ELECTRICAL SPECIFICATIONS

I GENERAL CONDITIONS

A. THE SCOPE OF THE WORK SHALL INCLUDE THE FURNISHING AND INSTALLATION OF THE NECESSARY MATERIAL AND LABOR TO ACCOMPLISH THE WORK INDICATED BY THE DRAWINGS AND HEREIN SPECIFIED. ALL WORK BY THIS CONTRACTOR SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE AND LOCAL BUILDING CODES.

B. THE CONTRACT DOCUMENTS DO NOT PROPOSE TO SHOW ALL EXISTING SYSTEMS, EQUIPMENT OR MATERIAL. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THE EXISTING CONDITIONS AT THE JOB SITE BEFORE SUBMITTING PROPOSALS. SUBMISSION OF PROPOSALS SHALL BE TAKEN AS EVIDENCE THAT SUCH INSPECTION HAS TAKEN PLACE. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE COMPLETE SET OF CONSTRUCTION DOCUMENTS, AND THE LACK OF SPECIFIC INFORMATION ON THE DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR OF ANY RESPONSIBILITY.

C. MATERIALS AND EQUIPMENT FURNISHED UNDER THIS CONTRACT SHALL BE NEW AND SHALL BEAR THE U.L. LABEL WHERE APPLICABLE, UNLESS NOTED OTHERWISE. WORK SHALL BE GUARANTEED AGAINST DEFECTIVE MATERIALS AND WORKMANSHIP FOR A PERIOD OF NOT LESS THAN ONE (1) YEAR AFTER COMPLETION AND ACCEPTANCE BY THE OWNER.

D. CONTRACTOR SHALL INSTALL ELECTRICAL SYSTEMS WITHOUT INTERFERENCE AND IN STRICT COORDINATION WITH OTHER TRADES.

E. MATERIALS AND WORKMANSHIP SHALL COMPLY WITH THE CONTRACT DOCUMENTS AND APPLICABLE CODES AND STANDARDS. IN CASE OF DIFFERENCE BETWEEN APPLICABLE CODES AND STANDARDS AND THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL PROMPTLY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF SUCH DIFFERENCE. SHOULD THE CONTRACTOR PERFORM ANY WORK THAT DOES NOT COMPLY WITH THE REQUIREMENTS OF APPLICABLE CODES AND STANDARDS, HE SHALL BEAR ALL COSTS ARISING IN CORRECTING SUCH DEFECTS. APPLICABLE CODES AND STANDARDS SHALL INCLUDE ALL ORDINANCES, UTILITY COMPANY REGULATIONS, AND APPLICABLE REQUIREMENTS OF NATIONALLY ACCEPTED CODES AND STANDARDS. SHOULD THE CONTRACTOR SUPPLY EQUIPMENT DIFFERING FROM THE SPECIFIED ITEMS IN THE CONTRACT DOCUMENTS WITHOUT NOTIFICATION TO THE ENGINEER, HE SHALL BEAR ALL COSTS TO UPGRADE DEFICIENCIES ARISING FROM SUCH.

F. WHERE ONLY ONE MANUFACTURER'S NAME IS LISTED IN THE EQUIPMENT SPECIFICATION, OTHER MANUFACTURERS OF SIMILAR CHARACTERISTICS AND OF EQUAL OR BETTER PERFORMANCE CAPACITIES MAY BE CONSIDERED FOR "OR EQUAL" ACCEPTANCE BY THE ENGINEER. SUBSTITUTION REQUESTS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL. WHERE MORE THAN ONE MANUFACTURER IS LISTED IN THE NOTES AND EQUIPMENT SPECIFICATIONS, ONLY THOSE NAMED MANUFACTURERS WILL BE CONSIDERED FOR ACCEPTANCE. SHOULD A SUBSTITUTION BE ACCEPTED, AND SHOULD THE SUBSTITUTE MATERIAL PROVE DEFECTIVE, OR OTHERWISE UNSATISFACTORY FOR THE SERVICE INTENDED WITHIN THE GUARANTEE PERIOD, THIS MATERIAL OR EQUIPMENT SHALL BE REPLACED WITH THE MATERIAL OR EQUIPMENT SPECIFIED AT NO COST TO THE OWNER.

G. PROVIDE ACCESS, INCLUDING NECESSARY ACCESS DOORS, FOR NEW AND EXISTING EQUIPMENT REQUIRING OPERATION AND/OR MAINTENANCE. RELOCATE EXISTING AND LOCATE ALL NEW EQUIPMENT SUCH THAT OPERATION OR MAINTENANCE IS NOT RESTRICTED.

H. INSTALL EQUIPMENT WITH WORKING CLEARANCES COMPLYING WITH NEC 110-16 AND 110-34.

II PRODUCTS

A. CONDUIT

1. ELECTRIC METALLIC TUBING (EMT): OF HIGH GRADE STEEL MANUFACTURED SPECIFICALLY TO STANDARDS ASSURING MAXIMUM WELDING CHARACTERISTICS AND DUCTILITY, AND SHALL CONFORM TO FED. SPEC. WW-T-806b.

B. COUPLINGS AND TERMINATORS

1. FOR ELECTRICAL METALLIC TUBING: STEEL SET SCREW COUPLINGS; STEEL SET SCREW BOX CONNECTORS WITH NYLON INSULATED THROAT AND LOCKNUTS AT ALL BOXES AND CABINET TERMINATIONS OR NON-INSULATED BOX CONNECTOR, LOCKNUT AND NYLON-INSULATED GROUNDING BUSHING ON ALL TUBING WHERE GROUNDING BUSHINGS ARE REQUIRED.

2. FOR FLEXIBLE METAL CONDUIT: COUPLINGS AT CONNECTIONS BETWEEN FLEXIBLE CONDUIT AND EMT, AND NYLON INSULATED THROAT STEEL CONNECTORS AT BOX OR CABINET TERMINATIONS.

C. JUNCTION AND PULL BOXES

1. SIZE BOXES IN ACCORDANCE WITH THE REQUIREMENTS OF THE NEC. BOXES SHALL BE NO SMALLER THAN 4 INCHES SQUARE BY 1-1/2 INCHES DEEP WITH COVERS ACCESSIBLE AT ALL TIMES. SET BOXES ON CONCEALED CONDUITS WITH COVERS FLUSH WITH THE FINISHED WALL OR CEILING LINE. PROVIDE JUNCTION AND PULL BOXES OF APPROPRIATE DIMENSIONS FOR CONDUITS AND CONDUCTORS NOTED, WHERE SHOWN AND WHERE NECESSARY FOR THE INSTALLATION AND PULLING OF CABLES AND WIRES. INSTALL COVERS ON JUNCTION BOXES AND CONDULETS AFTER WIRING AND CONNECTIONS ARE COMPLETED.

D. PULL CORDS

1. PROVIDE A NYLON POLYETHYLENE CORD, WITH A TENSILE STRENGTH OF NOT LESS THAN 200 POUNDS, IN EACH EMPTY CONDUIT TO FACILITATE THE FUTURE INSTALLATION OF CONDUCTORS. INCORPORATE PLASTIC TAGS FOR IDENTIFICATION.

E. CONDUCTORS

1. CONDUCTORS SHALL BE 98% CONDUCTIVITY SOFT DRAWN ANNEALED COPPER, 600 VOLT, THHN/THWN INSULATION, #10 AND SMALLER - SOLID, #8 AND LARGER - STRANDED.

