SCOPE OF WORK:

.01 PROVIDE COMPLETE RADIATION DETECTION SYSTEMS FOR TWO INBOUND LANES LOCATED AT THE COMMERCIAL SCALE BUILDING AND ONE INBOUND LANE LOCATED AT THE RESIDENTIAL SCALE BUILDING.

.02 DISCONNECT AND REMOVE THE EXISTING RADIATION DETECTION SYSTEMS.

.03 PROVIDE COMMISSIONING SERVICES FOR THE RADIATION DETECTION SYSTEMS. REFER TO RADIATION DETECTION SYSTEM SPECIFICATION SECTION FOR MORE INFORMATION.

.04 PROVIDE SEPARATE PRICE FOR A 10-YEAR SERVICE AGREEMENT OF THE RADIATION DETECTION SYSTEM. REFER TO RADIATION DETECTION SYSTEM SPECIFICATION SECTION FOR MORE INFORMATION.

DIV.26 - ELECTRICAL SPECIFICATIONS

1.0 GENERAL PROVISIONS

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

.02 THE CONTRACT SHALL INCLUDE FURNISHING 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 A COMPLETE AND OPERATING SYSTEM AS INDICATED ON THE DRAWINGS OR SPECIFIED HEREIN, AND ITS DELIVERY TO THE OWNER, COMPLETE IN ALL RESPECTS AND READY FOR USE.

.03 ALL ELECTRICAL WORK AND MATERIAL SHALL CONFORM WITH THE CURRENT RELEVANT NBC, CEC, LOCAL BY-LAWS AND TO THE SATISFACTION OF THE AHJ AND CONTRACT ADMINISTRATOR.

.04 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 CONTRACT ADMINISTRATOR'S ATTENTION IN WRITING, PRIOR TO CLOSING OF BIDS. BY SIGNING THE CONTRACT, THE EC ACKNOWLEDGES A SITE WALK-THROUGH HAS BEEN COMPLETED AND THE EXISTING CONDITIONS WERE ACCEPTED.

.05 APPLY FOR AND INCLUDE THE ASSOCIATED COSTS FOR ALL PERMITS, SERVICES, FEES AND INSPECTIONS IN THE BID QUOTE.

.06 OBTAIN APPROVALS FROM THE AHJ AND NOTIFY THE CONTRACT ADMINISTRATOR OF ANY CHANGES REQUESTED BY THE AHJ PRIOR TO THE EXECUTION OF THE REQUEST.

.07 COMPLY WITH ALL DEPARTMENT OF LABOUR, WORKPLACE AND HEALTH REQUIREMENTS AT ALL TIMES.

.08 WHERE DOUBT EXISTS AS TO THE MEANING OF THE DRAWINGS OR SPECIFICATIONS, IT IS THE RESPONSIBILITY OF THE EC TO OBTAIN CLARIFICATION PRIOR TO BID.

.09 PROVIDE TEMPORARY ELECTRICAL SERVICES AS REQUIRED BY ALL TRADES. COORDINATE POWER REQUIREMENTS FOR THE TEMPORARY SERVICE WITH THE GC.

.10 ALL MATERIALS USED SHALL BE NEW, OF THE TYPE SPECIFIED, AND APPROVED BY CERTIFICATION AGENCY RECOGNIZED BY THE AHJ, AND FREE FROM DEFECTS.

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

.12 CLEAN ALL EQUIPMENT DURING CONSTRUCTION AND AGAIN ON COMPLETION OF THE CONTRACT. ALL SURPLUS MATERIALS, CUTTINGS, PACKAGING AND DEBRIS SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED.

.13 ALL ELECTRICAL EQUIPMENT (INCLUDING PANELBOARDS, DISCONNECT SWITCHES, MOTOR STARTERS, SERVICE ENTRANCE, AND MCC) SHALL HAVE A LIGHT GREY (ASA-61) FACTORY ENAMEL FINISH UNLESS SPECIFIED OTHERWISE IN THE OTHER SECTIONS.

