1 SUMMARY OF WORK

.1 Work covered by Contract Documents:
- .1 Work under this Contract comprises construction of a health care building expansion and renovation work as indicated, located at Mission Minimum Institution, Mission, B.C.

.2 Contractor's Use of Premises:
- .1 Contractor has controlled use of site within the construction area for Work, storage, and access as directed by the Departmental Representative.
- .2 Use of areas inside Mission Institution, for access to the construction site is controlled, by the Departmental Representative.
- .3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .4 The new building will be constructed inside the security fence. The institution will be fully operational during work of this Contract. Provide temporary construction fence around site until new security fencing is installed.

.3 Conform to National Building Code 2015 or British Columbia Building Code 2012 as applicable.

.4 Contractor to apply for Building Permit before construction and Occupancy Permit upon Substantial completion.
- .1 Departmental Representative will supply the required drawings and Letters of Assurance for such applications.
- .2 Contractor to pay for all required fees for Building Permit and Occupancy Permit.
- .3 Before issuing the Substantial Completion certificate, Contractor must provide fire alarm verification report and Occupancy Permit from local authority having jurisdiction.

2 WORK RESTRICTIONS

.1 Notify, Departmental Representative of intended interruption of disconnected services and provide schedule for review. Schedule major disruption of services in existing during approved times.

.2 Where Work involves breaking into or connecting to existing service lines, give departmental Representative 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions to a minimum. Coordinate interruptions affecting existing building if affected by the disruption.

.3 Construct barriers in accordance with Temporary Barriers and Enclosures clause.

.4 Security Requirements: refer to Section 01 14 10 - Security requirements.

.5 Hours of work:
- .1 Perform work during normal working hours of the Institution (0730 to 1600), Monday through Friday except holidays. Work may be performed after normal working hours of the Institution, Monday through Friday, on weekends and holidays, with a minimum forty-eight (48) hours advance notice and approval of the Departmental Representative. Provide schedule for prior approval of Departmental

Representative.

.2 Allow for delays due to security protocol when work interferes with Institution security operations.

.6 Access into Institution is required:

.1 Vehicular access through the Principal Entrance sally port will be restricted during the inmate "count" at breakfast, lunch and dinner hours. Confirm "count" times with Departmental Representative. Delays may occur when entering and exiting the Institution with vehicles during "count" times and due to security situations and heavy traffic.

.2 A construction escort will be provided by the Departmental Representative, at no cost to the Contract when access is required inside institution. Notify Departmental Representative minimum 24 hours in advance of when Construction Escort is required.

3 CONSTRUCTION MEETINGS

.1 During Construction, Consultant will record project meetings,

.2 Contractor shall update construction work schedule, contemplated change notices and change order check lists for each project meeting.

4 CONSTRUCTION WORK SCHEDULE

.1 Commence work immediately upon official notification of acceptance of offer and complete the work within thirty (30) weeks from the date of such notification.

.2 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Substantial Certificate and Final Certificate as defined times of completion are of essence of this contract.

.3 Submittals:

.1 Submit to Departmental Representative within ten (10) working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of construction progress.

.2 Identify each trade or operation for each phase of the work.

.3 Show dates for delivery of items requiring long lead time.

.4 Departmental Representative will review schedule and return one copy.

.5 Re-submit two (2) copies of finalized schedule to Departmental Representative within five (5) working days after return of reviewed preliminary copy.

.4 Project Scheduling Reporting:

.1 Update Project Schedule on monthly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

.5 Project Meetings:

.1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind

schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Weather related delays with their remedial measures will be discussed and negotiated.

.3 Before submitting first progress claim submit breakdown of Contract price in detail as directed by Departmental Representative and aggregating contract price. After approval by Departmental Representative cost breakdown will be used as basis for progress payments.

5 SUBMITTAL PROCEDURES

.1 Administrative:

.1 Submit to Departmental Representative submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work.

.2 Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.3 Do not proceed with work affected by submittal, until review is complete.

.4 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.5 Where items or information is not produced in SI Metric units converted values are acceptable.

.6 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.

.7 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.8 Verify field measurements and affected adjacent Work are coordinated.

.9 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative review of submittals.

.10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.11 Keep one reviewed copy of each submission on site.

.2 Shop Drawings:

.1 Drawings to be originals prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate appropriate portion of work; showing fabrication, layout, setting or erection details as specified in appropriate sections.

.3 Product Data:

.1 Certain specification Sections specify that manufacturer's standard schematic drawings, catalogue sheets, diagrams, schedules, performance charts, illustrations and other standard descriptive data will be accepted in lieu of shop drawings, provided that the product concerned is clearly identified. Submit in sets, not as individual submissions.

.4 Samples:

.1 Submit samples in sizes and quantities specified.

.2 Where colour is criterion, submit full range of colours.

.3 Submit all samples as soon as possible after the contract is awarded, to facilitate

production of complete colour scheme by the Departmental Representative.

.5 Mock-ups:
- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.
- .2 Construct in location as specified in specific Section.
- .3 Prepare mock-ups for Departmental Representative' review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

.6 Submission Requirements:
- .1 Schedule submissions at least ten days before dates reviewed submissions will be needed.
- .2 Submit number of copies of product data, shop drawings which Contractor requires for distribution plus four (4) copies which will be retained by Departmental Representative.
- .3 Accompany submissions with transmittal letter in duplicate.
- .4 Submit either bond copies or one (1) electronic pdf file of each shop drawing and product data as directed by Departmental Representative.

.7 Coordination of Submissions:
- .1 Review shop drawings, product data and samples prior to submission.
- .2 Coordinate with field construction criteria.
- .3 Verify catalogue numbers and similar data.
- .4 Coordinate each submittal with requirements of the work of all trades and contract documents.
- .5 Responsibility for errors and omissions in submittals is not relieved by Departmental Representative's review of submittals.
- .6 Responsibility for deviations in submittals from requirements of Contract documents is not relieved by Departmental Representative's review of submittals, unless Departmental Representative gives written acceptance of specified deviations.
- .7 Notify Departmental Representative, in writing at time of submission, of deviations in submittals from requirements of Contract documents.
- .8 Make any changes in submissions which Departmental Representative may require consistent with Contract Documents and re-submit as directed by Departmental Representative.
- .9 After Departmental Representative's review, distribute copies.
- .10 Shop Drawings Review:
  - .1 Review of shop drawings by Public Works and Government Services Canada (PWGSC) is for the sole purpose of ascertaining conformance with the general concept.
  - .2 The Departmental Representative’s review does not mean that PWGSC approves the detail design inherent in the shop drawings, responsibility remains with the contractor submitting same, and such review will not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the

construction and contract documents.

.3 Without restricting the generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation, and for co-ordination of the work of all sub trades.

6 HEALTH AND SAFETY

.1 Specified in Section 01 35 33 - Health and Safety Requirements.

7 ENVIRONMENTAL PROCEDURES

.1 Fires and burning of rubbish on site not permitted.

.2 Do not bury rubbish and waste materials on site unless approved by Departmental Representative.

.3 Do not dispose of waste or volatile materials such as oil, paint thinner or mineral spirits into waterways, storm or sanitary systems.

.4 Provide temporary drainage and pumping as necessary to keep excavations and site free from water during excavation and grading activities.

.5 Control disposal of run-off of water containing suspended materials or other harmful substances in accordance with local authority requirements. Construct settlement ponds and silt fences as required by the Provincial Environmental authority.

.6 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

.7 Under no circumstances dispose of rubbish or waste materials on property or CSC waste bins.

8 REGULATORY REQUIREMENTS

.1 References and Codes:

.1 Perform Work in accordance with National Building Code of Canada (NBCC 2015) or British Columbia Building Code 2012, including all amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:

.1 Contract documents.

.2 Specified standards, codes and referenced documents.

9 QUALITY CONTROL

.1 Inspection:

.1 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.

.2 If Contractor covers or permits to be covered Work that has been designated for

special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.3 Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

.2 Independent Inspection Agencies:

.1 Provide independent Inspection/Testing Agencies for purpose of inspecting and/or testing portions of Work as specified in relevant sections. Cost of such services will be borne by the Contractor.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no extra cost to Contract. Pay costs for retesting and re-inspection.

.3 Procedures:

.1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

.4 Rejected Work:

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.5 Reports:

.1 Submit (4) four copies or one scanned pdf copy of inspection and test reports to Departmental Representative.

.6 Tests and Mix Designs:

.1 Furnish test results and mix designs as may be requested.

.7 Mock-ups;

.1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.

.2 Construct in locations acceptable to Departmental Representative and as specified in specific Section.

.3 Prepare mock-ups for Departmental Representative review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.5 If requested, Departmental Representative will assist in preparing a schedule fixing dates for preparation.

.6 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

.8 Mill Tests:

.1 Submit mill test certificates as requested and as required of specification Sections.

.9 Equipment and Systems:

.1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

.2 Refer to specific Section for definitive requirements.

10 TEMPORARY UTILITIES

.1 Electrical power and lighting ,may be used for construction purposes at no extra cost, provided that guarantees are not affected thereby and electrical components used for temporary power are replaced when damaged.

.2 Installation and Removal:

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

.3 Dewatering:

.1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

.4 Water Supply:

.1 Existing water supply system may be used for construction purposes provided that damaged components are replaced when damaged. Provide own hoses from source.

.5 Temporary Heating and Ventilation:

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.2 Construction heaters used inside building must be vented to outside or be flameless type. Solid fuel salamanders are not permitted.

.3 Provide temporary heat and ventilation in enclosed areas as required to:

.1 Facilitate progress of Work.

.2 Protect Work and products against dampness and cold.

.3 Prevent moisture condensation on surfaces.

.4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.

.5 Provide adequate ventilation to meet health regulations for safe working environment.

.4 Maintain temperatures of minimum 10 degrees C in areas where construction is in

progress.

.6 The air system will be in use during work of this contract inside existing building. Protect ducting system by filters inspected daily and replaced as necessary. During dust generating construction work block off all outlets and seal air tight.
  .1 Before Substantial Completion comply with the following conditions:
    .1 Remove all temporary duct covers.
    .2 Replace used air filters with new filters.

.7 Ventilating:
  .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
  .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
  .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
  .4 Ventilate storage spaces containing hazardous or volatile materials.
  .5 Ventilate temporary sanitary facilities.
  .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.8 Activate air system under direction of Departmental Representative to provide temporary heat. Protect ducting system by filters inspected daily and replaced as necessary.
  .1 Before Substantial Completion comply with the following conditions:
    .1 Bring plant and systems to as new conditions. (Vacuum clean duct system.)
    .2 Replace used air filters with new filters.

.9 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
  .1 Conform with applicable codes and standards.
  .2 Enforce safe practices.
  .3 Prevent abuse of services.
  .4 Prevent damage to finishes.
  .5 Vent direct-fired combustion units to outside.

.10 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

.2 Temporary Power and Light:
  .1 Arrange, and maintain temporary electric power supply in accordance with local power authority governing regulations and ordinances.
  .2 Electrical power and lighting installed under this contract may be used for construction purposes at no extra cost, provided that guarantees are not affected thereby and electrical components used for temporary power are replaced when damaged.
  .3 Replace lighting bulbs/tubes used for more than three months or provide replacement bulbs/tubes and hand over to Departmental Representative.

.3 Temporary Communication Facilities:
  .1 Provide and pay for temporary telephone and fax hook up, line(s) necessary for own use. Conform to Section 01 14 10 Security Requirements.

.4 Fire Protection:
  .1 Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.

11 CONSTRUCTION FACILITIES

.1 Installation and Removal:
- .1 Provide construction facilities in order to execute work expeditiously.
- .2 Remove from site all such work after use.

.2 Scaffolding:
- .1 Design, construct and maintain scaffolding in rigid, secure and safe manner, in accordance with WCBBC regulations and Section 01 35 33.
- .2 Erect scaffolding independent of walls. Remove promptly when no longer required.

.3 Hoisting/lifts:
- .1 Provide, operate and maintain hoists/lifts required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.
- .2 Hoists/lifts: operated by qualified operator.

.4 Site Storage/Loading:
- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

.5 Construction Parking:
- .1 Make good damage to local roads used for access to project site.
- .2 Parking space is available outside double fence and temporary parking of delivery vehicles within construction site as directed by the Departmental Representative.

.6 Contractor's Site Office:
- .1 Provide office as required to accommodate Contractor's operations.
- .2 Provide a clearly marked and fully stocked first-aid case in a readily available location.

.7 Equipment, Tools and Material Storage:
- .1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

.8 Sanitary Facilities:
- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.9 Construction Signs:
- .1 Format, location and quantity of site signs and notices to be approved by Departmental Representative.
- .2 Signs and notices for safety or instruction to be in English language, or commonly understood graphic symbols.
- .3 Maintain signboards, signs and notices for duration of project. Remove and dispose of signs off site when directed by Departmental Representative.
- .4 Remove signs from site at completion of project or as directed by Departmental Representative.

12 TEMPORARY BARRIERS AND ENCLOSURES

.1 Enclosure of Structure:
- .1 Provide temporary weather tight secure protection for exterior openings until permanently enclosed. Design enclosures to withstand wind pressure. Secure construction areas inside institution with fenced area to secure materials and temporary buildings.
- .2 Provide temporary dust screens in existing building where dust generating work occurs.

.2 Guardrails and Excavations:
- .1 Provide secure, rigid guard rails and barricades around deep excavations, open edges of floors and roofs in accordance with WCB requirements.

.3 Access to Site:
- .1 Maintain existing access roads and designated parking area in broom clean condition.

.4 Protection of Building Finishes:
- .1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers, and hoardings.
- .3 Confirm with Departmental Representative locations and installation schedule 3 days prior to installation.
- .4 Be responsible for damage incurred due to lack of or improper protection.

13 COMMON PRODUCT REQUIREMENTS

.1 Reference Standards:
- .1 If there is a question as to whether any product or system is in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .2 Cost for such testing will be borne by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.
- .3 Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.

.2 Quality:
- .1 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .5 Permanent labels, trademarks and nameplates on products are not acceptable in

prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms

.3 Storage, Handling and Protection:

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

.9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

.4 Transportation:

.1 Pay costs of transportation of products required in performance of Work.

.2 Transportation cost of products supplied by Departmental Representative will be paid for by Departmental Representative. Unload, handle and store such products.

.5 Manufacturer’s Instructions:

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative may establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

.6 Quality of Work:

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

.7 Co-ordination:

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.
.2 Be responsible for coordination and placement of openings, sleeves and accessories.

.8 Concealment:
.1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
.2 Before installation, inform Departmental Representative if there is interference. Install as directed by Departmental Representative.

.9 Remedial Work:
.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.
.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

.10 Location of Fixtures:
.1 Inform Departmental Representative of conflicting installation. Install as directed.
.2 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

.11 Fastenings:
.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
.2 Prevent electrolytic action between dissimilar metals and materials.
.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
.5 Keep exposed fastenings to a minimum, space evenly and install neatly.
.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

.12 Fastenings - Equipment:
.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
.3 Bolts may not project more than one diameter beyond nuts.
.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

.13 Protection of Work in Progress:
.1 Prevent overloading of any part of building. Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated without written approval of Departmental Representative.

.14 Existing Utilities:

.1 Where work involves breaking into or connecting to existing services, carry out work at times directed by Departmental Representative and governing authorities, with minimum of disturbance to pedestrian and vehicular traffic. Maintain vehicular access on roadways at all times.
.2 Before commencing work, establish location and extent of service lines in areas of work and notify Departmental Representative of findings.
.3 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
.4 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
.5 Record locations of maintained and re-routed services lines.

14 EXAMINATION AND PREPARATION

.1 Existing Services:
.1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.
.2 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.

.2 Location of Equipment and Fixtures:
.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
.3 Inform Departmental Representative of impending installation and obtain approval for actual location.
.4 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

15 EXECUTION REQUIREMENTS

.1 Preparation:
.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
.2 After uncovering, inspect conditions affecting performance of Work.
.3 Beginning of cutting or patching means acceptance of existing conditions.
.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
.5 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

.2 Execution:
.1 Execute cutting, fitting, and patching, including excavation and fill, to complete Work.
.2 Fit several parts together, to integrate with other Work.
.3 Uncover Work to install ill-timed Work.
.4 Remove and replace defective and non-conforming Work.
.5 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

.6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
.7 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
.8 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
.9 Restore work with new products in accordance with requirements of Contract Documents.
.10 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
.11 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with fire stopping material, full thickness of the construction element.
.12 Refinish surfaces to match adjacent finishes: For continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.
.13 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

16 CLEANING

.1 Project Cleanliness:
.1 Maintain Work in tidy condition, free from accumulation of waste products and debris.
.2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
.3 Provide on-site containers for collection of waste materials and debris.
.4 Provide and use clearly marked separate bins for recycling. Refer to- Construction/Demolition Waste Management and Disposal.
.5 Clean interior areas prior to start of finish work, and maintain areas free of dust and other contaminants during finishing operations.
.6 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
.7 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
.8 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
.9 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

.2 Final Cleaning:
.1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
.3 Prior to final review, remove surplus products, tools, construction machinery and equipment.
.4 Remove waste products from site.
.5 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
.6 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical

fixtures, furniture fitments, walls, and floors.

.7 Clean lighting reflectors, lenses, and other lighting surfaces.

.8 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

.9 Wax, seal, vacuum clean, shampoo or prepare floor finishes, as recommended by manufacturer.

.10 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.11 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.12 Remove dirt and other disfiguration from exterior surfaces.

.13 Sweep and wash clean paved areas used during work of this contract.

.14 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.

.15 Clean roofs, downspouts, and drainage systems.

.16 Remove snow and ice from access to building.

17 CONSTRUCTION/DEMOLITION WASTE MANAGEMENT AND DISPOSAL

.1 Prior to beginning of Work on site submit a detailed Waste Reduction Workplan in Accordance with Section 01 01 50- General Instructions and indicate:

.1 Descriptions of and anticipated quantities in percentages of materials to be salvaged, reused, recycled and landfilled.

.2 Schedule of selective demolition.

.3 Number and location of dumpsters.

.4 Anticipated frequency of tippage.

.4 Name and address of haulers and waste receiving organizations.

.2 Government mandate is to reduce the environmental impact of waste by diverting at least 90% by weight of all construction and demolition waste. Indicate compliance with this mandate.

.3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and/or recyclable materials and waste. Separate non-salvageable materials from salvaged items. Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes. Transport and deliver non-salvageable items to licensed disposal facility.

.4 Provide containers to deposit reusable and/or recyclable materials. Locate containers in locations, to facilitate deposit of materials without hindering daily operations. Provide containers to deposit reusable and/or recyclable materials.

.5 Collect, handle, store on-site and transport off-site, salvaged materials in separate condition. Transport to approved and authorized recycling facility and/or users of material for recycling.

.6 Locate waste and salvage bins on site as directed by Departmental Representative.

18 CLOSEOUT PROCEDURES

.1 Inspection and Declaration:

.1 Contractor's Inspection: Conduct an inspection of Work with all subcontractors, identify deficiencies and defects, and repair as required to conform to Contract

Documents.

.2 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.

.3 Request Departmental Representative's Inspection.

.2 Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.

.3 Completion: submit written certificate that following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Equipment and systems have been tested, adjusted and balanced and are fully operational.

.4 Certificates required by HRSDC Fire Protection Engineering, Utility companies have been submitted.

.5 Operation of systems have been demonstrated to Department's personnel.

.6 Work is complete and ready for Final Inspection.

.4 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

19 CLOSEOUT SUBMITTALS

.1 Record Drawings:

.1 As work progresses, maintain accurate records to show all deviations from the Contract Drawings. Note on as-built drawings as changes occur. At completion supply:

.1 Four (4) set of CD's in AutoCad file format (version: 2007) with all as-built information on the diskettes.

.2 Four (4) sets of printed as-built drawings.

.3 Submit one copy of check plots to Departmental Representative prior to final printing of as-built drawings.

.4 Departmental Representative will supply copies of the original AutoCad files.

.5 Retain original logo and title block on the as-built drawings. Contractor may place on the upper right-hand title block area a small company logo, the text "AS-BUILT" and the date.

.2 Costs for transferring as-built information from marked up working set of drawings to electronic format using ACAD and plotting service is included in the Contract.

.2 Maintenance manual:

.1 On completion of project submit to Departmental Representative four (4) CD R/ disk copies and four paper (in loose leaf type binder) of Operations and Maintenance Manual, made up as follows:

.1 Provide maintenance manual on CDs using pdf, or other approved format for descriptive writing, page size images and page size drawings. Organize manuals into industry standard maintenance manual tabs with links in index to each descriptive section describing the component or maintenance procedure etc.

.2 Organize files into CSI Masterformat numbering system or other approved descriptive titles.

.3 Label disk "Operation and Maintenance Data", project name, date, names of Contractor, subcontractors, consultants and sub consultants.
.4 Include scanned guarantees, diagrams and drawings.
.5 Organize contents into applicable sections of work to parallel project specification break-down. Mark each section by labeled tabs (navigational buttons).
.6 Drawings, diagrams and manufacturer's literature must be legible.
.7 Refer to Mechanical and Electrical Divisions for specific details for Mechanical and Electrical data.

.3 Maintenance Materials, Special Tools and Spare Parts:
.1 Specific requirements for maintenance materials, tools and spare parts are specified in individual sections.
.2 Deliver maintenance materials, special tools and spare parts to Departmental Representative and store in designated area as directed by Departmental Representative.
.3 Prepare lists of maintenance materials, special tools and spare parts for inclusion in Manual specified in Clause 18.2.
.4 Maintenance materials:
.1 Deliver wrapped, identify on carton or package, colour, room number, system or area as applicable where item is used.
.5 Special tools:
.1 Assemble as specified;
.2 Include identifications and instructions on intended use of tools.
.6 Spare parts:
.1 Assemble parts as specified;
.2 Include part number, identification of equipment or system for which parts are applicable;
.3 Installation instructions;
.4 Name and address of nearest supplier.

.4 Warranties and Bonds:
.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing in maintenance manual.
.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.
.4 Except for items put into use with Departmental Representative's permission, leave date of beginning of time of warranty until the Date of Interim Completion is determined.
.5 Verify that documents are in proper form, contain full information, and are notarized.
.6 Retain warranties and bonds until time specified for submittal.

20 DEMONSTRATION AND TRAINING

.1 Demonstration and Training:

.1 Demonstrate operation and maintenance of equipment and systems to maintenance personnel following interim Completion and prior to date of final certificate of completion

.2 Departmental Representative will provide list of personnel to receive instructions, and will coordinate their attendance at agreed-upon times.

END OF SECTION

1 PURPOSE

.1 To ensure that both the construction project and the institutional operations may proceed without undue disruption or hindrance and that the security of the Institution is maintained at all times.

2 DEFINITIONS

.1 "Contraband" means:
- .1 an intoxicant, including alcoholic beverages, drugs and narcotics
- .2 a weapon or a component thereof, ammunition for a weapon, and anything that is designed to kill, injure or disable a person or that is altered so as to be capable of killing, injuring or disabling a person, when possessed without prior authorization,
- .3 an explosive or a bomb or a component thereof,
- .4 currency over any applicable prescribed limit, $25.00, and
- .5 any item not described in paragraphs (a) to (d) that could jeopardize the security of a Penitentiary or the safety of persons, when that item is possessed without prior authorization.

.2 “Unauthorized smoking and related Items” means all smoking items including, but not limited to, cigarettes, cigars, tobacco, chewing tobacco, cigarette making machines, matches and lighters.

.3 "Commercial Vehicle" means any motor vehicle used for the shipment of material, equipment and tools required for the construction project.

.4 "CSC" means Correctional Service Canada.

.5 "Director" means Director, Warden or Superintendent of the Institution as applicable.

.6 "Construction employees" means persons working for the general contractor, the sub-contractors, equipment operators, material suppliers, testing and inspection companies and regulatory agencies.

.7 "Departmental Representative" means the Public Works and Government Services Canada representative defined in General Conditions.

.8 "Perimeter" means the fenced or walled area of the institution that restrains the movement of the inmates.

.9 "Construction limits" means the area, as indicated in the contract documents, that the contractor will be allowed to work". This area may or may not be isolated from the security area of the institution. Limits to be confirmed at construction start-up meeting.

3 PRELIMINARY PROCEEDINGS

.1 At construction start-up meeting:
- .1 Discuss the nature and extent of all activities involved in the Project.
- .2 Establish mutually acceptable security procedures in accordance with this instruction and the institution's particular requirements.

.2 The Contractors’s responsibilities:
- .1 Ensure that all construction employees are aware of the security requirements.
- .2 Ensure that a copy of the security requirements is always prominently on display at the job site.
- .3 Co-operate with institutional personnel in ensuring that security requirements are observed by all construction employees.

4 CONSTRUCTION EMPLOYEES

.1 Submit to the Departmental Representative a list of the names with date of birth of all construction employees to be employed on the construction site and a security clearance form for each employee.

.2 Allow 10 working days for processing of security clearances. Employees will not be admitted to the Institution without a valid security clearance in place and a recent picture identification such as a provincial driver's license. Security clearances obtained from other CSC institutions are not valid at this institution except as approved otherwise.

.3 The Director may require that facial photographs may be taken of construction employees and these photographs may be displayed at appropriate locations in the institution or in an electronic database for identification purposes. The Director may require that these Photo ID cards be provided for all construction workers. ID cards will then be left at the designated entrance to be picked up upon arrival at the Institution and be displayed prominently on the construction employees clothing at all times while employees are in the institution.

.4 Entry to Institutional Property will be refused to any person there may be reason to believe may be a security risk.

.5 Any person employed on the construction site will be subject to immediate removal from Institutional Property if they:
.1 appear to be under the influence of alcohol, drugs or narcotics.
.2 behave in an unusual or disorderly manner.
.3 are in possession of contraband.

5 VEHICLES

.1 All unattended vehicles on CSC property must have windows closed; fuel caps locked, doors and trunks locked and keys removed. The keys must be securely in the possession of the owner or an employee of the company that owns the vehicle.

.2 The director may limit at any time the number and type of vehicles allowed within the Institution.

.3 Drivers of delivery vehicles for material required by the project will require security clearances and must remain with their vehicle the entire time that the vehicle is in the Institution. The director may require that these vehicles be escorted by Institutional staff or PWGSC Construction Escorts while in the Institution.

.4 If the Director permits trailers to be left inside the secure perimeter of the Institution, the trailer doors must be locked at all times. All windows must be securely locked bars when left unoccupied. Cover all windows with expanded metal mesh. When not in use lock all storage trailers located inside and outside the perimeter.

6 PARKING

.1 The parking area(s) to be used by construction employees will be designated by the Director. Parking in other locations will be prohibited and vehicles may be subject to removal.

7 SHIPMENTS

.1 To avoid confusion with the institution's own shipments, address all shipments of project material, equipment and tools in the Contractor’s name and have a representative on site to receive any deliveries or shipments. CSC or PWGSC staff will **NOT** accept receipt of deliveries or shipments of any material equipment or tools.

8 TELEPHONES

.1 The installation of telephones, facsimile machines and computers with Internet connections is not permitted within the Institution perimeter unless prior approved by the Director.

.2 The Director will ensure that approved telephones, facsimile machine and computers with Internet connections are located where they are not accessible to inmates. All computers will have an approved

password protection that will stop an Internet connection to unauthorized personnel.

.3 Wireless cellular and digital telephones, including but not limited to devices for telephone messaging, pagers, Blackberries, telephone used as 2-way radios are not permitted within the Institution unless approved by the Director. If wireless cellular telephones are permitted, the user will not permit their use by any inmate.

.4 The Director may approve but limit the use of 2-way radios.

9 WORK HOURS

.1 Conform to Division 1.

.2 Work is not permitted during weekends and statutory holidays without the permission of the Director. A minimum of seven days advance notice will be required to obtain the required permission. In case of emergencies or other special circumstances, this advance notice may be waved by the Director.

10 OVERTIME WORK

.1 Conform to Division 1.

.2 Provide 48 hours advance notice to Director for all work to be performed after normal working hours of the Institution. Notify Director immediately if emergency work is required, such as to complete a concrete pour or make the construction site safe and secure.

11 TOOLS AND EQUIPMENT

.1 Maintain a complete list of all tools and equipment to be used during the construction project. Make this inventory available for inspection when required by the Institution.

.2 Throughout the construction project maintain up-to-date the list of tools and equipment specified above.

.3 Keep all tools and equipment under constant supervision, particularly power-driven and cartridge-driven tools, cartridges, files, saw blades, rod saws, wire, rope, ladders and any sort of jacking device.

.4 Store all tools and equipment in approved secure locations.

.5 Lock all tool boxes when not in use. Keys to remain in the possession of the employees of the contractor. Secure and lock scaffolding when not erected and when erected Secure in a manner agreed upon with the Institution designate.

.6 Report all missing or lost tools or equipment immediately to the Departmental Representative/Director.

.7 The Director will ensure that the security staff members carry out checks of the Contractor's tools and equipment against the list provided by the Contractor. These checks may be carried out at the following intervals:

.1 At the beginning and conclusion of every work day or shift upon entering and exiting the Institution.

.2 At any time when contractor is on Institution property.