2. NO CONDUCTORS SHALL BE SMALLER THAN NO. 12, EXCEPT FOR SIGNAL OR CONTROL CIRCUITS AND FOR INDIVIDUAL LIGHTING FIXTURE TAPS AS PERMITTED BY NEC.

3. FOR HOME RUNS ON 120-VOLT, 20-AMPERE BRANCH CIRCUITS, WHERE LENGTH OF RUN FROM PANELBOARD TO FIRST OUTLET EXCEEDS 100 LINEAR FEET, USE NO. 10 CONDUCTORS. WHERE LENGTH OF RUN IS 100 LINEAR FEET OR LESS, USE NO. 12 CONDUCTORS.

4. FOR HOME RUNS ON 277-VOLT, 20-AMPERE BRANCH CIRCUITS, WHERE LENGTH OF RUN FROM PANELBOARD TO FIRST OUTLET EXCEEDS 200 LINEAR FEET, USE NO. 10 CONDUCTORS. WHERE LENGTH OF RUN IS 100 LINEAR FEET OR LESS, USE NO. 12 CONDUCTORS.

F. TRANSFORMERS

1. TRANSFORMER KVA AND VOLTAGE RATINGS: AS INDICATED ON THE DRAWINGS.

2. GENERAL LIGHTING AND DISTRIBUTION TRANSFORMERS

a. TRANSFORMER COILS: CONTINUOUS WOUND CONSTRUCTION AND IMPREGNATED WITH NON-HYGROSCOPIC, THERMOSETTING VARNISH.

b. RATED 150°C TEMPERATURE RISE ABOVE 40°C AMBIENT. THREE-PHASE TRANSFORMERS LESS THAN 25 KVA, 2 2-1/2% FCBN TAPS; 25 KVA AND LARGER, 2 2-1/2% FCAN TAPS, 4 2-1/2% FCBN TAPS.

c. INSULATING MATERIALS ARE TO BE IN ACCORDANCE WITH NEMA ST20 STANDARDS FOR 220°C UL COMPONENT RECOGNIZED INSULATION SYSTEMS.

d. CONSTRUCT ALL CORES OF HIGH GRADE, NON-AGING SILICON STEEL WITH HIGH MAGNETIC FLUX DENSITIES WELL BELOW THE SATURATION POINT. CLAMP THE CORE LAMINATIONS TOGETHER WITH STEEL ANGLES. BOLT THE COMPLETED CORE AND COIL TO THE BASE OF THE ENCLOSURE BUT ISOLATED THEREFROM BY MEANS OF RUBBER, VIBRATION-ABSORBING MOUNTS. THERE SHALL BE NO METAL-TO-METAL CONTACT BETWEEN THE CORE AND COIL AND THE ENCLOSURE. SOUND ISOLATION SYSTEMS REQUIRING THE COMPLETE REMOVAL OF ALL FASTENING DEVICES WILL NOT BE ACCEPTABLE.

e. VISIBLY GROUND THE CORE OF THE TRANSFORMER TO THE ENCLOSURE BY MEANS OF A FLEXIBLE GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH APPLICABLE UL AND NEC STANDARDS.

f. THE TRANSFORMER ENCLOSURES SHALL BE VENTILATED AND BE FABRICATED OF HEAVY GAUGE, SHEET STEEL CONSTRUCTION. THE ENTIRE ENCLOSURE SHALL BE FINISHED UTILIZING A CONTINUOUS PROCESS CONSISTING OF DEGREASING, CLEANING AND PHOSPHATIZING, FOLLOWED BY ELECTROSTATIC DEPOSITION OF A POLYMER POLYESTER POWER COATING AND BAKING CYCLE TO PROVIDE UNIFORM COATING OF ALL EDGES AND SURFACES. THE COATING SHALL BE ANSI 49 GRAY, BAKED ENAMEL.

g. THE MAXIMUM TEMPERATURE OF THE TOP OF THE ENCLOSURE SHALL NOT EXCEED 50°C RISE ABOVE A 40°C AMBIENT.

h. SOUND LEVELS SHALL BE WARRANTED BY THE MANUFACTURER NOT TO EXCEED THE FOLLOWING:

1) 15 TO 50kVA - 45db; 51 TO 150kVA - 50db; 151 TO 300kVA - 55db; 301 TO 500kVA - 60 db.

G. OVERCURRENT PROTECTIVE DEVICES

1. MOLDED CASE CIRCUIT BREAKERS

a. AS MANUFACTURED BY THE MANUFACTURER OF THE PANELBOARD IN WHICH INSTALLED.

b. ONE, TWO OR THREE POLE WITH RATINGS INDICATED ON THE DRAWINGS; (STANDARD) OR (HIGH INTERRUPTING) CONSTRUCTION AS REQUIRED BY THE SHORT CIRCUIT RATINGS INDICATED ON THE DRAWINGS.

c. QUICK-MAKE, QUICK-BREAK, CALIBRATED FOR OPERATION IN AN AMBIENT TEMPERATURE OF 40°C. TRIP INDICATION BY HANDLE POSITION, TRIP-FREE. TWO AND THREE POLE BREAKERS; COMMON TRIP WITH SINGLE OPERATING HANDLE WITHOUT HANDLE TIES, PERMANENT TRIP UNIT CONTAINING INDIVIDUAL THERMAL AND MAGNETIC TRIP ELEMENTS IN EACH POLE. FRAME SIZES GREATER THAN 100 AMPERES: VARIABLE MAGNETIC TRIP ELEMENTS WHICH ARE SET BY A SINGLE ADJUSTMENT.

d. REMOVABLE LUGS, UL LISTED FOR COPPER AND ALUMINUM CONDUCTORS. LISTED FOR INSTALLATION OF MECHANICAL OR COMPRESSION TYPE LUGS.

2. ALL OVERCURRENT PROTECTIVE DEVICES PROPOSED FOR INCLUSION IN THE WORK SHALL BE SELECTED TO BE SELECTIVELY COORDINATED WITH THE OVERCURRENT PROTECTIVE DEVICES INSTALLED ON THEIR SUPPLY SIDE SUCH THAT AN OVERCURRENT EVENT (OVERLOAD, SHORT-CIRCUIT, OR GROUND-FAULT) OCCURRING AT THE LOWEST LEVEL IN THE SYSTEM (BRANCH CIRCUIT) CANNOT CAUSE THE FEEDER PROTECTIVE DEVICE SUPPLYING THE BRANCH CIRCUIT PANELBOARD TO OPEN. THIS COORDINATION SHALL BE CARRIED THROUGH EACH LEVEL OF DISTRIBUTION FOR ALL BRANCHES OF EMERGENCY POWER TO 0.10 SECONDS.

H. PANELBOARDS

1. AS MANUFACTURED BY SQUARE D, GENERAL ELECTRIC, CUTLER-HAMMER OR SIEMENS.

2. LIGHTING AND APPLIANCE PANELBOARDS

a. PANELBOARD BUS STRUCTURE AND MAIN LUGS OR MAIN CIRCUIT BREAKER SHALL HAVE CURRENT RATINGS AS INDICATED ON THE DRAWINGS. BUS BARS SHALL ACCEPT BOLT-ON CIRCUIT BREAKERS. ALL CURRENT CARRYING PARTS OF THE BUS STRUCTURE SHALL BE PLATED. UL LABELED.

b. THE PANELBOARD BUS ASSEMBLY SHALL BE ENCLOSED IN A SURFACE OR FLUSH MOUNTED STEEL CABINET AS INDICATED ON THE DRAWINGS.

c. EACH PANELBOARD SHALL HAVE A SHORT CIRCUIT CURRENT RATING EQUAL TO OR GREATER THAN THE FAULT CURRENT INDICATED ON THE DRAWINGS. PANELBOARDS SHALL BE MARKED WITH THEIR MAXIMUM SHORT CIRCUIT RATING AT THE SUPPLY VOLTAGE.

