

SECTION 26 0010
SUPPLEMENTAL REQUIREMENTS FOR ELECTRICAL

PART 1 - GENERAL

- IT IS UNDERSTOOD AND AGREED BY THE INSTALLER THAT WORK HEREIN DESCRIBED SHALL BE COMPLETE IN EVERY DETAIL, EVEN THOUGH EVERY ITEM INCLUDED IS NOT PARTICULARLY MENTIONED. INSTALLER SHALL BE HELD TO PROVIDE ALL LABOR AND MATERIALS NECESSARY FOR THE WORK INTENDED AND DESCRIBED FOR A COMPLETE AND OPERATIONAL SYSTEM. SUCH MATERIALS SHALL INCLUDE, BUT ARE NOT LIMITED TO, CONDUIT, FITTINGS, COVERPLATES, WIRING, BREAKERS, CONTROL DEVICES, LIGHTING ACCESSORIES, ETC. THIS ALSO INCLUDES EQUIPMENT REQUIRED BY STATE AND LOCAL CODES.
- CONTRACTOR TO PROCURE ALL REQUIRED BUILDING PERMITS AND INSPECTIONS TO COMPLETE PROJECT.
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE MICHIGAN ELECTRICAL CODE.
- DO NOT INTERRUPT EXISTING ELECTRICAL SERVICE TO FACILITIES WITHOUT WRITTEN PERMISSION BY OWNER. COORDINATE WORK WITH EXISTING ELECTRICAL SERVICES WITH OWNER AND UTILITY COMPANY.
- ARRANGE TO PROVIDE TEMPORARY ELECTRICAL SERVICE AS REQUIRED FOR SCOPE OF WORK.
- PROVIDE NEW ELECTRICAL SERVICES FROM UTILITY COMPANY AS DIRECTED. COORDINATE SCOPE OF WORK AND PROVIDE ALL WORK TO PROVIDE A FULLY FUNCTIONAL ELECTRICAL SERVICE.
- PROVIDE SHOP DRAWINGS FOR THE FOLLOWING:
 - CONDUIT
 - CONDUCTORS
 - WIRING DEVICES, INCLUDING COVER PLATES
 - DISCONNECT SWITCHES, ENCLOSED CIRCUIT BREAKERS AND FUSED SWITCHES
 - PANELBOARDS AND SWITCHBOARDS
 - SURGE PROTECTION DEVICES
 - INTERIOR AND EXTERIOR LIGHTING FIXTURES, INCLUDING SITE POLES
 - LIGHTING CONTROL SYSTEM AND DEVICES
 - FIRE ALARM SYSTEM

PART 2 - EXECUTION

- PROVIDE SCHEDULE FOR ELECTRICAL INSTALLATION WORK TO OWNER AND ARCHITECT FOR MAJOR MILESTONE DATES.
- COORDINATION DRAWINGS: PROVIDE COORDINATION DRAWINGS FOR FOLLOWING INSTALLATIONS:
 - LARGE INDOOR EQUIPMENT INSTALLATIONS.
 - LARGE OUTDOOR EQUIPMENT INSTALLATIONS.
- DEMOLITION WORK
 - REMOVE ALL ELECTRICAL EQUIPMENT, WIRE, CONDUIT, ETC., ASSOCIATED WITH DEMOLISHED EQUIPMENT.
 - REMOVE ALL ABANDONED ELECTRICAL CONDUIT AND WIRE BACK TO SOURCE.
 - PATCH, REPAIR AND PAINT ANY OPENINGS THROUGH ROOF, CEILINGS, WALLS OR FLOORS TO MATCH EXISTING CONDITION. MAINTAIN ALL FIRE RATINGS OF WALLS AND DOORS.
 - OWNER SHALL HAVE FIRST RIGHT OF REFUSAL OF ALL DEMOLISHED EQUIPMENT.
- CLOSEOUT ACTIVITIES
 - PROVIDE NORMAL OPERATION, EMERGENCY OPERATION AND PREVENTIVE MAINTENANCE MANUALS FOR EACH SYSTEM, EQUIPMENT AND DEVICE.
 - PROVIDE SOFTWARE AND FIRMWARE OPERATION DOCUMENTS FOR SYSTEM INSTALLED.
 - PROVIDE BACKUP, UPGRADES AND UNRESTRICTED LICENSES FOR INSTALLED SOFTWARE, INCLUDING OPERATING SYSTEMS AND PROGRAMMING TOOLS REQUIRED FOR MAINTENANCE AND OPERATION.

SECTION 26 0519
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

- PROVIDE SHOP DRAWING SUBMITTALS FOR ALL CONDUCTORS AND CABLES INSTALLED DURING COURSE OF WORK.