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

.15 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.

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

.17 LOCATION OF DEVICES MAY BE ALTERED BY THE CONTRACT ADMINISTRATOR WITHOUT CHARGE TO OWNER, PROVIDED THE CHANGE IS MADE BEFORE FINAL INSTALLATION AND DOES NOT NECESSITATE ADDITIONAL MATERIALS. RECORD CHANGES ON RECORD DRAWINGS.

.18 DRAWINGS SHOW GENERAL LOCATIONS FOR EQUIPMENT AND CIRCUITS; INSTALL THEM IN SUCH A WAY AS TO CONSERVE HEADROOM AND TO INTERFERE AS LITTLE AS POSSIBLE WITH THE SPACE THROUGH WHICH THEY PASS.

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

.20 MAINTAIN 1m CLEARANCE IN FRONT OF ALL SERVICEABLE ELECTRICAL EQUIPMENT (i.e. PANELBOARDS) AS PER CEC REQUIREMENTS.

.21 INSTALL ALL EQUIPMENT IN ACCORDANCE WITH THE AHJ, CEC AND MANUFACTURER'S INSTRUCTIONS. EC SHALL COORDINATE WITH OTHER TRADES TO ENSURE PROPER INSTALLATION.

.22 THE EC SHALL KEEP A SET OF FULL SIZED RECORD DRAWINGS ON WHICH THE EC SHALL RECORD ALL ADDITIONS OR DEVIATIONS FROM THE CONTRACT DOCUMENTS INCLUDING ALL CHANGES COVERED BY ADDENDA, CHANGE ORDERS, FIELD CHANGES, SITE CONDITIONS, ETC. A SET OF DRAWINGS SHALL BE UTILIZED FOR EACH SYSTEM AND THE EC SHALL OBTAIN PRINTS AS REQUIRED. DRAWINGS TO INCLUDE LOCATIONS OF ALL JUNCTION AND PULL BOXES, ROUTING OF FEEDERS AND CONDUITS, AND CHANGES TO CIRCUIT NUMBERS. ALL PRINCIPLE BELOW GRADE OR INACCESSIBLE CONDUITS, SYSTEMS, ETC. SHALL BE DIMENSIONED AT EACH CHANGE IN DIRECTION. ALL CONDUIT ROUTES NOT SHOWN BY THE ENGINEER ON ORIGINAL DRAWING SHALL BE SHOWN INCLUDING CIRCUIT WIRING, JUNCTION BOXES, ZONED CONDUIT RUNS, ETC.

.23 PANELBOARDS AND OTHER EQUIPMENT WHICH ARE TO BE SURFACE MOUNTED SHALL BE INSTALLED ON MINIMUM 3/4" (19mm) FIRE RATED PLYWOOD MOUNTING BACKBOARDS. TREAT BACKBOARDS WITH WOOD PRESERVATIVE PRIOR TO INSTALLATION AND PAINT WITH PRIMER AND TWO (2) COATS OF GREY ENAMEL BEFORE ANY EQUIPMENT IS MOUNTED. PROVIDE PLYWOOD MOUNTED BOARDS UNLESS SPECIFIED OTHERWISE IN THE OTHER SECTIONS.

.24 ALL PCN COSTING SHALL BE REVIEWED BY THE CONTRACT ADMINISTRATOR USING PRICING STANDARDS BASED ON THE CURRENT EDITION OF RSMEANS "ELECTRICAL CHANGE ORDER COST DATA" PRICING GUIDE. THIS GUIDE SHALL BE THE MAXIMUM COST ALLOWED.

.25 EXCAVATION AND FILL

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

.26 FINAL ACCEPTANCE

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

- FINAL ELECTRICAL INSPECTION CERTIFICATE SIGNED BY THE ELECTRICAL INSPECTOR FOR THE PROJECT. A DECLARATION FORM SIGNED BY THE EC IS NOT ACCEPTABLE.

