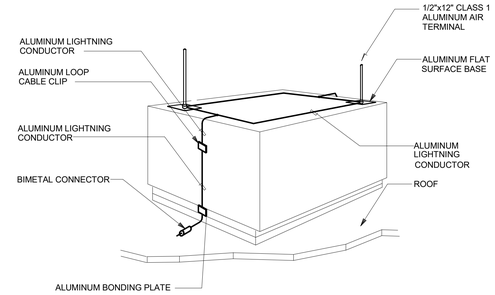


1 TYPICAL CABLE CONNECTORS
NTS



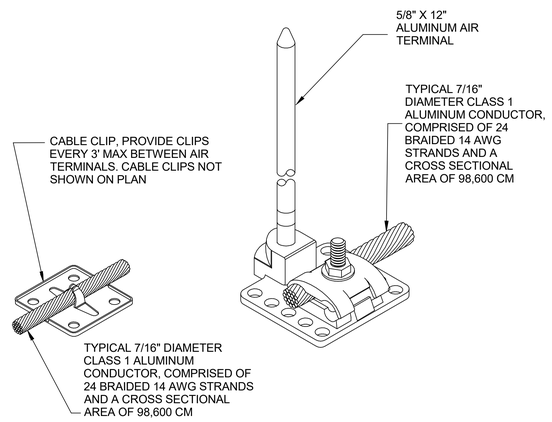
NOTE: AIR TERMINAL MUST BE WITHIN 2' FROM AN OUTSIDE CORNER AS INDICATED, THIS WOULD APPLY TO ALL SITUATIONS. PARAPETS, FLAT ROOFS, METAL UNITS, ETC.

2 PLACEMENT OF AIR TERMINAL AT OUTSIDE CORNERS
NTS



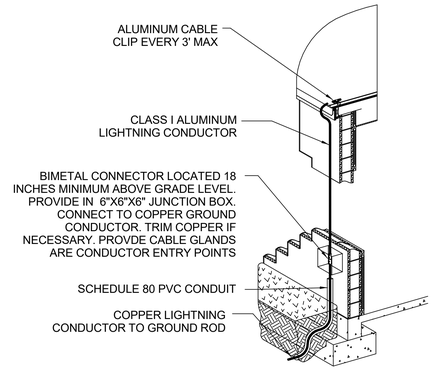
NOTES:
1. PROVIDE NFPA 780 CODE REQUIRED NUMBER OF AIR TERMINALS. MINIMUM OF TWO ON DIAGONAL CORNERS.

3 AIR TERMINAL AT LARGE ROOF EQUIPMENT
NTS



NOTE:
1. ANY MATERIAL THAT COMES IN CONTACT WITH THE ROOF (DEVICES, ADHESIVES, ETC.) SHALL BE APPROVED BY THE ROOFING SUBCONTRACTOR TO MAINTAIN ROOFING INTEGRITY AND WARRANTY. LIGHTNING PROTECTION SUBCONTRACTOR TO PROVIDE DOCUMENTATION OF ROOFING SUBCONTRACTOR'S ACCEPTANCE OF REQUIRED DEVICES.

4 MEMBRANE ROOF DETAIL
NTS



NOTE:
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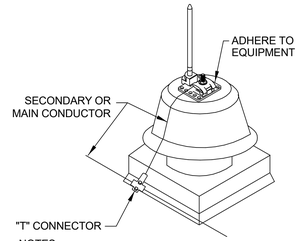
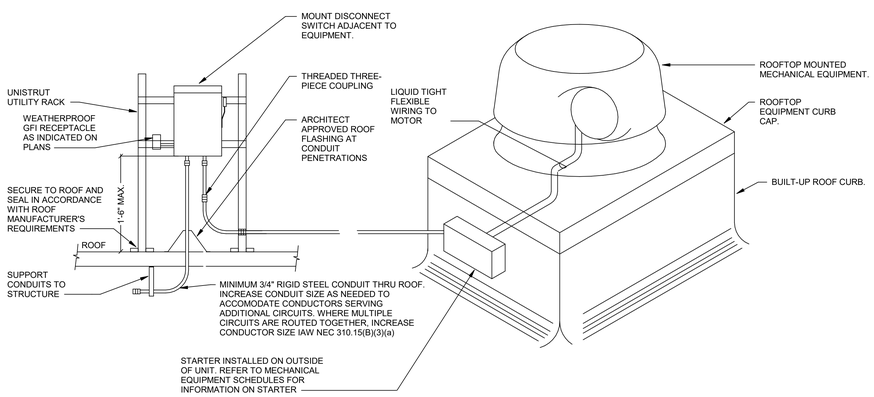
5 LIGHTNING PROTECTION DOWN CONDUCTOR DETAIL
NTS



NOTES:
1. ANY MATERIAL THAT COMES IN CONTACT WITH THE ROOF (DEVICES, ADHESIVES, ETC.) MUST BE APPROVED BY THE ROOFING SUBCONTRACTOR TO MAINTAIN ROOFING INTEGRITY AND WARRANTY. LIGHTNING PROTECTION SUBCONTRACTOR TO PROVIDE DOCUMENTATION OF ROOFING SUBCONTRACTOR'S ACCEPTANCE OF REQUIRED DEVICES.
2. IF METAL IS LESS THAN 3/16" THICK FULL PROTECTION IS REQUIRED.
3. IF METAL IS MORE THAN 3/16" THICK, AIR TERMINAL MUST NOT BE REQUIRED. BOND METAL DIRECTLY TO LIGHTNING PROTECTION CONDUCTOR GRID.

6 AIR TERMINAL AT SMALL ROOF EQUIPMENT
NTS



7 ELECTRICAL ROOF MOUNTING DETAIL
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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
DESIGNED BY: JKH
DRAWN BY: JKH
CHECKED BY: RSR
DO NOT SCALE DRAWINGS.

SHEET CONTENTS
ELECTRICAL DETAILS

SHEET NO.:
E-505

12/15/2022 9:10:29 AM C:\Users\jesse.hartan\Documents\3141700-181848.01-E-Central-2020_jesse.hartanEVCLV.rvt

Switchboard: MDP

Location: ELECTRICAL 116
Supply From: T-154
Mounting: FLOOR
Enclosure: NEMA 1

Volts: 480Y/277V
Phases: 3
Wires: 4

A.I.C. Rating: 22000
Mains Type: MCB
Mains Rating: 600 A
MCB Rating: 600 A

Notes:

CKT	Circuit Description	# of Poles	Frame Size	Trip Rating	Load	Remarks
1	LP-1	3	100 A	100 A	12668 VA	
2	HV-HVAC	3	225 A	225 A	110405 VA	
3	T-RDP	3	300 A	300 A	347173 VA	
4	RTU-1	3	100 A	35 A	18288 VA	
5	SPARE	3	100 A	100 A	0 VA	
6	SPARE	3	100 A	100 A	0 VA	
7	BUSSED SPACE	--	--	--	0 VA	--
8	BUSSED SPACE	--	--	--	0 VA	--
9	400HZ GPU	3	100 A	80 A	55416 VA	
10	SURGE PROTECTION DEVICE	3	--	60 A	0 VA	
11						
12						
				Total Conn. Load:	515939 VA	
				Total Amps:	621 A	

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Motor	68820 VA	80.00%	55056 VA		
Other	898 VA	100.00%	898 VA	**Total Conn. Load:**	515.9 kVA
Power	25975 VA	100.00%	25975 VA	**Total Est. Demand:**	245.1 kVA
Lighting	12050 VA	100.00%	12050 VA	**Total Conn. Current:**	620.6 A
Heating	15049 VA	100.00%	15049 VA	**Total Est. Demand Current:**	294.8 A
Receptacles	28020 VA	67.84%	19010 VA		
Mech	21257 VA	80.00%	17006 VA		
Aircraft Power - 25%	288000 VA	25.00%	72000 VA		
Aircraft Power - 50%	55416 VA	50.00%	27708 VA		

Notes:
1. PHASE, NEUTRAL, AND GROUND BUSSES SHALL BE COPPER.

PANELBOARD: HV-HVAC

LOCATION: ELECTRICAL 116
SUPPLY FROM: MDP
MOUNTING: Surface

480Y/277V **VOLTAGE**
3 **PHASE**
4 **WIRE**

MINIMUM INTERRUPTING CAPACITY: 22000
MAIN TYPE: MCB
MAIN SIZE: 225 A

CKT	DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	DESCRIPTION	CKT
1	EXISTING AC-1	20 A	3	3.3	0.4					3	15 A	MAU-1	2
3	--	--	--			3.3	0.4			--	--	--	4
5	--	--	--					3.3	0.4	--	--	--	6
7	EXISTING AC-2	35 A	3	7.5	1.9					3	15 A	OVERHEAD DOORS	8
9	--	--	--			7.5	1.9			--	--	--	10
11	--	--	--					7.5	1.9	--	--	--	12
13	EXISTING EF, UH, MAU - DOCK 104	30 A	3	5.3	1.6					3	15 A	EXISTING SOLV. PUMP, UH - FUEL TANK 119	14
15	--	--	--			5.3	1.6			--	--	--	16
17	--	--	--					5.3	1.6	--	--	--	18
19	EXISTING EF, UH, MAU - DOCK 103	30 A	3	5.6	3.0					3	15 A	HWP-1	20
21	--	--	--			5.6	3.0			--	--	--	22
23	--	--	--					5.6	3.0	--	--	--	24
25	NITROGEN GENERATOR - COMP*	15 A	3	1.7	3.0					3	15 A	HWP-2	26
27	--	--	--			1.7	3.0			--	--	--	28
29	--	--	--					1.7	3.0	--	--	--	30
31	EUH-1, 2 - ELEC 116, FIRE PROT. ROOM 117	20 A	3	3.3	1.7					3	15 A	EUH-3 - UTILITY 118	32
33	--	--	--			3.3	1.7			--	--	--	34
35	--	--	--					3.3	1.7	--	--	--	36
37	SPARE	15 A	3	0.0	0.0					3	15 A	SPARE	38
39	--	--	--			0.0	0.0			--	--	--	40
41	--	--	--					0.0	0.0	--	--	--	42
				Total Load:	36.8 kVA		36.8 kVA		36.8 kVA				

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	EST. DEMAND	PANEL TOTALS	
Motor	61284 VA	80.00%	49027 VA		
Mech	1245 VA	80.00%	996 VA	**TOTAL PANELBOARD KVA:**	82.5 kVA
Power	5000 VA	100.00%	5000 VA	**TOTAL EST. DEMAND:**	70.0 kVA
				TOTAL CONNECTED AMPS:	133 A
				TOTAL EST. DEMAND AMPS:	84 A

HV-HVAC NOTES:
1. PHASE, NEUTRAL, AND GROUND BUSSES SHALL BE COPPER
2. EACH CIRCUIT SHALL HAVE A SEPARATE NEUTRAL. SHARED NEUTRALS ARE NOT PERMITTED.
* PROVIDE CAPABILITY TO LOCK IN "ON" POSITION.

PANELBOARD: LP-1

LOCATION: ELECTRICAL 116
SUPPLY FROM: MDP
MOUNTING: Surface

480Y/277V **VOLTAGE**
3 **PHASE**
4 **WIRE**

MINIMUM INTERRUPTING CAPACITY: 22000
MAIN TYPE: MCB
MAIN SIZE: 100 A

CKT	DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	DESCRIPTION	CKT
1	LTG - STOR 126, STOR 127	20 A	1	0.2	0.6					1	20 A	LTG - EXTERIOR	2
3	LTG - CORR 108, MEN'S 111, WOMEN'S 112	20 A	1			0.3	0.3			1	20 A	LTG - UTILITY 118, FIRE PROT. RM 117 , ELEC...	4
5	LTG - CORR. 109, LAUNDRY 125, WASH 123	20 A	1					0.3	1.9	1	20 A	LTG - DOCK 103 FLOOD LIGHTS	6
7	LTG - BREAK 105, OFFICES 106, 107, 113	20 A	1	0.6	3.0					1	20 A	LTG - DOCK 104	8
9	LTG - FUEL TANK 119, OFFICE 115	20 A	1			0.7	3.0			1	20 A	LTG - DOCK 104	10
11	LTG - DOCK 104 FLOOD LIGHTS	20 A	1					1.9	0.0	1	20 A	SPARE	12
13	SPARE	20 A	1	0.0	0.0					1	20 A	SPARE	14
15	SPARE	20 A	1			0.0	0.0			1	20 A	SPARE	16
17	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	18
19	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	20
21	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	22
23	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	24
25	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	26
27	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	28
29	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	30
31	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	32
33	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	34
35	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	36
37	BUSSED SPACE	--	--	0.0	0.0					3	30 A	SURGE PROTECTION DEVICE	38
39	BUSSED SPACE	--	--			0.0	0.0			--	--	--	40
41	BUSSED SPACE	--	--					0.0	0.0	--	--	--	42
				Total Load:	4.4 kVA		4.3 kVA		4.0 kVA				

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	EST. DEMAND	PANEL TOTALS	
Other	698 VA	100.00%	698 VA		
Lighting	11978 VA	100.00%	11978 VA	**TOTAL PANELBOARD KVA:**	12.7 kVA
				TOTAL EST. DEMAND:	12.7 kVA
				TOTAL CONNECTED AMPS:	16 A
				TOTAL EST. DEMAND AMPS:	15 A

LP-1 NOTES:
1. PHASE, NEUTRAL, AND GROUND BUSSES SHALL BE COPPER
2. EACH CIRCUIT SHALL HAVE A SEPARATE NEUTRAL. SHARED NEUTRALS ARE NOT PERMITTED.

PANELBOARD: RP-400HZ

LOCATION: ELECTRICAL 116
SUPPLY FROM: 400HZ-GEN
MOUNTING: Surface

200Y/120V **VOLTAGE**
3 **PHASE**
4 **WIRE**

MINIMUM INTERRUPTING CAPACITY: 10000
MAIN TYPE: MCB
MAIN SIZE: 225 A

CKT	DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	DESCRIPTION	CKT
1	400HZ AIRCRAFT POWER	50 A	3	4.6	4.6					3	50 A	400HZ AIRCRAFT POWER	2
3	--	--	--			4.6	4.6			--	--	--	4
5	--	--	--					4.6	4.6	--	--	--	6
7	400HZ AIRCRAFT POWER	50 A	3	4.6	4.6					3	50 A	400HZ AIRCRAFT POWER	8
9	--	--	--			4.6	4.6			--	--	--	10
11	--	--	--					4.6	4.6	--	--	--	12
13	SPARE	50 A	3	0.0	0.0					3	50 A	SPARE	14
15	--	--	--			0.0	0.0			--	--	--	16
17	--	--	--					0.0	0.0	--	--	--	18
19	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	20
21	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	22
23	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	24
25	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	26
27	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	28
29	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	30
31	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	32
33	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	34
35	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	36
37	BUSSED SPACE	--	--	0.0	0.0					3	30 A	SURGE PROTECTION DEVICE	38
39	BUSSED SPACE	--	--			0.0	0.0			--	--	--	40
41	BUSSED SPACE	--	--					0.0	0.0	--	--	--	42
				Total Load:	18.5 kVA		18.5 kVA		18.5 kVA				

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	EST. DEMAND	PANEL TOTALS	
Aircraft Power - 50%	55416 VA	50.00%	27708 VA		
				TOTAL PANELBOARD KVA:	55.4 kVA
				TOTAL EST. DEMAND:	27.7 kVA
				TOTAL CONNECTED AMPS:	161 A
				TOTAL EST. DEMAND AMPS:	80 A

RP-400HZ NOTES:
1. PHASE, NEUTRAL, AND GROUND BUSSES SHALL BE COPPER
2. EACH CIRCUIT SHALL HAVE A SEPARATE NEUTRAL. SHARED NEUTRALS ARE NOT PERMITTED.

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
DESIGNED BY: JKH
DRAWN BY: JKH
CHECKED BY: RSR
DO NOT SCALE DRAWINGS

SHEET CONTENTS
ELECTRICAL PANEL SCHEDULES

SHEET NO.:
E-601

12/15/2022 9:10:30 AM C:\Users\jesse.harlan\Documents\3141700-181848.01-E-Central-2020_jesse.harlanEVCLV.rvt

PANELBOARD: RDP

LOCATION: ELECTRICAL 116
SUPPLY FROM: T-RDP
MOUNTING: Surface

208Y/120V **VOLTAGE**
3 **PHASE**
4 **WIRE**

MINIMUM INTERRUPTING CAPACITY: 10000
MAIN TYPE: MCB
MAIN SIZE: 400 A

CKT	DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	DESCRIPTION	CKT
1	100A RECEPTACLE - DOCK 103	100 A	3	12.0	12.0					3	100 A	100A RECEPTACLE - DOCK 103	2
3	--	--	--			12.0	12.0			--	--	--	4
5	--	--	--					12.0	12.0	--	--	--	6
7	100A RECEPTACLE - DOCK 103	100 A	3	12.0	12.0					3	100 A	100A RECEPTACLE - DOCK 103	8
9	--	--	--			12.0	12.0			--	--	--	10
11	--	--	--					12.0	12.0	--	--	--	12
13	100A RECEPTACLE - DOCK 104	100 A	3	12.0	12.0					3	100 A	100A RECEPTACLE - DOCK 104	14
15	--	--	--			12.0	12.0			--	--	--	16
17	--	--	--					12.0	12.0	--	--	--	18
19	100A RECEPTACLE - DOCK 104	100 A	3	12.0	12.0					3	100 A	100A RECEPTACLE - DOCK 104	20
21	--	--	--			12.0	12.0			--	--	--	22
23	--	--	--					12.0	12.0	--	--	--	24
25	PANEL RP-FA*	100 A	3	1.6	8.1					3	100 A	PANEL RP-1	26
27	--	--	--			1.2	7.2			--	--	--	28
29	--	--	--					1.2	7.0	--	--	--	30
31	SPARE	100 A	3	0.0	11.3					3	225 A	PANEL RP-2	32
33	--	--	--			0.0	11.0			--	--	--	34
35	--	--	--					0.0	10.5	--	--	--	36
37	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	38
39	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	40
41	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	42
		Total Load:		117.0 kVA		115.5 kVA		114.7 kVA					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	EST. DEMAND	PANEL TOTALS	
Motor	7536 VA	80.00%	6029 VA		
Other	200 VA	100.00%	200 VA	**TOTAL PANELBOARD KVA:**	347.2 kVA
Mech	1724 VA	80.00%	1379 VA	**TOTAL EST. DEMAND:**	120.2 kVA
Power	20975 VA	100.00%	20975 VA	**TOTAL CONNECTED AMPS:**	976 A
Lighting	73 VA	100.00%	73 VA	**TOTAL EST. DEMAND AMPS:**	334 A
Receptacles	28020 VA	67.84%	19010 VA		
Aircraft Power - 25%	288000 VA	25.00%	72000 VA		

RDP NOTES:
1. PHASE, NEUTRAL, AND GROUND BUSSES SHALL BE COPPER
2. EACH CIRCUIT SHALL HAVE A SEPARATE NEUTRAL. SHARED NEUTRALS ARE NOT PERMITTED.
3. MCB SHALL BE 100% RATED.
* PROVIDE CAPABILITY TO LOCK IN "ON" POSITION.