PART 2 - PRODUCTS

- COPPER BUILDING WIRE
 - FLEXIBLE, INSULATED, DRAWN COPPER WITH AN INSULATION JACKET, RATED 600V OR LESS.
 - PROVIDE THIN-2 COPPER INDOORS AND THIN-2 COPPER OUTDOORS, UNLESS NOTED OTHERWISE OR DICTATED OTHERWISE BY THE NEC.
 - MINIMUM CONDUCTOR SIZE FOR POWER SHALL BE #12 AWG. ANY BRANCH CIRCUIT(S) OVER 100' IN LENGTH SHALL BE #10 AWG MINIMUM FOR VOLTAGE DROP.
 - PROVIDE COLOR CODED WIRE WITH DIFFERENT COLOR FOR EACH PHASE, NEUTRAL AND GROUND, BASED ON ELECTRICAL SYSTEM TYPE.
- CONNECTORS AND SPLICES
 - FACTORY-FABRICATED CONNECTORS, SPLICES, AND LUGS OF SIZE, AMPACITY RATING, MATERIAL, TYPE, AND CLASS FOR APPLICATION AND SERVICE INDICATED.
 - SHALL BE MARKED FOR INTENDED LOCATION AND USE.

PART 3 - EXECUTION

- INSTALLATION
 - CONCEAL CABLES IN FINISHED WALLS, CEILINGS AND FLOORS UNLESS OTHERWISE NOTED.
 - USE PULLING MEANS, INCLUDING FISH TAPE, CABLE, ROPE, AND BASKET-WEAVE WIRE/CABLE GRIPS, THAT WILL NOT DAMAGE CABLES OR RACEWAY. USE MANUFACTURER APPROVED PULLING COMPOUND OR LUBRICANT WHEN NECESSARY.
 - INSTALL CONDUCTORS AT EACH OUTLET, WITH AT LEAST 12" OF SLACK.
 - ALL CABLING SHALL BE IN CONDUIT UNLESS ABOVE AN ACCESSIBLE CEILING WHERE "J" HOOKS ARE ACCEPTABLE.
- CONNECTIONS
 - TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES.
 - SPLICES, TERMINATIONS, AND TAPS SHALL BE COMPATIBLE WITH CONDUCTOR MATERIAL.
 - CONDUCTORS SHALL BE CONTINUOUS FROM ORIGIN TO PANEL OR EQUIPMENT TERMINATION WHERE POSSIBLE. SPLICES AND TAPS, WHERE REQUIRED, SHALL BE MADE IN JUNCTION BOXES WITH SUITABLE CONNECTORS.
- ACCEPTANCE
 - ALL CONDUCTORS AND CONNECTIONS SHALL TEST FREE OF GROUNDS, SHORTS, AND OPENS PRIOR TO ENERGIZING CIRCUIT.

SECTION 26 0526
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

- PROVIDE SHOP DRAWING SUBMITTALS FOR ALL GROUNDING AND BONDING PRODUCTS INSTALLED DURING COURSE OF WORK.

PART 2 - PRODUCTS

- GROUNDING AND BONDING CONDUCTORS
 - PROVIDE THIN/THIN-2, TINNED-COPPER WIRE OR CABLE, GREEN COLOR. CABLE SHALL BE RATED 600V.
- GROUNDING AND BONDING CLAMPS
 - CLAMPS SUITABLE FOR ATTACHMENT OF GROUNDING AND BONDING CONDUCTORS TO ELECTRODES, PIPES, TUBING, AND REBAR. SUITABLE TYPES SHALL BE:
 - STRAP-TYPE PIPE AND ROD CLAMPS
 - BEAM GROUNDING CLAMPS
 - EXOTHERMICALLY WELDED CONNECTIONS
- GROUNDING (EARTHING) ELECTRODES
 - COPPER CLAD STEEL
 - 3/4" DIAMETER BY 10' LENGTH

