

1.1 GENERAL CONDITIONS

1. SUPPLY ALL LABOUR, EQUIPMENT, AND MATERIALS NECESSARY TO INSTALL, COMPLETE AND OPERATIONAL, THE ELECTRICAL SYSTEMS DESCRIBED HEREIN AND SHOWN ON THE DRAWINGS. THE REQUIREMENTS OF THIS SECTION ARE IN ADDITION TO THOSE CONTAINED IN THE GENERAL CONDITIONS AND OTHER PORTIONS OF THE CONTRACT DOCUMENTS.

1.2 DRAWINGS & SPECIFICATIONS

1.1 IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO PROVIDE FOR AN ELECTRICAL INSTALLATION COMPLETE AND IN OPERATING CONDITION. THE RESPONSIBILITY FOR SUPPLYING AND INSTALLING ALL MATERIAL NECESSARY TO ACCOMPLISH THIS, EXCEPT WHERE SPECIFICALLY NOTED THAT SUCH WORK OR MATERIALS IS NOT INCLUDED, SHALL BE PART OF THIS SECTION.

2. DRAWINGS ARE SCHEMATIC; EXACT LOCATIONS, DISTANCES, LEVELS AND OTHER DIMENSIONS SHALL BE GOVERNED BY THE BUILDING AS CONSTRUCTED.

1.3 LOCAL RULES AND COSTS

1. THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE CANADIAN ELECTRICAL CODE AND THE BY-LAWS OF THE PROVINCE AND MUNICIPAL ELECTRICAL ENERGY INSPECTION DEPARTMENT WHOSE AUTHORITY COVERS THE AREA IN WHICH THE WORK IS BEING DONE.

2. OBTAIN AND PAY FOR ALL PERMITS AND LICENSES REQUIRED TO EXECUTE THE WORK.

1.4 EQUIVALENT PRODUCTS

1. EQUIVALENT PRODUCTS MAY BE SUBSTITUTED ONLY AFTER REVIEW AND APPROVAL BY THE CONTRACT ADMINISTRATOR. SEE B7.

1.5 CO-ORDINATION OF WORK

1. CO-ORDINATE WITH OTHER TRADES ON THE LOCATION OF EQUIPMENT SUPPLIED BY OTHERS PRIOR TO THE INSTALLATION OF CONDUIT, OUTLETS, ETC. WHERE ELECTRICAL EQUIPMENT IS BEING BUILT-IN, SUPPLY THE EQUIPMENT OR NECESSARY DIMENSION TO THE OTHER TRADES.

2. ARRANGE FOR AND COORDINATE ROUGH-IN AND FINAL INSPECTIONS WITH INSPECTION AUTHORITIES, CONTRACT ADMINISTRATOR.

3. INSTALL EQUIPMENT, AND APPARATUS REQUIRING MAINTENANCE, ADJUSTMENT OR EVENTUAL REPLACEMENT WITH ADEQUATE CLEARANCES AND ACCESSIBILITY FOR SAME.

4. INCLUDE, IN THE WORK, ALL REQUIREMENTS SHOWN ON THE SHOP DRAWINGS OR MANUFACTURERS' INSTALLATION INSTRUCTIONS.

5. REPLACE WORK UNSATISFACTORY TO THE CONTRACT ADMINISTRATOR WITHOUT EXTRA COST.

6. USE OF CLIPS FOR SECURING AC90 TO CEILING SYSTEM IS PROHIBITED.

1.6 MATERIALS

1. ALL MATERIALS SUPPLIED SHALL BE NEW (OR AS NOTED) AND OF THE QUALITY INDICATED IN THE SPECIFICATIONS AND SHALL CONFORM TO THE STANDARDS OF THE C.S.A. AND THE U.L.C. AND APPROVED BY THESE AGENCIES WHERE APPLICABLE.

2. IN THE EVENT THAT A MATERIAL SPECIFIED DOES INDICATE C.S.A./U.L.C. OR EQUAL APPROVAL, CONTRACTOR IS TO OBTAIN THE APPROVAL OF THE LOCAL INSPECTION AUTHORITY, PAY ALL CHARGES LEVIED BY THE INSPECTION AUTHORITY AND MAKE ANY MODIFICATIONS REQUIRED, AT NO ADDITIONAL EXPENSE TO THE CITY OF WINNIPEG.