.8 Certain tools/equipment such as cartridges and hacksaw blades are highly controlled items. The contractor will be given at the beginning of the day, a quantity that will permit one day's work. Used blades/cartridges will be returned to the Director's representative at the end of each day. Maintain

up to date inventory of all used blades/cartridges.

.9 If propane or natural gas is used for heating the construction, the institution will require that the contractor supervise the construction site during non-working hours.

12 KEYS

.1 Security Hardware Keys.
- .1 Arrange with the security hardware supplier/installer to have the keys for the security hardware to be delivered directly to Institution, specifically the Security Maintenance Officer (SMO).
- .2 The SMO will provide a receipt to the Contractor for security hardware keys.
- .3 Provide a copy of the receipt to the Departmental Representative.

.2 Other Keys
- .1 Use standard construction cylinders for locks for his use during the construction period.
- .2 Issue instructions to employees and sub-trades, as necessary, to ensure safe custody of the construction set of keys.
- .3 Upon completion of each phase of the construction, the CSC representative will, in conjunction with the lock manufacturer:
  - .1 Prepare an operational keying schedule
  - .2 Accept the operational keys and cylinders directly from the lock manufacturer.
  - .3 Arrange for removal and return of the construction cores and install the operational core in all locks.
- .4 Upon putting operational security keys into use, the PWGSC construction escort shall obtain these keys as they are required from the SMO and open doors as required by the Contractor. The Contractor shall issue instructions to his employees advising them that all security keys shall always remain with the PWGSC construction escort.

13 SECURITY HARDWARE

.1 Turn over all removed security hardware to the Director of the Institution for disposal or for safekeeping until required for re-installation.

14 PRESCRIPTION DRUGS

.1 Employees of the contractor who are required to take prescription drugs during the workday shall obtain approval of the Director to bring a one day supply only into the Institution.

15 SMOKING RESTRICTIONS

.1 Smoking is not permitted inside correctional facilities or outdoors within the perimeter of a correctional facility and persons must not possess unauthorized smoking items within the perimeter of a correctional facility.

.2 Persons in violation of this policy will be requested to immediately cease smoking or dispose of any unauthorized smoking items and, if they persist will be directed to leave the Institution.

.3 Smoking is permitted outside the perimeter of a correctional facility in an area designated by the Director.

16 CONTRABAND

.1 Weapons, ammunition, explosives, alcoholic beverages, drugs and narcotics are prohibited on institutional property.

.2 The discovery of contraband on the construction site and the identification of the person(s) responsible for the contraband shall be reported immediately to the Director.

.3 Contractors should be vigilant with both their staff and the staff of their sub-contractors and suppliers that the discovery of contraband may result in cancellation of the security clearance of the affected employee. Serious infractions may result in the removal of the company from the Institution for the duration of the construction.

.4 Presence of arms and ammunition in vehicles of contractors, sub-contractors and suppliers or employees of these will result in the immediate cancellation of security clearances for the driver of the vehicle.

17 SEARCHES

.1 All vehicles and persons entering institutional property may be subject to search.

.2 When the Director suspects, on reasonable grounds, that an employee of the Contractor is in possession of contraband, he may order that person to be searched.

.3 All employees entering the Institution may be subject to screening of personal effects for traces of contraband drug residue.

18 ACCESS TO AND REMOVAL FROM INSTITUTIONAL PROPERTY

.1 Construction personnel and commercial vehicles will not be admitted to the institution after normal working hours, unless approved by the Director.

19 MOVEMENT OF VEHICLES

.1 Escorted commercial vehicles may not be allowed to enter or leave the institution through the vehicle access gate during the regular “inmate count” occurring at breakfast, lunch and dinner hour as established by the Institution. Confirm “count” times with Director or Departmental Representative to reduce down times for deliveries to Institution and movement of contractors vehicles through Institution vehicle access gate.

.2 Construction vehicles will not be allowed to leave the Institution until an inmate count is completed.

.3 The contractor shall advise the Director twenty four (24) hours in advance to the arrival on the site of heavy equipment such as concrete trucks, cranes, etc.

.4 Vehicles being loaded with soil or other debris, or any vehicle considered impossible to search, must be under continuous supervision by CSC staff or PWGSC construction escorts working under the authority of the Director.

.5 Commercial vehicles will only be allowed access to institutional property when their contents are certified by the Contractor or his representative as being strictly necessary to the execution of the construction project.

.6 Vehicles shall be refused access to institutional property if, in the opinion of the Director, they contain any article which may jeopardize the security of the institution. Arrange with Director for parking of contractor’s vehicles at minimum security Institutions.

.7 Private vehicles of construction employees will not be allowed within the security wall or fence of medium or maximum security institutions without the permission of the Director.

.8 With prior approval of the Director, a vehicle may be used in the morning and evening to transport a group of employees to the work site. This vehicle will not remain within the Institution the remainder of the day.

.9 With the approval of the Director, certain equipment may be permitted to remain on the construction

site overnight or over the weekend. This equipment must be securely locked, with the battery removed. The Director may require that the equipment be secured with a chain and padlock to another solid object.

20 MOVEMENT OF CONSTRUCTION EMPLOYEES ON INSTITUTIONAL PROPERTY

.1 Subject to the requirements of good security, the Director will permit the Contractor and his employees as much freedom of action and movement as is possible.

.2 However, notwithstanding paragraph above, the Director may:
- .1 Prohibit or restrict access to any part of the institution.
- .2 Require that in certain areas of the institution, either during the entire construction project or at certain intervals, construction employees only be allowed access when accompanied by a member of the CSC security staff.

.3 During the lunch and coffee/health breaks, all employees will remain within the construction site. Employees are not permitted to eat in the officer's lounge and dining room.

21 SURVEILLANCE AND INSPECTION

.1 Construction activities and all related movement of personnel and vehicles will be subject to surveillance and inspection by CSC security staff members to ensure that established security requirements are met.

.2 CSC staff members will ensure that an understanding of the need to carry out surveillance and inspections, as specified above, is established among construction employees and maintained throughout the construction project.

22 STOPPAGE OF WORK

.1 The director may request at any time that the contractor, his employees, sub-contractors and their employees not enter or leave the work site immediately due to a security situation occurring within the Institution. The contractor's site supervisor shall note the name of the staff member making the request and the time of the request and obey the order as quickly as possible.

.2 The contractor shall advise the Departmental Representative within 24 hours of this delay to the progress of the work.

23 CONTACT WITH INMATES

.1 Unless specifically authorized, it is forbidden to come into contact with inmates, to talk with them, to receive objects from them or to give them objects. Any employee doing any of the above will be removed from the site and his security clearance revoked.

.2 It is forbidden to take pictures of inmates, of CSC staff members or of any part of the Institution other than those required as part of this contract.

END OF SECTION

1 REFERENCES

.1 Government of Canada:
- .1 Canada Labour Code - Part II.
- .2 Canada Occupational Health and Safety Regulations.

.2 American National Standards Institute (ANSI):
- .1 ANSI A10.3-2006, – Safety Requirements for Powder-Actuated Fastening Systems ANSI for Construction and Demolition Operations

.3 Canadian Standards Association (CSA):
- .1 CSA Z797-2009 Code of Practice for Access Scaffold.

.4 HRSDC Fire Protection Engineering Section:
- .1 FCC No. 301-1982, Standard for Construction Operations.

.5 National Building Code of Canada (NBCC 2005):
- .1 Part 8, Safety Measures at Construction and Demolition Sites

.6 Province of British Columbia Building Code (2006):
- .1 Part 8, Safety Measures at Construction and Demolition Sites.

.7 Province of British Columbia:
- .1 Workers Compensation Act Part 3 - Occupational Health & Safety.
- .2 Occupational Health & Safety Regulations.

2 RELATED SECTIONS

.1 Section 01 01 50 - General Instructions for; Submittals procedures, Section Temporary utilities, Construction facilities and Temporary barriers and enclosures.

3 WORKERS' COMPENSATION BOARD COVERAGE

.1 Comply fully with the Workers' Compensation Act, regulations and orders made pursuant thereto, and any amendments up to the completion of the work.

.2 Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.

4 COMPLIANCE WITH REGULATIONS

.1 PWGSC may terminate the Contract without liability to PWGSC where the Contractor, in the opinion of PWGSC, refuses to comply with a requirement of the Workers' Compensation Act or the Occupational Health and Safety Regulations.

.2 It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

5 **SUBMITTALS**

.1 Make submittals in accordance with Section 01 01 50 General Instructions for Submittals.

.2 Submit the following:
- .1 Health and Safety Plan.
- .2 Copies of reports or directions issued by federal and provincial health and safety inspectors.
- .3 Copies of incident and accident reports.
- .4 Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
- .5 Emergency Procedures.

.3 The Departmental Representative will review the Contractor's site-specific project Health and Safety Plan and emergency procedures, and provide comments to the Contractor within 5 days after receipt of the plan. Revise the plan as appropriate and resubmit to Departmental Representative for review.

.4 No work can start until the Health and Safety Plan has been submitted and approved.

.5 Medical surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of work, and submit additional certifications for any new site personnel to Departmental Representative.

.6 Submission of the Health and Safety Plan, and any revised version, to the Departmental Representative is for information and reference purposes only. It shall not:
- .1 Be construed to imply approval by the Departmental Representative.
- .2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.
- .3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

6 RESPONSIBILITY

.1 Assume responsibility as the Prime Contractor for work under this contract and appoint a qualified coordinator for the purpose of ensuring the coordination of health and safety activities for the location in accordance with sections 118 and 119 of Part 3 of the Workers Compensation Act.

.2 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.3 Comply with and enforce compliance by employees with safety requirements of Contract documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

7 **HEALTH AND SAFETY COORDINATOR**

.1 The Health and Safety Coordinator (Registered Occupational Hygienist, Certified Industrial Specified Hygienist) must:
- .1 Be responsible for completing all health and safety training, and ensuring that personnel

that do not successfully complete the required training are not permitted to enter the site to perform work.

.2 Be responsible for implementing, daily enforcing, and monitoring the site-specific Health and Safety Plan.

.3 Be on site during execution of work.

8 GENERAL CONDITIONS

.1 Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.

.2 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.

.1 Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.

.2 Secure site after working hours in accordance with Section 01 14 10 - Security Requirements.

9 PROJECT/SITE CONDITIONS

.1 Work at site will involve:

.1 Working in areas where inmates may be present who are under supervision by CSC staff. Conform to Security Requirements Section 01 41 10 Contact with Inmates clause and other security requirements pertaining to a CSC institution.

10 REGULATORY REQUIREMENTS

.1 Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at site.

.2 In event of conflict between any provision of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will advise on the course of action to be followed.

11 FILING OF NOTICE

.1 Submit a Notice of Project, form 52E49, to WorkSafeBC in accordance with OH&S Regulation 20.2, at least 24 hours before start of work.

.2 Submit copy to Departmental Representative.

12 HEALTH AND SAFETY PLAN

.1 Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risks and safety hazards.

.2 Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:

.1 Primary requirements:

.1 Contractor's safety policy.

.2 Identification of applicable compliance obligations.

.3 Definition of responsibilities for project safety/organization chart for project.

.4 General safety rules for project.
.5 Job-specific safe work, procedures.
.6 Inspection policy and procedures.
.7 Incident reporting and investigation policy and procedures.
.8 Occupational Health and Safety Committee/Representative procedures.
.9 Occupational Health and Safety meetings.
.10 Occupational Health and Safety communications and recordkeeping procedures.

.2 Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.
.3 List hazardous materials to be brought on site as required by work.
.4 Indicate engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.
.5 Identify personal protective equipment (PPE) to be used by workers.
.6 Identify personnel and alternates responsible for site safety and health.
.7 Identify personnel training requirements and training plan, including site orientation for new workers.

.3 Develop the plan in collaboration with all subcontractors. Ensure that work/activities of subcontractors are included in the hazard assessment and are reflected in the plan.

.4 Revise and update Health and Safety Plan as required, and re-submit to the Departmental Representative.

.5 Departmental Representative's review: the review of Health and Safety Plan by Public Works and Government Services Canada (PWGSC). PWGSC's review shall not relieve the Contractor of responsibility for errors or omissions in final Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract documents.

13 EMERGENCY PROCEDURES

.1 List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (i.e. names/telephone numbers) of:
.1 Designated personnel from own company.
.2 Regulatory agencies applicable to work and as per legislated regulations.
.3 Local emergency resources.
.4 Departmental Representative.

.2 Include the following provisions in the emergency procedures:
.1 Notify workers of the nature and location of the emergency.
.2 Evacuate all workers safely.
.3 Check and confirm the safe evacuation of all workers.
.4 Notify the fire department or other emergency responders.
.5 Notify adjacent workplaces which may be affected if the risk extends beyond the workplace.
.6 Notify Departmental Representative.

.3 Provide written rescue/evacuation procedures as required for, but not limited to:
.1 Work at high angles.
.2 Work in confined spaces or where there is a risk of entrapment.
.3 Work with hazardous substances.
.4 Underground work.

14 HAZARDOUS PRODUCTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials, and regarding labeling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canada Labour Code.

.2 Where use of hazardous and toxic products cannot be avoided:

.1 Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents in accordance with clause 5.2.4.

15 ELECTRICAL SAFETY REQUIREMENTS

.1 Comply with authorities and ensure that, when installing new facilities or modifying existing facilities, all electrical personnel are completely familiar with existing and new electrical circuits and equipment and their operation.

.1 Before undertaking any work, coordinate required energizing and de-energizing of new and existing circuits with Departmental Representative.

.2 Maintain electrical safety procedures and take necessary precautions to ensure safety of all personnel working under this Contract, as well as safety of other personnel on site.

16 ELECTRICAL LOCKOUT

.1 Develop, implement and enforce use of established procedures to provide electrical lockout and to ensure the health and safety of workers for every event where work must be done on any electrical circuit or facility.

.2 Prepare the lockout procedures in writing, listing step-by-step processes to be followed by workers, including how to prepare and issue the request/authorization form. Have procedures available for review upon request by the Departmental Representative.

.3 Keep the documents and lockout tags at the site and list in a log book for the full duration of the Contract. Upon request, make such data available for viewing by Departmental Representative or by any authorized safety representative.

17 OVERLOADING

.1 Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation.

18 FALSEWORK

.1 Design and construct false work in accordance with CSA S269.1.

19 SCAFFOLDING

.1 Design, construct and maintain scaffolding in a rigid, secure and safe manner, in accordance with CSA Z797-2009 Code of Practice for Access Scaffold and BC Occupational Health and Safety Regulations.

20 CONFINED SPACES

.1 Carry out work in confined spaces in compliance with provincial regulations.

21 POWDER-ACTUATED DEVICES

.1 Use powder-actuated devices in accordance with ANSI A10.3 only after receipt of written permission from the Departmental Representative.

22 FIRE SAFETY AND HOT WORK

.1 Obtain Departmental Representative's authorization before any welding, cutting or any other hot work operations can be carried out on site.

.2 Hot work includes cutting/melting with use of torch, flame heating roofing kettles, or other open flame devices and grinding with equipment which produces sparks.

23 FIRE SAFETY REQUIREMENTS

.1 Store oily/paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

24 FIRE PROTECTION AND ALARM SYSTEM

.1 Do not obstruct, shut-off or leave inactive at the end of a working day or shift, the fire protection and alarm systems.

.2 Do not use fire hydrants for purposes other than firefighting.

.3 Be responsible/liable for costs incurred from the fire department and the Departmental Representative, resulting from false alarms.

25 UNFORESEEN HAZARDS

.1 Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the work, immediately stop work and advise the Departmental Representative verbally and in writing.

26 POSTED DOCUMENTS

.1 Post legible versions of the following documents on site:
- .1 Health and Safety Plan.
- .2 Sequence of work.
- .3 Emergency procedures.
- .4 Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.

.5 Notice of Project.
.6 Floor plan(s).
.7 Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.
.8 Workplace Hazardous Materials Information System (WHMIS) documents.
.9 Material Safety Data Sheets (MSDS).
.10 List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.

.2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, visible to all workers and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupied areas.

.3 Postings should be protected from the weather, and visible from the street or the exterior of the principal construction site shelter provided for workers and equipment, or as approved by the Departmental Representative.

27 MEETINGS

.1 Attend health and safety pre-construction meeting and all subsequent meetings called by the Departmental Representative.

28 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by the Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.

.3 The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time. The Contractor will be responsible for any costs arising from such a "stop work order".

END OF SECTION

1 RELATED SECTIONS

.1 Section 01 01 50 - General Instructions for training.

.2 Division 22- Plumbing.

.3 Division 23 - Heating, Ventilating and Air-Conditioning.

.4 Division 25 - Integrated Automation (EMCS).

.5 Division 26 - Electrical.

.6 Division 28 - Electronic Safety and Security.

2 DEFINITIONS

.1 Acronyms:
- .1 Cx - Commissioning.
- .2 EMCS - Energy Monitoring and Control Systems.
- .3 O&M - Operation and Maintenance.
- .4 PI - Product Information.
- .5 PV - Performance Verification.
- .6 TAB - Testing, Adjusting and Balancing.

3 QUALITY ASSURANCE

.1 Testing organization: current member in good standing of AABC certified to perform specified services.

.2 Comply with applicable procedures and standards of the certification sponsoring association.

.3 Perform services under direction of supervisor qualified under certification requirements of sponsoring association.

4 REFERENCES

.1 Associated Air Balance Council (AABC): National Standards for Field Measurement and Instrumentation, Total Systems Balance, Air Distribution-Hydronics Systems.

5 SUBMITTALS

.1 Submit test reports in accordance with Section 01 01 50 - General Instructions; Submittal Clause.

.2 Prior to start of Work, submit name of organization proposed to perform services. Designate who has managerial responsibilities for coordination of entire testing, adjusting and balancing.

.3 Prior to start of Work, designate who has managerial responsibilities for coordination of entire testing and adjusting of electronic equipment.

.4 Submit documentation to confirm organization compliance with quality assurance provision.

.5 Submit 3 preliminary specimen copies of each of report forms proposed for use.

.6 Ten (10) days prior to Substantial Performance, submit 3 copies of final reports on applicable forms.

.7 Submit reports of testing, adjusting and balancing postponed due to seasonal, climatic, occupancy, or other reasons beyond Contractor's control, promptly after execution of those services.

6 PROCEDURES - GENERAL

.1 Comply with procedural standards of certifying association under whose standard services will be performed.

.2 Notify Departmental Representative 3 days prior to beginning of operations.

.3 Accurately record data for each step.

.4 Report to Departmental Representative any deficiencies or defects noted during performance of services.

7 CONTRACTOR'S RESPONSIBILITY

.1 Prepare each system for testing and balancing.

.2 Cooperate with testing organization and provide access to equipment and systems.

.3 Provide personnel and operate systems at designated times, and under conditions required for proper testing, adjusting, and balancing.

.4 Notify testing organization 7 days prior to time project will be ready for testing, adjusting, and balancing.

8 PREPARTATION

.1 Provide instruments required for testing and adjusting operations.

.2 Make instruments available to Departmental Representative to facilitate spot checks during testing.

.3 Test electronic system for proper operation and programming.

9 FINAL REPORTS

.1 Reports to be completed by organization having managerial responsibility.

.2 Ensure each form bears signature of recorder and his supervisor.

10 COMPLETION OF COMMSSIONING

.1 Upon completion of Cx leave systems in specified operating and program mode.

.2 Complete Cx prior to issuance of Substantial Completion.

.3 Cx deliverables have been submitted and accepted by Departmental Representative.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.

.2 References - Federal Legislation

.1 Canadian Environmental Assessment Act (CEAA), 2012, c. 37.

.2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.

.3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.2 SUBMITTALS

.1 Submit shop drawings in accordance with Section 01 01 50 - General Instructions].

.2 Before proceeding with demolition of slab on grade and excavation adjacent to existing building and where required by authority having jurisdiction submit for review by Departmental Representative shoring and underpinning drawings prepared by qualified professional engineer registered or licensed in the Province of British Columbia, showing proposed method.

.3 Prior to beginning of Work on site submit detailed Waste Reduction Workplan in accordance with Sections 01 01 50 - General Instructions and indicate:

.1 Descriptions of and anticipated quantities in percentages of materials to be salvaged reused, recycled and landfilled.

.2 Schedule of selective demolition.

.3 Number and location of dumpsters.

.4 Anticipated frequency of tippage.

.5 Name and address of haulers and waste receiving organizations.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 01 50 - General Instructions.

1.4 REGULATORY REQUIREMENTS

.1 Comply with WCB Industrial Health and Safety Regulations and Canada Labour code Canada Occupational Safety and Health Regulations.

1.5 EXISTING CONDITIONS

.1 Take over areas where demolition / removal work is indicated based on the condition at the time of examination prior to tendering.

.2 Should unidentified Asbestos Containing Materials (ACM) or other hazardous substance encountered in course of removal work or cutting and boring activities, stop work, take preventive measures, and notify Departmental Representative. immediately. Do not proceed until written instructions have been received from the Departmental Representative.

.3 Unidentified hazardous material removal is additional work and will be paid either as an extra to the contract price in accordance with General Conditions, or removed under a separate contract by the Departmental Representative.

.4 The existing building will be occupied and operational by the Institution during the work of this Contract. Maintain building access around protected work areas.

1.6 PROTECTION

.1 Protect adjoining floor areas from migrating dust and fumes from work area.

.2 At end of each day's work, leave work in safe and secure condition.

.3 Clean up and remove debris and materials not being reinstalled.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 PREPARATION

.1 Prior to beginning work, inspect site, building and work areas with Departmental Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage, storage and items to remain.

.2 Locate and protect utilities. Preserve active utilities traversing site and existing building in operating condition.

.3 Notify and obtain approval of utility companies before starting demolition.

.4 Disconnect, cap, plug or divert, as required, existing public utilities within the property where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal

and vertical) on the record drawings. Support, shore up and maintain pipes and conduits encountered.

.1 Immediately notify Departmental Representative and utility company concerned in case of damage to any utility or service, designated to remain in place.

.2 Immediately notify the Engineer should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.

3.2 PROTECTION

.1 Prevent movement, settlement, or damage to adjacent structures, utilities, and landscaping features and parts of building to remain in place. Provide bracing and shoring required.

.2 Keep noise, dust, and inconvenience to occupants to minimum.

.3 Protect building systems, services and equipment.

.4 Provide temporary dust screens, covers, railings, supports and other protection as required.

.5 Protect adjoining floor areas from migrating dust and fumes from work areas.

.6 At end of each day's work, leave work in safe and secure conditions. Clean up and remove debris and materials not being reinstalled.

.7 Comply with WCB Industrial Health and Safety regulations, Canada Labour Code, Canada Occupational Safety and Health Regulations.

.8 Do Work in accordance with Section 01 35 33 - Health and Safety Requirements.

3.3 SALVAGE

.1 Refer to demolition drawings and specifications for items to be salvaged for reuse.

.2 Remove items to be reused, store as directed by Departmental Representative, and re-install under appropriate section of specification.

3.4 SITE REMOVALS

.1 Site Verification of Conditions:

.1 Investigate site and building to determine removal work, processing and storage logistics required prior to beginning of Work.

.2 Inspect work area with Departmental Representative to verify extent and location of items designated for removal and disposal and items to remain.

.3 Locate and protect building system. Preserve active systems in operating condition serving remainder of site and building.

.2 Remove items as indicated and required.

.3 Removal of Pavements, Curbs and Slabs:

.1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by Departmental Representative.

.2 Protect adjacent joints and load transfer devices.

.3 Protect underlying and adjacent granular materials.

3.5 DEMOLITION

.1 Remove parts of existing building site to permit new construction. Sort materials into appropriate piles for reuse and recycling.

.2 Trim edges of partially demolished building elements to tolerances as defined by Departmental Representative to suit future use.

3.6 CUTTING AND PATCHING

.1 General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay:

.1 Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

.2 Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations:

.1 In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

.2 Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

.3 Concrete or Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond core drill.

.4 Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.

.5 Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.

.6 Proceed with patching after construction operations requiring cutting are complete.

.3 Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable

seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications:

.1 Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

.2 Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

.3 Floors and Walls: Where walls or partitions that are removed extend from one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, colour, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform colour and appearance:

.1 Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

.4 Ceilings: Patch, repair, or re-hang existing ceilings as necessary to provide an even plane surface of uniform appearance.

.5 Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather tight condition.

3.7 DISPOSAL

.1 Dispose of removed materials, to appropriate recycling facilities except where specified otherwise, in accordance with authority having jurisdiction.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 01 50 - General Instructions.

.2 Section 02 41 99 – Demolition for Minor Works.

1.2 REFERENCES

.1 Reports:

.1 "Hazardous Building Materials Assessments – 55 Buildings/Structures at CSC Mission Minimum Institution, Mission, British Columbia", prepared by Stantec Consulting Ltd., dated November 9, 2017 (further referred to herein as the Assessment Report) – the applicable report section for the Institutional Services Building is attached in the Appendix of the Project Specifications.

.2 Definitions:

.1 Dangerous Goods: product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

.2 Hazardous Material: product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.3 Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.4 Hazardous Building Material: component of a building or structure that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when altered, disturbed or removed during maintenance, renovation or demolition.

.3 Reference Standards:

.1 Canadian Environmental Protection Act,1999 (CEPA 1999)

.1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).

.2 Department of Justice Canada

.1 Transportation of Dangerous Goods Act, 1992 (TDG Act) [1992], (c. 34).

.2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).

.3 Canada Labour Code

.1 Part II – Occupational Health and Safety

.3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.4 National Research Council Canada Institute for Research in Construction (NRC-IRC)

.1 National Fire Code of Canada (2010).

.5 WorkSafe BC

.1 British Columbia's Occupational Health and Safety Regulation (BC Reg. 296/97, including amendments to date of work)

.2 "Safe Work Practices for Handling Asbestos" (2017)

.3 "Lead-Containing Paints and Coatings; Preventing Exposure in the Construction Industry" (2011)

.4 "Safe Work Practices for Handling Lead" (2017)

.6 British Columbia Hazardous Waste Regulation (BC Reg. 63/88)

.7 The Federal PCB Regulations (SOR/2008-273).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section Section 01 01 50 General Instructions.

.2 Product Data for hazardous materials to be used by the Contractor to complete the Work:

.1 Submit manufacturer's instructions, printed product literature and data sheets, and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 33 - Health and Safety Requirements to Departmental Representative for each hazardous material required prior to bringing hazardous material on site.

.3 Submit hazardous materials management plan to Departmental Representative that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements.

.4 Low-Emitting Materials: submit listing of adhesives and sealants used in building, comply with VOC and chemical component limits or restrictions requirements.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle hazardous materials to be used by the Contractor to complete the Work in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver hazardous materials to be used by the Contractor to site in original factory packaging, labelled with manufacturer's name and address.

.3 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

.4 Storage and Handling Requirements:

.1 Co-ordinate storage of hazardous materials to be used by the Contractor to complete the Work with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.

.2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

.3 Store and handle flammable and combustible materials in accordance with National Fire Code of Canada requirements.

.4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.

.1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.

.2 Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Departmental Representative.

.5 Transfer of flammable and combustible liquids is prohibited within buildings.

.6 Transfer flammable and combustible liquids away from open flames or heat-producing devices.

.7 Solvents or cleaning agents must be non-flammable or have flash point above 38 degrees C.

.8 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.

.9 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.

.10 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:

.1 Store hazardous materials and wastes in closed and sealed containers.

.2 Label containers of hazardous materials and wastes in accordance with WHMIS.

.3 Store hazardous materials and wastes in containers compatible with that material or waste.

.4 Segregate incompatible materials and wastes.

.5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.

.6 Store hazardous materials and wastes in secure storage area with controlled access.

.7 Maintain clear egress from storage area.

.8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.

.9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.

.10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.

.11 When hazardous waste is generated on site:

.1 Co-ordinate transportation and disposal with Departmental Representative.

.2 Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.

.3 Use licensed carrier authorized by provincial authorities to accept subject material.

.4 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material.

.5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.

.6 Only trained personnel handle, offer for transport, or transport dangerous goods.

.7 Provide photocopy of shipping documents and waste manifests to Departmental Representative.

.8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to Departmental Representative.

.9 Report discharge, emission, or escape of hazardous materials immediately to Departmental Representative and appropriate provincial authority. Take reasonable measures to control release.

.12 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

.13 Report spills or accidents immediately to Departmental Representative. Submit a written spill report to Departmental Representative within 24 hours of incident.

Part 2 Products

2.1 MATERIALS

.1 Description:

.1 Bring on site only quantities hazardous material required to perform Work.

.2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

Part 3 Execution

3.1 HAZARDOUS MATERIALS ABATEMENT

.1 Scope of Abatement Activities.

.1 Abatement shall be conducted to handle, alter, remove and/or dispose of hazardous building materials as identified in the Assessment Report in

accordance with applicable regulations, guidelines, standards and/or best practices for such work, where such identified hazardous building materials will be impacted (handled, altered, damaged, removed) by the Work.

.2 Contractor is responsible for reviewing plans, specifications and reports such that they understand the locations and amounts of hazardous materials that will be impacted by the Work of this contract, and such that appropriate plans and budgets can be included in their overall bids.

