DIV.26 – ELECTRICAL SPECIFICATIONS

1.0 GENERAL PROVISIONS

1.01
THE DRAWINGS, GENERAL CONDITIONS AND GENERAL PROVISIONS OF THE CONTRACT SHALL FORM AN INTEGRAL PART OF THE SPECIFICATIONS. WHERE CONFLICTS ARISE BETWEEN THESE DOCUMENTS, THE MORE STRINGENT PROVISION WILL BE APPLICABLE, SUBJECT TO THE INTERPRETATION OF THE ENGINEER.

1.02
FURNISH ALL LABOR, MATERIAL, SERVICES, AND SKILLED SUPERVISION NECESSARY FOR THE CONSTRUCTION, ERECTION, INSTALLATION, CONNECTIONS, TESTING, AND ADJUSTMENT OF ALL MATERIALS AND ELECTRICAL EQUIPMENT NECESSARY FOR COMPLETE AND OPERATING SYSTEMS AS INDICATED ON THE DRAWINGS OR SPECIFIED HEREIN, AND ITS DELIVERY TO THE OWNER, COMPLETE IN ALL RESPECTS AND READY FOR USE.

1.03
ALL ELECTRICAL WORK AND MATERIAL SHALL CONFORM WITH THE CURRENT RELEVANT AND/OR APPLICABLE BUILDING CODE, ELECTRICAL CANADIAN CODE AND TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AND THE DESIGN PROFESSIONAL. FOR THE PURPOSE OF THIS SPECIFICATION INTERPRETATION OF THE WORD "CODE" SHALL MEAN ALL CODES, REGULATIONS AND REQUIREMENTS AS STATED ABOVE.

1.04
THE CONTRACT INCLUDES THE FURNISHING OF LABOUR, MATERIAL, EQUIPMENT, AND SERVICES NECESSARY FOR A COMPLETE ELECTRICAL SYSTEM AS SHOWN ON THE DRAWINGS AND OPERATING TO THE COMPLETE SATISFACTION OF THE ENGINEER.

1.05
THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE WHERE THE CONTRACT DOCUMENTS EXCEED CODE, UTILITY OR RECOGNIZED STANDARDS REQUIREMENTS

1.06
EXAMINE THE SITE, BUILDING AND LOCAL CONDITIONS AFFECTING WORK OF THIS CONTRACT. EXAMINE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL CONDITIONS TO ENSURE WORK CAN BE PERFORMED WITHOUT CHANGES, AS SHOWN ON CONTRACT DRAWINGS. NO ALLOWANCE WILL BE MADE LATER FOR NECESSARY CHANGES, UNLESS IT HAS BEEN BROUGHT TO ENGINEER'S ATTENTION IN WRITING, PRIOR TO CLOSING OF TENDERS. BY SIGNING THE CONTRACT, THE CONTRACTOR ACKNOWLEDGES THE SITE VISIT HAS BEEN COMPLETED AND THE EXISTING CONDITIONS WERE ACCEPTED.

1.07
APPLY FOR ALL PERMITS, SERVICES, FEES AND INSPECTIONS AND PAY FOR ALL FEES TO THE AUTHORITIES HAVING JURISDICTION. INCLUDE ALL COST IN TENDER QUOTE.

1.08
OBTAIN APPROVALS FROM THE ELECTRICAL INSPECTION AUTHORITY AND NOTIFY THE ENGINEER OF ANY CHANGES REQUESTED BY THE INSPECTION AUTHORITY PRIOR TO THE EXECUTION OF THE REQUEST.

1.09
CONTRACTOR SHALL COMPLY WITH ALL DEPARTMENT OF LABOUR, WORKPLACE AND HEALTH REQUIREMENTS AT ALL TIMES

1.10
WHERE DOUBT EXISTS AS TO THE MEANING OF THE DRAWINGS OR SPECIFICATIONS, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN CLARIFICATION PRIOR TO TENDER.

1.11
INCLUDE ALL FEDERAL, PROVINCIAL AND MUNICIPAL TAXES FOR THE WORK IN THE TENDER PRICE.

1.12
THE CONTRACTOR IS RESPONSIBLE TO PROVIDE A TEMPORARY ELECTRICAL SERVICE AS REQUIRED BY ALL TRADES. COORDINATE POWER REQUIREMENTS FOR THE TEMPORARY SERVICE WITH THE GENERAL CONTRACTOR.

1.13
ALL MATERIALS USED SHALL BE NEW, OF THE TYPE SPECIFIED, AND APPROVED BY CERTIFICATION AGENCY RECOGNIZED BY AUTHORITY BARING JURISDICTION, AND FREE FROM DEFECTS.

1.14
ALL ELECTRICAL EQUIPMENT INSTALLED OR CONNECTED SHALL BE IDENTIFIED BY MEANS OF BLACK LAMICOID LABELS C/W MINIMUM 3/8" WHITE LETTERING. THIS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:

- SWITCHBOARDS,
- PANEL BOARDS,
- DISCONNECT SWITCHES,
- TRANSFORMERS,
- STARTERS/VFD'S,
- ETC.

1.15
CLEAN ALL EQUIPMENT DURING CONSTRUCTION AND AGAIN ON COMPLETION OF THE CONTRACT.

1.16
REMOVE ALL SURPLUS MATERIALS, CUTTINGS, PACKAGING AND DEBRIS FROM THE SITE DURING THE PROGRESS AND AT FINAL COMPLETION OF THE WORK.