1.7 LOCATING EQUIPMENT

1. MATERIALS AND LABOUR SHALL BE ADDED TO THE CONTRACT FOR OUTLETS MOVED WITHIN 10' OR 3.0m FROM THE LOCATION SHOWN ON THE PLANS PRIOR TO ROUGH-IN AT NO EXTRA CHARGE.

2. PUSHBUTTONS SHALL BE MOUNTED 9" OR 225mm OR 36" OR 900mm TO CENTER ABOVE FINISHED FLOOR.

3. RECEPTACLES TO BE MOUNTED AT 12" AFF, 18" AFF ON AN ACCESSIBLE ROUTE. SWITCHES TO BE MOUNTED AT 52" AFF, 48" AFF ON AN ACCESSIBLE ROUTE. CONTACT THE CONTRACT ADMINISTRATOR FOR ANY ROUGHIN ELEVATION THAT MAY BE IN QUESTION.

4. ALL EQUIPMENT SHALL BE INSTALLED WHERE THE INSTALLATION DOES NOT LEAVE THE DEVICE OR FIXTURE OBSTRUCTED IN ANY WAY. CONTRACTOR IS TO RELOCATE EQUIPMENT AS NECESSARY.

1.8 WARRANTY

1. WARRANTY ALL WORK FOR ONE YEAR, UNLESS OTHERWISE INDICATED. FOLLOWING FINAL ACCEPTANCE, THIS WARRANTY SHALL BE VOIDED IN THE EVENT OF PROBLEMS CAUSED BY IMPROPER INSTALLATION OR EQUIPMENT FAILURE.

1.9 AS BUILT DRAWINGS

1. KEEP A RECORD SET OF DRAWINGS ON THE SITE AT ALL TIMES RECORDING ANY CHANGES THAT MAY OCCUR. SUBMIT THESE DRAWINGS TO THE CONTRACT ADMINISTRATOR UPON COMPLETION OF THE WORK. AS-BUILTS SHALL INCLUDE TAGGING EXISTING AND NEW CIRCUITS AND EQUIPMENT.

2. SUBMIT ONE SET OF CORRECTED "AS-BUILT" DRAWINGS DONE IN RED TO THE CONTRACT ADMINISTRATOR. CONFIRM REQUIREMENTS PRIOR TO COMPLETION.

3. EACH DATA OUTLET MUST BE IDENTIFIED WITH A LABEL THAT CORRESPONDS WITH THE PATCH PANEL AND DATA RACK/CABINET. THIS MUST BE CORRECTLY DOCUMENTED ON THE CONTRACTOR MARKED UP AS-BUILT DRAWING.

1.10 PANELS AND EQUIPMENT

1. PROVIDE REVISED, CLEAN AND ACCURATE TYPED IN DIRECTORIES FOR ALL EQUIPMENT.

2. EQUIPMENT TO BE SAME AS EXISTING MANUFACTURER. PROVIDE ALL NECESSARY BREAKERS, HARDWARE AND COVER PLATES FOR COMPLETE INSTALLATION. FULL SIZE BREAKERS PREFERRED. ENSURE ALL EQUIPMENT IS RATED AND SUPPLIED TO COORDINATE WITH ALL POSSIBLE FAULT CONDITIONS PRESENT AT SITE.

1.11 GROUNDING SYSTEM

1. GROUNDING SYSTEM SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF CANADIAN ELECTRICAL CODE. ENSURE GROUND RESISTANCE IS SUITABLE FOR GRID LOCATION.

2. PROVIDE GROUNDING TO ALL RACEWAYS, AND EQUIPMENT TO C.E.C.

3. PROVIDE A MIN. #6 AWG COPPER BONDING CABLE TO EACH RACK OR CABINET FROM THE BUILDING GROUNDING CONDUCTOR.

1.12 DISCONNECT SWITCHES

1. SUPPLY AND INSTALL DISCONNECT SWITCHES AS INDICATED AND AS REQUIRED BY CODE. INCLUDE W/P FOR HIGH HUMID AND WET LOCATIONS.

1.13 AUXILIARY EQUIPMENT

1. PROVIDE WIRING, CONTROL TRANSFORMERS AND AUXILIARY CONTACTS AS REQUIRED FOR CONTROL CONNECTIONS. CO-ORDINATE ALL INTERLOCKS AND CONNECTIONS WITH EQUIPMENT.

1.14 WIRING METHODS

1. ALL WIRING SHALL BE COPPER IN EMT IN DRY AREAS, OR WEATHER TIGHT PVC IN HUMID, WET AND POOL AREAS, UNLESS INDICATED OTHERWISE.