PANELBOARD: RP-1

LOCATION: CORRIDOR 114
SUPPLY FROM: RDP
MOUNTING: Surface

208Y/120V **VOLTAGE**
3 **PHASE**
4 **WIRE**

MINIMUM INTERRUPTING CAPACITY: 10000
MAIN TYPE: MCB
MAIN SIZE: 100 A

CKT	DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	DESCRIPTION	CKT
1	REC. - DOCK 103	20 A	1	0.7	0.9					1	20 A	REC. - DOCK 103	2
3	REC. - EXTERIOR	20 A	1			0.9	0.9			1	20 A	REC. - EXTERIOR	4
5	REC. - DOCK 104	20 A	1					0.9	0.7	1	20 A	REC. - DOCK 104	6
7	REC. - CORR 109, LAUNDRY 125, WASH 123	20 A	1	0.9	0.9					1	20 A	REC. - CORR 109, CORR 108, VEST. 121	8
9	REC. - CLASSROOM/BREAK 105	20 A	1			0.7	0.9			1	20 A	REC. - MEN'S 111, WOMENS 112	10
11	REC. - FOUNTAIN	20 A	1					0.4	1.1	1	20 A	REC. - OFFICE 113	12
13	REC. - EXT. FUEL TANK 119	20 A	1	0.4	0.5					1	20 A	FURN. PWR - OFF. 106, 107, 113	14
15	REC. - OPEN OFFICE 106	20 A	1			0.5	0.9			1	20 A	FURN. PWR - OFF. 106, 107, 113	16
17	REC. - EXT. FUEL TANK 119	20 A	1					0.4	1.1	1	20 A	FURN. PWR - OFF. 106, 107, 113	18
19	REC. - EXT. FUEL TANK OFF 115	20 A	1	0.5	0.5					1	20 A	FURN. PWR - OFF. 106, 107, 113	20
21	REC. - BRK 105 COUNTER	20 A	1			0.4	0.4			1	20 A	REC. - BRK 105 COUNTER	22
23	REC. - EXT. FUEL TANK OFF 115	20 A	1					0.5	0.8	1	20 A	REC. - VENDING	24
25	LTG - CABINETS - CLSRM 105	20 A	1	0.1	0.6					1	20 A	REC. - FRIDGE	26
27	REC. - VENDING	20 A	1			0.8	0.8			1	20 A	REC. - TELECOMMUNICATIONS	28
29	PAGING UNIT - CLASSROOM/BREAK 105	20 A	1					0.3	0.8	1	20 A	REC. - TELECOMMUNICATIONS	30
31	MICROWAVE - CLASSROOM/BREAK 105	20 A	1	1.2	0.8					1	20 A	REC. - TELECOMMUNICATIONS	32
33	SPARE	20 A	1			0.0	0.0			1	20 A	SPARE	34
35	SPARE	20 A	1					0.0	0.0	1	20 A	SPARE	36
37	BUSSED SPACE	--	--	0.0	0.0					3	30 A	SURGE PROTECTION DEVICE	38
39	BUSSED SPACE	--	--			0.0	0.0			--	--	--	40
41	BUSSED SPACE	--	--					0.0	0.0	--	--	--	42
		Total Load:		8.1 kVA		7.2 kVA		7.0 kVA					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	EST. DEMAND	PANEL TOTALS	
Power	300 VA	100.00%	300 VA		
Lighting	73 VA	100.00%	73 VA	**TOTAL PANELBOARD KVA:**	22.2 kVA
Receptacles	21860 VA	72.87%	15930 VA	**TOTAL EST. DEMAND:**	16.3 kVA
				TOTAL CONNECTED AMPS:	67 A
				TOTAL EST. DEMAND AMPS:	45 A

RP-1 NOTES:
1. PHASE, NEUTRAL, AND GROUND BUSSES SHALL BE COPPER
2. EACH CIRCUIT SHALL HAVE A SEPARATE NEUTRAL. SHARED NEUTRALS ARE NOT PERMITTED.

PANELBOARD: RP-2

LOCATION: CORRIDOR 114
SUPPLY FROM: RDP
MOUNTING: Surface

208Y/120V **VOLTAGE**
3 **PHASE**
4 **WIRE**

MINIMUM INTERRUPTING CAPACITY: 10000
MAIN TYPE: MCB
MAIN SIZE: 200 A

CKT	DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	DESCRIPTION	CKT
1	REC. - ELEC. RM 116	20 A	1	0.4	1.1					1	15 A	WWH-1	2
3	GWH-1-4	20 A	1			1.1	0.1			1	15 A	CUH-1	4
5	BREATHING AIR DRYER	15 A	1					1.7	1.0	1	15 A	EYE WASH STATIONS	6
7	ELECTRIC DRYER	30 A	2	3.0	0.8					1	15 A	EF-1, UH-1 THRU UH-3	8
9	--	--	--			3.0	1.0			1	20 A	WASHING MACHINE	10
11	ELECTRIC DRYER	30 A	2					3.0	1.0	1	20 A	WASHING MACHINE	12
13	--	--	--	3.0	0.4					1	20 A	REC. - ROOF HVAC	14
15	FLUSH VALVE CONTROL XFMR	15 A	1			0.1	0.8			1	15 A	EXISTING EF-6, DF-3, DF-4 - DOCK 104	16
17	EXISTING BOILERS - B-1, B-2	15 A	1					0.6	1.5	1	20 A	EF-2, EF-3, EF-4, EF-5	18
19	RECIRCULATION PUMP RP-1	15 A	1	0.1	0.7					1	20 A	REC. - UTILITY 118	20
21	EX. EF-5, DF-3, DF-4 - DOCK 103	15 A	1			0.8	1.9			1	20 A	GARBAGE DISPOSAL	22
23	REC. - FIRE PROTECTION ROOM 117	20 A	1					0.7	0.0	1	20 A	SPARE	24
25	SPARE	20 A	1	0.0	1.0					1	20 A	CORD REEL - DOCK 103	26
27	EF-9	15 A	1			1.2	1.0			1	20 A	CORD REEL - DOCK 103	28
29	CORD REEL - DOCK 104	20 A	1					1.0	0.0	1	20 A	EF-6 & EF-7	30
31	CORD REEL - DOCK 104	20 A	1	1.0	0.0					1	20 A	SPARE	32
33	SPARE	20 A	1			0.0	0.0			1	20 A	SPARE	34
35	SPARE	20 A	1					0.0	0.0	1	20 A	SPARE	36
37	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	38
39	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	40
41	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	42
		Total Load:		11.3 kVA		11.0 kVA		10.5 kVA					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	EST. DEMAND	PANEL TOTALS	
Motor	7536 VA	80.00%	6029 VA		
Mech	1724 VA	80.00%	1379 VA	**TOTAL PANELBOARD KVA:**	32.9 kVA
Power	17435 VA	100.00%	17435 VA	**TOTAL EST. DEMAND:**	31.1 kVA
Receptacles	6160 VA	100.00%	6160 VA	**TOTAL CONNECTED AMPS:**	95 A
				TOTAL EST. DEMAND AMPS:	86 A

RP-2 NOTES:
1. PHASE, NEUTRAL, AND GROUND BUSSES SHALL BE COPPER
2. EACH CIRCUIT SHALL HAVE A SEPARATE NEUTRAL. SHARED NEUTRALS ARE NOT PERMITTED.

PANELBOARD: RP-FA

LOCATION: FIRE PROTECTION ROOM 117
SUPPLY FROM: RDP
MOUNTING: Surface

208Y/120V **VOLTAGE**
3 **PHASE**
4 **WIRE**

MINIMUM INTERRUPTING CAPACITY: 10000
MAIN TYPE: MCB
MAIN SIZE: 100 A

CKT	DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	DESCRIPTION	CKT
1	SPARE	20 A	1	0.0	0.5					1	20 A	FIRE ALARM CONTROL PANEL (FMCP)*	2
3	NITROGEN GENERATOR*	20 A	1			0.2	0.5			1	20 A	RADIO TRANSMITTER(RT) - RSFACU*	4
5	OWS TANK PNLS*	20 A	1					0.2	0.5	1	20 A	REMOTE POWER SUPPLY (RPS) - FMCP*	6
7	RADIO TRANSMITTER (RT) - FMCP*	20 A	1	0.5	0.0					1	20 A	SPARE	8
9	RELEASING CONTROL PANEL (RSFACU)*	20 A	1			0.5	0.0			1	20 A	SPARE	10
11	REMOTE POWER SUPPLY (RPS) - RSFACU*	20 A	1					0.5	0.0	1	20 A	SPARE	12
13	SPARE	20 A	1	0.0	0.6					1	20 A	BLUE BEACON LIGHTS - INVERTER*	14
15	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	16
17	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	18
19	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	20
21	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	22
23	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	24
25	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	26
27	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	28
29	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	30
31	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	32
33	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	34
35	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	36
37	BUSSED SPACE	--	--	0.0	0.0					3	30 A	SURGE PROTECTIVE DEVICE	38
39	BUSSED SPACE	--	--			0.0	0.0			--	--	--	40
41	BUSSED SPACE	--	--					0.0	0.0	--	--	--	42
		Total Load:		1.6 kVA		1.2 kVA		1.2 kVA					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	EST. DEMAND	PANEL TOTALS	
Other	200 VA	100.00%	200 VA		
Power	3240 VA	100.00%	3240 VA	**TOTAL PANELBOARD KVA:**	4.0 kVA
				TOTAL EST. DEMAND:	3.9 kVA
				TOTAL CONNECTED AMPS:	13 A
				TOTAL EST. DEMAND AMPS:	11 A

RP-FA NOTES:
1. PHASE, NEUTRAL, AND GROUND BUSSES SHALL BE COPPER
2. EACH CIRCUIT SHALL HAVE A SEPARATE NEUTRAL. SHARED NEUTRALS ARE NOT PERMITTED.
* PROVIDE CAPABILITY TO LOCK IN "ON" POSITION

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MICHIGAN AIR NATIONAL GUARD
ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
DESIGNED BY: JKH
DRAWN BY: JKH
CHECKED BY: RSR
DO NOT SCALE DRAWINGS

SHEET CONTENTS
ELECTRICAL PANEL SCHEDULES

SHEET NO.:
E-602

12/15/2022 9:10:31 AM C:\Users\jesse.harlan\Documents\3141700-181848.01-E-Central-2020_jesse.harlanERVCLV.rvt

LIGHTING FIXTURE SCHEDULE

TYPE	VOLTAGE	WATTS	LAMP	MOUNTING	DESCRIPTION
A1	277V	18 W	LED	LAY-IN	2X2 LED TROFFER. COLD-ROLLED STEEL HOUSING. DIRECT-INDIRECT DIFFUSER. 2000 LUMENS. 120-277V OPERATION. 3000K. 80 CRI. 0-10V DIMMING TO 1%. DAMP LOCATION RATED.
A1E	277V	18 W	LED	LAY-IN	2X2 LED TROFFER. COLD-ROLLED STEEL HOUSING. DIRECT-INDIRECT DIFFUSER. 2000 LUMENS. 120-277V OPERATION. 3000K. 80 CRI. 0-10V DIMMING TO 1%. DAMP LOCATION RATED. INTEGRAL 700 LUMEN BATTERY PACK CAPABLE OF 90 MINUTES OF CONTINUOUS OPERATION.
B1	277V	25 W	LED	LAY-IN	2X4 LED TROFFER. COLD-ROLLED STEEL HOUSING. DIRECT-INDIRECT DIFFUSER. 3000 LUMENS. 120-277V OPERATION. 3000K. 80 CRI. 0-10V DIMMING TO 1%. DAMP LOCATION RATED.
B1E	277V	25 W	LED	LAY-IN	2X4 LED TROFFER. COLD-ROLLED STEEL HOUSING. DIRECT-INDIRECT DIFFUSER. 3000 LUMENS. 120-277V OPERATION. 3000K. 80 CRI. 0-10V DIMMING TO 1%. DAMP LOCATION RATED. INTEGRAL 700 LUMEN BATTERY PACK CAPABLE OF 90 MINUTES OF CONTINUOUS OPERATION.
C1	277V	17 W	LED	PENDANT OR SURFACE	2' LED STRIPLIGHT FIXTURE. COLD-ROLLED STEEL ENCLOSURE. FROSTED DIFFUSE LENS. UPLIGHT. 120-277V OPERATION. 1500 LUMENS. 3000K. MINIMUM 80 CRI. DAMP LOCATION RATED.
C2	277V	30 W	LED	PENDANT OR SURFACE	4' LED STRIPLIGHT FIXTURE. COLD-ROLLED STEEL ENCLOSURE. FROSTED DIFFUSE LENS. UPLIGHT. 120-277V OPERATION. 3000 LUMENS. 3000K. MINIMUM 80 CRI. DAMP LOCATION RATED.
C2E	277V	41 W	LED	PENDANT OR SURFACE	4' LED STRIPLIGHT FIXTURE. COLD-ROLLED STEEL ENCLOSURE. FROSTED DIFFUSE LENS. UPLIGHT. 120-277V OPERATION. 3000 LUMENS. 3000K. MINIMUM 80 CRI. DAMP LOCATION RATED. INTEGRAL 7-WATT BACKUP BATTERY CAPABLE OF 90 MINUTES OF CONTINUOUS OPERATION.
C3	277V	41 W	LED	PENDANT OR SURFACE	4' LED STRIPLIGHT FIXTURE. COLD-ROLLED STEEL ENCLOSURE. FROSTED DIFFUSE LENS. UPLIGHT. 120-277V OPERATION. 5000 LUMENS. 3000K. MINIMUM 80 CRI. DAMP LOCATION RATED.
D1	277V	6 W	LED	RECESSED	6" LED ROUND DOWNLIGHT. GALVANIZED STEEL FRAME AND JUNCTION BOX. 500 LUMENS. 120-277V OPERATION. 3000K. 80 CRI MINIMUM. 55 DEGREE BEAM CUTOFF. 0-10V DIMMING TO 10%. CLEAR MATTE DIFFUSE FINISH. FRAME SUITABLE FOR 2x4 ACT CEILING GRID MOUNTING OR SOLD GYPSUM BOARD CEILING MOUNTING.
D1E	277V	6 W	LED	RECESSED	6" LED ROUND DOWNLIGHT. GALVANIZED STEEL FRAME AND JUNCTION BOX. 500 LUMENS. 120-277V OPERATION. 3000K. 80 CRI MINIMUM. 55 DEGREE BEAM CUTOFF. 0-10V DIMMING TO 10%. CLEAR MATTE DIFFUSE FINISH. 7-WATT INTEGRAL EMERGENCY BATTERY PACK WITH SELF-DIAGNOSTICS AND INTEGRAL TEST SWITCH CAPABLE OF 90 MINUTES OF CONTINUOUS OPERATION. FRAME SUITABLE FOR 2x4 ACT CEILING GRID MOUNTING OR SOLD GYPSUM BOARD CEILING MOUNTING.
D2	277V	9 W	LED	RECESSED	6" LED ROUND DOWNLIGHT. GALVANIZED STEEL FRAME AND JUNCTION BOX. 700 LUMENS. 120-277V OPERATION. 3000K. 80 CRI MINIMUM. 55 DEGREE BEAM CUTOFF. 0-10V DIMMING TO 10%. CLEAR MATTE DIFFUSE FINISH. FRAME SUITABLE FOR 2x4 ACT CEILING GRID MOUNTING OR SOLD GYPSUM BOARD CEILING MOUNTING.
D2E	277V	9 W	LED	RECESSED	6" LED ROUND DOWNLIGHT. GALVANIZED STEEL FRAME AND JUNCTION BOX. 700 LUMENS. 120-277V OPERATION. 3000K. 80 CRI MINIMUM. 55 DEGREE BEAM CUTOFF. 0-10V DIMMING TO 10%. CLEAR MATTE DIFFUSE FINISH. 7-WATT INTEGRAL EMERGENCY BATTERY PACK WITH SELF-DIAGNOSTICS AND INTEGRAL TEST SWITCH CAPABLE OF 90 MINUTES OF CONTINUOUS OPERATION. FRAME SUITABLE FOR 2x4 ACT CEILING GRID MOUNTING OR SOLD GYPSUM BOARD CEILING MOUNTING.
D3	277V	11 W	LED	RECESSED	6" LED ROUND DOWNLIGHT. GALVANIZED STEEL FRAME AND JUNCTION BOX. 1000 LUMENS. 120-277V OPERATION. 3000K. 80 CRI MINIMUM. 55 DEGREE BEAM CUTOFF. 0-10V DIMMING TO 10%. CLEAR MATTE DIFFUSE FINISH. FRAME SUITABLE FOR 2x4 ACT CEILING GRID MOUNTING OR SOLD GYPSUM BOARD CEILING MOUNTING.
D3E	277V	11 W	LED	RECESSED	6" LED ROUND DOWNLIGHT. GALVANIZED STEEL FRAME AND JUNCTION BOX. 1000 LUMENS. 120-277V OPERATION. 3000K. 80 CRI MINIMUM. 55 DEGREE BEAM CUTOFF. 0-10V DIMMING TO 10%. CLEAR MATTE DIFFUSE FINISH. 7-WATT INTEGRAL EMERGENCY BATTERY PACK WITH SELF-DIAGNOSTICS AND INTEGRAL TEST SWITCH CAPABLE OF 90 MINUTES OF CONTINUOUS OPERATION. FRAME SUITABLE FOR 2x4 ACT CEILING GRID MOUNTING OR SOLD GYPSUM BOARD CEILING MOUNTING.
EM	277V	5 W	LED	WALL	NON-METALLIC, ENCLOSED, GASKETED EMERGENCY LIGHTING UNIT FOR HAZARDOUS AND WET LOCATIONS. 120-277V OPERATION. TWIN 1W LED LAMP HEADS. SELF-DIAGNOSTICS. BATTERY CAPABLE OF OPERATING CONTINUOUSLY FOR 90 MINUTES. SUITABLE FOR USE IN CLASS 1, DIVISION 2 AREAS.
F	277V	169 W	LED	WALL	DIE-CAST ALUMINUM LED FLOODLIGHT. 120-277V OPERATION. 169 WATTS. 3000K. 15,900 NOMINAL LUMEN PACKAGE. MINIMUM 80 CRI. NEMA TYPE BEAM SPREAD 3x3. ADJUSTABLE MOUNTING BRACKET FOR FIELD AIMING. MINIMUM IP65 RATED.
F1	277V	18 W	LED	WALL; ABOVE MIRROR	2' LED SQUARE VANITY LIGHT. WALL MOUNTED. ACRYLIC DIFFUSER. 120-277V OPERATION. 4000K. 1300 LUMEN PACKAGE. MINIMUM 80 CRI. BRUSHED NICKEL FINISH.
H1	277V	125 W	LED	PENDANT	LED HIGH BAY DAMP LOCATION RATED FIXTURE. 18000 LUMENS. FROSTED ACRYLIC REFLECTOR AND DROP PRISMATIC LENS. IP65 RATED LED BOARD. 120-277V OPERATION. 3000K MINIMUM 80 CRI.
H1E	277V	125 W	LED	PENDANT	LED HIGH BAY DAMP LOCATION RATED FIXTURE. 18000 LUMENS. FROSTED ACRYLIC REFLECTOR AND DROP PRISMATIC LENS. IP65 RATED LED BOARD. 120-277V OPERATION. 3000K. MINIMUM 80 CRI. INTEGRAL SELF-DIAGNOSTICS BATTERY PACK 10W CONSTANT POWER FOR 90 MINUTES.
HH	277V	83 W	LED	PENDANT OR SURFACE	HAZARDOUS LOCATION HIGH BAY LED. CAST-ALUMINUM HOUSING. 12000 LUMENS. PRISMATIC GLASS LENS. WIDE DISTRIBUTION WITH UPLIGHT. 120-277V OPERATION. 3000K. MINIMUM 80 CRI. RATED FOR USE IN CLASS 1, DIVISION 2 HAZARDOUS AREAS. IP65 RATED. GRAY SUPER DURABLE FINISH
U12	120V	7 W	LED	SURFACE	LOW PROFILE 1' LED UNDER-CABINET LIGHT. 120V OPERATION. 430 NOMINAL LUMENS. ADJUSTABLE FROM 3000K TO 4000K. MINIMUM 80 CRI.
U24	120V	11 W	LED	SURFACE	LOW PROFILE 2' LED UNDER-CABINET LIGHT. 120V OPERATION. 736 NOMINAL LUMENS. ADJUSTABLE FROM 3000K TO 4000K. MINIMUM 80 CRI.
W1	277V	11 W	LED	WALL	DIE-CAST ALUMINUM ARCHITECTURAL LED WALLPACK. IP65 RATED MINIMUM. 120-277V OPERATION. 3500K. 1500 LUMEN PACKAGE. FULL-CUTOFF.
W1E	277V	11 W	LED	WALL	DIE-CAST ALUMINUM ARCHITECTURAL LED WALLPACK. IP65 RATED MINIMUM. 120-277V OPERATION. 3500K. 1500 LUMEN PACKAGE. FULL-CUTOFF. INTEGRAL BATTERY BACKUP CAPABLE OF 90 MINUTES OF CONTINOUS OPERATION. BATTERY RATED FOR COLD WEATHER DOWN TO -20°C.
W2	277V	25 W	LED	WALL	DIE-CAST ALUMINUM ARCHITECTURAL LED WALLPACK. IP65 RATED MINIMUM. 120-277V OPERATION. 3500K. 3000 LUMEN PACKAGE. FULL-CUTOFF.
X	277V	3 W	LED	CEILING OR WALL	THERMOPLASTIC LED EXIT SIGN. RED STENCIL LETTERING. INTEGRAL HIGH-OUTPUT NICKEL-CADMIUM EMERGENCY BATTERY BACKUP SUITABLE FOR POWERING TWIN REMOTE EMERGENCY HEADS FOR AT LEAST 90 MINUTES. NO INTEGRAL LAMP HEADS. UNIVERSALLY MOUNTABLE. 120-277V OPERATION. SELF-DIAGNOSTIC.
XH	277V	1 W	LED	CEILING OR WALL	LED EXIT SIGN. RED LETTERING. RATED FOR USE IN CLASS 1, DIVISION 2 HAZARDOUS AREAS. INTEGRAL BATTERY BACKUP. UNIVERSALLY MOUNTABLE. 120-277V OPERATION. SELF-DIAGNOSTIC.
XR	3.7V	2 W	LED	WALL ABOVE DOOR	TWIN WEATHERPROOF REMOTE LED EMERGENCY HEAD. POWERED FROM INTERIOR EXIT SIGN SOURCE. 2W PER LAMP HEAD. UNIT SHALL BE PROVIDED BY THE SAME MANUFACTURER AS, AND DESIGNED TO BE POWERED BY, INTERIOR EXIT SIGNS.