1.17
EXECUTE WORK IN A FIRST-CLASS AND WORKMANLIKE MANNER, TO PRESENT A NEAT AND MECHANICAL APPEARANCE.

1.18
ALL RECEPTACLE COVER PLATES, SWITCH COVER, AND EXHAUST FAN SWITCH COVERS TO BE C/W DYMOTAPE LABELS INDICATING PANEL NAME AND CIRCUIT NUMBERS

1.19
EXCAVATION AND FILL

1. WHERE REQUIRED THE CONTRACTOR SHALL PERFORM ALL EXCAVATION AND BACK-FILLING PERTAINING TO THIS PORTION OF THE CONTRACT. FILL MATERIAL SHALL BE EQUIVALENT TO THE SURROUNDING MATERIAL. CONTRACTOR SHALL COORDINATE ALL WORK REQUIRED.
2. UNDER NO CIRCUMSTANCES SHALL A CONTRACTOR PROCEED WITH DIGGING WITHOUT CHECKING WITH PERTINENT PARTIES AND/OR AUTHORITIES REGARDING THE EXISTING UNDERGROUND SERVICES DUCTS, STRUCTURES ETC.
3. WHEN UNDERGROUND SERVICE/INSTALLATION HAS TO BE CONNECTED TO SERVICES SUPPLIED AND INSTALLED BY OTHER PARTIES, CONTRACTOR SHALL FULLY COORDINATE WITH THE PARTIES THE EXACT POINT OF CONNECTION. THIS COORDINATION HAS TO BE PERFORMED BEFORE ANY EXCAVATION AND INSTALLATION.
4. ALL CIVIL CONCRETE, EXCAVATION OR BACKFILL WORK INCLUDING SHORING AND BEDDING SHALL BE PERFORMED UNDER THE DIRECTION OF THE RELEVANT PROFESSIONAL (CIVIL OR STRUCTURAL ENGINEER) ON THE PROJECT. FOR DIRECTIONS, GUIDANCE, SPECIFICATION REGARDING THIS WORK, THE CONTRACTOR SHALL CONTACT THE RELEVANT PROFESSIONAL(S).

1.20
BUILDING ENVELOPE PENETRATION OF ANY ELECTRICAL COMPONENT (I.E. CONDUIT, BOXES, CABLES, ETC.) SHALL BE EXECUTED SO INTEGRITY OF ASSEMBLY IS NOT COMPROMISED. PROVIDE FOR ADEQUATE SEALING, COVERS, GASKETS, CAPS, ETC. COORDINATE WORK AND REQUIREMENTS WITH ALL OTHER RELEVANT CONTRACTORS, ARCHITECT, ENVELOPE CONSULTANT AND OTHER RELEVANT CONSULTANTS AND CONTRACTORS.

1.21
THE ELECTRICAL SERIES DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS PERTAIN TO THE ELECTRICAL SCOPE OF WORK ONLY. TASKS WHICH ARE NOT PART OF THE ELECTRICAL SCOPE OF WORK EVEN IF MENTIONED IN THESE DOCUMENTS ARE INDICATED PURELY FOR REFERENCE AND COORDINATION PURPOSES ONLY.

1.22
THE DRAWINGS ARE DIAGRAMMATIC ONLY, AND DOES NOT SHOW ALL DETAILS. INFORMATION INVOLVING ACCURATE MEASUREMENTS OF THE BUILDING, STRUCTURAL STEEL, EXISTING WALLS, ETC. ARE TO BE TAKEN IN THE FIELD. THE CONTRACTOR SHALL MAKE, WITHOUT ADDITIONAL EXPENSE TO OWNER NECESSARY CHANGES OR ADDITIONS TO RUNS TO ACCOMMODATE STRUCTURAL CONDITIONS.

1.23
LOCATION OF DEVICES MAY BE ALTERED WITHOUT CHARGE TO OWNER, PROVIDED THE CHANGE IS MADE BEFORE FINAL INSTALLATION, IT DOES NOT NECESSITATE ADDITIONAL MATERIALS, AND ALL SUCH CHANGES ARE RATIFIED BY OWNER'S REPRESENTATIVE. RECORD CHANGES ON RECORD SET OF DRAWINGS.

1.24
DRAWING SHOWS GENERAL LOCATION FOR EQUIPMENT AND CIRCUITS; INSTALL THEM IN SUCH A WAY AS TO CONSERVE HEADROOM AND INTERFERE AS LITTLE AS POSSIBLE WITH THE FREE USE OF SPACE THROUGH WHICH THEY PASS.

1.25
ALL MATERIALS, TOOLS, APPLIANCES, SCAFFOLDING, APPARATUS AND LABOUR NECESSARY FOR THE EXECUTION, ERECTION AND COMPLETION OF SPECIFIED SYSTEMS SHALL BE FURNISHED

1.26
ALL PAINTING AND PATCHING SHALL BE DONE BY QUALIFIED LABOURERS.

1.27
1M SHALL BE KEPT CLEAR IN FRONT OF ALL PANELBOARDS AS PER CEC

1.28
INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURERS' INSTRUCTIONS, THE CANADIAN ELECTRICAL CODE AND ALL OTHER AUTHORITIES HAVING JURISDICTION. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES TO ENSURE PROPER INSTALLATION.

1.29
CONTRACTOR SHALL KEEP AN ONGOING SET OF 'RECORD' DRAWINGS ON SITE FOR REVIEW BY OWNER OR ENGINEER AT ANY TIME. DRAWINGS TO BE TURNED OVER UPON COMPLETION OF PROJECT.

