

ELECTRICAL SPECIFICATIONS

GENERAL REQUIREMENTS

INTENT

1. PROVIDE A COMPLETE FUNCTIONAL ELECTRICAL INSTALLATION AS DEPICTED ON THE DRAWINGS AND SPECIFICATIONS. INCLUDE ALL NECESSARY TAXES, FEES, EQUIPMENT, MATERIALS AND LABOR.

STANDARDS

1. WORK IS TO BE DONE IN ACCORDANCE WITH CURRENT PROVINCIAL AND FEDERAL CODES, REGULATIONS STANDARDS AND GOOD INSTALLATION PRACTICES.
2. EQUIPMENT TO BE INSTALLED AS PER MANUFACTURER'S INSTRUCTIONS AND AS NOTED ON THE DRAWINGS OR SPECIFICATIONS.
3. THESE PLANS AND SPECIFICATIONS MAY HAVE REQUIREMENTS ABOVE MINIMUM BUILDING CODES AND SHALL APPLY TO THIS PROJECT.
4. EQUIPMENT INSTALLED SHALL BE NEW UNLESS OTHERWISE STATED ON THE DRAWINGS.
5. ALL ELECTRICAL WORK IS TO BE PERFORMED BY LICENSED TRADES WORKERS AS PER PROVINCIAL REGULATIONS.
6. SUPPLY A WRITTEN GUARANTEE FOR THE SATISFACTORY OPERATION OF ALL WORK AND EQUIPMENT INSTALL UNDER THIS CONTRACT FOR A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION.
7. ALL ELECTRICAL EQUIPMENT AND JUNCTION POINTS ARE TO BE INSTALLED IN A LOCATION THAT THEY ARE READILY ACCESSIBLE. COORDINATE INSTALLATION LOCATION WITH OTHER TRADES.

DRAWINGS

1. DRAWINGS ARE CONSIDERED TO BE DIAGRAMMATIC AND DO NOT SHOW ALL CONSTRUCTION INSTALLATION DETAILS.
2. SPECIFIC EQUIPMENT LOCATIONS, UNLESS DETAILED ON THE DRAWINGS, ARE CONSIDERED GENERAL. EQUIPMENT PLACEMENTS TO BE DETERMINED BASED ON THE INTENT OF THESE DRAWINGS AND SITE CONDITIONS.
3. WIRING AND PIPING TO FOLLOW BUILDING LINES AND TO BE INSTALLED SO THERE ARE NO CONFLICTS WITH OTHER TRADES. INSTALL TIGHT TO STRUCTURAL MEMBERS AND TO INTERFERE AS LITTLE AS POSSIBLE WITH FREE USE SPACE THROUGH WHICH THEY PASS.
4. REFER TO ALL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL ELECTRICAL WORK IN CONNECTION WITH OTHER DIVISIONS.

PERMITS AND FEES

1. EACH CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL NECESSARY PERMITS AND PAY ALL FEES IN ORDER THAT ALL WORK SHOWN OR SPECIFIED MAY BE CARRIED OUT. INCLUDE ALLOWANCES FOR PLANS REVIEW.
2. SUBMIT A COPY OF THE PERMITS REQUIRED TO THE CONSULTANT WITHIN TWO WEEKS OF THE AWARD OF THIS CONTRACT.
3. SUBMISSION OF ALL IDENTIFIED REPORTS, PERMITS, OR CERTIFICATES ARE REQUIRED PRIOR TO SUBSTANTIAL COMPLETION.
4. INCLUDE ALL APPLICABLE INSURANCE REQUIRED FOR THIS PROJECT.

SAFETY

1. THE CONTRACTOR SHALL COMPLY WITH THE CURRENT PROVINCIAL OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS.
2. THE CONTRACTOR SHALL SUBMIT A SITE-SPECIFIC HEALTH AND SAFETY PLAN WITHIN 7 DAYS OF "NOTICE TO PROCEED" TO THE CONSULTANT AND OWNER FOR REVIEW.
3. THE CONTRACTOR SHALL AT HIS EXPENSE MEET THE ORIENTATION TRAINING AND SAFETY REQUIREMENTS OF THE OWNER OR DESIGNATED CONTRACTOR FOR THIS SITE.
4. REPORT TO THE OWNER OR DESIGNATED CONTRACTOR ANY HAZARDOUS SPILLS OR CONDITIONS AS THEY HAPPEN ON SITE. SUPPLY A COPY TO THE CONSULTANT.