2.0 DEFINITIONS

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

- AHJ - AUTHORITY HAVING JURISDICTION
- CA - CONTRACT ADMINISTRATOR
- EC - ELECTRICAL SUB-CONTRACTOR
- MC - MECHANICAL SUB-CONTRACTOR
- GC - GENERAL CONTRACTOR
- 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).
- CEC - MEANS CANADIAN ELECTRICAL CODE OR LOCAL CODE IN FORCE AT PROJECT LOCATION.
- NBC - MEANS NATIONAL BUILDING CODE OR LOCAL CODE IN FORCE AT PROJECT LOCATION.
- CODE - MEANS ALL CODES, REGULATIONS AND REQUIREMENTS INCLUDING BUT NOT LIMITED TO THE CURRENT RELEVANT NBC, CEC AND LOCAL BY-LAWS.
- 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 LEGALLY DISPOSE OF DELETED PRODUCTS OFF-SITE UNLESS OTHERWISE INSTRUCTED BY THE CONTRACT ADMINISTRATOR OR OWNER, HOWEVER THE OWNER RESERVES FIRST RIGHTS TO SALVAGE;
- 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 EC, UNLESS OTHERWISE NOTED;

3.0 SUBMITTALS

.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.

.02 MATERIALS AND EQUIPMENT LISTED ARE PREFERRED. THE EC MAY, HOWEVER, SUBMIT ALTERNATES TO THE CONTRACT ADMINISTRATOR TO BE APPROVED AS EQUALS AT LEAST FIVE (5) BUSINESS DAYS PRIOR TO CLOSING OF BID.

.03 SHOP DRAWINGS SHALL BE SUBMITTED TO THE CONTRACT ADMINISTRATOR FOR REVIEW AND APPROVAL BEFORE MANUFACTURING AND INSTALLATION CAN PROCEED.

.04 SUBMIT THE FOLLOWING CLOSE-OUT SUBMITTALS TO THE CONTRACT ADMINISTRATOR UPON COMPLETION OF THE CONTRACT:

- AS-BUILTS.
- ONE (1) O&M MANUAL HARDCOPY AND ONE (1) DIGITAL COPY IN DVD FORMAT. O&M MANUALS SHALL CONTAIN COPIES OF ALL FINAL SHOP DRAWINGS, WARRANTY LETTER, AS-BUILTS, TEST RESULTS AND THE CLOSED ELECTRICAL PERMIT. THE HARDCOPY SHALL BE SUBMITTED IN A D-RING BINDER C/W COVERPAGE, TABLE OF CONTENTS, DVD SLEEVE AND LABELED TABBED DIVIDERS FOR ALL SECTIONS. THE DIGITAL COPY SHALL BE LABELED AND ORGANIZED TO MATCH THE HARDCOPY. THE FILES IN THE DIGITAL COPY SHALL BE ORGANIZED WITHIN SUBFOLDERS SIMILAR TO THE HARDCOPY.
- A COPY OF THE 1 YEAR GUARANTEE LETTER.
- ONCE COMMISSIONING IS COMPLETE THE CONTRACTOR SHALL SUBMIT THE RESULTS TO THE CONTRACT ADMINISTRATOR FOR REVIEW.

.05 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.

4.0 COORDINATION

.01 THE EC IS RESPONSIBLE TO DETERMINE THE SCOPE OF THE WORK REQUIRED FOR EACH 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 TO COORDINATE. THE EC WILL REVIEW THE DRAWINGS WITH ALL TRADES PRIOR TO BID TO RESOLVE ALL COORDINATION ISSUES.

.02 COORDINATE WITH ALL TRADES AND ARRANGE EQUIPMENT IN PROPER RELATION WITH OTHER APPARATUS INCLUDING BUT NOT LIMITED TO ARCHITECTURAL FINISHES, DUCTS, PIPES, AND BUILDING CONSTRUCTION.

