MECHANICAL UPDATES FOR:
ATW FED EX

W6322 ATLANTIS DR., APPLETON, WI 54914

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HVAC			
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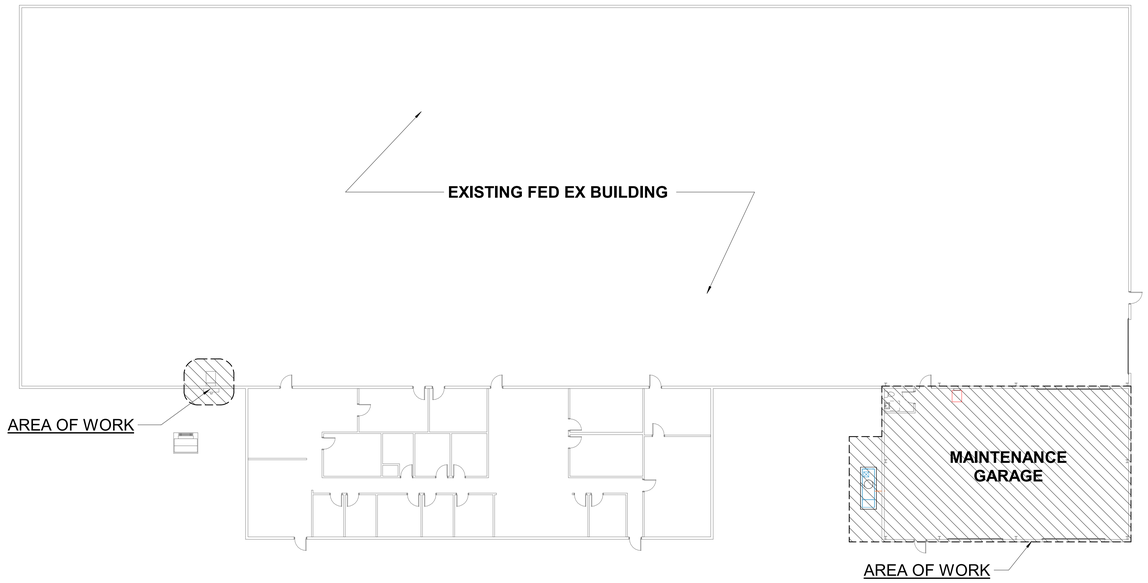
E401	ELECTRICAL SCHEDULES	X	X

PROJECT LOCATION MAP

PROJECT LOCATION



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IMPORTANT NOTICE: THE DRAWINGS AND THE SPECIFICATIONS TOGETHER REPRESENT THE CONSTRUCTION DOCUMENTS, AND AS SUCH, MUST BE USED TOGETHER AS THE BASIS OF DESIGN. THE CONTRACTOR IS SPECIFICALLY INSTRUCTED NOT TO LIMIT THEIR UNDERSTANDING OF THE SCOPE OF THIS PROJECT BASED UPON THE SPECIFICATIONS INDEX. THE CONTRACTOR IS RESPONSIBLE TO REVIEW ALL INFORMATION IN BOTH THE DRAWINGS AND SPECIFICATIONS, AND IS THEREFORE, REQUIRED TO PROVIDE ALL DEFINED, AND REASONABLY IMPLIED, SCOPE OF WORK NO MATTER WHERE IT APPEARS IN THE CONSTRUCTION DOCUMENTS. IN ADDITION, THE CONTRACTOR IS TO REVIEW ANY FORMALLY PROVIDED MODIFICATIONS, CLARIFICATIONS, ADDENDUMS AND/OR OTHER INFORMATION AND INCORPORATE THAT INFORMATION INTO THE CONTRACTOR'S UNDERSTANDING OF THE SCOPE OF THE PROJECT.

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NO.	DATE	REVISIONS
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	08/05/26	BID DOCUMENTS

BID DOCUMENTS - PRELIMINARY NOT FOR CONSTRUCTION

MECHANICAL UPDATES FOR:
ATW FED EX W6322 ATLANTIS DR., APPLETON, WI 54914
TITLE SHEET

DESIGNED	DRAWN
DJG	BKB

PROJECT NO. A0566 06-26-00105

DATE AUGUST 5, 2026

SHEET NO. G001

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DIVISION 01 - GENERAL REQUIREMENTS
SECTION 01 10 00
SUMMARY

PART 1 GENERAL
1.1 PROJECT
A. Project Name: Updates for ATW FED EX.
B. Owner's Name: Outagamie County.
C. Architect's Name: McMahon Associates, Inc.
D. The Project consists of the addition of a makeup air unit, exhaust fan and new electrical panel.
1.2 CONTRACT DESCRIPTION
A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 52 00 - Agreement Form.
1.3 OWNER OCCUPANCY
A. Owner intends to continue to occupy adjacent portions of the existing building during the entire construction period.
B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
C. Schedule the Work to accommodate Owner occupancy.
1.4 CONTRACTOR USE OF SITE AND PREMISES
A. Construction Operations: Limited to areas noted on Drawings.
1. Locate and conduct construction activities in ways that will limit disturbance to site.
B. Provide access to and from site as required by law and by Owner:
1. Do not obstruct roadways, sidewalks, or other public ways without permit.
PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

DIVISION 01 - GENERAL REQUIREMENTS
SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL
1.1 SECTION INCLUDES
A. General administrative requirements.
B. Progress meetings.
C. Construction progress schedule.
D. Submittals for review, information, and project closeout.
E. Number of copies of submittals.
F. Requests for Information (RFI) procedures.
G. Submittal procedures.
1.2 GENERAL ADMINISTRATIVE REQUIREMENTS
A. Make the following types of submittals to Architect:
1. Requests for Information (RFI).
2. Requests for substitution.
3. Shop drawings, product data, and samples.
4. Manufacturer's instructions and field reports.
5. Applications for payment and change order requests.
6. Progress schedules.
7. Correction Punch List and Final Correction Punch List for Substantial Completion.
8. Closeout submittals.
1.3 PROJECT COORDINATOR
A. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices, for access, traffic, and parking facilities.
B. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
C. Make submittals to Architect through the Project Coordinator:
PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION
3.1 PROGRESS MEETINGS
A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.
B. Project Coordinator will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
C. Record minutes and distribute copies, in PDF format only, within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.
3.2 CONSTRUCTION PROGRESS SCHEDULE
A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.
3.3 REQUESTS FOR INFORMATION (RFI)
A. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
B. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
C. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
D. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
3.4 SUBMITTALS FOR REVIEW
A. When the following are specified in individual sections, submit them for review:
1. Product data.
2. Shop drawings.
B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
3.5 SUBMITTALS FOR PROJECT CLOSEOUT
A. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 78 00 - Closeout Submittals:
1. Project record documents.
2. Operation and maintenance data.
3. Warranties.
B. Submit for Owner's benefit during and after project completion.
3.6 SUBMITTAL REVIEW
A. Submittals for Review: Architect will review each submittal, and take appropriate action.
B. Submittals for Information: Architect will acknowledge receipt, but will take no other action.
C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL
1.1 SECTION INCLUDES
A. Temporary utilities.
B. Temporary sanitary facilities.
C. Security requirements.
D. Vehicular access and parking.
E. Waste removal facilities and services.
1.2 TEMPORARY UTILITIES
A. Owner will provide the following:
1. Electrical power, consisting of connection to existing facilities.
2. Water supply, consisting of connection to existing facilities.
1.3 TEMPORARY SANITARY FACILITIES
A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
B. Maintain daily in clean and sanitary condition.
1.4 BARRIERS
A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
1.5 EXTERIOR ENCLOSURES
A. Provide temporary weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
1.6 INTERIOR ENCLOSURES
A. Provide temporary partitions as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.
1.7 SECURITY
A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
1.8 VEHICULAR ACCESS AND PARKING
A. Coordinate access and haul routes with governing authorities and Owner.
1.9 WASTE REMOVAL
A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
B. Provide containers with lids. Remove trash from site periodically.
PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART 1 GENERAL
1.1 SECTION INCLUDES
A. Project record documents.
B. Operation and maintenance data.
C. Warranties and bonds.
1.2 SUBMITTALS
A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
B. Operation and Maintenance Data:
1. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
C. Warranties and Bonds:
1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION
3.1 PROJECT RECORD DOCUMENTS
A. Maintain on site one set of the following record documents; record actual revisions to the Work:
1. Drawings.
2. Addenda.
3. Change Orders and other modifications to the Contract.
4. Reviewed shop drawings, product data, and samples.
5. Manufacturer's instruction for assembly, installation, and adjusting.
3.2 OPERATION AND MAINTENANCE DATA
A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
3.3 WARRANTIES AND BONDS
A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

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ATW FED EX W6322 ATLANTIS DR., APPLETON, WI 54914
SPECIFICATIONS

DESIGNED	DRAWN
DJG	BKB

PROJECT NO. A0566 06-26-00105
DATE AUGUST 5, 2026
SHEET NO. G011

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STRUCTURAL SPECIFICATIONS

DESIGN CODE:

1. COMPLY WITH THE FOLLOWING CODES:
   ASCE 7-16
   IBC 2021
   WISCONSIN BUILDING CODE, LATEST EDITION

DESIGN LOADS:

1. WIND:
   DESIGN WIND SPEED - 106 MPH
   WIND EXPOSURE - C

2. SEISMIC:
   MAPPED SPECTRAL RESPONSE:
   Ss - 0.052
   S_1 - 0.037
   IMPORTANCE FACTOR (I) - 1.00
   SITE CLASS - D

GENERAL:

1. VERIFY ALL DIMENSIONS, ELEVATIONS, SECTIONS AND DETAILS BETWEEN THE PLANS PRIOR TO STARTING WORK. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES OR INCONSISTENCIES.
2. VERIFY SIZE, LOCATION, AND NUMBER OF WALL, FLOOR, AND ROOF OPENINGS WITH THE STRUCTURAL, ARCHITECTURAL, MECHANICAL, AND ELECTRICAL PLANS. PROVIDE ALL OPENINGS AND SUPPORT FRAMING.
3. CONTRACTOR SHALL COORDINATE LOCATIONS OF ALL ARCHITECTURAL AND MECHANICAL ATTACHMENTS TO STRUCTURAL FRAMING.
4. SUBMIT SHOP DRAWINGS FOR ALL PRE-FABRICATED ITEMS. CONTRACTOR SHALL REVIEW SHOP DRAWINGS BEFORE SUBMITTING TO ENGINEER. FABRICATE ITEMS AFTER REVIEW BY ENGINEER.
5. JOBSITE SAFETY IS THE CONTRACTOR'S RESPONSIBILITY.
6. CONTRACTOR SHALL CONFORM WITH ALL OSHA REGULATIONS.
7. THE ENGINEER/ARCHITECT IS NOT RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION OR THE SAFETY OF THE JOB SITE. THESE RESPONSIBILITIES ARE INTENDED TO REMAIN SOLELY THOSE OF THE CONTRACTOR.
8. ALL MATERIAL INSTALLATIONS SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS.
9. WHEN REFERENCED IN THE PLANS AND DETAILS, THE FOLLOWING POST-INSTALLED ANCHORS SHALL BE PERMISSIBLE. CONTRACTOR SHALL SUBMIT SUBSTITUTION REQUEST FOR ANY ALTERNATE POST-INSTALLED ANCHORS.
   A. ADHESIVE/EPOXY ANCHORS
      1. HILTI: HY 200, HY 150 MAX
      2. DEWALT: AC100+ GOLD
   B. EXPANSION ANCHORS
      1. HILTI: KWIK BOLT TZ
      2. DEWALT: POWER-STUD+ SD2

EXISTING CONSTRUCTION/CONDITIONS:

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS CORRESPONDING TO THE LOCATION OF EXISTING ELEMENTS (COLUMNS, BEAMS, WALLS, ETC.).
2. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AND NOTIFY ARCHITECT/ENGINEER OF ANY CONFLICTS WITH CONSTRUCTION DOCUMENTS.
3. REMOVE AND REPLACE AND/OR MODIFY ALL EXISTING CONSTRUCTION (ARCHITECTURAL, STRUCTURAL, ELECTRICAL, MECHANICAL) AS REQUIRED IN ORDER TO PLACE NEW STRUCTURAL WORK SHOWN ON THE CONSTRUCTION DOCUMENTS.
4. CONTRACTOR SHALL DESIGN AND PROVIDE ALL SHORING REQUIRED TO SUPPORT EXISTING CONSTRUCTION AND NEW CONSTRUCTION AS REQUIRED.

FOUNDATION:

1. ASSUMED SOIL BEARING - 2,000 P.S.F. CONTRACTOR SHALL EMPLOY A CERTIFIED GEOTECHNICAL CONSULTANT DURING CONSTRUCTION TO TEST AND VERIFY ASSUMED SOIL CONDITIONS AND REPORT FINDINGS TO ARCHITECT/ENGINEER.
2. CONTRACTOR SHALL OBTAIN A GEOTECHNICAL ENGINEER TO INSPECT SUB-GRADE AFTER EXCAVATION TO VERIFY SOIL BEARING PRESSURES. AT THE DIRECTION OF THE GEOTECHNICAL ENGINEER, REMOVE UNSATISFACTORY SOILS TO AN ELEVATION WHERE SATISFACTORY SOILIS ENCOUNTERED. REPLACE UNSATISFACTORY SOIL w/ EITHER COMPACTED STRUCTURAL FILL OR CONCRETE SLURRY.
3. PLACE FOUNDATION CONCRETE ON CLEAN FIRM BEARING SOILS MATERIAL.
4. CONTRACTOR TO CONSULT WITH LOCAL AUTHORITIES PRIOR TO EXCAVATION TO LOCATE UNDERGROUND GAS, SEWER, WATER, AND ELECTRICAL OBSTACLES.
5. STRUCTURAL FILL
   LOCATION: ALL BACKFILL WITHIN 5'-0" OF THE BUILDING LINES, BELOW STRUCTURAL FOUNDATIONS, AND BEHIND RETAINING WALLS WITHIN A WEDGE EXTENDING UPWARDS 45 DEGREES FROM THE BACK FACE OF RETAINING WALL FOOTINGS.
   TYPE: PREDOMINANTLY WELL GRADED GRANULAR MATERIAL. UNLESS MORE STRINGENT REQUIREMENTS ARE SPECIFIED BY THE PROJECT GEOTECHNICAL ENGINEER. PROVIDE MATERIAL WITH 100% PASSING THE 3" SIEVE, 70-100% PASSING THE #4 SIEVE AND LESS THAN 15% PASSING THE #200 SIEVE.
   COMPACTION: UNLESS MORE STRINGENT REQUIREMENTS ARE SPECIFIED BY THE PROJECT GEOTECHNICAL ENGINEER, COMPACT TO 95% MODIFIED PROCTOR (ASTM: D1557) PLACED IN LIFTS NOT TO EXCEED 8".
6. ALL EARTHWORK WITH ON-SITE MATERIALS SHOULD BE PERFORMED WHEN TEMPERATURES ARE ABOVE FREEZING. FROZEN SOIL SHOULD NOT BE USED BENEATH STRUCTURES. ALL FOUNDATION EXCAVATION MUST BE INSULATED AGAINST FREEZING UNTIL CONSTRUCTION OF FOUNDATION IS COMPLETE.
7. SOILS THAT BECOME RUTTED OR DISTURBED BY CONSTRUCTION VEHICLES WILL BE UNSUITABLE FOR SUPPORTING FOUNDATION AND CONCRETE SLABS. THE SOILS SHALL BE REMOVED AND REPLACED WITH COMPACTED STRUCTURAL FILL.

CAST-IN-PLACE CONCRETE:

1. CONCRETE AND ITS PLACEMENT SHALL BE IN ACCORDANCE WITH ACI 318, ACI 301, AND THE PROJECT SPECIFICATIONS, EXCEPT AS MODIFIED BELOW. PROTECT ALL CONCRETE IN ACCORDANCE WITH ACI STANDARDS FOR HOT & COLD WEATHER CONCRETING.
2. STANDARD WEIGHT CONCRETE SHALL COMPLY WITH THE FOLLOWING:
   A. MINIMUM COMPRESSIVE STRENGTH (AT 28 DAYS) - 4,000 PSI
   B. MAXIMUM WATER/CEMENT RATIO - .45 (AIR ENTRAINED)
      - .52 (NON-AIR ENTRAINED)
   C. MAXIMUM AGGREGATE SIZE - 3/4"(TYPICAL)
      - 1 1/2" (FOOTINGS GREATER THAN 12" THICK)
   D. TOTAL AIR CONTENT - 6%±1 1/2% (3/4" AGGREGATE)
      - 5%±1 1/2% (1 1/2" AGGREGATE)
   E. MAX SLUMP - 3" (TYPICAL)
      - 4" (FLOOR SLAB)
   F. REINFORCING BARS: PROVIDE DEFORMED BARS COMPLYING WITH ASTM A615 GRADE 60.
   G. WELDED WIRE FABRIC: ASTM A185, COLD DRAWN STEEL PLAIN.
   H. NO ADMIXTURES WITHOUT REVIEW FROM ENGINEER. ADMIXTURES CONTAINING CHLORIDES SHALL NOT BE USED.
3. ALL CONCRETE SHALL BE AIR ENTRAINED (U.N.O.). FOOTINGS BELOW THE FROST DEPTH LINE AND INTERIOR CONCRETE PROTECTED FROM FREEZING & ENVIRONMENTAL EFFECTS MAY BE NON-AIR ENTRAINED, AT CONTRACTOR'S OPTION.
4. CONCRETE COVERAGE FOR REINFORCING (U.N.O.):
   A. UNFORMED CONCRETE IN CONTACT WITH EARTH = 3"
   B. FORMED CONCRETE IN CONTACT WITH EARTH = 2"
   C. OTHER CONCRETE = 1 1/2"
5. LAP SPLICES SHALL BE THE FOLLOWING BAR DIAMETERS UNLESS NOTED OTHERWISE ON DRAWINGS. LOCATE SPLICES AT POINT OF MINIMUM STRESS. WELDED SPLICES ARE NOT PERMITTED.
   A. ALL REINF. EXCEPT FOR THAT NOTED IN 4B.

REINFORCEMENT	LAP LENGTH IN BAR DIAMETERS
#3 THROUGH #6	38
#7 THROUGH #11	48

   B. HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 12 INCH OF CONCRETE IS CAST BELOW THE REINFORCEMENT (I.E. HORIZONTAL WALL REINFORCEMENT AND TOP BEAM REINFORCEMENT)

REINFORCEMENT	LAP LENGTH IN BAR DIAMETERS
#3 THROUGH #6	50
#7 THROUGH #11	62

   C. WELDED WIRE FABRIC - MESH SPACE +2".
6. COMPLY WITH ACI 301. POSITION, SUPPORT AND SECURE REINFORCEMENT AGAINST DISPLACEMENT, LOCATE AND SUPPORT WITH METAL CHAIRS, RUNNERS, BOLSTERS, SPACERS, AND HANGERS, AS REQUIRED. SET WIRE TIES SO ENDS ARE DIRECTED INTO CONCRETE, NOT TOWARD EXPOSED CONCRETE SURFACES.
7. MAXIMUM FREE DROP OF ALL CONCRETE = 2'-0".
8. CONCRETE CAN ONLY BE PLACED ON A FROST-FREE SUBGRADE
9. MECHANICALLY VIBRATE ALL CONCRETE.
10. PROVIDE A 3/4"x3/4" CHAMFER ON ALL EXPOSED CORNERS OF CONCRETE.
11. ALL CAST-IN-PLACE CONCRETE SHALL BE PROTECTED AGAINST RAPID DRYING AND MUST BE KEPT MOIST FOR A MINIMUM OF (7) DAYS FOR NOMINAL CONCRETE.
12. CONCRETE FIELD TESTS FOR SLUMP, AIR CONTENT, YIELD AND STRENGTH SHALL BE CONDUCTED BY A CERTIFIED CONCRETE TECHNICIAN IN ACCORDANCE WITH ACI 301. TESTS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.

STRUCTURAL STEEL:

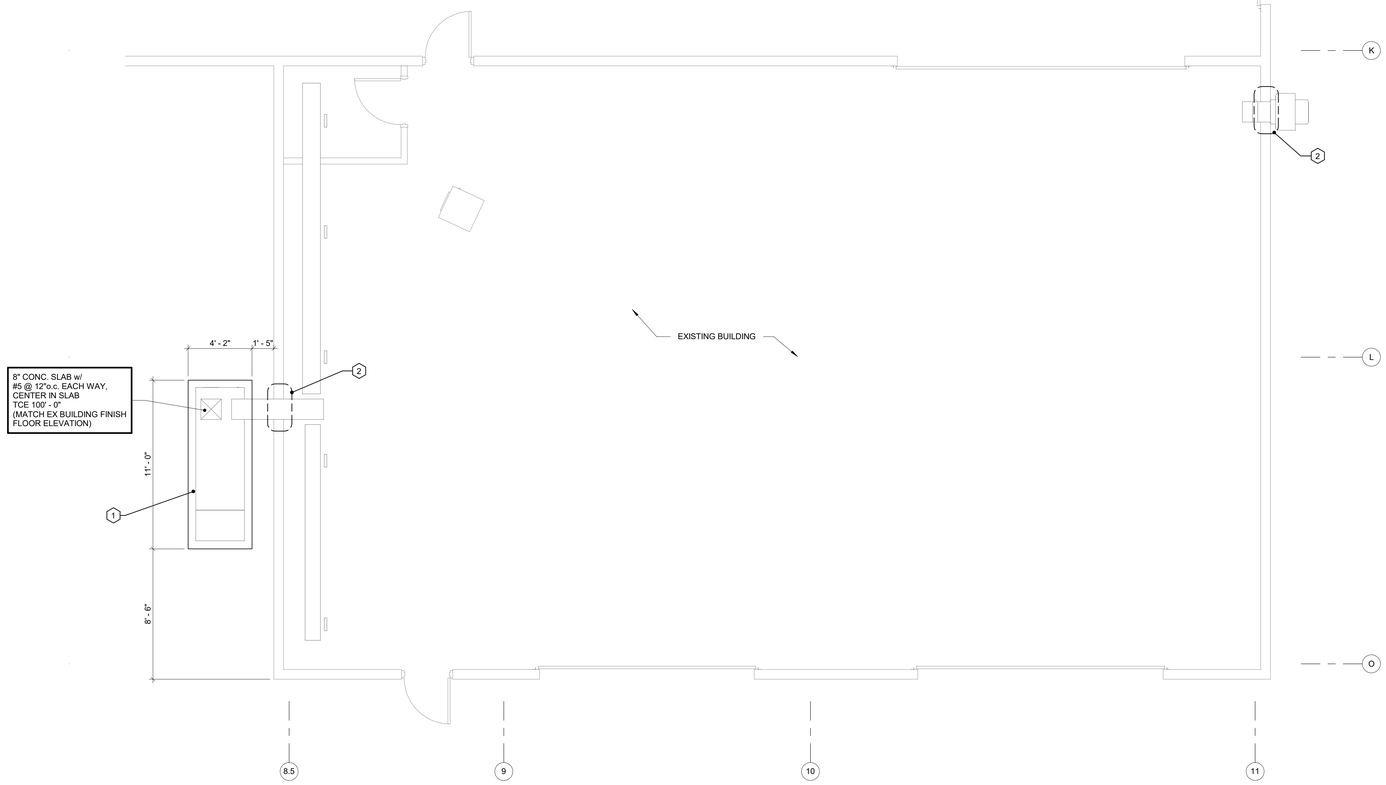
1. ALL DETAILING, FABRICATION AND ERECTION SHALL CONFORM TO ANSI/AISC 360 AND AISC 303.
2. STRUCTURAL STEEL SHALL MEET THE FOLLOWING MINIMUM YIELD STRENGTHS AND SPECIFICATIONS.