GENERAL NOTE: LIGHT FIXTURES SHALL HAVE 10-YEAR WARRANTIES.

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED:
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
DESIGNED BY: JKH
DRAWN BY: JKH
CHECKED BY: RSR
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SHEET CONTENTS
LIGHTING FIXTURE SCHEDULE

SHEET NO.:
E-603

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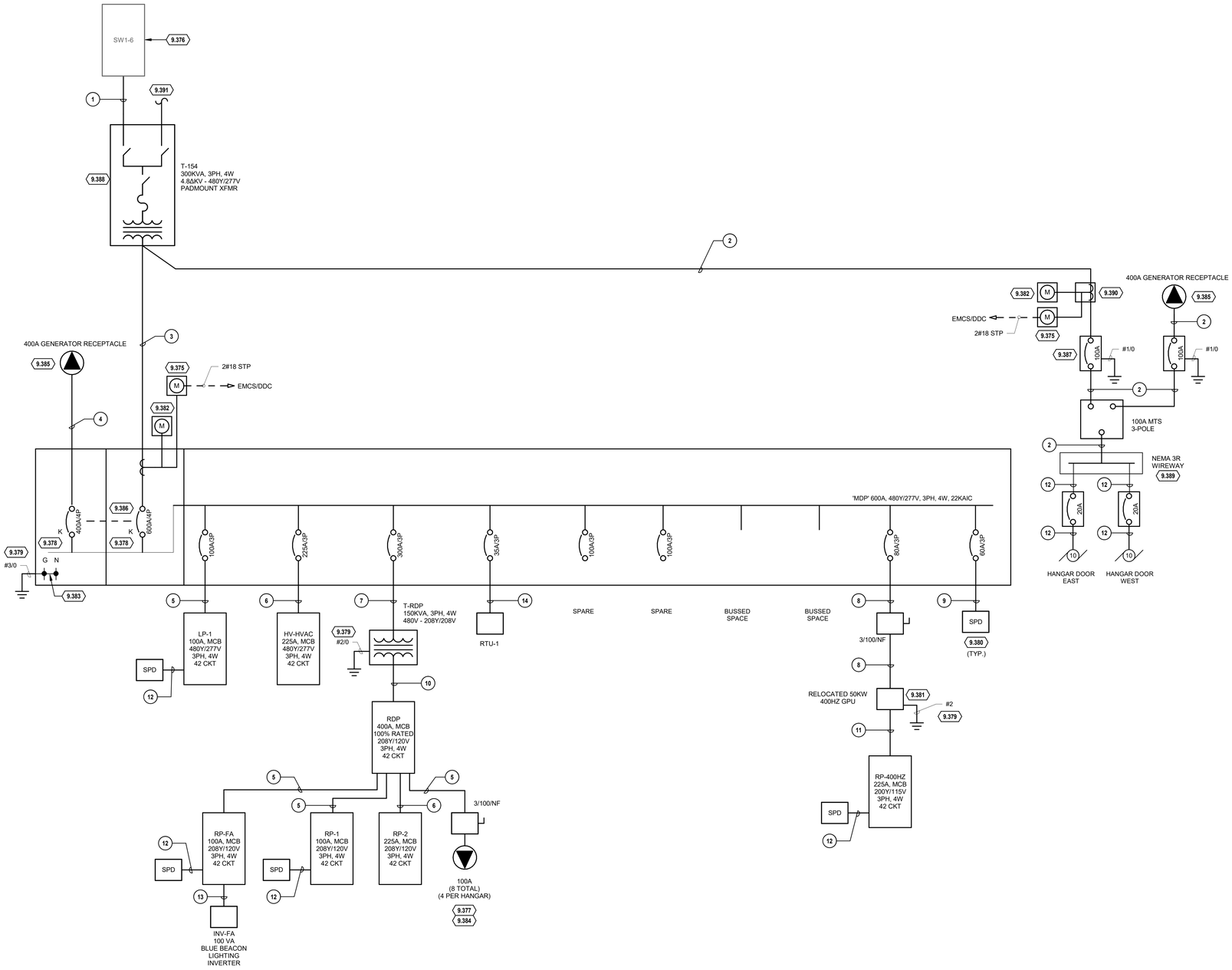

1 ELECTRICAL ONE-LINE DIAGRAM
N.T.S.

ONE-LINE GENERAL NOTES

1. SPLICES SHALL NOT BE ALLOWED IN PROPOSED PANELBOARD FEEDERS.
2. LIGHT GREY LINES AND TEXT REPRESENT EXISTING. HEAVIER LINES AND TEXT REPRESENT NEW.
3. REFER TO PANEL SCHEDULES ON E-601 AND E-602 FOR ADDITIONAL INFORMATION.
4. ALL PANELBOARD AND SWITCHBOARD PHASE, NEUTRAL, AND GROUND BUSSES SHALL BE COPPER.
5. PAD MOUNT TRANSFORMERS SHALL BE DEAD-FRONT, LOOP-FEED, FEED-THROUGH CAPABLE AND SHALL HAVE COPPER WINDINGS. REFER TO DETAIL 2/E-504 FOR TRANSFORMER SURGE ARRESTORS, FUSES, AND SWITCH REQUIREMENTS.

KEYED NOTES:

9.375. ELECTRIC SMART METER SHALL BE A VERIS E51 METER.

9.376. EXISTING PADMOUNT SWITCH.

9.377. FOR EACH RECEPTACLE, PROVIDE A DEDICATED 100A CB, 100A LOCAL DS, AND FEEDERS. DISCONNECT MAY BE INTEGRAL OR SEPARATELY MOUNTED.

9.378. KEYED INTERLOCK FOR CIRCUIT BREAKERS. INTERLOCK SHALL PREVENT PARALLELING OF NORMAL AND STANDBY SOURCES.

9.379. BOND TO GROUND BAR IN ELECTRICAL ROOM.

9.380. SPD SHALL BE UL 1449 AND 1283 LISTED. LOCATE IN HINGED BOX ADJACENT TO PANEL. LEADS SHALL NOT EXCEED 36" IN LENGTH.

9.381. COORDINATE DISCONNECTION AND RECONNECTION OF 400HZ GPU WITH CONTRACTING OFFICER.

9.382. ELECTRIC SMART METER SHALL BE ITRON CENTRON POLYPHASE ELECTRIC METER (WITH RF) - ITRON CP3 9S CL20 3 ERT DEMAND + CLOCK.

9.383. BOND GROUND AND NEUTRAL BUS.

9.384. PROVIDE PIN AND SLEEVE INTERLOCKING RECEPTACLE RATED FOR 100A, 3-POLE, 4-WIRE AT 208V. SHALL BE RATED NEMA 4X. DISCONNECT SHOWN ADJACENT TO RECEPTACLE MAY BE REMOTELY MOUNTED OR INTEGRAL WITH RECEPTACLE.

9.385. PROVIDE 400AMP POWERTITE PIN AND SLEEVE PLUG, PRODUCT NUMBER AJA40144-400, FOR GENERATOR PLUG IAW SELFRIDGE BASE STANDARDS.

9.386. PROVIDE PERMANENT, DURABLE, CLEARLY VISIBLE LABEL STATING: "SERVICE DISCONNECT NO. 1: SERVICE NO. 2 DISCONNECT ON SOUTHEAST EXTERIOR WALL NEAR HANGAR DOOR"

9.387. PROVIDE PERMANENT, DURABLE, CLEARLY VISIBLE LABEL STATING: "SERVICE DISCONNECT NO. 2: SERVICE NO. 1 DISCONNECT LOCATED IN ELECTRICAL ROOM"

9.388. TRANSFORMER PRIMARY SIDE FUSING SHALL BE RATED FOR 100A. REFER TO 2/E-504 FOR QUANTITY OF FUSES REQUIRED.

9.389. LOCATE WITHIN 10'-0" OF LOAD SIDE DISCONNECTS.

9.390. PROVIDE CT ENCLOSURE WITH HINGED DOOR OR LIFT OFF COVER. SUITABLE FOR 3P/3W SERVICE TYPE. NEMA 3R ENCLOSURE. INCLUDE CT MOUNTING BASE CAPABLE OF MOUNTING THREE (3) CTS. ENCLOSURE AND CT MOUNTING BASE RATED FOR AT LEAST 100A AT 480V.

9.391. STUB TWO (2) 5" CONDUITS OUT 5'-0" BEYOND THE EDGE OF THE TRANSFORMER PAD FOR FUTURE EXTENSION.

WIRING SCHEDULE

1 3#1CU 133% SHIELDED XLP PVC (15KV), 1#6CU THWN(GND, 600V) IN 5"C, ONE SPARE 5"C

2 3#1CU THWN (600V),1#6CU THWN(GND, 600V) IN 1-1/2"C.

3 2 SETS OF: 4#350KCMIL CU THWN (600V) IN 4"C. PROVIDE ONE SPARE 4"C.

4 2 SETS OF: 4#3/0CU THWN (600V), 1#6CU THWN(GND, 600V) IN 4"C. PROVIDE ONE SPARE 4"C.

5 4#1CU THWN (600V), 1#8CU THWN(GND, 600V) IN 1-1/2"C.

6 4#4/0CU THWN (600V), 1#4CU THWN(GND, 600V) IN 2-1/2"C.

7 3#350KCMIL CU THWN (600V), 1#4CU THWN(GND, 600V) IN 3"C.

8 4#3CU THWN (600V), 1#8CU THWN(GND, 600V) IN 1-1/2"C.

9 3#4CU THWN (600V), 1#10CU THWN(GND, 600V) IN 1"C.

10 2 SETS OF 4#3/0CU THWN (600V), 1#6CU THWN(GND, 600V) IN 2-1/2"C.

11 3#4/0CU THWN (600V), 1#4CU THWN(GND, 600V) IN 2-1/2"C.

12 3#10CU THWN (600V), 1#10CU THWN(GND, 600V) IN 3/4"C.

13 2#12CU THWN (600V), 1#12CU THWN(GND, 600V) IN 3/4"C.

14 4#8CU THWN (600V), 1#10CU THWN(GND, 600V) IN 1"C.

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
DESIGNED BY: JKH
DRAWN BY: JKH
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SHEET CONTENTS
ELECTRICAL
ONE-LINE DIAGRAM

SHEET NO.:
E-701

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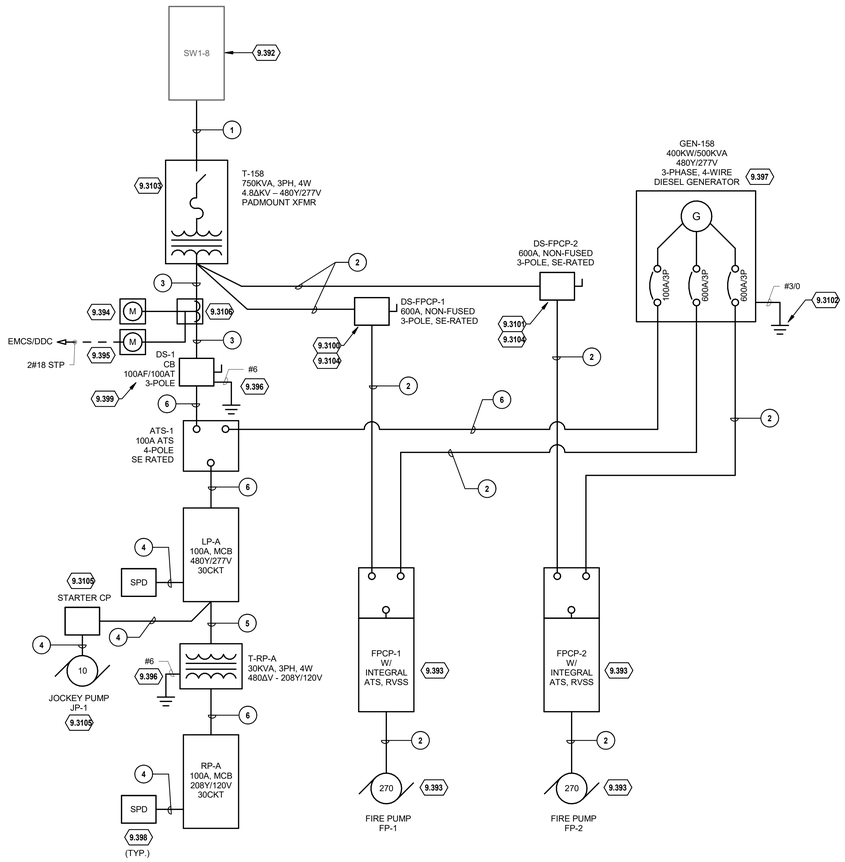

1 ELECTRICAL ONE-LINE DIAGRAM

N.T.S.

PANELBOARD: LP-A

LOCATION: ELECTRICAL 102
SUPPLY FROM: ATS-1
MOUNTING: Surface

480Y/277V **VOLTAGE**
3 **PHASE**
4 **WIRE**

MINIMUM INTERRUPTING CAPACITY: 22000
MAIN TYPE: MCB
MAIN SIZE: 100 A

CKT	DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	DESCRIPTION	CKT
1	T-RP-A	60 A	3	3.6	3.9					3	25 A	JOCKEY PUMP	2
3	--	--	--			4.8	3.9			--	--	--	4
5	--	--	--					4.7	3.9	--	--	--	6
7	LTG - INTERIOR	20 A	1	0.3	5.7					3	70 A	WATER TANK - PROCESS CONTROL PANEL	8
9	LTG - EXTERIOR	20 A	1			0.1	5.7			--	--	--	10
11	SPARE	20 A	1					0.0	5.7	--	--	--	12
13	SPARE	20 A	1	0.0	2.3					2	20 A	GENERATOR JACKET WATER HEATER	14
15	SPARE	20 A	1			0.0	2.3			--	--	--	16
17	SPARE	20 A	1					0.0	1.0	1	20 A	WATER TANK - HEAT TRACE - GFI	18
19	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	20
21	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	22
23	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	24
25	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	26
27	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	28
29	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	30
31	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	32
33	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	34
35	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	36
37	BUSSED SPACE	--	--	0.0	0.0					3	30 A	SURGE PROTECTION DEVICE	38
39	BUSSED SPACE	--	--			0.0	0.0			--	--	--	40
41	BUSSED SPACE	--	--					0.0	0.0	--	--	--	42
			Total Load:	15.7 kVA		16.7 kVA		15.2 kVA					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	EST. DEMAND	PANEL TOTALS	
Motor	12228 VA	80.00%	9782 VA		
Mech	3944 VA	80.00%	3155 VA	**TOTAL PANELBOARD KVA:**	47.4 kVA
Power	6600 VA	100.00%	6600 VA	**TOTAL EST. DEMAND:**	44.2 kVA
Lighting	347 VA	100.00%	347 VA	**TOTAL CONNECTED AMPS:**	60 A
Receptacles	2340 VA	100.00%	2340 VA	**TOTAL EST. DEMAND AMPS:**	53 A

LP-A NOTES:
1. PHASE, NEUTRAL, AND GROUND BUSSES SHALL BE COPPER
2. EACH CIRCUIT SHALL HAVE A SEPARATE NEUTRAL. SHARED NEUTRALS ARE NOT PERMITTED.