L. GROUNDING

1. GROUNDING SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.

2. GROUNDING CONDUCTORS SHALL BE ANNEALED COPPER CABLES OF THE SIZES INDICATED OR REQUIRED.

3. A "GREEN WIRE" EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED WITHIN EACH FEEDER AND BRANCH CIRCUIT RACEWAY, WHETHER METALLIC OR NON-METALLIC, TO FORM A COMPLETE AND CONTINUOUS GROUNDING PATH. CONNECT GROUNDING CONDUCTORS TO GROUND TERMINALS AT EACH END OF THE RUN.

III EXECUTION

A. INSTALLATION OF BUILDING CONDUIT

1. ALL INTERIOR RACEWAYS SHALL BE EMT. RACEWAYS IN DAMP OR WET LOCATIONS, OR IN HAZARDOUS LOCATIONS, SHALL BE GRC OR IMC.

2. CONDUITS SHALL BE OF SUCH SIZE AND SO INSTALLED THAT THE CONDUCTORS MAY BE DRAWN THROUGH WITHOUT INJURY OR EXCESSIVE STRAIN, SHALL BE SECURED AT CABINETS AND BOXES WITH GALVANIZED LOCKNUTS, BOTH INSIDE AND OUTSIDE, AND SHALL HAVE APPROPRIATE BUSHINGS INSIDE. BUSHINGS SHALL BE INSULATING TYPE WITH BOND GROUND CLAMPS.

3. USE LENGTHS OF FLEXIBLE METAL CONDUIT NOT LESS THAN 12 INCHES LONG AT FINAL CONNECTIONS TO ALL MOTORS, TRANSFORMERS AND SIMILAR DEVICES SUBJECT TO MOVEMENT BECAUSE OF VIBRATION OR MECHANICAL ADJUSTMENT. USE FLEXIBLE METAL CONDUITS TO EFFECT FINAL CONNECTIONS TO RECESSED LIGHTING FIXTURES. USE LIQUID TIGHT FLEXIBLE METAL CONDUIT, WITH APPROPRIATE CONNECTORS, IN DAMP OR WET LOCATIONS, AT MOTOR OR EQUIPMENT LOCATIONS IN MECHANICAL EQUIPMENT ROOMS, AT OR NEAR PUMPS, AND WHEN INSTALLED OUTDOORS.

4. GROUND METALLIC CONDUITS AS REQUIRED BY NEC.

5. INSTALL RACEWAYS CONTINUOUS FROM OUTLET TO OUTLET BOX, OR CABINET, WITH A MAXIMUM OF 150 FEET BETWEEN PULLS. IN AREAS WHERE THERE ARE NO SUSPENDED CEILINGS, RUN ALL CONDUITS PARALLEL/PERPENDICULAR TO BUILDING SURFACE LINES.

6. IN SYSTEMS OPERATING AT MORE THAN 300 VOLTS BETWEEN PHASE CONDUCTORS, AND WHERE DIFFERENT PHASE CONDUCTORS ARE TO BE RUN TO A COMMON GANG WALL SWITCH BOX, PROVIDE SUBSTANTIAL BARRIERS BETWEEN ADJACENT SWITCHES IN THE BOX SO THAT TWO DIFFERENT PHASE WIRES WILL NOT BE IN THE SAME COMPARTMENT.

7. WHEREVER RACEWAYS PASS THROUGH FLOORS, WALLS, PENETRATIONS, OR OTHER PARTITIONS, CAREFULLY FILL ANY SPACE BETWEEN THE OUTSIDE OF THE RACEWAY AND THE BUILDING MATERIAL TO PREVENT PASSAGE OF AIR, WATER, SMOKE, AND FUMES. FILLING MATERIAL SHALL BE A UL LISTED, INTUMESCENT SEALING HAVING FIRE/SMOKE RESISTIVE RATING EQUAL TO THE BUILDING MATERIAL PENETRATED.

8. CONDUITS UTILIZED THROUGHOUT THE PROJECT SHALL NOT BE SMALLER THAN 3/4 INCH FOR FEEDERS, MULTIPLE BRANCH CIRCUIT HOMERUNS AND HOMERUNS OF CONDUCTORS LARGER THAN NO. 12. INDIVIDUAL BRANCH CIRCUIT WIRING FOR NO. 12 CONDUCTORS SHALL BE ACCEPTABLE IN 1/2" CONDUIT, I.E. 2#12, 1#12G, 1/2"C.

B. INSTALLATION OF PULL AND JUNCTION BOXES

1. FASTEN ALL BOXES SECURELY TO THE BUILDING CONSTRUCTION, INDEPENDENT OF CONDUIT SYSTEMS.

2. ON CONCEALED CONDUIT SYSTEMS WHERE BOXES ARE NOT OTHERWISE ACCESSIBLE, SET BOXES FLUSH WITH FINISHED SURFACES FOR ACCESS, AND PROVIDE OVERLAPPING COVERS.

C. INSTALLATION OF CONDUIT HANGERS AND SUPPORTS

1. FURNISH AND INSTALL ALL HANGERS AND SUPPORTS REQUIRED BY RACEWAY SYSTEMS.

2. SUPPORT ALL ABOVE-GROUND ELECTRICAL CONDUITS FROM THE BUILDING STRUCTURE/CONSTRUCTION. SUPPORT CONDUITS RUNNING VERTICALLY OR HORIZONTALLY ALONG WALLS WITH GALVANIZED MALLEABLE IRON ONE-HOLE CLAMPS. CARRY INDIVIDUALLY SUPPORTED HORIZONTAL CONDUITS 1-1/4 INCH AND LARGER ON SUITABLE HANGERS.

3. LOCATE HANGERS AND TRAPEZES TO SUPPORT HORIZONTAL RACEWAYS WITHOUT APPRECIABLE SAGGING. HANGER SPACING SHALL NOT EXCEED NEC REQUIREMENTS, OR RECOMMENDATIONS OF THE NECA "STANDARD OF INSTALLATION".

4. WHERE CONDUITS SMALLER THAN 1-1/4 INCH ARE INSTALLED ABOVE REMOVABLE TYPE DRY CEILINGS, SUPPORT THEM ON SUITABLE HANGER RODS WITH METAL CLIPS AT A DISTANCE ABOVE THE CEILING SUFFICIENT TO PERMIT REMOVAL OF CEILING PANELS AND LAY-IN LIGHT FIXTURES. LOCATE SUCH CONDUITS SO AS NOT TO HINDER ACCESS TO MECHANICAL EQUIPMENT THROUGH CEILING PANELS.