PART 3 - EXECUTION

- PROVIDE GROUNDING ELECTRODE SYSTEM AND EQUIPMENT GROUNDING PER THE NATIONAL ELECTRIC CODE.
- GROUNDING AND BONDING CONDUCTORS
 - PROVIDE SOLID CONDUCTOR FOR 8 AWG AND SMALLER, AND STRANDED CONDUCTORS FOR 6 AWG AND LARGER, UNLESS OTHERWISE NOTED.
 - ROUTE CONDUCTORS ALONG SHORTEST AND STRAIGHTEST PATHS POSSIBLE. AVOID OBSTRUCTING ACCESS TO OR PLACING CONDUCTORS WHERE THEY MAY BE SUBJECTED TO STRAIN, IMPACT, OR DAMAGE.
 - PROVIDE GROUNDING AND BONDING BUSBARS IN ELECTRICAL EQUIPMENT ROOMS, ROOMS HOUSING SERVICE EQUIPMENT, AND ELSEWHERE INDICATED ON DRAWINGS.
- CONNECTIONS
 - MAKE CONNECTIONS SO POSSIBILITY OF GALVANIC ACTION OR ELECTROLYSIS IS MINIMIZED.
 - USE EXOTHERMIC WELDS FOR ALL BELOW GRADE CONNECTIONS.
- GROUNDING ELECTRODES
 - DRIVE GROUND RODS UNTIL TOPS ARE 2" BELOW FINISHED FLOOR OR GRADE.
 - INSTALL AT LEAST (3) RODS SPACED AT LEAST ONE-ROD LENGTH FROM EACH OTHER AND CONNECT TO SERVICE GROUNDING ELECTRODE CONDUCTOR.
 - FOR CONCRETE-ENCASED ELECTRODE (UFER GROUND), USE MINIMUM 20' OF BARE COPPER CONDUCTOR NOT SMALLER THAN 4 AWG.
 - IF FOUNDATION IS LESS THAN 20' LONG, COIL EXCESS CONDUCTOR WITHIN BASE OF FOUNDATION.
 - BOND GROUNDING CONDUCTOR TO REINFORCING STEEL IN AT LEAST (4) LOCATIONS AND TO ANCHOR BOLTS. EXTEND GROUNDING CONDUCTOR BELOW GRADE AND CONNECT TO GROUNDING GRID OR GROUNDING ELECTRODE EXTERNAL TO CONCRETE.
- EQUIPMENT GROUNDING AND BONDING
 - INSTALL INSULATED EQUIPMENT GROUNDING CONDUCTORS WITH THE FOLLOWING ITEMS:
 - FEEDERS AND BRANCH CIRCUITS
 - LIGHTING CIRCUITS
 - RECEPTACLE CIRCUITS
 - SINGLE, AND THREE-PHASE MOTOR AND APPLIANCE BRANCH CIRCUITS
 - FLEXIBLE RACEWAY, ARMORED, AND METAL-CLAD CABLE RUNS
 - ALL CORRUGATED STAINLESS STEEL TUBING FOR GAS PIPING SYSTEM IN KITCHENS SHALL BE BONDING TO THE GROUNDING ELECTRODE SYSTEM. BONDING JUMPER SHALL NOT BE SMALLER THAN 6 AWG.

SECTION 26 0529
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

- PROVIDE SHOP DRAWING SUBMITTALS FOR ALL SUPPORT, ANCHORAGE, AND ATTACHMENT PRODUCTS INSTALLED DURING COURSE OF WORK.

PART 2 - PRODUCTS

- STEEL HANGERS, CLAMPS, AND ASSOCIATED FITTINGS SHALL BE DESIGNED FOR TYPES AND SIZES OF RACEWAY OR CABLE TO BE SUPPORTED.
- MOUNTING, ANCHORING, AND ATTACHMENT COMPONENTS FOR FASTENING ELECTRICAL ITEMS OR SUPPORTS TO BUILDING SURFACES:
 - POWDER-ACTUATED FASTENERS
 - MECHANICAL-EXPANSION ANCHORS
 - CONCRETE INSERTS
 - CLAMPS FOR ATTACHMENT TO STEEL STRUCTURAL ELEMENTS
 - THROUGH BOLTS AND TOGGLE BOLTS
 - HANGER RODS

PART 3 - EXECUTION

- SUPPORT INSTALLATION
 - PROVIDE SIZES OF COMPONENTS SO STRENGTH WILL BE ADEQUATE TO CARRY PRESENT AND FUTURE STATIC LOADS WITHIN SPECIFIED LIMITS.
 - CUT, FIT, AND PLACE MISCELLANEOUS METAL SUPPORTS ACCURATELY IN LOCATION, ALIGNMENT, AND ELEVATION TO SUPPORT AND ANCHOR ELECTRICAL MATERIALS AND EQUIPMENT.
- CONCRETE BASES
 - ALL FLOOR MOUNT ELECTRICAL EQUIPMENT SHALL BE ON 4" HOUSEKEEPING PADS. PADS SHALL BE NOT LESS THAN 4" LARGER IN BOTH DIRECTIONS OF ELECTRICAL EQUIPMENT TO BE SUPPORTED.
- TOUCHUP
 - CLEAN WELDS AND ABRADED AREAS OF SHOP PAINT. PAINT EXPOSED AREAS IMMEDIATELY AFTER ERECTING HANGERS AND SUPPORTS.

SECTION 26 0533.13
CONDUITS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

- PROVIDE SHOP DRAWING SUBMITTALS FOR ALL CONDUIT AND RACEWAY PRODUCTS INSTALLED DURING COURSE OF WORK.

PART 2 - PRODUCTS

- ALL PRODUCTS SHALL BE UL LISTED AND LABELED.
 - INDOORS - EMT, AND/OR RMC, WITH SET- SCREW FITTINGS. MC CABLE IS ACCEPTABLE FOR BRANCH CIRCUITS WHERE CONCEALED.
 - OUTDOORS - RIGID GALVANIZED STEEL.
 - RMC - RIGID, STEEL, ZINC-COATED (INTERIOR AND EXTERIOR).
 - FMC - FLEXIBLE, STEEL. PROVIDE AT TERMINATION POINT FOR EQUIPMENT SUBJECT TO MOTION AND VIBRATION.
 - MC CABLE - COLOR-CODED COPPER CONDUCTORS WITH INTERLOCKING GALVANIZED STEEL SHEATHING.
 - PVC - SCHEDULE 40, SCHEDULE 80, FOR USE WITH MAXIMUM 90 DEG C WIRE.
 - FITTINGS
 - SHALL BE LISTED FOR USE WITH RACEWAY SYSTEM TO BE INSTALLED.

PART 3 - EXECUTION

- CONDUIT TYPE SHALL BE SUITABLE FOR THE ENVIRONMENT IN WHICH IT IS LOCATED:
 - INDOORS - EMT, AND/OR RMC, WITH SET- SCREW FITTINGS. MC CABLE IS ACCEPTABLE FOR BRANCH CIRCUITS WHERE CONCEALED.
 - OUTDOORS - RIGID GALVANIZED STEEL.
 - UNDERGROUND - RIGID, NON-METALLIC SCHEDULE 80 PVC.
 - CONDUIT EXITING FROM UNDERGROUND SHALL TRANSITION TO EMT/RGS PRIOR TO BEING EXPOSED ABOVE GROUND.
- MINIMUM CONDUIT SIZE SHALL BE 1/2" TRADE SIZE.
- PROVIDE CONDUIT SLEEVES FOR LOW VOLTAGE DATA CABLING.
- USE LARGE RADIUS ELLS FOR ALL CONDUIT BENDS.
- CONDUITS SHALL BE CONCEALED WITHIN FINISHED WALLS, CEILINGS AND FLOORS UNLESS OTHERWISE INDICATED. CONDUITS SHALL BE SUPPORTED WITHIN 12" OF ENCLOSURES TO WHICH ATTACHED.
- INSTALL RACEWAY SEALS AND FITTINGS AT ACCESSIBLE LOCATIONS.
- DO NOT INSTALL CONDUITS WITHIN 2" OF THE BOTTOM SIDE OF METAL DECK ROOF.
- KEEP CONDUITS AT LEAST 6" AWAY FROM PARALLEL RUNS OF FLUES AND STEAM OR HOT-WATER PIPES.
- INSTALL PULL RINGS IN EMPTY RACEWAYS FOR FUTURE USE. PROVIDE POLYPROPYLENE OR MONOFILAMENT PLASTIC LINE WITH NOT LESS THAN 200lb TENSILE STRENGTH. LEAVE AT LEAST 12" OF SLACK AT BOTH ENDS OF CONDUIT.
- CAP AND SEAL UNDERGROUND RACEWAYS DESIGNATED AS SPARE ABOVE GRADE ALONGSIDE DUCT RACEWAYS IN USE.
- PROVIDE SEPARATE RACEWAY SYSTEM FOR EMERGENCY CIRCUIT(S). EMERGENCY CIRCUITS SHALL NOT BE IN CONDUIT WITH OTHER NON-EMERGENCY CIRCUITS.

SECTION 26 0533.16
BOXES AND COVERS ELECTRICAL SYSTEMS

PART 1 - GENERAL

- PROVIDE SHOP DRAWING SUBMITTALS FOR ALL BOX AND COVER PRODUCTS INSTALLED DURING COURSE OF WORK.

PART 2 - PRODUCTS

- METALLIC OUTLET BOXES
 - LISTED AND LABELED FOR INTENDED LOCATION AND USE.
 - MATERIAL SHALL BE SHEET METAL GALVANIZED STEEL, WITH A MINIMUM DEPTH OF 2.5".
 - BOXES SHALL HAVE PRYOUT OPENINGS, KNOCKOUTS, THREADED ENTRIES, OR HUBS IN EITHER SIDES OR BACK FOR CONDUITS OR CONDUIT FITTINGS. SHALL HAVE PROVISIONS FOR MOUNTING OUTLET BOX COVER.
 - EXTENSION RINGS SHALL BE PROVIDED WHERE REQUIRED OR INDICATED ON DRAWINGS, TO EXTEND DEVICE BOX TO INCREASE DEPTH. EXTENSION RINGS SHALL BE SUITABLE FOR USE WITH ASSOCIATED DEVICE BOX.
- NONMETALLIC OUTLET BOXES
 - LISTED AND LABELED FOR INTENDED LOCATION AND USE.
- COVER PLATES
 - LISTED AND LABELED FOR INTENDED LOCATION AND USE WITH ASSOCIATED OUTLET BOX TYPE.
 - FOR USE IN FINISHED LOCATIONS. .032" THICK, TYPE 302/304 NON-MAGNETIC STAINLESS STEEL.
 - ALL DEVICE COVERS SHALL BE BRUSHED STAINLESS STEEL, UNLESS SPECIFIC DEVICE COLOR IS SPECIFIED.
 - PROVIDE GASKETS FOR WALLPLATES IN DAMP OR WET LOCATIONS.
 - WEATHERPROOF COVERS
 - SHALL BE METAL, "WHILE-IN-USE" TYPE. COVER SHALL BE GRAY COLOR.