PANELBOARD: RP-A

LOCATION: ELECTRICAL 102
SUPPLY FROM: T-RP-A
MOUNTING: Surface

208Y/120V **VOLTAGE**
3 **PHASE**
4 **WIRE**

MINIMUM INTERRUPTING CAPACITY: 10000
MAIN TYPE: MCB
MAIN SIZE: 100 A

CKT	DESCRIPTION	TRIP	POLES	A		B		C		POLES	TRIP	DESCRIPTION	CKT
1	GENERATOR BATTERY CHARGER	15 A	1	1.1	0.5					1	20 A	REC - EXTERIOR	2
3	REC - PUMP ROOM	20 A	1			0.7	0.5			1	20 A	RADIO TRANSMITTER (RT) - FACP*	4
5	FIRE ALARM CONTROL PANEL (FACP)*	20 A	1					0.5	0.2	1	20 A	REC - COMM - BACKBOARD	6
7	EF-8, GUH-1	15 A	1	0.6	0.4					1	20 A	REC - COMM - RACK	8
9	REC - COMM - BACKBOARD	20 A	1			0.2	0.4			1	20 A	REC - ELEC & COMM ROOM	10
11									2.0	1	25 A	BACKFLOW PREVENTER HEATER - GFI	12
13													14
15	HP-1, AC-1	25 A	2			2.0	0.1			1	20 A	GENERATOR REMOTE ANNUNCIATOR PANEL.	16
17	--	--	--					2.0	0.0	1	20 A	SPARE	18
19	FPCP-2 HEATER	20 A	1	1.0	0.0					1	20 A	SPARE	20
21	FPCP-1 HEATER	20 A	1			1.0	0.0			1	20 A	SPARE	22
23	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	24
25	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	26
27	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	28
29	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	30
31	BUSSED SPACE	--	--	0.0	0.0					--	--	BUSSED SPACE	32
33	BUSSED SPACE	--	--			0.0	0.0			--	--	BUSSED SPACE	34
35	BUSSED SPACE	--	--					0.0	0.0	--	--	BUSSED SPACE	36
37	BUSSED SPACE	--	--	0.0	0.0					3	30 A	SURGE PROTECTION DEVICE	38
39	BUSSED SPACE	--	--			0.0	0.0			--	--	--	40
41	BUSSED SPACE	--	--					0.0	0.0	--	--	--	42
			Total Load:	3.6 kVA		4.8 kVA		4.7 kVA					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	EST. DEMAND	PANEL TOTALS	
Motor	628 VA	80.00%	502 VA		
Mech	3944 VA	80.00%	3155 VA	**TOTAL PANELBOARD KVA:**	13.0 kVA
Power	2100 VA	100.00%	2100 VA	**TOTAL EST. DEMAND:**	12.1 kVA
Receptacles	2340 VA	100.00%	2340 VA	**TOTAL CONNECTED AMPS:**	42 A
				TOTAL EST. DEMAND AMPS:	34 A

RP-A NOTES:
1. PHASE, NEUTRAL, AND GROUND BUSSES SHALL BE COPPER
2. EACH CIRCUIT SHALL HAVE A SEPARATE NEUTRAL. SHARED NEUTRALS ARE NOT PERMITTED.
* PROVIDE CAPABILITY TO LOCK IN "ON" POSITION

ONE-LINE GENERAL NOTES:

1. SPLICES SHALL NOT BE ALLOWED IN PROPOSED PANELBOARD FEEDERS.
2. LIGHT GREY LINES AND TEXT REPRESENT EXISTING. HEAVIER LINES AND TEXT REPRESENT NEW.
3. PAD MOUNT TRANSFORMERS SHALL BE DEAD-FRONT, LOOP-FEED, FEED-THROUGH CAPABLE AND SHALL HAVE COPPER WINDINGS. REFER TO DETAIL 2/E-504 FOR TRANSFORMER SURGE ARRESTORS, FUSES, AND SWITCH REQUIREMENTS.
4. ALL PANELBOARD AND SWITCHBOARD PHASE, NEUTRAL, AND GROUND BUSSES SHALL BE COPPER.
5. GENERATOR AND DISCONNECTS FOR FIRE PUMPS SHALL COMPLY WITH REQUIREMENTS OF NEC ART 695.

KEYED NOTES:

9.392. EXISTING PADMOUNT SWITCH.

9.393. REFER TO FIRE PROTECTION DRAWING SERIES FOR ADDITIONAL INFORMATION ON FIRE PUMPS AND ASSOCIATED CONTROL PANELS.

9.394. ELECTRIC SMART METER SHALL BE ITRON CENTRON POLYPHASE ELECTRIC METER (WITH RF) - ITRON CP3 9S CL20 3 ERT DEMAND + CLOCK.

9.395. ELECTRIC SMART METER SHALL BE A VERIS E51 METER.

9.396. BOND GROUND BUS TO NEUTRAL BUS. BOND GROUND BUS TO GROUND BAR IN ELECTRICAL ROOM.

9.397. GENERATOR GEN-158 SHALL BE MOUNTED EXTERIOR TO THE BUILDING IN A WEATHERPROOF ENCLOSURE. PROVIDE A BASE TANK SIZED FOR AT LEAST 8 HOURS OF OPERATION.

9.398. SPD SHALL BE UL 1449 AND 1283 LISTED. LOCATE IN HINGED BOX ADJACENT TO PANEL. LEADS SHALL NOT EXCEED 36" IN LENGTH.

9.399. PROVIDE PERMANENT, DURABLE, CLEARLY VISIBLE LABEL STATING: "SERVICE DISCONNECT NO. 1: SERVICE NO. 2 AND NO. 3 DISCONNECTS LOCATED ON EXTERIOR SOUTH SIDE OF BUILDING"

9.3100. PROVIDE PERMANENT, DURABLE, CLEARLY VISIBLE LABEL STATING: "SERVICE DISCONNECT NO. 2: SERVICE NO. 1 DISCONNECT LOCATED IN ELECTRICAL ROOM, SERVICE NO. 3 DISCONNECT IS ADJACENT DISCONNECT SWITCH"

9.3101. PROVIDE PERMANENT, DURABLE, CLEARLY VISIBLE LABEL STATING: "SERVICE DISCONNECT NO. 3: SERVICE NO. 1 DISCONNECT LOCATED IN ELECTRICAL ROOM, SERVICE NO. 2 DISCONNECT IS ADJACENT DISCONNECT SWITCH"

9.3102. GENERATOR IS A SEPARATELY DERIVED SYSTEM. BOND NEUTRAL TO GROUND. REFER TO E-132 AND GENERATOR DETAIL ON E-504 FOR GROUNDING REQUIREMENTS.

9.3103. TRANSFORMER PRIMARY SIDE FUSING SHALL BE RATED FOR 140A. REFER TO 2/E-504 FOR QUANTITY OF FUSES REQUIRED.

9.3104. DISCONNECT SHALL BE PAD-LOCKABLE IN THE "ON" AND "OFF" POSITION.

9.3105. REFER TO FIRE PROTECTION DRAWING SERIES FOR ADDITIONAL INFORMATION ON JOCKEY PUMP AND ASSOCIATED CONTROL PANELS.

9.3106. PROVIDE CT ENCLOSURE WITH HINGED DOOR OR LIFT OFF COVER. SUITABLE FOR 3P/3W SERVICE TYPE. NEMA 3R ENCLOSURE. INCLUDE CT MOUNTING BASE CAPABLE OF MOUNTING THREE (3) CT'S. ENCLOSURE AND CT MOUNTING BASE RATED FOR AT LEAST 100A AT 480V.

WIRING SCHEDULE

1 3#1CU 133% SHIELDED XLP PVC (15KV), 1#6CU THWN(GND, 600V) IN 5"C, ONE SPARE 5"C

2 2 SETS OF: 3#4/0CU THWN (600V), 1#1(GND) IN 4"C

3 4#1CU THWN (600V) IN 1-1/2"C

4 3#10CU THWN (600V), 1#10CU THWN(GND, 600V) IN 3/4"C

5 3#4CU THWN (600V), 1#8CU THWN(GND, 600V) IN 1-1/2"C

6 4#1CU THWN (600V), 1#8CU THWN(GND, 600V) IN 1-1/2"C

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
DESIGNED BY: JKH
DRAWN BY: JKH
CHECKED BY: RSR
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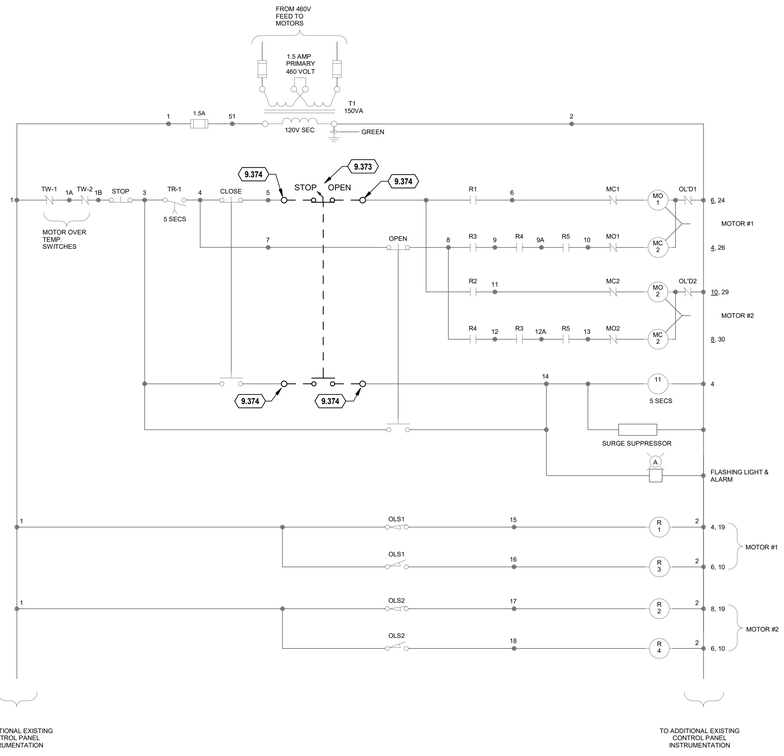
SHEET CONTENTS
B158 ONE-LINE DIAGRAM AND PANEL SCHEDULES

SHEET NO.:
E-702

12/15/2022 9:17:10 AM C:\Users\jesse.harlan\Documents\3141700-181848.01-E-FP-Central-2020_jesse.harlanEVCLV.rvt



1 **HANGAR DOOR CONTROL PANEL MODIFICATIONS**
NTS

WIRING DIAGRAM GENERAL NOTES

1. MODIFICATIONS SHOWN TO HANGAR DOOR CONTROL PANEL APPLY TO CONTROL PANELS WITHIN BOTH DOCKS.
2. LIGHT GREY LINES AND TEXT REPRESENT EXISTING. HEAVIER LINES AND TEXT REPRESENT NEW.
3. PUSHBUTTONS, INDICATORS, SWITCHES, AND OTHER USER INTERFACE DEVICES SHALL BE LOCATED ON THE FRONT OF THE CONTROL PANEL UON.

KEYED NOTES:

9.373. PROVIDE 2-POSITION KEYED SELECTOR SWITCH. REFER TO E-104 FOR LOCATIONS OF SWITCHES. SHALL BE MOUNTED REMOTE FROM CONTROL PANEL. KEY SHALL BE CAPTIVE IN THE "OFF" POSITION. WHEN SWITCHED TO "OFF", HANGAR DOOR SHALL STOP MOVING AND STAY IN ITS CURRENT POSITION. WHEN SWITCHED TO "OPEN", HANGAR DOOR SHALL BEGIN OR RESUME OPENING. OPENING VIA THIS SWITCH SHALL STILL TRIGGER AUDIBLE AND VISUAL ALARM.

9.374. UTILIZE EXISTING OR PROVIDE NEW TERMINAL BLOCKS WITHIN THE CONTROL PANEL FOR CONNECTION OF NEW KEYED SWITCH.

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SHEET CONTENTS
ELECTRICAL WIRING DIAGRAMS

SHEET NO.:
E-703

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TELECOMMUNICATIONS SYMBOLS

	GROUND BUS BAR
W	WALL PHONE +48" - 1 CAT 6 RJ-45 DATA DROP. PROVIDE 1" CONDUIT TO UNSECURE CABLE TRAY
	UNSECURE DATA +30" UON - 4 CAT 6 RJ-45 DATA DROPS. PROVIDE 1" CONDUIT TO UNSECURE CABLE TRAY
WAP	UNSECURE WIRELESS ACCESS POINT DATA - 2 CAT 6 RJ-45 DATA DROPS. PROVIDE 1" CONDUIT TO UNSECURE CABLE TRAY
PU	P.A./PAGING CONTROL UNIT
S	CEILING MOUNTED P.A./PAGING SPEAKER, PROVIDE 2#18 STP TO PU
S	WALL MOUNTED P.A./PAGING SPEAKER, 10'-0" AFF UON, PROVIDE 2#18 STP TO PU
S	P.A/PAGING HORN, PROVIDE 2#18 STP TO PU
CS	P.A/PAGING DOOR CALL STATION
J	JUNCTION BOX, WALL MOUNTED
	CONDUIT TURN UP
	CONDUIT TURN DOWN
	CONDUIT STUB-UP AND CAP, TERMINATION
	TELECOMMUNICATIONS BACKBOARD
	BASKET TYPE CABLE TRAY
	LADDER TYPE CABLE TRAY
C	TELECOMMUNICATIONS MANHOLE
H	TELECOMMUNICATIONS HANDHOLE
UC	UNDERGROUND COMMUNICATIONS LINE - NEW OR MODIFIED
UC	UNDERGROUND COMMUNICATIONS LINE - EXISTING TO REMAIN
	ANTENNA

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CAT	CATEGORY
CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CH	COUNTER HEIGHT
CKT	CIRCUIT
CTB	COMPUTER TERMINAL BACKBOARD
DN	DOWN
EIA	ELECTRONIC INDUSTRIES ALLIANCE
EMCS	ENERGY MANAGEMENT AND CONTROL SYSTEM
EMT	ELECTRICAL METALLIC TUBING
EX	EXISTING DEVICE TO REMAIN
EXT	EXTERIOR
FL	FLOOR
FO	FIBER OPTIC
FT	FEET
GFGI	GOVERNMENT FURNISHED, GOVERNMENT INSTALLED
GND	GROUND
IAW	IN ACCORDANCE WITH
IDS	INTRUSION DETECTION SYSTEM
ITN	INFORMATION TRANSFER NODE
LB	POUND
LC	LUCENT CONNECTOR
LCU	LIGHTING CONTROL UNIT
MAX	MAXIMUM
MIN	MINIMUM
MM	MULTI MODE
NEC	NATIONAL ELECTRICAL CODE
OSP	OUTSIDE PLANT
PNL	PANEL
POE	POWER OVER ETHERNET
PU	P.A./PAGING CONTROL UNIT
RE	RELOCATE DEVICE INDICATED
RGS	RIGID GALVANIZED STEEL
RM	ROOM
RMU	RACK MOUNT UNIT
SM	SINGLE MODE
STP	SHIELDED TWISTED PAIR
TGB	TELECOMMUNICATIONS GROUND BAR
TIA	TELECOMMUNICATIONS INDUSTRY ASSOCIATION
TMGB	TELECOMMUNICATIONS MAIN GROUND BAR
TSP	TWISTED-SHIELDED PAIR
TTB	TELEPHONE TERMINAL BACKBOARD
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
UTP	UNSHIELDED TWISTED PAIR
W/	WITH
WAP	WIRELESS ACCESS POINT
WKST	WORKSTATION
WP	WEATHERPROOF
XFMR	TRANSFORMER

LEGEND - PLAN SYMBOLS

1 / A-101	DETAIL SYMBOL
1 / A-101	ENLARGED PLAN SYMBOL
ROOM NAME 000	ROOM NAME AND NUMBER
A100	NEW GRID LINES
XXX X' - X"	LEVEL OR SPOT ELEVATIONS
	DEMOLITION - AREAS IN HATCHED PATTERN ARE TO BE DEMOLISHED, UON

GENERAL NOTES

1. TELECOMMUNICATIONS LEGEND IS GENERIC. NOT ALL ITEMS NOTED ARE IN THE PROJECT.
2. ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH THE REQUIREMENTS OF NFPA 70 AND ALL OTHER REQUIREMENTS STATED HEREIN AND IN THE TECHNICAL SPECIFICATIONS FOR THIS PROJECT.
3. COORDINATE FINAL LOCATION OF TELECOMMUNICATIONS FIXTURES AND PATHWAYS WITH MECHANICAL, ELECTRICAL AND OTHER DISCIPLINES TO ENSURE PROPER LOCATION AND ADEQUATE CLEARANCES.
4. ALL TELECOMMUNICATION WIRING / CABLES SHALL TERMINATE IN THE TELECOMMUNICATIONS CABINET.
5. ALL TELECOMMUNICATION RACKS, PATCH PANELS, CABLE TRAYS, CONDUITS, CABINETS AND OTHER COMPONENTS AS REQUIRED SHALL BE PROPERLY BONDED AND GROUNDED.
6. MOUNT TELEPHONE WALL OUTLETS 48" AFF, UON.
7. MOUNT TELEPHONE WEATHERPROOF ENCLOSURES 48" AFF, UON.
8. MOUNT TELECOMMUNICATION WALL OUTLETS:
   A. ALL ADMINISTRATIVE AREAS - 30" AFF, UON.
   B. ALL INDUSTRIAL & SHOP AREAS - 48" AFF, UON.
9. ALL CONDUIT PENETRATIONS THRU FIRE RATED WALLS SHALL BE SEALED / FIRE STOPPED AT BOTH ENDS.
10. ALL SERVICE ENTRANCE CONDUITS / DUCTS WITH CABLES SHALL BE SEALED AT BOTH ENDS WITH APPROPRIATE DUCT PLUGS / SEALER. ALL EMPTY CONDUITS SHALL BE CLEANED, PROVIDED WITH PULL-WIRE AND CAPPED.
11. ALL OUTLET LABELS, CABLE LABELS, PATCH PANEL LABELS / DIRECTORIES SHALL BE TYPE-WRITTEN IN ENGLISH AND SHALL BE COMPLETE. LABEL AT SOURCE AND DESTINATION SHALL MATCH. ALL LABELING SHALL COMPLY WITH TIA/EIA 606-C LABELING STANDARDS.