SHOP DRAWINGS, RECORD DRAWINGS, MAINTENANCE MANUALS, SUBMITTALS, TRAINING

1. SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION OF ALL NEW ELECTRICAL COMPONENTS. PROVIDE FOUR COPIES OF ALL SHOP DRAWINGS, FAX COPIES ARE NOT ACCEPTABLE.
2. MAINTAIN ONE SET OF DRAWINGS ON SITE, RECORD DEVIATIONS FROM DESIGN LAYOUT ON A DAILY BASIS. SUBMIT A COPY OF THE AS BUILT DRAWINGS TO THE CONSULTANT AT SUBSTANTIAL COMPLETION.
3. PROVIDE FOUR COPIES OF MAINTENANCE & OPERATING MANUALS. INCLUDE LETTER OF GUARANTEE, LIST OF SUPPLIERS, SHOP DRAWINGS, MODEL AND SERIAL NUMBERS, PARTS BREAK DOWN, WIRING DIAGRAMS, OPERATING AND MAINTENANCE INSTRUCTIONS.
4. MANUALS TO BE D RING HARD COVER BINDERS WITH DIVIDER TABS. BINDERS TO BE SIZED TO ACCOMMODATE SPARE SPACE OF 50%.
5. SPARE PARTS, KEYS, SPECIAL TOOLS SHALL BE TURNED OVER TO THE OWNER PRIOR TO SUBSTANTIAL COMPLETION. SUBMIT DOCUMENTATION TO CONSULTANT.
6. ALLOW FOR ADEQUATE TIME FOR INSTRUCTION OF THE OWNERS OPERATING STAFF ON THE OPERATION CARE AND MAINTENANCE OF EQUIPMENT INSTALLED. SCHEDULE WITH THE OWNER DURING NORMAL BUSINESS HOURS FOR THE REQUIRED TRAINING.

EXISTING CONDITIONS

1. BEFORE SUBMITTING A TENDER, EXAMINE THE SITE AND THE LOCAL CONDITIONS AFFECTING THE WORK UNDER THIS DIVISION AND VERIFY THAT THE WORK CAN BE SATISFACTORILY CARRIED OUT AS SHOWN ON THE PLANS WITHOUT CHANGES.
2. ADVISE THE ENGINEER AT LEAST SEVEN DAYS BEFORE TENDERS CLOSE OF ANY CONFLICT OR INTERFERENCE FAILURE TO DO SO IMPLIES ACCEPTANCE OF EXISTING CONDITIONS AND THAT ALL ALLOWANCES AS MAY BE NECESSARY TO COMPLETE THE WORK ARE INCLUDED IN THE TENDER.

SCOPE

1. SUMMARY OF WORK
 - DEMOLITION OF EXISTING ELECTRIC HEAT.
 - EXISTING PANEL BOARD MODIFICATIONS.
 - NEW ELECTRICAL SERVICES TO MECHANICAL EQUIPMENT.
 - MODIFICATIONS TO MISCELLANEOUS BUILDING SYSTEMS.
2. FIELD TESTING:
 1. PHASE ROTATION ON MOTORS REPORT
 2. INSULATION RESISTANCE TESTING FOR CIRCUITS AND FEEDERS 350-600 VOLT USING A 1000 VOLT INSTRUMENT, CHECK RESISTANCE TO GROUND BEFORE ENERGIZING.
3. TEST AND VERIFY ALL ELECTRICAL SYSTEM COMPONENTS FOR CORRECT POLARITY, OPERATION AND CIRCUITRY.
4. VERIFY PANEL BOARD DIRECTORIES AND BRANCH CIRCUIT DESIGNATIONS AS INDICATED ON RECORD DRAWINGS.

GENERAL

1. COORDINATE AND SCHEDULE THE ELECTRICAL INSTALLATION WITH ALL OTHER TRADES ON SITE.
2. TAKE RESPONSIBILITY FOR MAINTAINING ALL MATERIALS AND EQUIPMENT DELIVERED TO THE SITE IN NEW CONDITION. MAKE ARRANGEMENTS AS NECESSARY FOR PROPER STORAGE AND SECURITY OF MATERIALS DELIVERED TO THE SITE.
3. CLEAN UP WORK AREA AS WORK PROGRESSES.
4. CLEAN ALL DEVICES, FIXTURES, PANEL AND SWITCHGEAR INTERIORS AT END OF PROJECT PRIOR TO SUBSTANTIAL COMPLETION.
5. THIS CONTRACTOR WILL ASSUME RESPONSIBILITY FOR REPAIR AND ALL ASSOCIATED COSTS AS A RESULT OF DAMAGE AT THE SITE WHILE EXECUTING THIS INSTALLATION.
6. MAINTAIN INTEGRITY OF EXISTING THERMAL BARRIERS, INSULATION AND WATERPROOFING.
7. VERIFY WIRING REQUIREMENTS AND LOCATIONS OF EQUIPMENT BEING SUPPLIED BY OTHERS.

DEMOLITION

1. REMOVE ELECTRICAL INFRASTRUCTURE, INCLUDING CONDUIT, WIRE, AND JUNCTION BOXES, AS INDICATED ON PLANS.
2. DO NOT REINSTALL EXISTING CONDUIT, BOXES, DEVICES, WIRE OR CABLE.
3. REMOVE ALL MATERIALS AND EQUIPMENT WHICH IS NOW REDUNDANT OR WHICH BECOMES REDUNDANT DURING THE COURSE OF CONSTRUCTION. REMOVE ALL CONDUITS WHICH ARE ABANDONED TO THE SOURCE OF SUPPLY. ABANDON CONDUITS EMBEDDED IN CONCRETE OR OTHER INACCESSIBLE LOCATIONS.
4. EXISTING SYSTEMS TO REMAIN: LIGHTING, FIRE ALARM, EMERGENCY HELP PUSHBUTTONS, BLOWOUT DOOR ALARMS, SHELVING GROUNDING SYSTEM, ALL CONDUIT AND WIRING THAT IS NOT REDUNDANT.
5. REVISE PANEL BOARD DIRECTORIES TO SUIT.

CUTTING, PATCHING, SLEEVES AND HOLES

1. PERFORM ALL CUTTING REQUIRED. PATCHING AND PAINTING IN AREAS TO BE FINISHED TO BE PERFORMED BY OTHER TRADES. PROVIDED CUTTING IS PERFORMED IN ADVANCE OF FINISHING. COSTS FOR CUTTING PERFORMED AFTER COMPLETION OF FINISHING WORK TO BE THE RESPONSIBILITY OF THIS TRADE.
2. PENETRATIONS (NEW AND ABANDONED) OF FIRE WALLS OR SEPARATIONS ARE TO BE SEALED WITH AN APPROVED SYSTEM. ACCEPTABLE SYSTEMS ARE HILTI OR APPROVED ALTERNATIVE.
3. PRIOR TO CUTTING OR DRILLING INTO STRUCTURAL MEMBERS OBTAIN CONSULTANT APPROVAL.

IDENTIFICATION AND LABELS

1. IDENTIFY ELECTRICAL EQUIPMENT WITH LAMACOID NAMEPLATES.
2. LAMACOID TO BE 3MM THICK, BLACK WITH WHITE LETTERING AND A MATT FINISH, MECHANICALLY ATTACHED WITH MACHINE SCREWS OR RIVETS.
3. ALL JUNCTION OR PULL BOXES, SPLITTERS, OUTLETS ETC. SHALL BE IDENTIFIED WITH PANEL AND CIRCUIT NUMBERS CONTAINED WITH-IN.

CONDUIT, WIRE AND CABLE

1. ALL POWER WIRING TO BE COPPER R90 XLPE CONDUCTORS, MINIMUM 600V RATING #12 AWG MINIMUM. #14 AWG FOR CONTROL ONLY. NO ALUMINUM CONDUCTORS ARE TO BE USED.
2. ALL CONCEALED WIRING IS TO BE INSTALLED IN EMT CONDUIT ABOVE GRADE AND PVC OUTSIDE OR BELOW GRADE OR AREAS LIMITED BY THE ELECTRICAL CODE.
3. INSTALL NEW CONDUIT FOR ALL NEW OR RELOCATED INSTALLATIONS.
4. ALL CONDUITS ARE TO BE CONCEALED INSIDE WALLS OR IN THE CEILING SPACE EXCEPT FOR IN MECHANICAL AND STORAGE ROOMS.
5. INSTALL CONDUIT PARALLEL TO BUILDING LINES. SECURELY FASTEN TO WALLS, UNDERSIDE OF FLOOR ABOVE OR OTHER STRUCTURAL MEMBERS. DO NOT SUPPORT FROM OTHER EQUIPMENT OR CEILING SUPPORT SYSTEMS.
6. MINIMUM CONDUIT SIZE 21mm.
7. PROVIDE PULL AND JUNCTION BOXES AT A MAXIMUM 30 METER SPACING.
8. SEAL ALL PIPING WHERE CONDENSATION MAY BUILD UP FROM TEMPERATURE CHANGE. SEAL SHALL BE COMPATIBLE WITH THE PIPING AND WIRING AND MAY BE REQUIRED TO MEET FIRE STANDARDS WHEN PASSING THROUGH FIRE SEPARATIONS OR WALLS.
9. CONDUITS, CABLES, RACEWAYS OR WIRES ARE NOT TO BE USED AS A SUPPORT FOR OTHER ELECTRICAL OR NON ELECTRICAL EQUIPMENT.
10. CONDUITS TO BE PROVIDED WITH INSULATED THROAT CONNECTORS
11. COLOR CODING OF NON-PHASE WIRES SHALL MATCH EXISTING.