.03 THE EC IS RESPONSIBLE TO DETERMINE WHICH DIVISION OR SECTION PROVIDES VARIOUS PRODUCTS AND WORK. ADDITIONAL COMPENSATION WILL NOT BE CONSIDERED BECAUSE OF DIFFERENCES IN INTERPRETATION OF TECHNICAL PROVISIONS.

.04 COORDINATE AS REQUIRED WITH THE OWNER DURING THE DEMOLITION AND CONSTRUCTION PHASES OF THE WORK. THIS INCLUDES ANY TEMPORARY ELECTRICAL CONNECTIONS, REMOVAL OF EXISTING POWER SERVICES AND INSTALLATION OF NEW SERVICES. THE EC SHALL COMPLETE ALL PRELIMINARY WORK PRIOR TO ANY POWER OUTAGES IN ORDER TO MINIMIZE DOWNTIME.

.05 COORDINATE, NOTIFY AND ARRANGE WITH THE OWNER, GC AND ENGINEER ALL STAGING REQUIREMENTS TO MINIMIZE THE DURATION AND NUMBER OF POWER OUTAGES NECESSARY TO COMPLETE THE WORK AT NO ADDITIONAL COST.

.06 THE ELECTRICAL DRAWINGS AND SPECIFICATIONS SHALL BE READ IN CONJUNCTION WITH THE DRAWINGS AND SPECIFICATION OF ALL OTHER DISCIPLINES. THE EC SHALL BE RESPONSIBLE FOR THE INCLUSION OF ALL ELECTRICAL WORK ASSOCIATED WITH OTHER DISCIPLINES.

.07 OBTAIN AND REFER TO THE MECHANICAL EQUIPMENT SHOP DRAWINGS FOR THE REQUIRED CIRCUIT BREAKER (CB) AND WIRE SIZE PRIOR TO ORDERING. WHERE THE CB AND WIRE SIZE CHANGES THE EC SHALL ADJUST THE CB AND WIRE SIZE WITHOUT ADDITION COST TO OWNER.

5.0 IDENTIFICATION

.01 ALL ELECTRICAL EQUIPMENT INSTALLED OR CONNECTED SHALL BE IDENTIFIED BY MEANS OF ENGRAVED LAMACOID LABELS C/W MINIMUM 3/8" LETTERING. THIS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING: SWITCHBOARDS, PANEL BOARDS, DISCONNECT SWITCHES, TRANSFORMERS, STARTERS/VFD'S, MECHANICAL EQUIPMENT (INDICATE EQUIPMENT TAG), ETC. WHERE THE OWNERS LABELING STANDARDS EXCEED THIS SPECIFICATION THE EC SHALL FOLLOW THE OWNERS STANDARDS. THE EC SHALL ALLOW FOR A MINIMUM OF 25-CHARACTERS PER LABEL AND SUBMIT THE PURPOSED LABELS TO THE CONTRACT ADMINISTRATOR FOR APPROVAL PRIOR TO ORDERING.

- NORMAL POWER SYSTEMS: BLACK WITH WHITE LETTERING

.02 ALL RECEPTACLE AND SWITCH FACE PLATES SHALL BE C/W CLEAR DYMOTAPE LABELS WITH BLACK LETTERING INDICATING THE SOURCE PANEL NAME AND CIRCUIT NUMBER. (PNL 'X' - CCT#)

.03 ALL CONDUITS SHALL BE COLOR CODED UTILIZING SELF ADHESIVE TAPE.

.04 ALL EXTERIOR IDENTIFICATION SHALL BE UV RESISTANT AND WEATHERPROOF.