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HARRISON TWP, MICHIGAN

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SHEET CONTENTS
TELECOMMUNICATIONS GENERAL NOTES

SHEET NO.:
T-001

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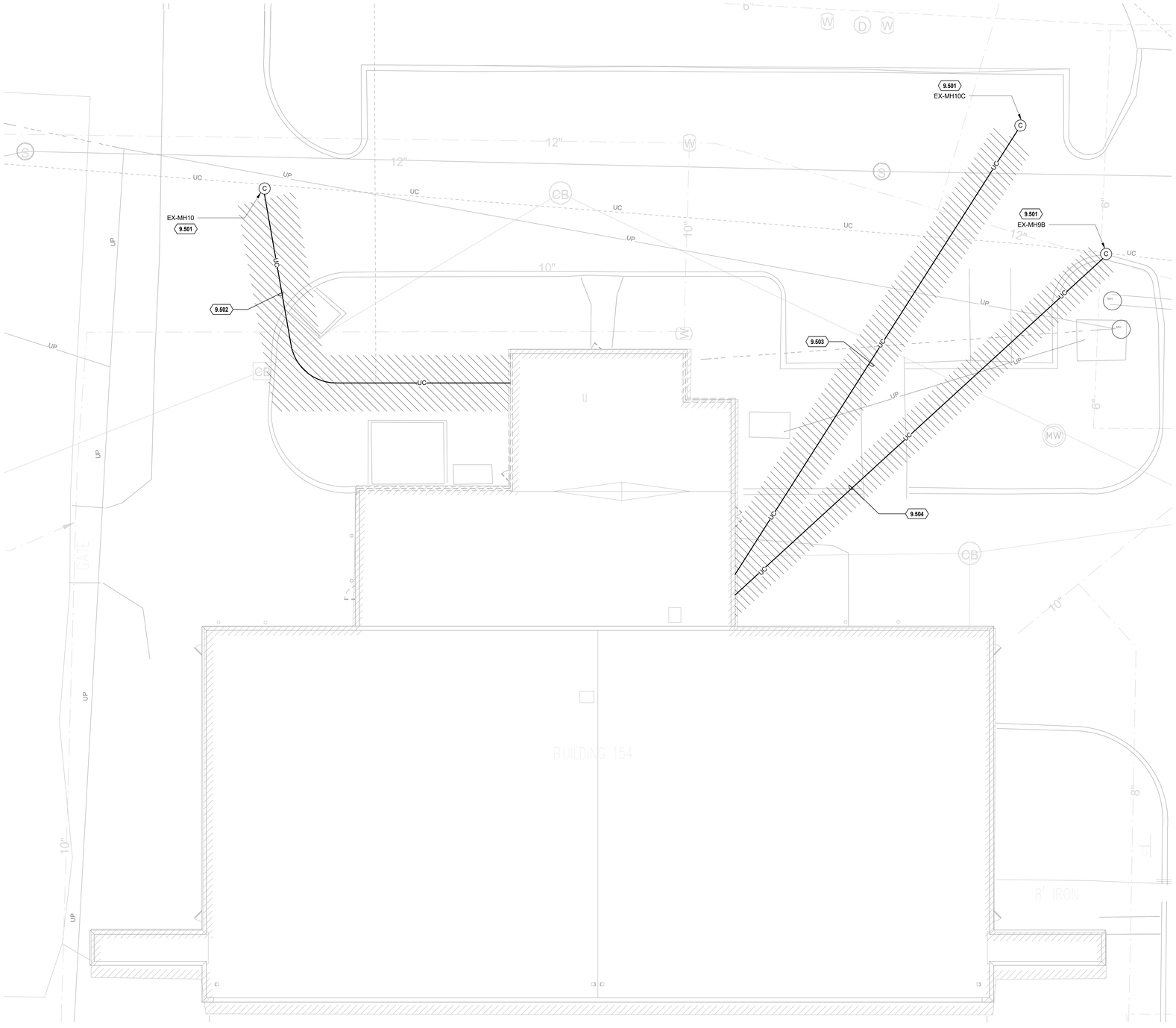

N 1 **TELECOMMUNICATIONS SITE DEMOLITION PLAN - B154**
1" = 10'-0"

DEMOLITION PLAN GENERAL NOTES

1. SEE SHEET T-001 FOR GENERAL TELECOMMUNICATIONS NOTES, ABBREVIATIONS, AND SYMBOL LEGEND.
2. SPECIAL CARE SHALL BE TAKEN TO AVOID DAMAGING EXISTING UTILITIES (WATER, SEWER, POWER, GAS, COMMUNICATIONS, ETC.). CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING AND LOCATING ALL EXISTING SITE UTILITIES (OVERHEAD & UNDERGROUND) IN THE AREA OF EXCAVATION AND/OR DRILLING. NO ADDITIONAL COMPENSATION SHALL BE GIVEN FOR REPAIRS REQUIRED FOR ANY INCIDENTAL DAMAGES, WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. SUCH DAMAGES (IF HAPPENED) SHALL BE REPAIRED IMMEDIATELY TO RESUME SERVICES WITH MINIMAL OUTAGES AND AT NO ADDITIONAL COST TO THE GOVERNMENT.
3. REFER TO T-100 FOR EXTENTS OF NEW TELECOMMUNICATIONS SITE WORK.
4. COORDINATE ALL TELECOMMUNICATIONS SITE DEMOLITION WITH DEMOLITION WORK SHOWN ON CIVIL DEMO PLANS.

KEYED NOTES:

9.501. COMMUNICATIONS MANHOLE IS EXISTING TO REMAIN. PROTECT DURING DEMOLITION OF SURROUNDING AREAS.

9.502. EXISTING 24 STRAND FIBER OSP CABLING IN THIS COMMUNICATIONS DUCT BANK IS EXISTING TO REMAIN. PULL BACK TO MH10 PRIOR TO DEMOLITION OF DUCT BANK.

9.503. EXISTING 12 STRAND FIBER OSP CABLE IN THIS COMMUNICATIONS DUCT BANK SHALL BE DEMOLISHED ALONG WITH THE DUCT BANK. REMOVE FIBER BACK TO INFORMATION TRANSFER NODE (ITN) LOCATED IN BUILDING 34. REMOVE DUCT BANK FROM B154 TO MH10C.

9.504. EXISTING 25-PAIR COPPER OSP CABLE SHALL BE DEMOLISHED WITH THE COMMUNICATIONS DUCT BANK. DEMOLISH DUCT BANK AND COPPER OSP CABLING FROM B154 TO MH9B. COPPER OSP CABLING IN MH9B SHALL BE PROTECTED FOR EXTENSION TO NEW COMMUNICATIONS BUILDING ENTRY POINT DURING CONSTRUCTION.

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SHEET CONTENTS
TELECOMMUNICATIONS DEMOLITION SITE PLAN

SHEET NO.:
TD101

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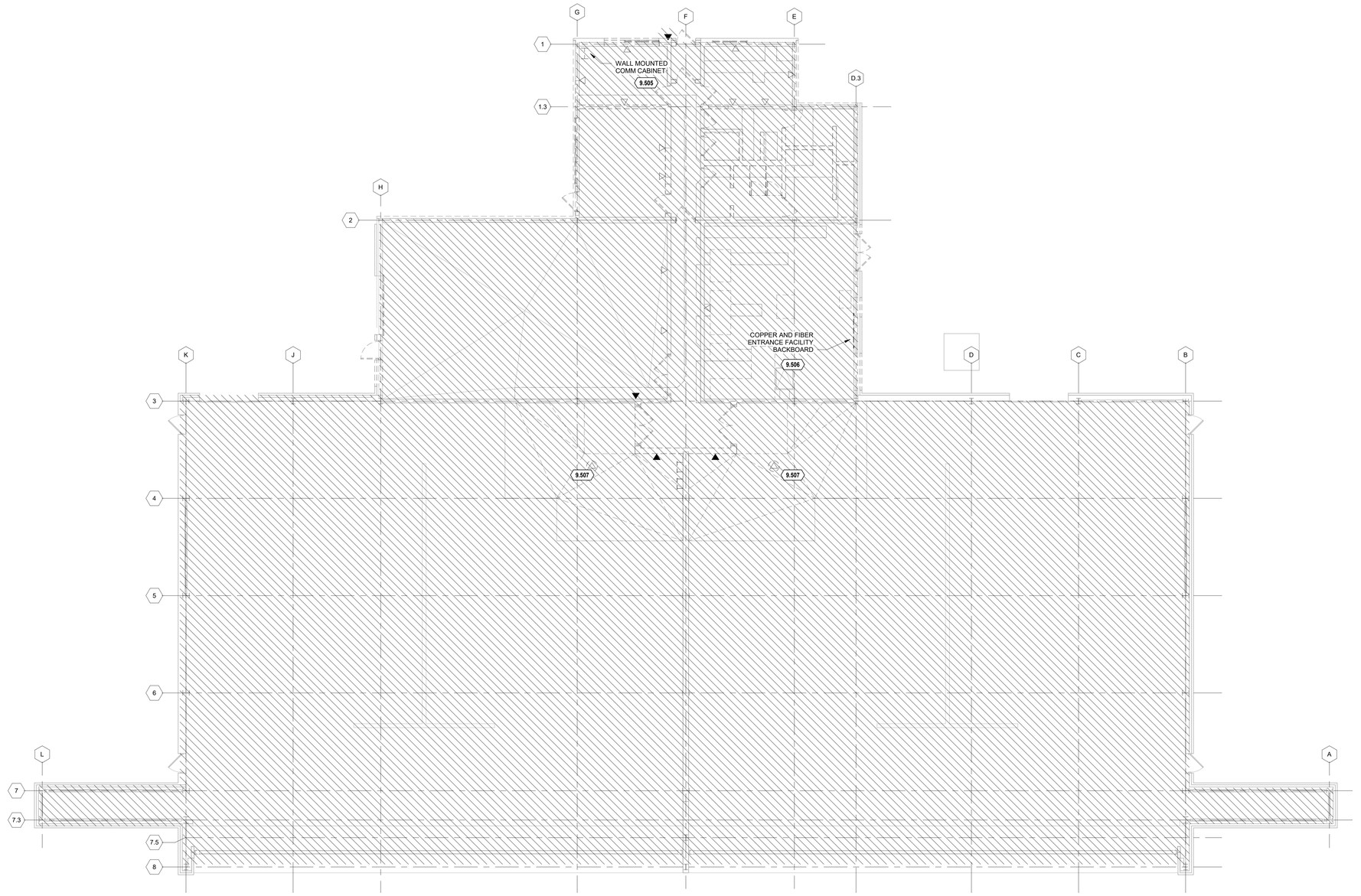

N 1 **TELECOMMUNICATIONS DEMOLITION FLOOR PLAN**
1/8" = 1'-0"

DEMOLITION PLAN GENERAL NOTES

1. SEE SHEET T-001 FOR GENERAL TELECOMMUNICATIONS NOTES, ABBREVIATIONS, AND SYMBOL LEGEND.
2. ALL COMMUNICATIONS EQUIPMENT AND INFRASTRUCTURE INCLUDING, BUT NOT LIMITED TO, PLYWOOD BACKBOARDS, PUNCH DOWNS, SURGE PROTECTORS, RACKS, RACEWAY, BACKBONE CABLING, HORIZONTAL CABLING, AND OUTLETS SHALL BE DEMOLISHED UON.
3. LOCATIONS AND QUANTITIES OF EXISTING DEVICES ARE BASED ON FIELD OBSERVATION AND AS-BUILT DOCUMENTS. DEMOLITION DRAWINGS SHOW GENERAL INTENT AND DO NOT SHOW EVERY DEVICE OR DETAIL. PROVIDE DEMOLITION IN ACCORDANCE WITH DESIGN INTENT.

KEYED NOTES:

9.505. DEMOLISH CABINET, STORE PATCH PANEL, CABLE MANAGEMENT AND OTHER PASSIVE EQUIPMENT. ACTIVE EQUIPMENT SHALL BE REMOVED BY THE GOVERNMENT PRIOR TO CABINET DEMOLITION.

9.506. DEMOLISH ALL TELECOMMUNICATIONS EQUIPMENT AND DEVICES ASSOCIATED WITH THE BUILDING ENTRANCE FACILITY BACKBOARD. REFER TO TD101 FOR EXTENTS OF CABLING DEMOLITION OUTSIDE THE BUILDING.

9.507. REMOVE AND STORE WIRELESS ACCESS POINT.

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SHEET CONTENTS
TELECOMMUNICATIONS DEMOLITION FLOOR PLAN

SHEET NO.:
TD102

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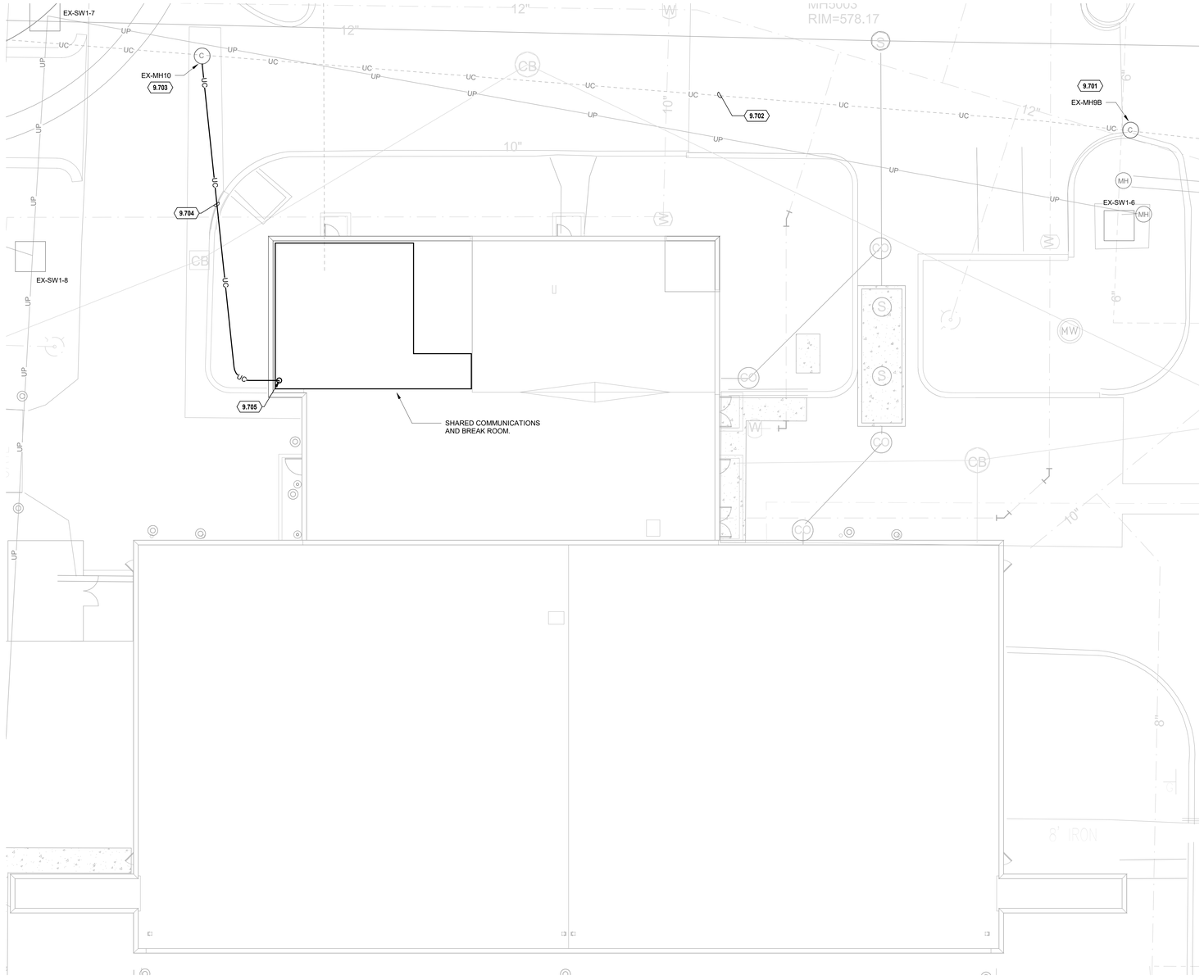

N 1 **TELECOMMUNICATIONS SITE PLAN**
1" = 10'-0"

SITE PLAN GENERAL NOTES

1. SEE SHEET T-001 FOR GENERAL TELECOMMUNICATIONS NOTES, ABBREVIATIONS, AND SYMBOL LEGEND.
2. SPECIAL CARE SHALL BE TAKEN TO AVOID DAMAGING EXISTING UTILITIES (WATER, SEWER, POWER, GAS, COMMUNICATIONS, ETC.). CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING AND LOCATING ALL EXISTING SITE UTILITIES (OVERHEAD & UNDERGROUND) IN THE AREA OF EXCAVATION
3. ALL MANUFACTURER WARRANTIES FOR EQUIPMENT MATERIALS SHALL BE TURNED OVER TO OWNER AT COMPLETION OF PROJECT.
4. TELECOMMUNICATIONS PLANS AND DETAILS DO NOT SHOW ALL INTERFERENCES AND CONDITIONS, VISIBLE AND/OR HIDDEN, THAT MAY EXIST. CONTRACTOR SHALL INSPECT AND SURVEY THE SPACE PRIOR TO PERFORMING WORK.
5. COORDINATE TELECOMMUNICATIONS AND ELECTRICAL WORK WITH OWNER AND OTHER DISCIPLINES PRIOR TO COMMENCING WORK.
6. ALL WORK SHALL BE PERFORMED BY LICENSED WORKMEN IN ACCORDANCE WITH STATE AND LOCAL GOVERNING AUTHORITIES.
7. MAINTAIN A MINIMUM ONF 12" SEPARATION BETWEEN COMMUNICATIONS AND POWER CABLING.
8. PROVIDE EXCAVATION AS REQUIRED FOR INSTALLATION OF EXTERIOR UNDERGROUND CONDUITS. REPLACE FILL MATERIAL AND COMPACT IN ACCORDANCE WITH CIVIL SPECIFICATIONS.
9. COMMUNICATIONS DUCT BANKS SHALL BE DIRECT BURIED, UON. REFER TO DETAILS ON T-501.
10. REFER TO T-101 FOR LOCATION OF TELECOMMUNICATIONS BUILDING ENTRY TERMINATIONS.
11. SEE TELECOMMUNICATIONS RISER DIAGRAM ON T-701 FOR QUANTITES OF COPPER AND FIBER OPTIC CABLING TO BE PROVIDED AND ROUTED TO BUILDING ENTRANCE TERMINALS.
12. REFER TO C-104 FOR CIVIL UTILITY PLAN.

KEYED NOTES:

9.701. EXTEND 25-PAIR COPPER OSP PULLED BACK TO THIS MANHOLE DURING DEMOLITION. EXTEND TO BUILDING ENTRANCE TERMINATION VIA MH10. ANY SPLICES SHALL BE ACCOMPLISHED WITH TYPE 710 CONNECTORS.

9.702. UTILIZE SPARE CONDUIT OR SPARE INNERDUCT IN PARTIALLY FILLED CONDUIT TO ROUTE 25-PAIR COPPER OSP. IF UTILIZING A SPARE CONDUIT, PROVIDE ONE (1)-3 CELL FABRIC INNDERDUCT IN CONDUIT.

9.703. EXTEND 24 STRAND OSP FIBER PULLED BACK TO MH10 DURING DEMOLITION. ROUTE TO BUILDING ENTRANCE TERMINATION VIA NEW COMMUNICATIONS DUCTBANK.