JUNCTION AND OUTLET BOXES

1. ELECTRO-GALVANIZED STEEL SINGLE AND MULTI GANG FLUSH DEVICE BOXES FOR FLUSH INSTALLATION, MINIMUM SIZE 75MM X 50MM X 32MM OR AS INDICATED OR REQUIRED FOR FILL RATINGS.
2. 100MM SQUARE OUTLET BOXES WHEN MORE THAN ONE CONDUIT ENTERS ONE SIDE. 100MM SQUARE OR OCTAGONAL OUTLET BOXES FOR LIGHTING FIXTURE OUTLETS.
3. BOXES ARE TO BE OF THE DESIGNATION TYPE SUITABLE FOR THE AREA.
4. SUPPORT BOXES INDEPENDENTLY OF CONNECTING CONDUITS.
5. PROVIDE CORRECT SIZE OF OPENINGS IN BOXES FOR CONDUIT, MINERAL INSULATED AND ARMORED CABLE CONNECTIONS. REDUCING WASHERS ARE NOT ALLOWED.
6. SECTIONAL BOXES ARE NOT TO BE USED UNLESS WELDED BOXES ARE UNAVAILABLE OR IMPRACTICAL FOR THE LOCATION.
7. PROVIDE FS TYPE BOXES WITH FACTORY THREADED HUBS AND MOUNTING FEET SUITABLE FOR EXPOSED SURFACE MOUNTING, EXTERIOR OF THE BUILDING, IN MECHANICAL AND STORAGE ROOMS OR WHERE INDICATED ON THE PLANS.
8. MAXIMUM ONE EXTENSION RING PER BOX.
9. PROVIDE APPROVED FOR THE PURPOSE HEAVY VAPOR BOXES IN EXTERIOR WALLS OR CEILINGS.
10. PROVIDE EXPLOSION PROOF BOXES AND FITTINGS WHERE REQUIRED.

LIGHTING

1. EXISTING CROUSE-HINDS EV264 LIGHTING FIXTURES TO REMAIN.
2. REPLACE CORRODED HOUSING SCREWS WHERE INDICATED ON PLANS.
3. EXISTING LIGHTING CONTROLS TO REMAIN.

FIRE ALARM SYSTEM

1. AS REQUIRED, REMOVE AND RE-INSTALL EXISTING DEVICES UNDER THE DIRECTION OF A FACTORY TRAINED TECHNICIAN.
2. IF REQUIRED, VERIFY THE SYSTEM IN CONFORMANCE WITH CAN/ULC-S537-M, "STANDARD FOR VERIFICATION OF FIRE ALARM SYSTEMS" TO ENSURE SATISFACTORY OPERATION AS PER NBC 2005 3.2.4.5 "INSTALLATION AND TESTING OF FIRE ALARM SYSTEMS."

ELECTRICAL SERVICE

1. EXISTING SUPPLY: 120/208 V 3 PHASE 4 WIRE 60 HZ.
2. OBTAIN NEW CIRCUITS FROM EXISTING LIGHTING AND POWER PANEL BOARDS AS NOTED ON THE DRAWINGS.
3. PROVIDE ALL NECESSARY CIRCUIT BREAKERS, MOUNTING ACCESSORIES, TRIM AND FILLER PLATES TO SUIT.
4. NEW BREAKERS SHALL BE BOLT-ON TYPE, COMPATIBLE WITH PANELBOARD IN WHICH THEY ARE INSTALLED.
5. SHORT CIRCUIT CURRENT RATINGS SHALL BE 10KAIC FOR BREAKERS.