1.30
CONDUITS SHALL NOT HAVE MORE THAN ONE VOLTAGE LEVEL OF WIRING RUNNING WITHIN THEM.

2.0 DEFINITIONS

2.01
THE FOLLOWING ARE DEFINITIONS OF TERMS AND EXPRESSIONS USED IN THE ELECTRICAL SPECIFICATION AND DRAWINGS:

- INSPECTION AUTHORITY – MEANS AGENT OF ANY AUTHORITY HAVING JURISDICTION OVER CONSTRUCTION STANDARDS ASSOCIATED WITH ANY PART OF ELECTRICAL WORK ON SITE.
- SUPPLY AUTHORITY – MEANS ELECTRICAL POWER UTILITY COMPANY RESPONSIBLE FOR DELIVERY OF ELECTRICAL POWER TO PROJECT (MANITOBA HYDRO).
- ELECTRICAL CODE – MEANS CANADIAN ELECTRICAL CODE OR LOCAL CODE IN FORCE AT PROJECT LOCATION.
- PROVIDE – MEANS TO SUPPLY, INSTALL AND LEAVE IN WORKING ORDER ALL MATERIALS AND NECESSARY WIRING, SUPPORTS, ACCESS PANELS, ETC., AS NECESSARY FOR EQUIPMENT INDICATED.
- CONCEALED – MEANS HIDDEN FROM NORMAL SIGHT IN FURRED SPACES, SHAFTS, CEILING SPACES, WALLS AND PARTITIONS;
- EXPOSED – MEANS WORK NORMALLY VISIBLE, INCLUDING WORK IN EQUIPMENT ROOMS, TUNNELS, AND SIMILAR SPACES;
- FINISHED – MEANS WHEN IN DESCRIPTION OF ANY AREA OR PART OF AN AREA OR A PRODUCT WHICH RECEIVES A FINISH SUCH AS PAINT, OR IN CASE OF A PRODUCT MAY BE FACTORY FINISHED;
- INSTALL (AND TENSES OF "INSTALL") – MEANS SECURE IN POSITION, CONNECT COMPLETE, TEST, ADJUST AND VERIFY;
- CONNECT – TO BRING SERVICE TO THE EQUIPMENT AND MAKE FINAL ATTACHMENT INCLUDING NECESSARY SWITCHES, OUTLETS, BOXES, TERMINATIONS, ETC.;
- SUPPLY – MEANS TO PROCURE, ARRANGE FOR DELIVERY TO SITE, DISTRIBUTE TO FLOORS, INSPECT, ACCEPT DELIVERY AND ADMINISTER SUPPLY OF MANUFACTURER'S PRODUCTS AND/OR SYSTEMS, AND INCLUDES MANUFACTURER'S SUPPLY OF ANY SPECIAL CABLES, STANDARD ON SITE TESTING, INITIAL START-UP, PROGRAMMING, BASIC COMMISSIONING, WARRANTIES AND ASSISTANCE TO CONTRACTOR;
- DELETE OR REMOVE (AND TENSES OF "DELETE" OR "REMOVE") – MEANS TO DISCONNECT, MAKE SAFE, REMOVE INCLUDING ANY BACK BOX AND EXPOSED CONDUITS, PATCH AND REPAIR/FINISH SURFACES TO MATCH ADJOINING SIMILAR CONSTRUCTION, INCLUDE FOR ASSOCIATED RE-PROGRAMMING OF SYSTEMS AND/OR CHANGE OF DOCUMENTATION IDENTIFICATIONS TO SUIT DELETIONS, AND PROPERLY DISPOSE OF DELETED PRODUCTS OFF SITE UNLESS OTHERWISE INSTRUCTED BY CONSULTANT;
- BAS – MEANS BUILDING AUTOMATION SYSTEM; "BMS" – MEANS BUILDING MANAGEMENT SYSTEM, "FMS" – MEANS FACILITY MANAGEMENT SYSTEM; AND "DDC" MEANS DIRECT DIGITAL CONTROLS; REFERENCES TO "BAS", "BMS", "FMS" AND "DDC" GENERALLY MEAN SAME;
- ELECTRICAL DIVISIONS – REFERS TO DIVISIONS 26, 27, 28 AND OTHER DIVISIONS AS SPECIFICALLY NOTED, AND WHICH WORK AS DEFINED IN SPECIFICATIONS AND /OR ON DRAWINGS IS RESPONSIBILITY OF ELECTRICAL CONTRACTOR, UNLESS OTHERWISE NOTED;
- MECHANICAL DIVISIONS – REFERS TO DIVISIONS 20, 21, 22, 23, 25 AND OTHER DIVISIONS AS SPECIFICALLY NOTED, AND WHICH WORK AS DEFINED IN SPECIFICATIONS AND /OR ON DRAWINGS IS RESPONSIBILITY OF MECHANICAL CONTRACTOR, UNLESS OTHERWISE NOTED;

3.0 SUBMITTALS

3.01
SUBMIT PRODUCT DATA FOR ALL EQUIPMENT. ACCEPTABLE MATERIALS SHALL BE AS SPECIFIED, CODE APPROVED OR OWNER APPROVED. ALL MATERIAL SHALL BE NEW, UNLESS SPECIFIED OTHERWISE.

3.02
LIGHTING FIXTURES LISTED ARE PREFERRED. CONTRACTOR MAY, HOWEVER, SUBMIT ALTERNATES ONE WEEK PRIOR TO CLOSING OF TENDER TO DESIGN ENGINEER FOR APPROVAL AS EQUIVALENT.

3.03
SHOP DRAWINGS FOR ELECTRICAL EQUIPMENT/MATERIALS SHALL BE SUBMITTED FOR REVIEW BY THE ENGINEER BEFORE MANUFACTURING AND INSTALLATION CAN PROCEED.