9.704. PROVIDE THREE (3) SCHEDULE 40 PVC CONDUITS. CONDUITS SHALL BE CONCRETE-ENCASED WHERE PASSING UNDER PAVEMENT AND DIRECT BURIED IN ALL OTHER LOCATIONS. ROUTE FIBER AND COPPER OSP CABLING IN SEPARATE CONDUITS. PROVIDE ONE (1)-3 CELL FABRIC INNERDUCT IN BOTH OCCUPIED CONDUITS. PROVIDE A PULL STRING IN THE SPARE CONDUIT.

9.705. STUB UP ABOVE CEILING.

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

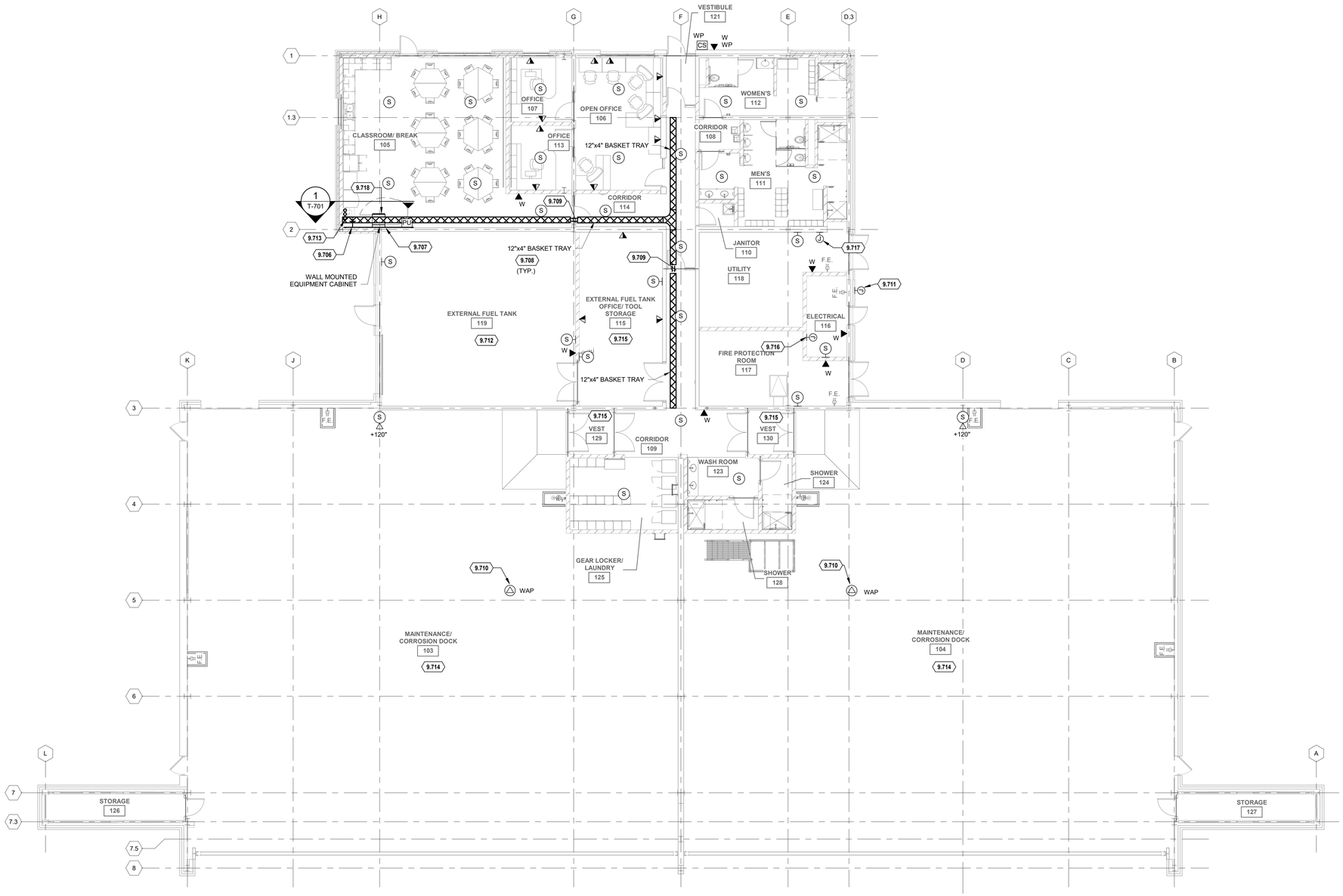
ISSUED
12/16/22 TYPE B3 FINAL
HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
DESIGNED BY: JKH
DRAWN BY: JKH
CHECKED BY: JRM
DO NOT SCALE DRAWINGS

SHEET CONTENTS
TELECOMMUNICATIONS SITE PLAN

SHEET NO.:
T-100

12/15/2022 9:12:25 AM C:\Users\jesse.hartan\Documents\3141700-181848.01-E-Central-2020_jesse.hartan(EV2LV.rvt



TELECOMMUNICATIONS FLOOR PLAN

1/8" = 1'-0"

FLOOR PLAN GENERAL NOTES

1. SEE SHEET T-001 FOR GENERAL TELECOMMUNICATIONS NOTES, ABBREVIATIONS, AND SYMBOL LEGEND.
2. REFER TO T-701 FOR TELECOMMUNICATION AND PA/PAGING RISER DIAGRAMS.
3. ALL MANUFACTURER WARRANTIES FOR EQUIPMENT MATERIALS SHALL BE TURNED OVER TO OWNER AT COMPLETION OF PROJECT.
4. TELECOMMUNICATIONS PLANS AND DETAILS DO NOT SHOW ALL INTERFERENCES AND CONDITIONS, VISIBLE AND/OR HIDDEN, THAT MAY EXIST. CONTRACTOR SHALL INSPECT AND SURVEY THE SPACE PRIOR TO PERFORMING WORK.
5. COORDINATE TELECOMMUNICATIONS AND ELECTRICAL WORK WITH OWNER AND OTHER DISCIPLINES PRIOR TO COMMENCING WORK.
6. ALL WORK SHALL BE PERFORMED BY LICENSED WORKMEN IN ACCORDANCE WITH STATE AND LOCAL GOVERNING AUTHORITIES.
7. MAINTAIN A MINIMUM ONE 12" SEPARATION BETWEEN COMMUNICATIONS AND POWER CABLING.
8. ANY COMMUNICATIONS EQUIPMENT WITHIN A HANGAR SHALL BE IN A NEMA 3R OR WEATHERPROOF ENCLOSURE.
9. ALL TELECOMMUNICATIONS CABLING SHALL BE TERMINATED IN THE TELECOMMUNICATIONS EQUIPMENT CABINET IN CLASSROOM/BREAK 105.
10. CONDUIT IN MAINTENANCE DOCKS AND FUEL TANK 119 SHALL BE RGS.
11. COMMUNICATION OUTLETS SHALL HAVE A MINIMUM 1"C EXTENDED FROM OUTLET LOCATION TO NEAREST CABLE TRAY.

KEYED NOTES:

9.706. PROVIDE 1/4" X 4" X 12" COPPER GROUND BUS BAR MOUNTED ON PLYWOOD BACKBOARD. PROVIDE BONDING AS INDICATED ON E-131.

9.707. 3/4" BY 8' HIGH, A-C GRADE, VOID FREE, FIRE RATED PLYWOOD BACKBOARD. PROVIDE WIDTH AS INDICATED ON PLAN. PAINT ALL SIDES WITH TWO COATS OF WHITE OR GRAY FIRE RETARDANT PAINT. DO NOT PAINT MANUFACTURERS 'FIRE-TREATED' STAMP. MOUNT 18" AFF.

9.708. PROVIDE 12" WIDE BY 4" HIGH BASKET TYPE CABLE TRAY WITHIN ACCESSIBLE CEILING SPACE. INSTALL TO MAINTAIN ACESSIBILITY AROUND MECHANICAL DUCTS. MOUNT 18" ABOVE CEILING GRID.

9.709. PROVIDE TWO (2) 4"C THROUGH WALL ABOVE CEILING. MATCH ELEVATION TO CABLE TRAY.

9.710. PROVIDE WAP OUTLET MOUNTED TO ROOF STEEL. COORDINATE EXACT LOCATION WITH CONTRACTING OFFICER.

9.711. COMMUNICATIONS CONNECTION FOR GAS METER TO EMCS/DDC. PROVIDE COMMUNICATIONS CABLING COMPATIBLE WITH SELECTED METER AND TIE INTO EMCS/DDC.

9.712. SPACE SHALL BE RATED CLASS 1, DIVISION 2 FROM FLOOR TO CEILING. ANY EQUIPMENT LOCATED IN HERE SHALL BE RATED FOR USE IN THIS ENVIRONMENT.

9.713. OSP CABLE ENTRY CONDUIT STUB-UPS. COORDINATE LOCATION WITH DUCT ROUTING SHOWN ON T-100.

9.714. SPACE SHALL BE RATED CLASS 1, DIVISION 2 FROM FLOOR TO 18" AFF. ANY EQUIPMENT LOCATED BELOW 18" SHALL BE RATED FOR USE IN THIS ENVIRONMENT.

9.715. SPACE IS IMMEDIATELY ADJACENT TO HAZARDOUS HANGAR OR OTHER AIRCRAFT MAINTENANCE AREA. SPACE SHALL BE RATED CLASS 1, DIVISION 2 FROM FLOOR TO 18" AFF WITHIN 25'-0" OF DOOR ENTERING HANGAR OR MAINTENANCE AREA. ANY EQUIPMENT LOCATED BELOW 18" SHALL BE RATED FOR USE IN THIS ENVIRONMENT.

9.716. COMMUNICATIONS CONNECTION FOR ELECTRIC METER TO EMCS/DDC. REFER TO E-701 FOR ADDITIONAL INFORMATION ON CONNECTION TO METER AND EMCS/DDC.

9.717. COMMUNICATIONS CONNECTION FOR WATER METER TO EMCS/DDC. PROVIDE COMMUNICATIONS CABLING COMPATIBLE WITH SELECTED METER AND TIE INTO EMCS/DDC.

9.718. PROVIDE ONE (1) WALL MOUNTED EQUIPMENT CABINET 18RU HIGH AND 28" DEEP. DO NOT REUSE EXISTING. PROVIDE PATCH PANELS AND TERMINATIONS PER RISER DIAGRAM ON T-701.

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28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

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12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
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DRAWN BY: JKH
CHECKED BY: JRM
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SHEET CONTENTS
TELECOMMUNICATIONS FLOOR PLAN

SHEET NO.:
T-101

12/15/2022 9:12:28 AM C:\Users\jesse.harlan\Documents\3141700-181848.01-E-Central-2020_jesse.harlanEVCLV.rvt

SITE PLAN GENERAL NOTES:

1. SEE SHEET T-001 FOR GENERAL TELECOMMUNICATIONS NOTES, ABBREVIATIONS, AND SYMBOL LEGEND.
2. SPECIAL CARE SHALL BE TAKEN TO AVOID DAMAGING EXISTING UTILITIES (WATER, SEWER, POWER, GAS, COMMUNICATIONS, ETC.). CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING AND LOCATING ALL EXISTING SITE UTILITIES (OVERHEAD & UNDERGROUND) IN THE AREA OF EXCAVATION
3. ALL MANUFACTURER WARRANTIES FOR EQUIPMENT MATERIALS SHALL BE TURNED OVER TO OWNER AT COMPLETION OF PROJECT.
4. TELECOMMUNICATIONS PLANS AND DETAILS DO NOT SHOW ALL INTERFERENCES AND CONDITIONS, VISIBLE AND/OR HIDDEN, THAT MAY EXIST. CONTRACTOR SHALL INSPECT AND SURVEY THE SPACE PRIOR TO PERFORMING WORK.
5. COORDINATE TELECOMMUNICATIONS AND ELECTRICAL WORK WITH OWNER AND OTHER DISCIPLINES PRIOR TO COMMENCING WORK.
6. ALL WORK SHALL BE PERFORMED BY LICENSED WORKMEN IN ACCORDANCE WITH STATE AND LOCAL GOVERNING AUTHORITIES.
7. MAINTAIN A MINIMUM ONF 12" SEPARATION BETWEEN COMMUNICATIONS AND POWER CABLING.
8. PROVIDE EXCAVATION AS REQUIRED FOR INSTALLATION OF EXTERIOR UNDERGROUND CONDUITS. REPLACE FILL MATERIAL AND COMPACT IN ACCORDANCE WITH CIVIL SPECIFICATIONS.
9. COMMUNICATIONS DUCT BANKS SHALL BE DIRECT BURIED, UON. REFER TO DETAILS ON T-501.
10. REFER TO T-103 FOR LOCATION OF TELECOMMUNICATIONS BUILDING ENTRY TERMINATIONS.
11. SEE TELECOMMUNICATIONS RISER DIAGRAM ON T-702 FOR QUANTITES OF COPPER AND FIBER OPTIC CABLING TO BE PROVIDED AND ROUTED TO BUILDING ENTRANCE TERMINALS.
12. REFER TO C-104 FOR CIVIL UTILITY PLAN.

KEYED NOTES:

9.719. PROVIDE TWO (2) 4" SCHEDULE 40 PVC CONDUITS. CONDUITS SHALL BE CONCRETE-ENCASED WHERE PASSING UNDER PAVEMENT AND DIRECT BURIED IN ALL OTHER LOCATIONS. ROUTE OSP FIBER IN ONE OF THE TWO CONDUITS. PROVIDE ONE (1)-3 CELL FABRIC INNERDUCT IN THE UTILIZED CONDUIT. PROVIDE A PULL STRING IN THE SPARE CONDUIT. STUB CONDUIT INTO EXISTING MH-10B EITHER UTILIZING AN EXISTING KNOCKOUT OR CORING A NEW OPENING. OTHER END OF DUCT BANK SHALL BE TERMINATED AT HAND HOLE.

9.720. FIBER OSP SERVING B158 ROUTED FROM B34 ITN. REFER TO CIVIL PLANS FOR SITE PLAN WITH LOCATION OF B34 RELATIVE TO B158. FIBER SHALL EXIT B34 AND ENTER MH-34 UTILIZING EXISTING DUCT BANK. MH-34 IS LOCATED IN FRONT OF B34. FIBER SHALL BE ROUTED FROM MH-34 TO MH-10B THROUGH MH-9B AND MH-10 UTILIZING EXISTING DUCT BANK. REFER TO T-100 FOR LOCATIONS OF MH-9B AND MH-10. WHERE ROUTING THROUGH EXISTING DUCT BANK, UTILIZE ANY INNERDUCT WITH SPARE CAPACITY. PROVIDE A 50'-0" SERVICE LOOP WITHIN EACH MANHOLE. APPROXIMATE LENGTH OF FIBER REQUIRED IS 1200'-0". FIELD VERIFY LENGTH PRIOR TO INSTALLATION. UTILIZE MH-34, MH-9B, MH-10, OR MH-10B AS INTERMEDIATE PULL POINTS AS NEEDED.

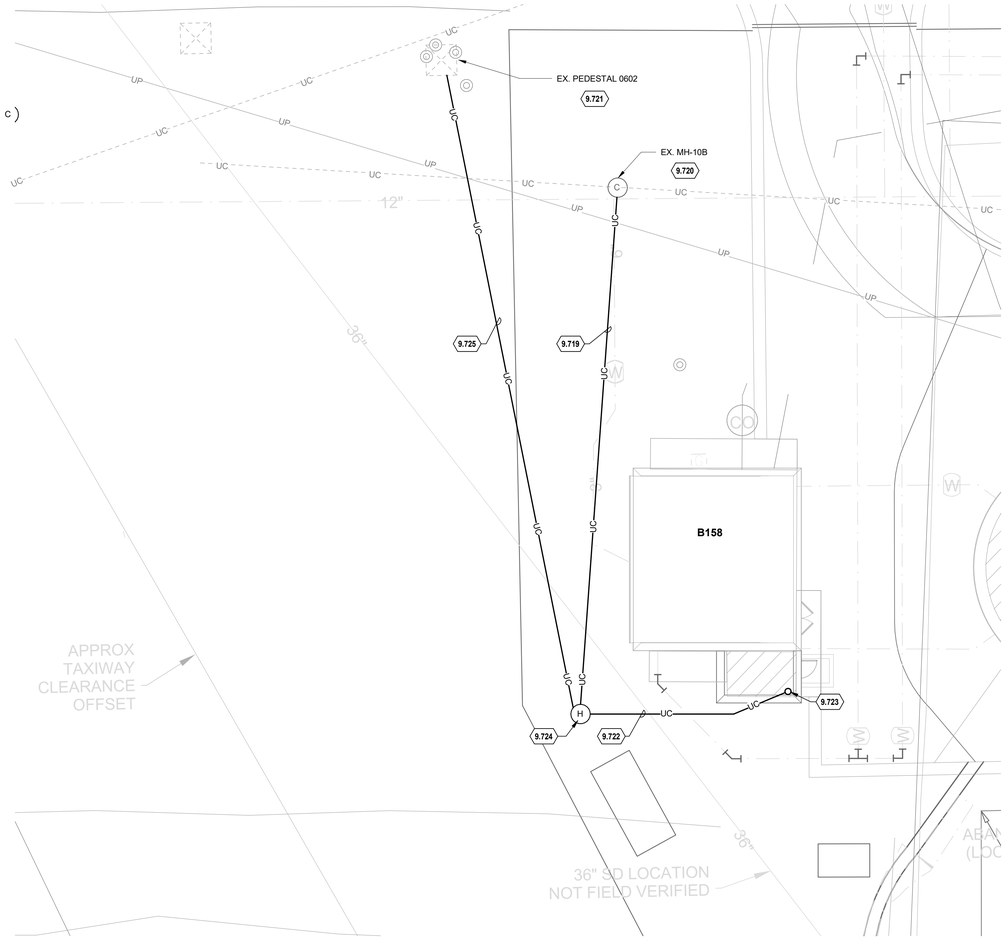
9.721. PROVIDE 25-PAIR COPPER OSP CABLE FROM THIS TELECOMMUNICATIONS PEDESTAL. PROVIDE TYPE 710 SPLICES TO SPLICE COPPER OSP TO EXISTING SPARE COPPER.

9.722. PROVIDE THREE (3) 4" SCHEDULE 40 PVC CONDUITS. CONDUITS SHALL BE CONCRETE-ENCASED WHERE PASSING UNDER PAVEMENT AND DIRECT BURIED IN ALL OTHER LOCATIONS. ROUTE FIBER AND COPPER OSP CABLING IN SEPARATE CONDUITS. PROVIDE ONE (1)-3 CELL FABRIC INNERDUCT IN BOTH OCCUPIED CONDUITS. PROVIDE A PULL STRING IN THE SPARE CONDUIT. STUB UP 8" AFF AT TELECOMMUNICATIONS BACKBOARD.