D. INSTALLATION OF CONDUCTORS

1. PULL NO CONDUCTORS INTO CONDUITS UNTIL ALL WORK OF A NATURE WHICH MAY CAUSE INJURY TO CONDUCTORS IS COMPLETED.

2. RUN FEEDERS IN CONTINUOUS PIECES, WITHOUT JOINTS OR SPLICES, INSOFAR AS PRACTICABLE.

3. RUN CONDUITS FOR EMERGENCY POWER CONDUCTORS SEPARATE FROM ALL OTHER WIRING.

E. SEGREGATION OF WIRING SYSTEMS

1. SEGREGATION OF WIRING SYSTEMS SHALL NOT BE COMPROMISED BY THE USE OF COMMON PULLBOXES, WIREWAYS, CABINETS OR ANY OTHER TYPE OF ENCLOSURE.

2. THE RACEWAY SYSTEM FOR EACH FEEDER SHALL BE A SEPARATE SYSTEM COMPLETELY FAULT ISOLATED FROM ALL OTHER RACEWAY SYSTEMS.

3. THE RACEWAY SYSTEM FOR THE BRANCH CIRCUITS OF EACH PANELBOARD SHALL BE A SEPARATE SYSTEM COMPLETELY FAULT ISOLATED FROM ALL OTHER RACEWAY SYSTEMS.

F. INSTALLATION OF TRANSFORMERS

1. INSTALL FLOOR MOUNTED TRANSFORMERS ON A 3" HIGH CONCRETE HOUSEKEEPING PAD AND A NEOPRENE VIBRATION, ISOLATING PAD.

2. PROVIDE WALL MOUNTED TRANSFORMERS WITH NEOPRENE VIBRATION ISOLATORS BETWEEN WALL AND TRANSFORMER.

G. EXISTING SYSTEMS TO REMAIN

1. THE CONTRACT DOCUMENTS DO NOT PROPOSE TO SHOW ALL EXISTING SYSTEMS, MATERIAL OR EQUIPMENT. OBTAIN DATA RELATED TO EXISTING CONDITIONS FROM EXISTING DOCUMENTS, MEASUREMENTS, NOTATIONS, PHOTOGRAPHS, SURVEYS AND OTHER OBSERVATIONS AT THE SITE.

2. REMOVE EXISTING WIRE, CONDUIT, EQUIPMENT, FIXTURES AND OTHER ITEMS TO PROVIDE ACCESS FOR WORK IN EXISTING FACILITIES. REINSTALL AND REFINISH ITEMS REMOVED, OR OTHERWISE DAMAGED, TO MATCH EXISTING ADJACENT SURFACED UPON COMPLETION OF THE WORK.

3. WHERE EXISTING FUNCTIONS TO REMAIN IN USE ARE DISRUPTED, THEY SHALL BE FULLY RESTORED AFTER DISRUPTION, IN FULL COMPLIANCE WITH THIS DIVISION OF THE SPECIFICATIONS FOR NEW WORK.

4. MODIFY, REMOVE OR RELOCATE MATERIALS AND ITEMS INDICATED ON THE DRAWINGS OR REQUIRED BY THE INSTALLATION OF NEW WORK.

5. WORKING JOINTLY WITH THE ARCHITECT, ESTABLISH AND MARK SALVAGE AND DEMOLITION ITEMS BEFORE COMMENCING WORK; REPORT ITEMS SCHEDULE FOR RELOCATION, REINSTALLATION OR REUSE, WHICH ARE FOUND TO BE IN DAMAGED CONDITION; AWAIT FURTHER INSTRUCTIONS FROM THE ARCHITECT BEFORE COMMENCING WITH WORK.

6. DEMOLITION EQUIPMENT, DEVICES AND MATERIAL SHALL BE REMOVED FROM THE SITE AND DISPOSED OF BY THE CONTRACTOR. SALVAGED EQUIPMENT AND DEVICES SHALL BE THE PROPERTY OF THE CONTRACTOR UNLESS NOTED OTHERWISE.

7. MAKE MINOR RELOCATIONS NECESSITATED BY THE CONDITIONS AT THE SITE OR AS DIRECTED BY THE ARCHITECT, WITHOUT ADDITIONAL COST TO THE OWNER. REPAIR AND RESTORE TO GOOD FUNCTIONAL CONDITION, EQUIPMENT, MATERIALS AND ITEMS SCHEDULED FOR RELOCATION, WHICH ARE DAMAGED DURING DISMANTLING OR REASSEMBLY OPERATIONS. NEW MATERIALS AND ITEMS OF SIMILAR DESIGN AND QUALITY MAY BE SUBSTITUTED FOR MATERIALS AND ITEMS INDICATED TO BE RELOCATED UPON APPROVAL OF SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. REMOVE CAREFULLY, IN REVERSE ORDER TO ORIGINAL ASSEMBLY OR PLACEMENT, ITEMS WHICH ARE TO BE RELOCATED. PROTECT ITEMS UNTIL RELOCATION IS COMPLETE. CLEAN AND REPAIR ITEMS TO BE RELOCATED, AND PROVIDE NEW MATERIALS, FITTINGS AND APPURTENANCES REQUIRED TO COMPLETE THE RELOCATIONS AND TO RESTORE TO GOOD OPERATING ORDER. PERFORM THE RELOCATION WORK IN ACCORDANCE WITH APPLICABLE PORTIONS OF THESE SPECIFICATIONS, UTILIZING SKILLED WORKERS.

8. RELOCATING DEVICES: REMOVE AND REINSTALL IN LOCATIONS DESIGNATED BY THE ARCHITECT TEMPERATURE CONTROL SYSTEM DEVICES. RELAYS, WIRE, CONDUIT, FIXTURES, EQUIPMENT AND OTHER DEVICES REQUIRED FOR THE OPERATION OF THE VARIOUS SYSTEMS THAT ARE INSTALLED IN EXISTING-TO-BE-REMOVED CONSTRUCTION.

H. CONTRACTOR SHALL KEEP A CLEAN SET OF DRAWINGS ON THE JOB, NOTING DAILY ALL CHANGES MADE IN THESE DRAWINGS IN CONNECTION WITH THE FINAL INSTALLATION INCLUDING EXACT DIMENSIONED LOCATIONS OF ALL NEW AND UNCOVERED EXISTING UTILITIES AND SHALL, WITH HIS REQUEST FOR FINAL PAYMENT, TURN OVER A CLEAN, NEATLY MARKED SET OF PDF'S SHOWING "AS INSTALLED" WORK TO THE ARCHITECT FOR SUBSEQUENT REVIEW AND TRANSMITTAL TO THE OWNER. CONTRACTOR SHALL NOTE ALL CONSTRUCTION CHANGES, DATE EACH SHEET AND LABEL "AS-BUILTS" IN THE REVISION BLOCK ON THE DRAWINGS.

I. IN ADDITION TO THE ABOVE, CONTRACTOR SHALL ACCUMULATE DURING THE JOB'S PROGRESS, THE FOLLOWING DATA PREPARED IN PDF AND TURNED OVER TO THE ARCHITECT FOR REVIEW AND SUBSEQUENT DELIVERY TO THE OWNER.

1. ALL WARRANTIES AND GUARANTEES AND MANUFACTURER'S DIRECTIONS ON EQUIPMENT AND MATERIAL COVERED BY THE CONTRACT INCLUDING THE NAMES, ADDRESSES AND TELEPHONE NUMBERS OF THE MANUFACTURER'S REPRESENTATIVE.