3.04
SUBMIT TO THE ENGINEER UPON COMPLETION OF THE CONTRACT, TWO MARKED UP SETS OF RECORD DRAWINGS AND THREE SETS OF MAINTENANCE MANUALS FOR SERVICE, DISTRIBUTION, PANELS, LIGHT FIXTURES, LAMPS, EXITS, EMERGENCY UNITS, EMERGENCY HEADS, AND FIRE ALARM EQUIPMENT.

3.05
SUBMIT TO THE ENGINEER A COPY OF CERTIFICATE VERIFYING THAT EMERGENCY LIGHTING SYSTEM HAS BEEN TESTED UNDER FULL LOAD AS PER CODE REQUIREMENTS.

3.06
AFTER WORK IS COMPLETED, FURNISH TO OWNER A WRITTEN GUARANTEE THAT FOR ONE YEAR FROM DATE OF ACCEPTANCE, ANY DEFECTS IN MATERIALS OR WORKMANSHIP WILL BE CORRECTED AT NO COST TO THE OWNER. SUBMIT COPY OF GUARANTEE TO ENGINEER.

3.07
SUBMIT COPIES OF FIRE ALARM VERIFICATION AND TESTING REPORT TO THE ENGINEER PRIOR TO FINAL ACCEPTANCE. THESE MUST BE PROVIDED THREE WORKING DAYS BEFORE ENGINEERS FINAL OCCUPANCY REVIEW.

4.0 COORDINATION

4.01
THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE SCOPE OF THE WORK REQUIRED FOR EACH TRADE. WORK SHALL BE DONE BY THE APPROPRIATE SKILLED TRADE. ALL TRADES MUST COORDINATE WORK TO ENSURE THAT THE ENTIRE SCOPE OF THE PROJECT IS COVERED. THERE SHALL BE NO ALLOWANCES GIVEN FOR ITEMS WHICH RESULT AS A FAILURE OF CO-ORDINATION. THE CONTRACTOR WILL REVIEW THE DRAWINGS WITH ALL TRADES PRIOR TO TENDER SUBMISSION TO RESOLVE ALL COORDINATION ISSUES.

4.02
COORDINATE WITH ALL TRADES AND ARRANGE EQUIPMENT IN PROPER RELATION WITH OTHER APPARATUS, DUCTS, PIPES, ETC. AND WITH BUILDING CONSTRUCTION AND ARCHITECTURAL FINISHES.

4.03
RESPONSIBILITY TO DETERMINE WHICH DIVISION OR SECTION PROVIDES VARIOUS PRODUCTS AND WORK, RESTS WITH THE CONTRACTOR. ADDITIONAL COMPENSATION WILL NOT BE CONSIDERED BECAUSE OF DIFFERENCES IN INTERPRETATION OF TECHNICAL PROVISIONS.

4.04
THE CONTRACTOR SHALL COORDINATE WITH THE OWNER DURING THE DEMOLITION AND CONSTRUCTION PHASES OF THE WORK FOR ALL TEMPORARY ELECTRICAL CONNECTIONS REQUIRED AND FOR THE REMOVAL OF EXISTING POWER SERVICES AND THE INSTALLATION OF NEW SERVICES. CONTRACTOR SHALL COMPLETE ALL PRELIMINARY WORK PRIOR TO ANY POWER OUTAGES.

4.05
CONTRACTOR SHALL COORDINATE, NOTIFY AND ARRANGE WITH THE OWNER, GENERAL CONTRACTOR AND CONSULTANT ALL STAGING REQUIREMENTS TO MINIMIZE ALL POWER DISRUPTIONS AND ANY POWER OUTAGES NECESSARY TO COMPLETE THE WORK AT NO ADDITIONAL COST.

5.0 UTILITY SERVICES

5.01
PROVIDE TERMINATION AND CONDUITS FOR INCOMING HYDRO, TELEPHONE AND CABLE TV UNDERGROUND SERVICES. OBTAIN EXACT LOCATION OF ALL DUCTS FROM SUPPLY AUTHORITIES BEFORE INSTALLATION. FOR EMPTY CONDUITS, PROVIDE NYLON PULL CORD FOR HYDRO, TELEPHONE, AND CABLE TV DUCTS. INCLUDE ALL HYDRO UTILITY, TELEPHONE UTILITY AND CABLE TV CHARGES IN THE TENDER PRICE. ALL THE ABOVE SHALL MEET THE REQUIREMENTS OF THE RESPECTIVE UTILITIES.

5.02
THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE FOLLOWING WITH THE LOCAL HYDRO, TELEPHONE AND CABLE TV OFFICES:

1. APPROVAL OF ANY CHANGES TO THE UNDERGROUND CONDUIT ROUTE PRIOR TO INSTALLATION.
2. HYDRO INSPECTION AND APPROVAL OF ALL UNDERGROUND CONDUIT AND TRANSFORMER PAD INSTALLATION PRIOR TO POURING OF CONCRETE AND BACKFILL.
3. SUBMISSION OF THREE COPIES OF THE ARRANGEMENT OF ALL SERVICE ENTRANCE EQUIPMENT PRIOR TO PURCHASE AND INSTALLATION.

5.03
CONFIRM EXACT LOCATION OF ALL HYDRO, TELEPHONE AND CABLE TV SERVICE ENTRANCES DIRECTLY WITH THE UTILITY BEFORE ANY INSTALLATION.

5.04
GENERALLY DBII ESII DUCT SHALL BE USED FOR UNDERGROUND ON SITE SERVICES FOR HYDRO, TELEPHONE AND CABLE TV SERVICES.

5.05
OBTAIN APPROVED PERMITS FROM HYDRO'S LOCAL INSPECTION DEPARTMENT FOR GAS AND HYDRO UNDERGROUND SERVICES PRIOR TO UNDERTAKING ANY EXCAVATIONS.