.3 The listing below is a summary of the identified hazardous building material categories and associated removal and disposal regulations, guidelines and/or standards.

.1 Asbestos-Containing Materials (ACMs)

.1 Refer to the Assessment Report for identities and locations of ACMs that may require disturbance during the Work. In summary, the following ACMs are known to be present in the building:

.1 Black (painted yellow) sealant applied to the threads of natural gas fittings

.2 Blue sealant applied to the threads of sprinkler system pipes

.2 Actions that will disturb identified ACMs are to be conducted in accordance with the requirements of the 2017 WorkSafe BC publication “Safe Work Practices for Handling Asbestos”, by appropriately trained personnel.

.1 Contractor is to conduct a risk assessment and document work procedures for actions/tasks that will or may disturb identified ACMs.

.2 Contractor is to submit the documented work procedures to the Departmental Representative for review, at least 10 days prior to initiation of work.

.3 Contractor must not proceed with work that will impact identified ACMs without approval from Departmental Representative.

.4 If air monitoring is required as part of the Contractor’s work procedures, the Contractor will be required to retain and pay for an independent, qualified (as defined in the current version of British Columbia’s Occupational Health and Safety Regulation) third part to conduct monitoring as necessary.

.5 If, in the opinion of the Departmental Representative, the work procedures developed by the Contractor do not meet the intent of the 2017 WorkSafeBC publication “Safe Work Practices for Handling Asbestos”, revisions will be required, at no cost to the Owner, and at no impact to the schedule.

.3 Waste transportation to be conducted in accordance with BC Reg. 63/88 and the Federal Transportation of Dangerous Goods Regulation.

.4 Waste disposal to be conducted in accordance with BC Reg. 63/88.

.5 Notify Departmental Representative of suspected ACM discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from DCC Representative.

.2 Lead and Lead-Containing Paints (LCPs)

.1 Refer to the Assessment Report for identities and locations of lead-containing materials (including LCPs) that may require disturbance during the Work.

.2 Actions that will disturb lead-containing materials (including paints and materials coated with LCPs) are to be conducted in accordance with the requirements of the 2017 WorkSafe BC publication “Safe Work Practices for Handling Lead”, keeping airborne exposure to lead dust to less than the 8-hour Occupational Exposure Limit (OEL) for lead of 0.05 milligram per cubic metre (mg/m^3).

.1 Actual methods to maintain exposures within applicable limits are to be determined by the contractor through their own risk assessment, which will take into account the lead content of the paints as indicated herein, along with their planned disturbance methods (and associated dust control), tools, PPE and the overall duration of the work.

.3 Although LCPs and items coated with LCPs may be disturbed and/or removed for disposal during the Work, unless deemed necessary through risk assessment or cost analysis conducted by the Contractor, comprehensive removal of LCPs from items or surfaces is not expected to be required during the Work.

.1 Refer to the provisions of the 2017 WorkSafeBC document “Safe Work Practices for Handling Lead” for removal of LCPs from surfaces before any welding and torch-cutting, should the Contractor plan to use such methods to complete the Work.

.1 Contractor will be responsible for verification testing of surfaces where LCPs have been removed. Confirmation of acceptable results is to be provided to the Departmental Representative for review before proceeding with any welding or torch-cutting on surfaces where LCPs were present.

.4 Waste transportation to be conducted in accordance with BC Reg. 63/88 and the Federal Transportation of Dangerous Goods Regulation.

.5 Waste disposal to be conducted in accordance with BC Reg. 63/88.

.3 Polychlorinated Biphenyls (PCBs)

.1 Removal, alteration and/or disposal of PCB-containing equipment is not anticipated to be required during the Work.

.4 Mould

.1 Removal, alteration and/or disposal of mould-impacted materials is not anticipated to be required during the Work.

.5 Mercury

.1 Refer to the Assessment Report for identities and locations of mercury-containing equipment that may require disturbance during the Work.

.2 Precautions should be taken if workers may potentially be exposed to mercury or mercury vapours to ensure that workers exposure levels do not exceed the occupational exposure limit of 0.025 mg/m^3 as per the BC Reg. 296/97. This can be achieved by providing respiratory and skin protection applicable to the hazard and task to be completed.

.3 Waste transportation to be conducted in accordance with BC Reg. 63/88 and the Federal Transportation of Dangerous Goods Regulation.

.4 Waste disposal to be conducted in accordance with BC Reg. 63/88.

.6 Ozone-Depleting Substances (ODSs)

.1 Refer to the Assessment Report for identities and locations of ODSs that may require disturbance during the Work.

.2 If ODS-containing equipment is to be removed for renovation or demolition activities, ODSs must be recovered, handled, recycled, stored, and/or disposed of in accordance with the requirements of the following:

.1 British Columbia Waste Management Act—Ozone Depleting Substances and Other Halocarbons Regulation (BC Reg. 387/99 as amended by BC Reg. 109/2002)

.2 Transportation requirements of the Federal Transportation of Dangerous Goods Regulation

.3 Federal Halocarbons Regulations

.7 Silica

.1 When silica-containing materials are to be disturbed and/or removed, ensure dust control measures are employed such that airborne silica dust concentrations do not exceed the exposure limit as stipulated by BC Reg. 296/97 (Cristobalite and Quartz – each 0.025 mg/m^3). This would include, but not be limited to, the following:

.1 Providing workers with respiratory protection

.2 Wetting the surface of the materials, use of water or dust suppressing agents to prevent dust emissions

.3 Providing workers with facilities to properly wash prior to exiting the work area.

3.2 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 01 50 General Instructions. Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section Section 01 01 50 General Instructions..

.3 Waste Management: separate waste materials for reuse and recycling.

.1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.

.2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.

.3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.

.4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.

.5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.

.6 Dispose of hazardous wastes in timely fashion in accordance with applicable federal and provincial regulations.

.7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

.8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:

.1 Hazardous wastes recycled in manner constituting disposal.

.2 Hazardous waste burned for energy recovery.

.3 Lead-acid battery recycling.

.4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

1 General

1.1 RELATED WORK

.1 Fire stopping and smoke seals within mechanical assemblies (i.e. inside ducts, dampers) and electrical assemblies (i.e. Inside cable trays) are specified in Division 22, 23, 26 and 27 respectively.

1.2 DESCRIPTION OF WORK

.1 Apply firestop sealant and systems around all penetrations through openings in fire rated wall and ceiling assemblies.

.2 Seal around ducts and conduits penetrating fire separations.

1.3 REFERENCES

.1 ULC-S115-2005 Standard Method of Fire Tests of Firestop Systems.

1.4 PRODUCT DATA

.1 Submit product data in accordance with Section 01 01 50.

.2 Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site. Include manufacturer's printed instructions for installation.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 01 50 - General Instructions.

2 Products

2.1 MATERIALS

.1 Fire stopping and smoke seal systems: in accordance with ULC-S115.
- .1 Systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of ULC-S115 and not to exceed opening sizes for which they are intended.
- .2 Fire stop system rating: to match wall/floor/roof assembly of one hour rating.

.2 Service penetration assemblies: certified by ULC in accordance with ULC-S115 and listed in ULC Guide No. 40 U19.

.3 Prefabricated flange units, with outer metal flange die-stamped from 0.3 mm thick 316 stainless steel, with inset of premoulded silicone elastomeric ring, factory moulded, U.L.C. or W.H. listed as a through penetration fire stop. Flange hinged for fixing over pipe and then secured tight with self-tapping screw.

.4 Fire-resistance rating of installed fire stopping assembly not less than the fire- resistance rating

of surrounding wall assembly.

.5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal; do not use cementitious or rigid seal at such locations.

.6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: prefabricated silicone elastomeric seal; do not use a cementitious or rigid seal at such locations.

.7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

3 Execution

3.1 PREPARATION

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.

.2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.

3.2 INSTALLATION

.1 Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.

.2 Seal holes or voids made by through penetrations, poke-through termination devices, and openings or joints to ensure continuity and integrity of fire separation are maintained.

.3 Tighten self-tapping screw on flange unit to ensure adequate tight and permanent seal.

3.3 INSPECTION

.1 Notify Departmental Representative when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.

3.4 SCHEDULE

.1 Fire stop and smoke seal at:
- .1 Penetrations through fire-resistance rated walls and ceilings.
- .2 Around mechanical and electrical assemblies penetrating fire separations.
- .3 Rigid ducts: greater than 129 cm^2: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.

3.5 CLEAN UP

.1 Remove excess materials and debris and clean adjacent surfaces immediately after application.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry.

.2 Section 09 21 16 - Gypsum Board.

.3 Section 09 22 16 - Non-Structural Metal Framing.

.4 Section 09 51 00 - Acoustic Ceilings.

.5 Section 09 65 16 - Resilient Sheet Flooring.

.6 Mechanical.

.7 Electrical.

1.2 DESCRIPTION OF WORK

.1 Supply and installation of all equipment as specified below, in locations as indicated plans and Appendices. Include connections to all services provided by others.

.2 Provide a proposed contract between supplier and Owner for maintenance of dental equipment.

.3 Provide a quotation for maintenance of all equipment provided for a period of two (2) from date of occupancy of the facility.

.4 Electrical and Mechanical trade contractors to provide primary services and make connections to appropriate installed healthcare equipment of the patient lift systems as shown on plans and as herein specified.

.5 After installation, examine and test equipment under operating condition to determine that each component of the assembly has been installed correctly and functions properly.

.6 Instruct Owner's representatives on proper operation and maintenance of the equipment.

1.3 SUBMITTALS

.1 Submit manufacturer's product data in accordance with Section 01 01 50 - General Instructions.

.2 Submit shop drawings in accordance with Section 01 01 50 - General Instructions..

.3 Submit within 30 days of contract award, complete detailed shop drawings showing items in plan and elevation. Show dimensions and details of construction, supports, installation and interface to related services, which require cutting or close fitting.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Deliver products and materials in accordance with the construction schedule.

.2 Store to avoid damage.

.3 Protect installed items against damage. Leave protective coverings in place until final clean-up.

1.5 WARRANTY

.1 Provide manufacturer's written warranty covering repair service and replacement of defective parts on the following from date of Substantial Completion:

.1 One year warranty for any part of the healthcare equipment that fails as a result of material defect of workmanship.

.2 Extended warranty for any part of the healthcare equipment that fails as a result of material defect of workmanship as listed in Part 2.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 01 50 - General Instructions.

2 Products

2.1 HEALTHCARE EQUIPMENT TO BE RELOCATED BY CONTRACTOR.

.1 Equipment as listed in List of equipment to be Relocated by Contractor, as indicated in Drawing A901 – Furniture and Equipment Layout Floor Plan, as described and specified in Medical Equipment Picture Inventory February 28, 2018 and Medical Equipment Cut Sheets, shall be relocated from existing Building 20a in Mission Minimum Institution from existing locations described in the List of Equipment.

.2 Contractor to relocate healthcare equipment to new locations indicated in the Contract documents.

.3 Confirm functioning conditions of all equipment prior to relocation.

2.2 HEALTHCARE EQUIPMENT TO BE RELOCATED AND INSTALLED BY CONTRACTOR.

.1 Equipment as listed in List of equipment to be Relocated and Installed by Contractor, as indicated in Drawing A901 – Furniture and Equipment Layout Floor Plan, as described and specified in Medical Equipment Picture Inventory February 28, 2018 and Medical Equipment Cut Sheets, shall be relocated from existing Building 20a in Mission Minimum Institution from existing locations described in the List of Equipment.

.2 Contractor to install healthcare equipment to ne locations indicated in the Contract Documents.

.3 Mount and connect to mechanical and electrical services.

.4 Confirm functioning conditions of all equipment being relocated.

.5 Contractor to engage the following company and personnel to relocate all existing dental equipment and warrant its condition:

Susan Trask
National Institutional Strategic Accounts Manager
HENRY SCHEIN®
604-559-6944
1-866-568-8284
Cell 778-838-4452
susan.trask@henryschein.ca

2.3 HEALTHCARE EQUIPMENT TO BE PURCHASED AND INSTALLED BY CONTRACTOR.

.1 Healthcare equipment as listed in List of Equipment to be Purchased and Installed by contractor, as indicated in Drawing A806 – Washroom and Equipment accessories, as described and specified in Medical Equipment Picture Inventory February 28, 2018 and Medical Equipment cut sheets, shall be purchased, put in place and mounted to new locations indicated in the Contract documents.

2.4 HEALTHCARE EQUIPMENT NOT TO BE RELOCATED

.1 Healthcare equipment as listed in List of Equipment Not to be Relocated is to remain in existing locations.

3 Execution

3.1 INSTALLATION

.1 Healthcare equipment hangers with mounting hardware and instructions included with the equipment delivery. Mounting hardware to seismic requirements of National Building Code Seismic Zone for Mission, BC.

.2 Install the healthcare equipment with mounting hardware and instructions furnished by manufacturer.

.3 Electrical Contractor to furnish and install conduit to the service boxes with wiring. Make connection of building services to prewired junction box as shown on the electrical drawings.

.4 Mechanical Contractor to furnish and install plumbing services to locations required for dental equipment and make final connections.

3.2 TESTING AND DEMONSTRATION

.1 Operate and test installed healthcare equipment to ensure proper operation. Adjust as required to ensure smooth operation and accurate positioning.

.2 Demonstrate to Departmental Representative's designated representatives complete operation and required maintenance.

3.3 PROTECTION AND CLEAN-UP

.1 Protect adjacent surfaces from damage during installation.

.2 Protect items installed under this Section from damage resulting from the work of other Sections.

.3 Promptly as the work proceeds and on completion remove all crating, wrapping, surplus materials and equipment.

END OF SECTION

Part 1 General

1.1 GENERAL

.1 The general conditions and general requirements together with all amendments and supplements contained in the General Specifications shall form an integral part of the electrical specification and will be made part of this contract.

.2 Reference to “Electrical Divisions” shall mean all Divisions 26, 27, 28, 33, 34 and 48 in the Master Format or the Canadian Master Specifications.

.3 The word "Provide" shall mean "Supply and Install" the products and services specified. "As Indicated" means that the item(s) specified are shown on the drawings.

.4 Confirm with the architectural plans and specifications the extent and nature of the work and how it will affect the electrical work. Include in the tender sum for any complications or additional work described therein.

.5 Review mechanical plans and specifications for the extent of electrical work required to make mechanical systems complete and include this work in the tender sum.

.6 Review structural plans for limitations of penetrations or inclusions of electrical equipment. In the tender sum, allow for avoiding critical areas with electrical equipment.

.7 Review existing record plans and site conditions for limitations of penetrations or inclusions of electrical equipment. In tender sum, allow for avoiding critical areas with electrical equipment.

.8 Comply with the requirements of the General Contract, and coordinate the installation with all other trades on site.

.9 Confirm on-site the exact location of equipment, outlets, and fixtures and the location of outlets for equipment supplied by other trades.

1.2 DRAWINGS AND SPECIFICATIONS

.1 The drawings and specifications compliment each other and what is called for by one is binding as if called for by both. If there is any doubt as to meaning or true intent due to a discrepancy between the electrical drawings and specifications, and all other contract documents. **The most expensive alternative is to be allowed for.**

.2 The plans show the approximate location of outlets and apparatus but the right is reserved to make such changes in location as may be necessary to meet the emergencies of construction in any way. No extra will be allowed for such changes to any piece of electrical equipment unless the distance exceeds 3 metres, or if the relocation is required after initial installation is complete.

.3 It is imperative that the contractor visit the site and completely familiarize himself as to the work to be undertaken.

1.3 CODES AND STANDARDS

.1 All electrical work shall be carried out in accordance with the latest edition of the CEC C22.1 (Canadian Electrical Code) as amended and adopted by the

Province of British Columbia and to the satisfaction of the Electrical Inspection Authority having jurisdiction, except where specified or specifically stated otherwise.

.2 Do overhead and underground systems in accordance with CSA C22.3 No.1 latest edition, except where specified or specifically stated otherwise.

.3 All work shall be carried out in accordance with the National Building Code current edition (including all local amendments) to the satisfaction of local building inspector authority having jurisdiction.

.4 Any electrical material and/or equipment supplied by any contractor or sub-contractor for installation on this project must bear evidence of CSA approval or special CSA certification acceptable to the Chief Electrical Inspector for the Province of British Columbia.

1.4 CARE, OPERATION AND START-UP

.1 Instruct Departmental Representative and Operating Personnel in the operation, care and maintenance of systems, system equipment and components.

.2 Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel.

.3 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with all aspects of its care and operation.

1.5 VOLTAGE RATINGS

.1 Operating voltages: to CAN3-C235 latest edition.

.2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard. Equipment to operate in extreme operating conditions established in above standard without damage to equipment.

1.6 PERMITS, FEES AND INSPECTION

.1 Submit to Electrical Inspection Department and Supply Authority necessary number of drawings and specifications for examination and approval prior to commencement of work.

.2 Pay all associated fees.

.3 Fees will cover all routine inspections by the District Electrical Inspector. Any fees for follow-up inspections found to be necessary by the District Electrical Inspectors as a result of incorrect work shall be borne by this contractor without any cost to the Departmental Representative.

.4 Notify Departmental Representative of changes required by Electrical Inspection Department prior to making changes.

.5 Furnish Certificates of Acceptance from Electrical Inspection Department [authorities having jurisdiction] on completion of work to Departmental Representative.

.6 Submit to Electrical Inspection Department and Supply Authority necessary number of drawings and specifications for examination and approval prior to commencement of work. Obtain electrical permit and pay associated fees.

.7 Departmental Representative will provide drawings and specifications required by Electrical Inspection Department and Supply Authority at no cost to the Contractor.

.8 Furnish to Departmental Representative on completion of work Certificates of Acceptance from Electrical Inspection Department.

1.7 LOCATION OF OUTLETS

.1 Locate outlets in accordance with these specifications and as indicated on the Architectural and Electrical drawings.

.2 Do not install outlets back-to-back in wall; allow minimum 150 mm horizontal clearance between boxes.

.3 Change location of outlets at no extra cost or credit, providing distance does not exceed 3000mm, and information is given before installation.

1.8 MOUNTING HEIGHTS

.1 Mounting height of equipment is from finished floor to centreline of equipment unless specified or indicated otherwise.

.2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.

.3 Install electrical equipment at following heights unless indicated otherwise on the Architectural and Electrical drawings.

.1 Local switches: 1200 mm.

.2 Wall receptacles:

.1 General: 400 mm.

.2 Above top of continuous baseboard heater: 200 mm.

.3 Above top of counters or counter splash backs: 175 mm.

.4 In mechanical rooms: 1200 mm.

.3 Panelboards: as required by Code or as indicated.

1.9 LOAD BALANCE

.1 Measure phase current to panelboards with normal loads (lighting and mechanical) operating at time of acceptance. Adjust branch circuit connections as required to obtain best balance of current between phases and record changes.

.2 Measure phase voltages at loads and adjust transformer taps to within 2% of rated voltage of equipment.

1.10 CONDUIT AND CABLE INSTALLATION

.1 Install flashing and gooseneck assembly for all roof penetrations for running cables to serve roof mounted equipment.

.2 Install cables, conduits and fittings to be embedded or plastered over, neatly and close to building structure so furring can be kept to minimum.

1.11 EXTRA WORK

.1 Any extra work ordered to be done shall be governed by this specification unless specific instructions or clauses are contained in the Change Order. In such cases, these instructions or clauses shall supersede those of the specification for this particular application only.

1.12 FIELD QUALITY CONTROL

.1 All electrical work to be carried out by qualified, licensed electricians or supervised apprentices as per the conditions of the Provincial Act respecting manpower vocational training and qualification. Employees registered in a provincial apprentices program shall be permitted, under the direct supervision of a qualified licensed electrician, to perform specific tasks. The activities permitted shall be determined based on the level of training attained and the demonstration of ability to perform specific duties.

.2 The work of this division to be carried out by a contractor who holds a valid Master Electrical Contractor License as issued by the Province that the work is being conducted.

.3 Conduct and pay for following tests:

- .1 Power distribution system including phasing, voltage, grounding and load balancing.
- .2 Circuits originating from branch distribution panels.
- .3 Lighting.
- .4 Motors, heaters and associated control equipment including sequenced operation of systems where applicable.

.4 Furnish manufacturer's certificate or letter confirming that entire installation as it pertains to each system has been installed to manufacturer's instructions.

.5 Insulation resistance testing:

- .1 Megger circuits, feeders and equipment up to 350V with a 500V instrument.
- .2 Megger 350V - 600 V circuits, feeders and equipment with a 1000V instrument.
- .3 Check resistance to ground before energizing.

.6 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.

.7 Submit test results for Departmental Representative's review.

1.13 CO-ORDINATION OF TRADES

.1 Consult with Construction Manager and all subtrades involved to confirm the location of the various outlets and equipment, and cooperate fully to ensure that no conflict arises during the installation.

.2 Special care shall be taken that equipment, outlets, junction boxes or pullboxes will not be obstructed by other structure, equipment, pipes or ducts installed under this general contract by other trades.

.3 Check drawings of all trades to verify space and headroom limitations for work to be installed. Coordinate work with all trades and make changes to facilitate a

satisfactory installation. Make no deviations to the design intent involving extra cost to the Departmental Representative.

.4 The drawings indicate the general location and route to be followed by the electrical services. Where details are not shown on the drawings or only shown diagrammatically, the services shall be installed in such a way as to conserve head room and interfere as little as possible with the free use of space through which they pass. Service lines shall run parallel to building lines. All services in the ceiling shall be kept as tight as possible to beams or other limiting members at high level. All electrical services shall be coordinated in elevation to ensure that they are concealed in the ceiling or structural space provided unless detailed otherwise on drawings.

.5 Work out jointly all interference problems on the site and coordinate all work before fabricating, or installing any material or equipment. Where necessary, produce interference/coordination drawings showing exact locations of electrical systems or equipment within service areas, shafts and the ceiling space. Distribute copies of the final interference/coordination drawings to the Departmental Representative.

.6 Ensure that all materials and equipment fit into the allotted spaces and that all equipment can be properly serviced and replaced, if and when required. Advise the Departmental Representative of space problems before installing any material or equipment. Demonstrate to the Departmental Representative on completion of the work that all equipment installed can be properly, safely serviced and replaced, if and when required.

1.14 SUBSTITUTIONS

.1 Unless otherwise noted on the plans or specifications, substitutions may be approved by the Departmental Representative if requested by the contractor or by equipment suppliers, for items specified by the manufacturer's catalogue number.

.2 Requests for approval of such substitutions shall be submitted at least five (5) working days prior to the tender closing date.

.3 Complete description and data sheets of proposed substitution shall accompany the application and supplier must be prepared to submit samples for approval on short notice.

.4 Proposed substitutions must be at least of equal quality to that of the specified item. The manufacturer's specification of the specified item shall apply for comparison if no other clause of this specification applies. The decision of the Departmental Representative to accept or reject shall be final.

.5 Off-the-shelf items such as standard boxes, EMT, which are specified by description only or indicated on the drawings, without any manufacturer, model, type or catalogue number, do not require approval prior to the tender closing date.

.6 Submit list of alternates used, within one week after acceptance of tender.

1.15 PROTECTION OF EQUIPMENT

.1 See section 1.23.7 for lighting.

.2 This contractor shall provide and ensure maximum protection of electrical equipment on the site. Electrical equipment, including existing electrical equipment, shall be kept clean and dry at all times and caution shall be taken to ensure no mechanical damage is done to the equipment. Equipment shall not be delivered to the site until it can be stored safely or placed in final position and the space is clean.

1.16 DAMAGES

.1 If the finish of electrical equipment is damaged either when received or during installation, have such equipment completely refinished and restored to its original condition at no cost to the Departmental Representative.

.2 Irreparably damaged equipment shall be replaced at no cost to the Departmental Representative.

1.17 SHOP DRAWINGS

.1 Submit shop drawings, product data and samples in accordance with the contract specifications.

.2 Shop drawings and product data shall indicate details of construction, dimensions, capacities, weights and electrical performance characteristics of equipment or material.

.3 Where applicable, include wiring, single line and schematic diagrams.

.4 Include wiring drawings or diagrams showing interconnection with work of other sections.

.5 Prior to manufacture of any item made specifically for this job, submit detailed drawings of the item through the Construction Manager.

.6 Shop drawings must be received by the Departmental Representative at a date early enough to permit reasonable study prior to approval and manufacture, or to permit alterations where necessary. Late submissions of shop drawings will be sufficient reason for a stoppage of construction pending approval, or removal and replacement of any unsatisfactory item at the contractor's expense.

.7 Shop drawings/product data content:

.1 Shop drawings submitted title sheet.

.2 Data shall be specific and technical.

.3 Identify each piece of equipment.

.4 Information shall include all schedule data.

.5 Advertising literature will be rejected.

.6 The project and equipment designations shall be identified on each document.

.7 The shop drawings/product data shall include:

.1 Dimensioned construction drawings with plans and sections showing size, arrangement and necessary clearances, with all equipment weights and mounting point loads.

.2 Mounting arrangements.

.3 Control explanation and internal wiring diagrams for packaged equipment.

.4 A written description of control sequences relating to the schematic diagrams.

1.18 CUTTING AND PATCHING

.1 This contractor is responsible for all cutting or blocking out required to install electrical equipment.

.2 If this contractor makes excessive cuts or does not coordinate work so that finished work requires cutting or patching, then this contractor shall pay for all patching to original condition.

.3 Any dispute resulting from this shall be referred to the Departmental Representative for decision.

.4 Prior to any major cutting of walls or floor, review the proposed location, size and method with the Departmental Representative. This includes notification when cutting or coring into any fire rated construction.

1.19 FIRESTOPPING

.1 Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of ULC or cUL firestop systems to be used and manufacturer's installation instructions to comply with Section 1300.

.2 Submit material safety data sheets provided with product delivered to job-site.

.3 Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having the necessary training to install manufacture’s products per specified requirements. A supplier’s willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.

.4 The work is to be installed by a contractor with at least one of the following qualifications:

.1 FM 4991 Approved Contractor

.2 UL Approved Contractor

.3 Hilti Accredited Fire Stop Specialty Contractor

.5 Installer shall have minimum 3 years of experience with fire stop installation.

.6 Seal all openings for conduit or sleeve penetrations in fire rated and smoke rated separations using approved materials.

.7 All block outs and access slots to be sealed using approved fire stopping assembly. Provide full details for all fire stopping applications as they relate to each application.

.8 Provide shop drawings for all fire stopping products, including assembly details as it relates to each application. Products shall be ULC approved as an assembly.

.9 Allow for the destructive testing of 10% of fire stopping applications. Should installations not conform to manufacturer’s details, an additional 25% of installation will be destructively tested and should there be more failures, the contractor will be responsible to remove all fire stopping products and reinstall products correctly, at no additional cost to the Departmental Representative.

1.20 PROTECTION OF EXPOSED LIVE EQUIPMENT

.1 Protect exposed live equipment during construction for personnel safety.

.2 Shield and mark live parts "LIVE 120 VOLTS", or with appropriate voltage.

.3 Arrange for installation of temporary doors for rooms containing electrical distribution equipment. Keep these doors locked except when under direct supervision of electrician.

1.21 SPRINKLER PROTECTION

.1 Provide drip covers or CSA Type 2 enclosure for all new surface mounted panelboards and cabinets in sprinklered rooms.

.2 Provide drip covers for all communications backboards in sprinklered rooms.

.3 Provide sprinkler covers for all communications racks in sprinklered rooms.

1.22 INSPECTIONS AND TESTS

.1 Notify the Departmental Representative and authorities having jurisdiction at least five (5) working days in advance when the installations will be ready for inspection or testing.

.2 Test reports, signed by all attending authorities, shall be submitted to the Departmental Representative through the General Contractor after successful completion of an inspection or test.

.3 Conduct all tests in a thorough and complete manner to the satisfaction of the Departmental Representative and pay for any fees incurred to complete tests.

.4 Furnish the Departmental Representative with a copy of Certificate of Inspection from B.C. Electrical Safety Branch indicating that all work has been satisfactorily completed and issued prior to final connection.

1.23 CLEAN UP

.1 Vacuum clean all new raceways and any electrical equipment. Ensure that no debris or spare parts are left in any electrical equipment.

.2 Any scrap material shall be removed from the site and disposed of by the Contractor.

.3 At time of final cleaning, clean lighting reflectors, lenses and other lighting surfaces that have been exposed to construction dust and dirt.

1.24 SURPLUS MATERIALS

.1 All material removed from existing site and not being reused in this contract shall be the property of the Departmental Representative. Material as it becomes surplus shall be reviewed by the Departmental Representative and that part considered of value to the Departmental Representative shall be classed as surplus material, all other becomes scrap material, and shall be disposed of by the contractor.

1.25 SPARE PARTS

.1 This contract calls for spare parts or material. These are to be provided new in unopened cartons to the Departmental Representative at the time of substantial completion of the contract.

.2 Obtain a signed receipt from the Departmental Representative for all these parts or materials and include a copy in the front of the maintenance manual. Without this receipt these items will be treated as a deficiency and the cost withheld at twice the estimated value by the Departmental Representative.

1.26 SUBSTANTIAL PERFORMANCE

.1 Provide request to Architect/Departmental Representative in writing that a Substantial Performance Inspection shall be carried out.