6.0 ELECTRICAL WORK IN EXISTING BUILDINGS

.01 COORDINATION

- ALLOW FOR AFTER HOURS WORK AS REQUIRED.
- WHERE EXISTING SERVICES OR SYSTEMS, SUCH AS ELECTRICAL POWER, TELEPHONE SYSTEM, DATA SYSTEMS, EQUIPMENT ALARM SYSTEM, FIRE ALARM SYSTEM, ETC. ARE REQUIRED TO BE DISRUPTED AND/OR SHUT-DOWN, COORDINATE THE SHUT-DOWNS WITH THE OWNER AND CARRY OUT THE WORK AT A TIME AND IN A MANNER ACCEPTABLE TO THEM. CAREFULLY SCHEDULE ALL DISRUPTIONS AND/OR SHUTDOWNS AND ENSURE THE DURATION OF SAME IS KEPT TO THE ABSOLUTE MINIMUM. SUBMIT FOR APPROVAL, A WRITTEN CONCISE SCHEDULE OF EACH DISRUPTION AT LEAST 120 HOURS IN ADVANCE OF PERFORMING WORK AND OBTAIN WRITTEN CONSENT PRIOR TO IMPLEMENTING.
- SHOULD ANY TEMPORARY CONNECTIONS BE REQUIRED TO MAINTAIN SERVICES OR SYSTEMS DURING WORK IN THE EXISTING BUILDING, SUPPLY AND INSTALL ALL NECESSARY MATERIAL AND EQUIPMENT AND PROVIDE ALL LABOUR AT NO EXTRA COST. SHOULD ANY EXISTING EQUIPMENT OR SYSTEM BE DAMAGED, MAKE FULL REPAIRS WITHOUT EXTRA COST, AND TO THE SATISFACTION OF THE OWNER AND CONTRACT ADMINISTRATOR.
- THE DRAWINGS INDICATE MAJOR ITEMS OF EQUIPMENT TO BE DELETED OR RELOCATED BUT MAY NOT INDICATE EVERY ITEM OF EQUIPMENT OR CONDUIT TO BE DELETED OR RELOCATED. THE EC SHALL BE RESPONSIBLE FOR DETERMINING WHICH EXISTING EQUIPMENT IS TO BE DELETED OR RELOCATED BY EXAMINING ALL SITE CONDITIONS AND ALL CONSTRUCTION DOCUMENTS.

.02 EXISTING DEVICES IN NEW CONSTRUCTION

- DISCONNECT AND REMOVE EXISTING ELECTRICAL EQUIPMENT MADE OBSOLETE DUE TO RENOVATIONS C/W ASSOCIATED WIRING AND CONDUITS BACK TO SOURCE PANEL.
- WHERE EXISTING DEVICES (RECEPTACLES, SWITCHES, ETC.) ARE PRESENTLY MOUNTED ON A WALL WHICH WILL BE COVERED WITH A NEW FINISH, PROVIDE AN EXTENSION RING, COVERPLATE, ETC., AS REQUIRED TO SUIT THE NEW WALL FINISH.
- ALL EXISTING JUNCTION BOXES IN WALLS AND CEILING SPACES REQUIRED TO MAINTAIN EXISTING CIRCUITS SHALL REMAIN ACCESSIBLE.
- ANY DAMAGES CAUSED BY THE EC SHALL BE THE RESPONSIBILITY OF THE EC TO TAKE ALL ACTIONS REQUIRED AND AS MAY BE DEEMED NECESSARY BY THE OWNER TO CORRECT ANY DAMAGE. NO CORING SHALL BE UNDERTAKEN UNLESS PERMISSION IS GIVEN BY THE BUILDING OWNER.
- THE EC SHALL UPDATE ALL PANEL SCHEDULES AFFECTED BY DEMOLITION WORK. REMAINING UNUSED BREAKERS SHALL BE LEFT IN PANELBOARDS AND BE LABELED "SPARE".

.03 INSTALLATION

- PATCH AND REPAIR WALLS AND CEILINGS IN EXISTING BUILDING AREAS THAT HAVE BEEN DAMAGED OR CUT OPEN DUE TO THE INSTALLATION OF NEW ELECTRICAL EQUIPMENT.
- PATCH AND MAKE GOOD EXISTING WALLS WHICH ARE TO REMAIN WHERE EXISTING ELECTRICAL DEVICES HAVE BEEN REMOVED.
- TEST AND CONFIRM ALL EXISTING GROUNDING SYSTEMS ARE EFFECTIVE AND IN GOOD CONDITION. INCLUDE WORK AND MATERIALS REQUIRED TO CHANGE WIRING AND MAKE GOOD.

7.0 PANELBOARDS

.01 PROVIDE BREAKERS AS DETAILED ON THE DRAWINGS AND SPECIFIED HEREIN.

.02 BREAKERS FOR USE IN EXISTING PANELBOARDS SHALL:

- BE LISTED FOR USE WITH THE EXISTING PANELBOARDS
- BE SUPPLIED WITH A BUS KIT TO SUIT THE INSTALLATION WHERE THE ORIGINAL BREAKERS ARE NO LONGER BEING MANUFACTURED
- MATCH THE EXISTING PANELBOARDS kA RATING UNLESS SPECIFICATIONS REQUIRE TO EXCEED EXISTING RATINGS

8.0 CONDUIT, WIRE, AND CONNECTIONS

.01 PROVIDE ALL CONDUIT, WIRING AND CONNECTIONS FOR A CODE COMPLIANT, COMPLETE AND OPERATIONAL SYSTEM.

.02 ALL WIRING SHALL BE INSTALLED IN EMT CONDUIT (MIN. 21mmØ) UNLESS OTHERWISE NOTED ON THE DRAWINGS OR SPECIFICATION.

.03 ALL WIRE AND CABLE SHALL BE COPPER, 98% CONDUCTIVITY, COLOUR CODED, NEW AND MARKED AS PER CEC REQUIREMENTS. WIRES SHALL BE RW90 TYPE RATED MINIMUM 600V. RWU90 SHALL BE USED FOR UNDERGROUND RACEWAY INSTALLATIONS.

.04 ALL WIRING SHALL BE SIZED AS PER CODE. MINIMUM ALLOWABLE WIRE SIZE IS #12 AWG. CONDUCTORS #8 AND LARGER SHALL BE STRANDED. ALL WIRING INSTALLED IN CONDUIT SHALL BE PULLED IN AT THE SAME TIME WITH APPROVED PULLING LUBRICANT.

.05 MAXIMUM VOLTAGE DROP SHALL BE AS PER CODE REQUIREMENTS. WHERE REQUIRED THE EC SHALL UPSIZE THE FEEDER WIRING FOR EQUIPMENT AT NO ADDITIONAL COST TO THE OWNER IN ORDER TO MEET MINIMUM VOLTAGE DROP REQUIREMENTS; AS THE FINAL FEEDER ROUTING IS DETERMINED BY THE EC. NO ALLOWANCE WILL BE GIVEN FOR A FAILURE TO ACCOUNT FOR VOLTAGE DROP PRIOR TO BID.

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

.07 ALL CABLES AND WIRES, ETC., TO BE FT4 FOR NON-COMBUSTIBLE BUILDINGS AND AS REQUIRED BY CODE.

.08 PROVIDE A SEPARATE RACEWAY FOR EACH ELECTRICAL SYSTEM.

.09 CONDUIT RUNS IN WALLS TO BE VERTICAL; HORIZONTAL RUNS IN WALLS ARE NOT ACCEPTABLE.

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

.11 WIRING DEVICES IN FINISHED AREAS SHALL BE RECESSED MOUNTED AND FOR ALL UNFINISHED AREAS MAY BE SURFACE MOUNTED. EXPOSED CONDUITS SHALL NOT BE ACCEPTED UNLESS OTHERWISE NOTED ON THE DRAWINGS. WHERE CONDUITS RUN EXPOSED ON EXISTING SURFACES PAINT TO MATCH WALL FINISH.

.12 EMT COUPLINGS AND CONNECTORS TO BE T&B STEEL.

.13 ALL CONDUITS AND ARMORED CABLES SHALL BE SECURELY FASTENED WITH APPROVED CLIPS. SCREWS IN PARTITIONS AND CADDY CLIPS IN CEILING. NAILS ARE NOT ACCEPTED.

.14 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 PRIOR TO INSTALLATION OF OUTLET.

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

.16 SURFACE MOUNTED CONDUITS IN FINISHED AREAS SHALL BE PAINTED OUT TO MATCH THE EXISTING SURFACE.

.17 RACEWAYS SHALL BE RGS, EMT OR FLEXIBLE CONDUIT AS SHOWN ON THE DRAWINGS. ALL CONDUIT INSTALLED IN CONCRETE FLOOR SHALL BE RIGID PVC OR RGS CONDUIT C/W BOND CONDUCTOR.

9.0 BONDING AND GROUNDING

.01 PROVIDE A COMPLETE BONDING AND GROUNDING SYSTEM AS REQUIRED BY CODE AND SPECIFIED HEREIN.

.02 PROVIDE A COMPLETE PERMANENT, CONTINUOUS GROUNDING SYSTEM INCLUDING ELECTRODES, CONDUCTORS AND CONNECTORS.

.03 PROVIDE UL LISTED BONDING CLAMPS AND TERMINATIONS.

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

10.0 WIRING DEVICES

.01 PROVIDE RECEPTACLES AND LINE VOLTAGE CONTROLS C/W SUITABLE DEVICE BOXES AND COVER PLATES WHERE INDICATED ON THE PLANS.

.02 RECEPTACLES SHALL MEET THE FOLLOWING REQUIREMENTS UNLESS NOTED OTHERWISE ON THE DRAWINGS.

- SINGLE / DUPLEX RECEPTACLES
- CSA TYPE 5-15 R, 125V, 15A
- SUITABLE FOR NO. 10 AWG FOR BACK AND SIDE WIRING
- BREAK-OFF LINKS FOR USE AS SPLIT RECEPTACLES
- SPECIFICATION GRADE
- DECORA FORM FACTOR - WHITE FINISH
- TAMPER RESISTANT
- ACCEPTABLE MANUFACTURERS: HUBBELL, LEVITON, LEGRAND

.03 DATA OUTLETS SHALL MEET THE FOLLOWING REQUIREMENTS UNLESS NOTED OTHERWISE ON THE DRAWINGS.

- SHALL CONSIST OF A MINIMUM OF THREE (3) CAT6 UTP HORIZONTAL CABLES (2 DATA, 1 SPARE) UNLESS OTHERWISE SHOWN.
- HORIZONTAL CABLES SHALL BE TERMINATED USING KEYSTONE TYPE CAT6 RJ45 FEMALE MODULAR CONNECTORS WHICH SNAP INTO THE OUTLET FACEPLATES.
- ALL LABELING SHALL COMPLY WITH THE CITIES STANDARD
- WHERE THE CITIES STANDARD IS NOT APPLICABLE OR AVAILABLE, TIA-606B ADMINISTRATION STANDARD FOR TELECOMMUNICATIONS INFRASTRUCTURE SHALL BE USED.
- MACHINE PRINTED LABELING SHALL BE USED ONLY, (I.E. BROTHER P-TOUCH).

.04 COVER PLATES SHALL MEET THE FOLLOWING REQUIREMENTS:

COVER PLATES FOR SURFACE MOUNTED DEVICES IN UTILITY ROOMS SHALL BE SHEET METAL WITH LAMACOID CIRCUITING LABEL.

PROVIDE WEATHERPROOF "WHILE-IN-USE" WET LOCATION LISTED METAL DIECAST COVER PLATES FOR ALL EXTERIOR WEATHERPROOF RECEPTACLES, EXCEPT FOR PARKING LOT BLOCK HEATER RECEPTACLES.

11.0 RADIATION DETECTION SYSTEM

.01 SUPPLY AND INSTALL A COMPLETE RADIATION SYSTEM AS SHOWN ON DRAWINGS. SYSTEM SHALL MEET THE FOLLOWING REQUIREMENTS:

- UTILIZE PVT (POLYVINYL TOLUENE) OR OTHER SCINTILLATOR TYPE TECHNOLOGY.
- DETECTOR SENSOR RANGE: 12' MINIMUM.
- DETECTOR ENCLOSURE: NEMA 4 (IP65). YELLOW PAINTED STEEL.
- ALL SYSTEM COMPONENTS INSTALLED OUTSIDE OF THE SCALE BUILDING SHALL BE RATED FOR +40°C TO -40°C AND BE WEATHERPROOF.
- MINIMUM SENSITIVITY RATING: 0.05 COUNTS / s / cm³ / nSv / h^-1.
- BUILT-IN AMBIENT BACKGROUND NOISE AND BACKGROUND RADIATION SUPPRESSION.
- REMOTE VPN SYSTEM TROUBLE SHOOTING AND SUPPORT.
- SUITABLE FOR COMMERCIAL, INDUSTRIAL, AND MUNICIPAL APPLICATIONS.

.02 COMMISSIONING REQUIREMENTS:

- CALIBRATION AND TESTING TO MEET ANSI STANDARD N42.35-2016
- INSTALL INTERFACE ON CITY SUPPLIED PC'S.
- COORDINATE WITH THE CITY AND MANUFACTURER RECOMMENDATIONS FOR ALARM LEVEL REQUIREMENTS.

.03 PROVIDE A SEPARATE PRICE FOR A 10-YEAR SERVICE AGREEMENT. SERVICE CONTRACT TO INCLUDE ALL PARTS, LABOUR, YEARLY CALIBRATION / CERTIFICATION LETTER, ETC. AS REQUIRED TO MAINTAIN THE SYSTEM. THE EXTENDED SERVICE CONTRACT TERM WILL START AFTER INITIAL ONE-YEAR SERVICE CONTRACT HAS ENDED.

.04 INCLUDE IN BID A 1 YEAR SERVICE CONTRACT TO MAINTAIN AND CALIBRATE THE SYSTEM.

.05 ACCEPTABLE VENDORS INCLUDE: RADCOMM SYSTEMS & RADIATION SOLUTIONS INC. ALL VENDORS MUST HAVE LOCAL SUPPORT. ALL EQUIPMENT MUST BE SUBMITTED FOR PRE-APPROVAL IN ACCORDANCE WITH B7 UNLESS ALREADY LISTED BELOW. 1

- APPROVED MODEL: RADCOMM MODEL 'RC2069' (OTHER RADCOMM MODELS MAY NOT BE USED).

ENGINEERS GEOSCIENTISTS MANITOBA
Certificate of Authorization
KGS Group
No. 245

LOCATION APPROVED
UNDERGROUND STRUCTURES

SUPV. U/G STRUCTURES COMMITTEE DATE

NOTE:
LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT. CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

B.M.
ELEV.

NO.	REVISIONS	DATE	BY
1	RE-ISSUED FOR CONSTRUCTION	21/01/19	CLS
0	ISSUED FOR CONSTRUCTION	20/11/27	CLS

KGS GROUP

DESIGNED BY	SDC	CHECKED BY	CLS
DRAWN BY	SDC	APPROVED BY	CLS
HOR. SCALE:	AS NOTED	RELEASED FOR CONSTRUCTION:	20/11/27
VERTICAL:	AS NOTED		
DATE	20/10/13	DATE	20/11/27

ENGINEER'S SEAL
PROVINCE OF MANITOBA
C.L. SARARAS
Member 32618
REGISTERED PROFESSIONAL ENGINEER
2021-01-19

CONSULTANT PROJECT NO.
20-0107-12

Winnipeg
THE CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

PROJECT TITLE
BRADY ROAD RESOURCE MANAGEMENT FACILITY
RADIATION DETECTION SYSTEM

SPECIFICATIONS
DIV.26

SHEET 4 OF 4

COMPUTER FILE NAME
839-2020-Drawing_20-0107-012_E04

CONSULTANT DRAWING NUMBER
E04