6.0 DISTRIBUTION EQUIPMENT

6.01
MAIN DISTRIBUTION CENTERS SHALL BE AS DETAILED ON THE DRAWINGS.

6.02
ALL ELEMENTS OF ELECTRIC POWER DISTRIBUTION SYSTEM SHALL BE RATED FOR PROPER VOLTAGE AND AVAILABLE FAULT LEVELS. OVER CURRENT PROTECTION DEVICES SHALL BE APPROVED AND MARKED AS BREAKERS OR BREAKER/FUSES COMBINATION IN SERIES. SHOP DRAWINGS SHALL CLEARLY IDENTIFY THE COMPLIANCE WITH THIS REQUIREMENT.

6.03
PROVIDE DRIP SHIELDS TO ADEQUATELY DEFLECT WATER FROM ALL ELECTRICAL EQUIPMENT.

6.04
ENSURE THAT THE SERVICE EQUIPMENT BEARS EVIDENCE OF "SUITABLE FOR SERVICE ENTRANCE"

7.0 DISCONNECT SWITCHES

7.01
NON-FUSIBLE, HORSE POWER RATED DISCONNECT SWITCH IN CSA (WEATHERPROOF WHERE INSTALLED OUTSIDE) ENCLOSURE.

- PROVISION FOR PADLOCKING IN SWITCH OFF POSITION.
- MECHANICALLY INTERLOCKED DOOR TO PREVENT OPENING WHEN HANDLE IN ON POSITION
- QUICK-MAKE, QUICK-BREAK ACTION
- ON-OFF SWITCH POSITION INDICATION ON SWITCH ENCLOSURE COVER.

ACCEPTABLE MANUFACTURER: SQUARE 'D', CUTLER HAMMER.

8.0 PANELBOARDS

8.01
LIGHTING AND POWER PANELS TO BE CIRCUIT BREAKER TYPE AND AS SHOWN ON DRAWINGS: PANELS SHALL CONTAIN THE FOLLOWING:

- BOLT-ON MOLDED CASE CIRCUIT BREAKERS: QUICK-MAKE, QUICK-BREAK TYPE, FOR MANUAL AND AUTOMATIC OPERATION WITH TEMPERATURE COMPENSATION FOR 40C AMBIENT,
- MULTI-POLE BREAKERS TO HAVE COMMON TRIP (NO TIE HANDLE WILL BE ACCEPTED),
- BREAKERS USED FOR LIGHTS SHALL BE RATED FOR SWITCHING THAT DUTY,
- PANEL AND BREAKERS TO BE OF ONE MANUFACTURER. CIRCUIT BREAKERS SHALL BE INSTALL IN PANELBOARDS BEFORE SHIPMENT,
- COPPER BUS WITH NEUTRAL OF SAME AMPERE RATING AS MAINS,
- DEAD FRONT TYPE,
- CODE GAUGE STEEL ENCLOSURE,
- TRIM WITH CONCEALED FRONT BOLTS AND HINGES AND DOOR
- FINISHED FACTORY PAINT CSA GRAY 61 ENAMEL,
- FIT WITH PLASTIC COVERED TYPED DIRECTORY IN FRAME ON INSIDE OF DOOR COVER,
- DIRECTORY TO INDICATE CIRCUITS SERVED AS PER FINAL WIRING CONNECTIONS,
- IN ADDITION TO CSA REQUIREMENTS MANUFACTURER'S NAMEPLATE SHALL SHOW FAULT CURRENT THAT THE PANEL INCLUDING BREAKERS HAVE BEEN BUILT TO WITHSTAND,
- DRIP SHIELDS TO ADEQUATELY DEFLECT WATER,
- PANELS SHALL MOUNT FLUSH IN STANDARD DEPTH WALL,
- TWO KEYS SHALL BE PROVIDED FOR EACH PANELBOARD AND ALL PANELBOARDS SHALL BE KEYED ALIKE FOR THE ENTIRE SITE

8.02
PROVIDE LOCK-ON DEVICES ON BREAKERS FOR THE FOLLOWING SYSTEMS.

- FIRE ALARM SYSTEM
- INTRUSION ALARM SYSTEM
- EXIT LIGHTS
- NIGHT LIGHTS

ACCEPTABLE MANUFACTURER: SQUARE 'D', CUTLER HAMMER, OR MATCH EXISTING.

9.0 CONDUIT, WIRE AND CONNECTIONS

9.01
DRAWINGS ARE SCHEMATIC ONLY. CONDUIT RUNS SHOWN INDICATE POINTS TO BE JOINED. RUNS MAY BE ALTERED BY THE CONTRACTOR TO SUIT ACTUAL FIELD CONDITIONS. ELECTRICAL DRAWINGS ONLY GIVE INDICATION OF OTHER TRADES EQUIPMENT.

9.02
WIRING DEVICES IN FINISHED AREAS SHALL BE RECESSED MOUNTED AND FOR ALL UNFINISHED AREAS MAY BE SURFACE MOUNTED.

9.03
A WARNING SIGN SHALL BE PLACED NEAR ALL MOTORS WITH THE FOLLOWING WORDING: "DO NOT SERVICE UNTIL DISCONNECTS ARE LOCKED OFF".

9.04
FINAL CONNECTIONS TO MOTORS SHALL BE WITH MIN. 18" LONG FLEX CONDUIT, PROVIDE SEPARATE LOCAL SAFETY DISCONNECTS AS PER CODE REQUIREMENTS.