.2 Do not issue this written request until the following have been completed and/or submitted to Departmental Representative:

.1 As-installed drawings (CAD files or Revit model) have been provided.

.2 All deficiencies noted during job inspections have been completed.

.3 Warranty Certificates have been provided.

.4 All systems have been tested and are ready for operation.

.5 All Inspection Certificates have been furnished including Final Electrical Inspection Certificate.

.6 The Departmental Representative personnel have been instructed in the operation and maintenance of all systems.

.7 All equipment identification has been completed.

.8 The cleaning up is finished in all respects.

.9 All spare parts and replacement parts specified have been provided and receipt of same acknowledged.

.10 Copies of Seismic Departmental Representative's Schedules B1, B2 and CB have been submitted.

.11 Fire Alarm System is verified and operational. Copy of Verification Report submitted to Departmental Representative.

.12 Maintenance handover reports have been submitted for each and every electrical/communication system. Refer to Appendix A for report sample.

1.27 AS-BUILT DRAWINGS

.1 Obtain two (2) sets of white prints for the sole purpose of recording changes in installation as they occur. One (1) set is to be used in the field for day-to-day recording, and one (1) set for submittal after completion.

.2 These plans shall be kept up-to-date as changes occur and shall be available to be inspected by the Departmental Representative.

.3 Arrange and pay for the incorporation of any "as-built" changes to reproducible plans and AutoCAD disks. These changes shall be of similar quality of presentation as the original plans. NOTE: All plans whether requiring as-built changes or not, shall be included in this set.

.4 These amended drawings shall be given to the Departmental Representative at time of final inspections.

.5 "As-built" drawings shall include the location and circuit numbers of junction boxes in ceiling spaces, and all conduit placed in or under poured concrete. Note normal depth of conduits below top of concrete slab.

1.28 OPERATING AND MAINTENANCE MANUALS

.1 Submit **four sets** of operating and maintenance manuals for equipment or as requested by the general section of the contract. Include descriptive and technical data, all shop drawings, operating procedures, routine and preventative maintenance, wiring diagrams, spare parts lists, warranties, service companies, suppliers for replacement parts, test results, fire alarm certificate of verification, electrical inspection authority certificate and contract guarantee.

.2 Submit documentation in **green colored** heavy duty three ring binders, with lettering on spine identifying: "OPERATING AND MAINTENANCE MANUAL", project title and system names.

.3 Submit one copy for approval by Departmental Representative prior to assembly of final sets.

1.29 DEMONSTRATION OF SYSTEMS

.1 Prior to demonstration of any electrical/communication system the contractor shall complete a ‘Maintenance and Handover Report’ for each and every electrical/communication system and submit for review. Refer also to Appendix A for blank copy of aforementioned report form.

.2 Instruct Departmental Representative and operating personnel in the operation, care and maintenance of equipment.

.3 Arrange and pay for services of manufacturer's factory service Departmental Representative to supervise start-up of installation, check, adjust, balance and calibrate components.

.4 Provide these services for such period, and for as many visits as necessary to put equipment in operation and ensure that operating personnel are conversant with all aspects of its care and operation.

1.30 WARRANTY

.1 Within a period of one year from the date of final acceptance of work, replace or repair at own expense any defect in workmanship or material. Reused material shall be operating satisfactorily at the time of final acceptance, but subsequent failures are not the responsibility of this contractor.

.2 Warranties for equipment having more than one-year guarantee shall be made out to Departmental Representative, and copies shall be provided in the maintenance manuals.

.3 Maintenance from manufacturer and contractor of all equipment shall be included for first year, including all lamps except incandescent.

1.31 PAINTING

.1 Arrange and pay for the painting of the devices noted in these specifications, in particular:

.1 exposed conduits and conduit fittings where required.

Part 2 Products

2.1 SUSTAINABLE REQUIREMENTS

.1 Refer to Section 01 35 18 of the General Requirements.

2.2 MANUFACTURERS AND CSA LABELS

.1 Visible and legible, after equipment is installed.

2.3 MATERIALS AND EQUIPMENT

.1 Equipment and material to be CSA certified. Where there is no alternative to supplying equipment which is not CSA certified, obtain special approval from Electrical Inspection Department.

.2 Factory assemble control panels and component assemblies.

2.4 ELECTRIC MOTORS, EQUIPMENT AND CONTROLS

.1 Supplier and installer responsibility is indicated in Motor, Control and Equipment Schedule on the electrical drawings and related mechanical responsibility is indicated on Mechanical Equipment Schedule.

.2 Control wiring and conduit is specified in [Division 16] [Divisions 26, 27, 28, 33, 34 and 48] except for conduit, wiring and connections below 50 V which are related to control systems specified in Mechanical Specifications and shown on mechanical drawings.

2.5 WARNING SIGNS

.1 As specified and to meet the requirements of the BC Electrical Inspection Authority and the Departmental Representative.

.2 Decal signs, minimum size 175mm x 250mm.

2.6 FINISHES

.1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.

.2 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.

.3 Clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting.

2.7 EQUIPMENT IDENTIFICATION

.1 Identify electrical equipment with [nameplates] [and] [labels] as follows:

.2 Nameplates:

.1 Lamicoid 3mm thick plastic engraving sheet, mechanically attached with self tapping screws.

.2 Nameplate colors shall be as follows:

.1 Normal power: Black face with white letters;

.2 Life safety emergency power: Red face with white letters;

.3 Standby power: Blue face with white letters.

.3 Nameplate sizes shall be as follows

Size 1	10 x 50 mm	1 line	3 mm high letters
Size 2	12 x 70 mm	1 line	5 mm high letters
Size 3	12 x 70 mm	2 lines	3 mm high letters
Size 4	20 x 90 mm	1 line	8 mm high letters
Size 5	20 x 90 mm	2 lines	5 mm high letters
Size 6	25 x 100 mm	1 line	12 mm high letters
Size 7	25 x 100 mm	2 lines	6 mm high letters

.3 Labels:

.1 Embossed plastic labels with 6mm high letters unless specified otherwise.

.4 Wording on nameplates and labels to be approved by Departmental Representative prior to manufacture.

.5 Allow for average of twenty-five (25) letters per nameplate and label.

.6 Identification to be English.

.7 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.

.8 Disconnects, starters and contactors: indicate equipment being controlled and voltage.

.9 Terminal cabinets and pull boxes: indicate system and voltage.

.10 Label all receptacles with branch circuit label indicating panel name and branch circuit number. Use brother P-Touch device or similar. Labels are to be white with black lettering.

2.8 WIRING IDENTIFICATION

.1 Identify wiring with permanent indelible identifying markings, either numbered or coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.

.2 Maintain phase sequence and colour coding throughout.

.3 Colour code: to CSA C22.1 [latest edition].

.4 Use colour coded wires in communication cables, matched throughout system.

2.9 CONDUIT AND CABLE IDENTIFICATION

.1 Colour code conduits, boxes and metallic sheathed cables.

.2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at [15] m intervals.

.3 Colours: [25] mm wide prime colour and [20] mm wide auxiliary colour.

	Prime	Auxiliary
up to 250 V	Yellow	
up to 600 V	Yellow	Green
up to 5 kV	Yellow	Blue
up to 15 kV	Yellow	Red
Telephone	Green	
Other Communication Systems	Green	Blue
Fire Alarm	Red	
Emergency Voice	Red	Blue
Other Security Systems	Red	Yellow

Part 3 Execution

3.1 PROJECT CLOSEOUT REQUIREMENTS

.1 The following items are required for the Contractor to provide to the Electrical Departmental Representative prior to releasing a Schedule C-B.

- .1 Final record drawings (as-built)
- .2 Maintenance manual
- .3 Warranty letter
- .4 System briefing to Departmental Representative
- .5 Electrical final from AHJ
- .6 Fire stopping letter

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CAN/CSA-C22.2No.18 latest edition, Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware.

.2 CSA C22.2No.65 latest edition, Wire Connectors.

.2 Electrical and Electronic Manufacturers' Association of Canada (EEMAC)

.1 EEMAC 1Y-2, latest edition, Bushing Stud Connectors and Aluminum Adapters (1200 Ampere Maximum Rating).

.3 National Electrical Manufacturers Association (NEMA)

Part 2 Products

2.1 MATERIALS

.1 Pressure type wire connectors to: CSA C22.2No.65, with current carrying parts of copper alloy sized to fit copper conductors as required.

.2 Fixture type splicing connectors to: CSA C22.2No.65, with current carrying parts of copper alloy sized to fit copper conductors 10 AWG or less.

.3 Bushing stud connectors: to EEMAC 1Y-2 to consist of:

.1 Connector body and stud clamp for stranded copper conductors.

.2 Clamp for stranded copper conductors.

.3 Stud clamp bolts.

.4 Bolts for copper conductors.

.5 Sized for conductors as indicated.

Part 3 Execution

3.1 INSTALLATION

.1 Remove insulation carefully from ends of conductors and:

.1 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CSA C22.2 No.65.

.2 Install fixture type connectors and tighten. Replace insulating cap.

.3 Install bushing stud connectors in accordance with EEMAC 1Y-2.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 CSA C22.2 No .0.3 latest edition, Test Methods for Electrical Wires and Cables.

.2 CAN/CSA-C22.2 No. 131 latest edition, Type TECK 90 Cable.

1.2 GENERAL REQUIREMENTS

.1 Typically use insulated 98% conductivity copper conductor wiring enclosed in EMT (steel) conduit for the general wiring systems unless otherwise indicated.

.2 Teck cable may only be used where specifically indicated on the drawings or in the specifications. Where permitted, Teck wiring up to 750 system volts to be PVC jacketed armoured cable, multi-copper conductor type Teck90 1000 volt having a PVC jacket with FT-4 flame spread rating.

.3 Flexible AC90 armoured cabling (BX) shall not be used for the general wiring system other than final drops to recessed light fixtures in concealed locations.

.4 Cabling indicated to be 2-Hour Fire-Rated shall be compliant to CAN/ULC-S139 and CSA 38-95 (Draka Lifeline, Raychem RHW, or Shawflex). Cabling shall be low smoke halogen free. Conduit to be sized and installed as per manufacturers' requirements for these specialized cables and assemblies regardless of the size indicated on drawings.

.5 Provide all control wiring except HVAC controls as specified in Mechanical Divisions.

.6 Non-metallic sheathed wiring is not to be used on this project.

Part 2 Products

2.1 WIRE AND CABLE GENERAL

.1 Conductors: stranded for 10 AWG and larger. Minimum size #12 AWG.

.2 Insulation to be 600 volt RW90XLPE (X link) for the general building wiring in conduit.

.3 Use RWU90XLPE for underground installations.

.4 Site services sub-circuits, including site lighting, to be minimum #10 AWG for power and #12 for controls. Increase wiring size for lengthy and/or loaded circuits so that system will not exceed the maximum voltage drop as recommended by the Canadian Electrical Code CSA 22.1.

.5 TBS90 #14 AWG stranded shall be used in all switchgear assemblies.

.6 Conductors to be colour-coded. Conductors No.10 gauge and smaller shall have colour impregnated into insulation at time of manufacture. Conductors size No.8 gauge and larger may be colour-coded with adhesive colour coding tape, but only black insulated conductors shall be employed in this case, except for neutrals which shall be white wherever possible. Where colour-coding tape is utilized, it shall be applied for a minimum of 50 mm at terminations, junctions and pullboxes and conduit fittings. Conductors not to be painted.

2.2 TECK CABLE

.1 Cable: to CAN/CSA-C22.2 No. 131 [latest edition].

.2 Conductors:

.1 Grounding conductor: copper.

.2 Circuit conductors: copper, size as indicated.

.3 Insulation:

.1 Chemically cross-linked thermosetting polyethylene rated type RW90, 600V.

.4 Inner jacket: polyvinyl chloride material.

.5 Armour: interlocking galvanized steel or aluminum.

.6 Overall covering: thermoplastic polyvinyl chloride material.

.7 Fastenings:

.1 One hole steel straps to secure surface cables 50 mm and smaller. Two hole steel straps for cables larger than 50 mm.

.2 Channel type supports for two or more cables at 1000 mm centers.

.3 Threaded rods: 6 mm dia. to support suspended channels.

.8 Connectors:

.1 Watertight, approved for TECK cable.

2.3 CONTROL CABLES

.1 Type LVT: 2 soft annealed copper conductors, sized as indicated, with thermoplastic insulation, outer covering of thermoplastic jacket.

.2 Low energy 300 V control cable: solid annealed copper conductors sized as indicated, with TWH over each conductor and overall covering of PVC jacket.

.3 600 V type: stranded copper conductors, sizes as indicated with R90 (x-link) ethylene-propylene rubber insulation type over each conductor and overall covering of PVC jacket.

Part 3 Execution

3.1 INSTALLATION OF BUILDING WIRES

.1 Install wiring as follows:

.1 In conduit systems in accordance with Section 26 05 34.

.2 In underground ducts in accordance with Section 26 05 34.

.3 In trenches in accordance with Section 26 05 34.

.4 All wires are to be pulled in together in a common raceway, using liberal amounts of Compound 77 lubricant.

.5 All power circuits connected to isolated ground type receptacles are to have individual separate neutral c/w insulated bonding conductor.

.6 No combining of circuits onto common neutral will be permitted. Use 2 pole or 3 pole breakers for combined circuits, no connector clips will be allowed.

.7 Ensure that all single phase loadings are reasonably closely balanced over the main feeders.

3.2 INSTALLATION OF TECK CABLE 0 -1000 V

.1 Install cables.

.1 Group cables wherever possible on channels.

.2 Install cable in trenches in accordance with Section 26 05 34.

.3 Terminate cables in accordance with Section 26 05 20 - Wire and Box Connectors - 0 - 1000 V.

3.3 INSTALLATION OF ARMOURED CABLES

.1 Group cables wherever possible.

.2 Install cable in trenches in accordance with Section 26 05 34.

.3 Terminate cables in accordance with Section 26 05 20 - Wire and Box Connectors - 0 - 1000 V.

3.4 INSTALLATION OF CONTROL CABLES

.1 Control cable and conduit will be supplied and installed by Mechanical Contractor. Controls wiring must be installed in conformance with Electrical Specifications. Install control cables in conduit.

.2 Ground control cable shield.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 CSA C22.2 No.41- Grounding and Bonding Equipment.

Part 2 Products

2.1 CONNECTORS AND TERMINATIONS

.1 Copper compression connectors as required sized for conductors.

.2 Joint boxes in accordance with Section 26 05 33 - Raceway and Boxes for Electrical Systems.

.3 Junction boxes with respective pothead for cables for enclosing stress - cone within.

Part 3 Execution

3.1 INSTALLATION

.1 Install stress cones, terminations, and splices in accordance with manufacturer's instructions.

.2 Bond and ground as required to CSA C22.2 No.41.

END OF SECTION

Part 1 General

1.1 PATIENT CARE

.1 Grounding in areas of patient care and diagnosis: to CAN/CSA Z32.

.2 Locate ground bus inside each patient care area, within the care area as defined in CAN/CSA Z32.

Part 2 Execution

2.1 INSTALLATION AND TESTING

.1 Engage a third-party familiar with CAN/CSA Z32.test procedures and recording of same to carry out testing procedures.

.2 Submit test results for review and acceptance prior to substantial completion.

END OF SECTION

Part 1 General

1.1 PRODUCT DATA

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data: submit manufacturer's product data sheets indicating dimensions, materials, and finishes, including classifications and certifications.

.3 Shop Drawings: submit shop drawings for custom manufactured items showing materials, finish, dimensions, accessories, layout, and installation details.

Part 2 Products

2.1 SPLITTERS

.1 Sheet metal enclosure, welded corners and formed hinged cover suitable for locking in closed position.

.2 Main and branch lugs to match required size and number of incoming and outgoing conductors as indicated.

.3 At least three spare terminals on each set of lugs in splitters less than 400 A.

2.2 JUNCTION AND PULL BOXES

.1 Welded steel construction with screw-on flat covers for surface mounting.

.2 Covers with 25 mm minimum extension all around, for flush-mounted pull and junction boxes.

2.3 CABINETS

.1 Sheet steel cabinet, with full length hinged door, latch, lock, 2 keys, containing 19 mm G1S fir plywood backboard (if required) for surface or flush mounting as required.

.2 Include filtered vents and/or fan-cooling when enclosed equipment is heat producing.

Part 3 Execution

3.1 SPLITTER INSTALLATION

.1 Install splitters and mount plumb, true and square to the building lines.

.2 Extend splitters full length of equipment arrangement except where indicated otherwise.

3.2 JUNCTION, PULL BOXES AND CABINETS INSTALLATION

.1 Install pull boxes in inconspicuous but accessible locations.

.2 Mount cabinets with top not higher than 2 m above finished floor.

.3 Install terminal blocks as required.

.4 Only main junction and pull boxes are indicated. Install pull boxes so as not to exceed 30 m of conduit run between pull boxes.

3.3 IDENTIFICATION

.1 Provide equipment identification in accordance with Section 20 05 00 – Common Work Results - Electrical.

.2 Install size 2 identification labels indicating system name, voltage and phase, as appropriate to clearly indicate the enclosure use.

END OF SECTION

Part 1 General

Part 2 Products

2.1 OUTLET AND CONDUIT BOXES – GENERAL

.1 Size boxes in accordance with CSA C22.1.

.2 102 mm square or larger outlet boxes as required for special devices.

.3 Gang boxes where wiring devices are grouped. Do not use sectional boxes.

.4 Blank cover plates for boxes without wiring devices.

.5 347V outlet boxes for 347V switching devices.

.6 Combination boxes with barriers where outlets for more than one system are grouped.

2.2 SHEET STEEL OUTLET BOXES

.1 Electro-galvanized steel single and multi-gang device boxes for flush installation, minimum size 76 x 51 x 38 mm or as indicated. For 347 V switches, use 347 V type device boxes.

.2 Larger 102 mm square x 54mm deep outlet boxes to be used for single gang when more than one conduit enters one side, for telecommunication outlets (for slack storage), or for flush mounting devices in finished plaster and/or tile walls. Provide raised device covers as required.

.3 For larger boxes (those requiring more wiring space, MUTOAs, etc.) use pre-ganged 102 mm high x 51 mm deep solid type as required. Allow extra gang for telecommunication outlets.

.4 Boxes for surface mounted switches, receptacles, or telecommunications outlets to be 102 mm square, or 102 mm high utility, boxes, with rounded corners and raised surface covers. Minimum 38 mm (54 for telecom.) deep

.5 Lighting fixture outlets: 102 mm square outlet boxes or octagonal outlet boxes.

.6 Provide extension and plaster rings as required.

2.3 MASONRY BOXES

.1 Electro-galvanized steel masonry single and multi gang type shallow or deep boxes for devices flush mounted in exposed block walls, minimum 95 mm high x 63 mm deep.

2.4 SURFACE CONDUIT BOXES

.1 Cast FS or FD aluminum boxes with factory-threaded hubs and mounting feet for surface wiring of switches and receptacles.

2.5 FITTINGS – GENERAL

.1 Bushing and connectors with nylon insulated throats.

.2 Knock-out fillers to prevent entry of foreign materials.

.3 Conduit outlet bodies for conduit up to 35 mm. Use pull boxes for larger conduits.

.4 Double locknuts and insulated bushings on sheet metal boxes.

Part 3 Execution

3.1 INSTALLATION

.1 Typical outlet box mounting heights are indicated in Section 26 05 00 or refer to wiring device and communication specification sections and to architectural layouts for particular mounting heights of outlet boxes where indicated.

.2 Support boxes independently of connecting conduits.

.3 Ceiling outlet boxes to be provided for each surface mounted fixture.

.4 Fill open boxes with paper, sponges, foam or similar approved material to prevent entry of construction material. Remove upon completion of work.

.5 Provide correct size of openings in boxes for conduit, mineral insulated and armoured cable connections. Reducing washers are not to be used.

.6 No sectional or handy boxes to be installed.

.7 Provide vapour barrier wrap or boots behind outlets mounted in exterior walls. Maintain integrity of the vapour barrier and insulation to prevent condensation through boxes.

.8 Coordinate location and mounting heights of outlets above counters, benches, splash-backs and with respect to heating units and plumbing fixtures. Coordinate with architectural details.

.9 Outlets installed back to back in party stud walls to be off-set by one stud space.

.10 Separate outlets located immediately alongside one another to be mounted at exactly the same height above finished floor. Similarly, outlets mounted on a wall in the same general location at varying heights to be on the same vertical centre-line unless otherwise noted.

.11 Where outlet boxes penetrate an assembly with a fire-resistance rating (fire separation), ensure that the boxes are externally tightly fitted with an approved non-combustible material to prevent passage of smoke or flame in the event of a fire. Such boxes may not exceed 0.016 mm2 per NBCC 3.1.9.2.

.12 All visible securing components to be a high tamperproof standard suitable to corrections Canada.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Outlet Boxes, Conduit Boxes, and Fittings and Associated Hardware: to CSA C22.2 No. 18.

.2 Rigid metal conduit (RMC): to CSA C22.2 No. 45.

.3 Epoxy coated conduit: to CSA C22.2 No. 45, with zinc coating and corrosion resistant epoxy finish inside and outside.

.4 Electrical metallic tubing (EMT): to CSA C22.2 No. 83.

.5 Rigid PVC conduit: to CSA C22.2 No. 211.2.

.6 PVC (DB2) conduit: to CSA #C22.1 211-1.

.7 Flexible metal conduit (FMC): to CSA C22.2 No. 56.

.8 Flexible PVC conduit: to CAN/CSA-C22.2 No. 227.3.

1.2 BASIC WIRING METHODS

.1 Underground or in concrete exterior to building:

.1 All wiring shall be in Schedule 40 RPVC conduit.

.2 Concrete walls and slabs interior to building:

.1 All wiring shall be in Schedule 40 RPVC conduit.

.3 Surface raceways - interior:

.1 All surface raceways shall be EMT, except if located without protection in areas susceptible to damage, which shall be rigid steel conduit.

.4 Surface raceways - exterior:

.1 All surface raceways shall be UV compensated Schedule 40 RPVC conduit, protected from damage and excessive heating to the Consultant's satisfaction.

1.3 LOCATION

.1 Electrical drawings are diagrammatic and do not show all conduits, wire, cable, etc. Electrical contractor to provide conduit, wire cable, etc. for a complete operating job to meet in all respects the intent of the drawings and specifications.

.2 Outlet positions shown on architectural drawings (plans and elevations) to take precedence over locations and mounting heights indicated on electrical plans or in specifications.

.3 Locate electrical devices on walls with regard given for convenience of operation and conservation of wall space. Switches, receptacles, etc. generally to be vertically lined up where items are in the same general location. Adjacent common devices to be installed in common outlet box.

.4 Review the exact location criteria of each electrical outlet and device with the Departmental Representative prior to rough-in. Relocate any item installed without architectural confirmation as required by the Departmental Representative at no cost to the Departmental Representative as long as the relocation is within 3m of the location originally shown on the electrical drawings.

.5 Do not install outlets back-to-back in party walls; allow a minimum of one stud space horizontal clearance between boxes. Install behind all outlets in party walls a Lowry Acoustic backing pad.

.6 Locate light switches on latch side of doors.

.7 All outlets located on exterior walls to be complete with moulded plastic vapour barriers to maintain integrity of wall vapour barrier system.

.8 All raceways and wiring shall be installed concealed in building fabric as much as possible.

.9 All outlet boxes, junction boxes, and cabinets to hold electrical devices shall be mounted so the equipment can be flush mounted unless indicated otherwise.

Part 2 Products

2.1 CONDUIT GENERAL

.1 All conduit fittings shall be malleable steel, set screw type. No cast fittings.

.2 All connectors shall have insulated throat type bushing, connectors etc.

.3 Bonding conductor to be provided in all conduit runs.

2.2 EMT RACEWAY

.1 Electrical Metallic Tubing (EMT) shall be galvanized steel of sufficient quality and thickness to allow smooth field formed bends.

.2 EMT couplings, connectors and fittings shall be steel. Cast type units shall not be used on this installation.

2.3 FLEXIBLE ELECTRIC NON-METALLIC (ENT) TUBING

.1 Flexible electrical non-metallic tubing (ENT) **shall not** be used on this project.

2.4 OUTLET BOXES AND JUNCTION BOXES

.1 Except as noted for rigid PVC raceways, all outlet boxes and junction boxes shall be one piece formed or welded.

.2 Outlet boxes to be galvanized steel.

.3 Junction boxes to be galvanized steel or aluminum.

2.5 CONDUIT FASTENINGS

.1 One hole steel straps to secure surface conduits 50 mm and smaller in other than resident rooms.

.2 Two hole steel straps to secure surface conduits of all sizes in resident rooms.

.3 Beam clamps to secure conduits to exposed steel work.

.4 Channel type supports for two or more conduits at 1500mm oc.

.5 Threaded rods, 6 mm dia., to support suspended channels.

2.6 CONDUIT FITTINGS

.1 Fittings: manufactured for use with conduit specified. Coating: same as conduit.

.2 Factory "ells" where 90° bends are required for 25 mm and larger conduits.

.3 Watertight connectors and couplings for EMT in all exterior applications. Set-screws are not acceptable.

2.7 EXPANSION FITTING FOR RIGID CONDUIT

.1 Weatherproof expansion fittings with internal bonding assembly suitable for 100mm linear expansion.

.2 Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19 mm deflection in all directions.

.3 Weatherproof expansion fittings for linear expansion at entry to panel.

2.8 FISH CORD

.1 Polypropylene.

Part 3 Execution

3.1 INSTALLATION

.1 Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.

.2 Use electrical metallic tubing (EMT) except in cast concrete and above 2.4 m not subject to mechanical injury.

.3 Use rigid pvc conduit underground, in corrosive areas, and surface mounted in wet areas not subject to damage.

.4 Minimum conduit size for lighting and power circuits: 21mm.

.5 Bend conduit cold. Replace conduit if kinked or flattened more than 1/10th of its original diameter.

.6 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.

.7 Install fish cord in empty conduits.

.8 Dry conduits out before installing wire.

.9 Conduits shall be installed mechanically continuous from outlet to outlet and without pockets. All the necessary standard bushings, elbows and bends shall be provided. All conduit bends shall have a radius of not less than six (6) times the internal diameter of the conduit and in no case shall the equivalent of more than four quarter bends from outlet to outlet be made. For all conduit sizes to be used for low voltage raceway, the conduits shall have a minimum bending radius of 230mm.

.10 Conduit bends shall be made with no more than 10% flattening of the conduit. Bends shall be smooth throughout deformations.

.11 On surface wall runs, all conduit shall be installed in true vertical or horizontal direction and on ceilings in true 90 degree angles or parallel to the walls. Crossings of conduits shall also be made at 90 degree angles. Parallel running conduit shall be kept on equal spacing on the entire length of run including bends.

.12 All conduits shall be fastened to structure with steel straps (no cast type straps allowed).

3.2 SURFACE CONDUITS

.1 Run parallel or perpendicular to building lines.

.2 Locate conduits behind infrared or gas fired heaters with 1.5 m clearance.

.3 Run conduits in flanged portion of structural steel.

.4 Group conduits wherever possible on suspended or surface channels.

.5 Do not pass conduits through structural members except as indicated.

.6 Do not locate conduits less than 75 mm parallel to steam or hot water lines with minimum of 25 mm at crossovers.

3.3 CONCEALED CONDUITS

.1 Run parallel or perpendicular to building lines.

.2 Do not install horizontal runs in masonry walls.

.3 Do not install conduits in terrazzo or concrete toppings.

3.4 CONDUITS UNDERGROUND

.1 Slope conduits to provide drainage.

.2 Waterproof joints (pvc excepted) with heavy coat of bituminous paint.

3.5 FIRESTOPPING

.1 Apply ULC approved fire stopping assembly to all conduit penetrations passing through fire rated walls and floors.

.2 Provide shop drawings showing details for each type of application on the project. Shop drawings shall include catalogue data and installation details.

.3 For all communication sleeves accessible via ceilings or in stacked closets/rooms passing through floors, provide 2 hour rated STI EZ-PATH assembly. Where quantity is not indicated on plans, provide minimum two sleeves between each floor and each communication closet/room.

END OF SECTION

Part 1 General

1.1 SYSTEM DESCRIPTION

.1 The exterior lighting shall be tied to and controlled by the existing lighting control system.

.2 Line voltage control system designed to provide switching of local lighting loads by use of:

- .1 Dimming switches
- .2 Occupancy sensor lighting control
- .3 Exterior lighting combination time clock and photoelectric control (tied into the existing lighting control panel and operate as per the exterior lighting in the existing Building).
- .4 Manual switch control.

.3 Low voltage (0 10V) control system designed to provide switching of local lighting loads by use of:

- .1 Dimming switches

1.2 PRODUCT DATA

.1 Submittal package: Submit shop drawings and product data as specified below in accordance with Section 01 33 00 - Submittal Procedures.

.2 Provide a composite wiring and/or schematic diagram of the complete lighting control system complete with all components, indicating relay panels, master switches, local switches, occupancy sensors and daylight sensors. Indicate the building location reference for all components.