2. APPROVED FIXTURE BROCHURES, WIRING DIAGRAMS AND CONTROL DIAGRAMS (ORIGINAL DATA, NO COPIES).

3. COPIES OF APPROVED SHOP DRAWINGS.

4. OPERATING INSTRUCTIONS FOR ALL ELECTRICAL SYSTEM EQUIPMENT. OPERATING INSTRUCTIONS SHALL ALSO INCLUDE RECOMMENDED MAINTENANCE PROCEDURES.

GENERAL NOTES

5. [illegible] REQUIRED BY THESE SPECIFICATIONS.

A1 THE DRAWINGS ARE GENERALLY DIAGRAMMATIC AND IT IS THE INTENT AND MEANING OF THE CONTRACT

6. DOCUMENTS [illegible] THAT IS COMPLETE AND ALL ITEMS AND APPURTENANCES NECESSARY, REASONABLE INCIDENTAL, OR CUSTOMARILY INCLUDED, EVEN

7. [illegible] SHALL BE PROVIDED FOR A COMPLETE SYSTEM IN SATISFACTORY OPERATION.

J. ALL OF THE ABOVE DATA SHALL BE SUBMITTED TO THE ENGINEER FOR HIS REVIEW AT SUCH TIME AS [illegible] SHALL BE FURNISHED TO THE ENGINEER FOR HIS REVIEW AND APPROVAL BEFORE ANY OF THE SYMBOLS USED, AN INTERPRETATION SHALL BE OBTAINED FROM THE ARCHITECT IN WRITING. THE DECISION OF THE ARCHITECT SHALL BE FINAL.

A3 IT SHALL BE THE RESPONSIBILITY OF EACH CONTRACTOR TO EXAMINE THE CONTRACT DOCUMENTS CAREFULLY BEFORE SUBMITTING HIS BID, WITH PARTICULAR ATTENTION TO ERRORS, OMISSIONS, CONFLICTS WITH PROVISIONS OF LAWS AND CODES HAVING JURISDICTION, CONFLICTS BETWEEN DRAWINGS OR DRAWINGS AND SPECIFICATIONS AND LACK OF DEFINITIVE DESCRIPTION OF THE EXTENT OF COVERAGE BETWEEN CONTRACTS. ANY SUCH DISCREPANCY SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ARCHITECT FOR CORRECTION. SHOULD ANY OF THESE ERRORS, OMISSIONS, CONFLICTS, OR AMBIGUITIES EXIST, THE CONTRACTOR SHALL HAVE THEM EXPLAINED AND ADJUSTED IN WRITING BEFORE SIGNING THE CONTRACT OR PROCEEDING WITH THE WORK; OTHERWISE, HE SHALL, AT HIS OWN EXPENSE, SUPPLY THE PROPER MATERIALS AND LABOR TO MAKE GOOD ANY DAMAGE OR DEFECTS IN HIS WORK OR THE RESULTS OBTAINED THEREFROM, CAUSED BY SUCH DISCREPANCY.

A4 WHEREVER CONFLICTS OCCUR BETWEEN DIFFERENT PARTS OF THE CONTRACT DOCUMENTS, THE GREATER QUANTITY, THE BETTER QUALITY, OR LARGER SIZE SHALL PREVAIL UNLESS THE ARCHITECT INFORMS THE CONTRACTOR OTHERWISE IN WRITING.

A5 THE SCALE OF EACH DRAWING IS RELATIVELY ACCURATE; ANY DIMENSIONS SHOWN ARE APPROXIMATE TO CENTERLINE FROM ASSUMED BUILDING PERIMETER. THE CONTRACTOR SHALL OBTAIN THE NECESSARY DIMENSIONS FOR ANY EXACT TAKEOFFS FROM THE ARCHITECT. NO ADDITIONAL COST TO THE OWNER WILL BE CONSIDERED FOR FAILURE TO OBTAIN EXACT DIMENSIONS WHERE NOT CLEAR OR IN ERROR ON THE DRAWINGS. ANY DEVICE OR FIXTURE ROUGHED IN IMPROPERLY AND NOT POSITIONED ON IMPLIED CENTER-LINES OR AS REQUIRED BY GOOD PRACTICE MUST BE REPOSITIONED AT NO COST TO THE OWNER.

A6 ALL WORK AND MATERIALS SHALL BE GUARANTEED FREE FROM DEFECTS FOR A MINIMUM PERIOD OF ONE YEAR UNLESS NOTED OTHERWISE. THE WARRANTY PERIOD SHALL BEGIN AT THE DATE OF BENEFICIAL OCCUPANCY OF THE FACILITY.

A7 THE CONTRACTOR IS RESPONSIBLE FOR FILING AND PAYING ALL FEES AND OBTAINING NECESSARY PERMITS AND CERTIFICATES OF INSPECTION. THE CONTRACTOR SHALL DELIVER ALL CERTIFICATES OF INSPECTION TO OWNER/CONSTRUCTION MANAGER INCLUDING COPIES WITH MAINTENANCE MANUALS.

A8 ONLY EXPERIENCED CRAFTSMEN KNOWLEDGEABLE IN THEIR RESPECTIVE TRADE SHALL PERFORM THE WORK DESCRIBED IN THE CONSTRUCTION DOCUMENTS.

A9 ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST ADDITION OF NFPA STANDARD 70 (NATIONAL ELECTRICAL CODE). CONTRACTOR SHALL ALSO CONFORM TO ALL APPLICABLE LOCAL CODES AND AMENDMENTS.

A10 ALL ELECTRICAL EQUIPMENT, INCLUDING BUT NOT LIMITED TO SWITCHGEAR, CONDUIT, WIRE, BOXES AND FITTINGS SHALL BE NEW AND SHALL MEET NEMA AND ANSI STANDARDS AND SHALL BEAR THE UL LABEL.

A11 PROVIDE SHOP DRAWINGS FOR ENGINEER'S REVIEW FOR ALL ELECTRICAL EQUIPMENT, DEVICES, AND MATERIALS PROPOSED TO BE PROVIDED UNDER THIS CONTRACT. ANY DEVIATIONS FROM ITEMS SPECIFIED SHALL BE CLEARLY IDENTIFIED AND SEPARATELY SUBMITTED WITH A FORMAL SUBSTITUTION REQUEST. REFER TO SPECIFICATIONS (PROJECT MANUAL) FOR REQUIREMENTS.

A12 THE EXISTING ELECTRICAL INSTALLATION SHALL REMAIN ENERGIZED AND OPERATIONAL THROUGHOUT THE DURATION OF CONSTRUCTION. THE CONTRACTOR SHALL SEQUENCE WORK TO MINIMIZE OUTAGES. PROVIDE TEMPORARY POWER VIA PORTABLE RENTAL GENERATORS AS REQUIRED TO MAINTAIN OPERATION OF THE FACILITY SERVED BY DOWNSTREAM EQUIPMENT WHILE EXISTING DISTRIBUTION EQUIPMENT OR FEEDERS ARE BEING REPLACED TO ALLOW AFFECTED AREAS TO FUNCTION PROPERLY AND WITHOUT INTERRUPTION.

ELECTRICAL EQUIPMENT

B1 PROVIDE AN IDENTIFICATION NAMEPLATE FOR EACH ELECTRICAL EQUIPMENT, APPURTENANCE DEPICTING THE DESIGNATION INDICATED ON THE DRAWINGS. REFER TO SPECIFICATIONS FOR EXACT REQUIREMENTS.

B2 WEATHERPROOF ENCLOSURES SHALL BE PROVIDED FOR ALL ELECTRICAL EQUIPMENT, DEVICES AND APPURTENANCES (ALL SYSTEMS) INSTALLED OUTDOORS.

B3 CONTRACTOR SHALL COORDINATE AND SCHEDULE ALL POWER OUTAGES WITH OWNER'S REPRESENTATIVE.

B4 CONTRACTOR SHALL NOT USE PERMANENT INK WHEN MAKING FIELD MARKINGS OR TEMPORARY CIRCUIT LABELS ON PANELS. CONTRACTOR SHALL USE REMOVABLE TAPE/TAGS FOR ALL TEMPORARY MARKINGS AND SHALL REMOVE THESE TEMPORARY MARKINGS AT THE CONCLUSION OF THIS PROJECT.

CONDUIT & RACEWAY

C1 ALL WORK SHALL BE COORDINATED SO THAT INTERFERENCES ARE AVOIDED. PROVIDE ALL NECESSARY OFFSETS IN CONDUITS, RACEWAYS, ETC., REQUIRED TO PROPERLY INSTALL THE WORK. EXPOSED WORK MUST BE KEPT AS CLOSE AS POSSIBLE TO WALLS, CEILINGS, COLUMNS, ETC., SO AS TO TAKE UP MINIMUM AMOUNT OF SPACE; ALL OFFSETS, FITTINGS, ETC., REQUIRED SHALL BE PROVIDED WITHOUT ADDITIONAL EXPENSE TO THE OWNER. WORK SHALL BE COORDINATED WITH OTHER TRADES.

C2 CONDUIT RUNS ARE DIAGRAMMATIC IN NATURE. CONTRACTOR IS RESPONSIBLE FOR SIZING AND LOCATING PULL BOXES PER N.E.C. AND FOR COORDINATION WITH OTHER DISCIPLINES.

C3 CONTRACTOR SHALL PROVIDE AND INSTALL ADEQUATE SUPPORTS NECESSARY FO

GENERAL NOTES

A. REFER TO SHEET E001 FOR LEGENDS, NOTES, ABBREVIATIONS, AND SPECIFICATIONS.

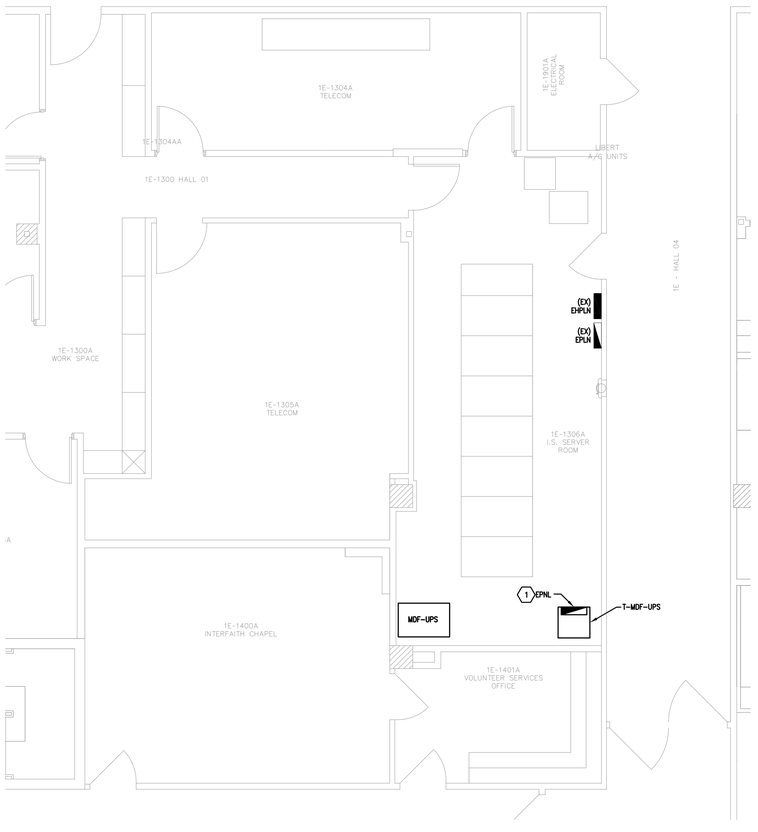
LEGEND NOTES

(1) PANEL SHALL BE MOUNTED TO UNISTRUT RACK ABOVE TRANSFORMER. ALIGN FRONT OF PANEL WITH FRONT OF TRANSFORMER.

Locate the required overcurrent protection per 2017 NEC 240.21

Install electrical connections per 2017 NEC 110.14, identify disconnects per 2017 NEC 110.22 and provide working space around electrical equipment per 2017 NEC 110.26.

Wiring in air handling spaces must comply with 2017 NEC 300.22. Firestop penetrations per 2017 NEC 300.21. Secure and support equipment per 2017 NEC 300.11.



01 FLOOR PLAN – MDF ROOM
SCALE: 1/4" = 1'-0"

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: William Griffin
Date: Jun 29, 2018
2015 INTERNATIONAL CODES & 2017 NEC

RSN: 1299424
Permit #: 18-1482510 LT

Project #: B1810019
5613 DTC PARKWAY
SUITE 500
Greenwood Village, CO 80111
WWW.WSP.COM

REVISIONS

MARK	DESCRIPTION	DATE

TMCA MDF UPS REPLACEMENT

1501 S POTOMAC ST,
AURORA, COLORADO 80012

KEYPLAN:

NORTH

JOB NO.: B1810019
DATE: 01 June, 2018
DRAWN BY: CL
DESIGNED BY: CL
APPROVED BY: TF
CHECKED BY: TF

SHEET TITLE:
ELECTRICAL
LEVEL 1
FLOOR PLAN

SHEET TITLE:
E201

AVAILABLE FAULT CURRENT CALCULATIONS

UTILITY CONTRIBUTION

Utility Fault Current	45200 Amperes	kVA	=	2000
		E	=	480
I = (kVAx1000)/(Ex1.732) = trans FLA		trans FLA	=	2405.7

FAULT CURRENT FROM . . UTILITY TO MSBA

Feeder: 11 sets 4 # 500
Conductor (Copper/Aluminum): Copper
Raceway (Steel/Aluminum): PVC
Voltage: 480

Conductor Length (distance)	L	=	150
ASC	ISCA	=	45,200
# conductors per phase	N	=	11
Phase conductor constant	C	=	26706
Voltage L-L	EL-L	=	480
f = (1.732xLxISCA)/(NxCxEL-L)	f	=	0.083
M = 1/(1+f)	M	=	0.923
ISCA = ISCA x M	ISCA	=	41,725

FAULT CURRENT FROM . . PANEL MSBA TO ATS-DPEQC

Feeder: 4 sets 4 # 350
Conductor (Copper/Aluminum): Copper
Raceway (Steel/Aluminum): Steel
Voltage: 480

Conductor Length (distance)	L	=	14
ASC	ISCA	=	41,725
# conductors per phase	N	=	4
Phase conductor constant	C	=	19703
Voltage L-L	EL-L	=	480
f = (1.732xLxISCA)/(NxCxEL-L)	f	=	0.027
M = 1/(1+f)	M	=	0.974
ISCA = ISCA x M	ISCA	=	40,638

FAULT CURRENT FROM . . ATS-EQDPC TO PANEL DPEQC

Feeder: 4 sets 4 # 350
Conductor (Copper/Aluminum): Copper
Raceway (Steel/Aluminum): Steel
Voltage: 480

Conductor Length (distance)	L	=	8
ASC	ISCA	=	40,638
# conductors per phase	N	=	4
Phase conductor constant	C	=	19703
Voltage L-L	EL-L	=	480
f = (1.732xLxISCA)/(NxCxEL-L)	f	=	0.015
M = 1/(1+f)	M	=	0.985
ISCA = ISCA x M	ISCA	=	40,042

FAULT CURRENT FROM . . PANEL DPEQC TO PANEL EHPLN

Feeder: 1 sets 4 # 2/0
Conductor (Copper/Aluminum): Copper
Raceway (Steel/Aluminum): Steel
Voltage: 480

Conductor Length (distance)	L	=	222
ASC	ISCA	=	40,042
# conductors per phase	N	=	1
Phase conductor constant	C	=	10755
Voltage L-L	EL-L	=	480
f = (1.732xLxISCA)/(NxCxEL-L)	f	=	2.982
M = 1/(1+f)	M	=	0.251
ISCA = ISCA x M	ISCA	=	10,055

FAULT CURRENT FROM . . PANEL EQDPC TO T-EPNL2 PRIMARY

Feeder: 1 sets 3 # 2
Conductor (Copper/Aluminum): Copper
Raceway (Steel/Aluminum): Steel
Voltage: 480

Conductor Length (distance)	L	=	25
ASC	ISCA	=	10,055
# conductors per phase	N	=	1
Phase conductor constant	C	=	5906
Voltage L-L	EL-L	=	480
f = (1.732xLxISCA)/(NxCxEL-L)	f	=	0.154
M = 1/(1+f)	M	=	0.867
ISCA = ISCA x M	ISCA	=	8,716

FAULT CURRENT FROM . . TFMR T-EPNL2 PRIMARY TO TFMR T-EPNL2 SECONDARY

ASC	ISCA(P)	=	8,716
transformer kva	KVA	=	45
transformer impedance	%Z	=	3.5
Voltage Primary	VP	=	480
Voltage Secondary	VS	=	208
f = (ISCA(P)xVPx1.732xtZ)/(100,000xKVA)	f	=	5.636
M = 1/(1+f)	M	=	0.151
ISCA(S) = VP/VS x M x ISCA(P)	ISCA(S)	=	1,313

FAULT CURRENT FROM . . T-EPNL2 SECONDARY TO PANEL EPNL2

Feeder: 1 sets 4 # 1/0
Conductor (Copper/Aluminum): Copper
Raceway (Steel/Aluminum): Steel
Voltage: 480

Conductor Length (distance)	L	=	5
ASC	ISCA	=	1,313
# conductors per phase	N	=	1
Phase conductor constant	C	=	8924
Voltage L-L	EL-L	=	480
f = (1.732xLxISCA)/(NxCxEL-L)	f	=	0.003
M = 1/(1+f)	M	=	0.997
ISCA = ISCA x M	ISCA	=	1,310

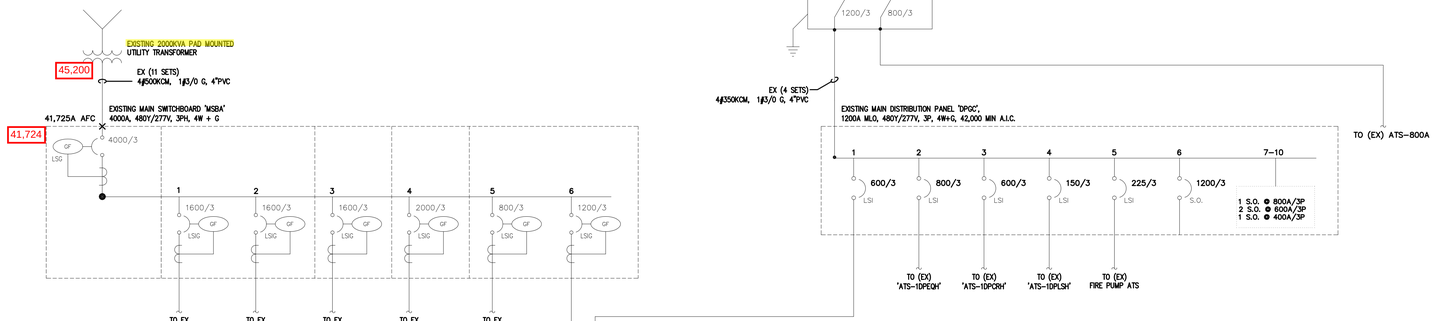
FAULT CURRENT FROM . . PANEL EPNL2 TO MDF-UPS

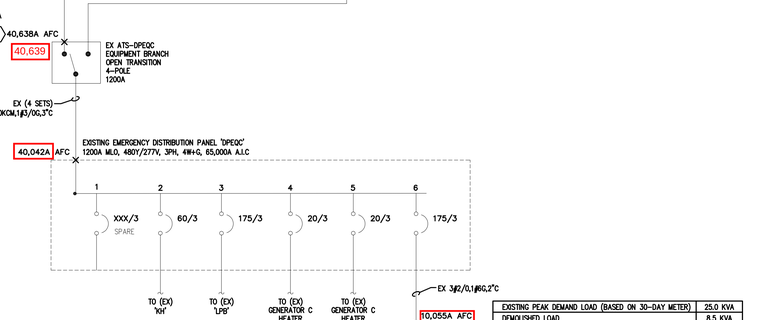
Feeder: 1 sets 2 # 2
Conductor (Copper/Aluminum): Copper
Raceway (Steel/Aluminum): Steel
Voltage: 480

Conductor Length (distance)	L	=	14
ASC	ISCA	=	1,310
# conductors per phase	N	=	1
Phase conductor constant	C	=	5906
Voltage L-L	EL-L	=	480
f = (1.732xLxISCA)/(NxCxEL-L)	f	=	0.011
M = 1/(1+f)	M	=	0.989
ISCA = ISCA x M	ISCA	=	1,295

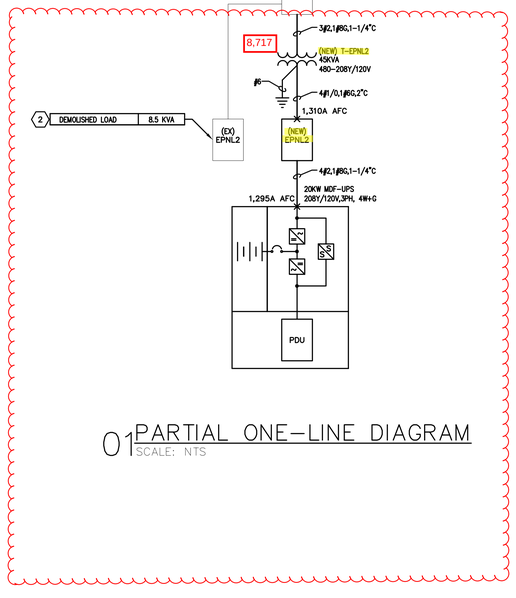
LEGEND NOTES

1. WORST CASE FAULT CURRENT SHOWN. AVAILABLE FAULT CURRENT FROM UTILITY EXCEEDS THAT OF THE GENERATOR.
2. DEMOLISHED LOAD FROM EXISTING UPS TO BE REPLACED.





EXISTING PEAK DEMAND LOAD (BASED ON 30-DAY METER)	25.0 KVA
DEMOLISHED LOAD	8.5 KVA
ADDED LOAD	8.5 KVA
TOTAL LOAD	25.0 KVA



AIC rating of new breaker must be a minimum of 12K AIC.

EXISTING PANEL: EHPNL — EQUIPMENT

LOCATION: MDF
MAIN BUS: 225A
MCB: N/A
VOLTAGE: 480/277
AIC: To Be Selected

FED FROM: DPEQC
WIRES: 4W + G
ENCLOSURE: NEMA 1
BUS TYPE: Copper
MOUNTING: Surface
PANEL LUGS: Main Lugs Only

NEUTRAL BUS: Yes
GROUND BUS: Yes
ISOLATED GROUND BUS: No
200% NEUTRAL: No
FEED THROUGH LUGS: No

CKT NO.	DESCRIPTION	TOTAL LOAD (VA)	CIRCUIT BREAKER AMPS	CIRCUIT BREAKER POLES	PHASE	CIRCUIT BREAKER AMPS	CIRCUIT BREAKER POLES	TOTAL LOAD (VA)	DESCRIPTION	CKT NO
1	EXISTING LOAD	–	15	3	A	90	3	–	EXISTING LOAD	2
3	---	–	–	–	B	–	–	–	---	4
5	---	–	–	–	C	–	–	–	---	6
7	EXISTING LOAD	–	45	3	A	15	3	–	EXISTING LOAD	8
9	---	–	–	–	B	–	–	–	---	10
11	---	–	–	–	C	–	–	–	---	12
13	PANEL 'EPNL2'	2833	+90	3	A	45	3	–	EXISTING LOAD	14
15	VIA XFMR	2833			B	–	–	–	---	16
17	*	2833			C	–	–	–	---	18
19	S.O.	–			A			–	S.O.	20
21	S.O.	–			B			–	S.O.	22
23	S.O.	–			C			–	S.O.	24
25	S.O.	–			A			–	S.O.	26
27	S.O.	–			B			–	S.O.	28
29	S.O.	–			C			–	S.O.	30

NOTES:
+ INDICATES TO PROVIDE NEW CIRCUIT BREAKER WITHIN EXISTING PREPARED SPACE. LOAD SHOWN IS NEW LOAD ONLY. REFER TO 1-LINE FOR FULL LOAD SUMMARY

"EHPNL" LOAD SUMMARY

	LTS	RCPTS	MISC	TOTAL (KVA)	TOTAL (AMPS)
TOTAL CONNECTED LOAD	0.0	0.0	8.5	8.5	10.2
DEMAND FACTOR	SEE DEMAND FACTOR TABLE				
TOTAL DEMAND LOAD	0.0	0.0	8.5	8.5	10.2
CONTINUOUS (DESIGN) FACTOR	1.25	1.00	1.00		
TOTAL DESIGN LOAD	0.0	0.0	8.5	8.5	10.2

PANEL: EPNL2 — EQUIPMENT

LOCATION: To Be Specified
MAIN BUS: 225A
MCB: 150A
VOLTAGE: 208/120
AIC: 10,000A

FED FROM: EHPNL
WIRES: 4W + G
ENCLOSURE: NEMA 1
BUS TYPE: Copper
MOUNTING: Surface
PANEL LUGS: Main Circuit Breaker

NEUTRAL BUS: Yes
GROUND BUS: Yes
ISOLATED GROUND BUS: No
200% NEUTRAL: No
FEED THROUGH LUGS: No

CKT NO.	DESCRIPTION	TOTAL LOAD (VA)	CIRCUIT BREAKER AMPS	CIRCUIT BREAKER POLES	PHASE	CIRCUIT BREAKER AMPS	CIRCUIT BREAKER POLES	TOTAL LOAD (VA)	DESCRIPTION	CKT NO
1	SPARE	–	20	1	A	20	1	–	SPARE	2
3	SPARE	–	20	1	B	20	1	–	SPARE	4
5	SPARE	–	20	1	C	20	1	–	SPARE	6
7	SPARE	–	20	1	A	20	1	–	SPARE	8
9	SPARE	–	20	1	B	20	1	–	SPARE	10
11	SPARE	–	20	1	C	20	1	–	SPARE	12
13	SPARE	–	20	1	A	20	1	–	SPARE	14
15	SPARE	–	20	1	B	20	1	–	SPARE	16
17	SPARE	–	20	1	C	20	1	–	SPARE	18
19	SPARE	–	20	1	A	20	1	–	SPARE	20
21	SPARE	–	20	1	B	20	1	–	SPARE	22
23	SPARE	–	20	1	C	20	1	–	SPARE	24
25	SPARE	–	20	1	A	20	1	–	SPARE	26
27	SPARE	–	20	1	B	20	1	–	SPARE	28
29	SPARE	–	20	1	C	20	1	–	SPARE	30
31	SPARE	–	20	1	A	20	1	–	SPARE	32
33	SPARE	–	20	1	B	20	1	–	SPARE	34
35	SPARE	–	20	1	C	20	1	–	SPARE	36
37	SPARE	–	20	1	A	90	3	2833	* MDF-UPS	38
39	SPARE	–	20	1	B	–	–	2833	---	40
41	SPARE	–	20	1	C	–	–	2833	---	42

NOTES:
* INDICATES TO PROVIDE BREAKER AS SUB-FEED, ELECTRONIC TRIP BREAKER WITH ADJUSTABLE LSI SETTINGS.

"EPNL2" LOAD SUMMARY

	LTS	RCPTS	MISC	TOTAL (KVA)	TOTAL (AMPS)
TOTAL CONNECTED LOAD	0.0	0.0	8.5	8.5	23.6
DEMAND FACTOR	SEE DEMAND FACTOR TABLE				
TOTAL DEMAND LOAD	0.0	0.0	8.5	8.5	23.6
CONTINUOUS (DESIGN) FACTOR	1.25	1.00	1.00		
TOTAL DESIGN LOAD	0.0	0.0	8.5	8.5	23.6

Legibly identify each breaker or switch for it's use or purpose on the circuit directory in the panel/switchboard per 2017 NEC 408.4.

Service equipment shall be permanently and legibly marked to show the available fault current and date.
2017 NEC Article 110.24(A)(B).

Install electrical connections per 2017 NEC 110.14, identify disconnects per 2017 NEC 110.22 and provide working space around electrical equipment per 2017 NEC 110.26.

01 PARTIAL ONE-LINE DIAGRAM
SCALE: NTS

City of Aurora Building Division
Reviewed for Code Compliance
Approved as Noted: William Griffin
Date: Jun 29, 2018
2015 INTERNATIONAL CODES & 2017 NEC

RSN: 1299424
Permit #: 18-1482510 LT

WSP
5613 DTC PARKWAY
SUITE 500
Greenwood Village, CO 80111
WWW.WSP.COM

Project #: B1810019

REVISIONS

MARK	DESCRIPTION	DATE

TMCA MDF UPS REPLACEMENT
1501 S POTOMAC ST,
AURORA, COLORADO 80012

KEYPLAN:



JOB NO.: B1810019	
DATE: 01 June, 2018	
DRAWN BY: CL	DESIGNED BY: CL
APPROVED BY: TF	CHECKED BY: TF

SHEET TITLE:
ELECTRICAL ONE-LINE DIAGRAM AND SCHEDULES

SHEET TITLE:
E301