9.05
UNLESS OTHERWISE NOTED, FOR ALL OUTSIDE LIGHTING, USE MINIMUM #10 RW90 RUN IN 1" RIGID PVC CONDUIT C/W BOND WIRE. INCREASE WIRE GAUGE ACCORDING TO LOAD AND DISTANCE.

9.06
TEST SYSTEM AND RECORD SAME FOR THE ENGINEER'S APPROVAL:

- VOLTAGE DROP
- PHASE BALANCE
- INSULATION RESISTANCE
- GROUND RESISTANCE

9.07
ALL WIRE AND CABLE SHALL BE COPPER, 98% CONDUCTIVITY, COLOUR CODED, NEW AND MARKED AS PER CODE REQUIREMENTS AND INSTALLED IN RACEWAYS. WIRES SHALL BE RATED MINIMUM 600V TYPE TWH OR R90X-LINK. RW90 SHALL BE USED FOR UNDERGROUND RACEWAY INSTALLATIONS.

9.08
ALL WIRING SHALL BE SIZED AS PER CODE MINIMUM ALLOWABLE WIRE SIZE IS #12 AWG. USE MINIMUM #14 GTF FOR LIGHT FIXTURE CONNECTIONS. CONDUCTORS #8 AND LARGER TO BE STRANDED. ALL WIRES INSTALLED IN CONDUIT SHALL BE PULLED IN AT THE SAME TIME. ONLY APPROVED PULLING LUBRICANT SHALL BE USED. COLOUR CODE CONDUCTORS WITH DIFFERENT COLOURS FOR EACH PHASE, NEUTRAL, GROUND AND BOND WIRES AS REQUIRED BY CODE.

9.09
MAXIMUM VOLTAGE DROP SHALL BE AS PER CODE REQUIREMENTS.

9.10
ALL CONDUITS, CABLES AND WIRES, ETC., TO BE RATED EITHER FT1 FOR COMBUSTIBLE BUILDINGS, FT4 FOR NON COMBUSTIBLE BUILDINGS AND FT6 FOR PLENUM AND AS REQUIRED BY THE CODE.

9.11
ALL WIRE CONNECTIONS TO BE SECURELY FASTENED BY MEANS OF APPROVED CONNECTORS.

9.12
ALL NON-CURRENT CARRYING METAL PARTS SHALL BE GROUNDED AND/OR BONDED IN ACCORDANCE WITH THE CODE.

9.13
THE BUILDING STRUCTURAL STEEL SHALL BE BONDED TO THE GROUND SYSTEM.

9.14
OPENINGS IN ALL ELECTRICAL METAL BOXES SHALL BE PUNCHED OR CUT. BURNING OF HOLES IS NOT PERMITTED.

9.15
INSTALL ALL CONDUITS, ETC. TO ACCOUNT FOR EXPANSION AND INSTALL APPROVED EXPANSION JOINTS WHERE REQUIRED.

9.16
RACEWAYS SHALL BE RIGID METAL CONDUITS, EMT OR FLEXIBLE CONDUIT AS SHOWN ON THE DRAWINGS, ALL CONDUIT INSTALLED IN CONCRETE FLOOR SHALL BE RIGID P.V.C. OR RIGID GALVANIZED STEEL CONDUIT C/W BOND CONDUCTOR.

9.17
EMT COUPLINGS AND CONNECTORS TO BE T & B STEEL, TAPE ALL JOINTS FOR ALL IN-SLAB INSTALLATIONS. STEEL SHALL BE USED ABOVE GRADE.

9.18
ALL CONDUITS MUST BE SECURELY FASTENED WITH APPROVED CLIPS AND SCREWS IN PARTITIONS AND CADDY CLIPS IN CEILING. NAILS ARE NOT ACCEPTED.

9.19
EXPOSED CONDUITS SHALL NOT BE ACCEPTED UNLESS OTHERWISE NOTED ON THE DRAWINGS. WHERE CONDUITS ARE RUN EXPOSED ON EXISTING SURFACES PAINT TO MATCH WALL FINISH.

9.20
CONDUITS MOUNTED EXPOSED UP TO 5'-0" A.F.F. SHALL BE RIGID STEEL GALVANIZED STANDARD WEIGHT WITH GALVANIZED THREADED COUPLINGS.

9.21
PROVIDE OUTLET BOXES FOR CONNECTING TO DEVICES AND EQUIPMENT AS REQUIRED OR AS INDICATED ON DRAWINGS. LOCATIONS OF OUTLETS MAY BE CHANGED UP TO 15'-0" WITHOUT EXTRA CHARGE PROVIDED THAT INSTRUCTIONS FOR CHANGE ARE ISSUED BEFORE INSTALLATION OF THE OUTLET.

9.22
ALL CONDUIT, CONDUCTORS, WIRES, ETC. TO BE LABELED IN INDELIBLE INK AT PANEL AND JUNCTION BOXES INDICATING DEVICE FED, PANEL NAME AND CIRCUIT NUMBER.

9.23
PRIOR TO INSTALLATION OF ANY CONDUIT IN CONCRETE SLABS, CONTRACTOR SHALL COORDINATE LAYOUT AND REQUIREMENTS WITH STRUCTURAL ENGINEER.

10.0 LUMINAIRES, LAMPS AND BALLAST

10.01
LUMINAIRES SHALL BE AS DETAILED IN FIXTURE SCHEDULE AND INSTALLED AS INDICATED IN LOCATIONS SHOWN. INSTALL COMPLETE WITH LAMPS, BALLAST, DRIVERS, DIFFUSERS, HANGERS, GASKETS, END CAPS, CANOPIES AND SUPPORTS FOR A COMPLETE AND FINISHED OPERATION. FINAL LAYOUT OF LUMINAIRES SHALL BE MADE AFTER DUCTING, PIPING, AND SHELVING LAYOUTS ARE FULLY COORDINATED WITH OTHER TRADES. ALL LUMINAIRES TO BE ADEQUATELY ATTACHED DIRECTLY TO THE BUILDING STRUCTURE.