2. CIRCUIT WIRING TO BE MINIMUM #12 AWG RW90 UNLESS OTHERWISE INDICATED. WHERE WIRE SIZE IS NOT SHOWN, AMPACITY MUST MATCH OR EXCEED THAT OF PROTECTIVE DEVICE AND ANY ALLOWANCE FOR VOLTAGE DROP IS TO BE APPLIED. CABLE TO BE UPSIZED AS NECESSARY.

3. CONDUIT AND WIRING SHALL BE GROUPED WHERE POSSIBLE AND CLIPPED IN A WORKMANLIKE MANNER.

4. ALL COMPUTER AND PRINTER RECEPTACLE CIRCUITS MUST BE CONNECTED WITH A SEPARATE NEUTRAL FOR EACH CIRCUIT.

5. AC-90 CABLE MAY BE USED WHEN RUN DIRECTLY TO A DEVICE OR FIXTURE FROM A JUNCTION BOX ATTACHED TO A CONDUIT SYSTEM. CABLE LENGTH NOT TO EXCEED 10FT.

1.15 INSTALLATION

1. INSTALL WIRING CONTINUOUSLY WITHIN RACEWAYS. SPLICES WILL BE PERMITTED ONLY AT OUTLETS AND JUNCTION BOXES. ADEQUATE CABLE SHALL BE PROVIDED TO PERMIT PROPER CONNECTION OF ALL EQUIPMENT.

2. ALL WIRING TO RUN CONCEALED IN CEILING, WALLS OR FLOORS WHEREVER POSSIBLE. ANY EXPOSED CONDUITS OR CABLES SHALL BE RUN PARALLEL TO OR AT RIGHT ANGLES TO BUILDING LINES AND IN A NEAT MANNER.

3. INSTALL PULL BOXES AS REQUIRED BY THE CANADIAN ELECTRICAL CODE. PULL BOXES SHALL BE LOCATED IN INCONSPICUOUS SPACES. PROVIDE RATED ACCESS DOORS AS REQUIRED.

4. PROVIDE ALL MOUNTING BRACKETS, STRAPS AND SUPPORTS TO SECURE ELECTRICAL DEVICES IN ACCORDANCE TO SPECIFICATIONS AND C.E.C. REQUIREMENTS.

5. INSTALL PULL BOXES SUCH THAT NO CONDUIT RUN IS LONGER THAN 30m. (100') OR CONTAINS MORE THAN 2 - 90 DEGREE BENDS. CONDUIT FITTINGS SUCH AS LB, LR, LL ARE NOT ACCEPTABLE.

6. PULL BOXES ARE REQUIRED AFTER EVERY TWO - 90 DEGREE BENDS.

7. INSTALL PULL CORD IN ALL CONDUITS.

8. SIZE CONDUIT IN ACCORDANCE WITH FILL TABLES IN EIA/TIA 569 TABLE 4-1-1.

1.16 WIRING DEVICES

1. RECEPTACLES SHALL BE SPEC COMMERCIAL GRADE, NYLON FACE, 15A, FINISH TO BE WHITE UNLESS OTHERWISE NOTED. IG RECEPTACLES TO BE ORANGE IN COLOUR.

2. WIRING DEVICES AND COVER PLATES SHALL BE ONE MANUFACTURER. ALL COVER PLATES SHALL MATCH EXISTING TO SUIT THE AREA UNLESS OTHERWISE NOTED.

3. GROUND FAULT CIRCUIT INTERRUPTING (GFI) DUPLEX RECEPTACLE SHALL BE EQUAL TO COOPER # VGF-15W.

1.17 LABELS

1. PROVIDE AND INSTALL ADHESIVE LAMACOID LABELS TO IDENTIFY ALL CIRCUITING AND MAJOR EQUIPMENT.

2. IDENTIFY ALL CONDUCTORS INCLUDING NEUTRAL AND GROUND CONDUCTORS AT EVERY JUNCTION BOX, OUTLET, PANEL, ETC.

1.18 MISCELLANEOUS EQUIPMENT

1. PROVIDE WIRING, CONNECTIONS, STARTERS, DISCONNECTS AND CONTROLS FOR ANY EQUIPMENT SUPPLIED AND INSTALLED BY OTHERS.

2. ALL CONTROL WIRING WILL BE BY THE ELECTRICAL SUBCONTRACTOR UNLESS OTHERWISE NOTED. WHERE 120V POWER IS REQUIRED FOR MECHANICAL EQUIPMENT, WIRING AND CONNECTIONS ARE TO BE PROVIDED BY THE ELECTRICAL SUBCONTRACTOR.

1.19 TESTING

1. THE ELECTRICAL INSTALLATION SHALL BE COMPLETELY TESTED DEMONSTRATING THE EQUIPMENT AND SYSTEMS INSTALLED PERFORM IN THE MANNER INTENDED.

1.20 CUTTING AND PATCHING

1. ARRANGE AND PAY FOR ALL CUTTING AND PATCHING AS REQUIRED FOR THE ELECTRICAL INSTALLATION.

2. PROVIDE & INSTALL APPROPRIATE ULCLISTED FIRE STOP SYSTEMS AT ALL FIREWALL &/OR FLOOR PENETRATIONS. ACCEPTABLE MANUFACTURES: HILTI, DOW CORNING, FIRE-STOP SYSTEMS (ELASTA-SEAL) OR G.E. SILICONE.

3. ALL WALLS AND FLOORS MUST BE EXAMINED (X-RAY) PRIOR TO CORING HOLES.

4. PRIOR TO ANY WORK, THE CONTRACTOR MUST REVIEW THE CITY OF WINNIPEG ASBESTOS INVENTORY TO IDENTIFY IF THE WORK IS IN AN AREA NOTED WITH ASBESTOS. THE CONTRACT ADMINISTRATOR WILL ENSURE ABATEMENT IS PROVIDED IF NECESSARY. THE CONTRACTOR SHALL ADHERE TO SAFE WORK PRACTICES IN ALL AREAS IDENTIFIED WITH ASBESTOS.

1.21 DATA SYSTEM

1. PROVIDE A COMPLETE TESTED AND OPERATING CAT6, 24AWG, UTP DATA SYSTEM MEETING TIA TRANSMISSION REQUIREMENTS UP TO 250MHz, 10Gbps. IN A DEDICATED RACEWAY IN ACCORDANCE TO EIA/TIA 568 AND T530 STANDARDS.

2. APPROVED MANUFACTURE IS: BELDON/CDT. CONTRACTORS ARE TO BE CERTIFIED AS INSTALLERS. BELDEN CSV. CONTRACTOR MUST HAVE A RCDD(REGISTERED COMMUNICATIONS DISTRIBUTION DESIGNER RECOGNIZED BY BICSI) ON STAFF, AND BE EXPERIENCED IN THE SCOPE OF WORK REQUIRED IN THIS PROJECT.

3. OUTLETS MUST BE RJ45 TYPE. DATA JACKS TO BE WHITE AND VOICE TO BE BLUE. INSTALL BOTH TYPES IN SAME OUTLET COVER WHEREVER POSSIBLE.

4. RACK IS TO BE C/W RUBBER FLOOR ISOLATORS. MIN. 44U BLACK IN COLOUR. RACK TO COME WITH 8 VELCRO STRAPS( 4 AT EACH SIDE).

5. PATCH PANELS ARE TO BE HIGH CAPACITY, 24 PORT, CAT6, WITH 1U OF HORIZONTAL FRONT CABLE MANAGEMENT FOR EACH PANEL AND OWNERS SWITCH, BLACK, LOADED WITH BLACK JACKS. PUNCH DOWN CABLES TO TIA-568-A FORMAT.

6. FIBRE OPTIC RACK (BELDEN FIBRE EXPRESS) MOUNTED PATCH PANEL ENCLOSURE TO BE PROVIDED.

7. PROVIDE CABLE STRAIN RELIEF, WIRE MANAGEMENT AND VENTED SHELVES AS REQUIRED.

8. ALL RACEWAYS TO HAVE A PULL STRING AND 33% SPARE CAPACITY FOR FUTURE. CABLES MUST BE INSTALLED IN A CONDUIT OR BASKET TYPE CABLE TRAY. J-HOOKS MAY NOT BE USED. CABLES ARE TO BE BUNDLED AND SECURED USING HOOK AND LOOP STRAPS. TY-WRAPS ARE NOT PERMITTED.

9. PROVIDE LABELS ON A BRADY OR PANDUIT LABEL MAKER ON SELF ADHESIVE, NON SMEAR LABELS WITH BLACK LETTERING. COORDINATE LETTER SIZE AND IDENTIFICATION WITH TENANT IT REP.

10. TESTING TO BE AS PER TIA 568 AND 526 FOR CAT6 COMPLETE SYSTEM. PROVIDE A COMPLETE TEST RESULTS IN INDIVIDUAL AND SUMMARY PDF REPORT TO CHANGE OVER.

11. TESTING FOR UTP CABLING:  
1. TESTING SHALL BE MADE IN ACCORDANCE WITH LATEST EDITION EIA/TIA STANDARD FOR CAT6 CABLING.

2. TEST EQUIPMENT MUST BE WITHIN THE CALIBRATION PERIOD RECOMMENDED BY THE VENDOR. PROVIDE A DATED COPY OF THE CALIBRATION/RE-CALIBRATION REPORT. INCLUDE SERIAL NUMBERS, FIRMWARE VERSION AND DATE OF MANUFACTURE. AN ACCREDITED LABORATORY THAT IS TRACEABLE TO NIST MUST HAVE COMPLETED THE CALIBRATION.

3. ONLY SPECIAL ADAPTERS AND OR SPECIAL PATCH CABLES OR OEM TEST KIT ARE ALLOWED TO BE USED TO PERFORM A CHANNEL TEST.

4. ALL INSTALLED UTP CABLES SHALL BE TESTED FROM THE TELECOMMUNICATIONS CLOSET TO THE WALL OUTLET AGAINST THE PERMANENT LINK PERFORMANCE LIMITS AS DEFINED IN THE LATEST EDITION OF EIA/TIA STANDARD FOR CAT6 CABLING INSTALLATION.

12. PROVIDE A MINIMUM 25 YEAR MANUFACTURE'S WARRANTY ON PRODUCT, INSTALLATION AND PERFORMANCE FOR THE VOICE/DATA SYSTEM. PROVIDE A CERTIFICATE IN THE O&M MANUALS.

13. PROVIDE CABLING TO HAVE 5m RESERVE AT THE USER END AND 3m RESERVE AT THE DISTRIBUTION END FOR FUTURE RELOCATION. DO NOT COIL CABLE, BUNDLE IN AN "S" OR "U" FORMAT.

14. PROVIDE PATCH CABLES OF SAME MANUFACTURER AND SPEC AS THE DISTRIBUTION CABLING C/W BOOTLESS AND SNAGLESS STRAIN RELIEF(UTP). QUANTITY TO BE:

1. A QUANTITY OF 3.04 METRE (10FOOT) CATEGORY 6 WHITE OR GREY PATCH CABLE EQUAL TO 2/3RD THE TOTAL USER AREA DROPS.

2. A QUANTITY OF 0.6 METRE (2 FOOT) CATEGORY 6 WHITE OR GREY PATCH CABLES EQUAL TO 2/9 THE TOTAL USER AREA DROPS.

3. A QUANTITY OF 0.9 METRE (3 FOOT) CATEGORY 6 WHITE OR GREY PATCH CABLES EQUAL TO 2/9 THE TOTAL USER AREA DROPS.

4. A QUANTITY OF 1.2 METRE (4 FOOT) CATEGORY 6 WHITE OR GREY PATCH CABLES EQUAL TO 2/9 OF THE TOTAL USER AREA DROPS.

5. A NUMBER OF 0.9 METRE (2 FOOT) CATEGORY 6 BLUE PATCH CABLES EQUAL TO 1/18 THE TOTAL USER AREA DROPS.

6. A NUMBER OF 0.9 METRE (3 FOOT) CATEGORY 6 BLUE PATCH CABLES EQUAL TO 1/18 THE TOTAL USER AREA DROPS.

7. A NUMBER OF 1.21 METRE (4 FOOT) CATEGORY 6 BLUE PATCH CABLES EQUAL TO 1/18 THE TOTAL USER AREA DROPS.

8. A NUMBER OF 2.1 METRE (7 FOOT) CATEGORY 6 BLUE PATCH CABLES EQUAL TO 1/9 THE TOTAL USER AREA DROPS.

15. ALL HORIZONTAL CABLING SHALL MAINTAIN THE FOLLOWING DISTANCES FROM EMI EQUIPMENT:

1. 1.2m: MOTORS OR TRANSFORMER  
2. 1.0m: CONDUIT AND OR CABLES USED FOR ELECTRICAL POWER DISTRIBUTION.  
3. 300mm: CONDUIT AND OR CABLES USED FOR ELECTRICAL POWER DISTRIBUTION. WITH VOLTAGES LESS THAN 300V.  
4. 300mm: FLUORESCENT LIGHTING

5. WHEN HORIZONTAL CABLING IS REQUIRED TO CROSS FLUORESCENT LIGHTING, CONDUIT AND OR CABLES USED FOR POWER THEY SHALL CROSS PERPENDICULAR TO EACH OTHER.

1.22 FIBRE OPTIC SYSTEM

1. ALL CABINETS WILL INCLUDE FIBRE OPTIC PATCH PANELS, FIBRE OPTIC PATCH CORDS, FANS AND A 15A DUPLEX ELECTRICAL OUTLET.

2. CABLING GOING FROM THE NEW WIRING CABINETS TO THE STAFF AREAS CAN BE CAT6 (RJ45) IF THE DISTANCE BETWEEN THE CABINET AND THE STAFF AREA DOESN'T EXCEED 90m. IF THE DISTANCE EXCEEDS WHAT IS RECOMMENDED FIBRE OPTIC CABLE MUST BE USED.

3. NEW CABLING WILL BE RUN BETWEEN THE NEW WIRING CABINETS AND STAFF AREAS IN THE VICINITY OF EACH NEW CABINET THAT CURRENTLY HAVE NETWORK CONNECTIVITY.

4. CONTRACTOR OR SUB-CONTRACTOR SHALL BE AN EXPERIENCED FIBRE OPTIC INSTALLER.

5. THE CONTRACTOR SHALL HAVE A MINIMUM OF ONE CERTIFIED FIBRE OPTIC TECHNICIAN PRESENT AT ALL TIMES DURING THE INSTALLATION, TERMINATION AND TESTING WORK. WITH THE BID, THE CONTRACTOR SHALL PROVIDE DOCUMENTATION DEMONSTRATING THAT THE CERTIFIED FIBRE OPTIC CABLE BEING INSTALLED, OR FROM A RECOGNIZED FIBRE OPTIC TRAINING ORGANIZATION.

6. ALL CONDUIT BENDS, TRANSITIONS AND PULL BOXES SHOULD BE OF SUFFICIENT SIZE TO MAINTAIN THE FIBRE MANUFACTURER'S SPECIFICATION FOR MINIMUM BEND RADIUS.

7. ATTACHMENT OF THE PULLING ROPE TO THE FIBRE OPTIC CABLE SHALL FOLLOW THE CABLE MANUFACTURER'S RECOMMENDATION, THE CONTRACTOR SHALL USE A FACTORY INSTALLED PULLING EYE, OR INSTALL A KELLUMS PULLING GRIP.

8. THE CONTRACTOR SHALL INSTALL A PULLING SWIVEL BETWEEN THE PULLING ROPE AND THE CABLE ATTACHMENT TO AVOID CABLE TWISTING.

9. AT NO TIME WILL THE FIBRE OPTIC CABLE MANUFACTURER'S TEMPERATURE RANGES FOR STORAGE AND INSTALLATION BE EXCEEDED.

10. AT NO TIME WILL PULLING TENSION EXCEED THE CABLE MANUFACTURER'S SPECIFICATION WHILE IT IS BEING PULLED THROUGH CONDUIT. IF POWER WINCHES OR MECHANICAL ADVANTAGE DEVICES ARE USED TO PULL CABLE, A TENSION METER MUST BE USED TO INSURE THAT MAXIMUM TENSION IS NOT EXCEEDED. ALTERNATIVELY, A "MECHANICAL FUSE" RATED AT OR BELOW THE CABLE MANUFACTURER'S INSTALLATION TENSION SPECIFICATION MAY BE INCLUDED IN THE LINKAGE.

11. WHILE UNDER TENSION, A MINIMUM BEND RADIUS OF 10 - 20 TIMES THE OUTSIDE CABLE DIAMETER WILL BE MAINTAINED THROUGH THE USE OF PULLEYS WHERE REQUIRED. AFTER PULLING, NO BEND MAY HAVE A RADIUS, AT REST, OF LESS THAN 10 TIMES THE OUTSIDE CABLE DIAMETER.

12. THE CONTRACTOR SHALL INSTALL A 12 STRAND CABLE OF 50/125 MICRON OM3 MULTIMODE FIBRE, TERMINATED IN A 19" RACK MOUNT SPLICE TRAY, CONNECTOR TYPE LC.

13. THE FIBRE OPTIC CABLE SHALL BE TERMINATED AT BOTH ENDS WITH LC CONNECTORS MOUNTED IN A CONNECTOR PANEL.

14. LEAVE A PULL STRING IN ALL CONDUITS FOR FUTURE CABLE PULLS.

15. THE CONTRACTOR SHALL PROVIDE ODR TEST RESULTS AT WAVELENGTHS 850NM AND 1300NM. FOR EACH STRAND TO BE SUPPLIED IN ELECTRONIC FORMAT (FILE FORMAT \*.SCR). CONSISTENT FILE NAMING SHOULD BE USED TO IDENTIFY THE STRAND, DIRECTION, AND WAVELENGTH OF THE TEST. ODR TESTS SHALL BE PERFORMED USING A LAUNCH CABLE SUFFICIENT IN LENGTH TO STABILIZE THE BEGINNING OF THE TRACE (100M MINIMUM, 500M RECOMMENDED).

16. THE MAXIMUM ALLOWABLE ATTENUATION FOR ANY SPLICE OR TERMINATION 0.3 dB. TESTS MUST ENSURE THAT THE MEASURED LINK LOSS FOR EACH STRAND DOES NOT EXCEED THE "WORST CASE" ALLOWABLE LOSS DEFINED AS THE SUM OF THE CONNECTOR LOSS (BASED ON THE NUMBER OF MATED CONNECTOR PAIRS AT THE EIA/TIA - 568 B MAXIMUM ALLOWABLE LOSS OF 0.75 dB PER MATED PAIR) AND THE OPTICAL LOSS (BASED ON THE PERFORMANCE STANDARD BELOW).

17. OM3 PERFORMANCE:  
WAVELENGTH 850NM - MAX ATTENUATION 3.5 dB/KM  
WAVELENGTH 1,300NM - MAX ATTENUATION 1.5 dB/KM

18. THE CONTRACTOR WILL PROVIDE OPTICAL LOSS TEST SET (OLTS) RESULTS INDICATING THE ATTENUATION AND LENGTH FOR EACH STRAND.

19. AT EACH END OF THE CABLE, A SUFFICIENT SERVICE COIL SHALL BE LEFT TO FACILITATE RELOCATION OF THE FIBRE CABLE. AT THE NETWORK CABINET END THIS SERVICE COIL SHALL BE 5 METERS. AT THE MAIN NETWORK ROOM ON THE MAIN FLOOR THIS SERVICE COIL SHALL BE 5 METERS.

20. PROVIDE ACCURATE AS-BUILTS DRAWINGS SHOWING THE LOCATION OF THE CONDUIT/CABLE.

21. ALL PATCH PANELS AND WORK AREA CABLE BOXES SHALL BE PERMANENTLY LABELED AND UNIQUELY IDENTIFIED IN ACCORDANCE WITH EIA/TIA 606-b STANDARDS.

22. ALL WORK MUST BE DONE TO MINIMIZE DOWNTIME TO STAFF AND THE PUBLIC. STAFF MUST CONTINUE TO USE THE EXISTING NETWORK CABLING UNTIL SUCH TIME AS THEY CAN BE QUICKLY TRANSITIONED OVER TO THE NEW CABLING.

1.23 COORDINATION AND SUPPLY OF WORK ON EXISTING EQUIPMENT

1. WHEN EXISTING SERVICES SUCH AS VOICE/DATA SERVICE, ELECTRICAL POWER, ETC. ARE REQUIRED TO BE DISRUPTED AND/OR SHUT DOWN, CO-ORDINATE THE SHUTDOWNS AND CARRY OUT THE WORK AT AN ACCEPTABLE TIME TO THE OWNER. CAREFULLY SCHEDULE AND DISRUPTION AND/OR SHUT-DOWNS AND ENSURE THAT 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 PERFORMANCE WORK AND OBTAIN CONTRACT ADMINISTRATOR WRITTEN CONSENT PRIOR TO IMPLEMENTING.

2. SHOULD ANY TEMPORARY CONNECTIONS BE REQUIRED, SUPPLY AND INSTALL ALL NECESSARY MATERIAL AND EQUIPMENT AND PROVIDE ALL LABOUR AT NO EXTRA COST. SHOULD ANY EXISTING SYSTEM BE DAMAGED, MAKE FULL REPAIRS WITHOUT EXTRA COST, AND TO THE SATISFACTION OF THE CITY AND CONTRACT ADMINISTRATOR.

1.24 SITE REVIEW

1. CONTACT THE CONTRACT ADMINISTRATOR FOR SITE REVIEW AT THE FOLLOWING STAGES OF CONSTRUCTION:  
- ROUGH-IN OF WALLS AND FEEDERS  
- SUBSTANTIAL PERFORMANCE  
- COMPLETION OF DEFICIENCIES (IF REQUIRED)  
NOTE: ALL REVIEWS ARE AT THE DISCRETION OF THE CONTRACT ADMINISTRATOR.

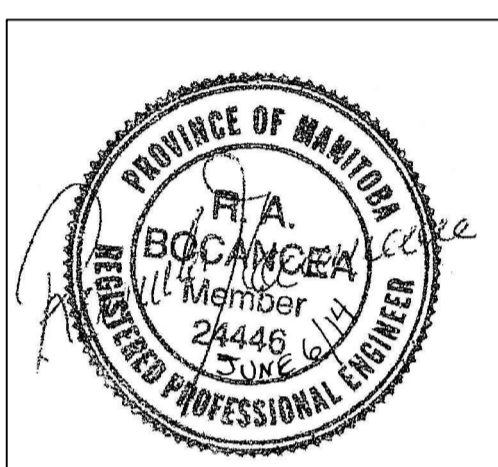
2. PROVIDE FIVE (5) WORKING DAYS NOTICE FOR ALL REVIEWS.

1.25 SUBSTANTIAL PERFORMANCE

1. BEFORE REQUESTING A SUBSTANTIAL PERFORMANCE REVIEW, THE FOLLOWING ARE AMONG ITEMS THAT MUST BE COMPLETE:

- ALL OUTLETS AND EQUIPMENT MUST BE TERMINATED AND TESTED WITH A REPORT SENT TO THE CONTRACT ADMINISTRATOR.  
- ANY DEVICES NOT INSTALLED MUST HAVE THE WIRING MADE SAFE AND TERMINATED IN AN OUTLET BOX COMPLETE WITH COVER.  
- ALL OUTLETS MUST HAVE COVER PLATES INSTALLED.  
- ALL ELECTRICAL EQUIPMENT MUST HAVE COVERS AND/OR DOORS INSTALLED COMPLETE.  
- PROVIDE CERTIFICATE OF ACCEPTANCE FROM ELECTRICAL INSPECTION DEPARTMENT.

ELECTRICAL SYMBOLS	
◀	PROVIDE 2-NEW CAT6 CABLES BACK TO DESIGNATED PATCH PANEL. EXISTING VOICE CABLE TO REMAIN. RE-TERMINATE INTO NEW JACK IN FACEPLATE.
☐	POWER PANEL
⊕	NEW DUPLEX RECEPTACLE, PROVIDE A NEW CIRCUIT AS THE NEAREST PANEL WITH CAPACITY.
Δ	EXISTING DATA OUTLET. PROVIDE 1-NEW CAT6 CABLE BACK TO DESIGNATED PATCH PANEL. REMOVE OLD CABLING.
Δ N	NEW DATA OUTLET. PROVIDE 1-NEW CAT6 CABLE BACK TO DESIGNATED PATCH PANEL.
Δ H	NEW DATA OUTLET. INSTALL AT HIGH LEVEL. PROVIDE 1-NEW CAT6 CABLE BACK TO DESIGNATED PATCH PANEL.



No.	REVISION/DESCRIPTION	BY	DATE
4	ISSUED FOR TENDER AND CONSTRUCTION	KO	04.06.14
3	ISSUED FOR FINAL REVIEW	KO	17.04.14
2	ISSUED FOR REVIEW	KO	20.02.14
1	ISSUED FOR REVIEW	KO	21.11.13

SCALE	PROJECT No:	SHEET No:
AS SHOWN	2013-034	E0

DRAWN	KOLO	CHECKED	DH	DESIGNED	KO	APPROVED	KO
DATE	2013.08.20	USER	APPROVAL				

THE CITY OF WINNIPEG  
PLANNING, PROPERTY AND DEVELOPMENT DEPARTMENT  
MUNICIPAL ACCOMMODATIONS DIVISION  
3-65 GARRY STREET, R3C 4K4

PROJECT  
PAN AM POOL  
NETWORK INFRASTRUCTURE UPGRADE  
499-2014  
25 POSEDON BAY

SHEET TITLE  
SPECIFICATION AND LEGEND

DRAWING SHEET SIZE: A1 (841mm x 594mm) PLOT 1:1