.3 Provide manufacturers catalogue sheets, specifications and installation instructions for all system components.

Part 2 Products

2.1 COMPONENTS

.1 All system components shall be of the same manufacturer and match existing.

.2 Designed for lighting control up to and including 600V 20 amp.

.3 Certified to make or break under full rated load.

.4 from local emergency power panel.

.5 Electronic low voltage dimmers

- .1 Full range dimmer designed to produce 1 to 100% brightness control by means of single slider.
- .2 Advanced solid-state circuitry with silicon symmetrical switch.
- .3 LED push button switch separate from slide to turn dimmer on/off.
- .4 Rated: 425 watts.
- .5 Multi-location capability.
- .6 Radio/TV interference filter.

2.2 OCCUPANCY SENSOR LIGHTING CONTROLS

.1 Wall mounted wall switch

.1 Dual technology, PIR and ultrasonic occupancy sensor.

.2 Adjustable delayed-off time setting 30 seconds to 30 minutes.

.3 180° field of view.

.4 120V supply as required.

.2 Ceiling mounted controls 120V supply

.1 Dual technology, PIR and ultrasonic occupancy sensor.

.2 Adjustable delayed-off time setting 20 seconds to 15 minutes.

.3 360° field of view.

.4 120V supply.

.5 Built-in isolated relay.

2.3 MANUAL CONTROL

Part 3 Execution

3.1 INSTALLATION

.1 Install system panels and components at locations shown on the drawings and in strict accordance with manufacturer's instructions.

3.2 OCCUPANCY SENSORS

.1 Locate sensors in rooms indicated on the drawings. Locate sensors so there are no objects blocking the infra red sensor from viewing all of the coverage area. Keep away from HVAC vents and direct light from light fixtures.

.2 Dual technology, PIR and ultrasonic occupancy sensors shall be utilized.

.3 Adhere to manufacturer’s recommendations for location, wiring and programming.

3.3 LINE VOLTAGE WIRING

.1 Use wire gauges from #10AWG to #12AWG as appropriately sized for the circuit.

3.4 FIELD QUALITY CONTROL

.1 On completion of installation, manufacturer representative shall be notified to carry out site inspection and report any inconsistencies in the installation or system operation to the Departmental Representative. Corrections are to be implemented to comply with required installation and operational parameters defined in the drawings and specifications.

END OF SECTION

Part 1 General

1.1 PRODUCT INFORMATION

.1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.

.2 Shop drawings to include electrical detail of panel, branch breaker type, quantity, ampacity and enclosure dimension.

.3 Shop drawings to include matching tub and trim details for factory installed low voltage relay cabinets where specified.

.4 Where panels are existing and new breakers are required, shop drawings to include branch breaker type, quantity, and ampacity

1.2 PLANT ASSEMBLY

.1 Install circuit breakers in panelboards before shipment from plant.

.2 In addition to CSA requirements, manufacturer's nameplate must show fault current that panel including breakers has been built to withstand.

.3 All panelboards to be of a common manufacturer.

1.3 FINISH

.1 Apply finishes in accordance with Section 26 05 00 – Common Work Results - Electrical.

.2 Panel finish to be standard ASA Grey baked enamel. Confirm with Departmental Representative prior to shop finishing panels.

Part 2 Products

2.1 PANELBOARDS, DOORS AND TRIMS

.1 Panelboards: to CSA C22.2 No. 29 and product of one manufacturer.

.2 Bus and breakers unless otherwise indicated on the drawings and in the specifications, shall be rated for:

.1 Minimum 10 kA at 208Y/120V.

.2 Minimum 22 kA at 600Y/347V.

.3 Tin plated aluminum bus with full size neutral.

.4 Sequence phase bussing with odd numbered breakers on left and even on right, with each breaker identified by permanent number identification as to circuit number.

.5 Mains capacity, number of circuits and number and size of branch circuit breakers as indicated.

.6 Provide all necessary connectors and mounting hardware in every space to facilitate installation of future breakers. Provide blank fillers for all spaces.

.7 Concealed hinges and concealed trim mounting screws, hinged locking door with flush catch.

.8 Panelboards to have flush doors.

.9 Provide two keys for each panelboard and key similar voltage and system panelboards alike.

.10 Panel tubs to be typically 600mm wide.

.11 Provide "sprinkler-proof" design in areas where sprinkler fire protection is installed. In any event, all surface mounted enclosures to be complete with sprinkler drip cover.

.12 Provide door within door trims where indicated to facilitate ease of service maintenance Each tub trim cover to be hinged and self supporting and to swing out to expose breaker cable terminations and wireways. Hinged trim shall be secured with cover screws on opening side by concealed machine screws. Hinged breaker cover shall be recessed into the hinged overall tub cover. Breaker cover shall have latch type closures. Submit details on shop drawings prior to manufacturing.

2.2 BREAKERS

.1 For Power Distribution Panelboards: Bolt on type molded case, adjustable and interchangeable trip, single, two and three pole, 120/208V and with trip free position separate from "On" or "Off" positions.

.2 Two and three pole breakers to have common simultaneous trip and able to be located in any circuit position within the panelboard.

.3 Main breaker (where required) to be separately mounted at top or bottom of panel to suit cable entry. When mounted vertically, down position should open breaker.

.4 Provide circuit breakers with indicated trip ratings as shown in the panelboard schedules.

.5 Provide minimum 10% spare breakers.

.6 Provide breaker type Ground Fault Interrupter(s) (GFI) as indicated.

2.3 PANELBOARD IDENTIFICATION

.1 Provide equipment identification in accordance with Section 26 05 00 – Common Work Results - Electrical.

.2 Nameplate for each panelboard size 5 (2 line) engraved as indicated and include panel designation and voltage/phase.

.3 Complete updated circuit directory with typewritten cards located in slide-in plastic pocket fixed to the back of the related door. Directory card to indicate the panel designation, mains size, voltage/phase and the location and load controlled of each circuit. Include a “letter sized” paper copy of each directory in the project maintenance manual.

.4 Provide a plasticized typewritten information card fixed to the back of the each panel door. Information card to indicate the panel designation and location, feeder type and size and locations of any controlling contactors and feeder pullboxes. Include a “letter sized” paper copy of each information card in the project maintenance manual.

Part 3 Execution

3.1 INSTALLATION

.1 Locate panelboards as indicated and mount securely, plumb true and square, to adjoining surfaces.

.2 Mount panelboards to height given in Section 26 05 00 or as indicated.

.3 Connect loads to circuits as indicated.

.4 Connect neutral conductors to common neutral bus with respective neutral identified.

END OF SECTION

Part 1 General

1.1 PRODUCT DATA

.1 Submit shop drawings and product data in accordance with Section 01 330 00 – Submittal Procedures.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA-C22.2 No.42, General Use Receptacles, Attachment Plugs and Similar Devices.

.2 CSA-C22.2 No.42.1, Cover Plates for Flush Mounted Wiring Devices.

.3 CSA-C22.2 No.55, Special Use Switches.

.4 CSA-C22.2 No.111, General Use Snap Switches.

Part 2 Products

2.1 SWITCHES

.1 Heavy duty commercial grade.

.2 20 A, 120 V or 347 V, single pole, double pole, three-way, four-way switches as indicated.

.3 Manually-operated general purpose ac switches as indicated and with following features:

.1 Terminal holes approved for No.10 AWG wire.

.2 Silver alloy contacts.

.3 Urea or melamine molding for parts subject to carbon tracking.

.4 Suitable for back and side wiring.

.5 White toggle (red toggle for emergency power circuits).

.4 Toggle operated fully rated for tungsten filament and fluorescent lamps, and up to 80% of rating capacity of motor loads.

.5 Switches of one manufacturer throughout project.

.6 Standards of acceptance: Specification grade.

2.2 RECEPTACLES – GENERAL

.1 Heavy duty commercial grade.

.2 In patient environment areas within patient care and treatment areas/rooms, receptacles shall be of hospital grade.

.3 Duplex receptacles, CSA type 5-20 R, 125 V, 15 A, U ground, with following features:

.1 Decora style.

.2 White nylon molded housing.

.3 Suitable for No.10 AWG for back and side wiring.

.4 Break-off links for use as split receptacles.

.5 Eight back wired entrances, four side wiring screws.

.6 Triple wipe contacts and non riveted grounding contacts.

.4 Receptacles of one manufacturer throughout project.

.5 Standards of acceptance: Specification grade, and hospital grade.

2.3 RECEPTACLES – PARTICULAR APPLICATION

.1 Ground Fault Interrupter type to be 15 Amp, 125 volt duplex receptacles to be 2 pole, 3 wire hospital grade, white face, parallel blade, U ground, impact resistant nylon face, complete with breaker and reset button. Equal to Specification grade.

.2 All other single outlet and special purpose receptacles to be equal to Specification grade. Confirm ampacity, voltage and pin configuration prior to installation.

2.4 COVER PLATES

.1 Stainless steel: Type 302 or 304, No. 4 finish, 1mm thick, accurately die cut, protective cover for shipping. Outlets in labs or as indicated in the drawings or specifications.

.2 Steel: sheet steel hot dip galvanized with rolled edges for surface mounted utility boxes.

.3 Wall plates to be flush mounting with "positive bow" feature to ensure that all edges of plate are flush with wall or surface box when installed.

.4 All plates to be beveled type with smooth rolled outer edge and smooth face. Exposed sharp edges are not acceptable.

.5 Cast metal: die cast profile, ribbed for strength, flash removed, primed with grey enamel finish and complete with four mounting screws to box for special purpose wiring devices.

.6 Weatherproof double lift spring-loaded cast aluminum cover plates, complete with gaskets for wiring devices as indicated. Double doors for standard duplex receptacles. Cover plates to fasten to box by four screws.

.7 Gaskets: resilient rubber or close cell foam urethane.

.8 Cover plates for all wiring devices to be from one manufacturer throughout project.

Part 3 Execution

3.1 INSTALLATION GENERAL

.1 Mount wiring devices to height specified in Section 26 05 00 or as indicated.

.2 All plates to be installed parallel or perpendicular to building lines.

.3 All plates in resident rooms to be secured with two rivets.

3.2 INSTALLATION PARTICULAR

.1 Switches:

.1 Install single throw switches with handle in "UP" position when switch closed.

.2 Install switches in gang type outlet box when more than one switch is required in one location.

.2 Receptacles:

.1 Install all receptacles in the vertical plane unless otherwise noted.

.2 Generally install the L5-15/20R U ground pin down unless otherwise noted. Neutral up when receptacle in mounted horizontal.

.3 Install receptacles vertically in gang type outlet box when more than one receptacle is required in one location.

.4 Where split receptacles has one portion switched, mount vertically and switch the upper portion.

.5 Ground fault interrupter duplex receptacles to be used, where shown on the drawings.

.3 Cover plates:

.1 Protect cover plate finish with paper or plastic film until painting and other work is finished.

.2 Install suitable common cover plates where wiring devices are grouped.

.3 Do not use cover plates meant for flush outlet boxes on surface-mounted boxes.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 CAN/CSA C22.1-09, Canadian Electrical Code, Part I.

.2 CAN/CSA C22.2 No.9.0, General Requirements for Luminaires.

1.2 ADDITION OF ACCEPTABLE MANUFACTURERS

.1 See Section 26 05 00 subsection 1.23.7.

1.3 PRODUCT DATA

.1 Submit shop drawings and product data in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit complete photometric and heat dissipation data prepared by independent testing laboratory for proposed luminaires.

1.4 INTENT

.1 Provide lighting fixtures and accessories for all outlets as listed in the Luminaire Schedule and as shown on drawings.

.2 Lighting fixtures shall be structurally well designed and constructed, using new parts and materials of the highest commercial grade available.

.3 Ground all lighting equipment to grounding system.

.4 Verify all ceiling and/or wall types and finishes before ordering fixtures and provide fixtures suitable for mounting in or on ceilings and/or walls being installed in each area, as specified. Where fixture types specified are not suitable for ceiling and/or wall being installed, obtain written instructions from the Departmental Representative before ordering fixtures.

.5 Fixtures of the same or similar type shall be supplied by the same manufacturer.

Part 2 Products

2.1 LED DRIVERS

.1 Electronic type

.2 Thermally protected

.3 Dimmable to 20% minimum output

2.2 LUMINAIRES

.1 Accessories and components shall comply with relevant CSA Standards.

.2 All fixture diffusers, lens panels, lens frames, etc., shall be securely and adequately supported and shall be removable without the use of tools for cleaning.

.3 Fixtures shall incorporate adequate gasketting, stops and barriers to form light traps and prevent light leaks.

.4 Fixtures shall be designed for adequate dissipation of ballast and lamp heat to avoid short ballast life, nuisance thermal tripping and decreased lamp output.

.5 Construction of all fixtures shall be such as to provide a rigid well aligned fixture. Formed or ribbed backplates, end plates, reinforcing channel, heavy gauge sockets, straps, etc., shall be used where required to accomplish this.

.6 The construction and performance of all LED fixtures shall be subject to the acceptance of the Departmental Representative. Full photometric data from independent testing laboratory shall be provided when requested by the Departmental Representative.

.7 All fixtures in resident rooms shall be designed and constructed to a high standard of tamperproof capabilities.

Part 3 Execution

3.1 INSTALLATION AND SUPPORTS

.1 Provide complete and proper support for all fixtures, fixture hangers, etc., including headers in ceiling space, where required, for proper support of outlet boxes and fixture hanger assemblies.

.2 Support fixtures as shown on the drawings, level, plumb and true with the structure and other equipment in a horizontal or vertical position as intended. Wall or side bracket mounted fixture housings shall be rigidly installed and adjusted to give a neat flush fit to the surface on which it is mounted.

.3 All hangers, supports, fastenings or accessory fittings shall be protected against corrosion. Care shall be taken during the installation to assure that insulation and corrosion protection is not damaged.

.4 Self aligning seismically rated ball joint hangers shall be used for rod suspended fixtures. Ceiling canopies or hood assemblies intended to cover the suspension attachments shall be installed to fit tightly to the ceiling without restricting the alignment of the hanger. Support fixtures by hangers and mounting arrangements which will not cause the fixture frame, housing, sides or lens frame to be distorted; or prevent complete alignment of several fixtures in a row.

.5 The suspension length of all ceiling mounted suspended types of lighting fixtures as listed in the Luminaire Schedule shall be the overall length from the ceiling to the lowest point of the fixture body, reflector or glassware in its hanging position.

.6 Metal inserts, expansion bolts or toggle bolts in concrete slabs for stems which do not carry wiring must be accurately located in relation to the outlet boxes, to allow perfect alignment and spacing of suspension stems.

.7 Install fixture lenses as late as possible to protect from dirt and dust. Remove and clean or replace lenses to the satisfaction of the Departmental Representative.

.8 All fastening methods/components shall provide a high standard of tamperproof capabilities.

END OF SECTION

Part 1 **General**

1.1 SECTION INCLUDES

.1 This section specifies materials and installation for exit signs complete with directional arrows.

1.2 TYPE OF EXIT SIGN

.1 Install specification grade LED type with universal green ‘’running man’ pictogram exit signs in general public areas where indicated on drawings.

.2 Install specification grade weatherproof LED type exit signs where designated ‘WP’ where indicated on drawings.

1.3 PRODUCT DATA

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data: submit manufacturer's product data sheets indicating dimensions, materials, and finishes, including classifications and certifications.

Part 2 **Products**

2.1 EXIT SIGN TYPES

.1 General Public Areas:

.1 Thin line, LED type with white finish thermoplastic housing.

.2 All exit signs shall comply with CAN/CSA C860.

.3 Exit signs shall be complete with 10 year warranty.

2.2 MOUNTING TYPE

.1 Exit signs to be suitable for universal mounting. Allow for exit signs to be mounted as to best suit ceiling/wall type and architectural features:

.1 surface wall mounted

.2 end wall mounted double face

.3 recessed wall mounted

.4 ceiling mounted single face

.5 ceiling mounted double face

.2 Exit signs to have direction arrows where indicated.

.3 Provide steel rod pendant supports for exit signs to mount to +3.5m A.F.F. in high ceiling areas as required.

Part 3 **Execution**

3.1 INSTALLATION

.1 Install exit signs as shown on plans complete with double face units where indicated.

.2 Connect to life safety emergency power circuit as indicated on the plans.

.3 Exit signs must be clear of all visual obstruction.

.4 Install 6 additional exit signs as direct replacements for existing exist signs in areas of the building outside of the renovated area.

3.2 LOCATION

.1 Review locations of exit signs with Departmental Representative to ensure effectiveness and compatibility with decor before rough in. Failure to do so may result in relocation at no extra charge to the project.

3.3 MOUNTING HEIGHT

.1 Wall mounted signs shall be clear above doors and, if space allows, 2.4 metres to centre, but with 25mm clearance of ceiling.

.2 Ceiling mounted signs shall be mounted directly on ceiling, unless it is obstructed from view. Stem mount using two fixture rods (9.5mm white smooth type).

END OF SECTION

1 General

1.1 OVERVIEW

1.1.1 The telecommunications wiring infrastructure (Cable Plant) shall serve as an information transport system for analog voice, voice over IP (VoIP), data (LAN) and video signals distributed throughout a building from designated demarcation points to telecommunication outlets placed at various locations specific to each project.

1.1.2 All cables and terminations of the Cable Plant shall be identified and labeled at all locations. All cables shall be labeled in an alpha-numeric scheme at all termination locations. All terminations shall comply with requirements of EIA /TIA-568A standard (and all associated addenda), and shall be tested for Category 6 performance.

1.1.3 All cables, terminations, coverplates, equipment, and testing associated with the telephone and data system will be carried out by Shared Services Canada (SSC). The electrical contractor shall coordinate with SSC to provide the necessary outlet boxes and raceway system. As the following specification is applicable for other than the telephone and data system it is carried in its entirety. It also provides information to which SCC will be governed.

1.2 SCOPE OF WORK

1.2.1 Include detailed design, manufacturer, supply, installation, inspection and testing of communications wiring infrastructure and items contained within as described in these performance specifications and summarized in the following elements of the work:

1.2.1.1 Section 27 05 26 – Grounding and Bonding
1.2.1.2 Section 27 05 28 – Interior Pathways
1.2.1.3 Section 27 05 53 – Identification
1.2.1.4 Section 27 11 00 – Communications Equipment Rooms and Fittings
1.2.1.5 Section 27 13 10 – Backbone Cabling
1.2.1.6 Section 27 15 00 – Communication Cable Inside Buildings

1.3 DEFINITION OF TERMS

1.3.1 The following abbreviations may be used within this specification document and in the drawings.

1.3.1.1 ANSI: American National Standards Institute
1.3.1.2 ASTM: American Society for Testing and Materials
1.3.1.3 BICSI: Building Industry Consulting Service International
1.3.1.4 ATV: Cable TV
1.3.1.5 CP: Consolidation Point
1.3.1.6 CSA: Canadian Standards Association - equipment safety approvals and testing for Canada
1.3.1.7 EF: Entrance Facility
1.3.1.8 EGB: Electrical Ground Breaker
1.3.1.9 EIA: Electronic Industries Association
1.3.1.10 ER: Equipment Room

1.3.1.11 ETL: ETL Testing Laboratories – product testing laboratory for U.S. and Canada
1.3.1.12 FDC: Fibre Distribution Centre (fibre splice tray or termination tray)
1.3.1.13 IDF: Intermediate Distribution Frame
1.3.1.14 IEEE: Institute of Electrical and Electronic Engineers
1.3.1.15 ISO: International Standards Organization
1.3.1.16 MEGB: Main Electrical Ground Busbar
1.3.1.17 NEMA: National Electrical Manufacturer's Association
1.3.1.18 TGB: Telecommunications Ground Busbar
1.3.1.19 TR: Telecommunications Room
1.3.1.20 TMGB: Telecommunications Main Ground Busbar.
1.3.1.21 TO: Telecommunications Outlet
1.3.1.22 ULC: Underwriters Laboratories of Canada - testing laboratory for Canada (see C-UL and UL)
1.3.1.23 UTP: Unshielded Twisted Pair
1.3.1.24 WA: Work Area

1.4 REFERENCES STANDARDS

1.4.1 Design, manufacturer, supply, installation, inspection and testing of communications wiring infrastructure and related items shall comply with the following codes and standards in their latest draft including all addendum, unless otherwise stated:

1.4.1.1 Canadian Electric Code
1.4.1.2 BC Building Code
1.4.1.3 ANSI/TIA/EIA-568-B.1 - Commercial Building Telecommunications Cabling Standard Part 1 – General Requirements
1.4.1.4 ANSI/TIA/EIA-568-B.2 - Commercial Building Telecommunications Cabling Standard Part 2 – Balanced Twisted Pair Cabling Components Cabling
1.4.1.5 ANSI/TIA/EIA-568-B.3 - Commercial Building Telecommunications Standard Part 3 – Optical Fibre Cable Components Standard
1.4.1.6 ANSI/TIA/EIA-569-B - Commercial Building Standard for Telecommunications Pathways and Spaces
1.4.1.7 ANSI/TIA/EIA-606-A - Administration Standard for the Commercial Telecommunications Infrastructure
1.4.1.8 TIA J-STD-607-A – Commercial Building Grounding and Bonding Requirements for Telecommunications
1.4.1.9 IEEE 802.11 series of Wireless Standards
1.4.1.10 IEEE 802.3 series of Ethernet Standards
1.4.1.11 ISO 8802-3 series of Standards
1.4.1.12 BICSI – Information Technology Systems Installation Methods Manual (IT’S IMM).
1.4.1.13 Canadian Electrical Code (CEC) Part 1 C22.1 including B.C. Amendment and Regulation
1.4.1.14 WorkSafe BC
1.4.1.15 British Columbia Building Code
1.4.1.16 UL Cable Certification Program
1.4.1.17 NEMA
1.4.1.18 ASTM
1.4.1.19 UL Testing Bulletin
1.4.1.20 TIA/EIA-568-C.0 Generic Telecommunications Cabling for Customer Premises
1.4.1.21 TIA/EIA-568-C.1 Commercial Building Telecommunication Standard

1.4.1.22 TIA/EIA-568-C-2 Balanced Twisted-Pair Telecommunications Cabling and Component Standards
1.4.1.23 TIA/EIA-568-C-3 Optical Fibre Cabling Components
1.4.1.24 TIA/EIA-569-B Commercial Building Standard for Telecommunication Pathways and Spaces
1.4.1.25 TIA/EIA-606-A Administration Standard for Commercial Telecommunication Infrastructure of Commercial Buildings
1.4.1.26 TIA/EIA-758-A Customer-Departmental Representative Outside Plant Telecommunications Infrastructure Standard
1.4.1.27 TIA/EIA-942 Telecommunications Infrastructure Standard for Data Centres
1.4.1.28 CSA-T527 Grounding and Bonding for Telecommunications in Commercial Buildings
1.4.1.29 TIA/EIA-492CAAA Detail Specification for Class Iva Dispersion-Unshifted Singlemode Optical Fibre
1.4.1.30 TIA/EIA-492AAAC-A Detail Specification for 850-nm Laser Optimized, 50-um Core Diameter/ 125-um Cladding Diameter Class Ia Grade-Index Optical Fibre
1.4.1.31 TIA-526-7 Measurement of Optical Power Loss of Installed Single-Mode Fibre Cable Plant
1.4.1.32 TIA-526-14A Measurement of Optical Power Loss of Installed Multimode Fibre Cable Plant
1.4.1.33 IEEE 802.3af, Power over Ethernet (PoE) Standard
1.4.1.34 IEEE 802.3at, Power over Ethernet + (Plus) Standard
1.4.1.35 IEEE 802.3an, Physical Layer and Management Parameters for 10 Gbps Operation, Type 10GBASE-T
1.4.1.36 IEEE 802.11, Wireless Standard
1.4.1.37 BICSI – Telecommunication Distribution Methods Manual
1.4.1.38 BICSI – Information Transport Systems Installation Manual
1.4.1.39 BICSI – Customer-Departmental Representative Outside Plant Design Manual

1.5 APPLICATION STANDARDS

1.5.1 Applications standards supported should include, but not be limited to, IEEE 802.3, IEEE 802.11, 10/100/1000 BASE-T up to 100m (328 feet), IEEE 802.5, 250MHZ. The 100-meter distance limit includes a maximum 90 meter of horizontal copper cable length between the patch panel and user outlet jack + 10 meters for the patch cords.

1.6 APPROVED MANUFACTURER

1.6.1 All signal carrying components (connectors, cabling, panels etc.) of the structured cabling systems for telecommunication system provisions shall be from a single manufacturer.

1.6.2 Approved cabling manufacturers are Belden, Panduit, and Commscope.

1.6.3 Match existing cable and connectivity manufacturer for renovations.

1.7 CONTRACTOR QUALIFICATIONS

1.7.1 Contractor shall hold current manufacturer’s certification and shall employ manufacturer- certified and trained staff to perform installation of the cabling system.

2 Definition of Terms

2.1.1.1 The following abbreviations may have been used within these documents and standard drawings.

2.1.1.1.1 AFF Above Finished Floor
2.1.1.1.2 AHJ Authority Having Jurisdiction
2.1.1.1.3 AWG: American Wire Gauge
2.1.1.1.4 BICSI: Information Transportation Systems Association
2.1.1.1.5 BACnet: Building Automation Data Communications Protocol
2.1.1.1.6 CATV: Cable Television/Satellite Television
2.1.1.1.7 CCTV: Closed Circuit Television
2.1.1.1.8 COMM: Communications
2.1.1.1.9 CP: Consolidation Point
2.1.1.1.10 CSA: Canadian Standards Association
2.1.1.1.11 EIA: Electronic Industries Association
2.1.1.1.12 ESBC: Electrical Service Bonding Conductor
2.1.1.1.13 IEEE: Institute of Electrical and Electronic Engineers
2.1.1.1.14 IP: Internet Protocol
2.1.1.1.15 OTDR: Optical Time Domain Reflectometer
2.1.1.1.16 POE: Power Over Ethernet
2.1.1.1.17 SRG: Signal Reference Grid
2.1.1.1.18 TIA: Telecommunications Industry Alliance
2.1.1.1.19 TBB: Telecommunications bonding Backbone
2.1.1.1.20 TEBC: Telecommunications Equipment Bonding Conductor
2.1.1.1.21 TGB: Telecommunications Grounding Busbar
2.1.1.1.22 TMGB: Telecommunications Main Grounding Busbar
2.1.1.1.23 TYP: Typical
2.1.1.1.24 ULC: Underwriters Laboratories of Canada
2.1.1.1.25 UTP: Unshielded Twisted Pair
2.1.1.1.26 U/FTP: Shielded Twisted Pair
2.1.1.1.27 VOIP: Voice over Internet Protocol

3 Quality Assurance

3.1 QUALITY ASSURANCE

3.1.1 The Installer shall be an employee of the Contractor and/or authorized sub-contractor. Submit a copy of the manufacturers training certificate to the on-site telecommunications project manager with the tender package.

3.1.2 Manufacturer refers to the company that manufactures the components and is responsible for the design and installation guidelines used by the Contractor to complete this cabling system installation. The manufacturer along with the Contractor is responsible for the final warranty and certification of the installation and application assurance.

3.1.3 All cabling, termination hardware, and connecting cords shall be sourced from the certifying manufacturer to assure quality control and validity of the manufacturer’s warranty.

3.1.4 The contractor shall accept complete responsibility for the installation, certification, and support of the cabling system. Contractor shall show proof that it has the certifying manufacturer’s support on all of these issues.

3.1.5 All work shall be performed and supervised by Telecommunications Technicians who are qualified to install voice, data & multimedia cabling systems and to perform related tests as required by the manufacturer in accordance with the manufacturer's methods.

3.1.6 The Telecommunications Technicians employed shall be fully trained and qualified by the manufacturer on the installation and testing of the equipment to be installed. Evidence that the vendor is a current certified installer of the manufacturer must be provided in writing prior to work commencing on the structured cabling of the building.

3.1.7 The contractor (including subcontractors if any) shall have a proven 7-year track record in projects of similar nature.

3.2 PERMITS

3.2.1 Contractor shall obtain and pay for all permits and inspections by Authority Having Jurisdiction as required by local authorities to commence, execute and substantially complete work.

3.3 DAMAGE

3.3.1 Where existing structure, grade or paving has to be removed, altered or otherwise defaced to facilitate communication installation, Contractor shall arrange for breaking of openings or grooves in any building structure or breaking of pavement and/or digging of trenches

3.3.2 Any equipment, structure, pavement or grade damaged by the execution of this Contract will be repaired to its original condition. Any cost incurred for such work shall be allowed for in tender sum.

3.3.3 Irreparably damaged equipment, structures, walls, surfaces etc. shall be replaced at no cost to the Departmental Representative.

3.3.4 If the finish of new equipment, structures, walls, surfaces etc. damaged by this contractor, the contractor, at the discretion of the Departmental Representative, shall either replace or restore the equipment, structures, walls, surfaces etc. to its original condition by re-spraying, refinishing, etc. at no cost to the Departmental Representative.

3.3.5 Openings and conduits shall not be burned into panels. Oversized openings shall not be patched up with loose plates or oversized washers. Oversized openings will be considered damaged to the equipment and are to be treated as specified above.

3.3.6 The Contractor shall use extreme care when working near existing services and any services disturbed will be replaced at his cost to the satisfaction of the Consultant.

3.3.7 Contractor shall determine the location of the existing underground services from the Authorities Having Jurisdiction and/or Departmental before excavation of existing grade and sub-grade, or new construction begins.

3.4 NOT IN CONTRACT

3.4.1 Supply and installation of computers, servers, switches, routers and wireless access points are not in this contract and shall be provided by others.

3.5 WARRANTY AND CERTIFICATION

3.5.1 Contractor shall provide a one year Labour Warranty for the entire installation to guarantee against substandard installation practices based on the installation guidelines outlined in codes and standards listed. The warranty shall commence from the date final acceptance.

3.5.2 Contractor shall provide a one year Product Warranty for the entire installation. The warranty shall commence from the date of final acceptance.

3.5.3 Contractor shall provide a twenty-five-year performance guarantee and certification on all non-consumable products installed.

3.6 MANUFACTURER'S CABLING SYSTEM PERFORMANCE WARRANTY

3.6.1 A system performance warranty shall be issued to guarantee that the telecommunications wiring infrastructure shall support up to, but not be limited to, 10/100/1000G Base-T applications.

3.6.2 All cabling products and workmanship must include coverage as follows:

3.6.2.1 System Performance Warranty to Category 6 Standards from manufacturer;

3.6.3 System Performance Warranty certificate must be provided by the subject warranty manufacturer;

3.6.4 The System Performance Warranty term will be as provided by the warranty underwriting manufacturer, from the date of final acceptance of the project;

3.6.5 The name and address of the building/facility and location of the site must appear on the warranty document;

3.6.6 The Contractor must be fully approved and certified by the proposed warranty underwriting manufacturer prior to responding to the bid;

3.6.7 Testing shall be performed by telecommunications technicians who are qualified and certified by the manufacturer to perform related tests as required by the manufacturer in accordance with the manufacturer's methods

3.7 CLEANING

3.7.1 Contractor shall leave the site every day in a clean and safe manor.

3.7.2 Contractor shall remove all debris, surplus material and all tools.

3.8 CONSTRUCTION SUBMITTALS

3.8.1 The contractor shall submit directly to the IT Department a PDF copy of all shop drawings relating to communications infrastructure, including but not limited to:

3.8.1.1 Copper Cable
3.8.1.2 Patch Panels
3.8.1.3 Jacks
3.8.1.4 Patch Cords
3.8.1.5 Racks and all related accessories
3.8.1.6 Consolidation Points
3.8.1.7 Cable Tray
3.8.1.8 Faceplates

3.8.2 The contractor shall receive written approval from consultant of these shop drawings before purchasing or installation.

3.9 SUBSTANTIAL SUBMITTALS

3.9.1 The contractor shall submit directly to the consultant an electronic copy of the maintenance manuals which shall contain the following documents:

3.9.1.1 Contractors name, address and telephone numbers.
3.9.1.2 Neatly type written table of contents arranged in a systematic order
3.9.1.3 All communication infrastructure shop drawings
3.9.1.4 Warranty and Certification Certificates
3.9.1.5 Test results of all cable installations
3.9.1.6 As built drawings in PDF and AutoCAD format – showing accurate riser diagrams, room layouts, rack layouts and floor plans indicating all outlets with associated outlet labels.

END OF SECTION

1 General

1.1 SECTION INCLUDES

1.1.1 This section specifies the materials and installation for interior pathways for communications systems.

1.2 SCOPE

1.2.1 Extend existing communication services to suit relocated communication outlets.

2 Design and Performance Requirements

2.1.1 All pathways shall be sized with 50% spare capacity, based on a 40% fill ratio.

2.1.2 All pathways shall avoid potential sources of electromagnetic interference by maintaining clearances of at least:

2.1.2.1 305 mm from fluorescent ballasts
2.1.2.2 305 mm from electrical power distribution conduit and cable, less than 1kV
2.1.2.3 1000 mm from electrical power distribution conduit and cable, more than 1kV.
2.1.2.4 1220 mm from motors and transformers.
2.1.2.5 305 mm from fluorescent lighting. Pathways shall cross perpendicular to fluorescent lighting and power distribution and conduits.
2.1.2.6 305 mm from HVAC equipment, ducts and pipes

2.1.3 Communication pathways shall never be occupied by any system, other than IT related communications.

2.1.4 Communication pathways shall never be routed through rooms containing large amounts of heat above average room temperature or sources of EMI such as mechanical rooms.

2.1.5 Conduit and boxes shall be installed as follows:

2.1.5.1 The minimum size of communications back box shall be a 103mm x 103mm (4”x4”), 90mm (3 5/8”) deep flush- mounted box c/w single gang mud-ring.
2.1.5.2 Mounting heights shall be 300mm (12”) AFF and 150mm (6”) above counter tops.
2.1.5.3 The minimum size conduits extending from each communications back box shall be 27mm (1”) EMT conduit c/w pull string to nearest major cable pathway accessible ceiling or floor space.
2.1.5.4 Surface raceway such as Wiremold containing outlets shall have a depth of 90mm.
2.1.5.5 A minimum of one 27 mm diameter conduit shall run from the outlet box to the cable tray. A conduit run shall serve no more than one outlet box and shall not be daisy chained.
2.1.5.6 If conduit has an internal diameter of 50 mm or less then the bend radius shall be at least six times the internal diameter. If conduit has an internal diameter of more than 50 mm then the bend radius shall be at least ten times the internal diameter.
2.1.5.7 The maximum number of bends between cable pull boxes in a conduit run shall be two 90° bends.

2.1.5.8 Conduit runs shall have no continuous sections longer than 30m between pull boxes.
2.1.5.9 If a conduit run requires a reverse bend between 100° and 180° then a pull box shall be inserted into the bend but shall not be used as the bend.
2.1.5.10 Pull boxes shall be adequately sized for the radius of the connecting conduits and the manufacturer's specified cable bend radius.
2.1.5.11 Pull boxes shall be installed in fully accessible spaces.
2.1.5.12 Support and secure all boxes independent of the conduit connected thereto.
2.1.5.13 All conduit ends shall be protected by insulating bushings.
2.1.5.14 Use only manufacturer approved cable lubricants. Any excess lubricant shall be cleaned so as to leave conduit exteriors suitable for painting.
2.1.5.15 All conduits shall be left with a nylon pull string installed.
2.1.5.16 All visible securing components to be of a high tamperproof standard and suitable to Corrections Canada.

END OF SECTION

1 General

1.1 SECTION INCLUDES

1.1.1 This section specifies the materials and installation of Identification labeling for communications systems.

1.2 SCOPE

1.2.1 The scope of work included within the section includes identification and administration of an end-to-end structured cabling system and its pathways and spaces.

1.2.2 Identification of voice and data cables and outlets shall be as per the scheme used in the existing part of the building, and in coordination with CSC IT.

2 Design and Performance Requirements

2.1.1 Labeling shall be in accordance with the following:

2.1.1.1 Labeling and administration shall adhere to EIA/TIA 606A labeling Standard.

2.1.1.2 All general identification labels shall be uniform and made using a mechanically imprinted label (e.g. Brother P-Touch Type label). All cable labels shall have black lettering (approx. 3mm high) on white background. Hand written labels shall not be accepted.

2.1.1.3 All receptacles and power connections in areas of patient care and treatment shall use lamacoid labels mounted on the wall immediately above or below the coverplate for each device.. Normal power shall utilise white lettering on black background and generator backed devices shall use white lettering on red background. All devices within the entire room shall use lamacoid whether they are in the patient care environment or not.

2.1.1.4 All distribution equipment shall use lamacoid labels mounted in a very visible location on the equipment. Power distribution equipment identification shall include voltage, phase, wires, and where fed from.

2.1.1.5 All telecommunications cabling (horizontal and backbone), faceplate/connectors, patch panels, cross-connects, racks, cabinets, grounding and bonding, etc. shall be labeled.

2.1.1.6 All Identification markings shall be uniform for each type of system.

2.1.1.7 Horizontal cables and Faceplate Port Identification

2.1.1.8 Patch Panel Identification: Shall match existing facility labeling scheme.

2.1.1.8.1 All patch panels shall be numbered sequentially from top to bottom (i.e., P1, P2, P3, etc.).

2.1.1.8.2 Ports within patch panel shall follow a similar labeling convention to that of the horizontal cabling excluding the telecommunications room identifier.

2.1.1.9 Rack Identification

2.1.1.9.1 All racks shall be numbered sequentially (i.e. R1, R2, R3, etc.)

2.1.1.10 Grounding and Bonding Identification

2.1.1.10.1 The Telecommunications Main Ground Bus bar shall be labeled with TMGB.

2.1.1.10.2 The Telecommunications Ground Bus bar in each telecommunications space shall have the following convention: TR-TGB (where TR = Telecommunications Room ID)

2.1.1.11 A wiring record (spreadsheet or table) shall be provided containing the following information:

2.1.1.11.1 Identification label/numbers for patch panel port jacks
2.1.1.11.2 Cable pair-to-pin assignment for each port
2.1.1.11.3 Cable length for each cable
2.1.1.11.4 The cable pairs to pin assignment for each telecommunication outlet.
2.1.1.11.5 A complete legend on how to read the cable identification system

2.1.1.12 Cable labels shall be vinyl construction with a white printing area and a clear tail that self-laminate the printed area when wrapped around the cable. The clear area should be of sufficient length to wrap around the cable at least 1.5 times.

2.1.1.13 Vinyl identification labels shall appear on the following locations with the designations indicated on the cable schedule and drawings:

2.1.1.13.1 Outlet identification on both ends of every cable
2.1.1.13.2 Outlet identification on the front of all faceplates
2.1.1.13.3 Port identification on the front of all patch panels
2.1.1.13.4 Panel identification on the front middle of all patch panels
2.1.1.13.5 Pair identification on the front of termination fields
2.1.1.13.6 Wireless identification on the front of all wireless access points
2.1.1.13.7 Pull Box identification stating “Communications”
2.1.1.13.8 Consolidation Points on the cover stating grid location

2.1.1.14 Lamacoid identification labels shall appear on the following locations with the designations indicated on the drawings:

2.1.1.14.1 Rack identification on the top centre of the cabinet
2.1.1.14.2 Grounding identification

2.1.1.15 All firestops shall be labelled stating “WARNING FIRESTOP SEAL DO NOT DISTURB” and also the contractors name, address and phone number, date installed, fire rating.

END OF SECTION

1 General

1.1 SECTION INCLUDES

1.1.1 This section specifies the materials and installation for communication cables inside buildings.

1.2 SCOPE

1.2.1 All Voice/Data cabling will be supplied and installed by a communications cabling contractor outside of this contract. All telecommunications cabling patch panels, cabinets, active components, switches, and similar infrastructure associated with voice and data cabling is not included in this contract (NIC).

1.2.2 Provide an empty raceway system consisting of outlet boxes, conduits, pullstrings, cabletrays and bonding of these components to ground to support the Voice/Data system.

1.2.3 Firestopping of raceways after cable installation is complete.

1.3 REFERENCES

1.3.1 Bicsi (latest edition) Telecommunications Distribution Methods Manual

2 Design and Performance Requirements

3 Products

4 Execution

4.1 INSTALLATION

4.1.1 Horizontal distribution communication cable shall be run in EMT to cabletray near voice/data equipment room, and from cabletray to voice/data equipment room in larger conduits indicated. No free air unsupported cabling will be accepted.

4.1.2 When routing communication cabling, avoid: sources of EMF, mechanical/electrical rooms, areas of high or low ambient temperatures, exterior or structural load bearing walls.

4.1.3 Optimum cabling routing is to be coordinated on site prior to rough-in of conduit or installation of cable supports. No extras will be allowed for re-roughing of installed infrastructure that have not been coordinated with other trades on site.

4.1.4 Minimum conduit size to each outlet shall be 27mm.

4.1.5 Bend radius of cable in conduit less than 53mm in diameter shall not be less than 6 times cable diameters or as per cable manufacturer recommendation.

4.1.6 Pulling tension must not exceed cable manufacturers recommended pulling tension guidelines. Maximum number of bends per BICSI standards.

4.1.7 All penetrations in fire rated partitions are to be firestopped per specifications. Any re-pulling of cable through penetrations after firestopping has been applied shall result in re-firestopping the penetration affected to meet the requirements of the firestopping specification.

5 Testing

5.1 GENERAL REQUIREMENTS

5.2 FIRE STOPPING

5.2.1 Fire-stopping systems shall meet the requirements of applicable codes and the approval of the authorities having jurisdiction.

5.2.2 All communications pathways and/or cable penetrations of fire rated barriers must be firestopped with an approved system after cable installation.

5.2.3 Wherever two systems partitions exist the demising wall shall be treated as a fire rated barrier.

END OF SECTION

1 General

1.1 Overview

1.1.1 Supply and install a Public Address System as indicated on drawings and specifications.

1.1.2 The existing audio amplifier is located in an existing equipment cabinet in room R10. Install conduit and wiring for the PA system from the renovated area to room R10.

1.1.3 The contractor shall use the existing public address audio amplifier to drive the new speakers.

1.1.4 The existing PA system may have several existing inputs. The Health Care speakers are intended to receive the audio from the all-call input.

1.1.5 Contractor shall adjust all sound levels for the existing speaker zones and the new additional speaker zone to suit the owner’s requirements. Coordinate speaker volume levels with the owner’s departmental representative.

1.1.6 Supply and install vandal resistant speakers as shown on drawings. Supply and install speaker backboxes to suite location. Use recess backboxes for false ceiling areas and use surface mounted speaker backboxes for exposed ceiling areas.

1.1.7 All speakers shall have seismic restraints installed.

1.2 Section Includes

1.2.1 This section specifies the materials and installation sound systems in various configurations including paging, voice and music operations.

1.3 References

1.3.1 Industry Canada - Terminal Attachment Program

1.3.1.1 CS-03-1996, Telecommunication Apparatus Compliance Specification, Issue 8.

1.4 Submittals

1.4.1 Product Data: Submit manufacturer's printed product literature, specifications and data sheets in accordance with Section 01 33 00 Submittal Procedures.

1.4.2 Shop Drawings: Submit in accordance with Section 01 33 00 Submittal Procedures.

1.4.2.1 Submit shop drawings to indicate project layout, device locations, point-to-point diagrams, cable schematics, risers, mounting details and identification labeling scheme including:

1.4.2.1.1 Functional description of equipment
1.4.2.1.2 Technical data sheets of all devices
1.4.2.1.3 Device location plans and cable lists
1.4.2.1.4 Paging zoning
1.4.2.1.5 Sound system interconnection detail drawings
1.4.2.1.6 Programming worksheets

1.4.3 Samples: Submit in accordance with Section 01 33 00 - Submittal Procedures.

1.4.3.1 Submit sample floor plans with device layout that will be used with the sound system.

1.4.4 Quality Assurance Submittals: Submit the following in accordance with Section 01 33 00 – Submittal Procedures.

1.4.4.1 Test Reports: Submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.

1.4.4.2 Certificates: Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

1.4.4.2.1 Submit UL/CSA Product Safety Certificates.

1.4.4.3 Instructions: Submit manufacturer's installation instructions.

1.4.5 Maintenance Data: Submit maintenance data for incorporation into manual specified in Section 01 78 00 Closeout Submittals. Include following:

1.4.5.1 System configuration and equipment physical layout
1.4.5.2 Functional description of equipment
1.4.5.3 Instructions on operation, adjustment and cleaning
1.4.5.4 Illustrations and diagrams to supplement procedures
1.4.5.5 Manufacturer's operation instructions
1.4.5.6 All programming worksheets

1.5 Warranty

1.5.1 For all materials, the 12-month warranty for parts and labour.

1.5.2 Manufacturer's Warranty: Submit, for Department Representative's Consultant's acceptance, manufacturer's standard warranty document executed by authorized company official.

1.6 Support Services

1.6.1 Provide manufacturer/dealer advice, information and support services for 1 year.

1.7 Closeout Submittals

1.7.1 Provide operation and maintenance data for the sound system for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

2 Products

2.1 Supply of System Components

2.1.1 Unless otherwise specified in this document, the contractor shall supply all components necessary to complete the system. All materials shall be new and of the latest hardware, software, and firmware versions.

2.1.2 Conduits: to Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings and Section 26 05 36 - Cable Trays for Electrical.

2.1.3 Communication conductors: as indicated, to Section 27 15 00 - Communication Cables Inside Buildings.

2.1.4 All components shall be new and CSA/UL approved.

2.2 Materials

2.2.1 Public Address System Speakers:

2.2.1.1	Frequency Response:	50 – 15kHz
2.2.1.2	Coverage:	105°
2.2.1.3	Impedance:	8 ohms
2.2.1.4	Transformer Taps:	.25, .5, 1, 2, 4 Watts
2.2.1.5	Enclosure Material:	steel
2.2.1.6	Dimensions:	290mmH x 298mmW
2.2.1.7	Weight:	2.8kg
2.2.1.8	Referenced Product:	Atlas Sound VP14MB Series c/w metal backbox – or approved equal

3 Execution

3.1 Installation

3.1.1 Install equipment in accordance with manufacturer's instructions, and as indicated.

3.1.2 Install equipment in accordance with local bylaw and the Canadian Electrical code.

3.1.3 Coordinate installation of public address system equipment into main security systems equipment rack.

3.1.4 Install cables neatly along building lines.

3.1.5 All cables shall have a permanent label. Label shall match shop drawings.

3.1.6 All cables shall be terminated with permanent crimp type or screw connectors. Marrette or twist-on type connectors are not acceptable.

3.1.7 Provide seismic restraints for speakers and suspended equipment.

3.1.8 Shielded cables shall be grounded at the cabinet/rack end only.

3.1.9 Ground all equipment cabinets/racks to a dedicated grounding system.

3.1.10 All cable runs shall be neatly fastened at minimum 4ft spans.

3.1.11 All cables in equipment rack shall be neatly fastened.

3.1.12 All rack mounted equipment shall have a permanent label indicating use.

3.1.13 Route all cables as far away for high voltage sources as possible. Minimum distance for parallel horizontal runs shall be 24 inches.

3.1.14 Adjust speaker taps to suit owner and consultant’s requirements.

3.2 Field Quality Control

3.2.1 Perform tests in accordance with Section 26 05 01 - Common Work Results - Electrical.

3.2.2 Perform tests using Smaartlive or similar software. Provide consultant with test results for equalizer settings, transfer tests, delays, speaker muting.

3.2.3 Conduct intelligibility test.

END OF SECTION

1.0 GENERAL

1.1 OVERVIEW

.1 Supply and Install a card access system as described in the specifications and drawings.

.2 The card access system shall be an extension of the existing card access system at the facility. The contractor shall provide all required hardware and software to integrate the new Healthcare renovation with the existing card access system.

.3 The existing card access system is a Lenel system. All hardware and software shall be compatible with the Lenel system. The existing card access system software is installed on a PC server that is located in the server room in an adjacent Building (Building 1).

.4 Install all new door control modules in room 116. Connect door control modules to local network switch for connection to main card access system server. Coordinate network port assignment with owner's departmental representative.

.5 The contractor shall provide card access stations at each door noted on the drawings.

.6 All alarms shall be annunciated at the central station in Building 1.

.7 The existing facility card access system workstation shall administer the card access system requirements for the new Healthcare renovation.

.8 Access cards shall be supplied by CSC.

.9 The contractor shall provide all required components to ensure a fully functional card access system as described in the contract documents. The contractor shall provide all required components that are not listed in the specification, but are required to supply a fully functional card access system as described in the contract documents.

.10 The contractor shall install cards in secure access control equipment cabinet(s) located in room 116, immediately adjacent the M&E room R10. All wall mounted security systems equipment shall be installed on walls of room 116 in a neat and orderly manner.

.11 Electric door locks/strikes, door contacts, and request-to-exit (REX) door hardware shall be supplied and installed by the door hardware contractor. The card access system contractor shall coordinate the installation of control wiring for the electric door locks/strikes, door contacts and REX hardware with the door hardware contractor and connect these devices to the card access system input modules.

.12 The contractor shall interconnect the control panels of Building 3 with Building 1 via two fibres of the fibre cable terminated in the CCTV security system rack.

1.2 SUMMARY

.1 Section Includes:

.1 This section of the specification forms part of the contract documents and is to be read, interpreted, and co-ordinated with all other parts.

.2 The specifications to supply, install, and operate an integrated security management system.

1.3 RELATED REQUIREMENTS

.1 Section 01 11 00 – Electrical General Provisions
.2 Section 01 33 00 - Submittal Procedures
.3 Section 01 78 00 - Closeout Submittals
.4 Section 08 71 00 – Finish Hardware
.5 Section 26 05 00 – Common Work Results – Electrical
.6 Section 26 05 21 – Wire and Cables
.7 Section 26 05 34 – Conduit, Conduit Fastenings and Fittings
.8 Section 27 15 00 – Communications Cables Inside Buildings
.9 Section 27 05 28 – Interior Pathways

1.4 REFERENCE STANDARDS

.1 The installation shall, as minimum, meet all national, provincial, and municipal, including, but not limited to:

.1 Building, fire, electrical and labour codes and standards.
.2 Workmanship shall meet or exceed nationally accepted workmanship standard.

.2 Underwriters Laboratories of Canada (ULC):

.1 CAN/ULC S301 latest edition, Central and Monitoring Station Burglar Alarm Systems
.2 CAN/ULC S302 – latest edition, Installation and Classification of Burglar Alarm Systems for Financial and Commercial Premises, Safes and Vaults
.3 CAN/ULC S303 latest edition, Local Burglar Alarm Units and Systems
.4 CAN/ULC S304 – latest edition, Central and Monitoring Station Burglar Alarm Units
.5 ORD C827 – latest edition, Central Stations for Watchman, Fire alarm and Supervisory Services
.6 ORG C1076 – latest edition, Proprietary Burglar Alarm Units and Systems
.7 ORD C488 – latest edition, Remote Burglar Alarm Signalling Centres

.3 Underwriters' Laboratories (UL):

.1 UL 294 latest edition, Standard for Safety for Access Control System Units
.2 UL 365 – latest edition, The Standard for Police Station Connected Burglar Alarm Units and Systems
.3 UL 609 1996, The Standard for Local Burglar Alarm Units and Systems
.4 UL 827 1996, Standard for Central Station Alarm Services or (the Standard for Central Station for Watchman, Fire Alarm and Supervisory Services)
.5 UL 1076 1995, Standard for Safety for Proprietary Burglar Alarm Units and Systems
.6 UL 1610 1998, The Standard for Central Station Burglar Alarm Units
.7 UL 1635 1996, The Standard for Digital Alarm Communicator System Units
.8 UL 1981 1994, Standard for Central Station Automation Systems

1.5 SCOPE OF WORK

.1 Supply and installation of a complete and operating system including but not necessarily limited to:

- .1 Card readers
- .2 Card reader interface modules
- .3 Card access system accessories
- .4 Card access system peripherals
- .5 Card access transmission methods

1.6 DEFINITIONS

- .1 SMS: Security Management System
- .2 CCTV: Closed Circuit Television System
- .3 CA: Card Access System
- .4 CR: Card Reader
- .5 REX: Request-to-exit sensor
- .6 DPS: Door Position Sensor
- .7 P.S.: Power Supply
- .8 ES: Electric Door Strike
- .9 MT: Mortise Door Lock
- .10 UPS: Uninterrupted Power Supply

1.7 CONTRACTOR QUALIFICATIONS

.1 The Card Access System shall be installed by a qualified Security Systems Contractor, certified by the respective equipment manufacturer, and having a minimum of five (5) years installation and service experience with similar installations. The contractor business, employees, managers and owners must be licensed in the Province of British Columbia under the Private Investigators and Security Agencies Act. The business must be licensed and bonded as an Alarm Service and each employee who is installing and servicing security alarm devices and equipment, must be licensed and bonded as an employee of the company and not as a sub-contractor. The equipment installers must hold a valid Trade Qualification Certificate issued by the Province of British Columbia. Proof of the Company and Installers Certification shall be requested and reviewed prior to contract award.

.2 The card access system contractor must be a certified Lenel systems contractor. The card access system contractor’s technicians must be trained and certified by Lenel.

1.8 SYSTEM PERFORMANCE REQUIREMENTS

.1 The Security Management System (SYSTEM) provides a number of functions including the ability to regulate access through specific doors and gates to secured areas of the owner’ facility and provide computer generated color employee and visitor credentials for that use. The system also records and stores digital video of activities occurring in the facility as well as manage and tracking corporate assets. The system must utilize a single seamlessly integrated relational database for all functionality. This integration shall be provided with one operating environment.

1.9 SUBMITTALS

.1 Product Data: Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures.

.1 Submit manufacture's literature for each system component.

.2 Submit:

.1 Functional description of equipment

.2 Technical data for all devices

.3 Device location plans and cable lists

.4 Devices mounting location detail drawings

.5 Typical devices connection detail drawings

.6 Programming worksheets

.2 Shop Drawings: Submit in accordance with Section 01 33 00 - Submittal Procedures.

.1 Submit shop drawings to indicate project layout, including details as follows:

.1 Indicate mounting heights and locations.

.2 Zone layout drawing indicating number and location of zones and areas covered.

.3 Wiring diagrams.

.4 Complete equipment list.

.3 Quality Assurance Submittals: Submit the following in accordance with Section 01 33 00 - Submittal Procedures:

.1 Test Reports: Submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.

.2 Certificates: Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties:

.1 Submit ULC/UL/CSA Product Safety Certificates.

.2 Submit verification Certificate that Installation/service Company is ULC/UL Listed alarm service Company.

.3 Submit verification Certificate that security access system is "Certified alarm system".

.3 Instructions: Submit manufacturer's installation instructions.

.4 Maintenance Data: Submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.1 Include:

.1 System configuration and equipment physical layout

.2 Functional description of equipment

.3 Instructions of operation of equipment

.4 Illustrations and diagrams to supplement procedures

.5 Operation instructions provided by manufacturer.

.6 Cleaning instructions

.7 All programming worksheets

1.10 WARRANTY

.1 Manufacturer’s Warranty: Submit, for Department Representative’s acceptance, manufacturer’s standard warranty document executed by authorized company official.

2.0 PRODUCTS

2.1 SUPPLY OF SYSTEM COMPONENTS

.1 Unless otherwise specified in this document, the contractor shall supply all components necessary to complete the system. All materials shall be new and of the latest hardware, software, and firmware versions.

2.2 MATERIALS

.1 Provide only ULC/UL Listed access control and security access systems products.

.2 Dual Door Interface Module (DDI):

.1	DC Input Power:	12 to 24VDC
.2	Current Consumption:	1200mA @ 12VDC, 600mA @ 24VDC
.3	BTU/Hour:	49.1
.4	DC Output Power:	400mA @ 12VDC
.5	Relay Outputs:	6 x Form-C
.6	Card formats:	8
.7	Door Contact Supervision:	Supported
.8	REX supervision:	Supported
.9	LED:	Bicolour
.10	Beeper Control:	Supported
.11	Tamper:	Supported
.12	Communication Protocol:	RS-485
.13	Reader Port Compatibility:	Wiegand Data1/Data0, Magnetic Clock/Data, F/2F single wire
.14	Operating Temperature:	-10° to 70°C
.15	Dimensions:	127 x 203 x 32mm
.16	Referenced Product:	Lenel 1320 Series

.3 Input Control Module (ICM):

.1	DC Input Power:	12 to 24VDC
.2	Current Consumption:	300mA @ 12VDC, 150mA @ 24VDC
.3	Inputs:	16 programmable, supervised
.4	Relays:	2 x Form-C
.5	Supervised Inputs:	Tamper, power failure, low voltage
.6	Line Supervision:	Grade B, A and AA
.7	Referenced Product:	Lenel 1100 Series

.4 Output Control Module (OCM):

.1	DC Input Power:	12 to 24VDC
.2	Current Consumption:	805mA @ 12VDC, 407mA @ 24VDC
.3	BTU/Hr:	33
.4	Relay Contacts:	16 x Form-C
.5	Operating Temperature:	10° to 70°C
.6	Tamper Input:	Supported
.7	Power Failure Indication:	Supported

	.8	Communication Protocol:	RS-485
	.9	Dimensions:	127 x 203 x 32mm
	.10	Referenced Product:	Lenel 1200 Series

.5 Mortise Locks and Electric Strikes:

.1 All mortise locks and electric strikes shall be supplied by Div. 8 door hardware supplier.

.2 Mortise locks shall come with proximity reader, door position sensor and request-to-exit sensor built-in.

.3 Mortise lock and electric strike power supplies shall be provided by Division 26 & 28.

.6 Proximity Reader 1-Gang Style:

.1	Read range:	3.8cm to 11.4cm
.2	Mounting:	1-gang standard back box
.3	Mobile device compatibility:	Seos supported
.4	Transmitting frequency:	13.56MHz, 125kHz
.5	Voltage:	5 to 16VDC
.6	Operating temperature:	-35° to 65°C (-31° to 150°F)
.7	Operating humidity:	0 to 95% non-condensing
.8	Dimensions:	122mmH x 84mmW x 24mmD
.9	Color:	Black or Gray
.10	Referenced Product:	HID iClass SE RP40 Series

.7 Request-To-Exit sensors shall be provided in the door hardware equipment. Coordinate the connection to the Division 8 supplied REX hardware with Division 8 contractor.

.8 Door Release Push Buttons: (nurse station)

.1	Illumination Colours:	Red, Green, Red/Green
.2	Dimensions:	1-gang, 4.5”H x 2.75” W x 1.5’D
.3	Operating Voltage:	12-24VDC
.4	Timer Delay:	1-40 seconds
.5	Contact Rating:	2A @ 30VDC
.6	Contacts:	NO, NC
.7	Faceplate Graphics:	“PUSH TO OPEN”
.8	Illumination when door released:	Green
.9	Illumination when door locked:	None
.10	Referenced Product:	Camden 9600/9610 series

.9 2-board Cabinet for Card Access Modules:

.1 UL 294 and 1076-Listed

.2 Tamper switch

.3 Locking cabinet door

.4 Switch selectable 12VDC or 24VAC power limited output

.5 Class 2 rated

.6 Input 115VAC 60Hz, 1.45 amp

.7 Maximum charge current .7A

.8 4-amps continuous supply current at 12VDC

.9 3-amps continuous supply current at 24VDC
.10 Filtered and electronically regulated outputs
.11 Built-in charger for sealed lead acid or gel type batteries
.12 Automatic switchover to standby battery when AC fails
.13 AC input and DC output LED indicators
.14 AC fail supervision (form C contact)
.15 Low battery supervision (form C contact)
.16 Thermal overload protection
.17 Short circuit protection
.18 Enclosure Dimensions: 304 x 406 x 114mm (12 x 16 x 4.4 in)

.10 6-board Cabinet for Card Access Modules:
.1 UL 294 and 1076-Listed
.2 Tamper switch
.3 Locking cabinet door
.4 Switch selectable 12VDC or 24VAC power limited output
.5 Class 2 rated
.6 Input 115VAC 60Hz, 1.9 amp
.7 Maximum charge current .7A
.8 6-amps continuous supply current at 12VDC or 24VAC
.9 Filtered and electronically regulated outputs
.10 4 individual circuit breaker outputs
.11 Surge protected outputs
.12 Built-in charger for sealed lead acid or gel type batteries
.13 Automatic switchover to standby battery when AC fails
.14 AC input and DC output LED indicators
.15 AC fail supervision (form C contact)
.16 Low battery supervision (form C contact)
.17 Thermal overload protection
.18 Short circuit protection
.19 Enclosure Dimensions: 610 x 457 x 114mm (24 x 18 x 4.5 in)

.11 Din Rail Termination Blocks: (Match existing)

.1	Termination style:	Screw
.2	Typical wire gauge:	18AWG – 24AWG
.3	Referenced Product:	Weidmuller WMF 2.5 Series

.12 Power Supply Backup Battery:
.1 Gel type battery
.2 7AH rated
.3 Provide two batteries per power supply

.13 Power Supply for Electric Door Locks:

.1	Input Voltage:	120VAC
.2	Input Power:	170 Watts

.3	Output Voltage:	24VDC/VAC
.4	Output Current:	6 Amps
.5	Output Channels:	9
.6	Battery Charge Capacity:	80Ah
.7	BTU Rating:	68 BTU/Hr
.8	Fire Alarm Interface:	Included

.14 Wiring:

.1 All wiring shall be FT4 in accordance with local jurisdiction fire code and the local building codes.

.2 All wiring shall be as recommended by the manufacturer of the device/s.

3.0 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and datasheet.

3.2 INSTALLATION

.1 Installation shall comply with all other relevant sections.

.2 Division 8 shall supply all mortise locks, electric strikes, request-to-exit door handles and push bars, wired hinges, and door contacts. Di, and prewire these devices to a junction box above the door. Division 26 & 28 shall install continuous wiring (no splices) from the card access system control panels to the individual devices via a pullbox above each door (if required). The pullbox shall be on the secure side of each door and complete with blank coverplate fastened using tamper-resistant bolts.

.3 Division 8 shall provide wiring schematics for all doors.

.4 Division 26 & 28 shall provide all required power supplies for all low current door hardware devices including the mortise lock and electric strikes. Division 8 shall provide all high current power supplies if required (items such as motorized operators, electric solenoids, electric push bars, etc. are considered high current). Coordinate with Division 8 for requirements.

.5 All power supplies and cards shall be installed in room 116 adjacent the access control panel(s).

.6 Install components in accordance with manufacturer's written installation instructions to locations, heights and surfaces shown on reviewed shop drawings.

.7 Install components secure to walls, ceilings or other substrates.

.8 The appropriate cable type FT4 shall be used in accordance with local jurisdiction fire code and the local building codes.

.9 All cabling is to be secured to the rack frames at sufficient intervals to prevent the weight of the cable from contributing to fatigue or early failure of the cable or the device and connector to which it is attached.

.10 All category 6 and fiber optic cables shall utilize Velcro fasteners in place of Ty-wraps.

.11 All CAT6 cabling methods and distance shall be in conformance with industry best practices and EIA/TIA 568 and NFPA 73.

.12 All wiring shall be concealed in conduit.

.13 All wiring shall be labeled and both ends. Labeling shall match as-built drawings.

.14 Install required boxes in inconspicuous accessible locations.

3.3 PROGRAMMING

.1 Provide all required programming for security systems servers, client workstations, field hardware, networking switches, and all other components of the security system. Close involvement with the owners security personnel will be required.

.2 Co-ordinate, with owner's departmental representative, on the exact sequence of events, that should occur during alarms and other daily events.

.3 Provide functional maps for every level of the building. Each map shall have functional icons that represent the security system devices such as doors, cameras, and intercoms. Clicking the icon on a map will activate the device. Devices shall automatically change shape and colour to represent the state that they are in.

.4 Program the security system to pop-up alarms on workstations related to any alarm event. The floor map for the same alarm shall also pop-up.

3.4 TRAINING

.1 The contractor as part of their tendered price shall provide a minimum three (3) sessions of two (2) hours each additional time allotted, as needed, to perform thorough instruction on the proper operational features of the security systems.

.2 The contractor as part of their tendered price shall provide a three (3) hour instruction session 30 days after completion of initial training sessions.

3.5 VERIFICATION

.1 Perform verification inspections and tests in the presence of Departmental Representative

- .1 Provide all necessary tools, ladders and equipment.
- .2 Ensure appropriate subcontractors, manufacturer's representatives are present for verification.

.2 Pretesting Procedure:

- .1 Verify that System is fully operational and meets all System performance requirements of this specification.
- .2 Measure and record, control carrier levels of every System channel at each of following points in the system:
  - .1 Door located actuating devices.
  - .2 Door control panel functions.
  - .3 Electronic supervisory control unit's inputs and outputs.
  - .4 Distribution system input and output.
  - .5 Telephone system interface input and output.
- .3 Provide and submit to Departmental Representative two copies of recorded system pre-test measurements, along with pre-test certification.

.3 Performance Testing:

- .1 Test procedure: perform test on a "go-no-go" basis.
  - .1 Make only operator adjustments required to show proof of performance.
  - .2 Test to demonstrate and verify that the installed Systems complies with installation and technical requirements of this specification under operating conditions.

.3 Test results to be evaluated by Departmental Representative as either acceptable or unacceptable using following procedures.

.2 Documentation Review:

.1 This review will determine if information provided is sufficient to meet requirements of this specification.

.2 Provide for review all System manuals, as installed drawings, pre-test forms, equipment cabinet pictorials, and audio equipment details.

.3 Mechanical Inspection:

.1 Departmental Representative and Contractor to tour all areas to ensure that all Systems and Subsystems are installed in place for proof of performance testing.

.2 Take system inventory at this time. Verify following items before beginning proof of performance tests:

.1 All electrical power circuits designated for system equipment are properly labelled, wired, phased, protected and grounded.

.2 Conductor ends are protected by heat shrink wrap; audio spade lugs, barrier strips and punch blocks are used.

.3 Dust, debris, solder splatter, etc. are cleaned and removed from site.

.4 All equipment is properly labeled.

.5 All equipment identified in System's equipment lists are in place and properly installed.

.6 Each system ground is installed in accordance with manufacturer's instructions and this specification.

.4 Subsystem Functional Test:

.1 Conduct operational testing after review of documentation and mechanical inspection completed. Proceed as follows:

.1 Perform operational test of each Subsystem to verify that all equipment is properly connected, interfaced and is functionally operational to meet requirements of this specification.

.2 Control Units:

.1 Take S/N readings from control unit's input and output in manual and/or automatic mode. Check output of DC/Data converter for S/N. Evaluate entire signal quality at baseband connector output of control unit and remote equipment.

.3 Audio:

.1 Take S/N readings from transmitter input and receiver output with equipment placed in manual gain mode. Check output of the audio converter, modulator or demodulator for S/N. Evaluate entire audio signal at baseband connector input and output of control unit.

.4 Distribution (or Interface) System:

.1 Check each door utilizing a volt/ohm or signal level meter to confirm each function and to ensure that System meets all performance requirements.

.2 Test each interconnection point (i.e. Door unit, junction box "cross connection", control unit, etc.) to ensure compliance with this specification.

.5 Total System Test:

.1 Proceed with testing when System and Subsystems are functionally tested and accepted. Total System tests to verify that requirements have been met for DC and/or audio, sub carrier, and control signals in accordance with this specification.

.6 Safety:

.1 Demonstrate with documentation that access control system meets safety requirements specified in UL 294.

.5 Visual verification: Objective is to assess quality of installation and assembly and overall appearance to ensure compliance with Contract Documents. Visual inspection to include:

.1 Sturdiness of equipment fastening.

.2 Non-existence of installation related damages.

.3 Compliance of device locations with reviewed shop drawings.

.4 Compatibility of equipment installation with physical environment.

.5 Inclusion of all accessories.

.6 Device and cabling identification.

.7 Application and location of ULC approval decals.

.6 Technical verification: Purpose to ensure that all systems and devices are properly installed and free of defects and damage. Technical verification includes:

.1 Validate sensitivity of readers and applicability and application of cards.

.2 Connecting joints and equipment fastening.

.3 Compliance with manufacturer's specification, product literature and installation instructions.

.7 Operational verification: Purpose to ensure that devices and systems' performance meet or exceed established functional requirements. Operational verification includes:

.1 Operation of each device individually and within its environment.

.2 Operation of each device in relation with programmable schedule and or/specific functions.

3.6 CLEANING AND ADJUSTING

.1 Remove protective coverings from accessories and components.

.2 Adjust all components for correct function.

.3 Clean housings and system components, free from marks, packing tape, and finger prints, in accordance with manufacturer's written cleaning recommendations.

.4 Clean all components free from dirt and fingerprints.

3.7 SPARE PARTS

Provide the following spare parts:

.1 1 each door control modules (input and output),

.2 1 each door interface module,

.3 1 each card reader,

.4 1 each door release pushbutton

END OF SECTION

1 General

1.1 EXISTING IP CCTV CAMPUS WIDE SYSTEM

.5 The existing IP CCTV System consists of the following:
- .1 "Genetec" Security Center Version 5.8 operating System.
- .2 Storage; "Genetec Stream Vault" storage appliances located in CER.
- .3 Various Network User Stations (NVUS) located throughout Institution.
- .4 "Planet Layer 3" Network Switches.
- .5 "Planet" POE Injectors.

1.2 SCOPE OF WORK

.1 Work under this contract includes but is not limited to:
- .1 Provide 3 new IP CCTV Cameras as indicated on the drawings and specifications.
- .2 Provide Category 6, UTP Cable from new patch panel in the building to each new IP CCTV Cameras indicated.
- .3 Provide all on-site programming of the existing "Genetec" operating system to incorporate the new IP CCTV cameras onto the existing NVR's and NVUS's as directed by Departmental Representative.
- .4 Provide all testing, aiming and adjustments to the new IP CCTV Cameras.
- .5 Provide before and after screen shots of any moved or new cameras for approval
- .6 Provide new "Genetec" camera licence (Om-E-1C) and failover licence (Om-E-FO) for new CCTV Cameras and install licenses on existing server
- .7 Submit all camera test reports, Maintenance Handover Report.
- .8 Provide test reports for all new Category 6, UTP Cabling.
- .9 Provide new Category 6, UTP Patch Cables at Camera location, POE Injector, and Network Switch as indicated.
- .10 Provide four-post security (data) rack in Building 3 with patching equipment with patching and switching equipment for local cameras.
- .11 Provide new fibre connection link from HealthCare Server rack in Building 3 room 116 (which is immediately adjacent room R10) to existing central control equipment in Building 1via existing underground duct system.

1.3 CONTRACTOR QUALIFICATIONS

.1 The contractor and all personnel performing any work related to this Section shall be a Genetec certified vendor and have successfully completed the latest Genetec Security Center certification. Certificate to be provided with bid package.

1.4 STANDARDS AND CODES

.1 TIA/EIA, 568-D series standards – Commercial Building Telecommunications Standards.

.2 NECA/BICSI 568-2006 – Standards for Installing Commercial Building Telecommunications Cabling.

.3 IEC EN 60950-1; EN 61000-4-3; EN 60529 IP66; EN 62262 IK10

.4 Canadian Electrical Code including all BC amendments and bulletins.

1.5 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 01 50 – General Instructions.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 01 50 – General Instructions.

2 PRODUCTS

2.1 SUPPLY OF SYSTEM COMPONENTS

.1 Unless otherwise specified in this document, the contractor shall supply all components necessary to complete the system. All materials shall be new.

CAMERA JUNCTION BOX:

.1 Metal, sized to handle all system conduit interconnections with appropriate expansion

2.2

2.3 IP CAMERA Dome

.1 Compatible with existing “Genetec”, Security Center 5.8 and listed as “certified” from Genetec.

.2 Multi sensor Dome camera (with minimum two lenses) shall meet the following requirements;

.1 IK-10 and IP66 rated Impact resistant casing with polycarbonate hard coated dome, aluminum base and dehumidifying membraneCamera case and dome must be heavy-duty, vandal-resistant rated at IK10, dust-resistant and water-resistant with an IP67 rating, wall-mount housing consisting of fixed mounting frame and removable front plate. Lens shall be varifocal, and appropriate to location and desired field of view.

.2 Capable of continuous operation; start and operate from -40 Deg. To 55 Deg. C

.3 Certified compliant to IEC EN 61000-4-3, Radiated RF immunity

.4 Mean Time Between Failures (MTBF) of at least 25,000 hours

.5 Meet safety standard IEC 60950-1 or CSA C22.2

.6 Digital wide dynamic range

.7 Low light capability Color: 0.15lux, B/W:0.03lux

.8 Power-over-Ethernet (IEEE 802.3af)

.9 Integrated IR LEDs (20 m range)

.10 Streaming: H.264 Baseline, with multiple configurable streams in H.264

.11 Must interface over IPV4 TCP/IP; be able to operate on 100Base-TX (IEEE 802.3u); connect using an RJ45 connector and be ONVIF compliant

.12 Camera model must be identified as “Certified” or “Supported by Design” in the Genetec Security Center Supported Hardware camera list

.13 Must retain its configuration over a power cycle

.14 Automatic or remote back focus

.15 Automatic Gain Control (AGC)

.16 Automatic removable infrared cut filter for day/night transition

.17 Camera case and dome must have threaded openings for conduits; a threaded plug to seal all unused openings; set screws to secure all conduit and plugs from inside the dome; tamper resistant heads on all externally accessible screws; permanently affixed label on the interior and exterior of the unit which identifies the manufacturer, the model or assembly number, the serial number and the power requirement.

2.4 360 DGREE (FISHEYE) CAMERA

.3 Interior mounted fisheye cameras shall meet the following requirements.

.1 Similar characteristics to IP camera dome noted above.

.2 Fisheye lens with 360-degree field of view.

.3 Integrated IR LEDs (10 m range)

.4 IK-10 and IP66 rated Impact resistant casing with polycarbonate hard coated dome, aluminum base and dehumidifying membraneCamera case and dome must be heavy-duty, vandal-resistant rated at IK10, dust-resistant and water-resistant with an IP67 rating, wall-mount housing consisting of fixed mounting frame and removable front plate. Lens shall be varifocal, and appropriate to location and desired field of view.

.5 Standard of acceptance; Avigilon H4.

2.5 CATEGORY 6 UTP CABLE

.1 Four (4) pair, unshielded twisted, solid copper core, 100 ohm, 24 AWG, Category 6, FT4 rated for two (2) new CCTV Cameras.

.2 Green color outer jacket.

.3 Transmission requirements shall conform to or exceed all applicable section of the TIA/EIA 5668-B current specifications and addendums for Category 6 cable and components.

2.6 CATEGORY 6 UTP CABLE CONNECTORS

.1 8P/8W, Female, RJ45, Category 6 punch down jack at Camera. Category 6 patch panel at head end.

.2 Suitable for 24 AWG, solid copper wire.

.3 Meet or exceed technical criteria outlined in TIA/EIA 568, “Transmission Performance Specifications for 4-Pair, 100-ohm, Category 6 Cabling.

.4 Cables shall be wired straight through; no crossover is allowed. Pin 1 at one end is connected to Pin 1 at the other end of the cable.

.5 All cable supports shall be Velcro type. No ‘zap straps’ are permitted anywhere on the cable run/length.

.6 All connectors shall be factory molded to premeasured cables (patch cables). Field installation or adjustment of connectors is not acceptable for CCTV cables.

2.7 CATEGORY 6 UTP PATCH CORDS

.1 Four (4) pair, unshielded twisted, stranded copper core, 100 ohm, 24 AWG,

Category 6.

.2 Green color outer jacket. Length as required, factory molded ends, **no site crimping is permitted**.

.3 Transmission requirements shall conform to or exceed all applicable section of the TIA/EIA 568-B current specifications and addendums for Category 6 cable and components.

2.8 FIBRE CABLE

.1 6 strand multimode OM3.

.2 Suitable jacket or inner duct for mechanical protection for installation in existing underground duct system.

2.9 CABLE LABELS

.1 Bold face laser quality printed labels, black print on white background. No hand written labels will be accepted.

.2 Self adhesive, one piece label and clear cover wrapped around cable.

.3 Wording on labels to be approved by Departmental Representative prior to manufacture.

2.10 RACK

.1 Provide a metal rack with a minimum 42U of useable rack space.

.2 Rack to be approximately 2.1M high x 915mm W x 850mm D.

.3 PDU with a minimum of 15 NEMA 5-20R receptacles mounted vertically.

.4 Internal vertical wiring channel.

.5 Horizontal wiring channel below each 1U space with device.

.6 Fully welded.

.7 Minimum 900 Kg load capacity rating.

.8 Black powder coat finish.

.9 Seismic mounting.

.10 Heavy duty framing and supports complete with sides.

.11 Fully vented roof.

.12 Velcro cable management straps.

.13 Leveling feet and Secured to floor.

.14 Heavy duty lockable doors fully perforated and vented front door. Rear door to be similar or vented split type. Both doors also require a heavy-duty pad-lockable hasp.

.15 Grommeted cable opening(s) through top.

.16 Cat 6 24 port patch panel(s) as required. Uppermost patch panel to be mounted approximately 1600mm to top of panel.

.17 Fibre patch panel (fan out kit) as required. All fibres to be terminated at both ends to facilitate testing.

.18 Bold face laser quality printed labels, black print on white background. No handwritten labels will be accepted.

.19 Self adhesive, one piece label and clear cover wrapped around cable.

.20 Wording on labels to be approved by Departmental Representative prior to manufacture

3 EXECUTION

3.1 INSTALLATION OF CCTV CAMERA

.1 Install cameras as indicated.

.2 Adjust Field-of-View and focus camera as directed by Departmental Representative.

.3 Caulk neatly around the conduits, junction boxes and entire camera enclosure between walls and ceiling with security caulking.

.4 All Camera views of effected cameras to be captured prior to editing or moving. New camera views to be approved by Departmental Representative.

3.2 INSTALLATION OF CATEGORY 6 UTP CABLING

.1 Supply & install new Category 6, UTP cable to new camera in conduit as indicated.

.2 Terminate all new Category 6, UTP cables on existing Patch Panels as indicated.

.3 Label both ends of all Category 6, UTP Cables indicating Camera I.D. and location. Wording on labels to be approved by Departmental Representative prior to manufacture.

.4 Provide 3 m of slack cable at Patch Panel end of cable. Neatly coil slack cable to side of existing CCTV Cabinet.

3.3 INSTALLATION OF CATEGORY 6 UTP PATCH CORDS

.1 Supply & Install one new Category 6 UTP Patch Cord for each new Camera as follows:
- .1 From Patch Panel to existing POE Injector.
- .2 From POE Injector to POE Switch.
- .3 From camera to female jack at Camera.

3.4 CATEGORY 6 UTP CABLE TESTING

.1 Test all cables with a CAT6 certification analyzer that comply with all TIA/ISO standards.

.2 No marginal passes or conditional passes will be accepted on these cables.

.3 Replace entire length of cable for any cables that do not pass tests outlined in the specification.

.4 Provide electronic and paper copy of all test results for incorporation into Maintenance Manuals specified in Section 01 01 50 – General Instructions.

3.5 PROGRAMMING CAMERA INTO THE EXISTING CCTV SYSTEM

.1 Contractor shall program camera into the existing “Genetec” operating system as required to incorporate new and existing cameras into the system as directed by Departmental Representative.

.2 Camera shall be recorded on existing “Pivot3 vSTAC” Virtual server/storage array.

.3 Contractor shall program the existing “Genetec” operating system for viewing on existing Network Video User Stations as directed by Departmental Representative.

.4 All programming to the existing system shall be carried out by personnel who have successfully completed all training and received necessary certification from "Genetec".

.5 Camera licenses to be included and updated on existing server by Contractor, both enterprise "connection" and "failover" licenses are required for each new camera.

3.6 MAINTENANCE HANDOVER REPORT

.1 Submit a Maintenance Handover Report as per Appendix `A' of these Specifications.

.2 Maintenance Handover Report to be completed in its entirety. Complete project information, Warranty Details, Distribution Details and Training Details.

.3 Include a list of all equipment itemizing the locations, quantity, model number, serial number, MAC and IP addresses, and latest revision level of all installed equipment.

.4 Attach "Genetec" licenses for new cameras to Maintenance Handover Report.

.5 Insert copy of Maintenance Handover Report in each copy of Maintenance Manuals.

.6 Provide Electronic Copy of Maintenance Handover Report in Microsoft Word format.

3.7 SPARE PARTS

.1 Provide the following spare parts:
.1 1 camera of each type

END OF SECTION

1.0 GENERAL

1.1 OVERVIEW

.1 Supply and Install a wired intrusion system as described in the specification and drawings.

.2 The intrusion system shall replace the existing intrusion system in its entirety (all equipment and devices) for Building 3, for which the Health Care expansion is part of. The contractor shall provide all required hardware and software to integrate the new Healthcare renovation with the existing campus intrusion system.

.3 The existing intrusion system in Building 3 is as manufactured by DSC.

.4 All hardware and software shall be compatible with the new Campus Bosch system. The existing intrusion system connects central monitoring equipment in adjacent Building 1.

.5 Install new local control panel in room R10 to replace existing control equipment. reconnect existing wiring to central monitoring equipment. Coordinate network assignment with owner's departmental representative.

.6 The contractor shall provide intrusion alarm keypads as shown on drawings and as otherwise noted in this specification. The keypads shall indicate all zone/security partition status, arm/disarm and supervisory signals.

.7 The contractor shall provide motion detectors and door contacts as shown on the drawing. The contractor shall connect these devices to the intrusion system input modules.

.8 All alarms shall be annunciated at the keypad and at the central monitoring location (Building 1). Install a keypad in Building 1 to monitor Building 3.

.9 The contractor shall provide all required components to ensure a fully functional intrusion system as described in the contract documents. The contractor shall provide all required components that are not listed in the specification, but are required to supply a fully functional intrusion system as described in the contract documents.

.10 The contractor shall install new equipment cabinet(s) located in the M&E room (R10).

1.2 SUMMARY

.1 Section Includes:

.1 This section of the specification forms part of the contract documents and is to be read, interpreted, and co-ordinated with all other parts.

.2 The specifications to supply, install, and operate an integrated intrusion system.

1.3 RELATED REQUIREMENTS

.1 Section 01 11 00 – Electrical General Provisions

.2 Section 01 33 00 - Submittal Procedures

.3 Section 01 78 00 - Closeout Submittals

.4 Section 26 05 00 – Common Work Results – Electrical
.5 Section 26 05 21 – Wire and Cables
.6 Section 26 05 34 – Conduit, Conduit Fastenings and Fittings
.7 Section 27 15 00 – Communications Cables Inside Buildings
.8 Section 27 05 28 – Pathways for Communications Systems

1.4 REFERENCE STANDARDS

.1 The installation shall, as minimum, meet all national, provincial, and municipal, including, but not limited to:
.1 Building, fire, electrical and labour codes and standards.
.2 Workmanship shall meet or exceed nationally accepted workmanship standard.

.2 Underwriters Laboratories of Canada (ULC):
.1 CAN/ULC S301 latest edition, Central and Monitoring Station Burglar Alarm Systems
.2 CAN/ULC S302 – latest edition, Installation and Classification of Burglar Alarm Systems for Financial and Commercial Premises, Safes and Vaults
.3 CAN/ULC S303 latest edition, Local Burglar Alarm Units and Systems
.4 CAN/ULC S304 – latest edition, Central and Monitoring Station Burglar Alarm Units
.5 ORD C827 – latest edition, Central Stations for Watchman, Fire alarm and Supervisory Services
.6 ORG C1076 – latest edition, Proprietary Burglar Alarm Units and Systems
.7 ORD C488 – latest edition, Remote Burglar Alarm Signalling Centres

1.5 SCOPE OF WORK

.1 Supply and installation of a complete and operating system including but not necessarily limited to:
.1 Door contacts (Door position switches)
.2 Interface modules
.3 Arm/disarm keypad stations
.4 Motion detectors

1.6 CONTRACTOR QUALIFICATIONS

.1 The intrusion System shall be installed by a qualified Security Systems Contractor, certified by the respective equipment manufacturer, and having a minimum of five (5) years installation and service experience with similar installations. The contractor business, employees, managers and owners must be licensed in the Province of British Columbia under the Private Investigators and Security Agencies Act. The business must be licensed and bonded as an Alarm Service and each employee who is installing and servicing security alarm devices and equipment, must be licensed and bonded as an employee of the company and not as a sub-contractor. The equipment installers must hold a valid Trade Qualification Certificate issued by the Province of British Columbia. Proof of the Company and Installers Certification shall be requested and reviewed prior to contract award.

.2 The intrusion system contractor must be a certified Bosch systems contractor. The intrusion system contractor’s technicians must be trained and certified by Bosch.

1.7 SYSTEM PERFORMANCE REQUIREMENTS

.1 The Security Management System provides a number of functions including the ability to monitor unauthorised access through specific doors.

1.8 SUBMITTALS

.1 Product Data: Submit manufacturer's printed product literature, specification and datasheet in accordance with Section 01 33 00 - Submittal Procedures.

.1 Submit manufacture's literature for each system component.

.2 Submit:

.1 Functional description of equipment

.2 Technical data for all devices

.3 Device location plans and cable lists

.4 Devices mounting location detail drawings

.5 Typical devices connection detail drawings

.6 Programming worksheets

.2 Shop Drawings: Submit in accordance with Section 01 33 00 - Submittal Procedures.

.1 Submit shop drawings to indicate project layout, including details as follows:

.1 Indicate mounting heights, types, and locations.

.2 Zone (security partition) layout drawing indicating number and location of zones and areas covered.

.3 Wiring diagrams.

.4 Complete equipment list.

.3 Quality Assurance Submittals: Submit the following in accordance with Section 01 33 00 - Submittal Procedures:

.1 Test Reports: Submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.

.2 Certificates: Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties:

.1 Submit ULC/UL/CSA Product Safety Certificates.

.2 Submit verification Certificate that Installation/service Company is ULC/UL Listed alarm service Company.

.3 Submit verification Certificate that intrusion system is "Certified alarm system".

.3 Instructions: Submit manufacturer's installation instructions.

.4 Maintenance Data: Submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.1 Include:

.1 System configuration and equipment physical layout

.2 Functional description of equipment

.3 Instructions of operation of equipment

.4 Illustrations and diagrams to supplement procedures

.5 Operation instructions provided by manufacturer.

.6 Cleaning instructions

.7 All programming worksheets

1.9 WARRANTY

.1 Manufacturer's Warranty: Submit, for Department Representative's acceptance, manufacturer's standard warranty document executed by authorized company official.

2.0 PRODUCTS

2.1 SUPPLY OF SYSTEM COMPONENTS

.1 Unless otherwise specified in this document, the contractor shall supply all components necessary to complete the system. All materials shall be new and of the latest hardware, software, and firmware versions.

2.2 MATERIALS

.1 Provide only ULC/UL Listed access control and security access systems products.

.2 Control panel

.1	DC Input Power:	12 to 24VDC
.2	Points capacity	minimum 96
.3	Security partitions	minimum of 10 (6 current use, 4 spare)
.4	Remote programming connection	On board ethernet port:
.5	Relay Outputs:	1 aux power to 1A, 2 50mA at 12VDC
.6	Custom point profiles	minimum 20
.7	Authority	by area & 32 character name per user
.8	Supervision:	minimum 12 keypads
.9	Custom function capability:	programmable multifunction activity
.10	Passcode security:	14 programmable levels
.11	Door control	Supported.
.12	Monitor delay	up to 1 hour minimum
.13	IP Camera support	Supported.
.14	Event logging	Supported
.15	Scheduled events:	supported
.16	Standby power:	12V, 18Ah
.17	enclosure	attack resistant
.18	communications:	ethernet 10/100 full duplex
.19	upgradeable	supported
.20	Referenced Product:	Bosch B6512 IP

.3 Intrusion Alarm Keypads:

.1	Characters:	32 backlit 2-lineLCD
.2	Operating voltage:	12VDC @ 85mA
.3	Dimensions:	158mmW x 120mmH x 26mmD
.4	Weight:	320g
.5	Mounting:	Surface

	.6	Communications:	RS485
	.7	Keys	10 number keys, 7 function keys, 6 navigation keys
	.8	Audible tones	built-in speaker
	.9	Referenced Product:	Bosch B921C two-line Keypad w/Touch keys, Inputs
.4	Door Position Sensor:		
	.1	Mounting Type:	surface
	.2	Material:	brushed anodized aluminum
	.3	Gap	3/16" – 5/8"
	.4	Contacts	high security, c/w 3' stainless steel, triple biased
	.5	voltage:	30V AC/DC
	.6	Current:	0.25A max
	.7	Electrical Configuration:	SPDT
	.8	Form Type:	Form C
	.9	Voltage Rating:	30VDC, 50mA
	.10	Referenced Product:	aritech 2700 series

.5 2-board Cabinet for Card Access Modules:

- .1 UL 294 and 1076-Listed
- .2 Tamper switch
- .3 Locking cabinet door, keyed to match campus standard
- .4 Switch selectable 12VDC or 24VAC power limited output
- .5 Class 2 rated
- .6 Input 115VAC 60Hz, 1.45 amp
- .7 Maximum charge current .7A
- .8 4-amps continuous supply current at 12VDC
- .9 3-amps continuous supply current at 24VDC
- .10 Filtered and electronically regulated outputs
- .11 Built-in charger for sealed lead acid or gel type batteries
- .12 Automatic switchover to standby battery when AC fails
- .13 AC input and DC output LED indicators
- .14 AC fail supervision (form C contact)
- .15 Low battery supervision (form C contact)
- .16 Thermal overload protection
- .17 Short circuit protection
- .18 Enclosure Dimensions: 304 x 406 x 114mm (12 x 16 x 4.4 in)

.6 Motion sensors:

- .1 Passive infrared Detectors (PIR's)
- .2 Coverage pattern

.3 Temperature requirement

.4 Tamper switch

.5 Mounting wall and ceiling (as indicated on drawings

.6 r 24VAC power limited output

.7 Class 2 rated

.7 Spare parts

.8 .1 3 door position sensors,

.2 1 keypad station,

.3 2 wall mounted motion sensors,

.4 1 ceiling mounted motion sensors

.9 Wiring:

.1 All wiring shall be FT4 in accordance with local jurisdiction fire code and the local building codes.

.2 All wiring shall be as recommended by the manufacturer of the device/s.

3.0 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and datasheet.

3.2 INSTALLATION

.1 Installation shall comply with all other relevant sections.

.2 All power supplies and control equipment shall be installed in M&E room R10.

.3 Install components in accordance with manufacturer's written installation instructions to locations, heights and surfaces shown on reviewed shop drawings.

.4 Install components secure to walls, ceilings or other substrates.

.5 The appropriate cable type FT4 shall be used in accordance with local jurisdiction fire code and the local building codes.

.6 All CAT4 cabling methods and distance shall be in conformance with industry best practices and EIA/TIA 568 and NFPA 73.

.7 All wiring shall be concealed in conduit.

.8 All wiring shall be labelled at both ends. Labeling shall match as-built drawings.

.9 Install required boxes in inconspicuous accessible locations.

.10 Spare parts are included as there may be a discrepancy with the number of devices indicated on the drawings. Include for installation of spare parts. Any spare parts not used are to be turned over to the owner and a receipt requested. Receipt to be included in maintenance manual.

3.3 PROGRAMMING

.1 Provide all required programming for intrusion systems servers, client workstations, field hardware, networking switches, and all other components of the intrusion system. Close involvement with the owners security personnel will be required.

.2 Co-ordinate, with owner's departmental representative, on the exact sequence of events, that should occur during alarms and other daily events.

.3 Provide functional maps for every level of the building. Each map shall have functional icons that represent the security system devices such as doors, cameras, and intercoms. Clicking the icon on a map will activate the device. Devices shall automatically change shape and colour to represent the state that they are in.

.4 Program the intrusion system to pop-up alarms on workstations related to any alarm event. The floor map for the same alarm shall also pop-up.

3.4 TRAINING

.1 The contractor as part of their tendered price shall provide a minimum three (3) sessions of two (2) hours each additional time allotted, as needed, to perform thorough instruction on the proper operational features of the security systems.

.2 The contractor as part of their tendered price shall provide a three (3) hour instruction session 30 days after completion of initial training sessions.

3.5 VERIFICATION

.1 Perform verification inspections and tests in the presence of Departmental Representative

.1 Provide all necessary tools, ladders and equipment.

.2 Ensure appropriate subcontractors, manufacturer's representatives are present for verification.

.2 Pretesting Procedure:

.1 Verify that System is fully operational and meets all System performance requirements of this specification.

.2 Provide and submit to Departmental Representative two copies of recorded system pre-test measurements, along with pre-test certification.

.3 Performance Testing:

.1 Test procedure: perform test on a "go-no-go" basis.

.1 Make only operator adjustments required to show proof of performance.

.2 Test to demonstrate and verify that the installed System complies with installation and technical requirements of this specification under operating conditions.

.3 Test results to be evaluated by Departmental Representative as either acceptable or unacceptable using following procedures.

.2 Documentation Review:

.1 This review will determine if information provided is sufficient to meet requirements of this specification.

.2 Provide for review all System manuals, as installed drawings, pre-test forms..

.3 Mechanical Inspection:

.1 Departmental Representative and Contractor to tour all areas to ensure that all Systems and Subsystems are installed in place for proof of performance testing.

.2 Take system inventory at this time. Verify following items before beginning proof of performance tests:

.1 All electrical power circuits designated for system equipment are properly labelled, wired, phased, protected and grounded.

.2 Conductor ends are protected by heat shrink wrap; audio spade lugs, barrier strips and punch blocks are used.

.3 Dust, debris, solder splatter, etc. are cleaned and removed from site.

.4 All equipment is properly labeled.

.5 All equipment identified in System's equipment lists are in place and properly installed.

.6 Each system ground is installed in accordance with manufacturer's instructions and this specification.

.4 Subsystem Functional Test:

.1 Conduct operational testing after review of documentation and mechanical inspection completed. Proceed as follows:

.1 Perform operational test of each Subsystem to verify that all equipment is properly connected, interfaced and is functionally operational to meet requirements of this specification.

.5 Visual verification: Objective is to assess quality of installation and assembly and overall appearance to ensure compliance with Contract Documents. Visual inspection to include:

.1 Sturdiness of equipment fastening.

.2 Non-existence of installation related damages.

.3 Compliance of device locations with reviewed shop drawings.

.4 Compatibility of equipment installation with physical environment.

.5 Inclusion of all accessories.

.6 Device and cabling identification.

.7 Application and location of ULC approval decals.

.6 Technical verification: Purpose to ensure that all systems and devices are properly installed and free of defects and damage. Technical verification includes:

.1 Validate sensitivity of readers and applicability and application of cards.

.2 Connecting joints and equipment fastening.

.3 Compliance with manufacturer's specification, product literature and installation instructions.

.7 Operational verification: Purpose to ensure that devices and systems' performance meet or exceed established functional requirements. Operational verification includes:

.1 Operation of each device individually and within its environment.

.2 Operation of each device in relation with programmable schedule and or/specific functions.

3.6 CLEANING AND ADJUSTING

.1 Remove protective coverings from accessories and components.

.2 Adjust all components for correct function.

.3 Clean housings and system components, free from marks, packing tape, and finger prints, in accordance with manufacturer's written cleaning recommendations.

.4 Clean all components free from dirt and fingerprints.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 This section specifies materials and installation for fire detection and fire alarm systems.

1.2 REFERENCES

.1 NBC-latest edition, National Building Code of Canada.

.2 Government of Canada

.1 TB OSH Chapter 3-03, latest edition, Treasury Board of Canada, Occupational Safety and Health, Chapter 3-03, Standard for Fire protection Electronic Data Processing Equipment.

.2 TB OSH Chapter 3-04, latest edition, Treasury Board of Canada, Occupational Safety and Health, Chapter 3-04, Standard for Fire Alarm Systems.

.3 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S524-latest edition, Installation of Fire Alarm Systems.

.2 ULC-S525- latest edition, Audible Signal Appliances.

.3 CAN/ULC-S526- latest edition, Visual Signal Appliances, Fire Alarm.

.4 CAN/ULC-S527- latest edition, Control Units.

.5 CAN/ULC-S528- latest edition, Manual Pull Stations.

.6 CAN/ULC-S529- latest edition, Smoke Detectors.

.7 CAN/ULC-S536- latest edition, Inspection and Testing of Fire Alarm Systems.

.8 CAN/ULC-S537- latest edition, Verification of Fire Alarm Systems.

1.3 DESCRIPTION OF SYSTEM

.1 System (Simplex 4007ES) is fully supervised, microprocessor-based, fire alarm system, utilizing digital techniques for data control and digital and multiplexing techniques for data transmission.

1.4 REQUIREMENTS OF REGULATORY AGENCIES

.1 System:

.1 To TB OSH Chapter 3-04.

.2 Subject to Fire Commissioner of Canada (FC) approval.

.3 Subject to FC inspection for final acceptance.

1.5 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Include:

.1 Layout of equipment.

.2 Zoning.

.3 Complete wiring diagram, including schematics of modules.

1.6 CLOSEOUT SUBMITTALS

.1 Provide testing results for Fire Alarm System for incorporation into manual.

.2 Include:

.1 Confirmation of proper operation for all new and /or relocated devices. As a minimum the devices immediately ahead .and behind each revised device shall be included in the testing.

Part 2 Products

2.1 MATERIALS

.1 Equipment and devices: ULC listed and labelled and supplied by single manufacturer.

.2 In accordance with applicable CAN/ULC standards.

2.2 SYSTEM OPERATION

.1 To match existing.

2.3 GRAPHIC DISPLAY

.1 Revise graphic display to reflect revisions made as part of this project.

Part 3 Execution

3.1 INSTALLATION

.1 Install systems in accordance with CAN/ULC-S524 and TB OSH Chapter 3-04.

.2 Locate and install manual alarm stations and connect to alarm circuit wiring.

.3 Locate and install detectors and connect to alarm circuit wiring. Do not mount detectors within 1 m of air outlets. Maintain at least 600 mm radius clear space on ceiling, below and around detectors.

.4 Locate and install signal devices/visual signal devices and connect to signalling circuit.

.5 Relocate devices as indicated on the drawings.

.6 Add devices and connect into existing system as indicated on the drawings.

3.2 FIRE ALARM ZONES

.1 Existing zoning for fire alarm detection devices, shall generally remain as is.

3.3 FIELD QUALITY CONTROL

.1 Perform tests as described herein and in accordance CAN/ULC-S537.

.2 Fire alarm system:

.1 Test each device and alarm circuit to ensure manual stations, thermal and smoke detectors, transmit alarm to control panel and actuate general alarm ancillary devices.

.2 Check annunciator panels to ensure zones are shown correctly.

.3 Simulate grounds and breaks on alarm and signalling circuits to ensure proper operation of system.

.4 Manufacturer's technician to verify all new devices and reconnected existing fire alarm system equipment and components in accordance with ULC Standard S537.

.5 Provide a Certification of Verification.

.6 After verification, demonstrate and spot test system as required by Consultant and Fire Commissioner.

.7 Provide Departmental Representative with written verification report for review and include copies in maintenance manuals

.8 Class B circuits.

.1 Test each conductor on all circuits for capability of providing alarm signal on line side of single open-circuit fault condition imposed at electrically most remote device on circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.

.2 Test each conductor on all circuits for capability of providing alarm signal during ground-fault condition imposed at electrically most remote device on circuit. Reset control unit after each alarm function and correct imposed fault after completion of each test.

END OF SECTION

Appendix 3

List of Equipment to be Relocated and Installed by Contractor

MISSION MINIMUM INSTITUTION EXPANSION OF HEALTH CARE
List of Equipment to be Relocated and Installed by Contractor

															FOOTPRINT mm			PLACEMENT				ELECTRICAL 60 Hz					PLUMBING			AIR/VAC		
NEW ROOM #	ROOM #	ROOM NAME	ITEM ID	QTY	ITEM NAME	DESCRIPTION	DESCRIPTION 2	MANUFACTURER	CATELOGUE#	UNIT COST	TOTAL COST	EXIST ROOM #	TAG #	PICT #	H	W	D	FLOOR	BENCH	WALL	MOUNT NOTES	V	PH	AMP	EMERG PWR	ELECTRICAL NOTES	COLD WATER	DRAIN SIZE	WATER NOTES	AIR	VACCUM	OTHER NOTES
111	F104	NURSE STATION	100460T	1	EYE WASH STATION	PORTABLE						20A-3		1773	381	431.8	127			XXX						N/A						
107	F106B	OPTOMETRIST	100775T	1	CHAIR	OPTHALMIC		REICHERT	ADVANTAGE			20A-6	21646	1741	2057.4	609.6	660.4	XXX			See literature #100174T	115	1			Power to come from floor. Can be hardwired.						
107	F106B	OPTOMETRIST	100098T	1	CONTAINER	SHARPS	W/WALL MOUNT					20A-6	21652	1747	431.8	279.4	177.8			XXX						N/A						
107	F106B	OPTOMETRIST	100760T	1	LENSOMETER			REICHERT	ML1			20A-6	21643	1738	474.98	129.54	327.66		XXX			110	1			15W						
107	F106B	OPTOMETRIST	100258T	1	PROJECTOR	CHART		HUVITZ	CCP-3100			20A-6	21650	1744	279.4	210.82	342.9			XXX		115	1									
107	F106B	OPTOMETRIST	100666T	1	RETNIOSCOPE	W/HEAD MOUNT						20A-6	21648	1743	203.2	304.8	203.2		XXX		plugs into the ophthamology stand 100174T	115	1									
107	F106B	OPTOMETRIST	100786T	1	SCOPE	OTOSCOPE/OPTHALMO SCOPE	PORTABLE	WELCH ALLYN				20A-6	21639	1734	1092.2	762	762			XXX	See literature 100497T for installation details											
107	F106B	OPTOMETRIST	100116T	1	SLIT LAMP	PART OF 100174T OPHTHALMIC STAND		HAGG-STREIT	BM900			20A-6	21649	1744	685.8	558.8	355.6				mounted onto the ophthalmic stand 100174T	115	1									
107	F106B	OPTOMETRIST	100174T	1	STAND	INSTRUMENT	OPTHALMIC W/SLIT LAMP & LIGHT	REICHERT	ADVANTAGE			20A-6	21647	1742	2209.8	635	1219.2	XXX				120	1	10								
104	F107	TREATMENT ROOM	100332T	1	CAUTERY UNIT			BOVIE	AARON 940			20A-8	21632	1725	152.4	228.6	114.3			XXX		115	1									
104	F107	TREATMENT ROOM	100378T	1	CHAIR	PHLEBOTOMY						20A-8	21629	1722	939.8	711.2	558.8	XXX								N/A						
104	F107	TREATMENT ROOM	100098T	1	CONTAINER	SHARPS	W/WALL MOUNT					20A-8	21635	1728	431.8	279.4	177.8			XXX						N/A						
104	F107	TREATMENT ROOM	100497T	1	DIAGNOSTIC PANEL	W/SPHYG, OTO/OPHTH		WELCH ALLYN				20A-8	21628	1721	304.8	863.6	152.4			XXX		115	1			Power for Oto/ophthalmoscope required nearby						
104	F107	TREATMENT ROOM	100353T	2	DISPENSER	GLOVE BOX						20A-8	21633	1726	254	139.7	101.6			XXX						N/A						
104	F107	TREATMENT ROOM	100015T	1	INCUBATOR	OVEN, SINGLE DOOR		QUINCY LABS	10-104E			20A-8	21624	1717	406.4	330.2	304.8		XXX			115	1			AC						
104	F107	TREATMENT ROOM	100392T	1	MONITOR	ECG	W/STAND	WELCH ALLYN	CP150			20A-1	21622	1715	1193.8	609.6	685.8	XXX				115	1									
104	F107	TREATMENT ROOM	100261T	1	MONITOR	NIBP	W/STAND	WELCH ALLYN	6000 SERIES			20A-8	21623	1716	1397	558.8	558.8	XXX			w/pole	115	1			rechargeable battery operated						
104	F107	TREATMENT ROOM	100513T	1	STAND	MAYO	W/TRAY					20A-8	21626	1719	939.8	609.6	508	XXX								N/A						
104	F107	TREATMENT ROOM	100066T	1	SUCTION	TRANSPORT		LAERDAL	LSU			20A-8	21627	1720	304.8	355.6	139.7	XXX				115	1	2		Battery operated						
104	F107	TREATMENT ROOM	100428T	1	TABLE	EXAMINATION		MIDMARK				20A-8	21630	1723	914.4	1828.8	711.2	XXX				115	1									
105	F109	DENTAL OPERATORY	100200T	1	CABINET	FILE LATERAL	4 DRAWER					20A-5	21655	1753	1333.5	914.4	457.2	XXX								N/A						
105	F109	DENTAL OPERATORY	100334T	1	CABINET	STORAGE	DENTAL	PELTON & CRANE				20A-5	21657	1757	1828.8	1066.8	457.2	XXX				115	1									
105	F109	DENTAL OPERATORY	100945T	1	CHAIR	DENTAL	W/LIGHT & DENTAL DELIVERY SYSTEM	DCI EQUIPMENT	Info to come	4000.00	$4,000	20A-5	21656	1754	1930.4	1016	2032	XXX			Review room layout & specs w/rep. See pictures 1754, 1755, 1756 & 1769						XXX	XXX		XXX	XXX	
105	F109	DENTAL OPERATORY	100098T	1	CONTAINER	SHARPS	W/WALL MOUNT					20A-5	21662	1763	431.8	279.4	177.8			XXX						N/A						
105	F109	DENTAL OPERATORY	100104T	1	RADIOGRAPHIC UNIT	DENTAL	WALL MOUNT	GENDEX	GX-770	1000.00	$1,000	20A-5	21654	21654				XXX								See literature						
105	F109	DENTAL OPERATORY	100942T	1	VIEWBOX	DENTAL						20A-5	21653	1751	203.2	381	76.2			XXX		120	1	.7								
105	F110	DENTAL REPROCESSING	100477T	1	CABINET	DENTAL W/SINK		PELTON & CRANE				20A-5	21665	1767	838.2	2006.6	457.2	XXX								N/A	XXX	YES				
111	F119	MEDICATION ROOM	100098T	1	CONTAINER	SHARPS	W/WALL MOUNT					20A-2	21671	1779	431.8	279.4	177.8			XXX						N/A						
111	F119	MEDICATION ROOM	100347	1	DISPENSER	PAPER TOWEL	HANDS FREE	AS PER FACILITY CONTRACT		0.00	$0			0	406.4	317.5	260.35			XXX	As per facility contract	115	1			Battery or manually operated						
111	F119	MEDICATION ROOM	100480T	1	REFRIGERATOR	BLOOD	SINGLE DOOR	SANYO	MBR-704GR			20A-2	21669	1775	1828.8	609.6	711.2	XXX			recommend 3" minimum be left on all sides for air flow	115	1		XXX	Emergency power						
111	F119	MEDICATION ROOM	100285T	1	SAFE	NARCOTIC	LEAD	DURAVAULT	T6222C			20A-2	21670	1776	1752.6	711.2	762	XXX			extreemely heavy					N/A						
116	F120	STORAGE, MEDICAL	100741T	1	RACK	CRUTCH/CANE		GLADIATOR				20A-3	21668	1772	152.4	1219.2	203.2			XXX						N/A						
114	F121	STAFF LOUNGE	100195T	1	REFRIGERATOR	FULL SIZE		WESTINGHOUSE				20A-1	21680	1796	1651	711.2	762	XXX			recommend 3" minimum be left on all sides for air flow	120	1	12.5								

Appendix 4

List of Equipment to be Purchased and Installed by Contractor

MISSION MINIMUM INSTITUTION EXPANSION OF HEALTH CARE
List of Equipment to be Purchased and Installed by Contractor

														FOOTPRINT mm			PLACEMENT				ELECTRICAL 60 Hz					PLUMBING			AIR/VAC		
NEW ROOM #	PROJECT BRIEF ROOM #	ROOM NAME	ITEM ID	QTY	ITEM NAME	DESCRIPTION	DESCRIPTION 2	MANUFACTURER	CATELOGUE#	UNIT COST	TOTAL COST	EXIST ROOM #	TAG #	PICT #	H	W	D	FLOOR	BENCH	WALL	MOUNT NOTES	V	PH	AMP	EMERG PWR	ELECTRICAL NOTES	COLD WATER	DRAIN SIZE	WATER NOTES	AIR	VACCUM	OTHER NOTES
103	F106	EXAMINATION ROOM	100350	1	CAN	GARBAGE		AS PER FACILITY STANDARD		12.00	$12			0	533.4	279.4	406.4	XXX			As per facility standard					N/A						
103	F106	EXAMINATION ROOM	100098	1	CONTAINER	SHARPS	ENCLOSED	TYCO HEALTHCARE	8967Y	40.00	$40			0	323.85	266.7	184.15			XXX						N/A						
103	F106	EXAMINATION ROOM	100497	1	DIAGNOSTIC PANEL	C/W SPHYGMANOMETER,	OTO/OPHTHALMOSCOPE	WELCH ALLYN		1300.00	$1,300		offset	0	254	1016	152.4			XXX	Width depends on what is being mounted on each unit.					Power for Oto/ophthalmoscope required nearby						
103	F106	EXAMINATION ROOM	100353	2	DISPENSER	GLOVE BOX				20.00	$40			0	254	139.7	101.6			XXX						N/A						
103	F106	EXAMINATION ROOM	100347	1	DISPENSER	PAPER TOWEL	HANDS FREE	AS PER FACILITY CONTRACT		0.00	$0			0	406.4	317.5	260.35			XXX	As per facility contract	115	1			Battery or manually operated						
103	F106	EXAMINATION ROOM	100348	1	DISPENSER	SOAP		AS PER FACILITY CONTRACT		0.00	$0			0	355.6	127	127			XXX	As per facility contract					N/A						
103	F106	EXAMINATION ROOM	100180	1	HAND SANITIZER	WATERLESS	AS PER SITE CONTRACT	AS PER SITE CONTRACT		0.00	$0			0	233.426	132.08	115.316			XXX	As per facility contract					N/A						
103	F106	EXAMINATION ROOM	100386	1	LIGHT	EXAM	WALL	WELCH ALLYN	GS600 #44610	1500.00	$1,500			0						XXX	See attached literature.	115	1	.5								
103	F106	EXAMINATION ROOM	100390	1	STOOL	PHYSICIAN	PNEUMATIC	RITTER	SEE CATALOGUE	260.00	$260			0	568.325	609.6	609.6	XXX								N/A						
103	F106	EXAMINATION ROOM	100428	1	TABLE	EXAMINATION		RITTER MEDICAL	RITTER MM104-XX	5075.00	$5,075			0	825.5	685.8	1371.6	XXX			Can be fixed to floor	115	1	6.5		6.5 amps with heater. Power can come through floor.						
107	F106B	OPTOMETRIST	100350	1	CAN	GARBAGE		AS PER FACILITY STANDARD		12.00	$12			0	533.4	279.4	406.4	XXX			As per facility standard					N/A						
107	F106B	OPTOMETRIST	100347	1	DISPENSER	PAPER TOWEL	HANDS FREE	AS PER FACILITY CONTRACT		0.00	$0			0	406.4	317.5	260.35			XXX	As per facility contract	115	1			Battery or manually operated						
107	F106B	OPTOMETRIST	100348	1	DISPENSER	SOAP		AS PER FACILITY CONTRACT		0.00	$0			0	355.6	127	127			XXX	As per facility contract					N/A						
107	F106B	OPTOMETRIST	100180	1	HAND SANITIZER	WATERLESS	AS PER SITE CONTRACT	AS PER SITE CONTRACT		0.00	$0			0	233.426	132.08	115.316			XXX	As per facility contract					N/A						
104	F107	TREATMENT ROOM	100350	1	CAN	GARBAGE		AS PER FACILITY STANDARD		12.00	$12			0	533.4	279.4	406.4	XXX			As per facility standard					N/A						
104	F107	TREATMENT ROOM	100347	2	DISPENSER	PAPER TOWEL	HANDS FREE	AS PER FACILITY CONTRACT		0.00	$0			0	406.4	317.5	260.35			XXX	As per facility contract	115	1			Battery or manually operated						
104	F107	TREATMENT ROOM	100348	2	DISPENSER	SOAP		AS PER FACILITY CONTRACT		0.00	$0			0	355.6	127	127			XXX	As per facility contract					N/A						
104	F107	TREATMENT ROOM	100180	1	HAND SANITIZER	WATERLESS	AS PER SITE CONTRACT	AS PER SITE CONTRACT		0.00	$0			0	233.426	132.08	115.316			XXX	As per facility contract					N/A						
104	F107	TREATMENT ROOM	100386	1	LIGHT	EXAM	WALL	WELCH ALLYN	GS600 #44610	1500.00	$1,500			0						XXX	See attached literature.	115	1	.5								
104	F107	TREATMENT ROOM	100017	1	POLE	I.V.	O.R., 4 HOOK	WILSON	106-NV1129-S	262.00	$262			0	2514.6	508	508	XXX														
105	F109	DENTAL OPERATORY	100350	1	CAN	GARBAGE		AS PER FACILITY STANDARD		12.00	$12			0	533.4	279.4	406.4	XXX			As per facility standard					N/A						
105	F109	DENTAL OPERATORY	100353	2	DISPENSER	GLOVE BOX				20.00	$40			0	254	139.7	101.6			XXX						N/A						
105	F109	DENTAL OPERATORY	100347	1	DISPENSER	PAPER TOWEL	HANDS FREE	AS PER FACILITY CONTRACT		0.00	$0			0	406.4	317.5	260.35			XXX	As per facility contract	115	1			Battery or manually operated						
105	F109	DENTAL OPERATORY	100348	1	DISPENSER	SOAP		AS PER FACILITY CONTRACT		0.00	$0			0	355.6	127	127			XXX	As per facility contract					N/A						
105	F109	DENTAL OPERATORY	100180	1	HAND SANITIZER	WATERLESS	AS PER SITE CONTRACT	AS PER SITE CONTRACT		0.00	$0			0	233.426	132.08	115.316			XXX	As per facility contract					N/A						
105	F109	DENTAL OPERATORY	100006	1	RACK	APRON		ULTRARAY	WALL MOUNTED TUBULAR RACK	190.00	$190			0	203.2	406.4	127			XXX	Hold 2 lead aprons and 2 thyroid collers					N/A						
106	F110	DENTAL REPROCESSING	100350	1	CAN	GARBAGE		AS PER FACILITY STANDARD		12.00	$12			0	533.4	279.4	406.4	XXX			As per facility standard					N/A						
106	F110	DENTAL REPROCESSING	100347	1	DISPENSER	PAPER TOWEL	HANDS FREE	AS PER FACILITY CONTRACT		0.00	$0			0	406.4	317.5	260.35			XXX	As per facility contract	115	1			Battery or manually operated						
106	F110	DENTAL REPROCESSING	100348	1	DISPENSER	SOAP		AS PER FACILITY CONTRACT		0.00	$0			0	355.6	127	127			XXX	As per facility contract					N/A						
107	F111	INMATE WC	100350	1	CAN	GARBAGE		AS PER FACILITY STANDARD		12.00	$12			0	533.4	279.4	406.4	XXX			As per facility standard					N/A						
107	F111	INMATE WC	100347	1	DISPENSER	PAPER TOWEL	HANDS FREE	AS PER FACILITY CONTRACT		0.00	$0			0	406.4	317.5	260.35			XXX	As per facility contract	115	1			Battery or manually operated						
107	F111	INMATE WC	100348	1	DISPENSER	SOAP		AS PER FACILITY CONTRACT		0.00	$0			0	355.6	127	127			XXX	As per facility contract					N/A						
107	F111	INMATE WC	100349	1	DISPENSER	TOILET TISSUE		AS PER FACILITY CONTRACT		0.00	$0			0	330.2	520.7	152.4			XXX	As per facility contract					N/A						