9.723. STUB UP 8" AFF AT TELECOMMUNICATIONS BACKBOARD.

9.724. PROVIDE 48"Wx72"Lx48"W COMMUNICATIONS HANDHOLE FOR FIBER AND COPPER OSP. ROUTE FIBER AND COPPER THROUGH THIS HANDHOLE AS ONE CONTINUOUS, UNSPLICED PULL. HANDHOLE SHALL BE H20 RATED MINIMUM. SEE DETAIL 7/T-501.

9.725. PROVIDE TWO (2) 4" SCHEDULE 40 PVC CONDUITS. CONDUITS SHALL BE CONCRETE-ENCASED WHERE PASSING UNDER PAVEMENT AND DIRECT BURIED IN ALL OTHER LOCATIONS. ROUTE OSP COPPER CABLE IN ONE OF THE TWO CONDUITS. PROVIDE ONE (1)-3 CELL FABRIC INNERDUCT IN THE UTILIZED CONDUIT. PROVIDE A PULL STRING IN THE SPARE CONDUIT. STUB UP CONDUIT WITHIN PEDESTAL. OTHER END OF CONDUIT SHALL BE TERMINATED AT HAND HOLE.



N 1 **TELECOMMUNICATIONS SITE PLAN - B158**
1" = 10'-0"

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12/16/22 TYPE B3 FINAL HEF MOD

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SHEET CONTENTS
B158
TELECOMMUNICATIONS
SITE PLAN

SHEET NO.:
T-102

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FLOOR PLAN GENERAL NOTES:

1. SEE SHEET T-001 FOR GENERAL TELECOMMUNICATIONS NOTES, ABBREVIATIONS, AND SYMBOL LEGEND.
2. ALL MANUFACTURER WARRANTIES FOR EQUIPMENT MATERIALS SHALL BE TURNED OVER TO OWNER AT COMPLETION OF PROJECT.
3. TELECOMMUNICATIONS PLANS AND DETAILS DO NOT SHOW ALL INTERFERENCES AND CONDITIONS, VISIBLE AND/OR HIDDEN, THAT MAY EXIST. CONTRACTOR SHALL INSPECT AND SURVEY THE SPACE PRIOR TO PERFORMING WORK.
4. COORDINATE TELECOMMUNICATIONS AND ELECTRICAL WORK WITH OWNER AND OTHER DISCIPLINES PRIOR TO COMMENCING WORK.
5. ALL WORK SHALL BE PERFORMED BY LICENSED WORKMEN IN ACCORDANCE WITH STATE AND LOCAL GOVERNING AUTHORITIES.
6. MAINTAIN A MINIMUM ONE 12" SEPARATION BETWEEN COMMUNICATIONS AND POWER CABLING.

KEYED NOTES:

9.726. DEMOLISH TELECOMMUNICATIONS EQUIPMENT AND INFRASTRUCTURE IN ITS ENTIRETY. THIS INCLUDES, BUT IS NOT LIMITED TO, BACKBOARDS, BUILDING ENTRANCE EQUIPMENT, PATCH PANELS, DISTRIBUTION PANELS, CABLING, RACEWAY, AND DEVICES.

9.727. COMMUNICATIONS CONNECTION FOR ELECTRIC METER TO EMCS/DDC. REFER TO E-701 FOR ADDITIONAL INFORMATION ON CONNECTION TO METER AND EMCS/DDC.

9.728. PROVIDE ONE (1) 4" CONDUIT THROUGH WALL TO ADJACENT SPACE.

9.729. 3/4" BY 8' HIGH, A-C GRADE, VOID FREE, FIRE RATED PLYWOOD BACKBOARD. PROVIDE WIDTH AS INDICATED ON PLAN. PAINT ALL SIDES WITH TWO COATS OF WHITE OR GRAY FIRE RETARDANT PAINT. DO NOT PAINT MANUFACTURERS 'FIRE-TREATED' STAMP. MOUNT 18" AFF.

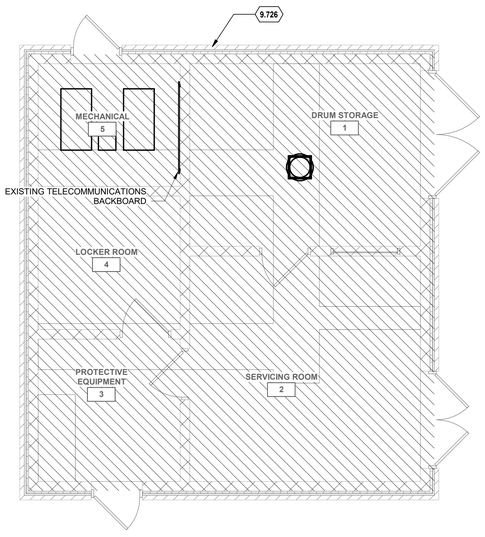
9.730. PROVIDE 1/4" x 4" x 12" COPPER GROUND BUS BAR MOUNTED ON PLYWOOD BACKBOARD. PROVIDE BONDING AS INDICATED ON E-132.

9.731. PROVIDE ONE (1) WALL MOUNTED EQUIPMENT CABINET 18RU HIGH AND 28" DEEP. PROVIDE PATCH PANELS AND TERMINATIONS PER RISER DIAGRAM ON T-702.

9.732. COMMUNICATIONS CONNECTION FOR GAS METER TO EMCS/DDC. PROVIDE COMMUNICATIONS CABLING COMPATIBLE WITH SELECTED METER AND TIE INTO EMCS/DDC.

9.733. COMMUNICATIONS CONNECTION FOR GENERATOR REMOTE ANNUNCIATOR TO EMCS/DDC. PROVIDE ONE (1) CAT6 CABLE EMCS/DDC.

9.734. OSP DUCT STUBBED UP INTO COMM ROOM. REFER TO T-102 FOR ADDITIONAL INFORMATION ON DUCTS.



N 1 **TELECOMMUNICATIONS DEMOLITION PLAN - B158**
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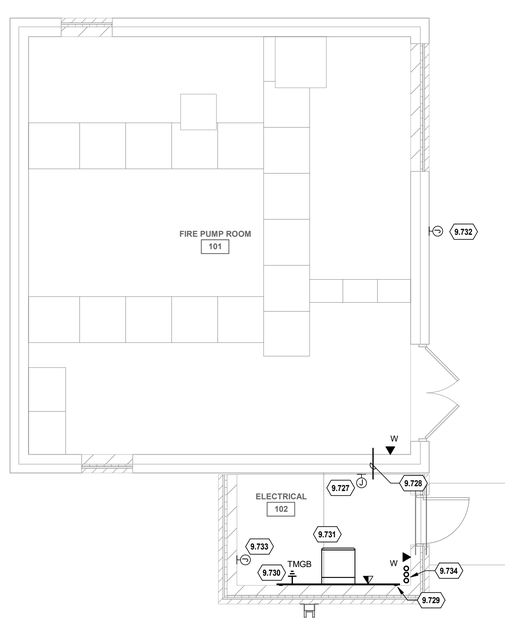

N 2 **TELECOMMUNICATIONS PLAN - B158**
1/4" = 1'-0"

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SHEET CONTENTS
B158 TELECOMMUNICATIONS PLAN

SHEET NO.:
T-103

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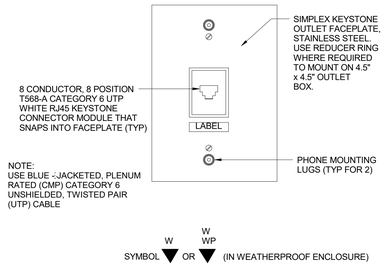

1 WALL PHONE OUTLET DETAIL
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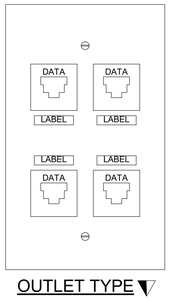

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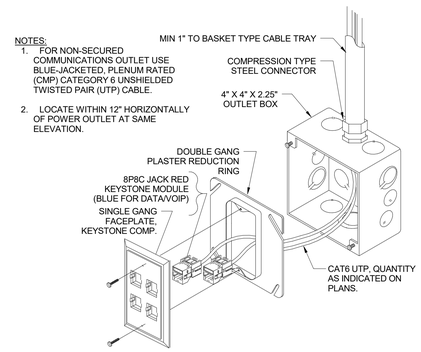

3 TYPICAL OUTLET DETAIL
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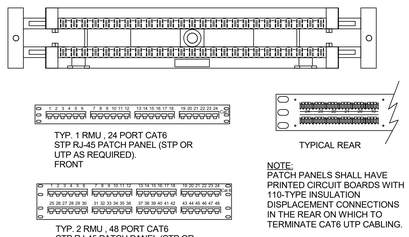

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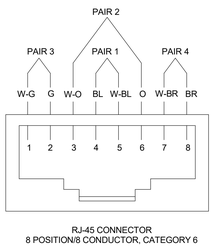

5 EIA-TIA - 568A WIRING
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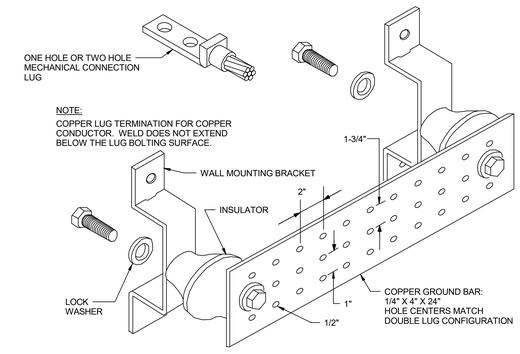

6 TYPICAL GROUNDING TERMINAL BUS BAR
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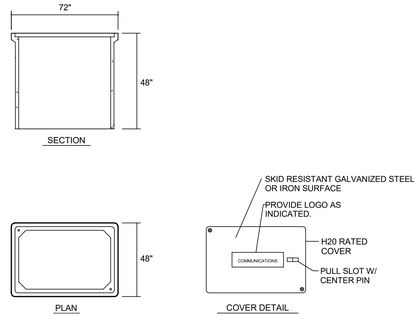

7 PULL BOX DETAIL
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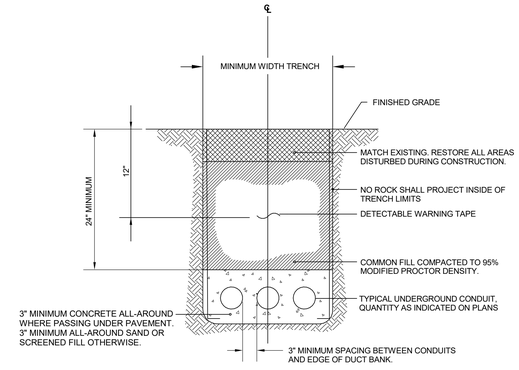

8 TRENCHING DETAIL - TELECOMMUNICATIONS
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TELECOMMUNICATIONS DETAILS

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T-501

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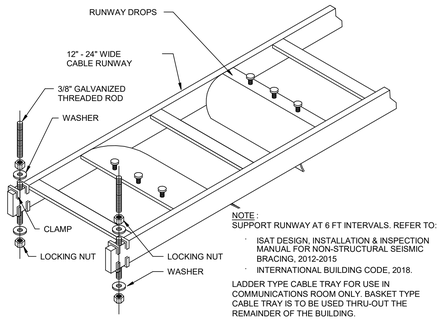

1 LADDER TYPE CABLE TRAY DETAIL
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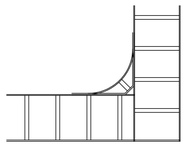

2 LADDER TYPE CABLE TRAY 90 DEGREE TURN
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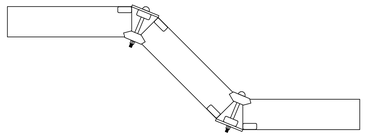

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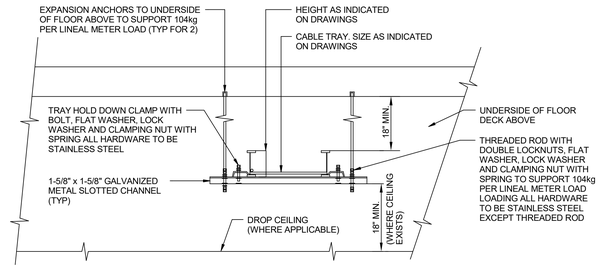
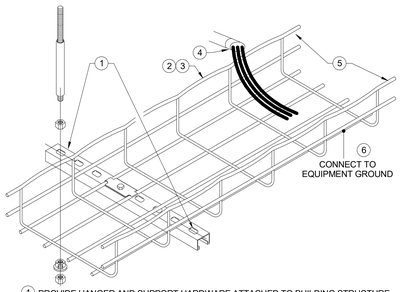
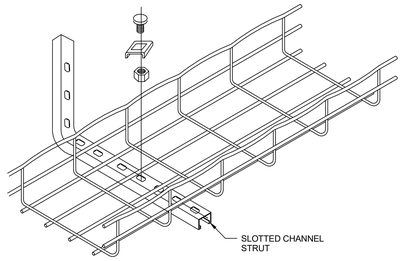


4 LADDER TYPE CABLE TRAY SUPPORT
NTS

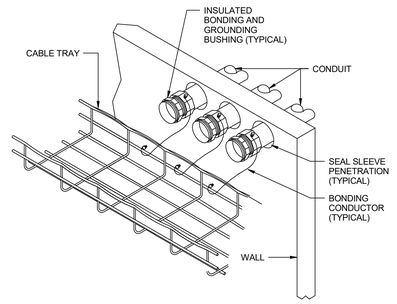


1. PROVIDE HANGER AND SUPPORT HARDWARE ATTACHED TO BUILDING STRUCTURE. PROVIDE COMPONENTS PER MANUFACTURER'S RECOMMENDATIONS. ALL SUPPORT HANGERS MUST SUPPORT THE FULL WIDTH OF THE CABLE TRAY AT RECOMMENDED INTERVALS.
2. PROVIDE CABLE TRAY IN SIZES AS INDICATED ON PLANS. IF NO SIZE IS INDICATED PROVIDE 8" WIDE BY 2" HIGH.
3. PROVIDE MULTIPLE OR LARGER SIZE CABLE TRAY WHERE REQUIRED TO SUPPORT ADDITIONAL CABLING.
4. ROUTE CONDUITS AND LOCATE CABLE TRAY AND CABLING FOR UNRESTRICTED ACCESS TO CABLE TRAY TOP. MOUNT CABLE TRAY TO PROVIDE MINIMUM 12" ACCESS ABOVE CABLE TRAY.
5. PROVIDE CONTINUOUS CABLE TRAY USING MANUFACTURER'S APPROVED FITTINGS FOR ALL TRANSITIONS.
6. PROVIDE ELECTRICAL GROUND CONNECTION EVERY 50 FT PER ANSI J STANDARD 607-A REQUIREMENTS. PROVIDE GROUND CONDUCTOR OR APROVED GROUNDING HARDWARE TO BOND ALL CABLE TRAY SEGMENTS TO FORM A CONTINUOUS GROUNDING PATH.

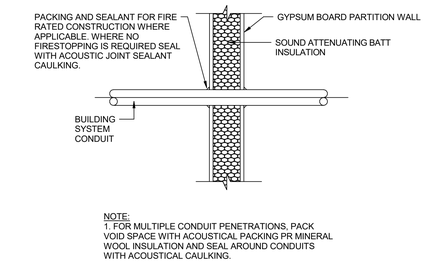
5 BASKET TYPE CABLE TRAY DETAIL
NTS



6 WALL MOUNTED CABLE TRAY DETAIL
NTS

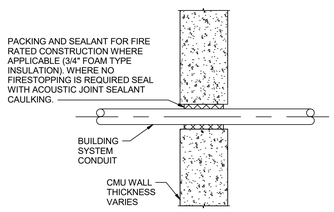


7 TYPICAL CONDUIT THRU WALL
NTS

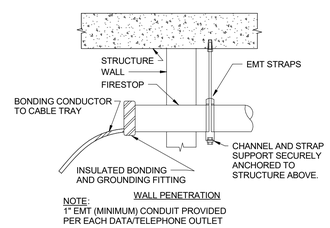


NOTE:
1. FOR MULTIPLE CONDUIT PENETRATIONS, PACK VOID SPACE WITH ACOUSTICAL PACKING PR MINERAL WOOL INSULATION AND SEAL AROUND CONDUITS WITH ACOUSTICAL CAULKING.

8 ACOUSTICAL CONDUIT PENETRATION THRU-GYPSUM BOARD WALL
NTS



9 ACOUSTICAL CONDUIT PENETRATION THRU-MASONRY WALL
NTS



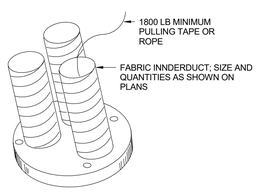
NOTE:
1" EMT (MINIMUM) CONDUIT PROVIDED PER EACH DATA/TELEPHONE OUTLET

10 WALL PENETRATION FOR TELECOMMUNICATIONS CONDUIT
NTS

NOTE:
EMPTY INNERDUCT WILL BE PROVIDED WITH AN EXPANDABLE PLUG WITH INTERNAL EYEBOLT TO TIE OFF PULL ROPE/TAPE.

INNERDUCTS WITH FIBER CABLE WILL BE PROVIDED WITH AN EXPANDABLE SPLIT PLUG THAT SEALS AROUND THE CABLE.

INNERDUCT TO EXTEND 2" BEYOND THE CONDUIT FACE.