PANEL BOARDS

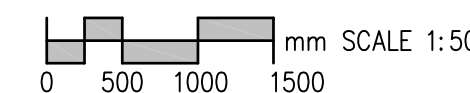
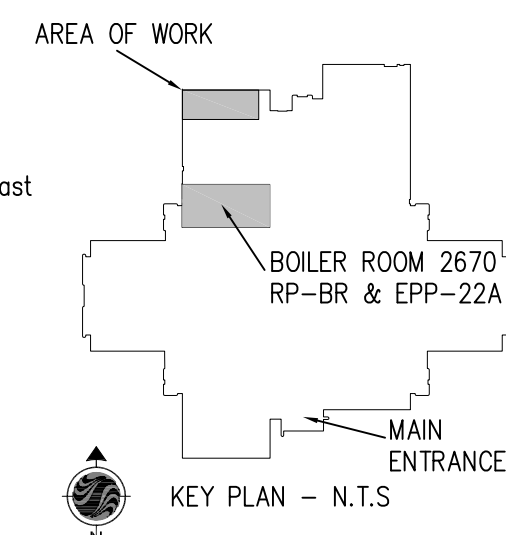
1. RE-WIRE EXISTING PANELS AS REQUIRED.
2. PROVIDE A NEW TYPEWRITTEN DIRECTORY IDENTIFYING ALL NEW AND EXISTING CIRCUITS. DETERMINE EXISTING CIRCUITING ON SITE.
3. INDICATE ALL CIRCUIT LOADS AND ENSURE PHASE LOADS ARE BALANCED.

GROUNDING

1. ALL METAL PARTS OF NON ELECTRICAL EQUIPMENT OR SYSTEMS ARE TO BE BONDED TO GROUND WITH A COPPER CONDUCTOR.
2. PROVIDE COPPER INSULATED GREEN BONDING CONDUCTORS, IN ALL POWER CONDUITS, SIZED TO TABLE 16 OF THE LATEST EDITION OF THE CANADIAN ELECTRICAL CODE PART 1, UNLESS INDICATED OTHERWISE, #12 AWG MINIMUM

LIGHTNING PROTECTION

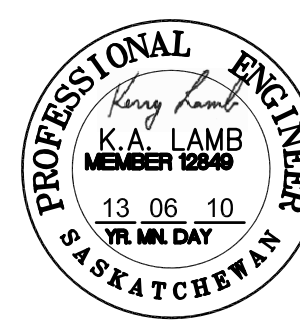
1. INSTALLATION TO BE IN ACCORDANCE WITH CAN/CSA-B72 "INSTALLATION CODE FOR LIGHTNING PROTECTION SYSTEM".
2. LIGHTNING CABLE: 98 PERCENT CONDUCTIVITY BRAIDED COPPER, DODD & STRUTHERS NO. 32 OR EQUIVALENT. FASTEN TO STEEL STRUCTURE AT MAXIMUM SPACING OF 1.5M.
3. AIR TERMINALS: 10MM DIA X 610MM DODD & STRUTHERS #330-B SOLID COPPER WITH THREADED UNIVERSAL MOUNTING BASE #60J FOR EASE OF REMOVAL.
4. MECHANICAL OR COMPRESSION CONNECTORS SHALL BE USED TO INTERCONNECT TO EXISTING LIGHTNING PROTECTION SYSTEM. USE TOOLS APPROVED FOR THE CONNECTORS BEING USED.



Stantec Consulting Ltd.
100 - 75 - 24th Street East
Saskatoon, Sk.
S7K 0K3
Tel. 306.667.2500
Fax. 306.664.6639
www.stantec.com



STANTEC JOB N.O. 113300648



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CHEMICAL ROOM ACID STORAGE RETROFIT

10-06-2013	TENDER	Drawn/Dessine	JD	Date/Date	2013.05.24		Enthronement Canada Gestion de l'immobilier District 2 #11 INNOVATION BLVD SASKATOON, SK, S7N 3H5	DWG # / DESSIN #	
24-05-2013	100%_REVIEW	DWG. Title/Titre Dessin		Scale/Echelle	NONE				E2
10_05-2013	50%_REVIEW	ELECTRICAL SPECIFICATIONS							
DATE	REVISION								