PART 3 - EXECUTION

- ALL BOXES SHALL BE RECESSED IN WALLS AND CONDUIT CONCEALED WHERE POSSIBLE.
 - CUT, PATCH, REPAIR AND PAINT GYPSUM AND/OR MASONRY WALLS TO RECESS NEW BOXES WHERE INDICATED.
 - HORIZONTALLY SEPARATE BOXES MOUNTED ON OPPOSITE SIDES OF WALLS SO THEY ARE NOT IN THE SAME VERTICAL CHANNEL.
- PROVIDE NEMA 1 BOXES AND COVERS FOR INDOOR LOCATIONS, UNLESS OTHERWISE NOTED.
- PROVIDE NEMA 3R BOXES AND COVERS FOR OUTDOOR LOCATIONS, UNLESS OTHERWISE NOTED.
- SUPPORT
 - SUPPORT BOXES IN RECESSED CEILINGS INDEPENDENT OF CEILING TILES OR GRID.
 - SUPPORT JUNCTION OR PULL BOXES FROM BUILDING STRUCTURE. DO NOT SUPPORT BOXES BY CONDUIT(S).
- ALL BOXES USED FOR LOW VOLTAGE DATA CABLING SHALL BE DOUBLE GANG, 3-1/2" DEEP WITH SINGLE GANG MUD RING. PROVIDE 1" CONDUIT TO ABOVE ACCESSIBLE CEILING FOR DATA CABLING.

SECTION 26 0553
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

- PROVIDE SHOP DRAWING SUBMITTALS FOR ALL LABEL AND IDENTIFICATION PRODUCTS INSTALLED DURING COURSE OF WORK.

PART 2 - PRODUCTS

- LABELS
 - LISTED AND LABELED FOR INTENDED LOCATION AND APPLICATION.
 - VINYL WRAPAROUND LABELS - PREPRINTED, FLEXIBLE LABELS LAMINATED WITH CLEAR, WEATHER AND CHEMICAL-RESISTANT COATING.
 - SELF-ADHESIVE WRAPAROUND LABELS - PREPRINTED, VINYL FLEXIBLE LABEL WITH ACRYLIC PRESSURE-SENSITIVE ADHESIVE.
 - SELF-ADHESIVE LABELS - POLYESTER VINYL, THERMAL, TRANSFER PRINTED, MULTI-COLOR, WEATHER AND UV-RESISTANT, PRESSURE-SENSITIVE ADHESIVE.
 - SIZE
 - 1-1/2" BY 6" FOR RACEWAYS AND CONDUCTORS.
 - 3-1/2" BY 5" FOR EQUIPMENT.
- SIGNS
 - LAMINATED ACRYLIC OR MELAMINE PLASTIC.
 - 1/16" THICK FOR SIGNS UP TO 20 SQ. IN.
 - 1/8" THICK FOR SIGNS GREATER THAN 20 SQ. IN.
 - ENGRAVED LEGEND WITH BLACK LETTERS ON WHITE FACE.
 - PUNCHED OR DRILLED FOR MECHANICAL FASTENERS WITH 1/4" GROMMETS IN CORNERS FOR MOUNTING.
- UNDERGROUND-LINE WARNING TAPE
 - SUITABLE TO IDENTIFY AND LOCATE UNDERGROUND ELECTRICAL AND COMMUNICATIONS UTILITY LINES.
 - PRINTING ON TAPE MUST BE PERMANENT AND NOT DAMAGED BY BURIAL OPERATIONS.
 - INSCRIPTIONS SHALL READ "CAUTION BURIED ELECTRIC LINE BELOW" OR "CAUTION BURIED COMMUNICATION LINE BELOW".
 - DETECTABLE WARNING TAPE
 - REINFORCED, DETECTABLE THREE-LAYER LAMINATE, CONSISTING OF ALUMINUM-FOIL CORE AND CLEAR PROTECTIVE FILM.

PART 3 - EXECUTION

- PROVIDE BAKED ENAMEL SIGNS FOR:
 - PANELBOARDS AND SWITCHBOARDS
 - TRANSFORMERS
 - DISCONNECT SWITCHES
 - VARIABLE FREQUENCY DRIVES
 - LIGHTING CONTROL PANELS. LABELS SHALL INDICATED ROOMS CONTROLLED
- IDENTIFY CONDUCTORS, CABLES, AND TERMINALS IN ENCLOSURES AND AT JUNCTIONS, TERMINALS, PULL POINTS, AND LOCATIONS OF HIGH VISIBILITY. IDENTIFY BY SYSTEM AND CIRCUIT DESIGNATION.
- PROVIDE UNDERGROUND-LINE WARNING TAPE FOR POWER, LIGHTING, AND COMMUNICATIONS CABLING.
- LABEL INDIVIDUAL COVER PLATES WITH SELF-ADHESIVE LABELS. LABEL TO INDICATE CIRCUIT WHICH DEVICE IS FED FROM WITH THE FOLLOWING INFORMATION
 - PANELBOARD DESIGNATION - BRANCH CIRCUIT NUMBER.
- INSTALL IDENTIFICATION MATERIALS AT LOCATIONS FOR MOST CONVENIENT VIEWING WITHOUT INTERFERENCE WITH OPERATION AND MAINTENANCE OF EQUIPMENT.
- PROVIDE FLOOR MARKING TAPE TO INDICATE WORKING CLEARANCE OF ELECTRICAL EQUIPMENT. FLOOR MARKING TAPE SHALL NOT BE USED FOR SURFACE OR FLUSH-MOUNTED PANELBOARDS AND SIMILAR EQUIPMENT IN FINISHED SPACES.

SECTION 26 2416
PANELBOARDS

PART 1 - GENERAL

- PROVIDE SHOP DRAWING SUBMITTALS FOR ALL PANELBOARD PRODUCTS INSTALLED DURING COURSE OF WORK.

PART 2 - PRODUCTS

- MANUFACTURER
 - SQUARE D - GOOD FOR 208/120V BRANCH PANELBOARDS, NF FOR 480/277V BRANCH PANELBOARDS.
 - OR EQUAL BY:
 - EATON CORP.
 - SIEMENS
- ELECTRICAL COMPONENTS, DEVICES, AND EQUIPMENT SHALL BE UL LABELED.
- ENCLOSURES
 - RATED FOR ENVIRONMENTAL CONDITIONS AT INSTALLED LOCATION
 - INDOOR, DRY AND CLEAN LOCATIONS - NEMA 1
 - OUTDOOR LOCATIONS - NEMA 3R
 - KITCHEN LOCATIONS - NEMA 3K, STAINLESS STEEL
 - OTHER WET AND DAMP INDOOR LOCATIONS - NEMA 4
 - FRONT - SECURE TO BOX WITH CONCEALED TRIM CLAMPS. FOR SURFACE-MOUNTED FRONTS, MATCH DIMENSIONS; FOR FLUSH-MOUNTED FRONTS, OVERLAP BOX. TRIMS MUST COVER LIVE PARTS AND MAY HAVE NO EXPOSED HARDWARE.
- BUSES
 - TIN-PLATED ALUMINUM FOR 400A OR LESS.
 - HARD DRAWN COPPER FOR ABOVE 400A.
- CONDUCTOR CONNECTORS
 - TIN-PLATED ALUMINUM OR HARD DRAWN COPPER, 98% CONDUCTIVITY.
 - MAIN AND NEUTRAL LUGS - MECHANICAL TYPE, WITH LUG ON NEUTRAL BAR FOR EACH POLE IN PANELBOARD.
 - GROUND LUGS AND BUS-CONFIGURED TERMINATORS - MECHANICAL TYPE, WITH LUG ON BAR FOR EACH POLE IN PANELBOARD.
 - SUBFEED LUGS - MECHANICAL TYPE, SUITABLE FOR USE WITH CONDUCTOR MATERIAL. LOCATE AT SAME END OF BUS AS INCOMING LUGS OR MAIN DEVICE.
- SHORT-CIRCUIT CURRENT RATING
 - FULLY RATED TO INTERRUPT SYMMETRICAL SHORT-CIRCUIT CURRENT AVAILABLE AT TERMINALS. SERIES RATED PANELS ARE NOT ACCEPTABLE.
- OVERCURRENT PROTECTIVE DEVICES
 - THERMAL-MAGNETIC CIRCUIT BREAKERS
 - INVERSE TIME CURRENT ELEMENT FOR LOW-LEVEL OVERLOADS.
 - INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS.
 - ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT-BREAKER FRAME SIZES 250A AND LARGER.
 - ELECTRONIC TRIP CIRCUIT BREAKERS
 - RMS SENSING.
 - FIELD-REPLACEABLE RATING PLUG OR ELECTRONIC TRIP.
 - FIELD ADJUSTABLE SETTINGS FOR: INSTANTANEOUS TRIP, LONG AND SHORT TIME PICKUP LEVELS, LONG AND SHORT TIME ADJUSTMENTS, AND GROUND FAULT PICKUP LEVEL, TIME DELAY AND T₁ RESPONSE.
 - SUBFEED CIRCUIT BREAKERS SHALL BE VERTICALLY ARRANGED ON PHASE BUSBARS.

PART 3 - EXECUTION

- INSTALLATION
 - MOUNT TOP OF PANELBOARD TRIP 7.5' ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED.
 - MOUNT PANELBOARD CABINET PLUMB AND RIGID WITHOUT DISTORTION OF BOX.
 - MOUNT RECESSED PANELBOARDS WITH FRONT UNIFORMLY FLUSH WITH WALL FINISH.
 - FOR RECESSED PANELBOARDS, STUB (4) 1" EMPTY CONDUITS FROM PANELBOARD INTO ACCESSIBLE CEILING SPACE OR SPACE DESIGNATED TO BE CEILING SPACE IN FUTURE.
 - MAKE GROUNDING CONNECTIONS AND BOND NEUTRAL FOR SERVICES AND SEPARATELY DERIVED SYSTEMS TO GROUND. MAKE CONNECTIONS TO GROUNDING ELECTRODES, SEPARATE GROUNDS FOR ISOLATED GROUND BARS, AND CONNECTIONS TO SEPARATE GROUND BARS.
- IDENTIFICATION
 - PANELBOARD LABEL MUST LIST MANUFACTURER NAME, TRADEMARK, VOLTAGE, AMPERAGE, NUMBER OF PHASES, AND NUMBER OF POLES AND MUST BE LOCATED ON INTERIOR OF PANELBOARD DOOR.
 - CIRCUIT BREAKER LABELS MUST LIST CURRENT RATING, UL AND IEC CERTIFICATION STANDARDS, AND AIC RATING.
 - CIRCUIT DIRECTORY
 - PROVIDE CIRCUIT DIRECTORY CARD INSIDE PANELBOARD DOOR, MOUNTED IN TRANSPARENT CARD HOLDER.
 - PANELBOARD DIRECTORY SHALL BE TYPE-WRITTEN, AND PROVIDE DETAILED INFORMATION SHOWN ON ASSOCIATED PANELBOARD LOAD SCHEDULE.
 - UPDATE ALL EXISTING CIRCUIT DIRECTORY CARDS AS REQUIRED.

KEY PLAN

ISSUE DATE ISSUED FOR

08/14/2025 Scoping Documents

DRAWN Author

CHECKED Checker

APPROVED Approver



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IGNYTE
MECHANICAL • ELECTRICAL DESIGN