10.02
UNLESS OTHERWISE INDICATED, BALLAST SHALL BE HIGH POWER FACTOR RAPID START SOUND RATING "A" SUITABLE FOR 120V OPERATION.

10.03
PROVIDE LAMPS FOR ALL FIXTURES. LAMPS SHALL BE PROVIDED AS INDICATED IN THE FIXTURE SCHEDULE, INCANDESCENT LAMPS SHALL HAVE MINIMUM 2,500 HOUR LIFE RATING.

10.04
CONTRACTOR SHALL SUPPLY AND INSTALL CONCRETE BASES FOR ALL POLE LIGHTING. PRIOR TO MANUFACTURING AND/OR INSTALLATION CONTRACTOR SHALL COORDINATE ANCHOR BOLT SIZES, LAYOUT AND SPEC, ETC. WITH POLE BASE AND LIGHT FIXTURE SUPPLIERS.

10.05
THE DIMENSIONS FOR CONCRETE BASES SHALL NOT BE SMALLER THAN INDICATED ON THE DRAWINGS.

10.06
ALL FIRE RESISTANCE RATED ASSEMBLIES (I.E. WALLS, CEILINGS, ETC.) WHICH CONTAIN RECESSED LIGHTING FIXTURES SHALL BE C/W FIRE RATED BACKING TO MAINTAIN THE INTEGRITY OF THE FIRE RESISTANCE.

11.0 FINAL ACCEPTANCE

11.01
AS KGS GROUP IS REQUIRED TO GIVE PROFESSIONAL ASSURANCE THAT ALL ELECTRICAL SYSTEMS HAVE BEEN INSTALLED, TESTED AND VERIFIED IN ACCORDANCE WITH THE MANITOBA BUILDING CODE AND THE CANADIAN ELECTRICAL CODE, KGS REQUIRES THE FOLLOWING ITEMS FROM THE CONTRACTOR PRIOR TO ISSUANCE OF "LETTER OF PROFESSIONAL ASSURANCE" FOR BUILDING OCCUPANCY":

1. VERIFICATION CERTIFICATE AND REPORT SHEETS SHOWING FIRE ALARM WAS "INSPECTED" AND "TESTED" IN ACCORDANCE WITH CAN/ULC-S537M "STANDARD FOR VERIFICATION OF FIRE ALARM INSTALLATIONS". THIS SHALL INCLUDE THE MONITORING OF FIRE ALARM, FIRE ALARM SYSTEM TROUBLE, AND SPRINKLER SUPERVISORY SIGNALS.
2. PROOF FROM MONITORING COMPANY THAT CORRECT CODES WERE RECEIVED FOR FIRE ALARM, FIRE ALARM SYSTEM TROUBLE AND SPRINKLER SUPERVISORY SIGNALS.
3. VERIFICATION CERTIFICATE OF INSTALLATION AND OPERATION OF EXIT AND EMERGENCY LIGHTING.
4. FINAL ELECTRICAL INSPECTION CERTIFICATE SIGNED BY THE ELECTRICAL INSPECTOR FOR THE PROJECT. A DECLARATION FORM SIGNED BY THE ELECTRICAL CONTRACTOR IS NOT ACCEPTABLE.

FOUNDATIONS (C.I.P. CONCRETE PILES):

1. FOUNDATIONS SHALL BE CAST-IN-PLACE CONCRETE FRICTION PILES AS SHOWN ON DRAWINGS.
2. CONCRETE PILES HAVE BEEN DESIGNED FOR AN AVERAGE ALLOWABLE SKIN FRICTION VALUE OF 14 KPA (SLS) AND 18 KPA (ULS) BASED ON THE FOLLOWING CONDITIONS:
   – NO FILL MATERIAL AT LOCATIONS OF LIGHT POLE FOUNDATIONS.
   – NO SHALLOW WATER BEARING SILT LAYER WITHIN THE 12 FOOT BONDING ZONE.
   ACTUAL SKIN FRICTION VALUES AND SOIL CONDITIONS TO BE TESTED ON SITE BY KGS GROUP DURING CONSTRUCTION.
3. INSTALLATION OF ALL CONCRETE PILES SHALL BE INSPECTED AND APPROVED BY THE GEOTECHNICAL ENGINEER REGISTERED IN THE PROVINCE OF MANITOBA, PRIOR TO PLACEMENT OF CONCRETE.
4. THE PILING CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND SERVICES IN PILING AREA WHETHER SHOWN OR NOT. EXPOSE ALL SERVICES CLOSE TO PILING AS REQUIRED.
5. PILES SHALL NOT BE MORE THAN 50MM OUT OF POSITION LATERALLY AT THE TOP AND NOT MORE THAN 2% OUT OF PLUMB.
6. REINFORCE ALL PILES AS DETAILED ON THE DRAWINGS. REFER TO CONCRETE NOTES FOR CONCRETE REQUIREMENTS. INSTALL EACH PILE AS A CONTINUOUS POUR.
7. VIBRATE TOP 14'-9" (4.5M) OF CONCRETE IN ALL PILES.
8. SLEEVING WHERE REQUIRED SHALL BE INCLUDED IN THE PILING CONTRACT.
9. CONTRACTOR TO PROVIDE CONTRACT ADMINISTRATOR MINIMUM 48 HOURS NOTICE PRIOR TO DRILLING PILES TO PERMIT KGS GROUP TO CONDUCT SOIL TESTING.