STEEL SHAPES	ASTM A992
ANGLES & RODS	ASTM A36
BARS & PLATES	ASTM A36
STRUCTURAL TUBES	ASTM A500 GRADE B
ANCHOR BOLTS	F1554 GRADE 36
STRUCTURAL BOLTS	ASTM A325 TYPE N
WELDS	E70 XX
GROUT	ASTM C1107, GRADE B, PREMIXED NON-SHRINK, NON-METALLIC CEMENTITIOUS GROUT. MINIMUM COMPRESSIVE STRENGTH 7000 PSI.

3. ALL WELDING SHALL BE PERFORMED BY A CERTIFIED WELDER IN ACCORDANCE WITH A.W.S. CODE FOR WELDING IN BUILDING CONSTRUCTION. SURFACES FOR FIELD WELDED MATERIAL SHALL BE PROPERLY PREPARED PRIOR TO BEING WELDED TO ASSURE A GOOD QUALITY WELD. REMOVE PAINT, GREASE, DIRT, ETC.
4. THE FABRICATOR SHALL BE RESPONSIBLE FOR THE DESIGN AND ADEQUACY OF ALL CONNECTIONS THAT ARE NOT DESIGNED AND FULLY DETAILED ON THE CONTRACT DOCUMENTS. CONNECTIONS SHALL BE DESIGNED AND DETAILED IN ACCORDANCE WITH ANSI/AISC 360. BEAM CONNECTIONS SHALL BE "SIMPLE FRAMING" TYPE N (UNLESS NOTED OTHERWISE).
5. ERECTION: COMPLY WITH AISC CODE AND SPECIFICATIONS. THE ERECTOR SHALL FURNISH AND INSTALL TEMPORARY SUPPORTS TO SECURE ANY ELEMENT OR ELEMENTS OF THE STEEL FRAMING UNTIL THEY ARE MADE STABLE WITHOUT EXTERNAL SUPPORT.
6. DO NOT PRIME SURFACES THAT WILL BE FIELD WELDED.
7. THE FABRICATOR SHALL PREPARE STEEL SURFACES TO MEET THE REQUIREMENTS OF SSPC-SP2 (HAND TOOL CLEANING). SHOP PRIME STRUCTURAL STEEL MEMBERS WITH STANDARD SHOP PRIMER.
8. TOUCH-UP PRIME PAINT AFTER ERECTION. USE SAME SURFACE PREPARATION AND PRIMER AS USED IN SHOP.
9. FINISH PAINT COAT SHALL BE DETERMINED BY OWNER.

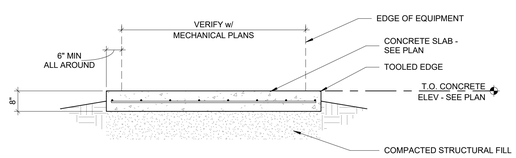
KEYNOTES

1	MAU ON EQUIPMENT STAND - SEE MECHANICAL PLANS.
2	PROVIDE C8x11.5 JAMB & GIRTS AROUND NEW WALL OPENING (SEE MECHANICAL PLANS FOR SIZE & LOCATIONS). CONNECTED TO EXISTING GIRTS w/ L3x3x1/4x0'-6" CLIP ANGLES & 1/4" FIELD FILLET WELDS. AT CONTRACTOR'S OPTION, WALL GIRT FRAMING MATCHING EXISTING CONDITIONS MAY BE PROVIDED IN LIEU OF C8 CHANNELS.



PARTIAL BUILDING FLOOR PLAN
1/4" = 1'-0"

NORTH



1 S101 EQUIPMENT FOUNDATION
1/2" = 1'-0"

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BID DOCUMENTS - PRELIMINARY NOT FOR CONSTRUCTION

MECHANICAL UPDATES FOR:
ATW FED EX W6322 ATLANTIS DR., APPLETON, WI 54914
STRUCTURAL SPECIFICATIONS, & PARTIAL BUILDING FLOOR PLAN

DESIGNED	DRAWN
DJB	GYV

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GENERAL ABBREVIATIONS

ACT	ACOUSTICAL CEILING TILES	HORZ	HORIZONTAL
(V.)	FIELD VERIFY	ID	INSIDE DIMENSION
AD	ACCESS DOOR	JST	JOIST
ADA	AMERICANS WITH DISABILITIES ACT	LOC	LOCATION
ADJ	ADJACENT	MAG	MAGNETIC
ADJ	ADJUSTABLE	MAX	MAXIMUM
AFF	ABOVE FINISHED FLOOR	MC	MECHANICAL CONTRACTOR
AP	ACCESS PANEL	MECH	MECHANICAL
APPROX	APPROXIMATE	MEZZ	MEZZANINE
ARCH	ARCHITECT	MFR	MANUFACTURER
AUTO	AUTOMATIC	MIN	MINIMUM
B/G	BELOW GRADE	MTD	MOUNTED
BLDG	BUILDING	NIC	NOT IN CONTRACT
BSMT	BASEMENT	NO	NUMBER
CFCI	CONTR. FURNISHED, CONTR. INSTALLED	NTS	NOT TO SCALE
CL	CENTER LINE	OC	ON CENTER
CLG	CEILING	OD	OUTSIDE DIMENSION
CONN	CONNECTION	OFCI	OWNER FURNISHED, CONTR. INSTALLED
CONT	CONTINUATION	OPG	OPENING
CONTR	CONTRACTOR	PT	POINT
DET	DETAIL	RCP	REFLECTED CEILING PLAN
DIA	DIAMETER	REF	REFERENCE
DN	DOWN	REQD	REQUIRED
DTL	DETAIL	RM	ROOM
DWG	DRAWING	SHT	SHEET
EA	EACH	SPECS	SPECIFICATIONS
ELEC	ELECTRICAL	SQ	SQUARE
ELEV	ELEVATION	STD	STANDARD
ELEV	ELEVATOR	STRUC	STRUCTURAL
EQUIP	EQUIPMENT	TEMP	TEMPORARY
EXIST	EXISTING	TEMP	TEMPERATURE
EXP	EXPLOSION	TYP	TYPICAL
FF	FINISHED FLOOR	UG	UNDERGROUND
FL	FLOOR	UNO	UNLESS NOTED OTHERWISE
FTG	FOOTING	VCT	VINYL COMPOSITE TILE
FV	FIELD VERIFY	VEST	VESTIBULE
GC	GENERAL CONTRACTOR	VIB	VIBRATION
HCP	HANDICAPPED LP	W/	WITH
		W/O	WITHOUT

MECHANICAL ABBREVIATIONS

AFMS	AIR FLOW MEASURING STATION	INSUL	INSULATION
BAS	BUILDING AUTOMATION SYSTEM	INV	INVERT
BD	BALANCE DAMPER	ISO	ISOLATION
BO	BLOW OFF	LAT	LEAVING AIR TEMPERATURE
BWV	BACKWATER VALVE	LDB	LEAVING DRY BULB
CLG	COOLING	LP	LOW PRESSURE
CO	CLEAN OUT	LPG	LIQUID PETROLEUM - PROPANE
COND	CONDENSATE	LWB	LEAVING WET BULB
CV	CONSTANT VOLUME	LWT	LEAVING WATER TEMPERATURE
DISCH	DISCHARGE	MAT	MIXED AIR TEMPERATURE
DMPR	DAMPER	NC	NOISE CRITERIA
DOAP	DEDICATED OUTSIDE AIR PATH	NC	NORMALLY CLOSED
DP	DIFFERENTIAL PRESSURE	NO	NORMALLY OPEN NEG NEGATIVE
DR	DRAIN	OA	OUTSIDE AIR
DS	DOWNSPOUT	OBD	OPPOSED BLADE DAMPER
DSN	DOWNSPOUT NOZZLE	ORD	OVERFLOW ROOF DRAIN
EA	EXHAUST AIR	PBD	PARALLEL BLADE DAMPER
EAT	ENTERING AIR TEMPERATURE	PC	PLUMBING CONTRACTOR
EDB	ENTERING DRY BULB	PE	PNEUMATIC-ELECTRIC
EFF	EFFICIENCY	PI	PRESSURE INDICATOR GAUGE
EG	ETHYLENE GLYCOL	PG	PROPYLENE GLYCOL
EMS	ENERGY MANAGEMENT SYSTEM	PLBG	PLUMBING
EP	ELECTRIC-PNEUMATIC	POS	POSITIVE PRESS PRESSURE
ESP	EXTERNAL STATIC PRESSURE	PT	PRESSURE TRANSMITTER
EWB	ENTERING WET BULB	PVC	POLY VINYL CHLORIDE
EWT	ENTERING WATER TEMPERATURE	RA	RETURN AIR
EXH	EXHAUST	RECIRC	RECIRCULATING
EXP	EXPANSION	RET	RETURN
F&T	FLOAT & THERMOSTATIC	RFG	REFRIGERATION
FD	FIRE DAMPER	RH	RELATIVE HUMIDITY
FDC	FIRE DEPARTMENT CONNECTION	SA	SUPPLY AIR
FHC	FIRE HOSE CABINET	SP	STATIC PRESSURE
FHR	FIRE HOSE RACK FLEX FLEXIBLE	STM	STEAM
FM	FIRE MAIN	TA	TRANSFER AIR
FP	FIRE PROTECTION	TCC	TEMPERATURE CONTROLS CONTRACTOR
FV	FACE VELOCITY	TD	TEMPERATURE DIFFERENCE
GA	GAUGE	TDH	TOTAL DYNAMIC HEAD
GRD	GROUND	TDL	TOTAL DEVELOPED LENGTH
GRD	GRILLES, REGISTERS & DIFFUSERS	TI	TEMPERATURE INDICATOR GAUGE
HD	HEAD	T-STAT	THERMOSTAT
HOA	HANDS-OFF-AUTOMATIC	TT	TEMPERATURE TRANSMITTER
HTG	HEATING	V	VENT
HTR	HEATER	VD	VOLUME DAMPER
HVAC	HEATING, VENTILATING & AIR-CONDITIONING	VEL	VELOCITY
		VSD	VARIABLE SPEED DRIVE
HYD	HYDRANT	VAV	VARIABLE AIR VOLUME

EQUIPMENT ABBREVIATIONS

AHU-#	AIR HANDLING UNIT	HRU-#	HEAT RECOVERY UNIT
ANB-#	ACID NEUTRALIZING BASIN	HST-#	HYDRONIC STORAGE TANK
AS-#	AIR SEPARATOR	HU-#	HUMIDIFIERS
ATT-#	SOUND ATTENUATOR	HWB-#	HOT WATER BOILER
B-#	BOILER	HX-#	HEAT EXCHANGER
BT-#	BUFFER TANK	IDU-#	INDUCTION DISPLACEMENT UNIT
CB-#	CHILLED BEAM	IR-#	INFRARED HEATER
CC-#	COOLING COIL	IH-#	INTAKE HOOD
CO-#	CLEAN OUT	LAV-#	LAVATORY
CH-#	CHILLER	MAU-#	MAKE-UP AIR UNIT
CT-#	CLAY TRAP	MH-#	MAN HOLE
CP-#	CONDENSATE PUMP	MS-#	MOP SINK / SERVICE SINK
CRU-#	COMPUTER ROOM UNIT	P-#	PUMPS
CT-#	COOLING TOWER	PR-#	PANEL RADIATOR
CU-#	CONDENSING UNITS	PRV-#	POWER ROOF VENTILATOR
CUH-#	CABINET UNIT HEATER	RF-#	RETURN FAN
CV-#	CONTROL VALVE	R-#	RETURN DIFFUSER OR GRILLE
CVR-#	CONVECTOR	RTU-#	ROOF TOP UNIT
DC-#	DRY COOLER	RH-#	RELIEF HOOD
DF-#	DRINKING FOUNTAIN	RD-#	ROOF DRAIN
DHC-#	DUCT HEATING COIL	RPZ-#	REDUCED PRESSURE ZONE BFP
E-#	EXHAUST DIFFUSER OR GRILLE	S-#	SUPPLY DIFFUSER OR GRILLE
EAV-#	EXHAUST AIR VALVE	S-#	SINK
EEW-#	EMERGENCY EYEWASH	SB-#	STEAM BOILER
EF-#	EXHAUST FAN	SF-#	SUPPLY FAN
ERU-#	ENERGY RECOVERY UNIT	SH-#	SHOWER
ET-#	EXPANSION TANK	SSEW-#	SAFETY SHOWER/EYEWASH
EWC-#	ELECTRIC WATER COOLER	SSF-#	SIDE STREAM FILTER
FCO-#	FLOOR CLEAN OUT	T-#	TRANSFER DIFFUSER OR GRILLE
FD-#	FLOOR DRAIN	TF-#	TRANSFER FAN
FCU-#	FAN COIL UNIT	UH-#	UNIT HEATERS
FLC-#	FLUID COOLER	UR-#	URINAL
FPVAV-#	FAN POWERED VAV	VAV-#	VARIABLE AIR VOLUME UNIT
FTR-#	FIN TUBE RADIATION	VTR-#	VENT THROUGH ROOF
FWT-#	FLAMMABLE WASTE TRAP	WB-#	WALL / VALVE BOX
GCO-#	GRADE CLEAN OUT	WC-#	WATER CLOSET
GI-#	GREASE INTERCEPTOR	WCO-#	WALL CLEAN OUT
GRV-#	GRAVITY ROOF VENTILATOR	WF-#	WASH FOUNTAIN
GT-#	GAS TURRET	WH-#	WALL HYDRANT
HB-#	HOSE BIBB	WH-#	WATER HEATERS
HC-#	HEATING COIL	WS-#	WATER SOFTENER UNIT
HP-#	HEAT PUMP		

PLUMBING PIPE SYSTEMS

CA	COMPRESSED AIR
CD	CONDENSATE DRAINAGE
D##W	DOMESTIC WATER AT SPECIFIED TEMP
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RECIRCULATION
DI	DEIONIZED WATER
DTW	DOMESTIC TEMPERED WATER
N	NITROGEN
NPW	NON-POTABLE WATER
O	OXYGEN
PC	PUMPED CONDENSATE
PW	POTABLE WATER
RO	REVERSE OSMOSIS WATER
ROR	REVERSE OSMOSIS REJECT
RWL	RAIN WATER LEADER
ORWL	OVERFLOW RAIN WATER LEADER
SAN	SANITARY SEWER
SCW	SOFTENED COLD WATER
SHW	SOFTENED HOT WATER
SWR	SPRAY WATER RETURN
SWS	SPRAY WATER SUPPLY
TW	TEMPERED WATER
V	SANITARY VENT
VAC	VACUUM

MECHANICAL PIPE SYSTEMS

BD	BLOWDOWN
BFW	BOILER FEED WATER
CTR	CONDENSER WATER RETURN
CTS	CONDENSER WATER SUPPLY
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
DTR	DUAL TEMPERATURE WATER RETURN
DTS	DUAL TEMPERATURE WATER SUPPLY
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOV	FUEL OIL VENT
HPC	HIGH PRESSURE CONDENSATE RETURN
HPS	HIGH PRESSURE STEAM
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
LPC	LOW PRESSURE CONDENSATE RETURN
LPS	LOW PRESSURE STEAM
NG	NATURAL GAS
PCWS	PRIMARY CHILLED WATER SUPPLY
PCWR	PRIMARY CHILLED WATER RETURN
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
SV	STEAM VENT
###	STEAM SPECIFIED PRESSURE

GENERAL MECHANICAL SYMBOLS

- REVISION NUMBER - SHOWN ON PLANS
- POINT WHERE NEW CONNECTS TO EXISTING
- NUMBER OF DETAIL ON SHEET
- NUMBER OF SHEET WHERE DETAIL APPEARS
- D1 KEYNOTE
- CONTINUATION SYMBOL
- 2" PIPE SIZE TAG (DIAMETER)
- ABOVE GROUND PIPING
- 1/8" / 12"SLOPE PIPE SLOPE TAG
- BELOW GROUND PIPING
- INVERT: -3'-1" PIPE INVERT ELEVATION TAG

HVAC SYMBOLS

CA	COMBUSTION AIR
EA	EXHAUST AIR
FLUE	FLUE
GE TYPE 1	GREASE EXHAUST TYPE
LA	RELIEF AIR
MA	MIXED AIR
OA	OUTSIDE AIR
RA	RETURN AIR
SA	SUPPLY AIR
TA	TRANSFER AIR
16x8	SQUARE DUCT SIZE TAG (WIDTH x HEIGHT)
16/8	OVAL DUCT SIZE TAG (WIDTH / HEIGHT)
16ø	ROUND DUCT SIZE TAG (DIAMETER)
(E)	EXISTING DUCT TAG
DROP 20 12	RECTANGULAR SUPPLY/OUTSIDE AIR DUCT RISE
DROP 20 12	ROUND SUPPLY/OUTSIDE AIR DUCT RISE
DROP 20 12	RECTANGULAR RETURN/TRANSFER AIR DUCT RISE
DROP 20 12	ROUND RETURN/TRANSFER AIR DUCT RISE
DROP 20 12	RECTANGULAR EXHAUST/RELIEF AIR DUCT RISE
DROP 20 12	ROUND EXHAUST/RELIEF AIR DUCT RISE

PHASE KEY - NEW, EXISTING & DEMO VISIBILITY

PIPE — EXISTING (E) — NEW — DEMO (D)

DUCT

EQUIP

GRILLES, REGISTERS, AND DIFFUSERS TAG

SUPPLY OUTLET — S1-225-6 — NECK SIZE, CFM, TYPE (SEE SCHEDULE)

RETURN/EXHAUST INLET — R1-400-24x12 — GRILLE SIZE, CFM, TYPE (SEE SCHEDULE)

LINEAR DIFFUSER TAG

S2-225-6 / 4'-0" / 2 — TYPE (SEE SCHEDULE); CFM; NECK SIZE; TOTAL NUMBER OF SLOTS; LINEAR LENGTH; NUMBER OF SLOTS IN DIRECTION OF SLOT FLOW; DIRECTION OF SLOT FLOW.

SPACE SENSORS - PLAN VIEW

CARBON DIOXIDE SENSOR	CO2	TH	TEMPERATURE & HUMIDITY SENSOR
CARBON MONOXIDE SENSOR	CO	TS	TEMPERATURE SENSOR
NITROGEN DIOXIDE SENSOR	NO2	T	THERMOSTAT
HUMIDITY SENSOR	HS	MS	MANUAL SWITCH
HUMIDISTAT	H	S	SENSOR

DAMPERS - PLAN / SECTION VIEW

FIRE DAMPER	FD		MANUAL BALANCING DAMPER
SMOKE DAMPER	SD	G	BACKDRAFT DAMPER
MOTORIZED DAMPER	M	FS	COMBINATION FIRE/SMOKE DAMPER

BAS CONTROL POINT LABELS

ALM	ALARM	OAD	OUTSIDE AIR DAMPER
BLDP	BUILDING PRESSURE	OAF	OUTSIDE AIR FLOW
BYPV	BYPASS VALVE	OAH	OUTSIDE AIR HUMIDITY
CAP	CAPACITY	OAT	OUTSIDE AIR TEMPERATURE
CES	CLOSED END SWITCH	OES	OPEN END SWITCH
CHWF	CHILLED WATER FLOW	PWR	POWER
CHWP	CHILLED WATER PRESSURE	RAD	RETURN AIR DAMPER
CHWT	CHILLED WATER TEMPERATURE	RAF	RETURN AIR FLOW
CLGV	COOLING VALVE	RAH	RETURN AIR HUMIDITY
CMD	COMMAND	RAP	RETURN AIR PRESSURE
CRD	CURRENT	RAQ	RETURN AIR QUALITY (CO2)
CWF	CONDENSER WATER FLOW	RAT	RETURN AIR TEMPERATURE
CWP	CONDENSER WATER PRESSURE	SAD	SUPPLY AIR DAMPER
CWT	CONDENSER WATER TEMPERATURE	SAF	SUPPLY AIR FLOW
DAD	DISCHARGE AIR DAMPER	SAH	SUPPLY AIR HUMIDITY
DAF	DISCHARGE AIR FLOW	SAP	SUPPLY AIR PRESSURE
DAH	DISCHARGE AIR HUMIDITY	SAT	SUPPLY AIR TEMPERATURE
DAP	DISCHARGE AIR PRESSURE	SMK	SMOKE DETECTOR
DAT	DISCHARGE AIR TEMPERATURE	SPD	SPEED
EAD	EXHAUST AIR DAMPER	SPT	SETPOINT
EAF	EXHAUST AIR FLOW	STS	STATUS
EAH	EXHAUST AIR HUMIDITY	ZNH	ZONE HUMIDITY
EAP	EXHAUST AIR PRESSURE	ZNO	ZONE OCCUPANCY SENSOR
EAT	EXHAUST AIR TEMPERATURE	ZNP	ZONE PRESSURE
ENRG	ELECTRICAL ENERGY CONSUMPTION	ZNQ	ZONE QUALITY (CO2)
FBK	FEEDBACK	ZNT	ZONE TEMPERATURE
FIRE	FIRE ALARM		
FRZ	FREEZESTAT		
GAS	NATURAL GAS CONSUMPTION		
HIP	HIGH PRESSURE SAFETY		
HTGV	HEATING VALVE		
HWF	HOT WATER FLOW		
HWP	HOT WATER PRESSURE		
HWT	HOT WATER TEMPERATURE		
ISOV	ISOLATION VALVE		
LOP	LOW PRESSURE SAFETY		
MAF	MIXED AIR FLOW		
MAP	MIXED AIR PRESSURE		
MAT	MIXED AIR TEMPERATURE		

POINT TABLE ABBREVIATIONS

AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI	DIGITAL/BINARY INPUT
DO	DIGITAL/BINARY OUTPUT
INT	INTEGRATION POINT
NET	NETWORK POINT
R	READABLE POINT
R/W	READABLE AND WRITABLE POINT
#	TOTAL NUMBER OF POINTS OF THAT TYPE

BAS CONTROL DEVICES & SYMBOLS

TT	TEMPERATURE SENSORS (BULB, AVERAGING, WELL)	OS	OCCUPANCY SWITCH
TSL	LOW TEMPERATURE SWITCH	JT	POWER METER
MT	HUMIDITY SENSOR	NGT	NATURAL GAS METER
AT	AIR QUALITY SENSOR (CO2, CO, ETC.)	CD	CONTROL DAMPERS (PARALLEL, OPPOSED, ROUND)
PDT	PRESSURE SENSORS (DIFFERENTIAL, STATIC/GAUGE)	CV	CONTROL VALVES (TWO-WAY, THREE-WAY)
PSL PSH	PRESSURE SWITCHES (LOW, HIGH)	C	COOLING COILS (WATER DIRECT EXPANSION)
FT FSL	FLOW SENSORS & SWITCH (WATER, AIR, SWITCH)	H C E C	HEATING COILS (WATER, GAS, ELECTRIC)
IT ISL	CURRENT SENSOR & SWITCH	VFD	VARIABLE FREQUENCY DRIVE, MOTOR STARTER
		MS	MANUAL STARTER

INSTRUMENTATION

SCHEMATICS		PLAN VIEWS
TI	TEMPERATURE INDICATOR	TI
TT	TEMPERATURE TRANSMITTER	TT
TE	TEMPERATURE ELEMENT	TE
PI	PRESSURE INDICATOR	PI
PT	PRESSURE TRANSMITTER	PT
MT	MOISTURE TRANSMITTER	MT
GT	GAS TRANSMITTER	GT
FIT	FLOW INDICATING TRANSMITTER	FIT
PSV	PRESSURE SAFETY VALVE	PSV
PD	DIFFERENTIAL PRESSURE SWITCH	PD
LT	LEVEL TRANSMITTER	LT
PDT	DIFFERENTIAL PRESSURE TRANSMITTER	PDT
AFS	AIRFLOW MEASURING STATION	AFS
T	THERMOSTAT	T

- MASS FLOW/DENSITY ELEMENT
- MAGNETIC FLOW ELEMENT
- SONIC FLOW ELEMENT
- VORTEX FLOW ELEMENT
- FLOW INDICATOR ELEMENT
- TARGET TYPE FLOW ELEMENT
- PILOT TUBE FLOW ELEMENT
- TUBE FLOW ELEMENT
- AVERAGING PILOT FLOW ELEMENT
- TURBINE FLOW ELEMENT
- FLOW ORIFICE
- IN-LINE STEAM SEPARATOR
- STEAM TRAP
- STEAM TRAP ASSEMBLY
- SIGHT GLASS
- MANWAY OR FLANGED CONNECTION
- FEED MAGNET
- RUPTURE DISK PRESSURE RELIEF
- RUPTURE DISK VACUUM RELIEF
- FLAME ARRESTOR
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- FEMALE HOSE CONNECTION
- MALE HOSE CONNECTION
- FLEX CONNECTION
- FLANGED FLEX CONNECTION
- HOSE
- BLIND FLANGE
- DIAPHRAGM SEAL
- WALL HYDRANT/HOSE BIBB
- PIPE ANCHOR
- PIPE GUIDE
- ELBOW UP
- ELBOW DOWN
- TEE DOWN
- PIPE CAP
- VALVE IN RISER
- SIPHON UNDER PRESSURE GAUGE
- SAFETY SHOWER & EYE WASH
- DOWNSPOUT
- FLOW DIRECTION
- FLOW SLOPE
- CONNECT TO EXISTING
- HATCH
- LIGHTED LEVEL GAUGE
- WEIR
- VENTRUI TUBE
- FLUME
- FLOW NOZZLE
- RESTRICTING ORIFICE
- QUICK CHANGE RESTRICTING ORIFICE
- Y-TYPE STRAINER
- BASKET STRAINER
- THERMOWELL
- SPOT DRAIN
- ROOF VENT
- TANK VENT
- NITROGEN SPARGER
- PLUGGED VALVE
- THREADED CONNECTION
- FLOWMETER
- FLOW INDICATOR
- UNION
- SPEC BLIND
- THERMOSTATIC AIR VENT
- AUTOMATIC DRAIN VALVE

VALVES - SYMBOLS

- GATE VALVE
- BALL VALVE
- GLOBE VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- CHECK VALVE SPRING LOADED
- NEEDLE/METERING VALVE
- DIAPHRAGM VALVE
- VEE BALL VALVE
- SAMPLE VALVE
- PLUG VALVE
- QUICK OPEN VALVE
- ANGLE VALVE
- THREE-WAY VALVE
- THREE-WAY BALL VALVE
- FOUR-WAY BALL VALVE
- VACUUM SAFETY RELIEF VALVE
- PRESSURE SAFETY RELIEF VALVE
- VACUUM/PRESSURE SAFETY RELIEF VALVE
- NORMALLY OPEN (ALLTYPES)
- NORMALLY CLOSED (ALL TYPES)
- SELF CONTAINED BACK PRESSURE CONTROL VALVE
- SELF CONTAINED PRESSURE CONTROL VALVE
- SELF OPERATED BACK PRESSURE CONTROL VALVE
- SELF OPERATED PRESSURE CONTROL VALVE
- PRESSURE REDUCING VALVE
- BALANCING VALVE
- PRESSURE REGULATOR
- TRIPLE DUTY VALVE
- BG BLAST GATE
- SG SLIDE GATE
- TWO-WAY DIVERTER
- BACKFLOW PREVENTER (RPZ)
- FLANGED VALVE
- BACKWATER VALVE

EQUIPMENT SYMBOLS

HEAT EXCHANGERS

- BOILER
- CHILLER WATER COOLED
- CHILLER AIR COOLED
- COOLING TOWER
- DRY COOLER
- FLUID COOLER
- SHELL & TUBE HEAT EXCHANGER
- PLATE & FRAME HEAT EXCHANGER
- SPIRAL HEAT EXCHANGER
- HAIRPIN HEAT EXCHANGER
- AIR HEATER OR INTERCHANGER

PUMPS / BLOWERS / FANS

- CENTRIFUGAL PUMP BASE MTD
- INLINE PUMP
- AIR DIAPHRAGM PUMP
- CENTRIFUGAL FAN / BLOWER
- EXTENDED LIFT OR SUMP PUMP
- SUMP PUMP
- METERING OR PROPORTIONING PUMP
- COMPRESSOR OR VACUUM PUMP
- SCREW PUMP
- DOSING PUMP
- EDUCTOR OR JET
- POSITIVE DISPLACEMENT PUMP OR BLOWER
- VERTICAL TURBINE PUMP

FILTERS / COLLECTORS

- HYDRONIC FILTER
- HYDRONIC AIR SEPARATOR
- AIR FILTER
- VERTICAL LEAF FILTER
- HORIZONTAL LEAF FILTER
- PLATE & FRAME FILTER
- ROTARY FILTER
- BAG OR CARTRIDGE FILTER
- BAGHOUSE
- CYCLONE

TANKS AND VESSELS

- TANK OR VESSEL
- HEAT JACKETED TANK OR VESSEL
- TANK OR VESSEL WITH SPIRAL COIL
- TANK OR VESSEL WITH CAGE COIL
- STORAGE TANK OR VESSEL
- CONE BOTTOM TANK OR VESSEL
- ROTARY VESSEL / DRYER

* NOTE *
ALL OF GENERAL NOTES ON THIS SHEET ARE TO BE APPLIED TO ALL OTHER DRAWINGS IN THIS SET. THE SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY OR MAY NOT BE USED IN THIS SET OF DRAWINGS.

PROJECT GENERAL NOTES

A. REMOVE ALL UNUSED PIPING, DUCTWORK AND ACCESSORIES.
B. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CONDITIONS FOR PLUMBING AND MECHANICAL SYSTEMS
C. WHERE FLOOR DRAINS OCCUR WITHIN THE LIMITS OF CONSTRUCTION, PREVENT CONSTRUCTION DEBRIS FROM ENTERING DRAIN BODY BY SEALING DRAIN OPENING PRIOR TO START OF WORK.
D. COORDINATE INSTALLATION OF PIPING, DUCTWORK, CONDUIT, LIGHTS, CABLE TRAY, STRUCTURE, AND EQUIPMENT TO PREVENT CONFLICTS.
E. THE CONTRACTOR SHALL BE FAMILIAR WITH ALL THE CONDITIONS BOTH EXISTING AND THOSE ILLUSTRATED BY THESE DOCUMENTS AS WELL AS THOSE WHICH CAN BE REASONABLY ANTICIPATED INCLUDING, BUT NOT LIMITED TO ARCHITECTURAL, ELECTRICAL, VENTILATION, PLUMBING, AND OTHER SYSTEMS INVOLVED ON THIS PROJECT.
F. FINAL PRODUCT SHALL BE A COMPLETE AND FUNCTIONING SYSTEM, AND SHALL CONFORM TO ALL REQUIREMENTS OF APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING BUT NOT LIMITED TO THE INTERNATIONAL BUILDING CODE AND INTERNATIONAL MECHANICAL CODE.
G. LOCATE EQUIPMENT REQUIRING ACCESS 2'-0" MAXIMUM ABOVE CEILING.
H. ALL ROOF MOUNTED EQUIPMENT SHALL BE A MINIMUM 10'-0" FROM EDGE OF ROOF.
I. LOCATE DUCTWORK, PIPING, AND MECHANICAL EQUIPMENT AWAY FROM THE SPACE ABOVE ELECTRICAL PANELS, TRANSFORMERS, AND OTHER ELECTRICAL EQUIPMENT.
J. FIRE SEAL AROUND DUCT AND PIPING PENETRATIONS OF FIRE RATED WALLS. REFER TO SPECIFICATION SECTION 07 80 00 "FIRESTOPPING" FOR MORE INFORMATION.
K. ADJUST PIPING AND DUCTWORK SIZES TO PROPERLY CONNECT TO MECHANICAL EQUIPMENT.
L. PIPE SIZES SHOWN SHALL BE CONTINUED IN THE DIRECTION OF FLOW UNTIL ANOTHER SIZE IS SHOWN.
M. FOR DETAILS, EQUIPMENT CONNECTIONS, AND PIPE SIZES NOT SHOWN ON THE SEGMENTS, REFER TO DETAILS, SCHEDULES, AND SPECIFICATIONS.
N. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH THE RESPECTIVE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS, AT A LEVEL OF QUALITY AND WORKMANSHIP CONSISTENT WITH THE SPECIFICATIONS.
O. LOCATIONS OF PIPING, DUCTWORK AND EQUIPMENT AS INDICATED ON THE DRAWING ARE APPROXIMATE AND SUBJECT TO MINOR ADJUSTMENTS IN THE FIELD. WORK SHALL BE COORDINATED WITH ALL OTHER TRADES TO AVOID INTERFERENCE IN THE FIELD.
P. INSTALL EXPOSED PIPING AND DUCTWORK AS HIGH AS PRACTICAL IN ROOMS WITHOUT CEILINGS.

HVAC GENERAL NOTES

A. SUPPLY AND RETURN PIPING TO COILS ARE THE SAME SIZE.
B. CONTRACTOR SHALL LOCATE THERMOSTATS 4'-0" AFF AND TEMPERATURE SENSORS AT 5'-0" AFF, A MINIMUM OF 8" FROM LIGHT SWITCH.
C. REFER TO PIPING DRAWINGS FOR THERMOSTAT AND TEMPERATURE SENSOR LOCATIONS.
D. CONDENSATE DRAINS SHALL BE SUPPLIED FOR ALL COOLING EQUIPMENT. CONTRACTOR SHALL ENSURE PROPER INSTALLATION AND DRAINAGE AS REQUIRED BY FEDERAL, STATE, AND LOCAL CODES. CONDENSATE PIPING SHALL BE TYPE "L" COPPER.
E. PROVIDE A 4" HOUSEKEEPING PAD FOR EACH PIECE OF MECHANICAL EQUIPMENT. COORDINATE SIZES WITH MECHANICAL EQUIPMENT SELECTED.
F. ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK SHALL BE RATED FOR PRESSURE CLASS OF 2" W.G. UNLESS NOTED OTHERWISE.
G. THIS CONTRACTOR SHALL BE REQUIRED TO REPLACE FILTERS IN HVAC EQUIPMENT AFTER ALL DUST PRODUCING CONSTRUCTION HAS BEEN COMPLETED AND PRIOR TO THE FINAL PUNCH.

MECHANICAL SHEET INDEX

M001	MECHANICAL SYMBOLS
M101	LEVEL 1 HVAC PLAN
M700	MECHANICAL DETAILS
M800	MECHANICAL SCHEDULES

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MECHANICAL UPDATES FOR:
ATW FED EX — W6322 ATLANTIS DR., APPLETON, WI 54914

MECHANICAL SYMBOLS

DESIGNED	DRAWN
CCK	CCK

PROJECT NO. A0566 06-26-00105
DATE AUGUST 5, 2026
SHEET NO. M001

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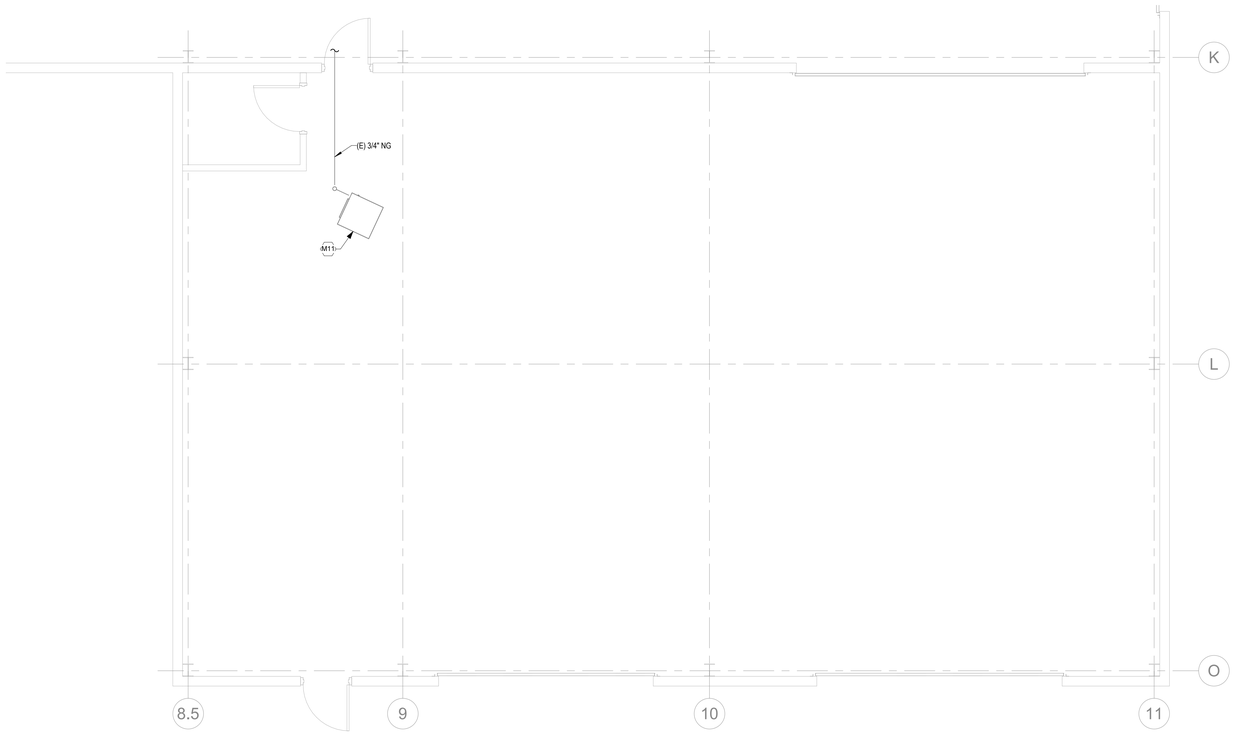
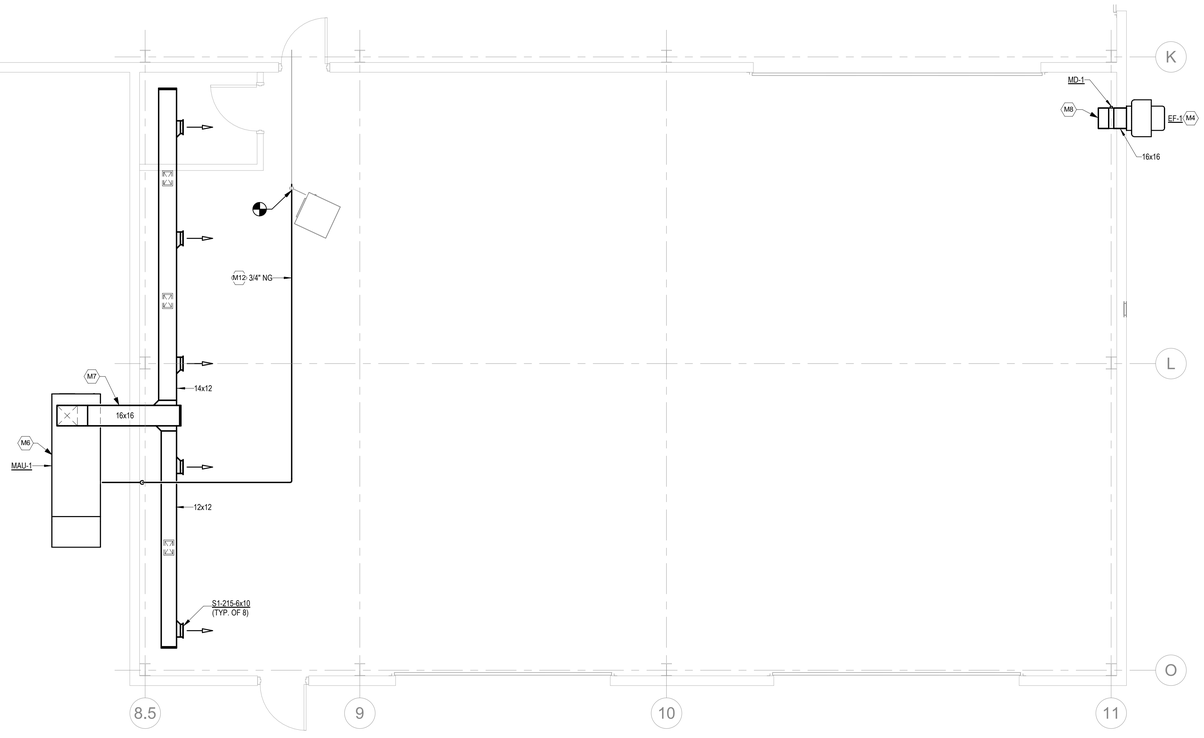


2 M101 HVAC DEMOLITION PLAN
1/4" = 1'-0"



1 M101 HVAC PLAN
1/4" = 1'-0"

KEYNOTES

M4	MOUNT BOTTOM OF EF-1 @ 9'-0' A.F.F.
M6	NEW MAKE-UP AIR UNIT. MOUNT ON STAND ON NEW 4" CONCRETE EQUIPMENT PAD. CONTRACTOR TO VERIFY AND INSTALL GAS REGULATOR, SHUT OFF VALVE, UNION AND DIRT LEG AT EQUIPMENT LOCATION. PROVIDE DUCT OFFSETS AS REQUIRED. CONFIRM.
M7	MOUNT BOTTOM OF DUCT THROUGH WALL AT 12'-0" A.F.F. FIELD VERIFY INSTALLATION LOCATION.
M8	INSTALL 1/2" X 1/2" SCREEN OVER OPEN END.
M11	EXISTING GAS UNIT HEATER AND ASSOCIATED NATURAL GAS PIPING TO REMAIN.
M12	CONNECT NEW GAS PIPING TO EXISTING GAS PIPING. FIELD VERIFY PIPE SIZE AND CONNECTION LOCATION.

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LEVEL 1 HVAC PLAN

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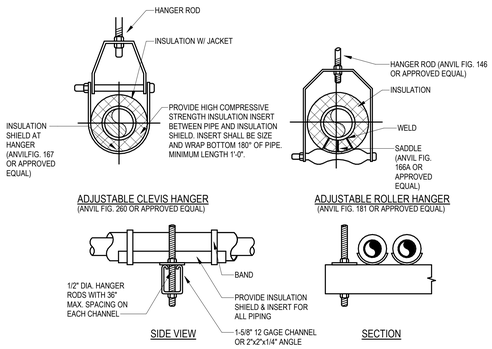
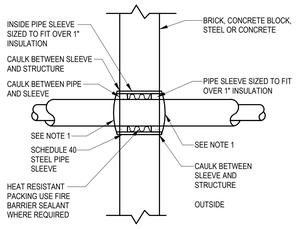


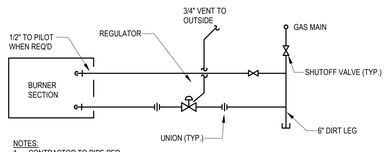
MAXIMUM PIPE/TUBING SUPPORT SPACING (LINEAR FEET)																					
NOM. PIPE SIZE (INCH)	TO 3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14	16	18	20	24
CARBON STEEL (MAX. 750°F)																		
SCH. 40/STD.	7	7	7	9	10	11	12	14	16	17	19	22	23	25	27	28	30	32
SCH. 80	7	7	7	9	10	11	12	14	16	17	19	22	23	25	27	28	30	32
STAINLESS STEEL (MAX. 750°F)																		
SCH. 10	7	8 1/2	10	11	11	13	14	15	17	18	20	22						
SCH. 40	7	7	7	9	10	11	12	14	16	17	19	22	23	25	27	28	30	32
PVC/CPVC																		
SCH 40 (100°F)	4	4 1/2	5	5	5	6	6	6 1/2	7	7 1/2	8	8 1/2	9 1/2	10	10 1/2	-	-	-
SCH. 80 (100°F)	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8	9	9 1/2	10	10 1/2	11	12 1/2	-	-	-	-
ANVIL HANGER ROD SIZE (INCH)	3/8	3/8	3/8	3/8	3/8	1/2	1/2	5/8	5/8	3/4	3/4	7/8	7/8	1	1	1	1 1/4	1 1/4
NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE.																		

4 / M700 PIPE SUPPORT/SPACING DETAIL
NOT TO SCALE



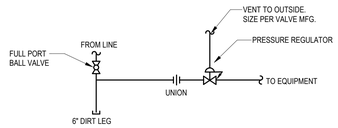
NOTES:
1. CONTRACTOR SHALL PROVIDE CHROME-PLATED WALL PLATE (ESCUTCHEON) IN ANY LOCATION WHERE THE PIPE PENETRATION IS EXPOSED, EXCEPTION ONLY IN MECHANICAL SPACES.

8 / M700 PIPE THRU EXTERIOR WALL DETAIL
NOT TO SCALE

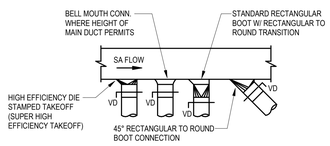


NOTES:
1. CONTRACTOR TO PIPE PER MANUFACTURES SHOP DRAWINGS AND IN ACCORDANCE WITH ALL LOCAL CODES. DIAGRAM SHOWN IS FOR REFERENCE ONLY

7 / M700 GAS PIPING TO EQUIPMENT
NOT TO SCALE

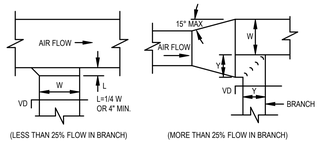


6 / M700 GAS CONNECTION
NOT TO SCALE



ROUND BRANCH CONNECTIONS TO RECTANGULAR DUCTS

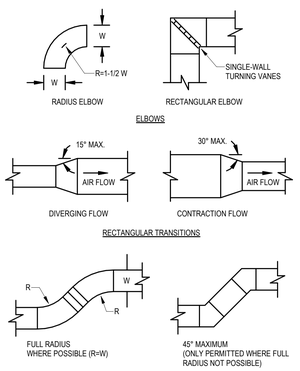
(LESS THAN 25% FLOW IN BRANCH)



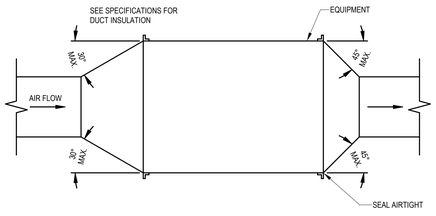
(LESS THAN 25% FLOW IN BRANCH) (MORE THAN 25% FLOW IN BRANCH)

RECTANGULAR BRANCH TAKE-OFFS

3 / M700 DUCTWORK TAKE-OFFS
NOT TO SCALE



2 / M700 DUCTWORK ELBOWS, TRANSITIONS, & ANGLES
NOT TO SCALE



PLAN OR SIDE VIEW

NOTE: UNLESS OTHERWISE INDICATED ON PLANS, MAXIMUM ANGLES SHOWN SHALL APPLY.

1 / M700 DUCT TRANSITION TO/FROM EQUIPMENT
NOT TO SCALE

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MECHANICAL SPECIFICATIONS

GENERAL

THE MECHANICAL WORK INCLUDES WORK AS INDICATED ON THE DRAWINGS TO PROVIDE COMPLETE HEATING AND VENTILATION SYSTEM INSTALLATIONS FOR THE MAINTENANCE GARAGE. PROVIDE ALL CONSTRUCTION ENGINEERING, SUPERVISION, LABOR, MATERIAL AND ANY AND ALL ITEMS NECESSARY FOR COMPLETE AND FUNCTIONING INSTALLATIONS.

NOTIFY THE ENGINEER OF ANY DISCREPANCIES IN, OR OMISSIONS FROM THE SPECIFICATIONS OR DRAWINGS. DISCREPANCIES DISCOVERED DURING CONSTRUCTION SHALL IMMEDIATELY BE CALLED TO THE ATTENTION OF THE ENGINEER FOR DECISION.

CONTRACTOR SHALL INSPECT THE SITE OF THE PROPOSED WORK AND NOTE THE CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED.

ALL WORK SHALL BE FINISHED, TESTED AND READY FOR OPERATION AND USE. THE TERM "PROVIDE" SHALL MEAN "FURNISH AND INSTALL COMPLETE AND READY FOR USE".

OBTAIN ALL PERMITS REQUIRED FOR THE MECHANICAL WORK AND ARRANGE FOR INSPECTIONS AS REQUIRED.

CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE LATEST AMENDED EDITION OF THE STATE BUILDING CODE/MECHANICAL CODE/ PLUMBING CODE, INCLUDING REQUIREMENTS OF OTHER CODES, STANDARDS AND REGULATIONS ADOPTED BY REFERENCE AS A PART THEREOF. CONTRACTOR SHALL COMPLY WITH ANY REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS THAT EXCEED THE STATE CODE REQUIREMENTS.

COORDINATE THE MECHANICAL WORK WITH THE GENERAL CONTRACTOR AND OTHER SUB-CONTRACTORS.

ALL WORK IS TO BE PERFORMED IN A CRAFTSMANSHIP MANNER AND EXCEPT WHERE OTHERWISE INDICATED, USING ONLY NEW, QUALITY MATERIALS.

DO ALL CUTTING AND PATCHING NECESSARY FOR THE INSTALLATION OF THE MECHANICAL WORK. ALL CUTTING SHALL BE DONE IN A MANNER DIRECTED BY THE GENERAL CONTRACTOR. PATCHING SHALL MATCH ADJACENT SURFACES.

ALL ELECTRICAL POWER WIRING WILL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

MAKE AN OPERATING TEST OF THE COMPLETED INSTALLATIONS AND REMEDY ALL DEFECTS DISCLOSED AS A RESULT OF THE TEST.

RECORD DRAWINGS

CONTRACTOR SHALL MAINTAIN ONE SET OF DRAWINGS AT THE JOB SITE FOR USE AS A RECORD COPY. EACH CHANGE ORDER OR OTHER REVISIONS, DELETIONS, OR ADDITIONS, SHALL BE CLEARLY MARKED AND NOTED BY COLORED MARKER. WHERE ANY MATERIAL, DUCTWORK, PIPING OR SYSTEM COMPONENT IS INSTALLED DIFFERENT FROM THAT SHOWN, RECORD SUCH DIFFERENCES CLEARLY AND NEATLY. THIS RECORD SET OF DRAWINGS SHALL BE SUBMITTED TO ENGINEER UPON COMPLETION OF THE PROJECT.

SHOP DRAWINGS

SUBMIT SHOP DRAWINGS FOR ALL MATERIALS AND EQUIPMENT USED FOR THE WORK. ALL CUTS SHALL HAVE COMPLETE DIMENSIONS, RATINGS, INSTALLATION REQUIREMENTS, ETC. SHOP DRAWINGS WILL NOT BE ACCEPTED FOR REVIEW BY THE ENGINEER UNTIL AFTER THEY HAVE BEEN CHECKED AND APPROVED BY THE CONTRACTOR AS EVIDENCED BY HIS APPROVAL STAMP AND SIGNATURE. WHERE THE SPECIFICATIONS STATE "OR EQUAL" OR "OR APPROVED EQUAL", MANUFACTURERS OTHER THAN THOSE LISTED MAY BE SUBSTITUTED SUBJECT TO THE APPROVAL OF THE ENGINEER.

OPERATION AND MAINTENANCE MANUALS

SUBMIT ONE (1) HARD COPY OF OPERATION AND MAINTENANCE MANUALS FOR ALL SYSTEMS AND EQUIPMENT AND ALSO TWO (2) ELECTRONIC COPIES WITHIN TEN DAYS AFTER FINAL INSPECTION. THE ELECTRONIC VERSION SHALL FOLLOW THE FORMAT OF THE PAPER VERSION AND BE IN PDF FORMAT. MANUALS SHALL BE BOUND IN NEW HARD BACKED 3 RING BINDERS WITH THE TITLE "OPERATIONS AND MAINTENANCE MANUALS" AND THE PROJECT TITLE CLEARLY PRINTED ON THE FRONT COVER. PROVIDE AN INDEX AT THE BEGINNING OF THE MANUAL FOR THE SECTIONS INCLUDED IN THE MANUAL. ALL SECTIONS SHALL BE REFERENCED WITH PLASTIC TABS. INCLUDE AT THE FRONT OF THE MANUAL A COMPLETE LISTING OF THE OWNER'S CONSTRUCTION REPRESENTATIVE, ENGINEER, CONTRACTORS AND SUB-CONTRACTORS ON THE PROJECT. LISTING SHALL INCLUDE NAMES, ADDRESSES AND PHONE NUMBERS FOR EACH . ALL MAT-OR PIECES OF EQUIPMENT SHALL BE REFERENCED WITH TABS. AT THE BEGINNING OF EACH SECTION, THE EQUIPMENT SUPPLIER'S NAME, ADDRESS AND PHONE NUMBER SHALL BE PROVIDED. DATA FOR EQUIPMENT INCLUDED IN THE MANUALS SHALL INCLUDE:

1. APPROVED SHOP DRAWINGS CLEARLY SHOWING THE MODELS, SIZES AND CAPACITIES OF EQUIPMENT INSTALLED.
2. OPERATIONS MANUALS WITH STEP-BY-STEP INSTRUCTIONS FOR COMPOUNDING PHARMACY THE EQUIPMENT.
3. MAINTENANCE MANUALS FROM THE MANUFACTURER OF EACH PIECE OF EQUIPMENT INCLUDING INSTRUCTIONS ON INSTALLATION, MAINTENANCE AND LUBRICATION. MANUALS SHALL INCLUDE PARTS LIST FOR ALL REPLACEMENT PARTS.

THE BALANCE REPORTS SHALL BE INCLUDED IN THE MANUALS FOR THE OWNER'S INFORMATION.

OPERATIONS AND MAINTENANCE MANUALS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO FINAL OBSERVATION OF THE WORK.

IDENTIFICATION

PIPE AND DUCT MARKERS SHALL BE SETON SET MARK, BRADY PERMA-CODE, OR APPROVED EQUAL, ONE-PIECE PREPRINTED PRESSURE SENSITIVE MARKERS AND TAPES AND SHALL BE IN ACCORDANCE WITH ANSI A13.1-1981 STANDARD ADOPTED BY OSHA. GREEN BANDS (BACKGROUNDS) ARE REQUIRED FOR SAFE CONTENTS, YELLOW BANDS FOR HAZARDOUS CONTENTS (EXHAUST HOOD DUCTWORK), BLUE BANDS FOR LOW HAZARD CONTENTS AND RED BANDS FOR FIRE QUENCHING CONTENTS. THE WIDTH OF THE COLOR BAND OR MARKER AND THE SIZE OF LEGEND LETTERS SHALL BE AS FOLLOWS:

O.D. OF PIPE AND COVERING	MARKER WIDTH	LEGEND LETTER SIZE
3/4" TO 1-1/4"	8"	1/2"
1-1/2" TO 2"	8"	3/4"
2-1/2" TO 6"	12"	1-1/4"

ARROWS SHALL BE BLACK WITH BACKGROUND COLOR SAME AS COLOR BANDING. A SINGLE ARROW SHALL INDICATE DIRECTION OF FLOW AND A DOUBLE ARROW SHALL INDICATE REVERSIBLE FLOW. LEGENDS AND BACKGROUND AND LETTER COLORS SHALL MATCH EXISTING COLOR SCHEME/NAMING CONVENTION ON SITE.

VALVE TAGS SHALL BE SETON, BRADY, OR APPROVED EQUAL, 1-1/2" DIAMETER, SOLID PLASTIC WITH HEAT STAMPED IDENTIFYING SERVICE AND NUMBER. BACKGROUND AND LETTER COLORS FOR EACH SERVICE SHALL BE THE SAME AS LISTED IN PARAGRAPH ABOVE. VALVE TAG FASTENERS SHALL BE NO. 6 BRASS BEAD CHAINS, 4-1/2" IN LENGTH, WITH LOCKING LINK. PERMANENT PRE-MANUFACTURED VALVE TAGS SHALL BE CHAINED TO ALL SHUT-OFF VALVES FURNISHED UNDER THE WORK, INCLUDING FACTORY PROVIDED VALVES. EACH TAG SHALL IDENTIFY THE SERVICE AND SEQUENCE NUMBER. 8-1/2" X 11" TYPED SCHEDULES LISTING ALL TAGGED VALVES FOR THE PROJECT SHALL BE PREPARED. LIST SHALL TABULATE VALVES IN NUMERICAL SEQUENCE AND SHOW VALVE LOCATION, SERVICE AND AREA SERVED.

ALL NEW PIPING AND DUCTWORK INSIDE THE BUILDING SHALL BE IDENTIFIED WITH MARKERS AFTER PIPE/DUCTWORK HAS BEEN INSTALLED. MARKERS SHALL BE APPLIED TO PIPES/DUCTWORK ADJACENT TO BOTH SIDES OF PARTITIONS AND ABOVE GROUND FLOORS, AT BRANCH TAKEOFFS ADJACENT TO VALVES, AT CONNECTIONS TO EQUIPMENT AND 30 FEET ON CENTER FOR STRAIGHT LENGTHS OF PIPE. AT EACH COLOR BAND LOCATION, A TITLE SHOWING THE PIPE CONTENTS AND AN ARROW SHOWING DIRECTION OF FLOW SHALL BE APPLIED. WHERE TITLES AND COLOR BANDS MATCH COLOR OF PIPE, PROVIDE WHITE BACKGROUND (BLACK WHERE COLOR IS WHITE) EXTENDING AT LEAST THREE (3) INCHES AROUND ALL BANDS AND TITLE. TITLES AND ARROWS SHALL BE PROMINENTLY DISPLAYED ADJACENT TO COLOR CODING AND SHALL BE CLEARLY VISIBLE FROM OPERATING POSITIONS, ESPECIALLY THOSE ADJACENT TO CONTROL VALVES.

EQUIPMENT MARKERS: PROVIDE ENGRAVED PLASTIC LAMINATED SIGNS OR PLASTIC EQUIPMENT MARKERS FOR ALL PIECES OF EQUIPMENT. COLOR OF MARKERS SHALL MATCH EXISTING IN AREA. IDENTIFICATION SHALL BE FOR THE FOLLOWING EQUIPMENT AS FOLLOWS:

A. MAKE-UP AIR UNITS
B. EXHAUST FANS
E. SHUT-OFF VALVES (WITH VALVE NUMBERS)

EQUIPMENT INSTALLATIONS

PROVIDE ALL NECESSARY RIGGING, SCAFFOLDING, TOOLS, TACKLE, LABOR, ETC. NECESSARY FOR THE COMPLETE INSTALLATION OF THE EQUIPMENT. ADAPT WORK TO JOB CONDITIONS AND INSTALL WORK TO CLEAR BEAMS, JOISTS, ETC. RAISE OR LOWER WORK AS REQUIRED TO MEET EXISTING CONDITIONS OR THE WORK OF OTHER TRADES, ALL AS REQUIRED OR AS JOB CONDITIONS DICTATE, WITHOUT ADDITIONAL COST TO THE OWNER. ALL EQUIPMENT SHALL BE INSTALLED AND CONNECTED WITH BEST ENGINEERING PRACTICES AND IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. PIPING AND ELECTRICAL CONNECTIONS, VALVES AND APPURTENANCES RECOMMENDED BY THE MANUFACTURER OR AS REQUIRED FOR PROPER OPERATION SHALL BE FURNISHED AND INSTALLED TO COMPLETE THE INSTALLATION. ALL EQUIPMENT SHALL BE INSTALLED AND LOCATED TO FACILITATE ACCESSIBILITY FOR MAINTENANCE AND/OR REPLACEMENT.

SHEET METAL

CONSTRUCT AND SUPPORT NEW DUCTWORK IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS FOR UP TO 2" W.G. STATIC PRESSURE INCLUDING GAUGES AND REINFORCING.

ALL SUPPLY AIR DUCTWORK SHALL BE GALVANIZED STEEL WITH GAUGES AND REINFORCING AS FOLLOWS:

GAUGE US STANDARD	MAXIMUM SIDE INCHES	TRANSVERSE JOINT	INTERMEDIATE BRACING	CENTERS
26	UP TO 12"	"S" DRIVE OR SLIP	NONE	
24	13" TO 18"	"S" DRIVE OR SLIP	NONE	
24	19" TO 30"	1" BAR DRIVE	1" X 1" X 1/8" ANGLES	5'-0"
22	31" TO 42"	1" BAR DRIVE OR SLIP	1" X 1" X 1/8" ANGLES	5'-0"

CROSS BREAK SHEET METAL SURFACES OF RECTANGULAR DUCTS 18 INCHES THROUGH 60 INCHES IN SIZE.

PROVIDE OFFSETS, ELBOWS, AND TRANSFORMATIONS IN DUCTWORK AS REQUIRED FOR COMPLETE INSTALLATION.

CURVED ELBOWS SHALL HAVE A CENTERLINE RADIUS EQUAL TO 1-1/2 TIMES THE DUCT WIDTH.

SQUARE TURN ELBOWS SHALL BE FITTED WITH TURNING VANES CONFORMING TO SMACNA STANDARDS. VANES SHALL BE DOUBLE THICKNESS, FASTENED TO RUNNERS AND ADEQUATELY BRACED.

SEAL LONGITUDINAL AND TRANSVERSE JOINTS IN ALL NEW AND EXISTING SUPPLY AIR, RETURN AIR AND EXHAUST AIR DUCTS WITH 3M SEALER 800, OR APPROVED EQUAL.

SECURELY ATTACH ALL DUCTWORK TO THE BUILDING CONSTRUCTION IN A MANNER TO BE FREE FROM VIBRATION AND SWAYING UNDER OPERATING CONDITIONS.

DIFFUSERS AND GRILLES

SUPPLY AIR REGISTER (S1) SHALL BE TITUS MODEL 300RL, PRICE AND TUTTLE & BAILEY EQUAL, 3/4" BLADE SPACING, ADJUSTABLE DOUBLE DEFLECTION BLADES, ALUMINUM WITH OPPOSED BLADE DAMPER. EXPOSED SURFACES SHALL BE FINISHED WITH FACTORY BAKED WHITE ENAMEL.

DUCTWORK INSULATION

ALL OUTSIDE AIR AND EXHAUST AIR DUCTS SHALL BE EXTERNALLY INSULATED WITH RIGID FIBER GLASS BOARD, 2" THICK, 3 LB / CU. FT. DENSITY HAVING VAPOR BARRIER JACKET OF FOIL-SCRIM-KRAFT (FSK) WITH 2" TAB.

ALL EXTERIOR DUCTWORK SHALL BE WEATHERPROOFED WITH PABCO ALUMINUM JACKETING. THE JACKETING IS TO BE MANUFACTURED FROM ALUMINUM ALLOY CONFORMING TO ASTM B-209 DESIGNATION WITH CLEAR STUCCO EMBOSSED FINISH. ALL JACKETING SHALL HAVE AN INTEGRALLY BONDED MOISTURE BARRIER OVER THE ENTIRE SURFACE IN CONTACT WITH THE INSULATION. A THICKNESS OF 0.032" IS TO BE USED. ALL SEAMS AND JOINTS SHALL BE SEALED WEATHER AND WATER TIGHT.

MAKE-UP AIR UNITS

FURNISH AND INSTALL WHERE INDICATED ON THE DRAWINGS TITAN, GREENHECK, ABSOLUTE AIR, OR APPROVED EQUAL OUTDOOR MOUNTED, PACKAGED DIRECT NATURAL GAS-FIRED MAKE-UP AIRHEATING UNIT, AGA CERTIFIED, ETL LISTED TO ANSI STANDARDS.

THE UNIT SHALL BE SHIPPED IN ONE (1) PIECE FROM THE FACTORY COMPLETELY WIRED AND PIPED, WITH THE EXCEPTION OF REMOTE CONTROL DEVICES, INLET DAMPERS, AND FILTER SECTIONS. LIFTING LUGS ARE TO BE PROVIDED FROM THE FACTORY FOR RIGGING THE UNIT.

THE CABINET SHALL BE SINGLE CONSTRUCTION. THE CONSTRUCTION MATERIAL USED SHALL BE HEAVY GAUGE BONDERIZED STEEL FINISH WITH ENAMEL PAINT. THE EXTERIOR UNITS SHALL BE FULLY WEATHERIZED FOR OUTDOOR MOUNTING. ALL GAS AND ELECTRICAL CONTROLS SHALL BE MOUNTED IN FULLY WEATHERIZED CONTROL COMPARTMENTS WITH EASY REMOVABLE DOORS. ALL ACCESS PANELS AND DOORS SHALL HAVE FULL LENGTH HINGES, LINERS, RAIN TROUGHS AND POSITIVE SEAL LATCHES.

THE AIR HANDLING UNIT SHALL BE SUITABLE FOR OPERATION FROM A SINGLE 208 VOLT, 3 PHASE SOURCE. THE AIR HANDLING UNIT SHALL INCLUDE A NEMA RATED DISCONNECT SWITCH THAT SHALL DISCONNECT THE SOURCE OF POWER TO THE UNIT. THE AIR HANDLING UNIT SHALL INCLUDE A UNIT MOUNTED, WEATHER-PROOF ENCLOSURE THAT SHALL HOUSE A FUSED 208/120 VOLT CONTROL POWER TRANSFORMER, A 120/24 VOLT TRANSFORMER, STARTERS, ALL CONTROLS AND ALL CONTROL SWITCHES FOR OPERATION OF THE UNIT AS DEFINED HEREIN. THE CONTROL PANEL SHALL INCLUDE A NEMA RATED COMBINATION STARTER WITH PHASE FAILURE PROTECTION AND OVERLOADS TO OPERATE THE MOTOR(S) THAT ARE INTEGRAL WITH THE AIR HANDLING UNIT. THE CONTROL PANEL SHALL INCLUDE GAS, SAFETY AND RELATED CONTROLS. THE RELATED CONTROLS SHALL INCLUDE BUT SHALL NOT BE LIMITED TO THE EXHAUST FANMOTORIZED DAMPER INTERFACE RELAYS, THE OCCUPIED/UNOCCUPIED RELAYS, LOGIC, RELAYS, INTERLOCKS TO MEET THE REQUIREMENTS OF THIS SPECIFICATION. ALL WIRING SHALL BE TERMINATED ON BARRIER TYPE TERMINAL BLOCKS IN THE UNIT MOUNTED CONTROL PANEL AND IN THE REMOTE CONTROL PANEL. THE CONTROL PANEL SHALL BE THIRD PARTY LABELED IN ACCORDANCE WITH THE REQUIREMENTS OF THE STATE BOARD OF ELECTRICITY.

THE UNIT SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:

1. A MOTOR WITH ADJUSTABLE DRIVE SHALL BE INCLUDED. PROVIDE FAN WITH PILLOW BLOCK BEARINGS AND EXTENDED GREASE LINES.
2. GAS SAFETY CONTROLS SHALL BE PROVIDED TO MEET ANSI REQUIREMENTS AND WILL INCLUDE A FLAME SAFEGUARD RELAY WITH FLAME ROD. AUTOMATIC AND MANUAL HIGH TEMPERATURE LIMITS ARE TO BE PROVIDED AT THE DISCHARGE OF THE UNIT AND A HIGH TEMPERATURE SAFETY LOCATED AT THE BURNER. PROVIDE A FREEZESTAT AT THE DISCHARGE OF THE UNIT.
3. THE VELOCITY OF AIR OVER THE BURNER MUST ALWAYS REMAIN CONSTANT AND AT NO TIME SHALL RECIRCULATED AIR PASS OVER THE BURNER. HIGH AND LOW AIR VELOCITY SAFETY PRESSURE SWITCHES SHALL BE PROVIDED TO PROTECT AGAINST LOW OR HIGH AIR FLOW OVER THE BURNER.
4. THE GAS TEMPERATURE CONTROLS SHALL BE ELECTRONIC WITH ACCURACY TO ± 2F. THE UNIT SHALL BE PROVIDED WITH PRE-PURGE TIME DELAY AND ARRANGED FOR POSITIVE LOW-FIRE START-UP.
5. BURNER SECTION - EACH UNIT SHALL BE EQUIPPED WITH A FULLY MODULATING DIRECT FIRED BURNER CAPABLE OF 30:1 TURNDOWN. THE BURNER SHALL HAVE STAINLESS STEEL COMBUSTION BAFFLES; SPARK-IGNITION INTERMITTENT PILOT AND FLAME SAFEGUARD SYSTEM. THE BURNER PROFILE IS TO BE EQUIPPED WITH ADJUSTABLE PROFILE PLATES.
6. THE GAS MANIFOLD SHALL INCLUDE:
   A. MAIN GAS PRESSURE REGULATOR.
   B. MANUAL SHUTOFF AND TEST FIRING VALVE.
   C. MAIN GAS AUTOMATIC SHUT-OFF VALVE.
   D. RTC OR JOHNSON FX CONTROLS MODULATING CONTROL SYSTEM.
   E. PILOT PRESSURE REGULATOR AND AUTOMATIC SHUT-OFF VALVE.
7. UNITS TO BE PROVIDED WITH A FILTER SECTION WITH 2", MERV 8 FILTERS.
8. UNITS SHALL BE PROVIDED WITH A SUPERVISORY REMOTE CONTROL PANEL. THIS PANEL SHALL INCLUDE SYSTEM SWITCHES, STATUS INDICATOR LIGHTS INCLUDING CLOGGED FILTER LIGHT, AND REMOTE TEMPERATURE SELECTORS AND THERMOSTATS. CONTROL PANELS TO BE CONSISTENT WITH THE CONTROL SEQUENCE DESCRIBED. INTERIOR MOUNTED CONTROL PANELS SHALL HAVE A GENERAL PURPOSE ENCLOSURE. THE CONTROL PANEL SHALL BE PROVIDED WITH THE FOLLOWING ACCESSORIES:
   A. EXHAUST FANMOTORIZED DAMPER INTERFACE RELAYS AS REQUIRED.
   B. OCCUPIED/UNOCCUPIED RELAYS AS REQUIRED.
   C. LOGIC, RELAYS, THERMOSTATS, SWITCHES, INTERLOCKS, WIRING TERMINALS, ETC. TO FULLY MEET THE CONTROL SCHEME REQUIREMENTS AS LISTED ON THE DRAWINGS.
9. MAKE-UP AIR UNIT SHALL BE SINGLE SPEED UNIT (UNLESS NOTED OTHERWISE) UTILIZING AN OUTSIDE AIR OR DISCHARGE AIR DAMPER AS APPLICABLE AND SCHEDULED, AND A SUPPLY AIR THERMOSTAT TO MODULATE THE BURNER.
10. PROVIDE UNIT WITH THE FOLLOWING OPTIONS/ACCESSORIES:
   A. FILTER SECTION WITH THROWAWAY FILTERS.
   B. 36" EQUIPMENT CURB.
   C. MAIN CIRCUIT BREAKER WITH EXTERNAL OPERATING HANDLE.
   D. DISCHARGE DAMPER.
   E. LOUVERED FULL TURN DOWN INTAKE HOOD

EACH UNIT SHALL BE FULLY FACTORY WIRED, EXCEPT FOR THERMOSTAT, ASSEMBLED AND TEST FIRED PRIOR TO SHIPMENT.