PROJECT

Livonia Public Schools

Central Office
Generator Upgrades

Livonia,
Michigan

SHEET

ELECTRICAL
SPECIFICATIONS

PROJECT NUMBER

25.131

SHEET NUMBER

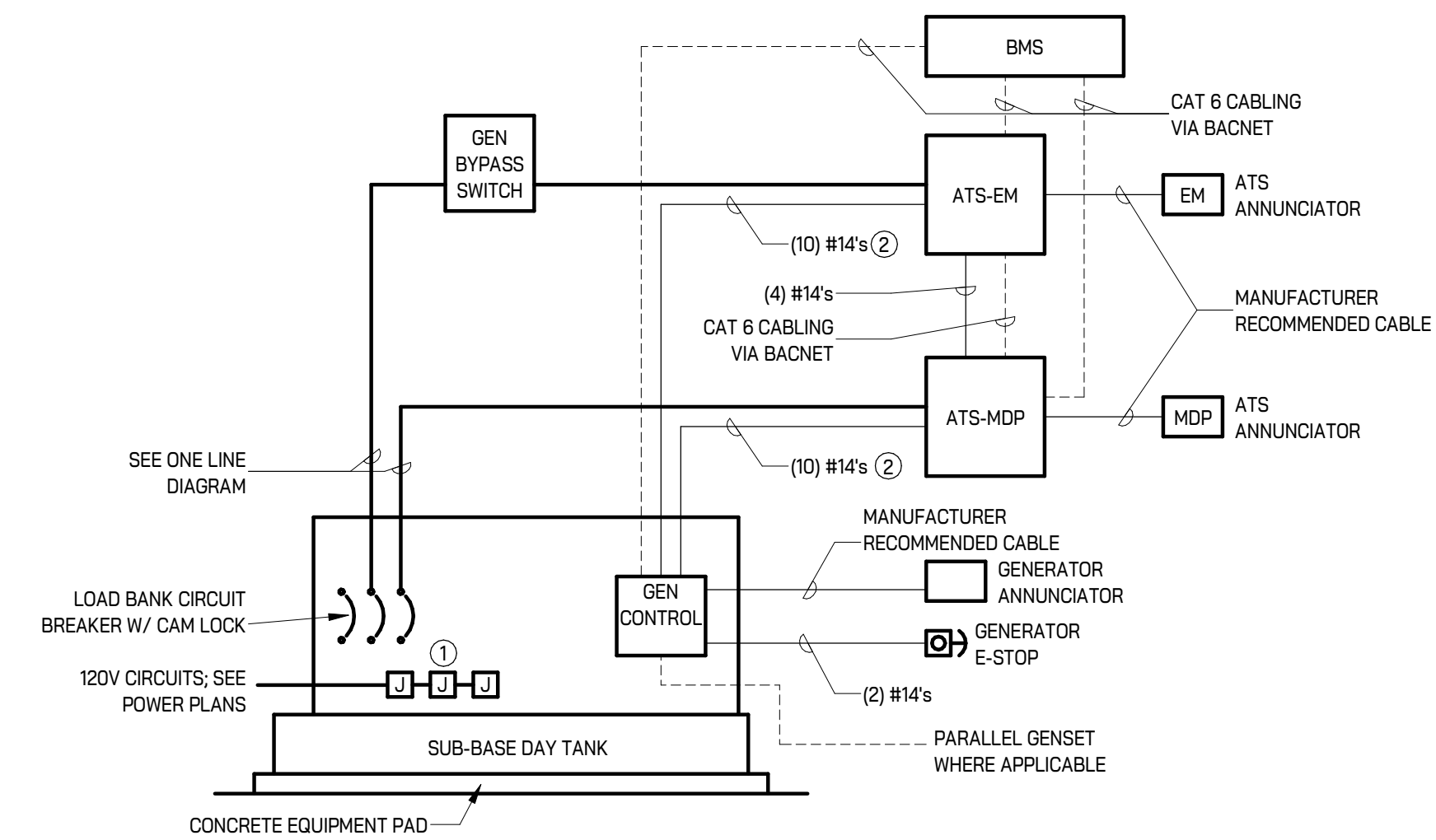
E001

ELECTRICAL PANEL FEEDER SCHEDULE									
PANELBOARD	FED FROM		FEEDER INFORMATION						
	PANEL - CIRCUIT	LOAD CURRENT	BREAKER / POLES	# OF RUNS	WIRE	NEUTRAL	GROUND	CONDUIT	TOTAL VOLTAGE DROP

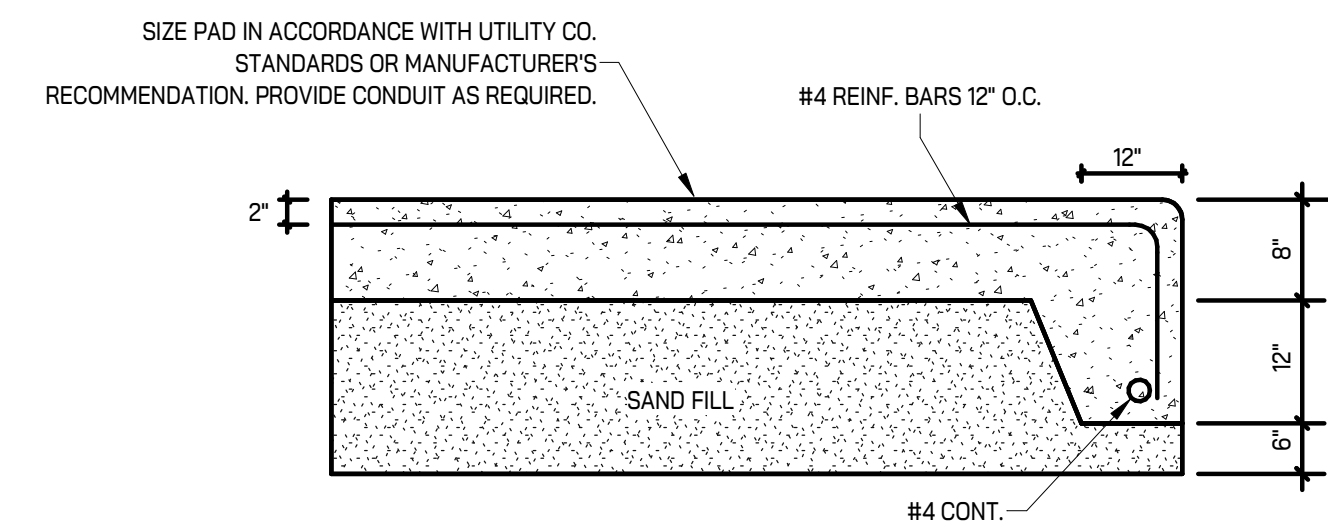
480Y/277

ATS-EM	GBS - 1	0 A	100 A / 3	1	#3	#3	#8	1-1/4"	0.00%
ATS-MDP	GEN-1 - 2,4,6	2 A	400 A / 3	1	600kcmil	600kcmil	#3	3-1/2"	0.00%
GBS	GEN-1 - 1,3,5	0 A	100 A / 3	1	#3	#3	#8	1-1/4"	0.00%
MDP	ATS-MDP - 1	2 A	400 A / 3	1	600kcmil	600kcmil	#3	3-1/2"	0.00%

NOTES:
 1. FOR ALL AUTOMATIC TRANSFER SWITCHES, PROVIDE CONDUIT AND FEEDER SIZES FROM BOTH NORMAL AND EMERGENCY SOURCES AS INDICATED IN THE SCHEDULE ABOVE.



1 GENERATOR INTERCONNECTION DIAGRAM
 NOT TO SCALE



2 CONCRETE EQUIPMENT PAD DETAIL
 NOT TO SCALE

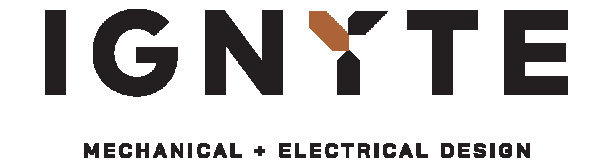
KEY PLAN

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PROJECT
 Livonia Public Schools

Central Office
 Generator Upgrades
 Livonia,
 Michigan

SHEET
**ELECTRICAL
 SCHEDULES AND
 DETAILS**

PROJECT NUMBER
25.131

SHEET NUMBER
E501