11 TYPICAL DUCT PLUG
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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154
28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
DESIGNED BY: JKH
DRAWN BY: JKH
CHECKED BY: JRM
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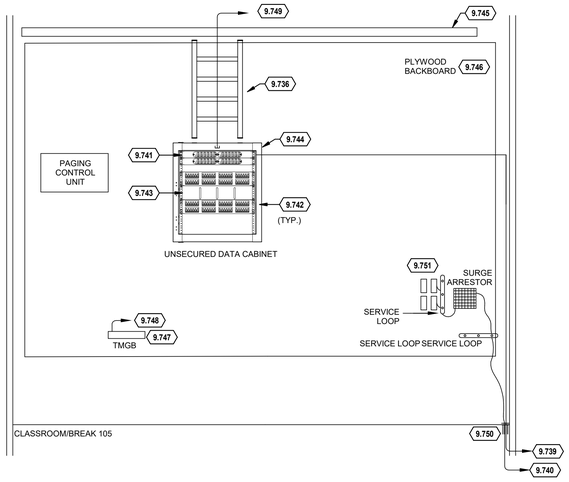
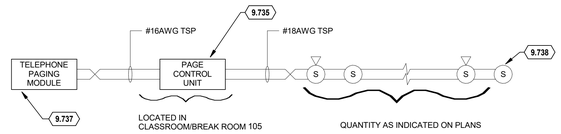
SHEET CONTENTS
TELECOMMUNICATIONS DETAILS

SHEET NO.:
T-502

12/15/2022 9:12:29 AM C:\Users\jesse.harlan\Documents\3141700-181848.01-E-Central-2020_jesse.harlanEVCLV.rvt



1 B154 TELECOMMUNICATIONS RISER DIAGRAM
NTS



2 PAGING SYSTEM RISER
NTS

RISER GENERAL NOTES

1. ALL HORIZONTAL DISTRIBUTION CABLES SHALL BE CONTINUOUS BETWEEN OUTLETS AND PATCH PANELS IN THE COMM ROOM. INSTALLED LENGTH OF HORIZONTAL CABLE SHALL NOT EXCEED 295 FEET.
2. PROVIDE COPPER PATCH PANELS TO ACCOMMODATE ALL THE COPPER TERMINATIONS PLUS 25% SPARE TERMINATION PORTS.
3. PROVIDE DEDICATED RACK MOUNTED PATCH PANEL FOR CATEGORY 6 TELEVISION (IPTV) CABLING. IPTV CABLING SHALL BE TERMINATED ON SEPARATE PATCH PANEL FROM GENERAL BUILDING CABLING.
4. PROVIDE #6 AWG GREEN INSULATED GROUND CONDUCTOR IN 3/4" EMT FROM EACH COMMUNICATION RACK GROUND TO TELECOMMUNICATIONS GROUND BAR IN THE ROOM.
5. ALL CABLING IN WALLS SHALL BE IN 1" CONDUIT, MINIMUM.
6. REUSE EXISTING PATCH PANELS, AND ANY OTHER PASSIVE EQUIPMENT REMOVED FROM THE EXISTING B154 TELECOMMUNICATIONS CABINET THAT IS IN GOOD CONDITION, UON. CONTRACTING OFFICER TO DETERMINE CONDITION.
7. PAGING SYSTEM CABLING SHALL BE ROUTED IN DEDICATED RACEWAYS.

KEYED NOTES:

9.735. PAGING CONTROL UNIT SHALL PROVIDE AUDIO SIGNALS AND POWER TO SPEAKERS. INPUT SHALL CONSIST OF TELEPHONE PAGING AND ONE LOCAL MICROPHONE MOUNTED ADJACENT TO UNIT. POWER AS INDICATED ON E-401.

9.736. PROVIDE WALL-MOUNTED VERTICAL 12"x4" LADDER TRAY FROM TOP OF CABINET UP TO BASKET TRAY ABOVE CEILING. PROVIDE WATERFALL-TYPE FITTINGS ON BASKET TRAY TO TRANSITION CABLING FROM VERTICAL TO HORIZONTAL TRAY.

9.737. TELEPHONE INTERFACE MODULE SHALL BE COMPATIBLE WITH VOIP. PROVIDE CAT6 CABLE FROM VOIP PATCH PANEL TO INTERFACE MODULE. COORDINATE WITH CONTRACTING OFFICER FOR CONNECTION TO BASE PHONE SYSTEM.

9.738. SPEAKERS SHALL BE SELF AMPLIFIED.

9.739. 24 STRAND, OS1 OSP SINGLE MODE FIBER OPTIC CABLE WITH SC/APC CONNECTORS AT EACH TERMINATION POINT. ROUTE TO MANHOLE SHOWN ON T-100.

9.740. 25 PAIR OSP COPPER TO MANHOLE SHOWN ON SITE PLAN, SEE T-100.

9.741. PROVIDE 24 STRAND/12 PAIR 1 RU HIGH FIBER DISTRIBUTION PANEL WITH 24 FIBER SC/APC DUPLEX SINGLE MODE ADAPTER PLATES AND FIBER SPLICE TRAYS.

9.742. PROVIDE 48 PORT, CAT-6, TYPE 568A WIRING, RACK MTD. PATCH PANEL, REUSE ANY EXISTING PATCH PANELS REMOVED FROM THE EXISTING B154 TELECOMMUNICATIONS CABINET.

9.743. PROVIDE HORIZONTAL CABLE MANAGEMENT PANEL. REUSE ANY CABLE MANAGEMENT PANELS REMOVED FROM THE EXISTING B154 TELECOMMUNICATIONS CABINET.

9.744. PROVIDE WALL-MOUNTED TELECOMMUNICATIONS CABINET, DOUBLE HINGED, 18RU HEIGHT, 24"W, 28"D, SUITABLE FOR MOUNTING 19" RACK MOUNTED EQUIPMENT. PROVIDE COOLING FANS AT THE TOP OF THE CABINET.

9.745. BASKET TYPE CABLE TRAY ABOVE CEILING INDICATED ON PLAN SHEETS. PROVIDE WATERFALL-TYPE FITTINGS AS REQUIRED TO PROTECT CABLE INSULATION FROM DAMAGE AND CONTROL BEND RADIUS. CABLE TRAY LOCATED ABOVE CEILING.

9.746. INSULATED FIRE RATED PLYWOOD BACKBOARD.

9.747. GROUND ALL EQUIPMENT RACKS, CABLE TRAY AND TELECOMMUNICATION CONDUIT TO THE GROUND BAR IN THE ROOM.

9.748. PROVIDE BONDING CONDUCTOR PER E-131.

9.749. PROVIDE 4-PAIR, CATEGORY 6, 24 AWG SOLID COPPER UTP CABLING FROM COMMUNICATION CABINET PATCH PANEL TO EACH COMMUNICATION JACK FOR UNSECURED DATA CABLING. REFER TO PLANS FOR OUTLET LOCATIONS. ROUTE CABLES IN CONDUIT AND CABLE TRAY. ALL CABLING SHALL BE PLENUM RATED.

9.750. PROVIDE SPARE 4" CONDUIT WITH PULL STRING TO COMMUNICATIONS MANHOLE.

9.751. TERMINATE 25 PAIR OSP COPPER CABLE AT BUILDING ENTRANCE TERMINAL. NO HORIZONTAL DISTRIBUTION ASSOCIATED WITH THE COPPER SERVICE IS PROVIDED IN THIS PROJECT. COPPER SERVICE IS SPARE.

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ADAL FUEL CELL & CORROSION CONTROL - BLDG 154

28040 WILBUR WRIGHT BLVD.
HARRISON TWP, MICHIGAN

ISSUED
12/16/22 TYPE B3 FINAL HEF MOD

ANG NO.: VGLZ162323
M&H NO.: 3141700-181848.01
DATE: December 16 2022
DESIGNED BY: JKH
DRAWN BY: JKH
CHECKED BY: JRM
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SHEET CONTENTS:
TELECOMMUNICATIONS ONE-LINE DIAGRAM

SHEET NO.:
T-701

12/15/2022 9:12:29 AM C:\Users\jesse.harlan\Documents\3141700-181848.01-E-Central-2020_jesse.harlanEVCLV.rvt

SITE PLAN GENERAL NOTES:

1. ALL HORIZONTAL DISTRIBUTION CABLES SHALL BE CONTINUOUS BETWEEN OUTLETS AND PATCH PANELS IN THE COMM ROOM. INSTALLED LENGTH OF HORIZONTAL CABLE SHALL NOT EXCEED 295 FEET.
2. PROVIDE COPPER PATCH PANELS TO ACCOMMODATE ALL THE COPPER TERMINATIONS PLUS 25% SPARE TERMINATION PORTS.
3. PROVIDE #6 AWG GREEN INSULATED GROUND CONDUCTOR IN 3/4" EMT FROM EACH COMMUNICATION RACK GROUND TO TELECOMMUNICATIONS GROUND BAR IN THE ROOM.
4. ALL CABLING IN WALLS SHALL BE IN 1" CONDUIT, MINIMUM.

KEYED NOTES:

9.752. 24 STRAND, OS1, OSP SINGLE MODE FIBER OPTIC CABLE WITH SC/APC CONNECTORS AT EACH TERMINATION POINT. ROUTE TO MANHOLE SHOWN ON T-102.

9.753. 25 PAIR OSP COPPER TO MANHOLE SHOWN ON SITE PLAN. SEE T-102.

9.754. PROVIDE 24 STRAND/12 PAIR 1 RU HIGH FIBER DISTRIBUTION PANEL WITH 24 FIBER SC/APC DUPLEX SINGLE MODE ADAPTER PLATES AND FIBER SPLICE TRAYS.

9.755. PROVIDE 48 PORT, CAT-6, TYPE 568A WIRING, RACK MTD. PATCH PANEL.

9.756. PROVIDE HORIZONTAL CABLE MANAGEMENT PANEL.

9.757. PROVIDE WALL-MOUNTED TELECOMMUNICATIONS CABINET, DOUBLE HINGED, 18RU HEIGHT, 24"W, 28"D, SUITABLE FOR MOUNTING 19" RACK MOUNTED EQUIPMENT. PROVIDE COOLING FANS AT THE TOP OF THE CABINET.

9.758. GROUND ALL EQUIPMENT RACKS, CABLE TRAY AND TELECOMMUNICATION CONDUIT TO THE GROUND BAR IN THE ROOM.

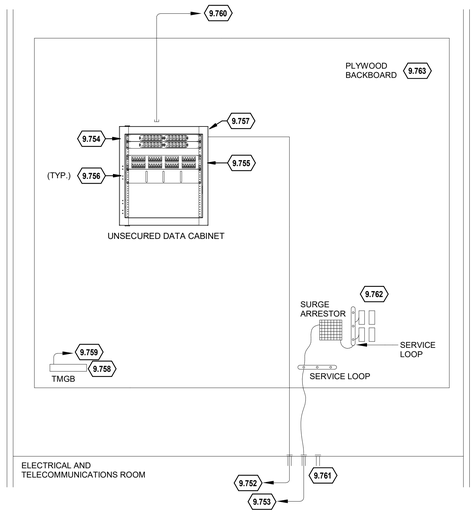
9.759. PROVIDE BONDING CONDUCTOR PER E-132.

9.760. PROVIDE 4-PAIR, CATEGORY 6, 24 AWG SOLID COPPER UTP CABLING FROM COMMUNICATION RACK PATCH PANEL TO EACH COMMUNICATION JACK FOR UNSECURED DATA CABLING. REFER TO PLANS FOR OUTLET LOCATIONS. ROUTE CABLES IN CONDUIT. ALL CABLING SHALL BE PLENUM RATED.

9.761. PROVIDE SPARE 4" CONDUIT WITH PULL STRING TO COMMUNICATIONS HANDHOLE.

9.762. TERMINATE 25 PAIR OSP COPPER CABLE AT BUILDING ENTRANCE TERMINAL. NO HORIZONTAL DISTRIBUTION ASSCIATED WITH THE COPPER SERVICE IS PROVIDED IN THIS PROJECT. COPPER SERVICE IS SPARE.

9.763. INSULATED FIRE RATED PLYWOOD BACKBOARD.



1 B158 TELECOMMUNICATIONS RISER DIAGRAM
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12/16/22 TYPE B3 FINAL HEF MOD

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DATE: December 16 2022
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SHEET CONTENTS
B158 TELECOMMUNICATIONS RISER DIAGRAM

SHEET NO.:
T-702

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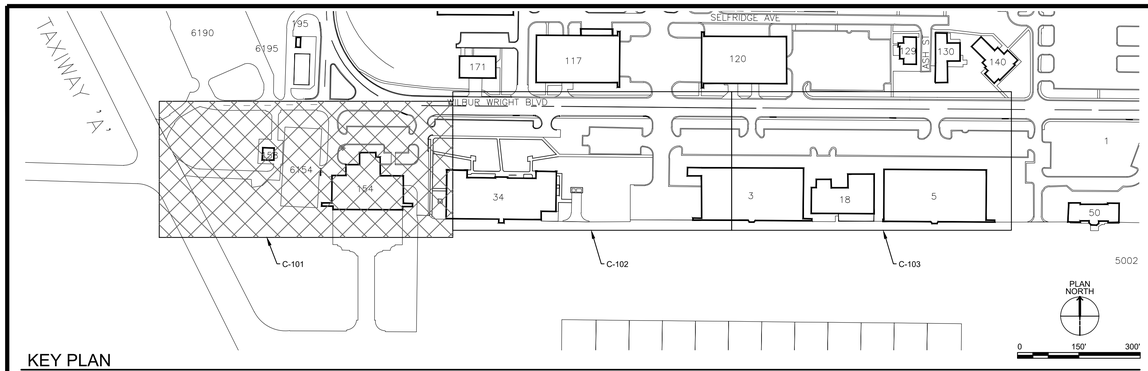
GENERAL NOTES

1. ALL LAWN AREAS DISTURBED BY CONTRACTOR SHALL BE RESTORED WITH SOD. LAWN SHALL BE GRADED TO MATCH EXISTING.

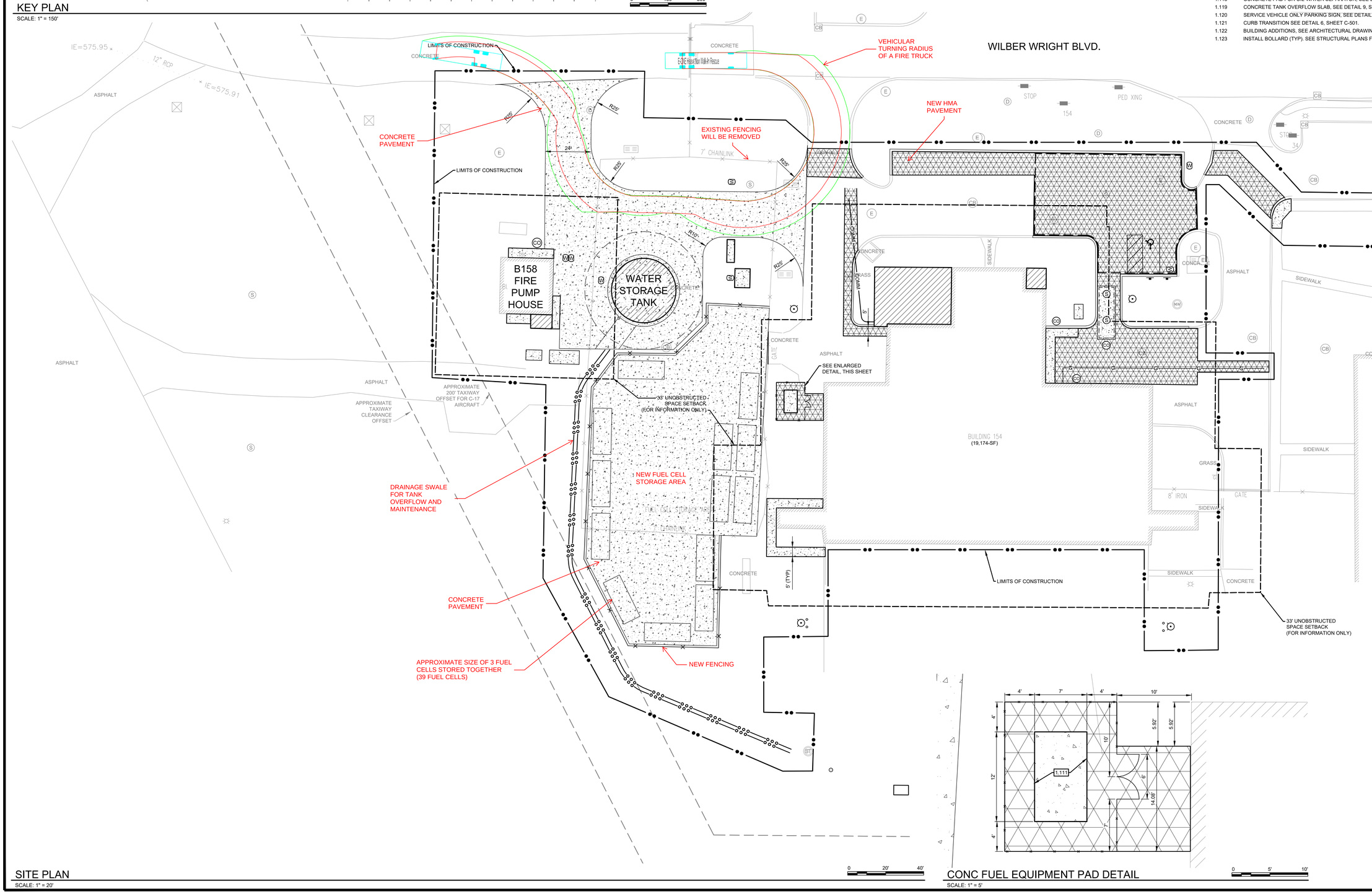
KEYED NOTES

1.101	GRAVEL ACCESS DRIVE, SEE DETAIL 2, SHEET C-502.
1.102	HMA PAVEMENT, SEE DETAIL 5, SHEET C-502.
1.103	CONCRETE WALK, SEE DETAIL 1, SHEET C-502.
1.104	ALTITUDE VALVE VAULT, SEE DETAIL 1, SHEET C-504.
1.105	ELECTRICAL TRANSFORMER PAD, SEE ELECTRICAL DRAWINGS FOR DETAILS
1.106	GENERATOR PAD, SEE ELECTRICAL DRAWINGS FOR DETAILS
1.107	CONCRETE CURB & GUTTER, SEE DETAIL 1, SHEET C-501.
1.108	ADA PAVEMENT STRIPING, SEE DETAIL 3, SHEET C-502.
1.109	ADA PARKING SIGN, SEE DETAIL 7, SHEET C-502.
1.110	7' HIGH CHAIN-LINK FENCE WITH 3-STRAND BARBED WIRE WITH 6' WIDE DOUBLE DOOR GATE, SEE SHEET C-506.
1.111	CONCRETE FUEL EQUIPMENT PAD, SEE STANDARD EXTERIOR HOUSEKEEPING PAD DETAIL ON SHEET S-511.
1.112	ELECTRICAL EQUIPMENT PAD, SEE ELECTRICAL DRAWINGS FOR DETAILS
1.113	WATER STORAGE TANK, SEE SHEET C-508.
1.114	THICKENED CONCRETE PAVEMENT SECTION, SEE DETAIL 6, SHEET C-502.
1.115	PCC PAVEMENT, SEE DETAIL 11, SHEET C-507.
1.116	CONTRACTOR STAGING AREA
1.117	REMOVE AND REPLACE FENCE AS NEEDED FOR ELECTRICAL INSTALLATION, MATCH EXISTING.
1.118	CONCRETE PAD FOR OIL-WATER SEPARATOR, SEE DETAIL 1, SHEET C-505.
1.119	CONCRETE TANK OVERFLOW SLAB, SEE DETAIL 9, SHEET C-501.
1.120	SERVICE VEHICLE ONLY PARKING SIGN, SEE DETAIL 10, SHEET C-502.
1.121	CURB TRANSITION SEE DETAIL 6, SHEET C-501.
1.122	BUILDING ADDITIONS, SEE ARCHITECTURAL DRAWINGS FOR DETAILS.
1.123	INSTALL BOLLARD (TYP). SEE STRUCTURAL PLANS FOR DETAILS.



KEY PLAN

SCALE: 1" = 150'



SITE PLAN

SCALE: 1" = 20'

CONC FUEL EQUIPMENT PAD DETAIL

SCALE: 1" = 5'

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DATE: September 16, 2022
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SHEET CONTENTS
SITE PLAN

SHEET NO.
C-101

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