PROVIDE ONE COMPLETE EXTRA SET OF AIR FILTERS AND FAN BELTS.

THE MAKE-UP AIR UNIT SHALL BE PUT INTO OPERATION UNDER THE DIRECT SUPERVISION OF THE MANUFACTURER'S FACTORY-TRAINED SERVICE ENGINEER AND HIS SERVICES SHALL BE PAID FOR BY THE MECHANICAL CONTRACTOR. THE SERVICE ENGINEER SHALL CHECK THE CALIBRATION AND CONTROL SETTINGS AND SHALL VERIFY THE PROPER OPERATION OF ALL SAFETY AND OPERATING CONTROLS. HE SHALL INSTRUCT THE OWNER'S DESIGNATED REPRESENTATIVE ON THE OPERATION OF THE UNITS AND THEIR CONTROLS.

CAPACITIES AND CHARACTERISTICS SHALL BE AS SCHEDULED ON THE DRAWINGS

EXHAUST FANS

SIDEWALL EXHAUSTERS SHALL BE GREENHECK, TWIN CITY FAN, SOLER & PALAU OR LOREN COOK, CENTRIFUGAL EXHAUSTERS, AMCA CERTIFIED.

CONSTRUCTION OF WIND BAND SHALL BE HEAVY GAUGE ALUMINUM WITH ROLLED BEAD FOR ADDED STRENGTH. UNIT CONSTRUCTION SHALL ALLOW FOR REMOVAL OF THE ENTIRE POWER ASSEMBLY AND WHEEL FOR SERVICING AND CLEANING BY REMOVING FASTENERS.

FAN WHEEL SHALL BE BACKWARD CURVED CENTRIFUGAL TYPE WITH INLET VENTURI, STATICALLY AND DYNAMICALLY BALANCED. BLADES, FINS, INLET CONE AND BACKPLATE SHALL BE FABRICATED FROM ALUMINUM AND SECURELY JOINED TOGETHER.

MOTOR AND FAN WHEEL SHALL BE MOUNTED ON VIBRATION ISOLATORS.

MOTOR SHALL BE ISOLATED FROM THE EXHAUST AIR STREAM AND READILY ACCESSIBLE FOR MAINTENANCE. DESIGN SHALL PROVIDE CONTAINMENT FREE AIR TO BE TAKEN INTO THE MOTOR COMPARTMENT FOR AIR COOLING MOTOR.

SIDEWALL EXHAUSTER PERFORMANCE CAPACITIES AND CHARACTERISTICS SHALL BE AS SCHEDULED ON THE DRAWINGS.

AIR BALANCING

BALANCE EACH AIR OUTLET/INLET TO PROVIDE THE INDICATED AIR FLOWS.

NATURAL GAS PIPING

2" AND SMALLER SIZES: ASTM A53/ A53M BLACK STEEL SCHEDULE 40 PIPE AND ASME B16.3 STANDARD WEIGHT, MALLEABLE IRON SCREWED FITTINGS. FOR EXTERIOR PIPING, PRIME COAT WITH RUST RESISTANT PRIMER.

SEQUENCE OF OPERATIONS

MAINTENANCE GARAGE HEATING AND VENTILATION SYSTEM:
MAKE-UP AIR UNIT MAU-1, EXHAUST FAN EF-1 AND MOTORZED DAMPER MD-1:

THE MAKE-UP AIR UNIT SHALL HAVE A CONTROL PANEL WITH AN ON-AUTO FAN SWITCH, BURNER, BLOWER AND DIRTY FILTER LIGHTS AND DISCHARGE AIR TEMPERATURE SELECTOR. AN AIR TEMPERATURE SENSOR, IN THE INTAKE PLENUM, SHALL AUTOMATICALLY SWITCH THE UNIT BETWEEN WINTER AND SUMMER MODE WHENEVER THE OUTSIDE AIR TEMPERATURE IS BELOW/ABOVE 50 DEGREES (ADJUSTABLE). A LOW LIMIT STAT LOCATED IN THE DISCHARGE OF MAU-1 SHALL SHUT DOWN SYSTEM WHENEVER DISCHARGE TEMPERATURE DROPS BELOW 35 DEGREES (ADJUSTABLE). THE CONTROL PANEL WILL BE MOUNTED WHERE INDICATED ON THE PLANS. CONTROL SEQUENCE SHALL BE AS FOLLOWS:

SYSTEM SWITCH IN THE "ON" POSITION:

THE MAKE-UP AIR UNIT WILL OPERATE AT FULL SPEED.

SYSTEM SWITCH IN THE "AUTO" POSITION:

THE MAKE-UP AIR UNIT SHALL BE INTERLOCKED WITH THE SPACE LIGHTING CIRCUIT TO OPERATE WHENEVER THE LIGHTS IN THE SPACE ARE SWITCHED ON. THE UNIT WILL CONTINUE TO OPERATE UNTIL THE LIGHTS ARE TURNED OFF.

A MANUAL RESET, STAINLESS STEEL FREEZE STAT IN THE DISCHARGE OF THE MAKE-UP UNIT SHALL SHUT THE UNIT OFF IF SUPPLY AIR TEMPERATURE IS BELOW SET POINT, (35 DEGREES). THE ALARM LIGHT SHALL BE ENERGIZED WHEN THE UNIT SHUTS DOWN ON LOW TEMPERATURE, A RELAY FOR REMOTE INDICATION OF ALARM SHALL BE PROVIDED.

ALL SENSORS AND CONTROL DEVICES IN THE MAKE-UP AIR UNIT AIRSTREAM SHALL BE CONSTRUCTED OF CORROSION RESISTANT STAINLESS STEEL.

THE DISCHARGE AIR DAMPER SHOULD FULLY OPEN WHEN-EVER THE UNIT IS ENERGIZED AND FULLY CLOSE WHEN-EVER THE MAKE-UP AIR UNIT IS SHUT DOWN BY ANY SAFETY DEVICE.

EXHAUST FAN EF-1 AND ITS ASSOCIATED MOTORIZED DAMPER SHALL BE INTERLOCKED TO OPERATE AND OPEN WHENEVER THE MAKE-UP AIR UNIT IS OPERATING.

THE TEMPERATURE SET-POINT CONTROLLER, CONTACTS FOR "OCCUPIED/UNOCCUPIED", CONTACTS FOR EXHAUST FAN, UNIT DAMPER ACTUATORS, AND ALL OTHER CONTROL DEVICES REQUIRED TO OPERATE AS DESCRIBED AND CONTROL PANEL SHALL BE FURNISHED WITH THE MAKE-UP AIR UNIT AND INSTALLED BY THE T.C. CONTRACTOR.

ALL INTERLOCKS, RELAYS, DAMPER ACTUATORS AND CONTROL WIRING TO BE FURNISHED AND INSTALLED BY THE T.C. CONTRACTOR. COORDINATE CONTROL WIRING TERMINATION POINT WITH DIVISION 26. ALL CONTROL WIRING TO BE ROUTED IN A DEDICATED CONDUIT IN ACCORDANCE TO THE DIVISION 26 STANDARDS. ALL POWER WIRING TO BE FURNISHED AND INSTALLED BY DIVISION 26.

GAS-FIRED MAKE-UP AIR UNIT SCHEDULE

					GAS BURNER					FILTER		MOTOR		ELECTRICAL						
ID	MANUFACTURER	MODEL	CFM	ESP (WG)	TYPE	PRESS AVAIL	EAT(db)	LAT(db)	MBH	MBH @ MIN FIRE	DESCRIPTION	EFF	POWER	RPM	FLA	VOLT	PH	FREQ	UNIT WEIGHT	REMARKS
MAU-1	TITAN	TA-109-NG-HRV	1,720	0.50	NAT. GAS	2 LB	-20	70	151	15	CLEANABLE	MERV 8	1.50 hp	1750	10 A	208 V	3	60 Hz	815 lb	ALL

FAN SCHEDULE

			MECHANICAL								ELECTRICAL					
EQUIP NO.	MANUFACTURER	MODEL NO.	CFM	ESP	RPM	TYPE	DRIVE	INLET dBA	INTERLOCK	WEIGHT	BHP	HP	VOLTAGE	PHASE	FREQUENCY	NOTES
EF-1	GREENHECK	CUBE-140	1845	0.50	1248	SIDEWALL	BELT	63	MAU-1	94	0.4	0.5	208	3	60	1

DAMPER SCHEDULE

									CONTROL			
EQUIP NO.	DESCRIPTION	SERVING	MANUFACTURER	MODEL	DESIGN CFM	WIDTH	HEIGHT	BLADE TYPE	ACTION	POS	ACTUATOR TYPE	NOTES
MD-1	MOTORIZED DAMPER	EF-1	RUSKIN	CD50	1,720	1' - 4"	1' - 4"	OPPOSED	2-POS	N.C.	120 V	1

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BID DOCUMENTS - PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION
	07/09/26	PRICING SET
	08/05/26	BID DOCUMENTS

MECHANICAL UPDATES FOR:
ATW FED EX W6322 ATLANTIS DR., APPLETON, WI 54914
MECHANICAL SCHEDULES

DESIGNED	DRAWN
CCK	CCK

PROJECT NO. A0566 06-26-00105
DATE AUGUST 5, 2026
SHEET NO. M800

Autodesk Docs://A0566 - ATW FedEx / ATWFE-D-MH-R24.rvt

GENERAL ELECTRICAL NOTES

DRAWINGS

1. THESE DRAWINGS ARE DIAGRAMMATIC IN NATURE, AND INDICATE THE GENERAL ARRANGEMENT OF EQUIPMENT, BUT ACCURACY IS NOT GUARANTEED, AND FIELD VERIFICATION OF ALL LOCATIONS AND DIMENSIONS IS DIRECTED.
2. THESE DRAWINGS WILL NOT SHOW ALL INSTALLATION DETAILS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE A COMPLETE AND SATISFACTORY INSTALLATION IN ACCORDANCE WITH THE BEST MODERN PRACTICE METHODS.
3. E.C. SHALL MAKE OWN COUNT OF ALL EQUIPMENT TO BE WIRED BASED ON ALL PLANS AND SPECIFICATIONS IN THEIR ENTIRETY.
4. CAREFULLY REVIEW THE ARCHITECTURAL, STRUCTURAL, MECHANICAL, HVAC AND PLUMBING PLANS AND SPECIFICATIONS FOR FURTHER WORK SCOPE AND FOR ADDITIONAL INFORMATION.
5. THE ELECTRICAL DRAWINGS ARE NOT TO BE USED FOR ROOM DIMENSIONS AND EQUIPMENT PLACEMENT. DREFERENCE THE APPROPRIATE ARCHITECTURAL, STRUCTURAL, OR MECHANICAL PLANS. DRAWINGS ARE SCHEMATIC -- VERIFY ALL LOCATIONS BEFORE INSTALLING CONDUIT, EQUIPMENT, ETC.
6. DETAILS ARE TYPICAL OF THE INSTALLATIONS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FAMILIARIZE THEMSELF WITH THE INSTALLATION AND TO PROVIDE THE PROPER INSTALLATION FOR SITUATIONS WHICH MAY VARY FROM THE DETAILS OR DRAWINGS. CONTRACTORS ARE ADVISED TO COMPLETELY SURVEY THE WORK AREA FOR NON-TYPICAL SITUATIONS, ETC.
7. ALL EQUIPMENT DIMENSIONS SHOWN ON PLANS AND ELEVATIONS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL USE THE SHOP DRAWINGS FOR PROPER LAYOUT, FOUNDATION AND PAD, ETC. FOR FINAL INSTALLATION WITHOUT AND ADDITIONAL COST TO THE OWNER.
8. REFER TO HVAC DRAWINGS FOR LOCATION OF HVAC EQUIPMENT.
9. REFER TO ARCHITECTURAL, HVAC PLANS FOR ADDITIONAL SCOPE, DETAILS, ORIENTATION & OTHER INFORMATION.
10. ELECTRICAL EQUIPMENT, RACEWAYS, AND CABLING THAT ARE NOT FOR THE STAIRWELLS OR ELEVATOR SHAFTS, SHALL NOT BE ROUTED THROUGH OR LOCATED IN STAIRWELLS OR ELEVATOR SHAFTS.

COORDINATION

1. E.C. SHALL BE RESPONSIBLE FOR COORDINATING THE ELECTRICAL WORK WITH CONTRACTORS OF OTHER TRADES.
2. CAREFULLY REVIEW THE FINAL EQUIPMENT LAYOUT. DO NOT ROUGH-IN ANY ELECTRICAL EQUIPMENT WITHOUT FIRST COORDINATING THE LATEST SET OF EQUIPMENT LAYOUT PLANS.
3. VERIFY THE LOCATION OF ALL DEVICES PRIOR TO ROUGH-IN.
4. FOR ALL CONTROL PANELS AND FIELD DEVICES, VERIFY ACTUAL FIELD WIRING REQUIRED PRIOR TO START OF ROUGH-IN. REVIEW SUBMITTAL DRAWINGS OF ALL EQUIPMENT TO BE WIRED.
5. IN CASE OF INTERFERENCE BETWEEN ELECTRICAL EQUIPMENT SHOWN ON THE DRAWINGS AND THE OTHER EQUIPMENT, THE CONTRACTOR SHALL NOTIFY THE FIELD REPRESENTATIVE IN WRITING AND THE ENGINEER SHALL REVIEW THE PROPOSED CHANGES BEFORE THEY ARE MADE.
6. REFER TO HVAC DRAWINGS FOR EXACT SIZE AND LOCATION OF ALL MOTORS AND EQUIPMENT. PROVIDE ELECTRICAL SERVICE AS REQUIRED FOR EACH ITEM. VERIFY CONTROL REQUIREMENTS OF ALL MOTORS WITH MECHANICAL, PLUMBING AND TEMPERATURE CONTROL CONTRACTORS AND PROVIDE STARTER AND AUXILIARY CONTACTS AS REQUIRED.
7. COORDINATE EXACT REQUIREMENTS OF MOTORS WITH DIVISION 23 CONTRACTORS, EQUIPMENT INSTALLATION DOCUMENTS AND EQUIPMENT NAMEPLATES, PRIOR TO INSTALLING BRANCH CIRCUITS, SAFETY SWITCHES AND CONDUIT. INSTALL THE REQUIRED BRANCH CIRCUIT, CONDUIT, OVER CURRENT PROTECTION AND SAFETY SWITCH REQUIRED BY THE EQUIPMENT SELECTED AND BEING INSTALLED.
8. COORDINATE ELECTRICAL CONTROL REQUIREMENTS OF 120 VOLT MOTORS WITH THE TEMPERATURE CONTROL CONTRACTOR. THE TEMPERATURE CONTRACTOR WILL INSTALL A CONTROL RELAY FOR 120 VOLT MOTORS. THE ELECTRICAL CONTRACTOR SHALL WIRE THE BRANCH CIRCUIT SERVING THE MOTOR FROM THE PANEL TO THE CONTACTS IN THE CONTROL RELAY AND EXTEND THE BRANCH CIRCUIT FROM THE CONTROL RELAY TO THE MOTOR.
9. CIRCUIT NUMBERS SHOWN ON PLANS ARE FOR DESIGN INTENT ONLY. IT IS UP TO THE E.C. TO DETERMINE WHICH CIRCUIT NUMBERS GET USED FOR EACH CIRCUIT BASED ON WIRING ORGANIZATION WITHIN THE PANEL. BLACK, RED, AND BLUE CONDUCTORS SHALL BE ORGANIZED IN REPEATING ORDER DOWN EACH SIDE OF THE PANEL. FINAL CIRCUIT NUMBERS SHALL BE DOCUMENTED IN AS-BUILT DOCUMENTATION AND FINAL PANEL CIRCUIT LABEL DIRECTORIES.

DEMOLITION

1. WHERE EXISTING MOTORS AND OTHER ELECTRICAL EQUIPMENT ARE TO BE REWIRED TO NEW ELECTRICAL DISTRIBUTION EQUIPMENT, PORTIONS OF EXISTING CONDUCTORS, RACEWAY AND JUNCTION BOXES MAY BE REUSED WHERE PRACTICABLE. WHERE NOT PRACTICABLE, PROVIDE ALL NEW CONDUCTORS, RACEWAY, AND JUNCTION BOXES. (TYPICAL)
2. WHERE EXISTING CONTROL AND INSTRUMENTATION DEVICES ARE TO REWIRED TO NEW CONTROL CABINETS, PORTIONS OF EXISTING CONDUCTORS, RACEWAY AND JUNCTION BOXES MAY BE REUSED WHERE PRACTICABLE. WHERE NOT PRACTICABLE, PROVIDE ALL NEW CONDUCTORS, RACEWAY, AND JUNCTION BOXES. (TYPICAL)
3. E.C. TO DE-ENERGIZE AND MAKE SAFE ALL AREAS, AND STRUCTURES, AND EQUIPMENT SCHEDULED OR OTHERWISE IDENTIFIED FOR DEMOLITION.
4. SEE ALSO ARCHITECTURAL AND MECHANICAL PLANS FOR DEMOLITION WORK. DEMOLITION WORK INDICATED ON SUCH PLANS ALSO APPLIES TO THE ELECTRICAL CONTRACTOR.
5. WHERE EQUIPMENT IS IDENTIFIED FOR DEMOLITION, E.C. SHALL MAKE SAFE, AND REMOVE EXISTING WIRING TO POINT OF SUPPLY. CONDUIT SERVING DEMOLISHED EQUIPMENT SHALL ALSO BE REMOVED TO POINT OF SUPPLY EXCEPT WHERE SUCH CONDUIT MAY BE REUSED.
6. NO ABANDONED CONDUIT SHALL REMAIN AT THE CONCLUSION OF THE PROJECT, EXCEPT:
   A. CONCRETE-ENCASED CONDUIT.
   B. CONDUITS DETERMINED BY THE ENGINEER AS SUITABLE FOR SPARE OR FUTURE USE.
7. WHERE EXISTING MOTORS ARE SCHEDULED FOR DEMOLITION, PROVIDE ALSO DEMOLITION OF ALL ASSOCIATED CONTROL WIRING BETWEEN MOTOR STARTER/CONTROLLER AND CONTROL PANEL.
8. MAINTAIN AND RESTORE, IF INTERRUPTED, ALL CONDUITS AND FEEDERS PASSING THRU RENOVATED AREAS AND SERVICING UNDISTURBED AREAS. THE EXACT METHOD OF RE-ROUTING NEW CONDUIT AND WIRE TO EQUIPMENT REMAINING SHALL BE COORDINATED WITH WORK OF OTHER TRADES PRIOR TO AND INSTALLATION.
9. MAINTAIN AND RESTORE, IF INTERRUPTED, ALL LOW VOLTAGE CABLING, FIRE ALARM CABLING, BRANCH CIRCUITS AND ASSOCIATED RACEWAY SYSTEMS PASSING THRU RENOVATED AREAS AND SERVICING UNDISTURBED AREAS. THE EXACT METHOD OF RE-ROUTING NEW RACEWAYS AND CABLE TO EQUIPMENT REMAINING SHALL BE COORDINATED WITH WORK OF OTHER TRADES PRIOR TO ANY INSTALLATION.
10. ALL ELECTRICAL EQUIPMENT BEING REMOVED OR RELOCATED BY DEMOLITION SHALL BE ELECTRICALLY DISCONNECTED BACK AT PANELBOARD WHICH SERVICES THE EQUIPMENT. REMOVE AND DISPOSE OF EQUIPMENT (OR RELOCATE IF NOTED) UNLESS NOTED OTHERWISE, AFTER TESTING TO DETERMINE THAT ELECTRICITY HAS BEEN TURNED OFF.
11. RE-ROUTE EXISTING CONDUIT AND WIRE INTERFERING WITH THE NEW WORK. RE-ROUTED CONDUIT AND WIRE SHALL BE CONCEALED IN THE NEW CONSTRUCTION, UNLESS NOTED OTHERWISE.
12. EXISTING ELECTRICAL EQUIPMENT REQUIRED TO BE REMOVED AND/OR RELOCATED, BUT NOT SHOWN ON THE DRAWINGS, SHALL BE INCLUDED IN THE SCOPE OF WORK.
13. VISIT AND EXAMINE THE BUILDING ELECTRICAL SYSTEMS AND EXISTING CONSTRUCTION SO AS TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL BE ENCOUNTERED AS PART OF THE PROJECT, BEFORE SUBMITTING PROPOSALS. SUBMISSIONS OF PROPOSAL WILL BE EVIDENCE THAT SUCH EXAMINATION HAS BEEN MADE AND LATER CLAIMS FOR LABOR, EQUIPMENT OR MATERIALS WILL NOT BE RECOGNIZED.
14. SHUTDOWN OF ANY SERVICE TO EQUIPMENT REMAINING SHALL ONLY BE FOR THE TIME AGREED UPON BY THE OWNER'S REPRESENTATIVE. ALL SHUTDOWN AGREEMENTS SHALL BE IN WRITING WITH COPIES TO THE OWNER, GENERAL CONTRACTOR AND CONSULTANTS.