REINFORCING STEEL:

1. REINFORCING STEEL TO BE NEW DEFORMED BILLET STEEL BARS CONFORMING TO CSA G30.18 (LATEST). GRADE TO BE 400 MPA.
2. REINFORCING STEEL SHALL BE CLEAN, FREE OF RUST, DIRT, LOOSE SCALE, OIL, GREASE OR ANY OTHER MATERIAL WHICH WOULD REDUCE BOND WITH THE CONCRETE.
3. SUBMIT SHOP DRAWINGS WHICH CLEARLY INDICATE BAR SIZES, SPACINGS, LOCATIONS & QUANTITIES OF REINFORCING STEEL, BENDING & CUTTING SCHEDULES, SUPPORTING & SPACING DEVICES, ETC. FOR REVIEW PRIOR TO FABRICATION. DETAIL, FABRICATE AND PLACE REINFORCING IN ACCORDANCE WITH CSA A23.1 (LATEST), CSA A23.3 (LATEST) AND ACI SP-66 (LATEST) UNLESS NOTED. LAP STEEL 36 BAR DIAMETERS (MINIMUM) UNLESS NOTED.
4. TIE, SUPPORT AND SPACE ALL REINFORCING STEEL WITH PROPER APPROVED DEVICES DESIGNED FOR USE IN REINFORCED CONCRETE, TO PREVENT DISPLACEMENT OF REINFORCING AND ENSURE SPECIFIED CONCRETE COVER.
5. PROVIDE MINIMUM CONCRETE COVER FOR REINFORCING STEEL AS FOLLOWS:
   PILES 75MM

CONCRETE:

1. CONCRETE MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH CSA A23.1 (LATEST). SEE BELOW FOR MIX REQUIREMENTS.
2. ADMIXTURES SHALL NOT BE USED UNLESS SPECIFIED HEREIN OR APPROVED BY THE DESIGN ENGINEER. CALCIUM CHLORIDE SHALL NOT BE USED.
3. MIX WATER SHALL BE POTABLE.
4. DESIGN, FABRICATE AND ERECT FORMWORK/SHORING IN ACCORDANCE WITH CAN/CSA-S269.3 (LATEST). ALLOW SUFFICIENT CONCRETE CURING TIME PRIOR TO REMOVAL.
5. CONCRETE FINISHING SHALL MEET THE REQUIREMENTS OF CSA A23.1 (LATEST).
6. FORM RELEASE AGENT SHALL BE BIODEGRADABLE, NON-STAINING AND NON-VOLATILE.
7. PROVIDE ADEQUATE COLD/HOT WEATHER PROTECTION AS REQUIRED DURING CURING PERIOD.
8. PLACE AND SECURE ALL EMBEDDED ANCHORS, WELD PLATES, SLEEVES, BUCKS, DOWELS, INSERTS, WATERSTOPS, ETC., PRIOR TO PLACING CONCRETE. CO-ORDINATE WITH ALL TRADES FOR EMBEDDING OF ALL OTHER, CONDUIT, SERVICES, BLOCKING, ETC.
9. ALL EXPOSED CORNERS TO HAVE 25MM CHAMFER FILLET UNLESS NOTED.
10. CAST-IN-PLACE ANCHOR BOLTS SHALL MEET REQUIREMENTS OF ASTM A307 (LATEST).
11. EXPANSION ANCHORS SHALL BE HILTI KWIK-BOLTS OR APPROVED EQUAL, UNLESS NOTED. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
12. THE CONCRETE SUPPLIER SHALL BE CERTIFIED TO MEET THE REQUIREMENTS OF CSA.A23.1.
13. THE CONCRETE SUPPLIER SHALL SUBMIT CONCRETE MIX DATA SUBMISSION FORMS FOR EACH TYPE OF CONCRETE SPECIFIED FOR REVIEW PRIOR TO BATCHING ANY CONCRETE.

CONCRETE MIX DESIGNS:

CONCRETE MIX DESIGN SHALL BE PROPORTIONED TO MEET THE FOLLOWING PERFORMANCE REQUIREMENTS:

C.I.P. PILES, PILE CAPS, FOOTINGS & RAFT SLABS:
EXPOSURE CLASS S-1 35 MPa @ 56 DAYS

NO.	YY/MM/DD	DESCRIPTION	DESIGN BY	DESIGN CHECK
0	16/06/24	ISSUED FOR CONSTRUCTION		

REVISIONS / ISSUE

CLIENT:
SCATLIFF + MILLER + MURRAY
visionary urban design + landscapes

PROJECT:
EAST END CULTURAL AND LEISURE CENTRE

DWG. DESCRIPTION:
ELECTRICAL SPECIFICATIONS

APEGM
Certificate of Authorization
KGS Group
No. 245

AUTHENTICATION FOR CURRENT REVISION
ENG. STAMP
PROVINCE OF MANITOBA
R. LALONDE
Member
32345
REGISTERED PROFESSIONAL ENGINEER

KGS GROUP
CONSULTING ENGINEERS

DESIGN BY: JLL	DATE (YY/MM/DD): 16/06/20	
DESIGN CHECK:	DATE: 16/06/23	
DRAWN BY: RAH	DATE: 16/06/20	
DWG CHECK:	DATE: 16/06/23	

DWG. NO. 16-0109-003 E4-00 REV: 0

FileName: P:\Projects\2016\16-0109-003\Dwg\Elec\16-0109-003_E4-00.dwg – Tab: E4-00 Plotted By: dderoche 16/06/24 [Fri 8:17am]
24"x36" /PLOT SCALE: