

project:	Scarborough Health Network Mental Health Inpatient Consolidation Pod 3A3030 Birchmount Road, Scarborough, ON	ADD:	03
MMC RFQ#:	CW29854	date:	2026-07-14
HJA project no:	24-20	page 1 of:	2 + attachments

This addendum forms part of the contract documents and is to be read, interpreted, and co-ordinated with all other parts. The cost of all contained herein is to be included in the stipulated bid price. The following revisions supersede the information contained in the original drawings and specifications issued for the above-named project to the extent referenced and shall become part thereof. Acknowledge receipt of this Addendum by inserting its number on the tender form. Failure to do so may subject bidder to disqualification.

1.0 GENERAL

1.1 Not Used

2.0 ALTERNATIVES

2.1 Not Used

3.0 ARCHITECTURAL GENERAL

3.1 Clarification – Aluminum Windows + Sull Sashes

- .1 Separate specification sections were provided for the Aluminum Window (section 08 51 13) and Sull Sash (section 08 52 11) to allow the Contractor the flexibility to use products and systems from different manufacturers. However, it is important to note that the systems identified in each of these specification sections are to act together as one integral unit when tested in accordance with the requirements of AMMA 501.8-14 to attain an impact resistance of 2000 ft/lb soft body impact.

It is the responsibility of the Contractor to provide an integral aluminum window and sull sash system that is certified by a recognized testing authority to meet or exceed the specified AMMA 501.8-14 impact resistance. The impact testing data and report shall be submitted during the shop drawing review stage prior to carrying out the field testing specified in section 08 52 11 for the integral unit.

Per HJA ADD-02, Sherwood MHW-6200 Aluminum Window + Sull Sash assembly is an acceptable system. The manufacturer has confirmed they will provide a report attesting that this assembly has been tested to comply with the specified impact requirements stipulated in section 085113 and 085211.

4.0 ARCHITECTURAL SPECIFICATION

4.1 Section 08 51 13 Aluminum Windows

- .1 **Add** section 1.4.36 to read:
"AMMA 501.8-14 Standard Test Method for determination of Resistance to human impact of window system intended for use in a Psychiatric Application."
- .2 **Revise** section 1.7.4.1 to read:
"Submit drawings stamped and signed by Professional Engineer licensed in Ontario attesting the system has been designed to meet the performance requirements of this section. Same engineer to review/stamp both Aluminum Window and Interior Security Sull Sashes and confirm that the combined system can withstand the required 2000ftlb **soft body impact testing in conformance with AAMA 501.8-14.**"
- .3 **Add** section 1.7.6.4. to read: "Impact Testing (AMMA 501.8-14)"

5.0 ARCHITECTURAL DRAWINGS

5.1 Not Used

6.0 MECHANICAL ADDENDUM (SEE ATTACHED ADD# M-03)

7.0 ELECTRICAL ADDENDUM (SEE ATTACHED ADD# E-03)

end of addendum

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Addendum

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Date: July 14, 2026

Project Name: SHN Mental Health Inpatient Consolidation Pod 3A

Client: Scarborough Health Network

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+ Attachment

In accordance with the drawings and specifications, provide in the tender all costs required to complete the work including items as listed below.

Mechanical:

Reference	Description
M-001	1. Revised font size.
M-002	1. Added specification for heat trace and HVAC cleaning.

End of ADD # M-03

MECHANICAL SPECIFICATION

1 GENERAL PROVISIONS

- ALL EQUIPMENT INSTALLED AS PART OF THIS PROJECT SHALL BE ANTI-LIGATURE UNLESS OTHERWISE NOTED.
- COMPLY WITH REQUIREMENTS OF ALL MUNICIPAL, PROVINCIAL AND FEDERAL BYLAWS AND ORDINANCES AS WELL AS THE REQUIREMENTS OF THE ONTARIO BUILDING CODE, AND AUTHORITIES HAVING JURISDICTION, WHERE ANY CODE, REGULATION, BYLAW, STANDARD, CONTRACT FORM, MANUAL, PRINTED INSTRUCTION, AND INSTALLATION AND INSTALLATION INSTRUCTION IS QUOTED IT MEANS, UNLESS OTHERWISE SPECIFICALLY NOTED, LATEST PUBLISHED EDITION AT TIME OF PERMIT ADOPTED BY AND ENFORCED BY LOCAL GOVERNING AUTHORITIES HAVING JURISDICTION.
- MAINTAIN AT THE JOB SITE, AT ALL TIMES, QUALIFIED PERSONNEL AND SUPPORTING STAFF, WITH PROVEN EXPERIENCE IN ERECTING, SUPERVISING, TESTING AND ADJUSTING PROPERTIES OF COMPARABLE NATURE AND COMPLEXITY.
- PRIOR TO SUBMITTING THE TENDER, VISIT SITE TO DETERMINE SUITABILITY OF DESIGN FOR EXISTING SITE CONDITIONS, REFER TO AND EXAMINE ALL CONTRACT DOCUMENTS. ADDITIONAL PAYMENTS WILL NOT BE MADE FOR EXTRA LABOUR OR MATERIAL NECESSARY DUE TO LOCATION OR NATURE OF BEAMS, JOISTS, WALLS, FURRED CEILINGS, OR FINISHES WITH WHICH CONTRACTOR SHOULD BE FAMILIAR, DETERMINE EXACT DIMENSIONS AND OTHER RESTRICTIVE CONDITIONS ON SITE, NOT FROM DRAWINGS.
- THE WORD "PROVIDE" SHALL MEAN "SUPPLY, INSTALL, CONNECT, TEST AND COMMISSION".
- ON COMPLETION OF WORK, PRESENT TO THE OWNER OR OWNERS APPOINTED REPRESENTATIVE, A FINAL UNCONDITIONAL CERTIFICATE OF APPROVAL BY AUTHORITIES HAVING JURISDICTION.
- SCAN AND/OR X-RAY ALL CONCRETE SLABS TO IDENTIFY THE APPROPRIATE LOCATION TO CUT, TRENCH AND/OR CORE PRIOR TO COMMENCING ANY WORK. SUBMIT THE RESULTS OF THE SCAN AND/OR X-RAY IN A REPORT FORMAT TO THE STRUCTURAL ENGINEER FOR REVIEW PRIOR TO CUTTING, TRENCHING AND/OR CORING. THIS CONTRACTOR SHALL ENSURE THAT THERE ARE NO INTERFERENCES WITH OTHER EXISTING SERVICES PRIOR TO COMMENCING ANY WORK.
- RETURN ALL UNUSED EQUIPMENT AND MATERIAL BEING REMOVED TO THE OWNER OR OWNERS APPOINTED REPRESENTATIVE.
- SUBMIT SHOP DRAWINGS FOR EQUIPMENT REQUESTED BY THE CONSULTANT. UNLESS OTHERWISE SPECIFIED, FOR SUBMIT SHOP DRAWINGS EACH MAJOR ITEM OF EQUIPMENT SUCH AS PLUMBING FIXTURE(S), SUPPLY DIFFUSERS, RETURN GRILLE(S), AND EQUIPMENT ACCESSORIES.
- ALL DUCTWORK TO BE AS SPECIFIED. SUBSTITUTION OF ANY PRODUCT OTHER THAN SPECIFIED MUST ASSURE NO DEVIATION BELOW THE STATED PERFORMANCE CAPACITIES, AIR FLOW RATE, HEAT TRANSFER RATE, FILTRATION EFFICIENCY AND AIR MIXING QUALITY. PHYSICAL PROPERTIES INCLUDING SIZE AND WEIGHTS OF BASE SPECIFIED EQUIPMENT SHALL NOT BE EXCEEDED. POWER REQUIREMENTS MUST NOT BE EXCEEDED AND, WHERE SPECIFICALLY DEFINED, SOUND POWER LEVELS MUST NOT BE EXCEEDED. APPLICATIONS FOR "EQUAL" OR "ALTERNATE" MUST ADDRESS THESE FACTORS.
- SUBMIT WRITTEN GUARANTEE TO OWNER OR OWNERS APPOINTED REPRESENTATIVE COVERING REMEDY OF DEFECTS IN WORK AT COMPLETION OF WORK. SUBMIT SIMILAR WRITTEN GUARANTEE FOR ONE YEAR FROM DATE OF ACCEPTANCE FOR ANY PART OF WORK ACCEPTED BY OWNER OR OWNERS APPOINTED REPRESENTATIVE.
- DURING THE DEFECTS LIABILITY PERIOD, THE SUB-CONTRACTOR SHALL HAVE FACILITIES OF 24 HOURS "CALL OUT" WHEREBY AT ANY TIME OF DAY OR NIGHT TO ATTEND TO ALL FAULTS AND COMPLAINT, REMEDY ALL DEFECTS, REPLACE ALL MALFUNCTIONING ITEMS AND MAINTAIN THE COMPLETE INSTALLATION IN A CLEAN AND TIDY CONDITION TO THE SATISFACTION OF THE CONSULTING ENGINEER.
- CONTRACTOR PROVIDES COMMISSIONING SERVICES AND COMMISSIONING REPORT FOR ALL THE NEW EQUIPMENT, AND EXISTING EQUIPMENT MODIFIED AS PART OF THE PROJECTS SCOPE OF WORK. INCLUDE ON-SITE TRAINING (IF REQUIRED) FOR THE FACILITY MAINTENANCE STAFF FOR A MINIMUM OF TWO 8-HOUR SESSIONS.
- SUITABLY STORE AND PROTECT RECORD "AS-BUILT" SET OF DRAWINGS TO BE KEPT ON SITE AT ALL TIMES AND MAKE AVAILABLE AT ALL TIMES FOR INSPECTION, CHANGES TO PIPING, DUCTWORK AND EQUIPMENT SHALL BE RECORDED ON SAME. AFTER COMPLETION OF WORK PROVIDE OWNER WITH ONE SET OF DRAWINGS IN PDF FORMAT AND HARD COPY FOR REVIEW. SUBMIT REVIEWED RECORD "AS-BUILT" DRAWINGS IN AN EDITABLE CAD FORMAT. SHOW FINAL LOCATION OF PIPING, DUCTWORK AND EQUIPMENT.
- CONTRACTORS AS-BUILT DRAWINGS:
 - RECORD ACCURATELY INSTALLED (AS-BUILT) MECHANICAL WORK AS "RED-LINE" MARK-UPS ON WHITE PRINTS. MECHANICAL TRADES "RED-LINE" AS-BUILT DRAWINGS SHALL BE TRANSFERRED TO AN EDITABLE AUTOCAD FORMAT "AS-BUILT DRAWING" BY THE MECHANICAL TRADE CONTRACTOR. SUBMIT BOTH COPIES FOR REVIEW. KEEP ONE UP-TO-DATE SET ON SITE.
- OPERATING AND MAINTENANCE (O&M) MANUALS:
 - O&M MANUALS SHALL BE SUBMITTED TO THE CONSULTANT FOR REVIEW.
 - O&M MANUALS SHALL INCLUDE REVIEWED SHOP DRAWINGS, TESTING, ADJUSTING AND BALANCING (TAB) REPORTS, EQUIPMENT DATA SHEETS, WRITTEN WARRANTY, OPERATING INSTRUCTIONS AND MAINTENANCE PROCEDURES.
 - PROVIDE PIPING PRESSURE TESTS (FIRE PROTECTION, DOMESTIC WATER, HVAC PIPING) INDICATING SYSTEM TESTED, PRESSURE HELD, TIME OF TEST AND DATE, AND CERTIFIED BY THE CONSULTANT.
 - O&M MANUALS SHALL BE SEPARATED WITH DIVIDERS IN APPROPRIATE SECTIONS.
 - MAKE ALL CORRECTIONS REQUESTED BY THE CONSULTANT AND RESUBMIT FOR REVIEW.
- DOCUMENTATION AND SYSTEMS ACCEPTANCE: PROVIDE THE FOLLOWING UPON SUBSTANTIAL PERFORMANCE OF THE WORK:
 - OPERATING AND MAINTENANCE (O&M) MANUALS.
 - COMPLETED AND ACCEPTED AIR AND WATER BALANCING REPORT; THE WORK OF THE MECHANICAL TRADES WILL NOT BE CONSIDERED TOTALLY PERFORMED UNTIL COMPLETION OF AIR AND WATER BALANCING EVEN IF UNDERTAKEN BY SEPARATE CONTRACT FROM THE WORK OF THE MECHANICAL TRADES.
- PERFORM CUTTING AND PATCHING FOR MECHANICAL SERVICES AND INCLUDE FOR WORK IN TENDER.
- COORDINATE INSTALLATION OF NEW DUCTWORK, SPRINKLER AND PLUMBING LINES TO SUIT INSTALLATION OF ALL OTHER COMPONENTS BEING INSTALLED IN CEILING SPACE OR EXTENDING INTO CEILING SPACE. REVIEW MECHANICAL, ELECTRICAL AND ARCHITECTURAL DRAWINGS TO BECOME FAMILIAR WITH INSTALLATION REQUIREMENTS OF THESE COMPONENTS. PROBLEMS WITH INSTALLATION OF THESE COMPONENTS DUE TO INSTALLATION OF NEW DUCTWORK, SPRINKLER AND PLUMBING LINES WILL RESULT IN CONTRACTOR HAVING TO RELOCATE NEW DUCTWORK, SPRINKLER AND PLUMBING LINES AT THEIR OWN COST.
- ALL NEW PENETRATIONS THROUGH FLOORS TO BE SEALED WITH APPROVED NON-SHRINK, WATERPROOF AND ULC LISTED FIREPROOF SEALANT.
- THE CONTRACTOR AND ALL SUB-TRADES ARE RESPONSIBLE TO REPAIR OR REPLACE ANY ITEM DAMAGED WHILE PERFORMING WORK OUTLINED IN THIS CONTRACT.
- LAY-IN TYPE CEILING TILES, PROPERLY MARKED, MAY SERVE AS ACCESS PANELS. PROVIDE STICK-ON CIRCULAR TAB (APPROXIMATELY 1/2"), LOCATED ON A TIE SUPPORTING CEILING TILE USED AS ACCESS PANEL, FOR ALL NEW EQUIPMENT LOCATED IN CEILING SPACE (EG. CAVI VAV TERMINALS).
- EXISTING AND NEW SERVICES PENETRATING FLOOR SLAB OR FIRE RATED WALLS TO BE SEALED WITH ULC LISTED AND LABELLED 3.0 HR "F" RATED FIRE-RETARDANT SEALANT.
- VISIT THE SITE PRIOR TO TENDER AND VERIFY ALL CONDITIONS. PRIOR TO

- SUBMITTING PRICE. THE MECHANICAL CONTRACTOR IS TO REVIEW ALL DISCREPANCIES WITH THE CONSULTANT AND VERIFY THE LOCATIONS OF ALL EXISTING SERVICES THAT ARE BEING EXTENDED AND THE ROUTING OF NEW SERVICES. REPORT ALL AMBIGUITIES, DISCREPANCIES, DEPARTURES FROM BUILDING BY-LAWS AND/OR FROM GOOD PRACTICE. FAILURE TO DO SO WILL RESULT IN ALL ADDITIONAL COSTS BEING THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. INCLUDE FOR ANY ALTERNATE ROUTING OF NEW OR REROUTING OF EXISTING SERVICES TO ACCOMMODATE ALL SITE CONDITIONS IN THE TENDER PRICE.
- APPLY FOR, OBTAIN AND PAY FOR ALL PERMITS AND INSPECTIONS REQUIRED PRIOR TO COMMENCEMENT OF CONSTRUCTION. INCLUDE ALL SALES TAXES AND HST.
- PROVIDE THE LANDLORD AND TENANT WITH A WRITTEN WARRANTY FOR ALL LABOUR, MATERIALS, AND EQUIPMENT PROVIDED IN THIS CONTRACT, FOR A PERIOD OF ONE YEAR COMMENCING AT SUCH TIME THAT THE CONSULTANT DEEMS THE WORK ACCEPTABLE.
- INCLUDE THE COST OF PREMIUM TIME IN THE TENDER PRICE FOR WORK PROVIDED DURING NIGHTS, WEEKENDS OR OTHER TIMES OUTSIDE NORMAL WORKING HOURS. NECESSARY TO MAINTAIN ALL MECHANICAL SERVICES IN OPERATION AND TO MEET THE PROJECT SCHEDULE.
- ALTERNATE EQUIPMENT MAY BE PROPOSED DURING THE TENDER PERIOD, PROVIDED THAT THE SPACE REQUIREMENTS, QUALITY AND PERFORMANCE CHARACTERISTICS, POWER CHARACTERISTICS, AIR AND FLUID FLOW REQUIREMENTS AND WEIGHTS ARE EQUAL TO THE SPECIFIED PRODUCTS. ACCEPTANCE OF ALTERNATE EQUIPMENT SHALL BE AT THE DISCRETION OF THE CONSULTANT AND WILL ONLY BE AFTER REVIEW OF PROPERLY SUBMITTED SHOP DRAWINGS. ASSUME RESPONSIBILITY AND PAY FOR ALL ADDITIONAL INSTALLATION COSTS INCURRED BY ALL RELATED TRADES RESULTING FROM ALTERNATES AND/OR SUBSTITUTES. MAKE REVISIONS TO RECORD DRAWINGS, INCORPORATING ALTERNATES AND/OR SUBSTITUTES AND ALL RELATED CHANGES. ALTERNATE EQUIPMENT WILL NOT BE CONSIDERED SUBSEQUENT TO TENDER CLOSING.
- REUSE EXISTING MATERIALS AND EQUIPMENT WHEREVER POSSIBLE. PROVIDE NEW MATERIALS AND EQUIPMENT AS REQUIRED TO ENSURE A COMPLETE INSTALLATION. ALL EXISTING EQUIPMENT, MATERIALS AND ASSOCIATED CONTROLS NOT USED IN THIS CONTRACT SHALL BE PACKAGED AND TURNED OVER TO THE LANDLORD. INCLUDE IN THE TENDER FOR ALL SHIPPING AND PLACEMENT IN A DESIGNATED ON-SITE STORAGE LOCATION. REMOVE ANY EQUIPMENT OR MATERIAL NOT WANTED BY THE LANDLORD FROM THE SITE.
- PROVIDE SLEEVES FOR ALL NEW PIPING PASSING THROUGH FLOOR AND ROOF SLABS, BEAMS, CONCRETE WALLS AND SLAB TO SLAB PARTITIONS, ETC.
- SEAL TO BE AIR-TIGHT AROUND ALL DUCTWORK AND PIPING PENETRATIONS THROUGH PARTITIONS, Baffles ABOVE CEILINGS, AND THROUGH FLOORS THAT ARE NOT FIRE RATED.
- REQUEST IN WRITING FOR A COMPLETED ROUGH-IN AND FINAL INSPECTION OF THE MECHANICAL SYSTEMS. WHEN THE FINAL INSPECTION REQUEST IS MADE ALL DEFICIENCIES MUST BE COMPLETE, BALANCING REPORTS SUBMITTED, SYSTEMS READY FOR OPERATION, EQUIPMENT HAS BEEN COMMISSIONED, OPERATING AND MAINTENANCE MANUALS SUBMITTED, ALL TAGS, CHARTS AND NAMEPLATES COMPLETED, ALL FIXTURES AND EQUIPMENT CLEANED, SPARE PARTS PROVIDED, RECORD DRAWINGS COMPLETE, CONTROL SYSTEMS OPERATIONAL, AND THE LANDLORD'S STAFF INSTRUCTED IN ALL PHASES OF THE SYSTEM OPERATION.
- PROVIDE TEMPORARY FILTERS, 1IN. THICK DISPOSABLE MEDIA TYPE, OVER ALL RETURN AIR OPENINGS IN THE BASE BUILDING H.V.A.C. SYSTEMS THAT REMAIN IN OPERATION DURING CONSTRUCTION. MAINTAIN AND REPLACE THE TEMPORARY FILTER MEDIA AS REQUIRED TO PREVENT CONSTRUCTION DUST FROM FOUling THE BASE BUILDING EQUIPMENT. REMOVE THE TEMPORARY FILTER MEDIA AFTER COMPLETION. FILTERS ON EQUIPMENT, I.E. AIR HANDLING UNITS, INDUCTION UNITS, FAN COIL UNITS, ETC., SHALL BE REPLACED AFTER CONSTRUCTION IS COMPLETED.
- PRIOR TO OPERATING ANY EXISTING OR NEW EQUIPMENT DURING ANY STAGE OF CONSTRUCTION, APPROVAL FROM THE OWNER OR OWNERS APPOINTED REPRESENTATIVE AND CONSULTANT MUST BE RECEIVED IN WRITING.
- PROVIDE ALL RIGGING AS MAY BE REQUIRED FOR ALL SYSTEM MATERIALS AND EQUIPMENT. PROVIDE ALL REQUIRED SUPPLEMENTARY STEEL SUPPORTS NECESSARY FOR MOUNTING OR HANGING EQUIPMENT, EQUIPMENT BEING SUSPENDED FROM THE FLOOR STRUCTURE, OR SUPPORTED FROM OR ON THE ROOF, WITH A WEIGHT GREATER THAN 500 POUNDS. SHALL HAVE SUPPORTS REVIEWED BY A STRUCTURAL CONSULTANT. ALL REQUIRED STRUCTURE AS RECOMMENDED BY THE CONSULTANT SHALL BE INCLUDED IN THE TENDER.
- ALL NEW AND RELOCATED EXISTING SERVICES AND EQUIPMENT MUST BE SUPPORTED FROM THE BUILDING STRUCTURE. ALL DRILLING, APPROVED TYPE INSERTS AND HANGERS SHALL BE INCLUDED. REFER TO "SEISMIC RESTRAINT CONTROLS" SECTION FOR ADDITIONAL REQUIREMENTS.
 - AUXILIARY STRUCTURAL MEMBERS SHALL BE INCLUDED AND INSTALLED WHERE REQUIRED TO ACCOMMODATE HANGERS.
 - ALL SUPPORTS SHALL BE CONNECTED TO THE TOP OF JOISTS AND BEAMS WHERE APPLICABLE.
 - SUSPENSION FROM METAL DECK IS NOT ALLOWED.
 - SUSPENDING ONE HANGER FROM ANOTHER IS NOT PERMITTED.
- MONTHLY PROGRESS DRAWS:
 - PROVIDE A COMPLETE ITEMIZED COST BREAKDOWN OF ALL MATERIALS, EQUIPMENT AND LABOUR COSTS ASSOCIATED WITH EACH SUBMISSION FOR ADDITIONAL OR DELETED WORK.
- APPLY, OBTAIN AND PAY FOR ALL REQUIRED PERMITS, LICENSES AND INSPECTIONS REQUIRED FOR THIS WORK. IN CASE OF CONFLICT, CODES AND REGULATIONS TAKE PRECEDENCE OVER THE CONTRACT DOCUMENTS. IN NO INSTANCE REDUCE THE STANDARD OR SCOPE OF WORK OR INTENT ESTABLISHED BY THE DRAWINGS AND SPECIFICATIONS BY APPLYING ANY OF THE CODES.
- CHANGES TO THE WORK:
 - BEFORE PROCEEDING WITH ANY CHANGES, SUBMIT FOR REVIEW AND APPROVAL BY THE CONSULTANT. APPROVAL SHALL COME IN THE FORM OF A CHANGE ORDER SIGNED BY THE LANDLORD/OWNER.
 - CHANGE QUOTATIONS SHALL BE SUBMITTED COMPLETE WITH AN ITEMIZED COST BREAKDOWN OF ALL MATERIALS, EQUIPMENT AND LABOUR COSTS ASSOCIATED WITH EACH SUBMISSION FOR ADDITIONAL OR DELETED WORK. FAILURE TO PROVIDE WILL RESULT IN REJECTION.
 - ALL MECHANICAL CHANGE NOTICES SHALL BE PRICED USING MECHANICAL LABOUR UNIT COSTS IN ACCORDANCE WITH MECHANICAL CONTRACTORS ASSOCIATION OF AMERICA (MCAA) LABOUR ESTIMATING MANUAL. PROVIDE COPIES OF THE MCAA LABOUR UNITS APPLIED WHEN REQUESTED BY THE CONSULTANT.
 - IT IS UNDERSTOOD THAT EACH CHANGE MAY HAVE A VARIETY OF NON-TYPICAL OR ABNORMAL FACTORS THAT WILL REQUIRE ADJUSTMENTS. UNDER NO CIRCUMSTANCES SHALL THE CUMULATIVE TOTAL OF ADDITIONAL FACTORS EXCEED 20% OF THE HOURS ESTABLISHED USING BASE LABOUR UNITS.
- ALL MECHANICAL CHANGE NOTICES SHALL BE PRICED USING ALLPRISER MATERIAL PRICING, LESS A MINIMUM DISCOUNT OF 20%. PROVIDE COPIES OF THE ALLPRISER PUBLISHED LIST PRICES USED TO ESTIMATE MATERIAL AND EQUIPMENT COSTS WHEN REQUESTED BY THE CONSULTANT.
- THE MARK-UP FOR OVERHEAD AND PROFIT SHALL BE LIMITED TO AND BE CALCULATED AS FOLLOWS:
 - WORK CARRIED OUT BY THE TRADE CONTRACTOR OR TRADE SUBCONTRACTORS: 10% OVERHEAD AND PROFIT COMBINED.
 - TRADE CONTRACTORS' OVERHEAD AND PROFIT ON TRADE SUBCONTRACTORS' WORK: 5% OVERHEAD AND PROFIT COMBINED.
 - THE CUMULATIVE TOTAL PERCENTAGE FOR OVERHEAD AND PROFIT CHARGED BY THE TRADE CONTRACTOR, TRADE SUBCONTRACTOR AND OTHERS SHALL NOT EXCEED 20% OF THE CUMULATIVE TOTAL VALUE OF SUCH CHANGE IN THE WORK, NET OF OVERHEAD AND PROFIT.
- DEMOLITION AND REVISION WORK:
 - WHERE INDICATED ON DRAWINGS, DISCONNECT AND REMOVE EXISTING MECHANICAL WORK, INCLUDING HANGERS, SUPPORTS, INSULATION, AND SIMILAR DEVICES AND SYSTEM ANCILLARIES. DISCONNECT AT POINT OF SUPPLY, REMOVE OBSOLETE CONNECTING SERVICES AND MAKE SYSTEM SAFE. CUT BACK OBSOLETE PIPING BEHIND FINISHES AND CAP WATER-TIGHT, UNLESS OTHERWISE SPECIFIED.

- DRAIN DOWN EXISTING PIPING PRIOR TO ANY DEMOLITION WORK. SAFELY DISPOSE OF FLUIDS WITHIN PIPING, UNLESS SPECIFIED OTHERWISE.
- WHERE EXISTING MECHANICAL SERVICES EXTEND THROUGH OR ARE IN AN AREA SCHEDULED TO REMAIN OPERATIONAL, DURING THE PROJECT, MAINTAIN SERVICES IN OPERATION. INCLUDE FOR REROUTING EXISTING SERVICES CONCEALED BEHIND EXISTING FINISHES AND WHICH BECOME EXPOSED DURING THE RENOVATION WORK, SO AS TO BE CONCEALED BEHIND NEW OR EXISTING FINISHES.
- UNLESS OTHERWISE SPECIFIED, REMOVE FROM SITE AND DISPOSE OF EXISTING MATERIALS WHICH HAVE BEEN REMOVED AND ARE NOT TO BE RELOCATED OR REUSED. PRESENT TO THE OWNER EXISTING EQUIPMENT REMOVED BUT NOT IDENTIFIED FOR SALVAGE ON SITE. ACCEPTANCE OF REMOVED EQUIPMENT IS AT THE DISCRETION OF THE OWNER. REMOVE SUCH ITEMS FROM SITE WHEN DEEMED UNSUITABLE. MATERIALS WHICH ARE TO BE HANDED OVER TO THE OWNER SHALL BE TRANSPORTED BY THE CONTRACTOR TO A LOCATION WITHIN THE PROJECT SITE DESIGNATED BY THE OWNER. THE CONTRACTOR SHALL BE LIABLE FOR DAMAGE TO EXISTING SALVAGED EQUIPMENT DURING REMOVAL AND TRANSPORTING.
- IF ASBESTOS, PCB'S OR OTHER HAZARDOUS MATERIALS ARE ENCOUNTERED IN THE COURSE OF THE WORK, STOP WORK IN THE VICINITY OF SUCH MATERIALS AND REPORT THEIR PRESENCE TO THE OWNER OR OWNERS APPOINTED REPRESENTATIVE AND THE CONSULTANT.
 - OBTAIN AND PAY FOR THE SERVICES OF A CONTRACTOR LICENSED TO WORK IN AREA CONTAINING ASBESTOS. THIS CONTRACTOR TO SET UP ALL NECESSARY BARRIERS, ABOVE AND BELOW THE CEILINGS AND BE INVOLVED IN THE PROJECT AS LONG AS ASBESTOS IS EXPOSED.
 - ALL PERSONNEL ENTERING THE CONTAMINATED AREA MUST COMPLY WITH MINISTRY OF LABOUR CODES REGARDING ASBESTOS.
 - AFTER ALL WORK IN THE ASBESTOS CONTAMINATED AREA IS COMPLETED, THE ASBESTOS CONTRACTOR WILL CLEAN UP AND DISPOSE OF ALL DISTURBED ASBESTOS AND ASBESTOS CONTAMINATED MATERIALS.
- INTERRUPTION TO SHUT-DOWN OF MECHANICAL SERVICES AND SYSTEMS:
 - WHERE DISRUPTIONS OF EXISTING MECHANICAL SERVICES ARE REQUIRED, COORDINATE SHUT-DOWN WITH THE OWNER OR OWNERS APPOINTED REPRESENTATIVE AND DO THE WORK AT A TIME AND IN A MANNER MUTUALLY ACCEPTABLE.
 - PERFORM WORK ASSOCIATED WITH SHUT-DOWNS AND INTERRUPTIONS AS CONTINUOUS OPERATIONS TO MINIMIZE SHUT-DOWN TIME AND TO REINSTATE SYSTEMS AS SOON AS POSSIBLE, AND, PRIOR TO ANY SHUT-DOWN, ENSURE MATERIALS AND LABOUR REQUIRED TO COMPLETE THE WORK FOR WHICH SHUT-DOWN IS REQUIRED ARE AVAILABLE AT SITE.
 - SUBMIT A WRITTEN CONCISE SCHEDULE OF EACH DISRUPTION AT LEAST 72 (SEVENTY-TWO) HOURS IN ADVANCE AND OBTAIN OWNERS' WRITTEN CONSENT PRIOR TO IMPLEMENTATION.
- INSULATION
 - INSULATION SHALL BE REMOVED FROM ALL DUCTWORK, PIPING, FITTINGS, VALVES AND EQUIPMENT DESIGNATED FOR DEMOLITION.
 - COMPLY WITH ALL SAFETY PRECAUTIONS RELATED TO INSULATION REMOVAL.
- SEISMIC RESTRAINT CONTROLS
 - PROVIDE SEISMIC RESTRAINT CONTROLS FOR ALL EQUIPMENT AND SERVICES INSTALLED AS PART OF THIS PROJECT.
 - SRSs ACRONYM FOR SEISMIC RESTRAINT SYSTEM.
 - SFRSs ACRONYM FOR SEISMIC FORCE RESISTING SYSTEM.
 - DESIGN AND PROVIDE A COMPLETE SEISMIC RESTRAINT SYSTEMS FOR ALL MECHANICAL EQUIPMENT AND SYSTEMS. SUCH THAT THE EQUIPMENT AND SYSTEMS WILL REMAIN FUNCTIONAL DURING AND AFTER A SEISMIC EVENT. THE RESTRAINT SYSTEM SHALL ENSURE THAT OTHER UNRELATED SYSTEMS ARE NOT AFFECTED BY MECHANICAL SYSTEMS/EQUIPMENT MOTION DURING THE SEISMIC EVENT.
 - INSTALL MECHANICAL SYSTEMS AND EQUIPMENT WITH ADEQUATE STRUCTURAL SUPPORT TO WITHSTAND SEISMIC FORCES IN ACCORDANCE WITH PART 4 OF THE ONTARIO BUILDING CODE.
 - RETAIN AN ENGINEER LICENSED IN THE PROVINCE OF ONTARIO SPECIALIZING IN THE DESIGN OF SRS/SFRSs TO PERFORM A REVIEW OF THE PROPOSED DESIGN AND INSTALLATION, AND PREPARE INSTALLATION DOCUMENTS INDICATING ALL REQUIRED SEISMIC SUPPORTS, BRACINGS AND FASTENINGS. THESE DOCUMENTS SHALL BE SEALED AND SIGNED BY THE STRUCTURAL ENGINEER AND SUBMITTED AS PART OF THE SHOP DRAWING PACKAGE PRIOR TO ROUGH-IN WORK COMMENCING ON-SITE.
 - SCOPE SHALL INCLUDE BUT NOT BE LIMITED TO:
 - PUMPS;
 - HEAT EXCHANGERS;
 - HVAC EQUIPMENT;
 - DUCTWORK;
 - HYDRONIC PIPING;
 - STEAM AND CONDENSATE SYSTEM EQUIPMENT AND PIPING;
 - MEDICAL GAS EQUIPMENT AND PIPING;
 - PLUMBING EQUIPMENT AND PIPING;
 - FIRE PROTECTION SYSTEMS.
 - PROVIDE CONFIRMATION IN WRITING, SIGNED AND SEALED BY THE STRUCTURAL ENGINEER, AT COMPLETION OF PROJECT THAT THE MECHANICAL INSTALLATION IS IN GENERAL COMPLIANCE WITH THE STRUCTURAL INSTALLATION DRAWINGS SUBMITTED WITH THE SHOP DRAWING PACKAGE.
 - THE MECHANICAL CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE FULL SCOPE OF THIS WORK, INCLUDE ALL COSTS OF STRUCTURAL DESIGN, MATERIALS, AND SITE REVIEW IN TENDER PRICE.
 - SRS SHALL BE FULLY INTEGRATED INTO, COMPATIBLE WITH NOISE AND VIBRATION CONTROLS.
 - SRS TO PROVIDE GENTLE AND STEADY CUSHIONING ACTION AND AVOID HIGH IMPACT LOADS.
 - SRS TO LIMIT MOVEMENT TO AVOID DAMAGE TO OTHER BUILDING ELEMENTS AND/OR SYSTEMS.
 - SRS TO RESTRAIN SEISMIC FORCES IN EVERY DIRECTION.
 - FASTENERS AND ATTACHMENT POINTS TO RESIST SAME LOAD AS SEISMIC RESTRAINTS.
 - SRS OF PIPING SYSTEMS COMPATIBLE WITH:
 - EXPANSION, ANCHORING AND GUIDING REQUIREMENTS.
 - EQUIPMENT/VIBRATION ISOLATION AND EQUIPMENT SRS.
 - SRS UTILIZING CAST IRON, THREADED PIPE, OTHER BRITTLE MATERIALS NOT PERMITTED.
 - ATTACHMENTS TO RC STRUCTURE:
 - USE HIGH STRENGTH MECHANICAL EXPANSION ANCHORS.
 - DRILLED OR POWER-DRIVEN ANCHORS NOT PERMITTED.
 - FIRE PROTECTION SYSTEMS. REFER TO FIRE PROTECTION AND RELEVANT NFPA STANDARDS.
 - WET PIPE SPRINKLER SYSTEMS. REFER TO FIRE PROTECTION.
 - DRY PIPE SPRINKLER SYSTEMS. REFER TO FIRE PROTECTION.
 - SEISMIC CONTROL. MEASURES NOT TO INTERFERE WITH INTEGRITY OF FIRESTOPPING.
 - FLOOR-MOUNTED STATIC EQUIPMENT SYSTEMS:
 - ANCHOR EQUIPMENT TO EQUIPMENT SUPPORTS.
 - ANCHOR EQUIPMENT SUPPORTS TO STRUCTURE.
 - SIZE OF BOLTS SCHEDULED IN APPROVED SHOP DRAWINGS.
 - SUSPENDED STATIC EQUIPMENT SYSTEMS:
 - USE ONE OR COMBINATION OF FOLLOWING METHODS:
 - WHERE INDICATED ON DRAWINGS, DISCONNECT AND REMOVE EXISTING MECHANICAL WORK, INCLUDING HANGERS, SUPPORTS, INSULATION, AND SIMILAR DEVICES AND SYSTEM ANCILLARIES. DISCONNECT AT POINT OF SUPPLY, REMOVE OBSOLETE CONNECTING SERVICES AND MAKE SYSTEM SAFE. CUT BACK OBSOLETE PIPING BEHIND FINISHES AND CAP WATER-TIGHT, UNLESS OTHERWISE SPECIFIED.
 - INSTALL TIE TO STRUCTURE.
 - CROSS-BRACE IN EVERY DIRECTION.
 - BRACE BACK TO STRUCTURE.
 - CABLE RESTRAINT SYSTEM.
 - SCS TO PREVENT SWAY IN HORIZONTAL PLANE, "ROCKING" IN VERTICAL

- PLANE, SLIDING AND BUCKLING IN AXIAL DIRECTION.
- HANGER RODS TO WITHSTAND COMPRESSIVE LOADING AND BUCKLING. PROVIDE ANGLE STIFFENERS WHERE REQUIRED.
- SRS FOR FLOOR MOUNTED VIBRATION ISOLATED EQUIPMENT:
 - USE ONE OR COMBINATION OF FOLLOWING METHODS:
 - VIBRATION ISOLATORS WITH BUILT-IN SNUBBERS.
 - VIBRATION ISOLATORS AND SEPARATE SNUBBERS.
 - BUILT-UP SNUBBER SYSTEM APPROVED BY CONSULTANT, CONSISTING OF STRUCTURAL ELEMENTS AND ELASTOMERIC LAYER.
 - SRS TO RESIST COMBINATION EQUIPMENT UNLOADING.
 - SRS NOT TO JEOPARDIZE NOISE AND VIBRATION ISOLATION SYSTEMS. PROVIDE 4.8 MM CLEARANCE BETWEEN SEISMIC RESTRAINT SNUBBERS AND EQUIPMENT DURING NORMAL OPERATION OF EQUIPMENT AND SYSTEMS.
 - CUSHIONING ACTION: GENTLE AND STEADY BY UTILIZING ELASTOMERIC MATERIAL OR OTHER MEANS IN ORDER TO AVOID HIGH IMPACT LOADS.
- SRS FOR SUSPENDED VIBRATION ISOLATED EQUIPMENT:
 - USE ONE OR COMBINATION OF FOLLOWING METHODS:
 - SLACK CABLE RESTRAINT SYSTEM.
 - BRACE BACK TO STRUCTURE VIA VIBRATION ISOLATORS AND SNUBBERS.
 - SLACK CABLE RESTRAINT SYSTEM (SCS):
 - USE ELASTOMER MATERIALS OR SIMILAR TO AVOID HIGH IMPACT LOADS AND PROVIDE GENTLE AND STEADY CUSHIONING ACTION.
 - SCS TO PREVENT SWAY IN HORIZONTAL PLANE, "ROCKING" IN VERTICAL PLANE, SLIDING AND BUCKLING IN AXIAL DIRECTION.
 - HANGER RODS TO WITHSTAND COMPRESSIVE LOADING AND BUCKLING.
- CHEMICAL TREATMENT
 - PERFORM PIPING SYSTEM CLEANING AND WATER TREATMENT SERVICES UNDER THE SUPERVISION OF THE BASE BUILDING WATER TREATMENT SPECIALIST - DUBOIS CHEMICAL INC. (CONTACT INFO: LIAM ADAMSON, 888-712-4000).
 - CLEAN AND DEGREASE THE PIPING SYSTEMS DIRECT TO CONNECTION TO THE BASE BUILDING SYSTEM. CLEAN STRAINER BASKETS AS OFTEN AS NECESSARY DURING CLEANING AND DEGREASING. VERIFY CHEMICAL TREATMENT AND ANTIFREEZE CONCENTRATIONS WITH THE BASE BUILDING WATER TREATMENT SPECIALIST.
 - ADD CHEMICAL SOLUTION TO SYSTEM, CIRCULATE FOR PERIODS REQUIRED, DRAIN AND REFILL. REPEAT CHEMICAL TREATMENT RINSE, REFILL THE SYSTEM AND CONNECT TO BASE BUILDING CONDENSER WATER SYSTEM.
 - MAINTAIN CHEMICAL LEVELS FROM THE TIME THE SYSTEM IS FILLED AFTER CLEANING, UP TO SUBSTANTIAL PERFORMANCE OF THE CONTRACT.
 - PROVIDE SERVICE VISITS DURING WARRANTY PERIOD AS REQUIRED TO STABILIZE AND COMMISSION THE SYSTEMS. PERFORM CORROSION TESTS TO VERIFY PERFORMANCE REQUIREMENTS ARE BEING ACHIEVED. DOCUMENT RECOMMENDATIONS AND SUBMIT A WRITTEN REPORT TO THE LANDLORD'S/OWNER'S REPRESENTATIVE AFTER EACH VISIT.
 - PIPES INTENDED TO CARRY POTABLE (DRINKING) WATER SHALL BE FLUSHED AND DISINFECTED BEFORE BEING PLACED IN SERVICE.
 - DISINFECTION PROCEDURES SHALL CONFORM TO AWWA C501 AND AWWA C651, AND THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION (AHJ'S).
 - WHERE STAINLESS STEEL PIPING IS USED FOR DOMESTIC WATER APPLICATIONS, PIPING SYSTEMS SHALL BE ANNEALED, DEGREASED AND PICKLED, AND WILL BE SUBJECT TO FORMAL CLEANING AND DISINFECTING ALONG WITH ALL OTHER PARTS AND COMPONENTS OF THE DOMESTIC WATER SYSTEM AS PER ASTM A-380.
- INSULATION
 - QUALIFICATIONS: EXECUTE WORK OF THIS SECTION ONLY BY SKILLED TRADESMEN REGULARLY EMPLOYED IN THE APPLICATION OF INSULATION OF MECHANICAL SYSTEMS.
 - PROVIDE PIPE AND DUCTWORK INSULATION WITH MAXIMUM FLAME SPREAD RATING OF 25 AND SMOKE DEVELOPMENT CLASSIFICATION OF 50.
 - THE WORD "EXPOSED" WHERE USED IN THIS SECTION MEANS ANY WORK WHICH IS NOT CONCEALED IN WALL, SHAFT, OR CEILING CAVITIES OR SPACES. WORK BEHIND DOORS IN CLOSETS OR CLOUPARDS OR UNDER COUNTERS IS CONSIDERED EXPOSED.
 - CONCEALED INSULATED ITEMS REQUIRE NO FURTHER FINISH THAN PROVIDED IN FACTORY APPLIED JACKET. COVER EXPOSED INSULATION AND ALL INSULATED EQUIPMENT WITH CANVAS, FIELD APPLIED, ADHERED AND LAP SEALED AND FINISHED OFF BY A BRUSH COAT OF APPROVED SIZING. PAINT AND LABEL CANVAS AS NOTED IN SPECIFICATIONS OR DRAWINGS.
 - PROVIDE EXTERNAL DUCTWORK INSULATION IN THICKNESS AS LISTED BELOW:
 - ALL SUPPLY AIR DUCTWORK FROM VAV TERMINAL, OUTLET DELIVERING AIR AT TEMPERATURES LESS THAN 18°C (64°F) OR AT 18°C(64°F).
 - PROVIDE 25 MM (1") THICK FOR SYSTEMS WITH 18°C (64°F) OR LESS AIR SUPPLY TEMPERATURE.
 - PROVIDE 40 MM (1-1/2") THICK FOR SYSTEMS WITH 30°C (86°F) OR GREATER AIR SUPPLY TEMPERATURE.
 - WHERE SPECIFICALLY NOTED ON DRAWINGS THAT COULD BE AN EXCEPTION TO THE FOREGOING.
 - EACH FIRE DAMPER SHALL BEAR A UL 1½ HOURS OR 3 HOURS FIRE RESISTANCE RATING LABEL. IN ADDITION TO LABEL VERIFYING THE AIRFLOW AND CLOSURE PRESSURE RATINGS AS ESTABLISHED BY THE DYNAMIC CLOSURE TEST.
 - EACH FIRE DAMPER SHALL ALSO BE MARKED WITH THE WORDS "FOR USE IN DYNAMIC SYSTEMS". DAMPERS MARKED "FOR USE IN STATIC SYSTEMS ONLY" ARE NOT ACCEPTABLE.
 - EACH FIRE DAMPER SHALL BE COMPLETE WITH A 165°F (74°C) UL LISTED FUSIBLE LINK.
 - FIRE DAMPERS SHALL EACH INCLUDE A STEEL SLEEVE OF APPROPRIATE LENGTH/GAUGE AND RETAINING ANGLES, SUPPLIED BY DAMPER MANUFACTURER TO ENSURE PROPER INSTALLATION IN ACCORDANCE WITH DAMPER MANUFACTURER'S INSTRUCTIONS.
 - PROVIDE LATCHED ACCESS DOORS IN DUCTWORK FOR INSPECTION, TESTING AND FIELD LINK REPLACEMENT TO ALL FIRE DAMPERS; MINIMUM 12" X 12" (300MM X 300MM).
 - FUSIBLE LINK DAMPERS SHALL BE TYPE B OR TYPE C (AS REQUIRED) WITH CURTAIN BLADE OUT OF AIR STREAM. TYPE A DAMPERS (WITH THE CURTAIN BLADE IN THE AIR STREAM) SHALL BE INSTALLED WHERE SIZE OR LOCATION ARE SUCH THAT TYPE B AND TYPE C CANNOT BE INSTALLED. CONSULTANT SHALL REVIEW TYPE A USE PRIOR TO INSTALLATION.
 - SMOKE DAMPERS (SDS):
 - PROVIDE MOTORIZED SMOKE DAMPERS AT LOCATIONS SHOWN ON DRAWING ACHIEVE A POSITIVE SEAL AND ABLE TO MAINTAIN THE SMOKE BARRIER.
 - DAMPERS SHALL BE SUITABLE FOR USE IN DYNAMIC OR STATIC SMOKE CONTROL SYSTEMS.
 - DAMPERS SHALL BE FAIL SAFE OPPOSED BLADE CONFIGURATION WITH AN INTERLOCKING BLADE DESIGN THAT PROVIDES COMPLETE SMOKE SEAL UNDER ELEVATED TEMPERATURE CONDITIONS WHEN IN CLOSED POSITION.
 - PROVIDE SMOKE DAMPERS IN ACCORDANCE WITH THE REQUIREMENTS OF CANULC-S112.1 "STANDARD FOR LEAKAGE RATED DAMPERS FOR USE IN SMOKE CONTROL SYSTEMS", NFPA 90A, NFPA 92, NFPA 101 AND NFPA 105 AND SHALL BE CLASSIFIED AS A CLASS 1 LEAKAGE RATED (SMOKE) DAMPER UNDER UL 555s AT AN ELEVATED TEMPERATURE OF 250°F (121°C) AND EACH DAMPER SHALL BEAR A ULC LABEL VERIFYING SAME.
 - THE PRIMARY AIR VALVE DAMPER SHALL BE OPPOSED BLADE TYPE 16 GAUGE METAL, WITH PERIPHERAL GASKET, PIVOTED IN SELF-LUBRICATING BEARINGS. IN FULL CLOSED POSITION, AIR LEAKAGE PAST THE CLOSED DAMPER SHALL NOT EXCEED 2% OF THE NOMINAL CATALOG RATING AT 3 IN.W.G. (750 PA) INLET STATIC PRESSURE AS RATED BY ASHRAE STANDARD 130.
 - THE PRIMARY AIR VALVE DAMPER AND DDC MOTOR OPERATOR SHALL VARY PRIMARY AIR IN RESPONSE TO A SIGNAL. DAMPER OPERATION SHALL BE DEMONSTRATED TO BE CLOSED TO MINIMUM POSITION BEFORE

- DUCTING BEARING ULC-161 CLASS 1 LABEL, INSULATED ACOUSTIC, AS MANUFACTURED BY FLEXMASTER. ALPHA INDUSTRIES, OR THERMAFLEX ARE ACCEPTABLE ALTERNATIVE MANUFACTURERS. USE FLEXMASTER MODEL TL-AMG INSULATED ACOUSTIC FLEXIBLE DUCTS. FLEXIBLE ACOUSTIC DUCT SHALL HAVE A PERFORATED CORE WITH 20-25% OPEN AREA AND BE SPIRALLY WOUND FROM DEAD SOFT ALUMINUM UTILIZING A CONTINUOUS THREE PLY MECHANICAL LOCK WITHOUT THE USE OF ADHESIVES. THE PERFORATED DUCT SHALL BE SLEEVED WITH A SEAMLESS ACOUSTIC POLYETHYLENE LINER, WRAPPED WITH MINIMUM R4.2 FIBREGLASS INSULATION AND COVERED BY FLAME RETARDANT SCRIM FOIL OR POLYETHYLENE VAPOUR BARRIER.
- INSTALL WHERE INDICATED AND IN ACCORDANCE WITH PREFERRED METHOD OF SMACNA AND THE FOLLOWING:
 - PROVIDE A MINIMUM OF THREE (3) #8 SHEET METAL SCREWS EQUALLY SPACED TO HOLD THE FLEXIBLE DUCT.
 - FOR DUCT SIZES ABOVE 300 MM (12"), PROVIDE A MINIMUM OF FIVE (5) #8 SHEET METAL SCREWS EQUALLY SPACED TO HOLD THE FLEXIBLE DUCT.
 - SCREWS SHALL BE LOCATED AT LEAST 1/2" (12 MM) FROM THE END OF THE DUCT.
 - THE COLLAR TO WHICH THE FLEXIBLE DUCT IS ATTACHED SHALL BE A MINIMUM 2" (50 MM) IN LENGTH.
 - SUPPORT SHALL BE IN ACCORDANCE WITH SMACNA.
 - LENGTH - CLASS 1 DUCTWORK
 - MINIMUM LENGTH OF FLEXIBLE DUCT: 1500 MM (5 FT.).
 - MAXIMUM LENGTH OF FLEXIBLE DUCT: 3600 MM (12 FT.).
 - MINIMUM LENGTH OF FLEXIBLE DUCT CONNECTING TO LIGHT FIXTURE TROFFERS OR CEILING DIFFUSERS SHALL BE 72" (1800 MM).
 - DIFFUSER BRANCH DUCTS, PROVIDE SPIR-ON CONNECTORS COMPLETE WITH BALANCING DAMPER AT TAKE-OFF FROM MAIN DUCT.
 - DURING INSTALLATION OF DUCTWORK, PROTECT OPEN ENDS OF DUCTS TO PREVENT ENTRY OF DEBRIS AND DUST.
 - NEW DIFFUSERS AND GRILLES TO BE AS MANUFACTURED BY NAIOR INDUSTRIES. REFER TO SCHEDULE ON PLAN. APPROVED EQUAL IS ACCEPTABLE.
 - PROVIDE AIR BALANCING DAMPER FOR EACH TEE-OFF BRANCH DUCT.
 - WHERE INTERIOR OF DUCT IS VISIBLE THROUGH GRILLES, REGISTERS OR DIFFUSERS, PAINT INTERIOR OF DUCT WITH FLAT BLACK TREMCO PAINT FORMULATED FOR GALVANIZED SURFACES.
 - COVER OPEN END OF REGISTERS OR ACTIVE RETURN OR EXHAUST AIR DUCTS WITH 25 MM (1") THICK FILTER MEDIA SECURED BY METAL BAND PULLED TIGHT AROUND DUCT. MAINTAIN THIS CONDITION UNTIL PLASTERING, DRYWALL AND OTHER FINISHING OPERATIONS ARE COMPLETE.
 - ALL DISSIMILAR PIPING CONNECTIONS TO HAVE DIELECTRIC ISOLATORS.
 - EXISTING EQUIPMENT. VERIFY WITH FACILITIES MANAGER THAT EXISTING EQUIPMENT AND CONTROLS ARE MAINTAINED AND OPERATING AS ORIGINALLY DESIGNED.
 - ALL EXISTING EXTERNAL DUCT INSULATION TO BE INSPECTED AND REPAIRED AS REQUIRED.
 - EXISTING THERMOSTATS TO REMAIN OR PROVIDE NEW AS INDICATED. PROVIDE CONTROL WIRING FROM THE THERMOSTATS TO THE TERMINAL EQUIPMENT (VAV TERMINAL, FAN COIL UNIT, TERMINAL EQUIPMENT AND SIMILAR TYPE OF VAV).
 - DUCT ACCESS DOORS
 - SIZE:
 - 26" X 17" (650 X 425 MM) FOR PERSON SIZE ENTRY.
 - 21" X 14" (525 X 350 MM) OR 18" X 10" (450 X 250 MM) FOR SERVICING ENTRY DEPENDING ON REQUIRED SPACE.
 - 18" X 19" (450 X 250 MM) OR 12" X 6" (300 X 150 MM) FOR VIEWING DEPENDING ON SITE CONDITION.
 - AS INDICATED ON DRAWINGS AND IN THE SPECIFICATIONS.
 - LOCATION:
 - AT FIRE AND SMOKE DAMPERS.
 - AT CONTROL DAMPERS IF LINKAGE IS LOCATED INTERNALLY.
 - UPSTREAM OF ALL REHEAT COILS.
 - AT DEVICES REQUIRING MAINTENANCE.
 - AT LOCATIONS REQUIRED BY CODE.
 - AS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATIONS.
 - FIRE DAMPERS (FDS):
 - PROVIDE DYNAMIC RATED FIRE DAMPERS, ULC LISTED AND LABELLED, AND MEET THE FOLLOWING REQUIREMENTS:
 - MANUFACTURED, TESTED AND LABELLED IN ACCORDANCE WITH UL 555 SAFETY STANDARD FOR FIRE DAMPERS, INCLUDING DYNAMIC CLOSURE TEST. DAMPERS SHALL BE CLASSIFIED FOR DYNAMIC CLOSURE AGAINST AN AIRFLOW VELOCITY OF 2000 FT./MIN (10.16 M/S) AT 4 IN.W.G. (1 KPA) STATIC PRESSURE DIFFERENTIAL ACROSS CLOSED DAMPER.
 - PROVIDE FIRE DAMPERS IN ACCORDANCE WITH CANULC-S112 "STANDARD METHOD OF FIRE TEST OF FIRE-DAMPER ASSEMBLIES", NFPA 90A, UL555 AND SUPPLIERS INSTRUCTIONS, COMPLETE WITH RETAINING ANGLES ON BOTH SIDES OF WALL OR FLOOR AND FASTENED TO DAMPER COLLARS.
 - EACH FIRE DAMPER SHALL BEAR A UL 1½ HOURS OR 3 HOURS FIRE RESISTANCE RATING LABEL. IN ADDITION TO LABEL VERIFYING THE AIRFLOW AND CLOSURE PRESSURE RATINGS AS ESTABLISHED BY THE DYNAMIC CLOSURE TEST.
 - EACH FIRE DAMPER SHALL ALSO BE MARKED WITH THE WORDS "FOR USE IN DYNAMIC SYSTEMS". DAMPERS MARKED "FOR USE IN STATIC SYSTEMS ONLY" ARE NOT ACCEPTABLE.
 - EACH FIRE DAMPER SHALL BE COMPLETE WITH A 165°F (74°C) UL LISTED FUSIBLE LINK.
 - FIRE DAMPERS SHALL EACH INCLUDE A STEEL SLEEVE OF APPROPRIATE LENGTH/GAUGE AND RETAINING ANGLES, SUPPLIED BY DAMPER MANUFACTURER TO ENSURE PROPER INSTALLATION IN ACCORDANCE WITH DAMPER MANUFACTURER'S INSTRUCTIONS.
 - PROVIDE LATCHED ACCESS DOORS IN DUCTWORK FOR INSPECTION, TESTING AND FIELD LINK REPLACEMENT TO ALL FIRE DAMPERS; MINIMUM 12" X 12" (300MM X 300MM).
 - FUSIBLE LINK DAMPERS SHALL BE TYPE B OR TYPE C (AS REQUIRED) WITH CURTAIN BLADE OUT OF AIR STREAM. TYPE A DAMPERS (WITH THE CURTAIN BLADE IN THE AIR STREAM) SHALL BE INSTALLED WHERE SIZE OR LOCATION ARE SUCH THAT TYPE B AND TYPE C CANNOT BE INSTALLED. CONSULTANT SHALL REVIEW TYPE A USE PRIOR TO INSTALLATION.
 - SMOKE DAMPERS (SDS):
 - PROVIDE MOTORIZED SMOKE DAMPERS AT LOCATIONS SHOWN ON DRAWING ACHIEVE A POSITIVE SEAL AND ABLE TO MAINTAIN THE SMOKE BARRIER.
 - DAMPERS SHALL BE SUITABLE FOR USE IN DYNAMIC OR STATIC SMOKE CONTROL SYSTEMS.
 - DAMPERS SHALL BE FAIL SAFE OPPOSED BLADE CONFIGURATION WITH AN INTERLOCKING BLADE DESIGN THAT PROVIDES COMPLETE SMOKE SEAL UNDER ELEVATED TEMPERATURE CONDITIONS WHEN IN CLOSED POSITION.
 - PROVIDE SMOKE DAMPERS IN ACCORDANCE WITH THE REQUIREMENTS OF CANULC-S112.1 "STANDARD FOR LEAKAGE RATED DAMPERS FOR USE IN SMOKE CONTROL SYSTEMS", NFPA 90A, NFPA 92, NFPA 101 AND NFPA 105 AND SHALL BE CLASSIFIED AS A CLASS 1 LEAKAGE RATED (SMOKE) DAMPER UNDER UL 555s AT AN ELEVATED TEMPERATURE OF 250°F (121°C) AND EACH DAMPER SHALL BEAR A ULC LABEL VERIFYING SAME.
 - THE PRIMARY AIR VALVE DAMPER SHALL BE OPPOSED BLADE TYPE 16 GAUGE METAL, WITH PERIPHERAL GASKET, PIVOTED IN SELF-LUBRICATING BEARINGS. IN FULL CLOSED POSITION, AIR LEAKAGE PAST THE CLOSED DAMPER SHALL NOT EXCEED 2% OF THE NOMINAL CATALOG RATING AT 3 IN.W.G. (750 PA) INLET STATIC PRESSURE AS RATED BY ASHRAE STANDARD 130.
 - THE PRIMARY AIR VALVE DAMPER AND DDC MOTOR OPERATOR SHALL VARY PRIMARY AIR IN RESPONSE TO A SIGNAL. DAMPER OPERATION SHALL BE DEMONSTRATED TO BE CLOSED TO MINIMUM POSITION BEFORE

- BLADES SHALL BE TYPE 6003-T5 EXTRUDED ALUMINUM AIRFOIL DESIGN ON MAXIMUM 6" (153MM) DEPTH WITH INTEGRAL STRUCTURAL REINFORCING TUBE RUNNING FULL LENGTH OF EACH BLADE.
- BLADE AXLES SHALL BE 1/2" (13MM) DIA. PLATED STEEL, DOUBLE BOLTED AT EACH END OF BLADE TO PROVIDE POSITIVE LOCKING CONNECTION.
- BEARINGS SHALL BE SELF-LUBRICATING BRONZE TYPE.
- BLADE LINKAGE SHALL BE ZERO-MAINTENANCE, CONCEALED IN FRAME, OUT OF AIRSTREAM.
- JAMB SEALS SHALL BE COMPRESSION TYPE STAINLESS STEEL.
- BLADE SEALS SHALL BE SILICONE, MECHANICALLY LOCKED IN EXTRUDED BLADE SLOTS.
- EXTERNALLY MOUNTED ELECTRICAL ACTUATORS SHALL BE INSTALLED BY THE DAMPER MANUFACTURER IN THE FACTORY; REVIEW WITH CONSULTANT ANY SMOKE DAMPER ACTUATOR PROPOSED TO BE INTERNALLY MOUNTED PRIOR TO INSTALLATION.
- SUPPLY VOLTAGE OF ACTUATORS SHALL BE 115V, 1 PHASE; CONTROL VOLTAGE OF ACTUATORS SHALL BE 24 VDC TO FACILITATE OPERATION UPON SIGNAL FROM FIRE ALARM (WHERE REQUIRED). ACTUATORS SHALL INCORPORATE AN OEM INTERNAL SPRING RETURN MECHANISM. DAMPER AND ACTUATOR ASSEMBLY SHALL BE FACTORY CYCLED A MINIMUM OF THREE (3) TIMES TO ENSURE CORRECT OPERATION.
- SUBMITTED PRESSURE DROP DATA TO BE BASED ON TESTS IN ACCORDANCE WITH AMCA STANDARD 500-D AND SHALL DEMONSTRATE A MAXIMUM PRESSURE DROP OF 0.02 IN.W.G. @ 949 FPM (5 PA @ 4.3 M/S) ACROSS A 36" X 36" (914MM X 914MM) DAMPER.
- DAMPER SHALL COME COMPLETE WITH A POSITION INDICATOR SWITCH WHERE DAMPER IS REQUIRED TO BE REOPENED OR CLOSED FROM A REMOTE LOCATION FOR SMOKE MANAGEMENT AND CONTROL. DAMPER OPEN END SWITCHES SHALL BE ADJUSTABLE IN THE FIELD.
- PROVIDE MANUAL TEST SWITCH TO DEMONSTRATE PROPER DAMPER OPERATION AS PART OF REGULAR ON-GOING SYSTEM MAINTENANCE AND VERIFICATION.
- SMOKE DAMPERS SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 92A, UL555S AND THE MANUFACTURER'S INSTALLATION ULC LISTING.
- ALL JOINTS BETWEEN THE DAMPER AND THE SLEEVE OR DUCT AND BETWEEN DAMPERS IN MULTIPLE SECTIONS SHALL BE SEALED WITH SILICONE SEALANT.
- DAMPER SHALL BE INSTALLED A MAXIMUM OF 24" (600 MM) FROM THE SMOKE BARRIER.
- COMBINATION FIRE AND SMOKE DAMPERS (CFSDS):
 - PROVIDE COMBINATION FIRE/SMOKE DAMPERS (CFSDS) AS SHOWN ON PLANS AND/OR SCHEDULES.
 - PROVIDE COMBINATION FIRE SMOKE DAMPERS (CFSDS) IN ACCORDANCE WITH THE REQUIREMENTS OF BOTH CANULC-S112 "STANDARD METHOD OF FIRE TEST OF FIRE-DAMPER ASSEMBLIES", CANULC-S112.1 "STANDARD FOR LEAKAGE RATED DAMPERS FOR USE IN SMOKE CONTROL SYSTEMS", AND NFPA 80, NFPA 90A, NFPA 92, NFPA 101 AND NFPA 105.
 - COMBINATION FIRE SMOKE DAMPERS SHALL BE CLASSIFIED BY UNDERWRITERS' LABORATORIES AND LABELLED AS A 1½ HOUR FIRE DAMPER UNDER UL 555, AND AS A CLASS 1 SMOKE DAMPER UNDER UL 555S AT AN ELEVATED TEMPERATURE OF 250°F (121°C). EACH COMBINATION FIRE SMOKE DAMPER SHALL BEAR A ULC LABEL VERIFYING SAME FOR USE IN DYNAMIC OR STATIC SMOKE CONTROL SYSTEMS.
 - DAMPERS MUST COMPLY WITH THE REQUIREMENTS OF AMCA 511 CERTIFIED RATINGS PROGRAM AND BE QUALIFIED TO BEAR THE AMCA SEAL.
- FRAME SHALL BE CONSTRUCTED OF 16 GAUGE (1.6MM) GALVANIZED STEEL HAT CHANNEL, WITH MITERED CORNERS REINFORCED WITH DIE-FORMED CORNER GUSSETS FOR STRENGTH.
- BLADES SHALL BE 14 GAUGE (2.0MM) EQUIVALENT GALVANIZED STEEL FORMED DOUBLE SKIN, AIRFOIL DESIGN.
- DAMPERS SHALL BE OF OPPOSED BLADE CONFIGURATION WITH AN INTERLOCKING BLADE DESIGN THAT PROVIDES COMPLETE FLAME AND SMOKE SEAL UNDER FIRE CONDITIONS AT AN ELEVATED TEMPERATURE OF 200°F (109°C) WHEN IN CLOSED POSITION.
- BLADE AXLES SHALL BE PLATED STEEL, DOUBLE BOLTED AT EACH END OF BLADE TO PROVIDE POSITIVE LOCKING CONNECTION.
- BEARINGS SHALL BE SELF-LUBRICATING BRONZE TYPE.
- BLADE LINKAGE SHALL BE ZERO-MAINTENANCE, CONCEALED IN FRAME, OUT OF AIRSTREAM.
- JAMB SEALS SHALL BE COMPRESSION-TYPE STAINLESS STEEL.
- DAMPERS SHALL HAVE BEEN TESTED FOR DYNAMIC CLOSURE BY UL TO A MINIMUM VELOCITY/PRESSURE RATING OF 2000 FT./MIN (10.16 M/S) AT 4IN.W.G. (1 KPA).
- DAMPERS SHALL BE SUPPLIED WITH FACTORY INSTALLED SLEEVES OF MINIMUM 16" (400MM) LENGTH AND SHALL BE FIELD VERIFIED BY CONTRACTOR. DEPENDENT ON WALL THICKNESS, FACTORY SLEEVES SHALL BE CALKED TO UL REQUIREMENTS AND SHALL BE 20 GAUG. (1.0MM) THROUGH 84" (2134MM) WIDE, AND 18 GAUGE (1.2MM) ABOVE 84" (2134MM) WIDE.
- APPROPRIATE ELECTRIC (115 V/100W/2) ACTUATOR SHALL BE INSTALLED BY THE DAMPER MANUFACTURER IN THE FACTORY AND SHALL HAVE BEEN TESTED AND CLASSIFIED UNDER UL 555s. ACTUATORS SHALL INCORPORATE AN OEM INTERNAL SPRING RETURN MECHANISM.
- EACH DAMPER SHALL BE EQUIPPED WITH A UL CLASSIFIED HEAT RESPONSIVE DEVICE THAT WILL CAUSE THE DAMPER TO CLOSE IN A CONTROLLED MANNER AND LOCK IN A CLOSED POSITION BY MEANS OF AN OVER CENTER/KNEE LOCK LINKAGE, WHEN THE DUCT TEMPERATURE REACHES THE MAXIMUM DEGRADATION TEMPERATURE OF THE DAMPER/ACTUATOR ASSEMBLY AS REQUIRED BY UL 555S. CLOSURE DEVICES THAT CAUSE INSTANTANEOUS CLOSURE ARE NOT ACCEPTABLE.
- SUBMITTED PRESSURE DROP DATA TO BE BASED ON TESTS IN ACCORDANCE WITH AMCA STANDARD 500-D AND SHALL DEMONSTRATE A MAXIMUM PRESSURE DROP OF 0.

HEATING IS ALLOWED, NO OVERLAP UNDER ANY CIRCUMSTANCES SHALL BE ACTUATED. DAMPER SHALL BE LOCATED INSIDE UNIT. DAMPER CONNECTION TO OPERATING SHAFT SHALL BE A POSITIVE MECHANICAL CONNECTION.

6 THE AIR FLOW SENSOR SHALL BE OF CROSS OR DIAMOND CONFIGURATION LOCATED AT THE INLET OF THE ASSEMBLY. THE SENSOR SHALL HAVE TWELVE TOTAL PRESSURE SENSING PORTS AND A CENTRE AVERAGING CHAMBER DESIGNED TO ACCURATELY AVERAGE THE FLOW ACROSS THE INLET OF THE ASSEMBLY. SENSOR SHALL BE CERTIFIED TO PROVIDE ACCURACY WITHIN 5% OF ACTUAL AIR FLOW WITH A 90" SHEET METAL ELBOW DIRECTLY AT THE INLET OF THE ASSEMBLY. THE AIR FLOW SENSOR SHALL AMPLIFY THE SENSED AIR FLOW SIGNAL.

7 AT AN INLET VELOCITY OF 2000 FPM PRESSURE DROP FOR CFM RANGE OF BOX SHALL NOT EXCEED 0.11 IN.W.G. (27 PA.).

8 ALL SOUND DATA SHALL BE COMPILED IN AN INDEPENDENT LABORATORY AND IN ACCORDANCE WITH THE LATEST VERSION OF AHR1 STANDARD 880 AND ANSIASHRAE STANDARD 130. SOUND RATING OF ASSEMBLY INCLUDING BOX AND ATTENUATOR OR DISSIPATIVE SILENCER UNDER DESIGN OPERATING CONDITIONS SHALL NOT EXCEED THE FOLLOWING:

1. RADIATED: NC 35 UNLESS NOTED OTHERWISE ON THE EQUIPMENT SCHEDULES.

2. DISCHARGE: NC 35 BASED ON ROOM ABSORPTION OF 10 DB, AND AN INLET STATIC PRESSURE OF 1.5 IN.W.G. (375 PA.) UNLESS NOTED OTHERWISE ON THE EQUIPMENT SCHEDULES.

9 SOUND ATTENUATION:

1. THE MANUFACTURER SHALL SUPPLY SOUND ATTENUATORS TO MEET SCHEDULED ACOUSTICAL PERFORMANCE REQUIREMENTS OF NC 30 UNLESS NOTED OTHERWISE. THE UNIT SHALL BE PROVIDED WITH DISCHARGE ATTENUATORS AND/OR DISCHARGE SILENCERS AS REQUIRED TO MEET ACOUSTIC REQUIREMENTS.

2. PROVIDE MINIMUM 36" @14MM DISCHARGE ATTENUATOR(S).

3. ATTENUATORS SECTIONS SHALL CONTAIN A UNIT CASING CONSTRUCTED OF 22 GAUGE (0.8MM) COATED STEEL, PERFORATED Baffles ENCAPSULATE FIBERGLASS ACOUSTIC MEDIA, PROVIDE MYLAR LINING WITH ACOUSTICAL SPACER TO ISOLATE MATERIAL FROM AIRSTREAM.

4. INLET AND DISCHARGE SHALL BE RECTANGULAR AND CONFIGURED FOR SLIP AND DRIVE CONNECTIONS.

5. EACH ATTENUATOR SECTION SHALL BE INTERNALLY LINED WITH 1/2" (19MM) THICK, 4 LB./CU. FT. (64 KG/CU.M) DENSITY STERILINER INSULATION WITH A REINFORCED ALUMINUM FSK FACING, PLACED INSIDE THE TOP AND BOTTOM SIDES OF THE ATTENUATOR.

6. WHERE ONE ATTENUATOR FAILS TO PROVIDE THE SOUND PERFORMANCE REQUIRED, PROVIDE ADDITIONAL ATTENUATORS OR LENGTHS OF DUCT LINING. WHERE ATTENUATORS WITH OUTLETS ARE USED THEY SHALL BE RATED WITH THE OUTLETS AND NOT AS STRAIGHT ATTENUATORS WITHOUT OUTLETS

10. PROVIDE INTEGRAL HOT WATER HEATING COIL SIZED IN ACCORDANCE WITH THE SCHEDULE WHERE INDICATED ON THE DRAWINGS. HOT WATER HEATING COILS SHALL BE AS FOLLOWS:

1. TERMINAL UNIT HOT WATER HEATING COILS SHALL BE MOUNTED ON THE DISCHARGE OF THE UNIT WITH SLIP AND DRIVE CONNECTIONS; PROVIDE AN ACCESS DOOR OR PANEL ON THE BOTTOM OF THE ATTENUATOR SECTION OF THE TERMINAL UNIT FOR SERVICING AND CLEANING THE UNIT.

2. HOT WATER HEATING COILS SHALL BE CONSTRUCTED WITH COPPER TUBES AND ALUMINUM PLATE FINS. COILS SHALL HAVE A MAXIMUM OF 10 FINS PER INCH SUPPLY AND RETURN CONNECTIONS SHALL BE ON THE SAME END OF THE COIL. FINS SHALL BE SOWNED TO THE TUBES BY MEANS OF MECHANICAL EXPANSION OF THE TUBES. FINS SHALL BE AT LEAST .0045" (0.11MM) THICK.

3. COILS SHALL HAVE GALVANIZED STEEL CASINGS ON ALL SIDES NO LIGHTER THAN 22 GAUGE (1.00MM).

4. COPPER TUBES SHALL BE 1/2" (12.7MM) O.D. AND SHALL BE SPACED APPROXIMATELY 1/2" (32MM) APART AND SHALL HAVE A MINIMUM WALL THICKNESS OF 0.016" (0.41MM). HOT WATER SHALL BE EQUALLY DISTRIBUTED THROUGH ALL TUBES BY THE USE OF HEADER DESIGN.

5. SELECT COILS WITH WATER VELOCITY IN THE TUBES NOT TO EXCEED FIVE FEET PER SECOND. THE WATER PRESSURE DROP THROUGH THE COIL SHALL NOT EXCEED 5 FT.W.G. HEATING COIL FACE VELOCITIES SHALL NOT EXCEED THE MAXIMUM FACE VELOCITY INDICATED IN THE SCHEDULES.

6. COILS SHALL BE TESTED BY AIR PRESSURE UNDER WATER. COILS SHALL BE TESTED AT 350 PSI (2.413 KPA) AIR STATIC PRESSURE.

7. COIL RATINGS, CALCULATIONS AND SELECTION DATA SHALL BE IN ACCORDANCE WITH THE APPLICABLE AHR1 STANDARDS AND SHALL BE SUBMITTED WITH THE SHOP DRAWINGS.

8. CONTROL VALVES, AUTOMATIC AIR VENTS AND DRAIN VENTS, SHALL BE SUPPLIED BY BAS TRADES AND FIELD INSTALLED BY THE MECHANICAL TRADES.

19. HEAT TRACE

1. DESCRIPTION

1. COMPLY WITH REQUIREMENTS OF GENERAL REQUIREMENTS AND ALL DOCUMENTS REFERRED TO THEREIN.

2. COMPLY WITH REQUIREMENTS OF MECHANICAL WORK GENERAL INSTRUCTIONS AND BASIC MECHANICAL MATERIALS AND METHODS.

3. COMPLY WITH THE REQUIREMENTS OF COMMON WORK RESULTS FOR HVAC.

2. WORK PERFORMED BY THIS SECTION

1. PROVIDE A COMPLETE UL-C LISTED SYSTEM OF HEATING CABLES, COMPONENTS AND CONTROLS TO PREVENT PIPELINES FROM FREEZING.

2. DETERMINE THE EXTENT OF THE SCOPE OF WORK FROM THE DRAWINGS.

3. DIVISION 26 WILL PROVIDE A POWER PANEL WITH A NUMBER OF BREAKERS IN DESIGNATED LOCATIONS AS SHOWN ON THE PLAN TO ALLOW DIVISIONS 20, 21, 22, 23 AND 25 TO CONNECT TO THE NECESSARY PIPE TRACING CIRCUITS.

4. QUALIFICATIONS: EXECUTE WORK OF THIS SECTION ONLY BY LICENSED TRADESMEN REGULARLY EMPLOYED IN THE INSTALLATION OF ELECTRICAL HEAT TRACING. RETAIN THE SERVICES OF AN ELECTRICAL CONTRACTOR, AS A SUB-CONTRACTOR.

3. ELECTRIC HEATING CABLE

1. PROVIDE SELF-REGULATING HEATING CABLE CONSISTING OF TWO (2) 16 AWG Tinned-COPPER BUS WIRES EMBEDDED IN PARALLEL IN A SELF-REGULATING POLYMER CORE THAT VARIESITS POWER OUTPUT TO RESPOND TO TEMPERATURE ALL ALONG ITS LENGTH, ALLOWING THE HEATING CABLE TO BE CUT TO LENGTH IN THE FIELD.

2. THE HEATING CABLE SHALL BE COVERED BY A RADIATION-CROSSLINKED, MODIFIED POLYOLEFIN DIELECTRIC JACKET WITH A BRAID OF TINNED-COPPER AND AN OUTER JACKET OF MODIFIED POLYOLEFIN (OR) AS REQUIRED BY THE ELECTRICAL CODE.

3. PROVIDE HEATING CABLE WITH SELF-REGULATING FACTOR OF AT LEAST 10 PERCENT. THE SELF-REGULATING FACTOR IS DEFINED AS THE PERCENTAGE REDUCTION, WITHOUT THERMOSTATIC CONTROL, OF THE HEATING CABLE OUTPUT GROUND FROM 40°F PIPE TEMPERATURE OPERATION TO 150°F PIPE TEMPERATURE OPERATION.

4. THE HEATING CABLE SHALL OPERATE ON LINE VOLTAGES OF 120 AND/OR 208 VOLTS WITHOUT THE USE OF TRANSFORMERS.

5. THE HEATING CABLE SHALL BE SIZED ACCORDING TO THE TABLE BELOW. THE REQUIRED HEATING CABLE OUTPUT RATING IS IN WATTS PER FOOT AT 50°F. HEATING CABLE SELECTION IS BASED ON

1" FIBERGLASS INSULATION ON METAL PIPING.

	PIPE SIZE		MINIMUM AMBIENT	
	1	3 IN OR LESS	5 WATTS	-10°F
2	4 IN		5 WATTS	
3	6 IN		8 WATTS	
4	8 IN		2 STRIPS-5 WATTS	
5	12 IN TO 14 IN		2 STRIPS-8 WATTS	

6. PROVIDE POWER CONNECTION, END SEAL, SPLICE AND FEND JOINT COMPONENTS TO BE APPLIED IN THE FIELD.

7. HEATING CABLE CIRCUIT SHALL BE PROTECTED BY A GROUND FAULT DEVICE FOR EQUIPMENT PROTECTION. COORDINATE BREAKER REQUIREMENTS WITH DIVISION 26.

4. SYSTEM CONTROL

1. THE SYSTEM SHALL BE CONTROLLED BY AN AMBIENT [LINE] SENSING THERMOSTAT AMCA-1A SET AT 40°F EITHER DIRECTLY OR THROUGH AN APPROPRIATE CONTACTOR.

5. EXECUTION

1. MANUFACTURER'S INSTRUCTIONS

1. COMPLIANCE: COMPLY WITH MANUFACTURER'S WRITTEN RECOMMENDATIONS OR SPECIFICATIONS, INCLUDING PRODUCT TECHNICAL BULLETINS, HANDLING, STORAGE AND INSTALLATION INSTRUCTIONS, AND DATASHEET.

2. INSTALLATION

1. APPLY THE HEATING CABLE LINEARLY ON THE PIPE AFTER PIPING HAS BEEN SUCCESSFULLY PRESSURE-TESTED. SECURE THE HEATING CABLE TO PIPING WITH CABLE TIES OR FIBERGLASS TAPE.

2. APPLY "ELECTRIC TRACE" SIGNS TO THE OUTSIDE OF THE THERMAL INSULATION.

3. FOR HEAT TRACING FOR FIRE PROTECTION PIPING, ALL HEAT TRACING TO BE ULC LISTED AND FM LABELLED MEETING THE REQUIREMENTS OF NFPA 13 AND 14.

3. TESTS

1. AFTER INSTALLATION AND BEFORE AND AFTER INSTALLING THE THERMAL INSULATION, SUBJECT HEATING CABLE TESTING USING A 2500 VDC MEGGER. MINIMUM INSULATION RESISTANCE SHALL BE 20 TO 1000 MEGOHMS REGARDLESS OF LENGTH.

4. PIPING SYSTEMS WHICH REQUIRE HEAT TRACING AND INSULATION

1. UNLESS NOTED OTHERWISE, PROVIDE ELECTRIC HEAT TRACING FOR PIPING SUBJECT TO FREEZING. PIPING LOCATED IN AN UNHEATED OR PARTIALLY HEATED PARKING GARAGE IS CONSIDERED AS AREA SUBJECT TO FREEZING.

20. CLEANING

1. UPON COMPLETION OF PROJECT OR AS REQUIRED, VACUUM CLEAN AND REMOVE DEBRIS FROM THE INSIDE OF AIR HANDLING SYSTEMS, FANS, DUCTS, COILS AND TERMINAL UNITS.

2. CLEAN EXPOSED SURFACES OF MECHANICAL EQUIPMENT, DUCTWORK AND PIPING. POLISH PLATED WORK.

3. COMB ALL BENT FINS TO PROPER CONFIGURATION ON ALL COILS IN AIR HANDLING UNITS, FAN COIL UNITS, ENTRANCE HEATERS AND ON FINNED RADIATION ELEMENTS.

4. REPLACE ALL TEMPORARY AIR FILTERS WITH SPECIFIED FILTERS ON ALL HEATING, COOLING AND VENTILATING EQUIPMENT.

7. HVAC WORK

1. PIPING:

1. WORKING PRESSURE UP TO AND INCLUDING 1035 KPA (150 PSI), SCHEDULE 40 ASTM SPECIFICATION A53 SEAMLESS GRADE A OR B WROUGHT STEEL BLACK PIPE WITH HEAVY CAST IRON OR STANDARD BLACK MALLEABLE STEEL THREADED FITTINGS RATED AT 1380 KPA (200 PSI WOG) FOR PIPE SIZES UP TO AND INCLUDING 50MM (2").

2. WORKING PRESSURE UP TO AND INCLUDING 1035 KPA (150 PSI), SCHEDULE 40 ASTM SPECIFICATION A53 SEAMLESS WROUGHT STEEL BLACK PIPE WITH SCHEDULE 40 BLACK STEEL WELDING FITTINGS RATED AT 1380 KPA (200 PSI WOG) FOR PIPE SIZES 65MM (2 1/2") AND OVER.

3. TYPE L COPPER TO ASTM 888 WITH 95% SOLDERED WROUGHT COPPER PRESSURE FITTINGS TO ANSI B16.22 FOR PIPING SYSTEM RATED AT 1035 KPA (150 PSI WOG) FOR PIPE SIZES UP TO AND INCLUDING 50MM (2").

2. FITTINGS FOR PIPE FITTINGS UP TO AND INCLUDING 50MM (2"):

1. UP TO 862 KPA (125 PSI WSP) SOLDERED: WROUGHT BRONZE OR CAST COPPER, ASTM B32. SOLDER JOINT FITTINGS, ANSISME B16.18 OR B16.22.

2. UP TO 862 KPA (125 PSI WSP) THREADED: BANDED BLACK CAST IRON, ASTM A126. THREADED, ANSISME B16.4, CLASS 125, ASTM A126.

3. 1035 KPA (150 PSI WSP) THREADED: GALVANIZED MALLEABLE IRON, THREADED, ANSISME B16.3, CLASS 150.

4. 1725 KPA (250 PSI WSP) THREADED: BANDED BLACK CAST IRON, ASTM A126, THREADED, ANSISME B16.4, CLASS 250, AND ANSISME B1 20.1.

5. 2070 KPA (300 PSI WSP) THREADED: GALVANIZED MALLEABLE IRON, THREADED, ANSISME B16.3, CLASS 300.

3. FITTINGS FOR PIPE FITTINGS 65MM (2 1/2") AND UP TO 600MM (24"):

1. WELDED: BLACK STEEL, BUTT WELDED, ASTM A234/A234M, ANSISME B16.9, EACH STAMPED BY MANUFACTURER FOR CONFORMANCE AND WORKING PRESSURE.

2. UP TO 862 KPA (125 PSI WSP) FLANGED: CAST IRON FLANGED FITTINGS, ANSISME B16.1, CLASS 125.

3. 2070 KPA (300 PSI WSP) WELDED: BLACK STEEL, BUTT-WELDED, ASTM A234/A234M, ANSISME B16.9, CLASS 300.

4. FLANGES: PROVIDE EITHER FLAT-FACE OR RAISED-FACE FLANGES AS REQUIRED TO MATCH FLANGE FACES ON VALVES AND EQUIPMENT.

1. UP TO 862 KPA (125 PSI WSP) THREADED: THREADED CAST IRON FLANGES, ANSISME B16.1, CLASS 125.

2. 1035 KPA (150 PSI WSP) WELD NECK OR SLIP-ON STEEL FLANGES, ASTM A181A/181M, CLASS 60, ANSISME B16.5, CLASS 150.

3. 1725 KPA (250 PSI WSP) THREADED: THREADED CAST IRON FLANGES, ANSISME B16.1, CLASS 250.

4. 2070 KPA (300 PSI WSP) WELDED: WELD NECK OR SLIP-ON STEEL FLANGES, ASTM A105/A105M, GRADE 1, ANSISME B16.5, CLASS 300.

5. FLANGE BOLTS:

1. UP TO 862 KPA (125 PSI WSP), ASTM A307, GRADE B, SQUARE-HEAD MACHINE BOLTS WITH HEAVY HEX-NUTS.

2. ABOVE 862 KPA (125 PSI WSP), ASTM A193/A193M, GRADE B7 BOLTS, WITH GRADE 7 NUTS.

3. UNIONS FOR SIZES UP TO 50MM (2").

1. UP TO 862 KPA (125 PSI WSP) SOLDERED: WROUGHT BRONZE OR COPPER, GROUND JOINT, SOLDER END UNIONS.

2. 1035 KPA (150 PSI WSP) THREADED: ASTM A197/A197M, ANSISME B16.39, GALVANIZED MALLEABLE IRON UNIONS WITH GROUND JOINTS, BRASS SEAT, THREADED ENDS.

3. 1725 KPA (250 PSI WSP) THREADED: ASTM A197/A197M, ANSISME B16.39, GALVANIZED MALLEABLE IRON UNIONS WITH GROUND JOINTS, BRASS SEAT, THREADED ENDS.

6. GROOVED END COUPLINGS:

1. VICTAULIC COUPLINGS TO CSA STANDARD B242 FOR FIRE PROTECTION, HEATING, CHILLED WATER AND CONDENSER WATER IS ACCEPTABLE PROVIDED THAT THIS APPLICATION MEETS THE APPROVAL OF THE MUNICIPAL AUTHORITIES WHO HAVE JURISDICTION AT THE PLACE OF THE WORK.

2. RIGID COUPLINGS: DUCTILE IRON TO SPECIFICATION A536. IN MECHANICAL

ROOMS USE GROOVED COUPLINGS TO BE DESIGNED WITH ANGULAR BOLT PADS TO PROVIDE A RIGID JOINT. VICTAULIC STYLE 107N OR 07. IN MECHANICAL ROOMS USE GROOVED COUPLINGS TO BE DESIGNED WITH ANGULAR BOLT PADS TO PROVIDE A RIGID JOINT. VICTAULIC STYLE 107 AND 07.

3. FLEXIBLE COUPLINGS - DUCTILE IRON TO SPECIFICATION A536. FLEXIBLE GROOVED COUPLINGS SHALL BE USED WHERE SYSTEM FLEXIBILITY IS DESIRED, NOISE AND VIBRATION REDUCTION AT MECHANICAL EQUIPMENT CONNECTIONS IS ACHIEVED BY INSTALLING THREE FLEXIBLE COUPLINGS NEAR THE VIBRATIONS SOURCE IN LIEU OF BRAIDED FLEX CONNECTORS. VICTAULIC STYLE 77 OR 177.

4. AGS "W" SERIES COUPLINGS (350MM (14") AND LARGER); VICTAULIC STYLE W07 (RIGID) AND STYLE W77 (FLEXIBLE) TWO HOUSINGS CAST WITH A WIDE KEY PROFILE AND FLAT BOLT PADS FOR METAL-TO-METAL CONTACT. WIDE-WIDTH FLUSH-SEAL GASKET, AND PLATED STEEL BOLTS AND NUTS.

5. GASKETS: WATER SERVICES EPDM GRADE "E", WITH GREEN COLOUR CODE IDENTIFICATION, CONFORMING TO ASTM D-2000 FOR WATER SERVICES UP TO 110°C (230°F) OR GRADE "EH" EPDM, WITH RED COLOUR CODE IDENTIFICATION, CONFORMING TO ASTM D-2000 FOR WATER SERVICES UP TO 120°C (250°F).

6. FITTINGS: VICTAULIC FULL FLOW FITTINGS MANUFACTURED OF DUCTILE IRON TO ASTM A 536 GRADE 65 4 12 OR STEEL TO ASTM A-53, GRADE B, WITH GROOVED ENDS DESIGNED TO ACCEPT VICTAULIC COUPLINGS.

7. WATER BALANCING VALVES:

1. EQUAL TO TOUR AND ANDERSEN MODEL 787 STD., 3/4" (12MM) TO 7" (60 MM); 300 PSI (206 KPA) RATED, V-PATTERN, GLOBE TYPE WITH THREADED ENDS, NON-FERROUS BRASS COPPER ALLOY BODY, EPDM O-RING SEALS, 4-TURN DIGITAL, READOUT HANDWHEEL, FOR BALANCING, HIDDEN MEMORY FEATURE WITH LOCKING TAMPER-PROOF SETTING, AND CONNECTIONS FOR PORTABLE DIFFERENTIAL METER.

2. EQUAL TO TOUR AND ANDERSEN MODEL 789 STD., 2 1/2" (65 MM) TO 16" (400 MM) 350 PSI (2400 KPA) RATED V-PATTERN, GLOBE TYPE WITH GROOVED ENDS, ASTM A536 GRADE 65 IRON BODY, ALL OTHER METAL PARTS OF BRASS COPPER ALLOY, EPDM O-RING SEALS, 8, 12, 16, 20 OR 22 TURN DIGITAL READOUT HANDWHEEL, FOR BALANCING, HIDDEN MEMORY FEATURE WITH LOCKING TAMPER-PROOF SETTING, AND CONNECTIONS FOR PORTABLE DIFFERENTIAL METER.

3. PROVIDE WATER BALANCING VALVES AS FOLLOWS ON THE COMMON SUPPLY OR RETURN PIPING FROM EACH:

1. TERMINAL DEVICE (FAN COIL, UNIT HEATER, DUCT MOUNTED SWEAT INLET COIL, PERIMETER HEATING ELEMENT AND SIMILAR).

2. ON EACH RETURN PIPING RISER.

3. WHERE OTHERWISE REQUIRED BY THE DOCUMENTS.

8. PLUMBING

1. PROVIDE ALL PARTS OF THE PLUMBING SYSTEM INCLUDING ALL REQUIRED VENTING IN ACCORDANCE WITH THE ONTARIO BUILDING CODE, PART 7.

2. DOMESTIC WATER: TYPE L COPPER MARKED CERTIFIED FOR COMPLIANCE WITH ASTM B88-83 STANDARD WITH WROUGHT COPPER OR CAST BRONZE PRESSURE SOLDER FITTINGS TO ANSI B22.18-1973 AND ANSI B16.18-73, RESPECTIVELY. (BURIED PIPING: SOFT TEMPER TYPE K WITH SOLDERED FITTINGS).

3. SOLDERED FITTINGS IN POTABLE WATER SYSTEMS: PROVIDE LEAD, ANTIMONY, CADMIUM AND ZINC FREE SOLDERS COMPOSED OF TIN/COPPER/SILVER OR NICKEL COMPONENTS.

4. ACCEPTABLE MANUFACTURERS:

1. JOHNSON MATTHEY (416) 763-5111 "MATTISOL 430"

2. ENGLEHARDT CANADA LTD. (416) 733-6771 "SILVABRITE 100"

3. 133.3. X-ERQON CORP. (416) 452-5718 "STEELBOND #281"

5. SANITARY DRAINAGE - INTERNAL SUSPENDED:

1. CAST IRON PIPE AND FITTINGS TO CSA B70-M1978.

2. DWV COPPER TO ASTM B306-76 WITH 50-50 SOLDERED CAST BRASS DRAINAGE FITTINGS TO CSA B158-1-1976 OR WROUGHT COPPER FITTINGS TO ANSI B16-29-1973.

6. VENT PIPING: DWV GRADE COPPER TO ASTM B306-76 WITH 50-50 SOLDERED CAST BRASS OR WROUGHT COPPER DRAINAGE FITTINGS TO CSA B158-1-1976 AND ANSI B16-29-1973 RESPECTIVELY OR CAST IRON PIPE AND FITTINGS TO CSA B70-M1978.

7. VALVES: ALL VALVES TO HAVE MINIMUM CERTIFIED RATING OF 1380 KPA (200 PSI) WOG.

8. BALL VALVES: FULL PORT BRONZE OR BRASS BODY WITH S.S. BALL, BLOW-OUT PROOF STEM RATED AT 400 WOG.

9. HANGERS AND RISER SUPPORTS: PROVIDE ADJUSTABLE CLEVIS TYPE, USE ROD SIZES AS RECOMMENDED BY THE MANUFACTURER.

10. ON COPPER PIPING, PROVIDE COPPER PLATED TYPE HANGER OR SEPARATE PIPING FROM HANGER WITH AN APPROVED INSULATING TAPE OR PLASTIC COATING.

11. PROVIDE OVERSIZED HANGERS TO PASS OVER INSULATION ON ALL INSULATED HEAT TRACING PIPING. REFER TO DETAIL IN SPECIFICATIONS.

12. CLEAN-UP: LEAVE SYSTEMS OPERATING WITH WORK AREAS CLEAN TO ACCEPTANCE OF THE OWNER.

13. PIPING SYSTEM TESTS: DO NOT INSULATE PIPING SYSTEMS UNTIL COMPLETED, PERFECTED, AND PROVEN TIGHT. SHOULD LEAKS DEVELOP IN ANY PART OF THE PIPING SYSTEM, REMOVE AND REPAIR DEFECTIVE SECTIONS, FITTINGS, AND SIMILAR UNTILL TESTING IS PROVEN SUCCESSFUL.

1. TEST PIPING SYSTEM IN SECTIONS AS REQUIRED BY THE PROGRESS OF WORK.

2. TEST ALL HOT WATER AND DOMESTIC WATER PIPING HYDRAULICALLY TO A PRESSURE OF 1100 KPA (150 PSI) AND PROVE TIGHT FOR A PERIOD OF 8 HOURS. TESTING WITH NITROGEN IS ALSO ACCEPTABLE PROVIDED A PRESSURE OF 1380 KPA (200 PSI) IS USED.

3. ALL TESTS MUST BE RECORDED. SUBMIT RECORDED DATA TO THE CONSULTANT.

4. INCLUDE A COPY OF ALL THE TEST RESULTS IN THE MAINTENANCE MANUALS.

14. TRAP SEAL PRIMERS: ENPOCO FIG. TSP-1 CAST BRONZE WITH 1/2" COPPER TO COPPER CONNECTIONS OR 3/8" SOFT COPPER CONNECTED TO NEAREST WATER CLOSET FLUSH VALVE FLUSH TUBE CONNECT AT BACK OF FLUSH TUBE WITH CHROME PLATED EXPOSED PIPING. UNIT TO BE CONNECTED TO EXISTING SUPPLY PIPING WITH BACKFLOW PREVENTER IN WASHROOM AND TO SERVE ELEVATOR MACHINE ROOM AND SUMP PUMP PIT PRIME LINE.

15. WATER HAMMER ARRESTORS: ENPOCO "HAMMERTROL" SERIES "HT" WITH PRE-CHARGED STAINLESS-STEEL BELLOWS IN A STAINLESS STEEL CASING SIZED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS IN WASHROOM SUPPLY PIPING.

16. ALL PLUMBING FIXTURE(S), WHERE INDICATED ON PLAN, SHALL BE SUPPLIED AND INSTALLED BY THE MECHANICAL DIVISION TRADES UNLESS OTHERWISE INDICATED ON THE DRAWINGS. FIXTURES SHALL BE PIPED WITH ALL NECESSARY APPURTENANCES (I.E. VENTS, SANITARY, HOT AND COLD CONNECTIONS), INSTALL ALL COMPONENTS IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. INSTALL SHOCK ARRESTORS.

17. PROVIDE PRESSURE REGULATING VALVES (PRVS) TO MATCH BASE BUILDING STANDARD, WHERE REQUIRED AT NEW DOMESTIC WATER CONNECTIONS.

18. PROVIDE SHUT-OFF VALVES ON SUPPLY AND RETURN PIPING CONNECTIONS TO ALL FIXTURES AND PIECES OF EQUIPMENT.

19. FIXTURE INSTALLATION: INSTALL ALL FIXTURES, DRAINS, CLEANOUTS, BRASS AND SPECIALTIES TO MANUFACTURER'S REQUIREMENTS.

1. CONNECT FIXTURES, COMPLETE WITH SUPPLIES AND DRAINS, SEPARATELY TRAPPED, SUPPORTED LEVEL AND SQUARE. PROVIDE CHROME PLATED PIPING FOR ALL EXPOSED WATER SUPPLY, WASTE AND VENT CONNECTIONS COMPLETE WITH CHROME PLATED ESCUTCHEONS.

2. PROVIDE SUPPORTS TO SET FIXTURES SQUARE AND LEVEL.

3. OBTAIN ARCHITECTS ACCEPTANCE OF MOUNTING HEIGHTS OF ALL WALL MOUNTED FIXTURES.

4. INSTALL WATER HAMMER ARRESTORS FOR EACH FIXTURE OR GROUP OF FIXTURES.

20. PIPE INSTALLATION: INSTALL STRAIGHT, PARALLEL AND CLOSE TO WALLS AND CEILINGS, WITH SPECIFIED PITCH. USE STANDARD FITTINGS FOR DIRECTION CHANGES.

1. INSTALL GROUPS OF PIPING PARALLEL TO EACH OTHER ON TRAPEZE HANGERS, SPACE PIPING TO PERMIT APPLICATION OF INSULATION, IDENTIFICATION AND SERVICE ACCESS.

2. INSTALL ECCENTRIC REDUCERS IN HORIZONTAL PIPING TO PERMIT DRAINAGE AND ELIMINATE AIR POCKETS.

3. WHERE PIPE SIZES DIFFER FROM CONNECTION SIZES OF EQUIPMENT, INSTALL REDUCING FITTINGS CLOSE TO EQUIPMENT, REDUCING BUSHINGS ARE NOT PERMITTED.

4. INSTALL BRASS AND COPPER PIPE AND TUBING FREE FROM SURFACE DAMAGE, REPLACE DAMAGED PIPE OR TUBING.

5. LAY COPPER TUBING SO THAT IT IS NOT IN CONTACT WITH DISSIMILAR METAL AND WILL NOT BE KINKED OR COLLAPSED.

6. USE NON-TOXIC LUBRICANT OR TEFLON TAPE APPLIED TO MALE THREAD.

7. CLEAN ENDS OF PIPES OR TUBING AND RECESSES OF FITTINGS TO BE BRAZED OR SOLDERED ASSEMBLY JOINTS WITHOUT BINDING.

8. JOINTING OF PIPE: COMPATIBLE WITH TYPE OF PIPE USED.

9. WATER PIPING: RUN WATER PIPING FROM SERVICE CONNECTION TO FIXTURES AND EQUIPMENT AT LAVATORIES INSTALL SUPPLIES AS HIGH AS POSSIBLE.

21. SPECIALTIES INSTALLATION:

1. CLEANOUTS: INSTALL ACCESSIBLE CLEANOUTS AT TRAPS AND WHERE REQUIRED.

9. PLUMBING FIXTURES

1. LAV-1: LIGATURE RESISTANT BASIN:

1. WHITEHALL WH375 BASIN - WALL-HUNG LIGATURE RESISTANT BASIN, CORTERRA™ SOLID SURFACE POLYMER RESIN, POWDER COATED BLANCO (WHITE) FINISH.

2. WHITEHALL WH3378-KC FAUCET - BEST-CARE™, HEMISPHERICAL PUSH BUTTON ACTIVATED, HOT & COLD DUAL TEMPERATURE ACTUATORS, PNEUMATIC (AIR) OPERATED, LAVATORY FAUCET.

3. MCGUIRE LFBV170 SUPPLY - CONVERTIBLE™ COMMERCIAL FAUCET SUPPLY KIT, CONSISTING OF (2) STOP VALVES, (2) RISERS, (2) FLANGES (STANDARD), LEAD FREE BRASS BODY, CHROME-PLATED FINISH, CONVERTIBLE LOOSE KEYTRIANGLE HANDLE, ANGLE STOP, 305 MM (12") C.P. LAVATORY FLEXIBLE COPPER RISER TUBES (STANDARD), 13 MM (1/2") SWEAT INLET X 10 MM (3/8") O.D. OUTLET.

4. WATTS CA-421 CARRIER - LAVATORY SUPPORT, WALL PLATE.

5. LAWLER 570-8820 MIXING VALVE - POINT OF USE AND MASTER CONTROLLED FIXTURES, THERMOSTATIC MASTER WATER MIXING CONTROL VALVE.

2. LAV-2: LAVATORY:

1. AMERICAN STANDARD 0355912-020 BASIN - WALL-HUNG LAVATORY, VITREOUS CHINA, WHITE FINISH.

2. SLOAN EFX-200-PLUG-G-50GPM-MJ-MR-FCT FAUCET - BASYS®B, AUTOMATIC NO-TOUCH, PLUG-IN, LAVATORY FAUCET, INTEGRAL ABOVE DECK WATER SUPPLY SHUT OFF.

3. SLOAN SL-EAF-70-A FAUCET AND FLUSH VALVE POWER KIT - FOR FAUCET.

4. LAWLER 570-8820 MIXING VALVE - POINT OF USE AND MASTER CONTROLLED FIXTURES, THERMOSTATIC MASTER WATER MIXING CONTROL VALVE.

5. MCGUIRE 155A FIXTURE DRAIN - STRAIGHT DRAIN, CAST BRASS, CHROME-PLATED FINISH.

6. MCGUIRE LFBV170 SUPPLY - CONVERTIBLE™ COMMERCIAL FAUCET SUPPLY KIT, CONSISTING OF (2) STOP VALVES, (2) RISERS, (2) FLANGES (STANDARD), LEAD FREE BRASS BODY, CHROME-PLATED FINISH, CONVERTIBLE LOOSE KEYTRIANGLE HANDLE, ANGLE STOP, 305 MM (12") C.P. LAVATORY FLEXIBLE COPPER RISER TUBES (STANDARD), 13 MM (1/2") SWEAT INLET X 10 MM (3/8") O.D. OUTLET.

7. MCGUIRE 8872C P-TRAP - HEAVY CAST BRASS, POLISHED CHROME, 32 MM (1-1/4") X 32 MM (1-1/4") SIZE, ADJUSTABLE P-TRAP, WITH CLEANOUT PLUG.

8. WATTS WCA-411 CARRIER - WCA-411WCA-411-WC, LAVATORY CARRIER, FOR CONCEALED ARM CARRIER, ADJUSTABLE ARMS, EPOXY COATED CAST IRON.



Addendum

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Date: July 14, 2026

Project Name: SHN Mental Health Inpatient Consolidation Pod 3A

Client: Scarborough Health Network

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Project #: 24002-02

ADD #: E-03

Page #: 1 of 1

+ Attachment

In accordance with the drawings and specifications, provide in the tender all costs required to complete the work including items as listed below.

Electrical:

Reference	Description
E0-01b	Changed Responder 4 Platform to Responder 5 Platform.
E0-02b	Changed Responder 4 Platform to Responder 5 Platform.
E1-02	Modified Note 19 and 35.

End of ADD # E-03

1.30.6.2.3. MEASURE THE INSULATION RESISTANCE OF EACH BRANCH CIRCUIT WITH ALL WIRING DEVICES CONNECTED.

1.30.7. RECEPTACLE RETENTIVE FORCE TEST

1.30.7.1. REQUIREMENTS:

1.30.7.1.1. A FORCE OF 1.1 NEWTONS DOES NOT REMOVE A TEST PIN FROM THE GROUND SLOT OF A RECEPTACLE.

1.30.7.1.2. A FORCE OF 13 NEWTONS DOES NOT REMOVE A TWO PIN TEST ATTACHMENT PLUG FROM A RECEPTACLE.

1.30.7.2. METHOD:

1.30.7.2.1. USE THE TEST PINS AND METHODS SPECIFIED IN CSA STANDARD C22.2 NO. 42 AS AN ALTERNATIVE A COMMERCIALLY AVAILABLE "TENSION TESTED" COMPLYING WITH CSA STANDARD C22.2 NO.42. GENERAL USE RECEPTACES, PLUGS AND SIMILAR WIRING DEVICES MAY BE EMPLOYED.

1.30.7.2.2. IF USING THE TENSION CHECK, ENSURE THAT THE DEVICE IS CALIBRATED FOR TENSION (NEWTONS) FOR BOTH SINGLE-GROUND PIN AND FOR MULTIPLE PIN TESTING.

1.30.7.2.3. FOR EACH OUTLET, CHECK THAT THE TENSION OF GROUND PIN REMOVAL MEETS OR EXCEEDS THE REQUIREMENT.

1.30.7.2.4. FOR EACH OUTLET, CHECK THAT THE TENSION OF THE TWO PIN REMOVAL MEETS OR EXCEEDS THAT REQUIREMENT.

1.30.7.2.5. RECORD GROUND TO TENSION READING FOR EACH OUTLET.

1.30.8. RECEPTACLE POLARITY TEST

1.30.8.1. REQUIREMENTS:

1.30.8.1.1. RECEPTABLES TO BE CONNECTED IN ACCORDANCE WITH CONFIGURATIONS LISTED IN CANADIAN ELECTRICAL CODE CSA C22.1, LATEST EDITION SECTION 26.

1.30.8.2. METHOD:

1.30.8.2.1. UTILIZE POLARITY TEST SET, AND TEST EACH RECEPTACLE POLARITY.

1.30.8.2.2. CORRECT CONNECTION OF RECEPTABLES WHERE POLARITY INDICATION IS INCORRECT.

1.30.8.2.3. RECORD GROUND TO GO TEST RESULTS FOR EACH RECEPTACLE.

1.30.9. BRANCH CIRCUIT IMPEDANCE TEST (VOLTAGE DROP TEST - GROUNDED SYSTEMS ONLY)

1.30.9.1. REQUIREMENTS:

1.30.9.1.1. VOLTAGE DROP IN BRANCH CIRCUIT WIRING FROM PANELBOARDS TO RECEPTABLES NOT TO EXCEED 3% WHEN A LOAD OF NOT LESS THAN 80% OF THE BREAKER RATING IS APPLIED AT THE RECEPTACLE.

1.30.9.2. METHOD:

1.30.9.2.1. UTILIZE EQUIPMENT APPROVED BY THE CONSULTANT, SEE FIGURE 2 IN CSA STANDARD 232 FOR TEST CIRCUIT.

1.30.9.2.2. ENSURE THAT ALL CIRCUITS OTHER THAN THE ONE UNDER TEST ARE DE-ENERGIZED.

1.30.9.2.3. RECORD NO LEAD VOLTAGE AT RECEPTACLE (VO).

1.30.9.2.4. APPLY CURRENT TO 80% OF THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE CIRCUIT UNDER TEST AND RECORD VOLTAGE (VL).

1.30.9.2.5. REMOVE LEAD AND RECONFIRM VOLTAGE OF VO.

1.30.9.2.6. CALCULATE VOLTAGE DROP AT RECEPTACLE BY THE FORMULA ((VO - VL) / VO) * 100%.

1.30.9.2.7. RECORD THE RESULTS.

1.30.9.2.8. WHERE THE CALCULATED VOLTAGE DROP EXCEEDS 3.0%, REWORK THE BRANCH CIRCUIT WIRING AS REQUIRED TO REDUCE THE VOLTAGE DROP WITHIN THE REQUIRED VOLTAGE.

1.30.9.2.9. NOTE THAT A VOLTAGE DROP UP TO 5% AS IDENTIFIED IN THE 232 STANDARD IS NOT ACCEPTABLE FOR THIS PROJECT.

1.30.10. GROUND POINT VOLTAGE RISE TEST (GROUNDED SYSTEMS ONLY)

1.30.10.1. REQUIREMENTS:

1.30.10.1.1. THE VOLTAGE RISE AT THE FOUND POINT OF EACH RECEPTACLE NOT TO EXCEED 5V WHEN A CURRENT OF NOT LESS THAN 8% OF THE RATING OF THE OVERCURRENT DEVICE, PROTECTING THE CIRCUIT UNDER TEST, IS PASSED THROUGH THE BONDING CONDUCTOR.

1.30.10.2. METHOD:

1.30.10.2.1. USE THE TEST CIRCUIT OF FIGURE 4 IN CSA STANDARD 232.

1.30.10.2.2. CONNECT THE TEST CIRCUIT TO THE OUTLET.

1.30.10.2.3. WITH SWITCH SW OPEN, RECORD THE VOLTAGE INDICATED BY VOLTMETER V1 AS VN, THE NEUTRAL TO GROUND VOLTAGE WITHOUT LOAD. IF IT EXCEEDS ABOVE 2V, DETERMINE THE CAUSE AND CORRECT THE DEFECT.

1.30.10.2.4. USING THE LOW VOLTAGE SUPPLY, (NOMINALLY 5V OPEN CIRCUIT) APPLY A LOAD OF 80% OF THE RATED CURRENT OF THE CIRCUIT, BETWEEN THE NEUTRAL AND THE BONDING CONDUCTOR FOR A PERIOD OF FROM 1 TO 5 SECONDS. FEED THE LOW VOLTAGE INDICATED BY VOLTMETER V1 AS VL AND THE VOLTAGE INDICATED BY VOLTMETER V2 AS VO.

1.30.10.2.5. RECORD THE RESULTS. THE RETURN PATH VOLTAGE RISE VO NOT TO EXCEED 5V.

1.30.10.2.6. WHERE VOLTAGE RISE EXCEEDS 5V, REWORK THE BRANCH CIRCUIT BONDING CONDUCTOR AS REQUIRED TO REDUCE THE VOLTAGE RISE WITHIN THE REQUIRED VOLTAGE.

1.30.11. POTENTIAL DIFFERENCE BETWEEN GROUND POINTS TEST

1.30.11.1. REQUIREMENTS:

1.30.11.1.1. POTENTIAL DIFFERENCE BETWEEN THE GROUNDING POLES OF RECEPTABLES AND BETWEEN THESE POLES AND ALL CONDUIT WIRING ON THE BASIS OF NO MORE THAN TWO (2) - 90 DEG BENDS OR THEIR EQUIVALENT, OR A DISTANCE NOT TO EXCEED 100 FEET BETWEEN WORKS.

1.30.11.2. METHOD:

1.30.11.2.1. USE THE STANDARD FREQUENCY-WEIGHTED TEST CIRCUIT OF FIGURE 2 IN CSA STANDARD 232.

1.30.11.2.2. CONFIRM THAT ALL RECEPTABLES HAVE BEEN INSTALLED AND THAT NO UTILIZATION EQUIPMENT, EITHER PERMANENTLY WIRED OR CORO-CONNECTED, IS CONNECTED TO THE SYSTEM.

1.30.11.2.3. ENERGIZE THE SYSTEM.

1.30.11.2.4. SELECT A LOCAL REFERENCE POINT KNOWN TO BE BONDED TO GROUND AND RECORD THE MEASURED VOLTAGE BETWEEN THIS CHOSEN REFERENCE AND EACH RECEPTACLE GROUND POLE AND EACH EXPOSED CONDUCTIVE PART (EITHER UNFINISHED METAL PART).

1.30.11.2.5. IF THE TEST LEADS ARE LONG, CORRECT THE READINGS FOR PICKUP (ZERO READING WHEN THE TEST LEADS ARE CONNECTED TOGETHER).

1.30.11.2.6. RECORD THE RESULTS.

2. MATERIAL AND INSTALLATION

2.1. WIRING METHODS

2.1.1. ALL BUILDING WIRES AND CABLES SHALL BE COPPER THERMOPLASTIC TYPE TWH 90 DEGREES C RATED AND INSTALLED IN CONDUIT. MINIMUM SIZE SHALL BE #12 AWG. FOR FINAL CONNECTIONS TO LIGHTING FIXTURES USE TYPE THHN FOR FINAL CONNECTIONS TO HEATING EQUIPMENT USE SILICONE INSULATED TYPE WIRE, SUITED FOR THIS PURPOSE. ALL CONDUIT SHALL BE EMT TYPE GALVANIZED STEEL UTILIZING SET SCREW FITTINGS, INSULATED THROAT CONNECTION AND COUPLINGS. ALL CONDUIT SHALL BE CONCEALED EXCEPT IN UNFINISHED AREAS.

2.1.2. BRANCH CIRCUIT WIRING EXCEEDING 100 FEET TO THE FURTHEST OUTLET FROM A PANEL BOARD SHALL BE #10 AWG.

2.1.3. ARMoured CABLE (BX) MAY BE USED FOR FIXTURE TAILS AND WALL MOUNTED OUTLETS MAXIMUM LENGTH 10 FEET.

2.1.4. ALL CONDUIT SHALL BE RUN PARALLEL TO WALLS AND CEILINGS. PROVIDE A NYLON FISH WIRE IN ALL EMPTY CONDUIT. ALL CONNECTORS SHALL BE IDEAL WING NUT TYPE.

2.1.5. SUPPORT ALL CONDUIT INDEPENDENT OF CEILING SYSTEM.

2.1.6. WIRING FOR HEALTHCARE

2.1.6.1. RECEPTABLES

2.1.6.1.1. RECEPTABLES IN PATIENT CARE AREAS: HOSPITAL GRADE.

2.1.6.1.2. RECEPTABLES CONNECTED TO THE EMERGENCY POWER SYSTEM: COLOURED RED.

2.1.6.1.3. RECEPTABLES CONNECTED TO THE UPS POWER SYSTEM IF APPLICABLE: COLOURED ORANGE.

2.1.6.1.4. RECEPTABLES IN PATENT CARE AREAS SHALL HAVE CIRCUIT IDENTIFICATION IN ACCORDANCE WITH CSA STANDARD 232.

2.1.7. BONDING TO GROUND

2.1.7.1. THE FOLLOWING REQUIREMENT APPLY TO ALL PATIENT CARE AREAS:

2.1.7.1.1. BOND TO GROUND RECEPTACLE AND PERMANENTLY WIRE ELECTRICAL EQUIPMENT BY INSTALLING AN INTERCONNECT WIRE EQUIPMENT BONDING CONDUCTOR IN THE SAME CONDUIT AS THE BRANCH CIRCUIT CONDUCTORS.

2.1.7.1.2. TERMINATE THE BONDING CONDUCTOR AT THE LOAD END OF THE CIRCUIT TO THE GROUND SCREW IN THE BONDING CONDUCTOR ON THE GROUND BUS IN THE PANEL.

2.1.7.1.3. PROVIDE A SEPARATE BONDING CONDUCTOR FOR EACH CIRCUIT, EXCEPT TAP WHERE THE SINGLE PHASE RECEPTABLES IN A PATIENT CARE ENVIRONMENT ARE SUPPLIED FROM TWO 2-WIRE BRANCH CIRCUITS IN THE SAME CONDUIT, A SINGLE BONDING CONDUCTOR MAY BE PROVIDED FOR THE TWO CIRCUITS.

2.1.7.1.4. SIZE BONDING CONDUCTORS NOT LESS THAN THE BRANCH CIRCUIT CONDUCTORS. OVERSIZE BONDING CONDUCTORS WHERE NECESSARY TO COMPLY WITH THE VOLTAGE RISE LIMIT PER CSA STANDARD 232.

2.1.7.1.5. IN CRITICAL CARE AREAS PROVIDE A SEPARATE #10 BONDING CONDUCTOR FOR EACH CIRCUIT, FROM THE OUTLET BACK TO THE PANEL.

2.1.7.1.6. INTERCONNECT THE GROUND BUSSES IN ELECTRICAL PANELS WHICH SERVED THE SAME PATIENT CARE AREAS WITH AN INSULATED GREEN COPPED CONDUCTOR INSTALLED IN PVC CONDUIT AND SIZED PER THE ONTARIO ELECTRICAL SAFETY CODE, BUT NOT LESS THAN #6 AWG.

2.1.7.1.7. BOND THE GROUND EXPOSED METAL NON-CURRENT CARRYING PARTS OF EQUIPMENT LOCATED WITHIN 15M HORIZONTALLY FROM THE NOMINAL POSITION OF THE BED AND WITHIN 2.3M VERTICALLY ABOVE THE FLOOR. USE GREEN INSULATED COPPED BONDING CONDUCTORS.

2.1.7.1.8. TYPICAL EQUIPMENT TO BE BONDED TO GROUND INCLUDES:

2.1.7.1.8.1. FIXTURES.

2.1.7.1.8.2. HEADWALL UNITS.

2.1.7.1.8.3. SERVICE STRIPS.

2.1.7.1.8.4. INTERCOM STATIONS.

2.1.7.1.8.5. NURSE CALL STATIONS.

2.1.7.1.8.6. VIEW BOXES.

2.1.7.1.8.7. RECEPTABLES.

2.1.7.1.8.8. SWITCHES.

2.1.7.1.8.9. COVER PLATES.

2.1.7.1.8.10. OUTLET BOXES AND

2.1.7.1.8.11. OTHER EQUIPMENT AS REQUIRED BY CODE.

2.1.8. NEUTRAL CONDUCTORS

2.1.8.1.1. INTERMEDIATE CARE AREAS AND CRITICAL CARE AREAS, PROVIDE A SEPARATE NEUTRAL CONDUCTOR FOR EACH BRANCH CIRCUIT PHASE CONDUCTOR BACK TO THE PANEL, SURPASSING THE RECEPTABLES.

2.1.8.2. WHERE MULTIPLE CIRCUITS SHARE A CONDUIT, DERATE CONDUCTORS, WHERE REQUIRED, ON THE BASIS THAT THE NEUTRAL CONDUCTORS ARE FULL CURRENT CARRYING CONDUCTORS.

2.2. RACEWAYS

2.2.1. RIGID STEEL CONDUIT (RSD) SHALL BE ZINC-COATED STEEL THAT CONFORMS TO INDUSTRY STANDARDS. LOCK NUTS SHALL BE STEELZINC PLATED. CONNECTORS AND COUPLINGS SHALL BE STEEL. INSULATED BUSBARS SHALL BE IRONZINC PLATED. FITTINGS SHALL BE THREADED WITH INSULATED BUSHINGS.

2.2.2. ELECTRICAL METALLIC TUBING (EMT) SHALL BE ZINC-COATED STEEL THAT CONFORMS TO INDUSTRY STANDARDS. FITTINGS SHALL BE STEEL WITH SET SCREW CONNECTORS AND COUPLINGS.

2.2.3. RIGID NON-METALLIC CONDUIT (RNM) SHALL BE TYPE 40-40-PVC, DB-120 AND EPC-80-PVC CONDUIT SHALL BE 100% VIRGIN POLY(VINYL CHLORIDE (PVC) 90-UL ULTRATED THAT CONFORMS TO INDUSTRY STANDARDS.

2.3. BOXES

2.3.1. SUPPORT ALL BOXES INDEPENDENT OF CONDUIT.

2.3.2. IN AREAS WITH DRYWALL CEILINGS, CONTRACTOR SHALL LOCATE/RELOCATE ALL NEW/EXISTING JUNCTION BOXES, PULL BOXES, DISCONNECTS, ETC. TO ACCESSIBLE AREAS, AS REQUIRED BY THE CANADIAN ELECTRICAL CODE. WHERE IT IS NO POSSIBLE TO RELOCATE/INSTALL EXISTING/NEW SERVICES IN ACCESSIBLE AREAS, CONTRACTOR SHALL PROVIDE ACCESS PANELS C/W FIRE RATINGS AS REQUIRED. EXACT LOCATION OF ACCESS PANELS SHALL BE CO-ORDINATED WITH THE ARCHITECT.

2.3.3. OUTLET BOXES

2.3.3.1. PROVIDE AN OUTLET BOX FOR EACH LIGHTING FIXTURE. WIRING DEVICE, DATA OUTLET, TELEPHONE OUTLET, ETC. OUTLET BOXES FOR VARIOUS SYSTEMS AND COMPONENTS SHALL BE AS REQUIRED BY MANUFACTURER AND SUITABLE FOR THE APPLICATION.

2.3.3.2. OUTLET BOXES ON CONCEALED WORK SHALL BE 4" SQUARE OR OCTAGONAL, GALVANIZED PRESSED STEEL WITH PLASTER RINGS AS REQUIRED. OUTLET BOXES FOR EXPOSED CONDUIT WORK SHALL BE CAST ALUMINUM ALLOY WITH CAST ALUMINUM ALLOY COVERS.

2.3.3.3. WHERE INSTALLED IN PLASTER, BOXES SHALL BE FITTED WITH GALVANIZED STEEL PLASTER COVERS OF REQUIRED DEPTH TO FINISH FLUSH WITH FINISHED WALL OR CEILING.

2.3.3.4. SWITCH BOXES, RECEPTACLE BOXES AND OTHER OUTLET BOXES SHALL BE STANDARD 4" SQUARE WITH PLASTER RINGS OR GANG COVERS AS REQUIRED.

2.3.3.5. WEATHERPROOF BOXES SHALL BE CONDULET CAST BOXES WITH WEATHERPROOF DEVICES AND COVERS. PROVIDE HOT-DIPPED GALVANIZED CORROSION-RESISTANT EPOXY ENAMEL FINISH OR PVC-COATED PRODUCTS, WHERE NOTED ON DRAWINGS.

2.3.3.6. PROVIDE SCREW-JOINT OUTLET BOXES, WITH GASKETED WEATHERPROOF COVERS IN EXTERIOR LOCATIONS, WHERE EXPOSED TO MOISTURE. AT KITCHEN AND CAFETERIA EQUIPMENT WITH OR NEXT TO WATER OR STEAM CONNECTIONS, AND WHERE INDICATED AS WEATHERPROOF ON DRAWINGS.

2.3.3.7. PROVIDE ONLY ENOUGH CONDUIT OPENINGS TO ACCOMMODATE CONDUITS AT INDIVIDUAL LOCATION. EACH BOX SHALL BE LARGE ENOUGH TO ACCOMMODATE NUMBER AND SIZES OF CONDUITS, WIRES AND SPLICES TO MEET OESC REQUIREMENTS, BUT SHALL BE AT LEAST SIZE SHOWN OR SPECIFIED. NECESSARY VOLUME SHALL BE OBTAINED BY USING BOXES OF PROPER DIMENSIONS. BOX DEPTHS GREATER THAN 2" SHALL NOT BE USED TO OBTAIN NECESSARY VOLUME. BUT MAY BE USED WITH ARCHITECT'S APPROVAL. TO FACILITATE INSTALLATION, STANDARD CONCRETE BOXES MAY BE 6" DEEP WHERE NECESSARY TO PERMIT ENTRANCE OF CONDUITS INTO SIDES OF BOXES WITHOUT INTERFERENCE WITH REINFORCING BARS. OCTAGONAL, HUNG CEILING BOXES WITH SUSPENSION BARS MAY BE 3-1/2" DEEP. RECTANGULAR BOXES FOR INTER-CONNECTION OF BRANCH CIRCUITS MAY BE 3-1/2" DEEP.

2.3.3.8. DO NOT INSTALL OUTLET BOXES "BACK TO BACK" IN WALLS AND PARTITIONS. SUCH OUTLETS MUST BE STAGGERED AND SEALED AGAINST NOISE TRANSMISSION. "THRU WALL" TYPE OUTLET BOXES WILL NOT BE PERMITTED FOR ANY APPLICATION.

2.3.3.9. ALL RECESSED OUTLET BOXES FOR SURFACE MOUNTED DEVICES OR LIGHTING FIXTURES MUST BE TOTALLY CONCEALED BY THE DEVICE OR FIXTURE.

2.3.4. JUNCTION BOXES, PULL BOXES AND CABLE TROUGHS

2.3.4.1. PROVIDE CODE MARKED GALVANIZED STEEL, JUNCTION AND PULL BOXES FOR CONDUIT 1-1/4" TRADE SIZE AND LARGER, WHERE INDICATED. USE AS NECESSARY TO FACILITATE INSTALLATION, OF REQUIRED DIMENSIONS, WITH ACCESSIBLE, REMOVABLE SCREW-ON COVERS. PROVIDE JUNCTION AND PULL BOXES AND SPECIAL SIZES AND SHAPES DETERMINED IN FIELD WHERE NECESSARY.

2.3.4.2. JUNCTION BOXES FOR EXPOSED CONDUIT WORK IN FINISHED AREAS SHALL BE CAST ALUMINUM ALLOY WITH CAST ALUMINUM ALLOY COVERS.

2.3.4.3. PROVIDE CABLE TROUGHS OF SPECIAL SHAPES, DESIGN AND CONSTRUCTION REQUIRED TO INSTALL, SUPPORT AND PROTECT CABLES. TROUGHS SHALL BE AS SPECIFIED ABOVE FOR JUNCTION AND PULL BOXES, WITH REINFORCING, INSULATING SUPPORTS AND CLAMPING. FOR CABLE INSTALLATION, CABLES SHALL BE CONTINUOUS THROUGHOUT TROUGHS AND SHALL BE BACKED IN DISTRIBUTED PHASE EXPOSURE AREAS WITH PHASE CABLES SURROUNDING NEUTRAL CONDUCTORS.

2.3.4.4. ALL BOXES SHALL BE INSTALLED, SO AS TO BE ACCESSIBLE AFTER WORK IS COMPLETE. PROVIDE PULL BOXES ON ALL CONDUIT RUNS ON THE BASIS OF NO MORE THAN TWO (2) - 90 DEG BENDS OR THEIR EQUIVALENT, OR A DISTANCE NOT TO EXCEED 100 FEET BETWEEN BOXES.

2.4. FLOOR BOXES

2.4.1. FLOOR OUTLET BOXES SHALL BE STEEL, CONCRETE TIGHT ADJUSTABLE. TYPE LEGRANO EVOLUTION SERIES, EPB48, 4 OR 5 GANG AS REQUIRED TO SUIT DEVICES AND DEPTH OF CONCRETE. PROVIDE APPLICABLE FLOOR PLATE ASSEMBLY AND WIRING DEVICE TO SUIT THE POWER, COMMUNICATION AND AV REQUIREMENTS AS INDICATED ON THE PLANS. (ALTERNATE MANUFACTURERS: HUBBELL, WELLMARK)

2.4.2. ALL FLOOR PLATES SHALL BE COMPLETE WITH COVER AND FINISHING FLANGES AS REQUIRED TO SUIT FLOOR FINISH AND APPLICATION AS NOTED.

2.5. GROUNDING

2.5.1. INSTALL GREEN INSULATED EQUIPMENT GROUNDING CONDUCTORS WITH ALL FEEDERS AND BRANCH CIRCUITS.

2.5.2. SIGNAL AND COMMUNICATION EQUIPMENT: FOR TELEPHONE, ALARM, VOICE AND DATA, AND OTHER COMMUNICATION EQUIPMENT, PROVIDE NO. #2 AWG MINIMUM INSULATED GROUNDING CONDUCTOR IN RACEWAY FROM GROUNDING ELECTRODE SYSTEM TO EACH SERVICE LOCATION, TERMINAL, CABINET, WIRING CLOSET, AND CENTRAL EQUIPMENT LOCATION.

2.5.2.1. SERVICE AND CENTRAL EQUIPMENT LOCATIONS AND WIRING CLOSETS: TERMINATE GROUNDING CONDUCTOR ON A 1/8" X 2" X 12" GROUNDING BUS.

2.5.2.2. TERMINAL CABINETS: TERMINATE GROUNDING CONDUCTOR ON CABINET GROUNDING TERMINAL.

2.5.2.3. CONDUCTORS: INSTALL SLOD CONDUCTOR FOR #AWG AND SMALLER, AND STRANDED CONDUCTORS FOR #AWG AND LARGER, UNLESS OTHERWISE INDICATED.

2.5.4. UNDERGROUND GROUNDING CONDUCTORS: INSTALL BARE TINNED-COPPER CONDUCTOR, 20 AWG MINIMUM.

2.5.4.1. BURY AT LEAST 24" BELOW GRADE.

2.5.4.2. DUCT BANK GROUNDING CONDUCTOR: BURY 12" ABOVE DUCT BANK WHEN INDICATED AS PART OF DUCT-BANK INSTALLATION.

2.5.5. SIZE ALL WIRE FOR MAXIMUM 2% VOLTAGE DROP.

2.5.6. ALL HOME RUNS TO BE IN CONDUIT.

2.6. WALL PLATES

2.6.1. FACEPLATES OF FLUSH-MOUNTED TOGGLE SWITCHES AND RECEPTABLES SHALL BE AS FOLLOWS.

2.6.1.1. FINISHED AREAS: STAINLESS STEEL FINISH EACH SUPPLIED INDIVIDUALLY WRAPPED IN A SEALED PROTECTIVE ENVELOPE. MANUFACTURER TO MATCH RECEPTACLE AND SWITCH MANUFACTURER.

2.6.1.2. UNFINISHED AND SURFACE AREAS: GALVANIZED STEEL.

2.6.1.3. WET LOCATION, WEATHER-PROOF COVER PLATES.

2.7. LINE VOLTAGE SWITCHES

2.7.1. EXTRA HEAVY DUTY SPEC GRADE SWITCHES (20A, 120/277V MAX.) SHALL BE LEVITON #1211 (SINGLE POLE), #1223 (THREE WAY), MOUNTED 4/0" AFF, UNLESS OTHERWISE INDICATED UNDER ARCHITECTURAL DRAWINGS.

2.7.2. ALL NORMAL POWER LIGHT SWITCHES SHALL BE WHITE COLOUR UNLESS OTHERWISE NOTED.

2.7.3. ALL EMERGENCY POWER LIGHT SWITCHES SHALL BE RED COLOUR UNLESS OTHERWISE NOTED.

2.7.4. DECORATOR VARIABLE, SPEED EXHAUST FAN SWITCHES SHALL BE PASS & SEYMOUR LUMASPEC NON-PRESET SERIES, WATTAGE AS REQUIRED.

2.7.5. ALTERNATE MANUFACTURERS: PASS & SEYMOUR, LUTRON, HUBBELL

2.8. RECEPTABLES

2.8.1. NORMAL DEVICES SHALL BE WHITE IN COLOUR, UNLESS OTHERWISE SPECIFIED.

2.8.2. EMERGENCY DEVICES SHALL BE RED IN COLOUR, UNLESS OTHERWISE SPECIFIED.

2.8.3. HOSPITAL GRADE WITH FREE DOT SYMBOL, TAMPER-RESISTANCE, EXTRA HEAVY DUTY STATION AND WIRE, DUPLEX LG-GROUND, 15 AMPERE, 120V, 2 POLE, 3 WIRE GROUNDING DUPLEX RECEPTABLES COMPLETE WITH FRONT CIRCUIT IDENTIFICATION AREA, HOSPITAL GRADE, U-GROUND, 20 AMPERE, 120V, 3 WIRE DUPLEX RECEPTACLE.

2.8.4. ALL RECEPTABLES THROUGHOUT THE PROJECT SHALL BE HOSPITAL GRADE, UNLESS OTHERWISE NOTED.

2.8.5. ALL OTHER RECEPTACLE TYPES SHALL BE AS SCHEDULED ON THE DRAWINGS.

2.8.6. RECEPTABLES LOCATED IN ALL ROOMS CONTAINING PERSONAL WASHING FACILITIES SUCH AS WASHBASINS BATH TUBS, SHOWERS, KITCHEN SINKS OR SIMILAR DEVICES AND LOCATED WITHIN 3 METRES OF SUCH DEVICES SHALL PROVIDE GFCI PROTECTION.

2.8.7. RECEPTABLES LOCATED IN KITCHENS AND INSTALLED WITHIN 1.5 METRE OF KITCHEN SINK ALONG THE WALL BEHIND COUNTERTOP WORK SURFACES SHALL BE PROTECTED BY GROUND FAULT INTERRUPTER.

2.8.8. ALL RECEPTABLES DESIGNATED "WP" (WEATHERPROOF) ON THE DRAWINGS SHALL BE G.F.I. PROTECTED AND PROVIDED WITH "IN USE" WEATHERPROOF COVERS.

2.8.8. ALTERNATE MANUFACTURERS: LUTRON, HUBBELL

2.9. MECHANICAL TRADES WIRING

2.9.1. UNLESS OTHERWISE NOTED, ALL STARTERS AND CONTROL WIRING TO BE PROVIDED BY DIVISION 15. DIVISION 10 TO RECEIVE, INSTALL, STARTERS AND PROVIDE ALL LINE-SIDE AND LOAD-SIDE POWER WIRING AND REQUIRED ISOLATING DISCONNECT SWITCHES.

2.9.2. CONFIRM ELECTRICAL REQUIREMENTS AND EXACT LOCATIONS OF ALL MECHANICAL EQUIPMENT WITH DIVISION 15 PRIOR TO INSTALLATION.

2.10. LUMINAIRES

2.10.1. PROVIDE ALL LUMINAIRES AS SHOWN ON THE DRAWINGS AND AS SPECIFIED IN THE LUMINAIRE SCHEDULE.

2.10.2. PROVIDE NEW LIGHTING FIXTURES COMPLETE WITH MOUNTING ACCESSORIES, JUNCTION BOXES, TRIMS, AND LAMPS AS SPECIFIED AND PER ATTACHED FIXTURE CUT SHEETS.

2.10.3. ALL PRODUCTS OF A SPECIFIED TYPE ARE TO BE FROM THE SAME MANUFACTURER.

2.10.4. FIXTURE TYPE CATALOGUE SHALL NOT NECESSARILY DENOTE REQUIRED MOUNTING EQUIPMENT OR ACCESSORIES. PROVIDE COMPLETE MOUNTING ACCESSORIES APPROPRIATE FOR EACH MOUNTING CONDITION.

2.10.5. ALL NEW AND RELOCATED FIXTURES IN SCOPE OF WORK SHALL BE SUPPORTED INDEPENDENT OF THE CEILING SYSTEM TO THE APPROVAL OF THE CANADIAN ELECTRICAL CODE.

2.10.6. ALL FIXTURES SHALL BE INSTALLED WITH A FRAME OR CANOPY THAT IS COMPATIBLE WITH THE CEILING TYPE OR SPECIFIED BY THE CONSULTANT.

2.10.7. PROVIDE APPROPRIATE ACCESSORIES FOR PROPER MOUNTING OF ALL FIXTURES. INCLUDE PLASTER FRAMES FOR PLASTER CEILING AND FIRESTOP PROTECTION FOR FIXTURES IN RATED CEILING. FOR FIXTURES SUSPENDED FROM CEILING, PROVIDE PENDANTS OR AIRCRAFT CABLES COMPLETE WITH ACCESSORIES TO COMPLETE THE INSTALLATION AS INDICATED ON THE DRAWINGS.

2.10.8. WHERE LIGHT FIXTURE OR LIGHT FIXTURE SUSPENSION APPARATUS PENETRATES METAL PAN OR SHEET METAL CEILING OR CANOPIES, AN APPROVED COPY OF THE SHOP DRAWINGS OF THOSE FIXTURES SHALL BE PROVIDED TO THE CEILING MANUFACTURER. APERTURES IN THE CEILING OR OPENINGS FOR SUSPENSION CABLES SHALL BE PRE-CUT BY THE CEILING MANUFACTURER TO SUIT LIGHT FIXTURES. INSTRUCT THE MANUFACTURER ACCORDINGLY.

2.10.9. IF THE WORDS "EQUIVALENT" OR "APPROVED EQUAL" ARE NOT INDICATED AFTER LIGHT FIXTURE MANUFACTURER AND CATALOG NUMBER IN THE FIXTURE SCHEDULE, NO OTHER MANUFACTURER WILL BE ACCEPTABLE FOR THAT PARTICULAR TYPE.

2.10.10. WITH JUST EMERGENCY LIGHTING IN OPERATION, AND AT NIGHT, THE ELECTRICAL CONTRACTOR IS TO MEASURE THE "AVERAGE" ILLUMINATION ON THE FLOOR (BY ESTABLISHING THE MAXIMUM AND THE MINIMUM LEVEL) IN THE PRINCIPAL ROUTES PROVIDING ACCESS TO EXITS. PULL ALL LIGHTING RESULTS ON A CAD DISK OR ON A SET OF REPRODUCIBLE SERIAL DRAWINGS FOR REVIEW BY THE CONSULTANT. SUBMISSION TO THE BUILDING INSPECTION AUTHORITIES TO BE BY THE ELECTRICAL CONTRACTOR.

2.11. SERVICE EQUIPMENT

2.11.1. ALL NEW PANELBOARDS, DISCONNECT SWITCHES, METERS, TRANSFORMERS, ETC., TO BE COPPER WINDINGS-BUS-BARS, SAME MANUFACTURE, RATING AND TYPE AS BASE BUILDING EQUIPMENT UNLESS OTHERWISE NOTED. MOLDED CASE CIRCUIT BREAKERS TO BE BOLTON OR SAME EQUIVALENT. RATING AND TYPE AT BASE BUILDING BREAKERS. ALL AT/SS AND SURFACE MOUNTED PANELBOARDS TO BE SPINKLER PROOF.

2.11.2. ALL NEW PANELBOARDS SHALL BE COMPLETE WITH NEUTRAL BUS RATED 200 PERCENT OF PHASE BUS AND UL LISTED AS SUITABLE FOR NONLINEAR LOADS AND PANELBOARDS FED FROM "K" RATED TRANSFORMERS.

2.11.3. ALL MAIN BREAKERS SHALL BE SEPARATELY MOUNTED ON TOP OR BOTTOM OF PANEL TO SUIT CABLE ENTRY.

2.11.4. PROVIDE BREAKER LOOKS FOR ALL NEW AND EXISTING BREAKERS SERVING EXIT LIGHTS, EMERGENCY LIGHTING AND EMERGENCY BATTERY PACKS.

2.11.5. ALL FLOOR MOUNTED DISTRIBUTION EQUIPMENT, INCLUDING TRANSFORMERS, PANELBOARDS AND/OR UPS MODULES SHALL BE ALLEED ON A 100MM (4") HIGH CONCRETE BASE TO EXTEND (2") ON ALL SIDES WITH CHAMFERED CORNERS.

2.11.6. MANUAL STARTERS SHALL BE ALAN BRADLEY BUILDING 600, WITH FLOAT LIFT AND ON/OFF TOGGLE SWITCH.

2.11.7. FUSES SHALL BE GOLD SHAMMUT HRC 1, CLASS J SERIES CJ FOR CONSTANT RUNNING EQUIPMENT AND SERIES AJT FOR EQUIPMENT THAT CYCLES ON AND OFF.

2.11.8. EXTEND AND MODIFY THE EXISTING BASE BUILDING DISTRIBUTION SYSTEM AS INDICATED ON THE DRAWINGS AND CENTRAL EQUIPMENT LOCATION.

2.11.9. PROVIDE NEW SWITCHES AND BREAKERS IN EXISTING DISTRIBUTION EQUIPMENT AS DETAILED. NEW EQUIPMENT SHALL, IN ALL RESPECTS, BE COMPATIBLE WITH EXISTING EQUIPMENT.

2.11.10. BALANCE THE LOADING ON FEEDERS SO THAT UNBALANCED LOAD IS LESS THAN 10%.

2.12. EXIT AND EMERGENCY LIGHTING

2.12.1. PROVIDE A NEW EMERGENCY AND EXIT LIGHTING SYSTEM AS DETAILED ON THE DRAWINGS.

2.12.2. ALL SELF-CONTAINING EMERGENCY LIGHTING SHALL BE TO FIRE ALARM 241.

2.12.3. BATTERY UNITS SHALL BE AS SPECIFIED WITH 10 YEAR DESIGN LIFE, INTEGRAL, HIGH CHARGE WITH INDICATING AND PULL LIGHT, LOAD TRANSFER METERS AND TEST SWITCH, LOW VOLTAGE CUT OUT, OVERLOAD PROTECTION, AUTO TEST AND 120 HOUR TEST AND 120 HOUR TEST AND 120 HOUR TEST.

2.12.4. EXIT LIGHTS SHALL BE AS SPECIFIED ON THE DRAWINGS. PROVIDE DIRECTIONAL ARROWS AS SHOWN AND TO SUIT THE LOCAL AUTHORITIES. CONNECT 3RD SOCKET TO BATTERY UNIT.

2.12.5. WIRING SHALL CONFORM TO THE MANUFACTURERS RECOMMENDATIONS.

2.12.6. INCLUDE CASH LOCKS AND INSTALL TWO EXTRA EXIT LIGHTS AND EMERGENCY LIGHTS COMPLETE WITH REQUIRED CONDUITS AND CABLES, ACCORDING TO BUILDING INSPECTORS DIRECTION AT THE TIME OF INSPECTION.

2.13. FIRE ALARM

2.13.1. PROVIDE FIRE ALARM SYSTEM SERVICE AND DEVICES AS REQUIRED TO EXPAND THE EXISTING BUILDING SYSTEM TO SUIT THE NEEDS OF THE RENOVATED SPACE. THE FIRE ALARM SYSTEM SHALL BE THE SAME MANUFACTURER AND COMPATIBLE IN ALL ASPECTS. OBTAIN THE SERVICES OF THE BASE BUILDING AUTHORIZED FIRE ALARM INSTALLATION CONTRACTOR TO COMPLETE ALL THE NECESSARY WORK AS PART OF THE ELECTRICAL CONTRACTORS COST.

2.13.2. ALL WIRING FOR THE SYSTEM SHALL BE INSTALLED WITHIN CONDUIT AND SHALL COMPLY WITH REQUIREMENTS OF THE SYSTEM MANUFACTURER.

2.13.3. RELOCATE EXISTING FIRE ALARM DEVICES AS INDICATED ON DRAWING. EXTEND WIRING AND CONDUITS TO SUIT.

2.13.4. PROVIDE FIRE ALARM SIGNAL CONNECTION FOR MUTING THE AUDIO SYSTEM UPON ACTIVATION OF FIRE ALARM SYSTEM.

2.13.5. INSTALLATING AND SIGNALING DEVICES

2.13.5.1. PROVIDE PULL STATIONS, EVAC SPEAKERS AND SMOKE DETECTORS TO MATCH EXISTING BASE BUILDING DEVICES.

2.13.5.2. ALL SMOKE DAMPERS SHALL BE CONNECTED TO THE NEAREST AVAILABLE 120V LIFE SAFETY EMERGENCY CIRCUIT. EMERGENCY CIRCUIT DEVIATE INTO FIRE ALARM 241.

2.13.5.3. FIRE ALARM PULL STATIONS SHALL BE MOUNTED AT 48" TO CENTRE OF DEVE ABOVE FINISHED FLOOR AND MAXIMUM 24" FROM DOOR LATCH.

2.13.5.4. PROVIDE TIE-IN TO BASE BUILDING MAGLOCK SYSTEM TO ENSURE THAT ALL MAGLOCKS DROP IN THE EVENT OF A FIRE ALARM. MAGLOCKS SHALL ALSO RESET WITH MAGLOCK RESET SWITCH. OVERRIDE: COORDINATE INSTALLATION WITH BASE BUILDING FIRE ALARM CONTRACTOR AND PROVIDE ALL NECESSARY COMPONENTS FOR A COMPLETE INSTALLATION.

2.13.5.5. UPON COMPLETION OF FIRE ALARM AUDIBILITY TESTING, PROVIDE THE CONSULTANT A DRAWING OUTLINING AUDIBILITY RESULTS THROUGHOUT THE RENOVATED AREAS. INCLUDE FOR A REVISIT TO SITE TO ALLOW FOR ADJUSTMENTS TO SPEAKER TAP SETTINGS AS DIRECTED BY THE CONSULTANT. INCORPORATE ANY RE-VERIFICATION COSTS WITHIN THE TENDER. COST AND INCLUDE ALL SPEAKER TAP SETTINGS ON AS-BUILT DRAWINGS.

2.13.6. VISUAL OUTPUT DEVICES

2.13.6.1. SYSTEM CONNECTIONS FOR INITIATING AND SIGNALING LINE CIRCUITS SHALL BE CLASS "A" AND NOTIFICATION APPLIANCE CIRCUITS SHALL ALSO BE CLASS "A".

2.13.6.2. CIRCUIT SUPERVISION; CIRCUIT FAULTS SHALL BE INDICATED BY A TROUBLE SIGNAL AT THE FAC. PROVIDE A DISTINCTIVE INDICATING AUDIBLE TONE AND ALPHANUMERIC ANNUNCIATION.

2.13.6.3. VISUAL DEVICE TO BE COMPATIBLE WITH EXISTING FIRE ALARM SYSTEM CONTRACTOR TO PROVIDE ALL ASSOCIATED DRIVERS POWER SUPPLIES, CONDUIT, WIRE AND ACCESSORIES FOR A COMPLETE AND OPERATIONAL SYSTEM.

2.13.6.4. STROBE SHALL BE SUITABLE FOR OPERATION WITH EXISTING FIRE ALARM SYSTEM. THE VO SHALL CONSIST OF A XENON FLASH TUBE AND ASSOCIATED LENS/REFLECTOR SYSTEM. THE VO ENCLOSURE SHALL POINT DIRECTLY TO STANDARD SINGLE GANG, DOUBLE GANG OR 4" SQUARE ELECTRICAL BOX, WITHIN THE USE OF SPECIAL ADAPTERS OR TRIM RINGS. THE STROBE SHALL BE PROVIDED WITH DIFFERENT MINIMUM ADJUSTABLE FLASH INTENSITIES OF 15CD, 30CD, 75CD AND 110CD. PROVIDE A LABEL INSIDE THE STROBE LENS TO INDICATE THE LISTED CANDELA RATING OF THE SPECIFIC APPLIANCE. VISUALLY INSURE THAT THE STROBE IS NOT DIRECTED WHERE REFLECTIONS CAN BE SEEN FROM ONE LOCATION PROVIDED STROBE FLASH SYNCHRONIZATION.

2.13.7. FIRE ALARM SYSTEM COMMISSIONING

2.13.7.1. PROVIDE FIRE ALARM VERIFICATION AND SUBMIT VERIFICATION REPORTS TO THE CONSULTANT FOR RECORD.

2.14. COMMUNICATIONS

2.14.1. TELEPHONE:

2.14.1.1. PROVIDE A SYSTEM OF EMPTY CONDUITS (GROMMETS ON THE ENDS OF ALL CONDUITS THAT TERMINATE AT THE OUTLET BOXES AND CABLE TRAY), PULL WIRES, AND OUTLET BOXES AS INDICATED ON THE DRAWINGS.

2.14.1.2. OUTLET BOXES SHALL BE 4 1/16" SQUARE. FLUSH MOUNTED BOXES SHALL BE COMPLETE WITH PLASTER RINGS AND STAINLESS STEEL COVERS. RUN 3" EMPTY CONDUIT WITH PULL STRING FROM EACH OUTLET BOX TO CABLE TRAY.

2.14.1.3. SEE COMMUNICATION CABLEING SPECIFICATIONS FOR CABLEING REQUIREMENTS.

2.14.2. DATA COMMUNICATIONS:

2.14.2.1. PROVIDE A SYSTEM OF EMPTY CONDUITS (GROMMETS ON THE ENDS OF ALL CONDUITS THAT TERMINATE AT THE OUTLET BOXES AND CABLE TRAY), PULL WIRES AND OUTLET BOXES AS INDICATED ON THE DRAWINGS.

2.14.2.2. OUTLET BOXES SHALL BE 4 1/16" SQUARE. FLUSH MOUNTED BOXES SHALL BE COMPLETE WITH PLASTER RINGS AND STAINLESS STEEL COVERS. RUN 3" EMPTY CONDUIT WITH STRING FROM EACH OUTLET BOX TO CABLE TRAY.

2.14.2.3. ALL HORIZONTAL AND BACKBONE CONDUITS MUST NOT HAVE MORE THAN TWO NINETY DEGREE BENDS PRIOR TO INSTALLING A PULL BOX. IF ENTERING A PULL BOX FROM THE BOTTOM THE CONDUIT MUST BE INSTALLED IN THE TOP OF THE PULL BOX. IF ENTERING FROM THE LEFT SIDE THE OUTGOING CONDUIT MUST LEAVE FROM THE RIGHT SIDE. NO CHANGING OF DIRECTION WITHIN THE PULL BOX.

2.14.3. SEE COMMUNICATION CABLEING SPECIFICATIONS FOR CABLEING REQUIREMENTS.

2.15. SEISMIC RESTRAINT CONTROLS

2.15.1. PROVIDE A SEISMIC RESTRAINT CONTROLS FOR ALL EQUIPMENT AND SERVICES INSTALLED AS PART OF THIS PROJECT.

2.15.2. SRS: ACRONYM FOR SEISMIC RESTRAINT SYSTEM.

2.15.3. SFRS: ACRONYM FOR SEISMIC FORCE RESISTING SYSTEM.

2.15.4. DESIGN AND PROVIDE A COMPLETE SEISMIC RESTRAINT SYSTEMS FOR ALL ELECTRICAL EQUIPMENT AND SYSTEMS, SUCH THAT THE EQUIPMENT AND SYSTEMS WILL REMAIN FUNCTIONAL DURING AND AFTER A SEISMIC EVENT. THE RESTRAINT SYSTEM SHALL ENSURE THAT OTHER UNRELATED SYSTEMS ARE NOT AFFECTED BY ELECTRICAL SYSTEM/EQUIPMENT MOTION DURING THE SEISMIC EVENT.

2.15.5. INSTALL ELECTRICAL SYSTEMS AND EQUIPMENT WITH ADEQUATE STRUCTURAL SUPPORT TO WITHSTAND SEISMIC FORCES IN ACCORDANCE WITH PART 4 OF THE ONTARIO BUILDING CODE.

2.15.6. RETAIN AN ENGINEER LICENSED IN THE PROVINCE OF ONTARIO SPECIALIZING IN THE DESIGN OF SRS/SFRS TO PERFORM A REVIEW OF THE PROPOSED DESIGN AND INSTALLATION, AND PREPARE OUTLINE DOCUMENTS INDICATING ALL REQUIRED SEISMIC SUPPORTS, BRACINGS, AND FASTENINGS. THESE DOCUMENTS SHALL BE SEALED AND SIGNED BY THE STRUCTURAL ENGINEER AND SUBMITTED AS PART OF THE SHOP DRAWING PACKAGE PRIOR TO ROUGH-N WORK COMMENCING ON-SITE.

A. FIRE ALARM CONTROL PANELS AND DATA GATHERING PANELS.

B. DATA CABINETS AND RACKS.

2.15.8. PROVIDE CONFIRMATION IN WRITING, SIGNED AND SEALED BY THE STRUCTURAL ENGINEER, AT COMPLETION OF PROJECT THAT THE ELECTRICAL INSTALLATION IS IN GENERAL COMPLIANCE WITH THE STRUCTURAL INSTALLATION DRAWINGS SUBMITTED WITH THE SHOP DRAWING PACKAGE.

2.15.9. THE ELECTRICAL CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE FULL SCOPE OF THIS WORK, INCLUDE ALL COSTS OF: STRUCTURAL DESIGN, MATERIALS, AND SITE REVIEW IN TENDER PRICE.

SRS SHALL BE FULLY INTEGRATED INTO, COMPATIBLE WITH AND NOT VIBRATION CONTROLS.

SRS TO PROVIDE GENTLE AND STEADY CUSHIONING ACTION AND AVOID HIGH IMPACT LOADS.

SRS TO LIMIT MOVEMENT TO AVOID DAMAGE TO OTHER BUILDING ELEMENTS AND/OR SYSTEMS.

SRS TO RESTRAIN SEISMIC FORCES IN EVERY DIRECTION.

FASTENERS AND ATTACHMENT POINTS TO RESIST SAME LOAD AS SEISMIC RESTRAINTS.

SRS UTILIZING CAST IRON, THREADED PIPE, OTHER BRITTLE MATERIALS NOT PERMITTED.

ATTACHMENTS TO RC STRUCTURE:

A. USE HIGH STRENGTH MECHANICAL EXPANSION ANCHORS.

B. DRILLED OR POWER DRIVEN ANCHORS NOT PERMITTED.

2.15.17. SEISMIC CONTROL MEASURES NOT TO INTERFERE WITH INTEGRITY OF FIRESTOPPING.

2.15.18. FLOOR-MOUNTED STATIC EQUIPMENT SYSTEMS:

A. ANCHOR EQUIPMENT TO EQUIPMENT SUPPORTS.

B. ANCHOR EQUIPMENT SUPPORTS TO STRUCTURE.

C. USE SIZE OF BOLTS SCHEDULED IN APPROVED SHOP DRAWINGS.

2.15.19. SUSPENDED STATIC EQUIPMENT SYSTEMS:

USE ONE OR COMBINATION OF FOLLOWING METHODS:

A. INSTALL TIE-UP TO STRUCTURE.

B. CROSS-BRACE IN EVERY DIRECTION.

C. BRACE BACK TO STRUCTURE.

D. CABLE RESTRAINT SYSTEM.

2.15.20. SCSS TO PREVENT SWAY IN HORIZONTAL PLANE, "ROCKING" IN VERTICAL PLANE, SLIDING AND BUCKLING IN AXIAL DIRECTION.

2.15.21. ANGLES TO WITHSTAND COMPRESSIVE LOADING AND BUCKLING. PROVIDE ANGLE STIFFENERS WHERE REQUIRED.

2.15.22. SRS FOR FLOOR MOUNTED VIBRATION ISOLATED EQUIPMENT:

USE ONE OR COMBINATION OF FOLLOWING METHODS:

A. VIBRATION ISOLATORS WITH BUILT-IN SNUBBERS.

B. VIBRATION ISOLATORS AND SEPARATE SNUBBERS.

C. BUILT-UP SNUBBER SYSTEM APPROVED BY CONSULTANT, CONSISTING OF STRUCTURAL ELEMENTS AND ELASTOMERIC LAYER.

2.15.23. SRS TO RESIST COMPLETE ISOLATION UNLOADING.

2.15.24. SRS NOT TO JEOPARDIZE NOISE AND VIBRATION ISOLATION SYSTEMS. PROVIDE 4.8 MM CLEARANCE BETWEEN SEISMIC RESTRAINT SNUBBERS AND EQUIPMENT DURING NORMAL OPERATION OF EQUIPMENT AND SYSTEMS.

2.15.25. CUSHIONING ACTION: GENTLE AND STEADY BY UTILIZING ELASTOMERIC MATERIAL OR OTHER MEANS IN ORDER TO AVOID HIGH IMPACT LOADS.

2.16. BASE BUILDING VENDORS OR RECORD

2.16.1. THE CONTRACTOR MUST CARRY AND COORDINATE WITH THE SPECIFIC MANDATORY BASE BUILDING SUBCONTRACTORS DESIGNATED BY THE CARBOROUGH HEALTH NETWORK (SHN) FOR ALL SYSTEM INTEGRATIONS, MODIFICATIONS, AND TESTING.

2.3.6 ALL PATCH PANELS SHALL BE INSTALLED LEVEL AND PLUM WITHIN THE RACKS.

2.4 COPPER PATCH CORDS:

2.4.1 PROVIDE ALL LABOR, MATERIALS, AND EQUIPMENT FOR THE COMPLETE INSTALLATION OF ALL COPPER PATCH CORDS INTO THE APPROVED PATCH PANELS CALLED FOR IN THE BID DOCUMENTS.

2.4.2 ALL PATCH/EQUIPMENT CORDS SHALL BE NEW.

2.4.3 ALL PATCH/EQUIPMENT CORDS SHALL BE FACTORY MANUFACTURED AND TESTED FOR COMPLIANCE TO THE APPROPRIATE STANDARDS AND PERFORMANCE.

2.4.4 PATCH/EQUIPMENT CORD LENGTH SHALL BE DETERMINED BY THE END USER.

2.4.5 COPPER PATCH CORDS SHALL CONSIST OF CATEGORY 5E, 6 OR 6A COPPER CABLE FOR ALL DATA AND VOICE APPLICATIONS.

2.5 CABINETS, RACKS, FRAMES, AND ENCLOSURES:

2.5.1 APPROVED CABINET MANUFACTURERS: HAMMOND, BELDEN, PANDUIT, HUBBELL

2.5.2 NETWORKING WALL-MOUNT CABINETS HWC SERIES & LOW PROFILE CABINETS HLP SERIES.

2.5.3 ADJUSTABLE DEPTH CENTER SWING WALL RACK, HWMR SERIES.

2.5.4 HIGH-DENSITY OPEN-RACK 2-POST SYSTEM DNRHWDW SERIES (1,500LBS), HIGH-DENSITY OPEN-RACK 2-POST SYSTEM DRZA SERIES (2,000LB), HIGH-DENSITY OPEN-RACK 4-POST SYSTEM DCAR SERIES, SERVER CABINETS CARR SERIES, MULTIMEDIA (AV) CABINETS RB-ARV SERIES, DATA-CENTER NETWORK CABINETS H1 SERIES.

2.5.5 PROVIDE VERTICAL POWER DISTRIBUTION UNITS (PDU) 208V, 30A, 5KW, L6-30P LOCKED INPUT PLUG, 30XC13 & 6XC19 RECEPTACLES, INTEGRAL CIRCUIT BREAKER, ENVIRONMENTAL MONITORING PORT, HEAT CONTAINMENT, RACK ACCESSORIES SUCH AS: DOOR MOUNTING HARDWARE, CASE NUTS, CLIP NUTS, BOLT DOWN AND GANGING KITS, FILLER/BLANKING PANELS, VERTICAL AND HORIZONTAL CABLE MANAGEMENT.

2.6 IDENTIFICATION:

2.6.1 THE SIZE, COLOR, AND CONTRAST OF ALL LABELS SHOULD BE SELECTED TO ENSURE THAT THE IDENTIFIERS ARE EASILY READ. LABELS SHOULD BE VISIBLE DURING THE INSTALLATION OF AND NORMAL MAINTENANCE OF THE INFRASTRUCTURE.

2.6.2 LABELS SHOULD BE RESISTANT TO THE ENVIRONMENTAL CONDITIONS AT THE POINT OF INSTALLATION (SUCH AS MOISTURE, HEAT, OR ULTRAVIOLET LIGHT), AND SHOULD HAVE A DESIGN LIFE EQUAL TO OR GREATER THAN THAT OF THE LABELED COMPONENT.

2.6.3 ALL LABELS SHALL BE PRINTED OR GENERATED BY A MECHANICAL DEVICE. HAND WRITTEN LABELS ARE NOT ACCEPTABLE.

2.7 GROUNDING AND BONDING:

2.7.1 TWO MOUNTING HOLE GROUND TERMINAL BLOCK SHALL BE MADE OF ELECTROPLATED TIN ALUMINUM EXTRUSION, ACCEPT CONDUCTORS RANGING FROM #14 AWG THROUGH #20, THE CONDUCTORS SHALL BE IN PLACE BY TWO STAINLESS STEEL SET SCREWS, SHALL HAVE TWO 1/4" (6.4 MM) HOLES SPACED ON 5/8" (15.8 MM) CENTERS TO ALLOW SECURE TWO-BOLT ATTACHMENT TO THE RACK OR CABINET.

2.7.2 COMPRESSION LUGS SHALL BE MANUFACTURED FROM ELECTROPLATED TINNED COPPER, HAVE TWO HOLES SPACED ON 5/8" (15.8 MM) OR 1" (25.4 MM) CENTERS TO ALLOW SECURE TWO BOLT CONNECTIONS TO BUSBARS, SIZED TO FIT A SPECIFIC SIZE CONDUCTOR, SIZES #6 TO #40.

2.7.3 OXIDE INHIBITING JOINT COMPOUND FOR COPPER-TO-COPPER, ALUMINUM-TO-ALUMINUM OR ALUMINUM-TO-COPPER CONNECTIONS.

2.7.4 C-TYPE, COMPRESSION TAPS SHALL BE MANUFACTURED FROM COPPER ALLOY, BE C-SHAPED CONNECTORS THAT WRAP AROUND TWO CONDUCTORS FORMING AN IRREVERSIBLE SPLICE AROUND THE CONDUCTORS; INSTALLATION REQUIRES A HYDRAULIC CRIMPING TOOL, BE SIZED TO FIT SPECIFIC SIZE CONDUCTORS, SIZES #2 AWG TO #40.

2.7.5 PEDESTAL CABLE WITH GROUNDING CONNECTOR SHALL BE MADE FROM ELECTROPLATED TINNED COPPER OR BRONZE. INSTALLATION HARDWARE WILL BE STAINLESS STEEL, BE SIZED TO FIT A SPECIFIC SIZE CONDUCTOR, SIZE #6 AND/OR #20. HARDWARE SHALL BE SIZED TO ATTACH TO ROUNDO AND/OR SQUARE RAISED ACCESS FLOOR PEDESTALS THAT ARE 1-1/8" TO 1-3/4" IN DIAMETER, PROVIDE STRAIGHT (IN-LINE) OR CROSS (INTERSECTION) SUPPORT FOR UP TO TWO CONDUCTORS.

2.7.6 PIPE CABLE WITH GROUNDING CONNECTOR SHALL BE MADE FROM ELECTROPLATED TINNED BRONZE; INSTALLATION HARDWARE WILL BE STAINLESS STEEL, SIZED TO FIT UP TO TWO CONDUCTORS RANGING IN SIZE FROM #6 TO #250 MCM, CONDUCTORS MUST BE THE SAME SIZE, SIZED TO ATTACH TO PIPES, SIZES 1" TO 6" (75 TO 6.85 IN DIAMETER).

2.7.7 EQUIPMENT GROUND JUMPER KIT SHALL INCLUDE ONE 24" L INSULATED GROUND JUMPER WITH A STRAIGHT TWO-HOLE COMPRESSION LUG ON ONE END AND AN L-SHAPED TWO-HOLE COMPRESSION LUG ON THE OTHER END, TWO PLATED INSTALLATION SCREWS, AN ABRASIVE PAD AND A 3 OUNCE TUBE OF ANTIOXIDANT JOINT COMPOUND, GROUND CONDUIT, GROUND INSULATED GROUNDWELL STRIPS #6 AWG WIRE, LUGS ARE MADE FROM ELECTROPLATED TINNED COPPER AND HAVE TWO MOUNTING HOLES SPACES 5" TO .625" APART THAT ACCEPT 1/4" SCREWS.

2.8 TESTING & DOCUMENTATION:

2.8.1 PROVIDE INSTALLATION TESTING OF EQUIPMENT WHERE REQUIRED BY MANUFACTURERS' INSTALLATION INSTRUCTIONS.

2.8.2 PROVIDE COMPLETE END TO END TESTING FOR ALL COPPER AND FIBER OPTIC SYSTEMS/CHANNELS BASED ON LATEST APPLICABLE STANDARDS, DOCUMENT ALL TESTING AND SUBMIT WITH FINAL AS-BUILT SUBMITTAL PACKAGE.

2.8.3 FOR ALL CONTROLS AND OPERATING EQUIPMENT, SUBMIT EQUIPMENT'S SYSTEMS TO AT LEAST THREE COMPLETE OPERATIONAL SEQUENCES, IN WHICH ALL EQUIPMENT OPERATIONS ARE TESTED, OBSERVED, AND VERIFIED.

2.8.4 PRIOR TO SUBSTANTIAL COMPLETION AND PROJECT ACCEPTANCE INSPECTION, SUBMIT TEST REPORTS TO INDICATED SCOPE OF STARTUP AND OPERATIONAL TESTS, WITH RESULTS OF TESTING FOR EACH SPECIFIED OPERATION.

3 SECURITY SYSTEMS:

3.1 GENERAL

3.1.1 PROVIDE A FULLY INTEGRATED AND COMPATIBLE SECURITY PLATFORM FOR THE ACCESS CONTROL, INTRUSION DETECTION AND VIDEO SURVEILLANCE SYSTEMS.

3.1.2 PROVIDE RACK MOUNTED UPS WITH 20 MINS BACK UP TIME FOR THE SYSTEM IF THE BUILDING UPS POWER IS NOT AVAILABLE.

3.1.3 THE SECURITY SYSTEMS SHALL BE LIMITED TO THE FOLLOWING MANUFACTURERS AND AS SHOWN ON THE DRAWINGS, OR APPROVED EQUAL BY THE CONSULTANT.

- A. ACCESS CONTROL SYSTEM PLATFORM: SALTO XS4, LATCH OS, KANTECH ENTRAPASS, LENEL ONGUARD, GENETEC SYNERGIS, SOFTWARE HOUSE COURE, MILESTONE XPROTECT, EXACOVISION.
- B. CARD READERS: SALTO, LATCH, HID ICCLASS SE OR MULTICLASS SE, KEYSKAN.
- C. VIDEO SURVEILLANCE CAMERAS (ONVIF COMPLIANT): AXIS, BOSCH, ANVIOLON, HANWHA.
- D. VIDEO MANAGEMENT SOFTWARE (VMS): MILESTONE XPROTECT, GENETEC OMNICAST, EXACOVISION, SOFTWARE HOUSE COURE.
- E. VIDEO SURVEILLANCE MONITORS: LG, SAMSUNG, PLANAR, NEC.
- F. INTRUSION DETECTION: BOSCH, DSC POWERSERIES PRO, HONEYWELL VISTA, HONEYWELL VISTA PLUS (FOR RESIDENTIAL SUITE).
- G. INTERCOM: AIPHONE, TOA, COMMEND, GUARDIAN TELECOM, CODE BLUE.
- H. ENTRY PHONE: MIRCOTX T3, BUTTERFLY MX, AIPHONE KG, VISCOUNT ENTERPHONE IQ.
- I. SECURITY SWITCH & SERVER MANUFACTURERS: TRANSITION NETWORKS, CISCO, HP, DELL, LENOVO.

3.2 ACCESS CONTROL SYSTEM

3.2.1 THE ELECTRONIC ACCESS CONTROL SYSTEM SOFTWARE SHALL PROVIDE A FULLY INTEGRATED SYSTEM PACKAGE, WITH STANDARD SOFTWARE MODULES TO SUPPORT FUNCTIONS SUCH AS, BUT NOT LIMITED TO, ACCESS CONTROL, ALARM MONITORING & REPORTING, SYSTEM COMMAND AND CONTROL, ELEVATOR CONTROL, VISITOR MANAGEMENT, TIME & ATTENDANCE, AND MUSTER REPORT GENERATIONS, EMAILS, MESSAGING, FIRE ALARM INTEGRATION, INTRUSION DETECTION ALARM INTEGRATION, BUILDING MANAGEMENT SYSTEM INTEGRATION, ETC.

3.2.2 THE ELECTRONIC ACCESS CONTROL SYSTEM SHALL PROVIDE THE CAPABILITY TO FULLY INTEGRATE WITH VIRTUALLY ANY VIDEO SURVEILLANCE SYSTEM, PROVIDING ON-SCREEN DISPLAY OF LIVE VIDEO, AND PLAYBACK OF RECORDED VIDEO FROM ANY CAMERA ON THE VIDEO SURVEILLANCE SYSTEM. VIDEO DISPLAY SHALL BE MANUALLY REQUESTED, OR LINKED TO AUTOMATICALLY DISPLAY BASED ON ANY SPECIFIC SYSTEM EVENT.

3.3 INTRUSION DETECTION SYSTEM

3.3.1 PROVIDE AN 8-32 ZONES CONTROL PANEL, ONE ZONE PER SECURITY DEVICE, FULLY PROGRAMMABLE TOUCHSCREEN KEYPAD, ENSURE ALL DEVICES ARE PROGRAMMED, LOCATED AND SET TO MINIMIZE FALSE ALARMS.

3.3.2 ALL DEVICES SHALL BE FULLY WIRED. WIRELESS DEVICES ARE NOT ACCEPTABLE.

3.4 VIDEO SURVEILLANCE SYSTEM

3.4.1 REFER TO CAMERA SCHEDULE ON DRAWINGS FOR DETAILS. ALL CAMERAS SHALL BE ONVIF COMPLIANT.

3.4.2 NETWORK VIDEO RECORDER (NVR) SHALL BE 2U RACK MOUNTED SERVER WITH LICENSES INCLUDED, 8 HDD SLOTS AND 64 VIDEO CHANNELS.

3.4.3 NETWORK VIDEO RECORDER (NVR) SHALL BE MINIMUM 24TB, MINIMUM OF 30 DAYS CAMERA RECORDING STORAGE, USE 50% MOTION AS BASIS FOR STORAGE CALCULATION AT 30 FRAMES/SECOND AT MAXIMUM RESOLUTION IN H.264 VIDEO COMPRESSION FORMAT.

3.4.4 PROVIDE ALL POE AND POE+ SWITCHES, AND NETWORK CABLE EXTENDERS AS REQUIRED FOR A COMPLETE SYSTEM.

3.4.5 PROVIDE RACK MOUNT COMPUTER SERVERS, FLAT SCREEN MONITOR AND KEYBOARD AT SECURITY DESK OR AS SHOWN ON THE DRAWINGS.

3.4.6 PROVIDE VIDEO ANALYTICS SYSTEM AND VIDEO MANAGEMENT SOFTWARE AS PART OF THE COMPLETE VIDEO SURVEILLANCE SYSTEM.

4 NURSE CALL SYSTEM

4.1 GENERAL

4.1.1 PROVIDE A COMPLETE WORKING NURSE/PATIENT COMMUNICATIONS NETWORK BASED UPON THE SPECIFICATION OUTLINED HERE TO INCLUDE ALL NECESSARY DEVICES THAT PROVIDE THE FUNCTIONS LISTED IN THIS SPECIFICATION FOR HOSPITAL NAME. THIS FACILITY WILL BE REFERENCED AS THE OWNER IN THIS SPECIFICATION.

4.1.2 IF AN OPERATIONAL FUNCTION IS SPECIFIED THAT REQUIRES HARDWARE OR SOFTWARE TO COMPLETE THAT SPECIFIC FUNCTION, THEN CONSIDER THAT SOFTWARE OR HARDWARE PART OF THIS SPECIFICATION. THE COST OF ANY OMISSIONS OF SOFTWARE OR HARDWARE NECESSARY TO COMPLETE ALL OPERATIONAL FUNCTIONS OUTLINED IN THIS SPECIFICATION SHALL BE BORNE BY THE CONTRACTOR PROVIDING THIS SYSTEM.

4.1.3 ALL NURSE COMMUNICATIONS NETWORK DEVICES SHALL BE UL-1069 LISTED. THIS INCLUDES ROUTERS, HUBS, SWITCHES, AND ROOM CONTROL DEVICES. THE NURSE CALL NETWORK SHALL BE AN FDA REGISTERED CLASS II (OR HIGHER) MEDICAL DEVICE AND THE SYSTEMS MANUFACTURER SHALL BE AN FDA REGISTERED OPERATOR. FIELD WIRING SHALL BE CAT6A CABLE. CONTROL WIRING FOR POWER DISTRIBUTIONS AND VERY LONG RUNS, AND UTILIZE AN OPTIONAL FIBER BACKBONE (WHEN DISTANCES EXCEED NORMAL ETHERNET LIMITATIONS). ALL STATION EQUIPMENT SHALL USE PLUG ON CONNECTORS AND ALL SWITCHES, ROUTERS AND CONTROLLERS SHALL UTILIZE STANDARD RJ-45 MODULAR CONNECTIONS. ALL REMOTE DEVICES UTILIZING STANDARD STRUCTURED CABLING SHALL BE CAPABLE OF POE (POWER OVER ETHERNET) OR POWER SUPPLIED WITHIN THE CAT6A CABLE JACKET. SYSTEMS WHICH REQUIRE SEPARATE DC POWER TO DEVICES, REMOTE POWER SUPPLIES, OR HEAVY DC WIRING TO EACH INDIVIDUAL ROOM SHALL NOT BE ACCEPTED. WIRING SHALL BE CAPABLE OF EITHER BEING INSTALLED IN CONDUIT OR CABLE TRAYS WHERE SHOWN ON THE PLANS. NURSE COMMUNICATIONS CABLING MAY BE RUN ALONG WITH OTHER LOW VOLTAGE AND DATA CABLES WHERE PERMITTED BY CODE. NURSE COMMUNICATIONS CABLING TO BE SEPARATED OUT FROM ANY HIGH VOLTAGE AC OR DC WIRING THAT EXCEEDS 90 VOLTS, OR WHICH VIOLATES ANY NATIONAL OR LOCAL ELECTRICAL CODE.

4.1.4 THE SYSTEM MUST BE UL 1069 LISTED AS A NURSE COMMUNICATIONS NETWORK. SYSTEMS LISTED BY OTHER NATIONALLY RECOGNIZED TESTING LABORATORY MAY NOT BE ACCEPTED. THE SYSTEM SHALL BE CAPABLE OF INTERCONNECTING WITH THE HOSPITAL'S LAN (LOCAL AREA NETWORK). THIS CONNECTION SHALL BE MINIMAL AND UTILIZE ONLY ONE ETHERNET 100 MBPS OR OPTIONALLY 1 (5) GB. THE SYSTEM SHALL ALL ADT, HOSPITAL, AND INFORMATION, REPORTING SOFTWARE AND INFORMATION EXCHANGE. THE HL7 STANDARD SHALL BE UTILIZED FOR RECEIPT OF PATIENT INFORMATION FROM THE ADT SYSTEM.

4.1.5 THE OWNER WILL PROVIDE ONE VPN CONNECTION. ONE VPN IS FOR THE SERVICING CONTRACTOR TO DIAGNOSE ANY MAINTENANCE ISSUES AND TO MAINTAIN THE SYSTEM OFFSITE. DIAGNOSTIC SOFTWARE SHALL BE WEB BASED AND PERMIT E-MAIL NOTIFICATION OF HIGH LEVEL ALARMS. ALL SOFTWARE APPLICATIONS SHALL BE HIPAA AND PIPEDA COMPLIANT AND SHALL ALLOW FOR PATIENT NAME ALIASES AND ALTERNATIVE DISPLAY METHODS. COMPLEX USER NAME, PASSWORDS, REGULAR PERMISSION SETTINGS AND ROLE BASED SECURITY SHALL BE STANDARD. ALL DATABASES SHALL BE ODBC COMPLIANT, MS SQL 2008 OR LATER.

4.1.6 OVERALL NURSE COMMUNICATIONS NETWORK SHALL UTILIZE VOIP COMMUNICATIONS BETWEEN ALL MAJOR COMPONENTS. THE NURSE CALL SYSTEM SHALL BE CAPABLE OF ANSWERING ANY PATIENT CALL PLACED IN THE NETWORK. SYSTEMS NOT UTILIZING THE VOIP STANDARD WILL NOT BE ACCEPTABLE. THE COMMUNICATION STANDARD SHALL BE SIP PROTOCOL. WHEN TELEPHONES ARE INTEGRATED, THE OWNER WILL NOT BE PROVIDING ANY ANALOG PORTS TO THE NURSE CALL NETWORK. AS PART OF THIS CONTRACT, THE OWNER WILL EITHER SUPPLY OR ESTABLISH THAT THERE IS A TELEPHONY CALL NETWORK WHICH SUPPORTS THE SIP PROTOCOL WITHIN THE OWNER'S FACILITY. SYSTEMS REQUIRING DIGITAL TO ANALOG CONVERTERS WILL NOT BE ACCEPTED.

4.1.7 THE CAPABILITY TO ASSIGN PATIENTS TO STAFF SHALL BE VIA A NETWORKED SOFTWARE INFRASTRUCTURE ON EXISTING OWNER WORKSTATIONS. THERE ARE NO KNOWN SOFTWARE LIMITS TO THE NUMBER OF USERS OR UNITS BEING ASSIGNED. IT SHALL ALSO BE POSSIBLE TO HAVE MULTIPLE USERS LOGGING ONTO SYSTEM VIA BARCODE OR OTHER STANDARD HUMAN INTERFACE DEVICES. LOG ON PROCESS IDENTIFIES USER AND THE CURRENT DEVICE USED THAT DAY. STATION UTILIZING BAR CODE OR HID SIGN ON AND/OR ONLY SINGLE PC ASSIGNMENT FROM NURSES' STATION WILL NOT BE ACCEPTED UNDER THIS SPECIFICATION.

4.1.8 ETHERNET PORTS WILL BE PROVIDED BY THE OWNER FOR HL7 INTEGRATION TO THE ENTIRE NETWORK. THOSE NURSE CALL SYSTEMS REQUIRING MORE THAN ONE INTERFACE TO THE LIVE ENVIRONMENT WILL NOT BE ACCEPTED. ADDITIONAL SERVICES WILL BE PROVIDED BY THE OWNER ON AN AS NEEDED BASIS. THOSE SPECIFIC NURSE CALL OPTIONS THAT ARE SELECTED, ALL SERVERS WILL BE INSTALLED IN THE FACILITIES DATA CENTER. ALL SOFTWARE MUST BE CAPABLE OF BEING DIAGNOSED AND SUPPORTED BY THE DISTRIBUTOR REMOTELY.

4.1.9 THE NETWORK SHALL BE EXPANDABLE TO ANY COMBINATION OF OVER 15,000 BED, DUTY, OR STAFF STATIONS AND 120,000 SUB-STATIONS CONNECTED AS A CONTIGUOUS INTERCONNECTED SYSTEM. MULTIPLE BUILDINGS AND INTRA-BUILDING CONNECTIONS MAY BE LINKED TOGETHER UTILIZING A FIBER OR AN ETHERNET CONNECTION. GROUND CONDUIT, GROUND INSULATED GROUNDWELL STRIPS #6 AWG WIRE, LUGS ARE MADE FROM ELECTROPLATED TINNED COPPER AND HAVE TWO MOUNTING HOLES SPACES 5" TO .625" APART THAT ACCEPT 1/4" SCREWS.

4.1.10 THE NETWORK SHALL BE CAPABLE OF BACKWARD COMPATIBILITY TO PRIOR GENERATION OF NURSE/PATIENT COMMUNICATIONS. THE NETWORK SHALL BE CAPABLE OF SAME VENDOR, USER CONFIGURABLE, WITH 4 BUTTONS, 8 SCREENS DEEP. THE NETWORK SHALL BE CAPABLE OF BACKWARD COMPATIBILITY TO PRIOR GENERATION OF NURSE/PATIENT COMMUNICATIONS. THE NETWORK SHALL BE CAPABLE OF SAME VENDOR, USER CONFIGURABLE, WITH 4 BUTTONS, 8 SCREENS DEEP. THE NETWORK SHALL BE CAPABLE OF BACKWARD COMPATIBILITY TO PRIOR GENERATION OF NURSE/PATIENT COMMUNICATIONS. THE NETWORK SHALL BE CAPABLE OF SAME VENDOR, USER CONFIGURABLE, WITH 4 BUTTONS, 8 SCREENS DEEP.

4.1.11 THE NETWORK SHALL BE CAPABLE OF BACKWARD COMPATIBILITY TO PRIOR GENERATION OF NURSE/PATIENT COMMUNICATIONS. THE NETWORK SHALL BE CAPABLE OF SAME VENDOR, USER CONFIGURABLE, WITH 4 BUTTONS, 8 SCREENS DEEP. THE NETWORK SHALL BE CAPABLE OF BACKWARD COMPATIBILITY TO PRIOR GENERATION OF NURSE/PATIENT COMMUNICATIONS. THE NETWORK SHALL BE CAPABLE OF SAME VENDOR, USER CONFIGURABLE, WITH 4 BUTTONS, 8 SCREENS DEEP.

4.2 QUALIFICATIONS

4.2.1 AUTHORIZED DISTRIBUTOR FOR PRODUCT SUPPLIED. AUTHORIZED DISTRIBUTOR LETTER FROM MANUFACTURER REQUIRED UPON REQUEST OF SPECIFYING AUTHORITY.

4.2.2 CERTIFICATE OF SUCCESSFUL COMPLETION OF MANUFACTURER'S INSTALLATION/TRAINING SCHOOL FOR INSTALLING TECHNICIANS OF THE EQUIPMENT BEING PROPOSED. LETTER FROM MANUFACTURER STATING TECHNICIAN QUALIFICATIONS ON REQUEST.

4.2.3 CERTIFICATE OF COMPLETION OF NETWORK CERTIFICATIONS (I.E. CISCO OR MICROSOFT). COPY AVAILABLE UPON REQUEST.

4.3 SYSTEM DESCRIPTION

4.3.1 SYSTEM HARDWARE SHALL CONSIST OF A NURSE CALL NETWORK COMPRISED OF VOIP NURSE CONSOLES, PC CONSOLES (OWNER PROVIDED), NURSE CALL NETWORK CONTROLLERS, PATIENT STATIONS, POWER SUPPLIES, BATTERY BACK-UP, DOME LIGHTS, ENTERTAINMENT CORDS, CALL CORDS, PULL CORD STATIONS, EMERGENCY PUSH BUTTON STATIONS, WIRING AND OTHER OPTIONS SUCH AS BED SIDE-RAIL INTERFACES, WIRELESS BED INTERFACE, COMPUTER INTERFACES, WIRELESS/TELEPHONE NETWORK INTERFACES, VOIP STAFF TERMINALS, RTLS (REAL TIME LOCATING SYSTEM) AND NETWORK ADAPTER MODULE AS SHOWN ON DRAWINGS. ALL NECESSARY EQUIPMENT REQUIRED TO MEET THE INTENT OF THESE SPECIFICATIONS, WHETHER OR NOT ENUMERATED WITHIN THESE SPECIFICATIONS, SHALL BE SUPPLIED AND INSTALLED TO PROVIDE A COMPLETE AND OPERATING NURSE/PATIENT COMMUNICATIONS NETWORK.

4.3.2 SYSTEM HARDWARE AND FIRMWARE SHALL BE THE PRODUCT OF A SINGLE, REPUTABLE MANUFACTURER WITH A PROVEN HISTORY OF PRODUCT RELIABILITY AND SOLE CONTROL OVER ALL SOURCE CODE. MANUFACTURER SHALL PROVIDE, FREE OF CHARGE, PRODUCT FIRMWARE/SOFTWARE UPGRADES FOR A PERIOD OF ONE YEAR FROM DATE OF INSTALLATION FOR ANY PRODUCT FEATURE ENHANCEMENTS. MANUFACTURER SHALL PROVIDE A 5 YEAR WARRANTY ON ALL MANUFACTURED HARDWARE. SYSTEM CONFIGURATION PROGRAMMING CHANGES SHALL NOT REQUIRE ANY EXCHANGE OF PARTS AND SHALL BE CAPABLE OF BEING EXECUTED REMOTELY VIA A VPN CONNECTION. ANY SUPPLIER WHOSE EQUIPMENT CANNOT SUPPORT REMOTE SYSTEM CONFIGURATION PROGRAMMING AND DIAGNOSTICS VIA VPN OR REQUIRES THE EXCHANGE OF PARTS, CHIPS FOR SYSTEM CONFIGURATION PROGRAMMING CHANGES WILL NOT BE ACCEPTABLE.

4.3.3 ALL PROGRAMMING AND FIRMWARE CHANGES SHALL BE ACCOMPLISHED ON A WORKING SYSTEM WITHOUT INTERRUPTION TO ALL SYSTEM OPERATIONS. THE SYSTEM OPERATIONS SHALL BE CONTINUED. ALL CONTROLLERS, WHICH HOLD THIS FIRMWARE AND SYSTEM PARAMETERS MUST HAVE DUAL STORAGE. WHILE UPDATES ARE BEING MADE TO ONE SET OF FIRMWARE, THE SYSTEM SHALL BE WORKING AND FULLY FUNCTIONAL ON THE ORIGINAL FIRMWARE (I.E. A AND B MEMORY BLOCKS). IT SHALL BE POSSIBLE TO SWITCH TO THE NEW SYSTEM CONTROL SOFTWARE SYSTEMS BY A SINGLE SYSTEM COMMAND. IN THE EVENT OF AN ERROR OR FAILURE IN THE UPDATE PROCESS, THE SYSTEM SHALL REVERT BACK TO THE PREVIOUS FIRMWARE.

4.3.4 ALL COMMUNICATIONS SHALL BE FULL DUPLEX AUDIO, NOT ONLY ON HANDSETS, BUT ALL LOUD SPEAKING DEVICES, INCLUDING PATIENT AND NURSE STATIONS. THE SYSTEM SHALL BE CAPABLE OF PROVIDING FULL DUPLEX AUDIO OR DO NOT HAVE SEPARATE MICROPHONE AND SPEAKER CAPABILITY WITHIN THE PILLOW SPEAKERS WILL NOT BE ACCEPTED.

4.3.5 ALL WALL MOUNTED STATIONS SHALL BE FLUSH MOUNTED USING SNAP TIGHT COVER PLATES. SUB PLATES SHALL BE SLOTTED AND ADJUSTABLE FOR TRIMMING THE MOUNTING FOR "SQUARING" THE VERTICAL AND HORIZONTAL FIT. ALL SCREWS SHALL BE HIDDEN.

4.3.6 ALL FLUSH MOUNT STATION BUTTONS SHALL USE A BIO-SEAL COVER TO FACILITATE THE USE OF DISINFECTANT CLEANERS.

4.3.7 ENTIRE NETWORK SHALL BE SUPERVISED, INCLUDING ALL SUB-STATIONS. REPORTING OF STATION FAILURE SHALL BE TO ANY DESIGNATED CONSOLE, PC, E-MAIL, OR WIRELESS DEVICE. REMOTE DIAGNOSTICS SHALL BE UTILIZED TO QUICKLY LOCATE THE SOURCE OF THE PROBLEM.

4.3.8 UP TO 99 DIFFERENT STAFF LEVELS MAY BE DEFINED WITHIN THE NURSE CALL NETWORK TO FACILITATE WORK FLOW WITHIN AND OUTSIDE OF NORMAL NURSE CALL ACTIVITY (I.E. ENVIRONMENTAL SERVICES, FACILITIES, TRANSPORTATION, LAB, PHARMACY, ETC.).

4.3.9 NURSE CALL NETWORK SHALL SUPPORT A VLAN CONFIGURATION TO SEPARATE ACTIVITY IN THE NURSE CALL

NETWORK FROM OTHER HOSPITAL LAN TRAFFIC. NURSE CALL NETWORK CAN SPAN MULTIPLE SUBNETS ON A HOSPITAL'S LAN.

4.3.10 ALL SPECIFIED EQUIPMENT SHALL BE MANUFACTURED USING SURFACE MOUNT TECHNOLOGY (SMT) AND MANUFACTURING TESTING SHALL UTILIZE ATE (AUTOMATED TEST EQUIPMENT) TO ASSURE THE HIGHEST QUALITY PRODUCTION. SPECIFYING AUTHORITY MAY REQUEST TEST PROCEDURES AND/OR RESULTS OF TESTS ON SPECIFIC EQUIPMENT BEING SUPPLIED. MANUFACTURER'S TESTING PROCEDURES MUST BE AVAILABLE UPON REQUEST, INCLUDING TEST EQUIPMENTS MODEL NUMBER, SERIAL NUMBERS AND DATE OF LAST CALIBRATION.

4.3.11 THE NURSE CALL NETWORK SHALL SUPPORT A GUI INTERFACE THAT SITS ON THE HOSPITAL LAN. THIS INTERFACE CONSISTS OF MULTIPLE MODULES SUCH AS STAFF ASSIGNMENT, PC CALL DISPLAY, CALL DETAIL, RECORDING, EXCEPTION REPORTING, ETC.

4.3.12 THE NURSE CALL NETWORK SHALL SUPPORT AT LEAST 990 CALL PROCESSES TO FACILITATE WORK FLOW AND CALL ESCALATIONS TO VARIOUS STAFF AND OR GROUPS.

4.3.13 NURSE CALL NETWORK SHALL SUPPORT ANY REAL TIME LOCATING SYSTEM (RTLS) VIA AN OPEN ARCHITECTURAL INTERFACE.

4.3.14 NURSE CALL NETWORK SHALL SUPPORT ANY TELEPHONE DEVICE VIA AN OPEN ARCHITECTURAL INTERFACE.

4.3.15 NURSE CALL NETWORK SHALL SUPPORT ANY ADT SYSTEM VIA AN OPEN ARCHITECTURAL INTERFACE.

4.3.16 NURSE CALL NETWORK SHALL SUPPORT ANY STAFF ASSIGNMENT SYSTEM VIA AN OPEN ARCHITECTURAL INTERFACE.

4.3.17 NURSE CALL NETWORK SHALL SUPPORT ANY DATA BACKUP SYSTEM.

4.3.18 NURSE CALL NETWORK SHALL SUPPORT HL7 INTEGRATION WITH 3RD PARTY SYSTEMS FOR PATIENT STATUS AND WORKFLOW INCLUDING:

- A. ELECTRONIC MEDICAL RECORDS (EMR) WITH BI-DIRECTIONAL ROOM STATUS AND WORKFLOW
- B. SMART BEDS (UNIDIRECTIONAL BED STATUS INCLUDING BRAKE STATUS, PATIENT WEIGHT, RAIL STATUS, BED ANGLE, ETC.)
- C. OTHER SYSTEMS PROVIDING HL7 STATUS AND EVENT MESSAGES

4.4. MANUFACTURERS

4.4.1 THE PRODUCTS SPECIFIED SHALL BE NEW AND OF THE STANDARD MANUFACTURE OF A SINGLE REPUTABLE MANUFACTURER. BASIS OF DESIGN: DUKANE

4.5. NURSE CALL NETWORK WIRING

4.5.1 ALL NURSE CALL NETWORK WIRING SHALL BE ONLY CAT6A. PLENUM WIRE SHALL BE USED IN OPEN AREAS AND STANDARD CAT6A WITHIN CONDUIT. SYSTEM SHALL BE CAPABLE OF INJECTING DC POWER INTO A CAT6A RUN, FOR ADDITIONAL ROOMS, OR LONG RUNS, BY RUNNING A SEPARATE DC CABLE PAIR TO A REMOTE LOCATION.

4.6. NURSE CALL CONTROLLER(S)

4.6.1 FURNISH AS NEEDED IN EACH NURSING UNIT A NURSE CALL NETWORK CONTROLLER. EACH CONTROLLER SHALL PROVIDE THE FOLLOWING:

- A. NON-BLOCKING, DUPLEX COMMUNICATIONS BETWEEN CONSOLES AND ROOMS, SUB STATIONS AND DUPLEX PILLOW SPEAKERS, WITHIN EACH 6 STATION LOOP. PROVIDE FOUR LOOPS FOR A TOTAL OF 12 DYNAMICALLY ALLOCATED SPEECH PATHS.
- B. CAT6A WIRING STANDARD UTILIZING POE (POWER OVER ETHERNET) BETWEEN CONSOLE AND NURSE CALL CONTROLLERS AND LOCAL WIRING TO POWER ROOM STATION EQUIPMENT AND DOME LIGHTS.

C. VOIP AUDIO TO NURSE CALL NETWORK, VOIP NURSE CONSOLE, VOIP STAFF TERMINAL, WIRED OR WIRELESS PHONES VIA SIP PROTOCOL, VOIP DIGITAL AUDIO STREAM OUT TO ROOMS WITHOUT IP OVERHEAD SIGNALING.

D. UP TO 96 CORRIDOR LIGHTS CAN BE OPERATED WITH A SINGLE CONTROLLER.

4.6.2 CONTROLLER MUST BE LIFE SAFETY GRADE MEANING THAT IT SHALL NOT REQUIRE REGULAR REBOOTING FOR CONTINUED BASIC FUNCTIONS OF SYSTEM AND IT SHALL BE POSSIBLE FOR CONTROLLER TO ACT AS A STAND ALONE CONTROLLER SHOULD LOSS OF NETWORK COMMUNICATION OCCUR. PERSONAL COMPUTERS MAY NOT BE USED FOR THIS PURPOSE. PCS WILL ONLY BE ALLOWED OUTSIDE OF THE UL-LISTED NURSE CALL NETWORK ON THE CUSTOMER SUPPORTED LAN.

4.6.3 NURSE CALL CONTROLLER(S) ARE CONNECTED TO THE HOSPITAL'S LAN VIA ETHERNET SWITCHES. THE NURSE CALL SERVERS ALSO CONNECTED TO THE HOSPITAL'S LAN ARE RUNNING SPECIALIZED SOFTWARE FOR USING HOSPITAL DATA RESOURCES AND TELEPHONE COMMUNICATIONS RESOURCES.

4.7. VOIP NURSE CONSOLES

4.7.1 FURNISH AS SHOWN ON PLANS, A UL-1069 LISTED VOIP NURSE CONSOLE CAPABLE OF THE FOLLOWING FUNCTIONS:

- A. FULL DUPLEX AUDIO
- B. COLOR DISPLAY
- C. 12 OR 24 HOURS TIME DISPLAY AND SYNCHRONIZATION TO HOSPITAL STANDARD NETWORK TIME FROM THE NURSE CALL GATEWAY SERVER INCLUDING ANY DAYLIGHT SAVINGS TIME CHANGES SUPPORTED BY THE NETWORK.
- D. DISPLAY UP TO 3 INCOMING CALLS EACH WITH AN INDIVIDUAL ELAPSED TIME WHICH INCREMENTS TIME SINCE CALL WAS PLACED. ALSO PROVIDE THE ABILITY TO SCROLL TO SEE MORE INCOMING CALLS.
- E. POWER OVER ETHERNET POWERED CONNECTION TO UL-1069 LISTED ETHERNET CONTROLLER. NO LOCAL POWER SUPPLIES REQUIRED.
- F. CHOICE OF HANDS-FREE DUPLEX COMMUNICATIONS THROUGH BUILT IN SPEAKER AND SEPARATE MICROPHONE OR PRIVATE HANDSET CONVERSATION.
- G. ABILITY TO CREATE UP TO 32 SOFT KEYS, USER CONFIGURABLE, WITH 4 BUTTONS, 8 SCREENS DEEP.
- H. CONSOLE SHALL BE INTERACTIVE WITH AN ASSOCIATED PC WORKSTATION (USER PROVIDED) WITHOUT THE NECESSITY OF ANY INTERCONNECTION TO THE PC. THE WORK PROCESS RELATIONSHIP SHALL BE SOFTWARE DEFINED THROUGH THE NETWORK CONNECTIONS.
- I. OPTIONAL TONE/MUTE OF CALLS IN PROGRESS.
- J. ABILITY TO BLOCK ALL NURSE CALL LOUDSPEAKER PAGING TO FACILITATE A LOW NOISE PATIENT ENVIRONMENT. PASSWORD PROTECTION CAN BE ENABLED TO ONLY ALLOW AUTHORIZED ACCESS TO AUDIO PAGING.
- K. ABILITY TO SWING AN INDIVIDUAL ROOM OR ANY GROUP OF ROOMS BY TOUCHING ONE LABELED TOUCH POINT. ROOM(S) AND CONSOLES MAY BE LOCATED ANYWHERE WITHIN HOSPITAL NURSE/PATIENT COMMUNICATIONS NETWORK.
- L. CONSOLE CAN BE PROGRAMMED TO BE THE RECEIVER OF ANY CALL THAT IS NOT ANSWERED BY ANOTHER CONSOLE, OR CAN BE PROGRAMMED TO RECEIVE ANY CALL FROM A CONSOLE THAT HAS FAILED OR HAS BEEN UNPLUGGED, OR OTHERWISE NOT RECEIVING THE CALL (CALL ORPHANING).
- M. ABILITY TO DIAL THROUGH BUILT IN KEY PAD.
- N. SELF-CONTAINED UNIT WHICH SHALL NOT OCCUPY MORE THAN 88 SQUARE INCHES OF DESK SPACE AND IS DESK OR WALL-MOUNTABLE.
- O. SUPPORT MANUAL STAFF FOLLOW FUNCTIONS. WHEN STAFF FOLLOW IS ENABLED, CALL-TONES FOR A PRESCRIBED AREA WILL AUTOMATICALLY BE FORWARDED TO THE ROOM STATION SPEAKER WHERE STAFF MEMBERS ARE LOCATED. STAFF LOCATION MAY BE DETERMINED MANUALLY BY ENTERING THE ROOM NUMBER INTO THE CONSOLE OR AUTOMATICALLY USING STAFF REGISTER STATIONS OR REGISTRATION VIA RTLS. PRESSING THE CALL BUTTON ON THAT STATION SHALL SILENCE THE TONES. WHEN A NEW CALL IS PLACED, THE TONES SHALL AUTOMATICALLY BE RESTORED.

4.8. PC CONSOLE DISPLAY

4.8.1 PROVIDE A PC CONSOLE DISPLAY ON ANY NETWORKED OWNER PROVIDED PC THAT MEETS THE SYSTEM MANUFACTURER'S MINIMUM SPECIFICATIONS, WHETHER IT UTILIZES TOUCH SCREEN OR STANDARD MOUSE CONTROL. ALSO, OWNER PROVIDED WALL MOUNTED PC DISPLAYS SHALL HAVE THE GLOBAL OPTION PROVIDED IN THIS SOFTWARE PACKAGE OF A TOUCH SCREEN KEYBOARD. WHEN A PC IS 'ASSOCIATED' WITH A VOIP CONSOLE DESCRIBED PREVIOUSLY, IT SHALL HAVE FULL INTEROPERABILITY TO PROVIDE USER WITH EASY TO FOLLOW ON SCREEN FUNCTIONS, SUCH AS DISPLAY OF CALL PRIORITY, ROOM AND PATIENT INFORMATION, SELECTING A TOUCH POINT OR BY MOUSE. CLICK SHALL PROVIDE AN AUTOMATED SERVICE REMINDER, WHILE IN AUDIO CONTACT WITH THE PATIENT, AN ENRICHED DISPLAY SHALL SHOW ALL USER DEFINED DISPLAY INFORMATION, SUCH AS CAREGIVER ASSIGNED, AND PERTINENT PATIENT INFORMATION.

4.8.2 THE FOLLOWING ADDITIONAL FUNCTIONS SHALL BE PROVIDED AT EACH ONE OF THESE USERS' SCREENS:

4.8.3 FULL DISPLAY OF ALL STATIONS, INCLUDING CORRIDOR LIGHT COLOR SEQUENCING.

4.8.4 COMPLETE ELECTRONICALLY GENERATED CENSUS OF PATIENTS SHOWING ASSIGNED CAREGIVER, CURRENT PATIENT NEEDS AS SENT BY SERVICE REMINDER PROCESS, TIME PATIENT HAS BEEN WAITING FOR CALL ANSWERING, OR NEED, LIST OF CAREGIVERS ON DUTY AND STAFF LOCATION.

4.8.5 CUSTOMIZABLE VIEWS INCLUDING 1 WINDOW WITH 8 COLUMNS, 2 WINDOWS WITH 4 COLUMNS, AND 3 WINDOWS WITH 3 COLUMNS.

4.8.6 ABILITY TO TEXT MESSAGE TO ANY SINGLE INDIVIDUAL, GROUP OF USERS, OR ALL USERS, A TEXT MESSAGE TO A WIRELESS PHONE DISPLAY.

4.8.7 ABILITY TO DISPLAY CALLS IN A CENTRALIZED DISPLAY FORMAT (I.E. CENTRALIZED CODE BLUE DISPLAY).

4.8.8 ABILITY TO DISPLAY AND ROUTE CALLS IN A DE-CENTRALIZED WORKFLOW ENVIRONMENT.

4.8.9 ABILITY TO DISPLAY ALL STAFF INFORMATION, STAFF STATUS, WIRELESS EXTENSION AND THEIR LOCATION.

4.8.10 ABILITY TO INITIATE A ROOM STATUS OR CALL FROM THE PC CONSOLE.

4.9. VOIP STAFF TERMINAL

4.9.1 FURNISH AS SHOWN ON PLANS, AS PART OF THE NURSE CALL COMMUNICATIONS NETWORK, A UL 1069 LISTED VOIP STAFF TERMINAL. THIS DYNAMIC DEVICE SHALL SERVE AS A PATIENT OR PROCEDURE ROOM COMMUNICATIONS TOOL WHILE PROVIDING STAFF WITH "SOFT" TOUCH-POINTS TO INITIATE AN INSTANTANEOUS NOTIFICATION OF AN IN-ROOM NEED. ADDITIONALLY THIS TERMINAL MAY BE USED AS A FUNCTIONAL NURSE CALL CONSOLE.

4.9.2 THE FOLLOWING FUNCTIONS SHALL BE PROVIDED:

- A. COLOR TOUCHSCREEN DISPLAY.
- B. ABILITY TO CREATE UP TO 32 SOFT KEYS, USER-CONFIGURABLE, UP TO 8 SCREENS PER TERMINAL.
- C. SENDS SPECIFIC NEED FOR THAT LOCATION, EXAMPLES: EMERGENCY, STAFF ASSISTANCE, CLEANING NEEDED, LIFTING HELP, TRANSPORT, ORDER, STAFF, ORDER, ROUNDING, ETC.
- D. SPEED DIAL TO ANY LOCATION
- E. POWER OVER ETHERNET POWERED CONNECTION TO UL-1069 LISTED ETHERNET SWITCH. LOCAL POWER NOT REQUIRED.
- F. FULL DUPLEX AUDIO
- G. HANDS-FREE DUPLEX COMMUNICATIONS THROUGH BUILT IN SPEAKER AND SEPARATE MICROPHONE.
- H. DISPLAY UP TO 3 INCOMING CALLS EACH WITH AN INDIVIDUAL ELAPSED TIME WHICH INCREMENTS TIME SINCE CALL WAS PLACED. ALSO PROVIDE THE ABILITY TO SCROLL TO SEE MORE INCOMING CALLS.
- I. ABILITY TO DIAL THROUGH TOUCH KEY PAD.
- J. ABILITY TO CAPTURE AN INDIVIDUAL NURSING UNIT, SELECTED UNITS, OR ALL UNITS IN HOSPITAL BY

TOUCHING SINGLE CUSTOM LABELED TOUCH POINT.

I. ABILITY TO BI-DIRECTIONALLY INTERFACE TO THE EMR IN ORDER TO ALLOW STAFF TERMINAL WORKFLOW EVENTS TO BE LOGGED IN THE EMR AND HAVE EMR EVENTS (I.E. FALL RISK) ACTIVATE WORKFLOW IN THE STAFF TERMINAL INCLUDING CORRIDOR LIGHT ILLUMINATION, CALL PLACEMENT AND WIRELESS MESSAGING.

4.10. CAREGIVER ASSIGNMENTS AND SIGNING ON AND OFF DUTY

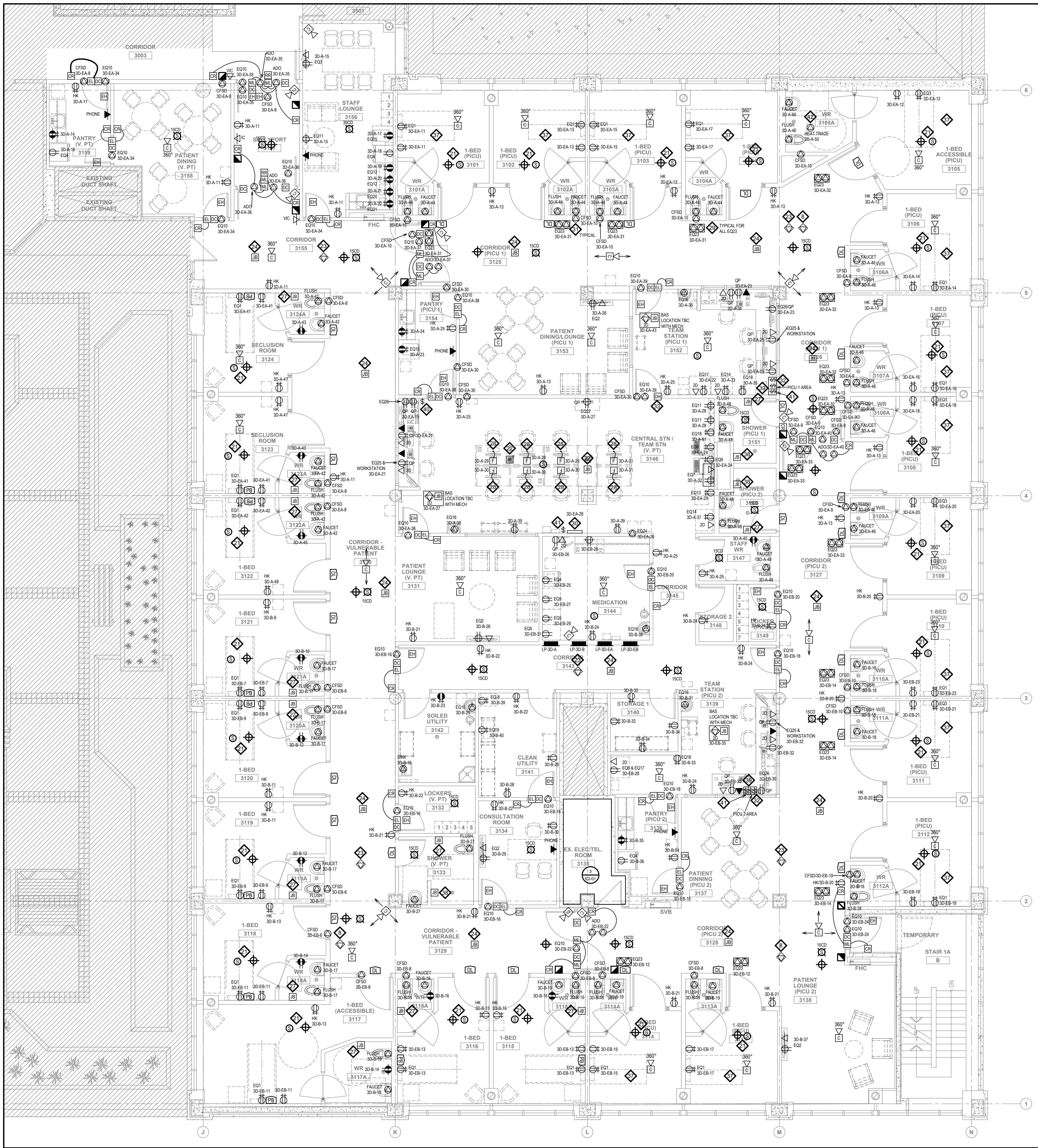
4.10.1 PROVIDE SOFTWARE TO MAKE CAREGIVER TO PATIENT ASSIGNMENTS FROM ANY OWNER PROVIDED PC WORKSTATION WITHIN THE HOSPITAL. BY EASY USER SIGN ON ASSIGNMENT PROCESS SHALL BE INTUITIVE AND INDICATE TO THAT SUPERVISOR MAKING THE ASSIGNMENT, EACH CAREGIVER'S PATIENT LOAD BASED ON NUMBER OF PATIENTS AND PATIENT DIFFICULTY. THESE ASSIGNMENTS SHALL STAY IN QUEUE UNTIL EACH INDIVIDUAL SIGNS ON DUTY. THE ASSIGNMENT IS RELEASED WHEN THE CAREGIVER GOES OFF DUTY.

4.10.2 THE FOLLOWING ADDITIONAL FUNCTIONS SHALL BE PROVIDED:

- A. UNLIMITED ASSIGNMENT OF CAREGIVERS TO PATIENTS, PATIENTS TO CAREGIVERS.
- B. GROUP ASSIGNMENTS.
- C. ASSIGNMENTS MAY BE MADE UP TO 7 DAYS IN ADVANCE.
- D. EASY DISPLAY OF PRIOR DAY'S ASSIGNMENT AND EASY CLICK TO ACCEPT IF YOU WANT TO KEEP ASSIGNMENT THE SAME.
- E. DISPLAY PERTINENT HL7 FIELDS FOR PATIENT.
- F. ALLOW FOR ASSIGNING ADVANCED CALL ESCALATION FOR UN-ANSWERED CALLS.
- G. STAFF MEMBER SHALL HAVE ABILITY TO USE BAR CODE FOR ID AND WIRELESS DEVICES.
- H. USER'S ASSIGNMENT CAN PRINT OUT TO A LOCAL PRINTER.
- I. USER SHALL HAVE THE ABILITY TO GO ON AND OFF BREAK FORWARDING THEIR DEVICE TO ANOTHER CAREGIVER AND REFLECTING THIS ACTIVITY IN THE REPORTING SOFTWARE.
- J. PUT STAFF ON AND OFF DUTY AND ASSIGN A PHONE.
- K. CONDUCT DEVICE BASED ASSIGNMENTS AS WELL AS STAFF BASED ASSIGNMENTS.

4.11. PATIENT STATIONS

4.



NOTES FOR NEW WORK PLAN

- CIRCUIT NUMBER SHOWN IN () ARE INDICATIVE ONLY TO IDENTIFY CIRCUITING ARRANGEMENT. CONTRACTOR SHALL COORDINATE EXACT CIRCUIT NUMBERS WITHIN PANEL ON SITE TO SUIT CONDITIONS.
- RECEPTACLES IN ALL AREAS SHALL BE HOSPITAL GRADE AND PROVIDED IN ACCORDANCE WITH CURRENT OESC, APPLICABLE BULLETINS, AND CSA-222 REQUIREMENTS.
- CONTRACTOR SHALL ADD THE NEW FIRE ALARM INITIATION AND NOTIFICATION DEVICES TO THE EXISTING FIRE ALARM LOOP AS PART OF THE EXISTING FIRE ALARM ZONE AND COORDINATE ALL INSTALLATION ON SITE TO SUIT SITE CONDITIONS.
- EXISTING FIRE ALARM SYSTEM SHALL BE RE-VERIFIED IN ACCORDANCE WITH ALL APPLICABLE CODE REQUIREMENTS AND CANULC-5537.
- CONTRACTOR SHALL UTILIZE THE EXISTING BRANCH CIRCUITS, WHERE POSSIBLE TO FEED THE NEW RECEPTACLES IN THE SCOPE OF WORK AREA. ALL INSTALLATIONS SHALL BE IN ACCORDANCE WITH CURRENT OESC, APPLICABLE BULLETINS, AND CSA-222 REQUIREMENTS.
- ENSURE EXISTING BRANCH CIRCUIT WIRING GROUND CONDUCTOR SERVING PATIENT CARE AREAS ARE INSULATED PER CODE REQUIREMENTS. CONTRACTOR SHALL PROVIDE AND INCLUDE FOR REMOVING EXISTING PATIENT CARE AREA WIRING AND REPLACING WITH NEW TO MEET CURRENT CODE REQUIREMENTS.
- SEE THIS DRAWING FOR EXISTING NEW PANELS LOCATION.
- CENTRAK STROBE SUPPLIED BY HONEYWELL (TYPICAL) DIVISION 26 TO PROVIDE 120V POWER CONNECTION, AND DIVISION 27 TO PROVIDE ONE (1) CAT 6 POE DATA DROP TO POE WEB RELAY. MODULE LOCATED IN ELECTRICAL ROOM. ELECTRICAL CONTRACTOR TO EXTEND 2-CONDUCTOR CABLES FROM RELAY TO EACH STROBE (DEDICATED RUNS). EXACT LOCATIONS OF STROBES TO BE COORDINATED ON SITE AND APPROVED BY OWNER PRIOR TO INSTALL.
- ALL NEW FIRE ALARM DEVICES SHALL BE ADDRESSABLE TYPE AND SAME PRODUCTS ONLY TO MATCH EXISTING SYSTEM AND DEVICES ON SITE.
- ALL NEW PROPOSED SYSTEMS, EQUIPMENT, AND DEVICES SHALL BE FULLY COMPATIBLE WITH, AND THE SAME MANUFACTURER AS EXISTING SYSTEMS, EQUIPMENT, AND DEVICES ON SITE. VERIFY ALL EXISTING SYSTEMS, EQUIPMENT, AND DEVICES ON SITE.
- CONTRACTOR SHALL VERIFY IF THE EXISTING FIRE ALARM SYSTEM HAS STROBING FUNCTION. IF IT DOES NOT, ALL FIRE ALARM SPEAKER STROBE DEVICES SHOWN ON THIS DRAWING SHALL BE FIRE ALARM SPEAKERS TO SUIT THE EXISTING SYSTEM.
- SEE MECHANICAL DRAWINGS FOR MECHANICAL EQUIPMENT SCHEDULE.
- REFER TO I.C.A.T. SPECIFICATIONS (DWG. E0-02a8b) FOR TYPE OF DATA CABLES.
- ALL DATA CABLES SHALL BE HOME RUN BACK TO COMMUNICATION ROOM 3135. SEE DRAWING E2-01 FOR LOCATION.
- ALL COMMUNICATIONS RACEWAYS SHALL BE INSTALLED IN STRAIGHT LINES WITH AS FEW TURNS AS POSSIBLE AND SHALL ALIGN WITH BUILDING GEOMETRY. ALL RACEWAYS SHALL BE INSTALLED IN COMMON CIRCULATION SPACES.
- ALL HORIZONTAL CABLING SHALL RUN IN CONDUITS OR J-HOOKS. CONDUITS SHALL BE MINIMUM 25MM, UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL PROVIDE POE INJECTOR FOR EACH DATA DROP AND NECESSARY PULL BOXES IF HORIZONTAL CABLE PERMANENT LINK LENGTH EXCEEDS 90M. COORDINATE EXACT CABLE ROUTING AND PATHWAYS ON SITE AND PROVIDE TO SUIT.
- PROVIDE ROUGH-INS ONLY FOR ALL SECURITY SYSTEMS, EQUIPMENT, AND DEVICES. SEE ELECTRICAL TYPICAL DETAILS AND SPECIFICATIONS FOR DETAILS. ALL SECURITY SYSTEMS, EQUIPMENT, AND DEVICES SHALL BE SUPPLIED AND INSTALLED BY THE OWNER.
- NURSE CALL SYSTEM AND ASSOCIATED DEVICES SHALL BE ATEL TO MATCH BASE BUILDING STANDARD. ALL NEW NURSE CALL DEVICES SHALL BE CONNECTED TO THE EXISTING BASE BUILDING NURSE CALL SYSTEM. ALL NURSE CALL DEVICES SHALL BE HIGH SECURITY AND ANTI-LIAGTURE.
- UPDATE FIRE ALARM ANNUNCIATOR PANEL AT THE ASSOCIATED NURSING STATION TO SUIT THE PROPOSED CHANGES AS PART OF THIS SCOPE OF WORK.
- INITIATION OF SMOKE DETECTOR WITHIN THE ROOM SHALL ACTIVATE SIGNAL ON DOME LIGHT.
- PROVIDE (1) 27MM C FOR POWER AND (1) 35MM C FOR DATA TO A RECESSED FLOOR BOX. EACH FLOOR BOX SHALL CONTAIN (4) 15A RECEPTACLES, (4) CAT6 DATA OUTLETS, AND (1) VOICE OUTLET. RUN POWER CONDUIT UP TO CEILING SPACE AND ROUTE BACK TO ELECTRICAL PANEL. RUN DATA/VOICE CONDUIT UP TO CEILING SPACE AND ROUTE BACK TO TELECOM ROOM. PROVIDE MODULAR FURNITURE TRACKS FROM THE FLOOR BOX UP TO THE DESK CHASSIS TO TERMINATE ALL HARDWARE ON THE WORKSTATION AT 400MM AFF.
- CENTRAK WIRELESS ACCESS POINT (WAP) SUPPLIED BY HONEYWELL (TYPICAL) DIVISION 27 TO PROVIDE CAT 6 POE DATA DROPS FOR ALL WAPS. ELECTRICAL CONTRACTOR TO INSTALL WAPS ABOVE CEILING AND CONNECT VIA RJ45 CONNECTORS. WAP ANTENNAS TO BE INSTALLED THROUGH CEILING TILES. EXACT LOCATIONS TO BE CONFIRMED AND COORDINATED WITH HONEYWELL.
- RTLS MONITOR SUPPLIED BY HONEYWELL (TYPICAL) DIVISION 26 TO PROVIDE 120V POWER CONNECTION TO ALTRONIX POWER SUPPLY LOCATED IN ELECTRICAL ROOM. ELECTRICAL CONTRACTOR TO EXTEND LOW VOLTAGE (2/18 AWG) CABLE FROM POWER SUPPLY TO EACH MONITOR (3 LOOPS). RTLS MONITORS ARE TO BE INSTALLED IN ANTI LIAGTURE CEILING ENCLOSURES EQUAL TO OBERON WITTE MODEL 1047 OR APPROVED ALTERNATE. DOOR STYLE, AND ACCESS POINT VENDOR TO BE COORDINATED BY HONEYWELL. ENCLOSURES TO BE SUPPLIED BY DIVISION 26 FOR INSTALLATION BY CEILING TRADE.
- THE EXISTING SECURITY SYSTEM IS C-CURE. ALL SECURITY SYSTEMS MUST BE COORDINATED WITH A.C. TECHNICAL SYSTEMS. CAMERAS SHALL BE AVIGILON, AND ACCESS CONTROLS SHALL BE HID.
- MAG LOCKS TO RELEASE SIMULTANEOUSLY UPON VALID CARD READ, REMOTE RELEASE, OR INITIATION OF A 2ND STAGE EVACUATION SIGNAL. ONCE MAG LOCKS ARE CONFIRMED RELEASED VIA INTERNAL SENSORS, BOTH ADS SHALL ACTIVATE TO OPEN DOOR LEAVES.
- PROVIDE WATERPROOF BEHAVIORAL HEALTH GRADE EMERGENCY NURSE CALL BUTTON. MUST FEATURE WITH FLUSH ANTI LIAGTURE SWITCH. WIRE TO CENTRAL NURSE CALL SYSTEM. SYSTEM SHALL TRIGGER AUDIBLE/VISUAL ALARM AT CENTRAL STATION AND CORRIDOR DOME LIGHT. RESET CAPABILITY FROM INSIDE SHOWER ONLY. COORDINATE LOCATION WITH ARCHITECT TO ENSURE DEVICE IS REACHABLE FROM FLOOR LEVEL.
- EACH DESK TO HAVE (1) 15A QUADPLEX RECEPTACLE, (1) DATA OUTLET WITH TWO PORT, AND (1) VOICE OUTLET. ONLY 2 DESKS TOTAL REQUIRE ACTIVE VOICE CORES). ALL OUTLETS MOUNTED ON FURNITURE AT 400MM AFF.
- PROVIDE LOCAL RELAY FOR EACH SOLENOID VALVE. RELAYS SHALL RECEIVE CONTROL SIGNALS FROM ON/OFF SWITCH AT THE NURSE STATION TO SIMULTANEOUSLY:
 - TRIGGER POWER CONTACTORS ISOLATING ALL POWER CIRCUITS FOR THE ASSIGNED GROUPS OF PICU PATIENT ROOMS.
 - ENERGIZE/DE-ENERGIZE LOW VOLTAGE CONTROL CIRCUITS ROUTED TO NORMALLY CLOSED ELECTRONIC SOLENOID VALVES ON THE WATER SUPPLY LINES FOR THE ASSIGNED GROUPS OF PICU ROOMS.
 - COORDINATE REQUISITE CONDUIT RUNS, VOLTAGES, AND TERMINATIONS WITH MECHANICAL CONTRACTOR.
- PROVIDE LIGHTING CONTROL PANEL EQUIPPED WITH INTEGRAL TIMELOCK AND MANUAL OVERRIDE SWITCHES. THE PANEL SHALL INDEPENDENTLY CONTROL LIGHTING ON/OFF FOR ALL PATIENT ROOMS VIA SCHEDULED TIMELOCK OPERATIONS, WITH INDIVIDUAL MANUAL OVERRIDE CONTROL LOCATED AT THE NURSE STATION.
- REFER TO MECHANICAL DRAWINGS FOR THE EXACT LOCATIONS AND QUANTITIES OF COMBINATION FIRE/SMOKE DAMPERS (CFSD). PROVIDE ONE DEDICATED DUCT-MOUNTED SMOKE DETECTOR FOR EACH CFSD IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS AND APPLICABLE CODES. COORDINATE ALL FINAL POWER, CONDUIT, AND WIRING LOCATIONS WITH THE MECHANICAL CONTRACTOR ON-SITE PRIOR TO ROUGH-IN.
- PROVIDE A SERIES OF EMERGENCY WATER SHUT-OFF SWITCHES (ONLY ONE IS SHOWN FOR CLARITY AND ASSOCIATED WIRING TO CONTROL THE MECHANICAL SOLENOID VALVES SERVING THE PICU PATIENT WASHROOMS. SWITCHES SHALL BE TOGGLE OR MUSHROOM-STYLE WITH CLEARLY LABELED NAMEPLATES AND RED LED PILOT LIGHTS TO INDICATE "WATER SHUT-OFF ACTIVATED". REFER TO MECHANICAL DRAWINGS FOR LOCATION AND QUANTITY OF SOLENOID VALVES SUPPLIED AND INSTALLED BY MECHANICAL.
- ELECTRICAL DOOR CLOSERS INTERCONNECT WITH THE BUILDING FIRE ALARM SYSTEM VIA ADDRESSABLE CONTROL MODULE OR RELAY. UPON FIRE ALARM ACTIVATION, POWER SHALL BE INTERRUPTED TO ALLOW THE DOOR TO CLOSE AUTOMATICALLY.
- ALL NURSE CALL DEVICES (INCLUDING CALL STATIONS, PUSH BUTTONS) IN PATIENT BEDROOMS, WASHROOMS, AND ALL OTHER PATIENT-ACCESSIBLE AREAS SHALL BE ANTI-LIAGTURE AND TAMPER-RESISTANT. DEVICES MUST BE SPECIALLY APPROVED FOR BEHAVIORAL HEALTH ENVIRONMENTS. FASTEN ALL DEVICES USING TAMPER-PROOF TORX SECURITY SCREWS.
- PROVIDE REMOTE NURSE CALL LOCKOUT FUNCTION CONTROLLED FROM THE MAIN NURSE SYSTEM REGULATION STATION. THE SYSTEM SHALL ALLOW STAFF TO TEMPORARILY DISABLE PATIENT CALL STATIONS. PROVIDE A DEFAULT AUTOMATIC TIME-OUT RE-ENABLE TIME OF 15 MINUTES. FINAL COMMISSIONING, DURATION, AND OPERATION PROTOCOLS TO BE CONFIRMED BY THE HOSPITAL SYSTEM USER PRIOR TO COMMISSIONING.
- ALL ELECTRICAL WIRING DEVICES, INCLUDING RECEPTACLES, DATA OUTLETS, AND FACEPLATES IN PATIENT-ACCESSIBLE AREAS SHALL BE ANTI-LIAGTURE AND TAMPER-RESISTANT. ALL DEVICES MUST BE SUITABLE FOR BEHAVIORAL HEALTH ENVIRONMENTS. RECESSED MOUNT ALL ENCLOSURES AND SECURE COVERS WITH TAMPER-PROOF TORX SECURITY SCREWS.
- PROVIDE TWO (2) DUPLEX RECEPTACLES PER PICU ROOM. TIED TO EMERGENCY POWER CIRCUIT. PROVIDE RECESSED IMPACT-RESISTANT LOCKABLE SECURITY COVERS OVER ALL RECEPTACLES. DEVICES AND PLATES TO BE ANTI-LIAGTURE AND TAMPER-RESISTANT SUITABLE FOR BEHAVIORAL HEALTH ENVIRONMENTS. SECURE WITH PIN-IN-TORX SECURITY SCREWS. COORDINATE EXACT LOCATION AND LOCATION WITH ARCHITECTURAL WALL ELEVATIONS PRIOR TO ROUGH-IN. POWER ON/OFF TO BE CONTROLLED BY A MASTER SWITCH AT TEAM STATION.
- PROVIDE WATERPROOF (MIN. IP65) FLUSH-MOUNTED ANTI-LIAGTURE NURSE CALL FLUSH MOUNT STATION. EQUIPMENT SHALL FEATURE STAINLESS STEEL FACEPLATE, PIEZOELECTRIC BUTTON WITH NO MOVING PARTS, AND TAMPER-PROOF SECURITY SCREWS. APPLY PICK-RESISTANT SECURITY SEALANT AROUND PERIMETER OF FACEPLATE. COORDINATE EXACT MOUNTING LOCATION WITH ARCHITECTURAL ELEVATIONS.
- PROVIDE A DEDICATED EMERGENCY RECEPTACLE CONTROL SHUT-OFF SWITCH FOR EACH INDIVIDUAL PICU PATIENT ROOM. LOCATED WHERE SHOWN ON DRAWINGS, TO DIRECTLY CONTROL THAT SPECIFIC ROOMS RECEPTACLES. SWITCH SHALL BE A STANDARD TOGGLE TYPE WITH A CLEARLY LABELED ENGRAVED NAMEPLATE. COORDINATE FINAL ROUGH-IN LOCATIONS ON SITE.
- PROVIDE AND INSTALL REMOTE DOOR RELEASE CONTROL SWITCH AT TEAM STATION (V.P.T). ROUTE CONDUIT AND WIRING FROM SWITCH TO SALLPORT DOOR CONTROL PANEL. COORDINATE EXACT INTERFAC AND ELECTRICAL REQUIREMENTS WITH THE DOOR HARDWARE SUPPLIER AND SECURITY CONTRACTOR. COORDINATE EXACT LOCATION PRIOR TO INSTALLATION.
- PROVIDE MANUAL OVERRIDE SWITCHES. AREA SHALL BE EQUIPPED WITH ONE DEDICATED SWITCH PER PATIENT ROOM, WITH EACH SWITCH CLEARLY LABELED WITH THE CORRESPONDING ROOM NUMBER. WIRING SHALL BY-PASS THE LOCAL TIMELOCK SCHEDULE TO PROVIDE INSTANT ON/OFF OVERRIDE CONTROL. RUN LOW-VOLTAGE CONTROL CABLING BACK TO THE LOCAL LIGHTING CONTROL PANEL.
- EXACT LOCATION OF HEAT TRACE POWER CONNECTION TO BE CONFIRMED ON SITE PRIOR TO INSTALLATION. HEAT TRACE IS LOCATED ON LEVEL 3D CEILING. PROVIDE CONDUIT STUB-DOWN THROUGH SLAB AS REQUIRED. REFER TO MECHANICAL DRAWING A-301 FOR LENGTH AND LOCATION AND DRAWING E2-03 FOR DETAIL.

FURNITURE AND EQUIPMENT	
PATIENT BED	EQ1
WALL MOUNTED TV IN PROTECTIVE ENCLOSURE	EQ2
WALL MOUNTED TV	EQ3
FRIDGE	EQ4
AUTOMATIC MEDICATION DISPENSING UNIT	EQ5
PYXIS MED-STATION ES RETURN	EQ6
WALL MOUNTED ELECTRONIC WHITEBOARD	EQ7
BLANKET WARMER	EQ8
WORKSTATION ON WHEEL	EQ9
POWER SUPPLY FOR DOOR HARDWARE	EQ10
PHONE CHARGING STATION	EQ11
MICROWAVE	EQ12

CRASH CART	
PRINTER	EQ13
ICE-WATER DISPENSING MACHINE	EQ14
HAND HYGIENE SINK	EQ15
PYXIS - MEDFLEX (MED)	EQ16
VITAL SIGN MONITOR ON STAND	EQ17
WARMER, BATHING WIPES	EQ18
COFFEE MACHINE	EQ19
ELECTRIC KETTLE	EQ20
EPIC ROVER	EQ21
WATER SOLENOID VALVES	EQ22
MEDICAL GAS ZONE ALARM BOX	EQ23
STAFF DRESS COMPUTER	EQ24
CCTV MONITORS	EQ25

SHEET ISSUANCE	
7	ISSUED FOR ADDENDUM ADD E-03
6	ISSUED FOR ADDENDUM ADD E-02
5	ISSUED FOR ADDENDUM ADD E-01
4	
3	
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1	
NO	

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4	ISSUED FOR TENDER AND PERMIT	04.06.26
3	ISSUED FOR CLIENT REVIEW	29.05.26
2	ISSUED FOR REVIEW	25.07.25
1	ISSUED FOR REVIEW	15.05.25
NO	ACTION	DATE

Client:
**SCARBOROUGH
HEALTH NETWORK**
3030 BIRCHMOUNT ROAD
SCARBOROUGH, ON

Project Title:
**SHN MENTAL HEALTH
INPATIENT CONSOLIDATION
POD 3A**

Sheet Title:
NEW POWER & SYSTEM

Project North	Stamp
Date: APR 2025	Project No.: 24002-02
Scale: 1:75	Drawn: P.T./K.O.
Drawing Number:	Checked: M.C.