LEGEND

X - EXISTING TO REMAIN
X/D - EXISTING TO BE DEMOLISHED
X/R - EXISTING TO BE RELOCATED
X/S - EXISTING TO BE SALVAGED
X/RL - RELOCATED EXISTING
- DEMO
- INDICATES DEMO

DEFINITIONS

1. "PROVIDE" MEANS FURNISH AND INSTALL.
2. "INSTALL" MEANS SET AND WIRE COMPLETE.

CONDUCTORS AND CABLE

1. EVERY WIRE/CABLE SHALL BE MARKED AT BOTH ENDS IN ALL JUNCTION BOXES, TERMINAL BOXES, AND FINAL DESTINATION EQUIPMENT. USE PRINTED HEAT SHRINK SLEEVE TYPE MARKERS. HAND MARKING IS NOT ACCEPTABLE. VERIFY WITH ENGINEER WHAT THE IDENTIFICATION SHALL BE IF NOT DESCRIBED WITHIN THESE DRAWINGS.
2. E.C. SHALL TERMINATE ALL CONDUCTORS INDICATED IN DRAWINGS, UNLESS OTHERWISE NOTED.
3. ROUTE A SEPARATE NEUTRAL CONDUCTOR FOR ALL CIRCUITS THAT REQUIRE A NEUTRAL. DO NOT USE CIRCUIT BREAKER TIE HANDLES.

RACEWAYS AND BOXES

1. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR CUTTING/CORING ANY OPENINGS THROUGH CONCRETE, PRECAST OR MASONRY WALLS AND FLOORS, AS NEEDED, FOR CONDUIT. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL TOUCH-UP PATCHING AROUND THE OPENINGS AND ALL CLEAN-UP OF STAINS, DEBRIS, DAMAGE, ETC., ON WALLS AND FLOORS BELOW TO RESTORE ALL SURFACES TO THEIR ORIGINAL CONDITION.
2. CONDUIT FITTINGS AND SUPPORTS ARE NOT SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL FURNISH ALL SUPPORT CHANNELS, CLAMPS, HARDWARE, ETC. MATERIAL TO BE SUITABLE FOR THE AREA IN WHICH THEY ARE INSTALLED.
3. THE E.C. SHALL BE RESPONSIBLE FOR PROVIDING ALL SLEEVES AND OPENINGS REQUIRED FOR THE PASSAGE OF ELECTRICAL RACEWAYS OR CABLES.
4. UNDERGROUND CONDUITS SHALL BE BURIED A MINIMUM OF 36" BELOW GRADE, U.N.O. WARNING MARKER TAPE SHALL BE LAID IN TRENCHES AND GROUND SYSTEM TRENCHES A MINIMUM OF 12" ABOVE CONDUIT. ALL UNDERGROUND CONDUIT RUNS SHALL BE WITH LONG RADIUS SWEEP BENDS. THE MINIMUM BENDING RADIUS SHALL BE 12 TIMES NOMINAL DIAMETER OF THE CONDUIT.
5. THE MINIMUM SIZE OF CONDUITS INSTALLED BELOW GRADE SHALL BE 1", UNLESS OTHERWISE NOTED.
6. THE MINIMUM SIZE OF CONDUIT INSTALLED ABOVE GRADE SHALL BE 3/4", UNLESS OTHERWISE NOTED.
7. ALL CONDUITS SHALL FOLLOW WALLS, COLUMNS, OR HANDRAILS OR BE IN APPROVED TRAPEZE HANGERS PARALLELING MECHANICAL RUNS.
8. IMMEDIATELY UPON AWARD OF THE CONTRACT, THE E.C. SHALL ASSUME RESPONSIBILITY FOR COORDINATION, PLACEMENT, AND COSTS FOR SLEEVES, CORES, AND BOX-OUTS REQUIRED FOR TRAY AND CONDUIT PENETRATIONS THROUGH CONCRETE, BLOCK, PRECAST, AND STEEL WALLS AND ROOFS.
9. ARRANGE STUB-UPS SO CURVED PORTIONS OF BENDS ARE NOT VISIBLE ABOVE FINISHED SLAB.
10. INSTALL NO MORE THAN THE EQUIVALENT OF THREE 90-DEGREE BENDS IN ANY CONDUIT RUN.
11. INSTALL SLEEVES AND SLEEVE SEALS AT PENETRATIONS OF EXTERIOR FLOOR AND WALL ASSEMBLIES.
12. INSTALL FIRESTOPPING AT PENETRATIONS OF FIRE-RATED FLOOR AND WALL ASSEMBLIES.

HVAC

1. SEE HVAC PLANS FOR LOCATION OF HVAC EQUIPMENT.

POWER/SPECIAL SYSTEMS

SYMBOL	DESCRIPTION	SUBSCRIPTS
—UE—	CONDUIT	UE = UNDERGROUND ELECTRIC UT = UNDERGROUND TELEPHONE UTV = UNDERGROUND CABLE T.V.
	CONDUIT STUBBED DOWN	
	CONDUIT STUBBED UP	
	CONDUIT STUBBED OUT	
	MOTOR	
	DISCONNECT OR SAFETY SWITCH	
	FUSED DISCONNECT OR SAFETY SWITCH	
	COMBINATION STARTER	
M	METER	UM = UTILITY METER
	TRANSFORMER	
PB	PULL BOX	
	SPECIAL OUTLET WALL MOUNT	
	SPECIAL OUTLET CEILING OR FLOOR MOUNT	
	POWER PANEL	H = HIGH VOLTAGE (ie: 277/480V) L = LOW VOLTAGE (ie: 120/208V) MDP = MAIN DISTRIBUTION PANEL
	GROUND PLATE	

RECEPTACLES

SYMBOL	DESCRIPTION	SUBSCRIPTS
	SIMPLEX (SINGLE) RECEPTACLE	240 = 240 VOLT 277 = 277 VOLT 480 = 480 VOLT D = DEDICATED R = EMERGENCY (RED FACE FACEPLATE) CR = CORROSION RESISTANT EWC = ELECTRIC WATER COOLER EX = EXISTING FG = FIELD GRADE IG = ISOLATED GROUND SM = SURFACE MOUNT SP = SUMP PUMP TP = TAMPER PROOF WP = WEATHER PROTECTIVE GFI = GROUND FAULT INTERRUPTING TVSS = TRANSIENT VOLTAGE SURGE SUPPRESSION RT = RAIN-TIGHT WHILE IN USE LCK = LOCKABLE ENCLOSURE USB = USB CHARGING CF = COFFEE MO = MICROWAVE REF = REFRIGERATOR VEND = VENDING MACHINE AC = ABOVE COUNTER PR = PRINTER CO = COPIER EP = EXPLOSION-PROOF
	SIMPLEX (SINGLE) RECEPTACLE CEILING MOUNTED	
	DUPLEX RECEPTACLE	
	DUPLEX RECEPTACLE CEILING MOUNTED	
	DOUBLE DUPLEX RECEPTACLE	
	DOUBLE DUPLEX RECEPTACLE CEILING MOUNTED	
	SWITCHED RECEPTACLE	
	EMERGENCY DUPLEX RECEPTACLE	
	ISOLATED GROUND DUPLEX RECEPTACLE	
	EMERGENCY DOUBLE DUPLEX RECEPTACLE	
J	JUNCTION BOX CEILING MOUNTED	P = POWER FA = FIRE ALARM T/D = TELEPHONE/DATA
J	JUNCTION BOX WALL MOUNTED	

ABBREVIATIONS

ABBR.	DESCRIPTION
A	AMPERES
AF	AMPERES FRAME SIZE
A.F.F.	ABOVE FINISHED FLOOR
A.F.G.	ABOVE FINISHED GROUND
AIC	AMPERE INTERRUPTING CAPACITY
AT	AMPERES TRIP
ATRVS	AUTO TRANSFORMER REDUCED VOLTAGE STARTER
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
A/V	AUDIO VISUAL
AWG	AMERICAN WIRE GAUGE
BAS	BUILDING AUTOMATION SYSTEM
BC	BYPASS CONTACTOR
BPS	BOLTED PRESSURE SWITCH
C	CONDUIT, CONTACTOR
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CNTL	CONTROL
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CT	CURRENT TRANSFORMER
CU	COPPER
D.C.	DIRECT CURRENT OR DRIVE CONTACTOR
DET.	DETAIL
DISC	DISCONNECT
DSW	DISCONNECT SWITCH
E.C.	ELECTRICAL CONTRACTOR
E.C.C.	EDDY CURRENT CONTROLLER
ECM	ELECTRICALLY COMMUTATED MOTOR
EF	EXHAUST FAN
EGC	EQUIPMENT GROUNDING CONDUCTOR
EH	ELECTRIC HEATER
EL	ELEVATION
EMT	ELECTRICAL METALLIC TUBING
ES	EMERGENCY STOP
ETM	ELAPSED TIME METER
EWC	ELECTRIC WATER COOLER
EX.	EXISTING
F.B.O.	FURNISHED BY OTHERS
F.C.	FAIL CLOSED
FCP	FAN CONTROL PANEL
FDR	FEEDER
FDSW	FUSIBLE DISCONNECT SWITCH
FECA	FUSE ENCLOSED CONTROLLER AT
FHP	FRACTIONAL HORSEPOWER
F.O.	FAIL OPEN
FUT	FUTURE
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
G.C.	GENERAL CONTRACTOR
GEC	GROUNDING ELECTRODE CONDUCTOR
GFEP	GROUND FAULT INTERRUPTING FOR EQUIPMENT PROTECTION
GFI	GROUND FAULT INTERRUPTING FOR PERSONNEL
GND	GROUND
GP	GROUND PLATE
GW	GROUND WELL
HOA	HANDS-OFF-AUTO
HP	HORSEPOWER
HVAC	HEATING, VENTILATION & AIR CONDITIONING
HW	HOT WATER
HWH	HOT WATER HEATER
HZ	HERTZ, CYCLES PER SECOND
IC	ISOLATION CONTACTOR
IMC	INTERMEDIATE METAL CONDUIT
INSTALL	INSTALLATION, WIRING, & CONNECTIONS BY E.C.
INTLK	INTERLOCK
IS	INTRINSICALLY SAFE
ISB	INTRINSIC SAFETY BARRIER
I/O	INPUT/OUTPUT
Kcmil	THOUSAND CIRCULAR MILS
KV	KILOVOLTS
KVA	KILOVOLT AMPERES (APPARENT POWER)
KVAR	KILOVARS (REACTIVE POWER)
KW	KILOWATTS (REAL POWER)
LC	LIGHTING CONTRACTOR
LCS	LOCAL CONTROL STATION
LP	LIGHTING PANEL
LPF	LUMENS PER FOOT
LV	LOW VOLTAGE
MAN	MANUAL
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILS
MCP	MOTOR CIRCUIT PROTECTOR
MDP	MAIN DISTRIBUTION PANEL
M, MTR	MOTOR
MOD	MOTOR OPERATED DAMPER
MPA	MANUAL PURGE/ALARM
MSB	MAIN SWITCHBOARD
mA	MILLIAMPERE
mV	MILLIVOLT
N.C.	NORMALLY CLOSED
N.I.C.	NOT IN CONTRACT
N.O.	NORMALLY OPEN
N.U.	NEAR UNIT
NEC	NATIONAL ELECTRICAL CODE
NL	NIGHT LIGHT
O.C.	ON CENTER
OH	OVER HEAD
O.L.	OVERLOAD
O/O	ON/OFF
OS/C	OPEN/STOP/CLOSE PUSH BUTTONS
O.T.	OVER TEMPERATURE
OVR. TQ	OVER TORQUE
PB	PUSHBUTTON
PLC	PROGRAMMABLE LOGIC CONTROLLER
PROVIDE	FURNISHED, INSTALLED, WIRED AND CONNECTED BY E.C.
PTT	PUSH TO TEST
PVC	POLYVINYL CHLORIDE CONDUIT
RAC	RIGID ALUMINUM CONDUIT
RECPT	RECEPTACLE
RGC	RIGID GALVANIZED CONDUIT
RMC	RIGID METAL CONDUIT
RMS SYM.	ROOT-MEAN-SQUARED VALUE OF SYMMETRICAL COMPONENT
RPC	RIGID PVC-COATED CONDUIT
RU	RACK UNIT
S.C.KVA	SHORT CIRCUIT KVA
SD	SMOKE DETECTOR
S.O.	SPECIAL OUTLET
SPD	SURGE PROTECTION DEVICE
SPEC	SPECIFICATIONS
SSRVS	SOLID STATE REDUCED VOLTAGE STARTER
SW	SWITCH
SSW	SAFETY SWITCH
ST	SHUNT TRIP
SUSE	SUITABLE FOR USE AS SERVICE EQUIPMENT
T.C.C.	TEMPERATURE CONTROL CONTRACTOR
TM	THERMAL MAGNETIC
TR.	TIMING RELAY
TS	TEMPERATURE SWITCH
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UG	UNDERGROUND
UGE	UNDERGROUND ELECTRIC
UPS	UNINTERRUPTABLE POWER SUPPLY
V	VOLTS
VAC	VOLTS ALTERNATING CURRENT
VDC	VOLTS DIRECT CURRENT
VFD	VARIABLE FREQUENCY AC DRIVE
VSD	VARIABLE SPEED DC DRIVE
W/	WITH
W/O	WITHOUT
WP	WEATHER PROTECTIVE
W/FT	WATTS PER FOOT
XDCR	TRANSDUCER
XFER	TRANSFER
XFMR	TRANSFORMER
XMTR	TRANSMITTER
Z	IMPEDENCE

BID DOCUMENTS - PRELIMINARY NOT FOR CONSTRUCTION

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	08/05/26	BID DOCUMENTS

MECHANICAL UPDATES FOR:
ATW FED EX W6322 ATLANTIS DR., APPLETON, WI 54914
ELECTRICAL SYMBOLS AND ABBREVIATIONS

DESIGNED	DRAWN
JAF	JRR

PROJECT NO. A0566 06-26-00105
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ELECTRICAL SPECIFICATIONS

DIVISION 26 ELECTRICAL

00 72 00 GENERAL CONDITIONS

A. SEE A00x SHEETS FOR ADDITIONAL REQUIREMENTS.

B. THE AIA GENERAL CONDITIONS A201 LATEST EDITION IS A PART OF THESE DOCUMENTS. COPIES ARE ON FILE AT THE OFFICE OF McMAHON ASSOCIATES, INC.

01 11 00 GENERAL REQUIREMENTS

A. SUBSTITUTIONS:
1. CONTRACTOR SHALL PROVIDE ALL SUPPORTING DATA AND ASSUME THE BURDEN OF PROOF THAT ANY SUBSTITUTION IS EQUIVALENT AS TO APPEARANCE, CONSTRUCTION, CAPACITY, AND PERFORMANCE. THE JUDGEMENT OF EQUIVALENCY SHALL BE MADE BY THE ENGINEER AT THE TIME OF SHOP DRAWING REVIEW, NOT DURING BIDDING.
2. WHERE SUBSTITUTE EQUIPMENT REQUIRES REDESIGN OF ANY PART OF THE PROJECT, THE COST OF REDESIGN AND ADDITIONAL COSTS OF THE WORK SHALL BE PAID BY THE CONTRACTOR. REDESIGN SHALL BE SUBJECT TO THE APPROVAL OF ALL AUTHORITIES HAVING JURISDICTION OVER THE WORK INCLUDING THE ARCHITECT / ENGINEER.

B. SHOP DRAWINGS, PRODUCT DATA, TEST RESULTS, SAMPLE SUBMITTALS:
1. SEE SPECIFICATIONS ON A00x SHEETS FOR ADDITIONAL REQUIREMENTS AND SUBMISSION PROCEDURES.
2. SHOP DRAWINGS SHALL BE SUBMITTED FOR THE FOLLOWING:
   a. PANELBOARDS
   b. SURGE PROTECTION DEVICES
3. INCLUDE OUTLINE AND GENERAL ARRANGEMENT DRAWINGS, DATA SHEETS, AND WIRING DIAGRAMS.
4. SHOP DRAWINGS SHALL CLEARLY INDICATE SPECIFIC MODEL BEING PROVIDED WHERE CUT SHEETS SHOW MULTIPLE MODELS.
5. FAILURE TO SUBMIT SHOP DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR FROM PROVIDING THE SPECIFIED EQUIPMENT AND MATERIALS.
6. SYSTEM WIRING RISER DIAGRAMS SHALL INDICATE ALL COMPONENTS SHOWN ON THE FLOOR PLANS, TYPE AND TERMINATION POINT OF CABLE TO EACH COMPONENT.

09 91 00 FINISH AND PAINTING

A. PREPARE EXPOSED CONDUIT, FITTINGS, SUPPORTS, AND ACCESSORIES FOR FINISH PAINTING IN ROOMS THAT WILL HAVE CEILINGS AND STRUCTURE PAINTED.

B. E.C. SHALL PROVIDE A FACTORY OF FIELD APPLIED PRIME AND FINISH COAT OF COLOR SELECTED BY THE OWNER'S REPRESENTATIVE TO ALL ROOF MOUNTED EQUIPMENT AND OTHER EXTERIOR MATERIALS, INCLUDING SUPPORT HARDWARE.

C. COORDINATE WORK WITH THE PAINTERS SO THAT ALL EQUIPMENT IS INSTALLED PRIOR TO PAINTING. E.C. SHALL PAINT ITEMS IF NOT IN PLACE PRIOR TO NORMAL ROUTINE PAINTING.

D. IF FINISH BECOMES RUSTED, CORRODED, SCRATCHED, OR FLAKED DURING STORAGE OR INSTALLATION, REFINISH THE EQUIPMENT TO THE SATISFACTION OF THE OWNER.

E. WHERE THE ELECTRICAL CONTRACTOR IS REQUIRED TO PAINT, THE PAINTING SHALL BE DONE IN ACCORDANCE WITH THE PAINTING PORTION OF THE ARCHITECTURAL SPECIFICATION.

26 05 01 BASIC ELECTRICAL REQUIREMENTS

A. ELECTRICAL CONTRACTOR SHALL VERIFY REQUIREMENTS FOR TEMPORARY LIGHTING AND POWER WITH GENERAL CONTRACTOR AND INCLUDE IN HIS SCOPE OF WORK WHEN DIRECTED BY G.C. INSTALL IN ACCORDANCE WITH ALL CODE AND OSHA REQUIREMENTS FOR CONSTRUCTION PROJECTS.

B. DETAILS AND SCHEDULES ARE SHOWN TO AID THE CONTRACTOR AND ARE NOT MEANT TO BE INCLUSIVE OF ALL DEVICES. PROVIDE REQUIRED EQUIPMENT AND ACCESSORIES FOR A COMPLETE INSTALLATION.

C. INSTALL ALL EQUIPMENT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS AND REQUIREMENTS. PROVIDE ADDITIONAL WORK AND MATERIALS AS REQUIRED.

D. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR AND SHALL HAVE CONTROL OF CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND SAFETY PRECAUTIONS AND PROCEDURES USED TO CONSTRUCT THE WORK.

E. COORDINATE INSTALLATION OF ELECTRICAL WORK WITH THE OTHER CONTRACTORS TO AVOID CONFLICTS WITH OTHER WORK.

F. MAINTAIN MAXIMUM HEADROOM AND SPACE CONDITION AT ALL POINTS IN THE BUILDING. WHERE HEADROOM OR SPACE CONDITIONS APPEAR INADEQUATE, NOTIFY.

G. COMPLY WITH THE REQUIREMENTS OF NFPA; NATIONAL, STATE, AND LOCAL ELECTRICAL CODES, AND LOCAL UTILITY REGULATIONS.

H. MATERIAL SHALL BEAR U.L. AND / OR OTHER APPROVED AGENCY LISTING.

I. INSTALL MOTOR STARTERS / VFDS FURNISHED BY HVAC AND PLUMBING CONTRACTORS, AND WIRE FROM THE POWER SOURCE TO THE STARTER / VFD AND FROM THE STARTER / VFD TO THE MOTOR.

J. VERIFY ELECTRICAL SIZE AND CONNECTION REQUIREMENTS FOR EQUIPMENT FURNISHED BY OTHERS WITH FINAL SHOP DRAWINGS.

K. PROVIDE ALL CUTTING AND PATCHING NECESSARY FOR ELECTRICAL WORK INSTALLATION UNLESS THIS WORK IS IDENTIFIED TO BE THE WORK OF OTHER CONTRACTORS. PATCHING SHALL MATCH ADJACENT SURFACES.

L. PROJECT COMPLETION:
1. CLEAN FIXTURES AND EQUIPMENT AND LEAVE IN PROPER WORKING CONDITION AT THE TIME OF FINAL CLEAN-UP.
2. MARK RECORD DRAWINGS ON A FINAL SET OF DRAWINGS WHICH INCLUDES ALL.
3. PROVIDE O&M INFORMATION FOR:
   a. PANELBOARDS
   b. SURGE PROTECTION DEVICES

M. LOCATION:
1. THE ARCHITECT SHALL RESERVE THE RIGHT TO MAKE OUTLET POSITION CHANGES UP TO 10' BEFORE INSTALLATION.
2. DO NOT LOCATE OUTLETS OR EQUIPMENT WHERE THE USEFULNESS AND / OR OPERATION WILL BE AFFECTED BY THE WORK OF OTHER TRADES, DOOR SWING, COUNTER, EQUIPMENT, ETC.

N. ACCESS:
1. INSTALL EQUIPMENT, JUNCTION BOXES, PULL BOXES AND ACCESSORIES TO PERMIT ACCESS WITHOUT RELOCATING INSTALLED OR YET TO BE INSTALLED EQUIPMENT.
2. ACCESS PANELS:
   a. FURNISH ACCESS PANELS OF ADEQUATE SIZE TO PERMIT SERVICE OF CONCEALED DEVICES. PANELS SHALL BE SUITABLE FOR INSTALLATION IN THE MATERIAL FORMING THE FINISHED SURFACE, WITH FLUSH METAL FRAME, FLUSH HINGED STEEL DOOR, FLUSH SCREWDRIVER OPERATED LATCH.
   b. PANELS U.L. LISTED TO CONFORM TO THE FIRE RATING OF THE SURFACE INSTALLED IN.
   c. TURN ACCESS PANEL OVER TO CONTRACTOR SKILLED IN THE CONSTRUCTION OF THE SURFACES INVOLVED FOR INSTALLATION.
   d. ARCHITECT TO APPROVE PANEL LOCATION PRIOR TO INSTALLATION OF EQUIPMENT REQUIRING ACCESS.
   e. COORDINATE WITH THE OTHER CONTRACTORS AND WHEREVER PRACTICAL, GROUP DEVICES IN SUCH A MANNER SO AS TO MINIMIZE PANELS.

26 05 19 LOW VOLTAGE POWER CONDUCTORS AND CABLES (600V AND LESS)

A. TYPE AND SIZE:
1. No. 10 & 12: SOLID OR STRANDED COPPER, 600V, THHN/THWN.
2. No. 8 TO 3: STRANDED COPPER, 600V, THHN/THWN.
3. No. 2 TO 250 KCMIL: STRANDED COPPER, 600V, THHN/THWN.
4. 250 KCMIL AND LARGER: STRANDED COPPER, 600V, XHHW.
5. MINIMUM BRANCH CIRCUIT WIRE SIZE No. 12.
6. CONTROL WIRING: STRANDED COPPER, MINIMUM NO. 14.
7. GREEN INSULATION, COPPER STRANDED EQUIPMENT GROUND.
8. GREEN INSULATION WITH YELLOW STRIPE, COPPER STRANDED ISOLATED GROUND.

B. NEUTRALS AND GROUNDS SHALL BE COLOR CODED PER NEC.

C. WIRE COLORS:
1. 120 / 208 - VOLT SYSTEM: PHASE-A (BLACK); PHASE-B (RED); PHASE-C (BLUE).
2. 277 / 480 - VOLT SYSTEM: PHASE-A (BROWN); PHASE-B (ORANGE); PHASE-C (YELLOW).

D. TWO PERCENT VOLTAGE DROP AT PANELBOARDS AND THREE PERCENT FOR BRANCH CIRCUITS FOR FIVE PERCENT VOLTAGE DROP PER NEC.

E. PROVIDE GROUND CONDUCTOR(S) WITH EVERY BRANCH CIRCUIT AND EVERY FEEDER.

F. PROVIDE A SEPARATE GROUND CONDUCTOR AND A SEPARATE NEUTRAL CONDUCTOR WHEN AN INDIVIDUAL RECEPTACLE OR PIECE OF EQUIPMENT IS SHOWN WITH AN INDIVIDUAL HOMERUN.

26 05 26 GROUNDING AND BONDING

A. GROUNDING AND BONDING PRODUCTS
1. GOVERNING REQUIREMENTS: WHERE TYPES, SIZES, RATINGS, AND QUANTITIES INDICATED ARE IN EXCESS OF NEC REQUIREMENTS, MORE STRINGENT REQUIREMENTS AND GREATER SIZE, RATING, AND QUANTITY INDICATIONS GOVERN.

B. WIRE AND CABLE GROUNDING CONDUCTORS
1. CONFORM TO NEC TABLE 8, EXCEPT AS OTHERWISE INDICATED FOR CONDUCTOR PROPERTIES, INCLUDING STRANDING.
   a. MATERIAL: COPPER.
2. EQUIPMENT GROUNDING CONDUCTORS: INSULATED WITH GREEN COLOR INSULATION.
3. GROUNDING-ELECTRODE CONDUCTORS: STRANDED CABLE.

C. CONNECTOR PRODUCTS
1. PRESSURE CONNECTORS: HIGH-CONDUCTIVITY-PLATED UNITS.
2. BOLTED CLAMPS: HEAVY-DUTY TYPE.
3. EXOTHERMIC-WELDED CONNECTIONS: PROVIDED IN KIT FORM AND SELECTED PER MANUFACTURER'S WRITTEN INSTRUCTIONS FOR SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND CONNECTED ITEMS.

D. APPLICATION
1. EQUIPMENT GROUNDING CONDUCTORS: COMPLY WITH NEC ARTICLE 250 FOR TYPES, SIZES, AND QUANTITIES OF EQUIPMENT GROUNDING CONDUCTORS, EXCEPT WHERE SPECIFIC TYPES, LARGER SIZES, OR MORE CONDUCTORS THAN REQUIRED BY NEC ARE INDICATED.
   a. INSTALL EQUIPMENT GROUNDING CONDUCTOR WITH CIRCUIT CONDUCTORS FOR ITEMS BELOW IN ADDITION TO THOSE REQUIRED BY CODE:
      1. FEEDERS AND BRANCH CIRCUITS.
      2. SINGLE-PHASE MOTOR OR APPLIANCE BRANCH CIRCUITS.
      3. THREE-PHASE MOTOR OR APPLIANCE BRANCH CIRCUIT.

E. INSTALLATION
1. GROUND ELECTRICAL SYSTEMS AND EQUIPMENT ACCORDING TO NEC REQUIREMENTS, EXCEPT WHERE DRAWINGS OR SPECIFICATIONS EXCEED NEC REQUIREMENTS.
2. GROUNDING CONDUCTORS: ROUTE ALONG SHORTEST AND STRAIGHTEST PATHS POSSIBLE, EXCEPT AS OTHERWISE INDICATED. AVOID OBSTRUCTING ACCESS OR PLACING CONDUCTORS WHERE THEY MAY BE SUBJECTED TO STRAIN, IMPACT, OR DAMAGE.

F. CONNECTIONS
1. MAKE CONNECTIONS SO POSSIBILITY OF GALVANIC ACTION OR ELECTROLYSIS IS MINIMIZED. SELECT CONNECTORS, CONNECTION HARDWARE, CONDUCTORS, AND CONNECTION METHODS SO METALS IN DIRECT CONTACT WILL BE GALVANICALLY COMPATIBLE.
   a. USE ELECTROPLATED OR HOT-TIN-COATED MATERIALS TO ASSURE HIGH CONDUCTIVITY AND TO MAKE CONTACT POINTS CLOSER IN ORDER OF GALVANIC SERIES.
   b. MAKE CONNECTIONS WITH CLEAN, BARE METAL AT POINT OF CONTACT.
   c. COAT AND SEAL CONNECTIONS HAVING DISSIMILAR METALS WITH INERT MATERIAL TO PREVENT FUTURE PENETRATION OF MOISTURE TO CONTACT SURFACES.
2. EQUIPMENT GROUNDING-WIRE TERMINATIONS: FOR No. 8 AWG AND LARGER, USE PRESSURE-TYPE GROUNDING LUGS. No. 10 AWG AND SMALLER GROUNDING CONDUCTORS MAY BE TERMINATED WITH WINGED PRESSURE-TYPE CONNECTORS.
3. NONCONTACT METAL RACEWAY TERMINATIONS: WHERE METALLIC RACEWAYS TERMINATE AT METAL HOUSINGS WITHOUT MECHANICAL AND ELECTRICAL CONNECTION TO HOUSING, TERMINATE EACH CONDUIT WITH A GROUNDING BUSHING. CONNECT GROUNDING BUSHINGS WITH BARE GROUNDING CONDUCTOR TO GROUNDING BUS OR TERMINAL IN HOUSING. BOND ELECTRICALLY NONCONTINUOUS CONDUITS AT BOTH ENTRANCES AND EXITS WITH GROUNDING BUSHINGS AND BARE GROUNDING CONDUCTORS, EXCEPT AS OTHERWISE INDICATED.
4. TIGHTEN SCREWS AND BOLTS FOR GROUNDING AND BONDING CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES. WHERE THESE REQUIREMENTS ARE NOT AVAILABLE, US THOSE SPECIFIED IN UL 486A AND UL 486B.
5. COMPRESSION-TYPE CONNECTIONS: USE HYDRAULIC COMPRESSION TOOLS TO PROVIDE CORRECT CIRCUMFERENTIAL PRESSURE FOR COMPRESSION CONNECTORS. USE TOOLS AND DIES RECOMMENDED BY MANUFACTURER OF CONNECTORS. PROVIDE EMBOSSING DIE CODE OR OTHER STANDARD METHOD TO MAKE VISIBLE INDICATION THAT CONNECTOR HAS BEEN ADEQUATELY COMPRESSED ON GROUND CONDUCTOR.
6. MOISTURE PROTECTION: WHERE INSULATED GROUNDING CONDUCTORS ARE CONNECTED TO GROUNDING RODS OR GROUNDING BUSES, INSULATE ENTIRE AREA OF CONNECTION AND SEAL AGAINST MOISTURE PENETRATION OF INSULATION AND CABLE.

26 05 29 HANGERS AND SUPPORTS

A. CONDUIT HANGERS, ATTACHMENTS, AND SUPPORTS
1. PROVIDE PROPER FITTINGS AND SUPPORT SUITABLE FOR AMBIENT / ENVIRONMENTAL CONDITIONS AND SERVICE DUTY.
2. ATTACH TO STRUCTURAL COMPONENTS TO NOT JEOPARDIZE STRUCTURAL INTEGRITY.
3. PROVIDE ANGLES, CHANNELS, AND BEAMS AS REQUIRED.
4. DO NOT USE TIE WIRES AS A MEANS TO SUPPORT CONDUITS AND CABLES.
5. SUPPORT LIGHT FIXTURES FROM STRUCTURE. DO NOT SUPPORT FROM GRID OR JUNCTION BOX FOR FIXTURES THAT ARE 24" x 24" OR LARGER.

26 05 30 CONDUIT

A. RMC
1. LOCATIONS:
   A. REQUIRED FOR ALL SIZES OF OUTDOOR ABOVE GRADE CONDUIT.
   B. GALVANIZED RIGID STEEL REQUIRED FOR ALL UNDERGROUND 90 DEGREE BENDS.
2. REQUIRED FOR ALL SIZES OF OUTDOOR ABOVE GRADE CONDUIT.
3. GALVANIZED RIGID STEEL REQUIRED FOR ALL UNDERGROUND 90 DEGREE BENDS.
4. GALVANIZED RIGID STEEL WITH GALVANIZED RIGID STEEL FITTINGS, THREADED WATERTIGHT.
5. MINIMUM SIZE 3/4".

B. EMT
1. ALLOWED FOR INSIDE ABOVE GRADE.
2. STEEL SET SCREW OR COMPRESSION TYPE FITTINGS WITH INSULATED THROAT.
3. MINIMUM SIZE 3/4".

C. FLEXIBLE
1. MINIMUM SIZE 1/2".
2. MAXIMUM LENGTH 36" FOR CONNECTION TO HVAC EQUIPMENT.
3. MAXIMUM LENGTH 72" FOR CONNECTION TO FIXTURES IN TILE CEILINGS.
4. STEEL FITTINGS WITH INSULATED THROAT, UL LISTED.
5. USE LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT FOR EXTERIOR ABOVE GRADE CONNECTIONS TO VIBRATING EQUIPMENT.

D. PVC
1. TYPE EPC-SCHEDULE 40
2. ALLOWED FOR UNDERGROUND EXTERIOR APPLICATIONS, DIRECT BURIED.

E. FITTINGS
1. FITTING MATERIAL SHALL MATCH CONDUIT MATERIAL UNLESS OTHERWISE NOTED IN PLANS AND SPECIFICATIONS OR WITH WRITTEN APPROVAL BY ENGINEER.

F. INSTALLATION
1. DRAWINGS AND DIAGRAMS SHOW SIZE AND APPROXIMATE LOCATION OF CONDUIT. THE DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED TO DETERMINE EXACT LOCATION. PROVIDE ADDITIONAL OFFSETS AS REQUIRED FOR FIELD CONDITIONS. ROUTE CONDUIT IN ORDERLY MANNER, PARALLEL TO BUILDING STRUCTURE. CONCEAL CONDUIT IN FINISHED AREAS.
2. INSTALL UL APPROVED EXPANSION FITTINGS COMPLETE WITH GROUNDING JUMPERS WHERE CONDUITS CROSS BUILDINGS EXPANSION JOINTS AND IN LONG CONDUIT RUNS WHERE DIFFERENTIAL EXPANSION OF CONTRACTION WOULD CAUSE BENDING OR SEPARATION.
3. INSTALL CONDUIT WITH ADEQUATE DRAINAGE.
4. PROVIDE SEPARATE CONDUIT / RACEWAY FOR TELECOMMUNICATIONS SYSTEMS.
5. ROUTE CONDUIT ABOVE LAY-IN SUSPENDED CEILINGS SO AS NOT TO INTERFERE WITH TILE REMOVAL.
6. INSTALL FLEXIBLE STEEL CONDUIT DROPS FROM INDEPENDENT JUNCTION BOX MOUNTED ABOVE CEILING TO RECESSED LIGHT FIXTURES.
7. SECURE CONDUITS WITH AT LEAST (1) CORROSION PROOF MALLEABLE ALLOY STRAP OR HANGER EVERY 8 FT. DO NOT USE PERFORATED STRAPPING.
8. PROVIDE UL LISTED FIRE-WALL PENETRATIONS WHEN CONDUIT PASS THROUGH A FIRE RATED WALL.
9. USE A CONDUIT BUSHING TO TERMINATE CONDUIT STUB-UPS.
10. PROVIDE CONDUIT SEALS IN RACEWAYS THAT EXTEND FROM INTERIOR TO EXTERIOR OF BUILDING.

26 05 33 BOXES

A. FLUSH INTERIOR 4" SQUARE STEEL BOXES WITH RAISED CORNERS AND SQUARE CUT CORNERS. PROVIDE BOXES RATED FOR THROUGH FEED.

B. PROVIDE CAST BOXES FOR EXTERIOR USE DEVICES. PROVIDE COVERS WITH GASKETS.

C. JUNCTION AND SPLICE BOXES SHALL HAVE GALVANIZED SCREW COVERS AND BE NOT LESS THAN CODE DIMENSIONS. THROUGH-WALL AND BACK-TO-BACK BOXES NOT ALLOWED.

D. OUTLET AND JUNCTION BOXES USED AS SURFACE METAL RACEWAY SHALL BE MANUFACTURED BY THE SURFACE METAL RACEWAY MANUFACTURER TO BE COMPATIBLE WITH THE RACEWAY USED.

E. VERIFY LOCATION PRIOR TO ROUGH-IN. MATCH THE HEIGHT OF EXISTING DEVICES FOR INSTALLATIONS IN ADDITIONS TO EXISTING FACILITIES.

F. BOXES FOR LIGHTING SHALL BE RATED FOR A MINIMUM OF 50 LBS.

26 05 35 PENETRATIONS

A. SLEEVES
1. FURNISH RIGID CONDUIT SLEEVES FOR CABLES PASSING THROUGH MASONRY, CONCRETE, OR OTHER SIMILAR CONSTRUCTION.
2. FURNISH SLEEVE TO MASON FOR NEW MASONRY WALLS.
3. FURNISH, INSTALL, AND GROUT SLEEVE IN EXISTING MASONRY AND NEW CONCRETE WALLS.
4. SLEEVE NOT REQUIRED FOR DRYWALL WALLS OR CORE DRILLED HOLE IN CONCRETE WALL.

B. NON-FIRE RATED INTERIOR WALL AND FLOOR PENETRATIONS: FILL VOID BETWEEN CONDUIT AND SLEEVE, CONCRETE, OR DRYWALL WITH EXPANDING POLYURETHANE FOAM. CAULK BETWEEN CONDUIT AND SLEEVE OR WALL WITH NON-HARDENING CAULK.

C. CONTRACTOR SHALL USE CAUTION PRIOR TO MAKING PENETRATIONS AS TO NOT DISTURB ANY EXISTING UTILITIES THAT MIGHT BE PRESENT IN EXISTING WALLS, CEILINGS, OR FLOORS. THIS CONTRACTOR IS RESPONSIBLE FOR LOCATING EXISTING UTILITIES IN EXISTING WALLS, CEILINGS, OR FLOORS.

D. PROVIDE FIRE-PROOF CAULKING AT ALL PENETRATIONS AT FIRE-RATED WALLS.

26 05 53 IDENTIFICATION FOR ELECTRICAL SYSTEMS

A. ENGRAVED LABELS: ENGRAVED 3-LAYER PHENOLIC LABEL WITH BLACK LETTERS ON WHITE MATERIAL. LABELS MINIMUM 3/4" HIGH AND 3" LONG. LABELS MAY BE ATTACHED WITH DOUBLE BACKED ADHESIVE TAPE. INCLUDE EQUIPMENT IDENTIFICATION, IDENTIFICATION OF "FED FROM" DEVICE. LABELS REQUIRED AT:
1. PANELBOARDS
2. DISCONNECTS

B. PROVIDE TYPEWRITTEN DIRECTORY ACCURATELY INDICATING ROOMS AND / OR EQUIPMENT BEING SERVED IN PANELBOARDS.

26 24 16 PANELBOARDS

A. MANUFACTURER:
1. SQUARE D

B. CABINET:
1. NEMA 1 CABINET, CODE GAUGE STEEL CONSISTING OF A BOX WITH A REMOVABLE FRONT WITH HINGED DOOR AND LATCH.
2. FABRICATE WITH STRAIGHT EDGES AND SQUARE CORNERS.
3. BOXES SHALL BE MINIMUM 20" WIDE.
4. MANUFACTURER'S STANDARD FINISH, PRIME COAT AND BAKED ENAMEL FINISH.

C. PROVIDE A NAMEPLATE LISTING OF THE PANEL TYPE AND NUMBER OF PROTECTIVE AND SWITCHING DEVICES AND RATINGS.

D. BUS BARS FOR THE MAINS SHALL BE COPPER OR ALUMINUM SIZED IN ACCORDANCE WITH UL STANDARDS. INCLUDE FULL SIZE NEUTRAL BARS UNLESS OTHERWISE NOTED. PROVIDE GROUND BUS.

E. NEUTRAL BUSSING SHALL HAVE ONE LUG FOR EVERY BRANCH CIRCUIT THAT THE PANELBOARD IS CAPABLE OF SUPPORTING.

F. BUS SPACES FOR FUTURE SWITCHING AND PROTECTIVE DEVICES FOR THE MAXIMUM DEVICES AND SWITCHES THAT THE PANELBOARD CAN ACCOMMODATE.

G. PANELBOARD SHORT-CIRCUIT CURRENT RATING: FULLY RATED TO INTERRUPT SYMMETRICAL SHORT-CIRCUIT CURRENT AVAILABLE AT TERMINALS. ASSEMBLY LISTED BY AN NRTL FOR 100 PERCENT INTERRUPTING CAPACITY.

H. CIRCUIT BREAKERS:
1. UNLESS INDICATED OTHERWISE, CIRCUIT BREAKERS SHALL BE PLUG-ON, INDIVIDUALLY REPLACING, THERMAL-MAGNETIC, AUTOMATIC FREE TRIPPING, SEPARATELY INDICATING "ON", "TRIPPED", AND "OFF"; AMBIENT COMPENSATED AT 40 DEGREES C., SINGLE, DOUBLE, OR TRIPLE POLE, AS REQUIRED BY THE PANEL SCHEDULES.
2. CIRCUIT BREAKERS INDICATED AS MULTIPLE POLE SHALL BE COMMON TRIP.
3. APPLICATION LISTING: APPROPRIATE FOR APPLICATION; TYPE HACR FOR MOTOR LOADS.

26 28 16 ENCLOSED DISCONNECT SWITCHES

A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.

B. NONFUSIBLE SWITCH: TYPE HD WITH LOCKABLE HANDLE.

C. FUSIBLE SWITCH: TYPE HD WITH CLIPS TO ACCOMMODATE FUSES. HANDLE LOCKABLE IN OPEN AND CLOSED POSITION. HANDLE INTERLOCKED WITH COVER IN CLOSED POSITION WITH INTERLOCK BYPASS.

D. ENCLOSURES: NEMA AS 1 AND NEMA KS 1 TO MEET ENVIRONMENTAL CONDITIONS OF INSTALLED LOCATION.
1. OUTDOOR LOCATIONS: NEMA 250 TYPE 3R.
2. OTHER WET OR DAMP INDOOR LOCATIONS: NEMA 250 TYPE 4.

E. MANUFACTURER'S STANDARD PRIME-COAT FINISH READY FOR FIELD PAINTING.

F. LABEL EACH ENCLOSURE WITH ENGRAVED METAL OR LAMINATED-PLASTIC NAMEPLATE MOUNTED WITH CORROSION-RESISTANT SCREWS.

G. INSTALL EQUIPMENT GROUNDING CONNECTIONS FOR SWITCHES AND CIRCUIT BREAKERS WITH GROUND CONTINUITY TO MAIN ELECTRICAL GROUND BUS.

H. DEMONSTRATE PRODUCT CAPABILITY AND COMPLIANCE WITH REQUIREMENTS AFTER INSTALLATION AND AFTER ELECTRICAL CIRCUITY HAS BEEN ENERGIZED.
1. PERFORM VISUAL AND MECHANICAL INSPECTION AND ELECTRICAL TEST. CERTIFY COMPLIANCE WITH TEST PARAMETERS.
2. CORRECT MALFUNCTIONING UNITS, ON-SITE WHERE POSSIBLE, AND RETEST TO DEMONSTRATE COMPLIANCE.

I. FOR MOTORS THAT ARE FED WITH VARIABLE FREQUENCY DRIVES PROVIDE DISCONNECTS WITH AUXILLARY CONTACTS AS PART OF THE DISCONNECT FOR THESE MOTORS.
1. PROVIDE TWO CONTROL CONDUCTORS FROM THE AUXILLARY CONTACT IN THE DISCONNECT TO THE VARIABLE FREQUENCY DRIVE'S CONTACTS. CONTACT TO INFORM THE VARIABLE FREQUENCY DRIVE THAT DISCONNECT HAS BEEN OPENED.
2. PROVIDE RACEWAY FOR THE CONTROL CONDUCTORS THAT COMPLIES WITH THESE SPECIFICATIONS.

26 43 13 SURGE PROTECTION FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS

A. MANUFACTURER:
1. BASIS OF DESIGN: RAYCAP
2. SOUTHERN TIER TECHNOLOGIES
3. EMERSON
4. ABB - CURRENT TECHNOLOGY

B. PANELBOARD SUPPRESSORS
   a. COMPLY WITH UL 1449 TYPE 2.
   b. PEAK SURGE CURRENT RATING: SEE PLANS
   c. PROTECTION MODES FOR GROUNDED WYE CIRCUITS WITH 208Y/120V, THREE-PHASE, FOUR-WIRE CIRCUITS SHALL NOT EXCEED THE FOLLOWING:
      1. L-N - 700V
      2. L-G - 700V
      3. N-G - 700V
      4. L-L - 1200V
   d. SCCR: 100 KAIC
   e. INOMINAL RATING: 20 KA.

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MECHANICAL UPDATES FOR:

ATW FED EX W6322 ATLANTIS DR., APPLETON, WI 54914

ELECTRICAL SPECIFICATIONS

McMAHON
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PROJECT NO. A0566 06-26-00105

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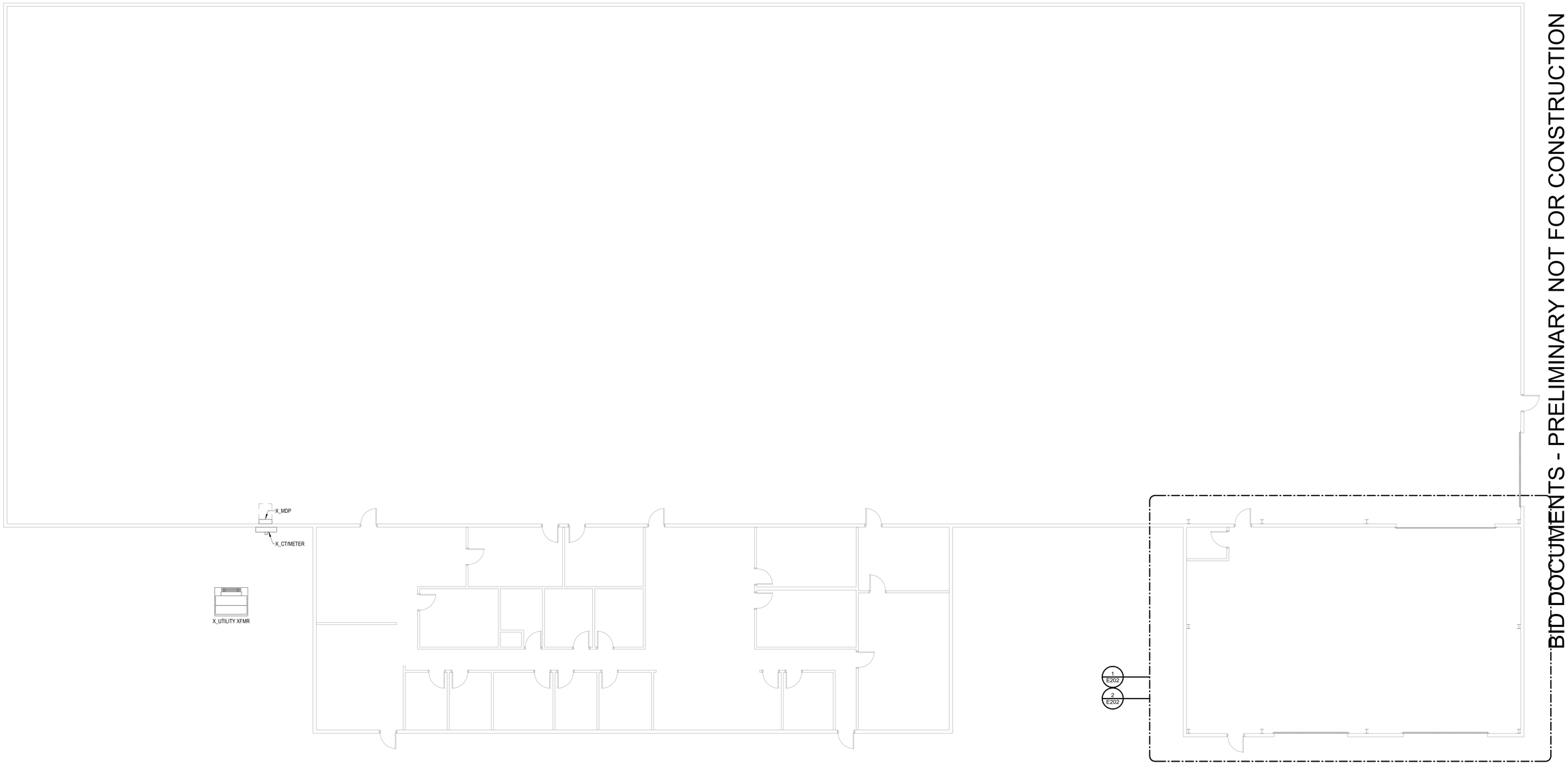
KEYNOTES



1 E201 OVERALL ELECTRICAL PLAN
1/8" = 1'-0"

NORTH

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MECHANICAL UPDATES FOR:

ATW FED EX W6322 ATLANTIS DR., APPLETON, WI 54914

OVERALL ELECTRICAL PLAN

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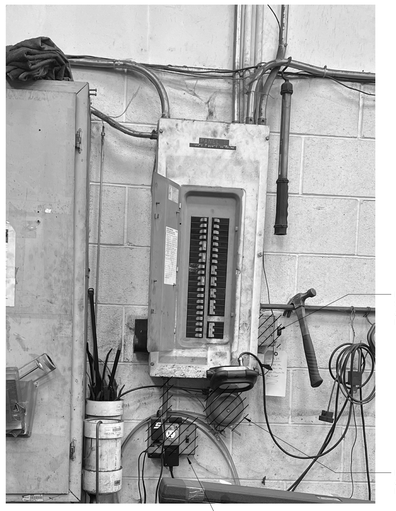
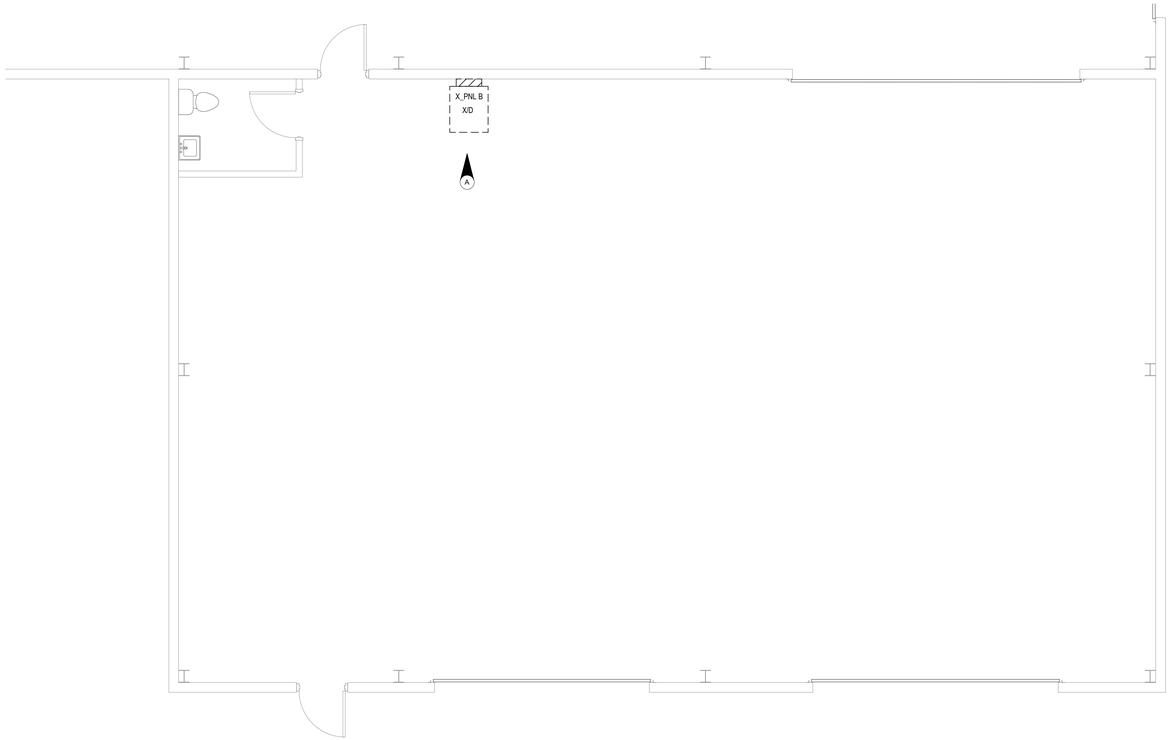


RELOCATE FAN SPEED CONTROL TO ACCOMMODATE NEW PANELBOARD.

RELOCATE BELL TO ACCOMMODATE NEW PANELBOARD.

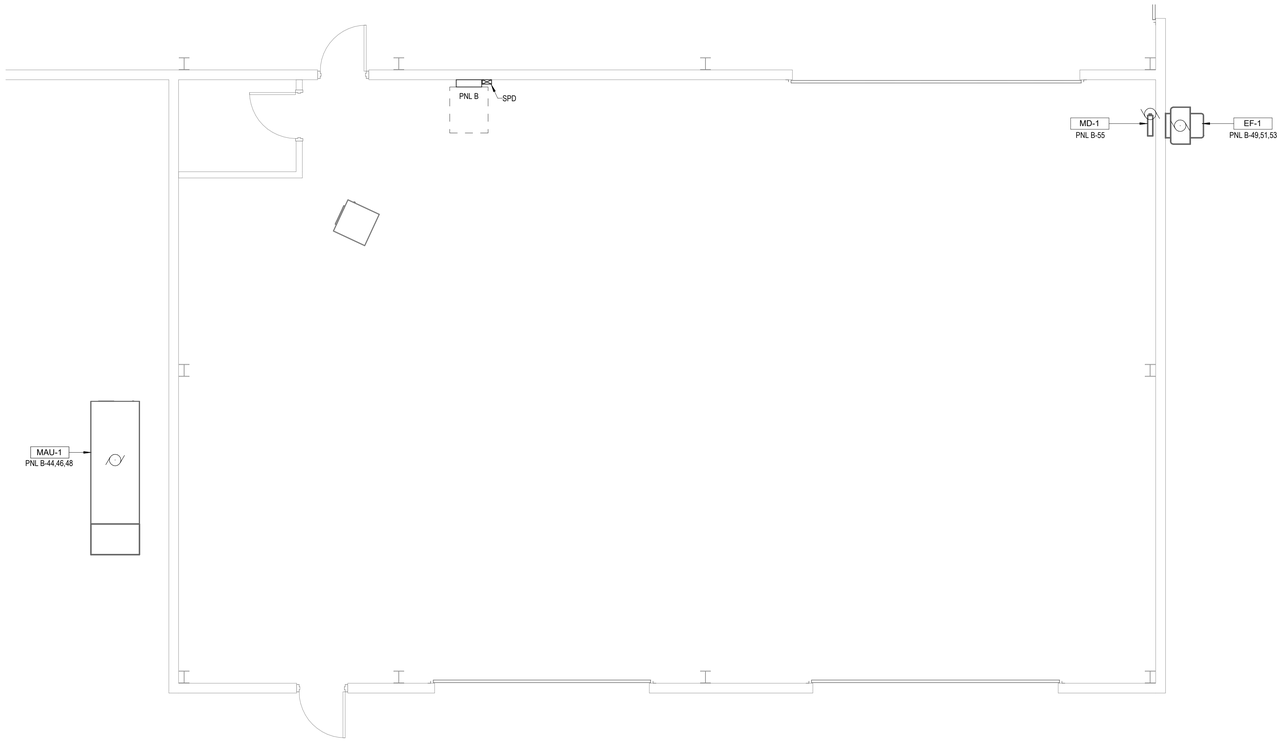
RELOCATE QUAD RECEPTACLE AND SWITCH TO ACCOMMODATE NEW PANELBOARD.

A / E202 PHOTO A
NOT TO SCALE



1 / E202 FIRST FLOOR ELECTRICAL DEMOLITION PLAN
1/4" = 1'-0"

NORTH



2 / E202 FIRST FLOOR POWER PLAN
1/4" = 1'-0"

NORTH

KEYNOTES

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MECHANICAL UPDATES FOR:
ATW FED EX W6322 ATLANTIS DR., APPLETON, WI 54914
ENLARGED ELECTRICAL PLANS

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PROJECT NO.
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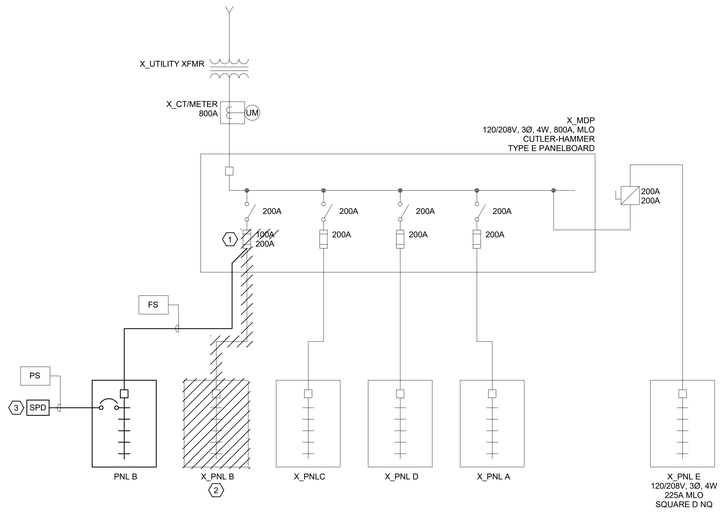
FS	=	SEE FEEDER SCHEDULE, SHEET E401
PS	=	SEE PANEL SCHEDULE, SHEET E401

- NEW
- DEMOLISH
- EXISTING

KEYNOTES

1. REMOVE 100A FUSES AND REPLACE WITH 200A FUSES IN EXISTING 200A SWITCH.
2. DISCONNECT AND REMOVE EXISTING PANEL "B". REMOVE ASSOCIATED FEEDER. EXISTING BRANCH CIRCUITS SHALL BE RE-CONNECTED TO REPLACEMENT PANELBOARD.
3. PROVIDE SPD, 208V, 3-PHASE WYE, 50KA PER MODE OR 150KA PER PHASE, SURGE & TOV COUNTER, RAYCAP RSE-2 SERIES. LOCATE ADJACENT TO THE PANELBOARD SO CONDUCTORS DO NOT EXCEED 36".



1 E301 ONE-LINE DIAGRAM
NOT TO SCALE

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MECHANICAL UPDATES FOR:
ATW FED EX W6322 ATLANTIS DR., APPLETON, WI 54914
ELECTRICAL ONE-LINE DIAGRAM

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FEEDER SCHEDULE

TO DEVICE	AMPACITY	FEEDER SIZE
PNL B	200	2"C, 3-3/0, 3/0N, #6G

FAULT CURRENT SCHEDULE

DEVICE	FAULT AT DEVICE	AIC RATING	VOLTAGE	FEEDER SIZE	TRANSFORMER KVA	TRANSFORMER Z%	TRANSFORMER FAULT AT PRIMARY
X_UTILITY XFMR	57,300		13,800V		300	2	
X_CT/METER	45,679		208V	(3)300kcmil			
X_MDP	41,592	42,000	208V	(3)300kcmil			
PNL B	5,930	10,000	208V	3/0			

VOLTAGE DROP SCHEDULE

DEVICE	FEEDER VOLTAGE DROP	FEEDER WIRE SIZE	BRANCH CIRCUIT MAX VOLTAGE DROP	BRANCH CIRCUIT CIRCUIT NUMBER	BRANCH CIRCUIT WIRE SIZE	TOTAL VOLTAGE DROP
X_UTILITY XFMR	0.00%					0.00%
X_CT/METER	0.01%	(3)300kcmil				0.01%
X_MDP	0.02%	(3)300kcmil				0.02%
PNL B	0.38%	3/0	1.19%	52,54,56	#12	1.57%

TYPICAL MOUNTING HEIGHTS

DEVICE	MOUNTING HEIGHT	NOTES
WALL LIGHTING CONTROL SWITCHES	48 IN.	1
RECEPTACLE OUTLETS	18 IN.	
POWER / LOW VOLTAGE OUTLETS - ABOVE COUNTER	44 IN.	5
RECEPTACLE OUTLETS - REFRIGERATOR	18 IN.	
POWER / LOW VOLTAGE OUTLETS - TV	70 IN.	6
POWER / LOW VOLTAGE OUTLETS - SMARTBOARD	36 IN.	6
POWER / LOW VOLTAGE OUTLETS - WALL PROJECTOR	96 IN.	
PUSH PLATE FOR POWER OPERATED DOOR	48 IN.	
SPECIAL RECEPTACLES	18 IN.	
AREA OF RESCUE AREA STATION	48 IN.	
AREA OF RESCUE MASTER STATION	60 IN.	
A/V OUTLET	18 IN.	
A/V SYSTEM ANTENNA	96 IN.	
DATA / TELEPHONE OUTLETS	18 IN.	
DATA / TELEPHONE OUTLETS - ABOVE COUNTER	44 IN.	5
CLOCKS	96 IN.	9
WALL SPEAKERS, BELLS, BUZZERS, CHIMES	96 IN.	9
VOLUME CONTROL	48 IN.	7
CALL-IN SWITCH	48 IN.	7
CARD READER	48 IN.	
SECURITY KEYPAD	48 IN.	
DOOR ENTRY INTERCOM STATION	60 IN.	8
THERMOSTATS	48 IN.	
PUSH BUTTONS	48 IN.	
ELEVATOR AND HOISTWAY CONTROL BUTTONS	42 IN.	
BED LIGHTS	72 IN.	
PATIENT BEDSIDE STATIONS	48 IN.	
FIRE ALARM PULL STATIONS	48 IN.	
WALL FIRE ALARMS (SPEAKERS, HORNS, STROBES)	80 IN.	2
FIRE ALARM ANNUNCIATOR PANEL	60 IN.	
DISCONNECT SWITCHES		3
PANELBOARDS		4

GENERAL NOTES

A. ALL HEIGHTS ARE MEASURED FROM FINISHED FLOOR TO CENTERLINE OF DEVICE.
B. ADDITIONAL REQUIREMENTS OF ADA GUIDELINES SHALL BE OBSERVED.
C. ALL INDICATED HEIGHTS: UNLESS OTHERWISE NOTED ON DRAWINGS.

NOTES

1. INDICATED HEIGHT IS A MAXIMUM
2. 80" ABOVE FLOOR OR 6" BELOW THE CEILING, WHICHEVER IS LOWER. MAXIMUM HEIGHT PER NFPA 72 IS 96" TO CENTER OF STROBE IF NEEDED TO CLEAR OBSTRUCTIONS.
3. DISCONNECT SWITCHES: NOT MORE THAN 6'-7" AFF, PER NEC. WHERE NOT OTHERWISE SPECIFIED, OPERATING HANDLE AT 60" AFF.
4. PANELBOARDS: LOCATE SUCH THAT HIGHEST OVERCURRENT PROTECTIVE DEVICE IS A MAXIMUM OF 6' 7" TO THE CENTER OF OPERATING HANDLE.
5. ADJUST TO ACCOMMODATE COUNTER TOP AND BACK SPLASH HEIGHT.
6. COORDINATE EXACT LOCATION AND HEIGHT WITH OTHER TRADES.
7. LOCATE CALL-IN SWITCH CENTERED UNDERNEATH WALL SPEAKER. LOCATE VOLUME CONTROL (IF SHOWN) NEXT TO CALL-IN SWITCH.
8. VERIFY MOUNTING HEIGHT WITH MANUFACTURER OF EQUIPMENT.
9. 96" ABOVE FLOOR OR 4" BELOW CEILING, WHICHEVER IS LOWER.

EQUIPMENT SCHEDULE

ID		LOCATION	LOAD							CONTROLS			LOCAL DISCONNECT					NOTES
TAG	DESCRIPTION	ROOM / AREA	HP	A	KW	MOCP	VOLTS	PHASE	SCCR	FURN BY	INST. BY	TYPE	FURN BY	INST. BY	TYPE	SWITCH AMPS	FUSE AMPS	
MAU-1	MAKE-UP AIR UNIT	EXTERIOR GRADE	1.5	6.96			208.0	3		DIV 23	DIV 23		DIV 23	DIV 23	PRE-WIRED			
EF-1	SIDEWALL EXHAUST FAN	EXTERIOR WALL	0.5	2.5			208.0	3		DIV 23	DIV 23		DIV 23	DIV 23	PRE-WIRED			
MD-1	MOTORIZED DAMPER	MAINTENANCE SHOP		2.4			120.0	1		DIV 23	DIV 23		DIV 26	DIV 26	MS2	30		

GENERAL NOTES:

1. REFER TO LOCAL DISCONNECT SWITCH / STARTER LEGEND FOR FURTHER INFORMATION FOR LISTED CONTROLS AND LOCAL DISCONNECT SWITCHES BY THE E.C.

PANELBOARD: PNL B

LOCATION: Space 223
MOUNTING: SURFACE NEMA 1
MAIN DEVICE: 225.0 A MLO
BUS AMPS: 225 AMPS
VOLTAGE: 208Y/120 V. 3 ø 4 W.
A.I.C. RATING: 10,000
SPECIAL: SQUARE D NQ
UPSTREAM DEVICE: X_MDP

LOAD DESCRIPTION	BKR	P	BRANCH CIRCUIT	TYPE	CKT	A		B		C		CKT	TYPE	BRANCH CIRCUIT	P	BKR	LOAD DESCRIPTION
EXISTING CIRCUIT	20 A	1	--		1	0.0	0.0					2		--	1	20 A	EXISTING CIRCUIT
EXISTING CIRCUIT	20 A	1	--		3			0.0	0.0			4		--	1	20 A	EXISTING CIRCUIT
EXISTING CIRCUIT	20 A	1	--		5					0.0	0.0	6		--	1	20 A	EXISTING CIRCUIT
EXISTING CIRCUIT	20 A	1	--		7	0.0	0.0					8		--	1	20 A	EXISTING CIRCUIT
EXISTING CIRCUIT	40 A	2	--		9			0.0	0.0			10		--	1	20 A	EXISTING CIRCUIT
					11					0.0	0.0	12		--	1	20 A	EXISTING CIRCUIT
EXISTING CIRCUIT	40 A	2	--		13	0.0	0.0					14		--	1	20 A	EXISTING CIRCUIT
					15			0.0	0.0			16		--	1	20 A	EXISTING CIRCUIT
EXISTING CIRCUIT	20 A	1	--		17					0.0	0.0	18		--	2	30 A	EXISTING CIRCUIT
EXISTING CIRCUIT	20 A	1	--		19	0.0	0.0					20					
EXISTING CIRCUIT	20 A	2	--		21			0.0	0.0			22		--	2	30 A	EXISTING CIRCUIT
					23					0.0	0.0	24					
EXISTING CIRCUIT	20 A	1	--		25	0.0	0.0					26		--	2	20 A	EXISTING CIRCUIT
EXISTING CIRCUIT	20 A	1	--		27			0.0	0.0			28					
EXISTING CIRCUIT	20 A	1	--		29					0.0	0.0	30		--	3	20 A	EXISTING CIRCUIT
EXISTING CIRCUIT	20 A	1	--		31	0.0	0.0					32					
EXISTING CIRCUIT	20 A	1	--		33			0.0	0.0			34					
EXISTING CIRCUIT	20 A	1	--		35					0.0		36					
EXISTING CIRCUIT	20 A	1	--		37	0.0	0.0					38		--	3	60 A	EXISTING CIRCUIT
EXISTING CIRCUIT	20 A	1	--		39			0.0	0.0			40					
EXISTING CIRCUIT	20 A	1	--		41					0.0	0.0	42					
SPD	30 A	3	3/4"C,3#10,#10N,#10G		43	0.0	0.8					44		3/4"C,3#12,#12G	3	20 A	MAU-1
					45			0.0	0.8			46					
					47					0.0	0.8	48					
EF-1	20 A	3	3/4"C,3#12,#12G		49	0.3						50					
					51			0.3				52					
					53					0.3		54					
MD-1	20 A	1	3/4"C,1#12,#12N,#12G		55	0.3						56					
					57							58					
					59							60					
					61							62					
					63							64					
SPARE	20 A	1	--		65					0.0	0.0	66		--	1	20 A	SPARE
SPARE	20 A	1	--		67	0.0	0.0					68		--	1	20 A	SPARE
SPARE	20 A	1	--		69			0.0	0.0			70		--	1	20 A	SPARE
SPARE	20 A	1	--		71					0.0	0.0	72		--	1	20 A	SPARE
				TOTAL LOAD:		1 kVA		1 kVA		1 kVA							
				TOTAL AMPS:		12 A		9.2 A		9 A							

LOAD CLASSIFICATION	CONNECTED	DEMAND	ESTIMATED
HVAC	3599 VA	100.00%	3599 VA
Other	0 VA	0.00%	0 VA

PANEL TOTALS	
CONNECTED LOAD:	3599 VA
ESTIMATED DEMAND:	3599 VA
CONNECTED CURRENT:	10.0 A
EST. DEMAND CURRENT:	10.0 A

CIRCUIT BREAKER TYPES:
G = GFI, S = SHUNT TRIP, A = AFCI
NOTES:

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MECHANICAL UPDATES FOR:
ATW FED EX W6322 ATLANTIS DR., APPLETON, WI 54914
ELECTRICAL SCHEDULES

NO.	DATE	REVISION
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