

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- .1 The Work includes but not limited to the following:
 - .1 As described above in this section and all specification sections and drawings.
 - .2 Municipal Address: 9530-101 Avenue, Edmonton, AB T5H 0B3.
 - .3 Legal Description: Plan D, Block 1, Lots 12-19 and 40-51.
 - .4 The Work involves the demolition and new construction of new addressable fire alarm systems. The Work is to include: two (2) new fire alarm control panels, sub-panel(s), initiating and signalling devices, annunciator(s), booster(s), facility maps, etc.
 - .5 The existing fire alarm system is to remain functional prior to final connection of the new fire alarm systems. Downtime of the fire alarm system should be limited and fire watch should be allowed for in the bid during downtime of the fire alarm system.
 - .6 Prior to disposal of any existing fire alarm devices, panels, and miscellaneous parts contractor to confirm with the Departmental Representative if any of these devices, panels, or parts would like to be kept by the Departmental Representative.
 - .7 Contractor to ensure all asbestos and lead paint procedures are followed. See other specification sections and drawings for more information.
 - .8 Contractor to obtain all required permits (building, electrical, etc.) required for construction.
 - .9 Daily reports must be submitted at the end of each work day, digital copy must be sent to the Departmental Representation. Daily reports must include:
 - .1 Summary of man hours spent that day (employee's name, trade, start time, finish time).
 - .2 Progress of work that has been completed that day (as well as anything performed during night shift)
 - .3 Deficient items
 - .4 Forecasted inspections (upcoming days)
 - .5 Forecasted occupancy disruptions (for next day, or day following)
 - .6 RFI, SI, CCN, CO (forecasted or outstanding)
 - .10 Weekly report needs to be submitted by 12 pm the first work day of the following week, and should include:
 - .1 Summary of weekly man hours spent the previous week, forecast of weekly man hours for the next week.
 - .2 Schedule forecast on areas of work for the week coming up and any major activities.
 - .3 Progress of work that has been completed that last week.
 - .4 Deficient items.
 - .5 Forecasted inspections (next week and following week)
 - .6 Forecasted occupancy disruptions (next week and following week)

- .7 RFI, SI, CCN, CO (forecasted or outstanding).
- .8 Any as-builts
- .9 Minimum one (1) picture required per active or complete work area (pertaining to the previous week of work)

1.2 CONTRACT METHOD

- .1 Construct Work under a single contract.
- .2 Relations and responsibilities between Contractor and subcontractors assigned by as defined in Conditions of Contract. Assigned Subcontractors must, in addition:
 - .1 Furnish to Contractor, bonds covering faithful performance of subcontracted work and payment of obligations thereunder when Contractor.
 - .2 Purchase and maintain liability insurance to protect Contractor from claims for not less than limits of liability which Contractor is required to provide to Departmental Representative.

1.3 WORK BY OTHERS

- .1 Cooperate with other Contractors in carrying out their respective works and carry out instructions from Departmental Representative.
- .2 Coordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Departmental Representative, in writing, any defects which may interfere with proper execution of Work.
- .3 Work of Project executed during Work of this Contract, and which is specifically excluded from this Contractor:
 - .1 R.090943.001 CSC Grierson AHU Replacement
 - .2 R.091023.001 CSC Grierson Smudging Exhaust

1.4 WORK SEQUENCE

- .1 Construct Work in stages to accommodate users use of premises during construction.
- .2 Coordinate Progress Schedule and coordinate with Departmental Representative Occupancy during construction.
- .3 Required stages:
 - .1 Building 1 Install New Fire Alarm & Commission; Cap or Place signs for Decommissioned Existing Fire Alarm System.
 - .2 Building 2 Install New Fire Alarm & Commission; Cap or Place signs for Decommissioned Existing Fire Alarm System.
 - .3 Building 3 Install New Fire Alarm & Commission; Cap or Place signs for Decommissioned Existing Fire Alarm System.
 - .4 Building 4 Disable Fire Alarm and Install New Fire Alarm & Commission, Remove Old Fire Alarm
 - .5 Building 3 Remove Old Fire Alarm
 - .6 Building 2 Remove Old Fire Alarm
 - .7 Building 1 Remove Old Fire Alarm

- .4 Construct Work in stages to provide for continuous public usage.
- .5 Maintain fire access/control.
- .6 All work must be scheduled and accepted by the Departmental Representative at least three (3) weeks in advance. Hours of work are 8am-4pm Monday-Friday except where indicated or as mutually agreed with Departmental Representative.
 - .1 Work on evenings, weekends, and federal statutory holidays must be requested at least two (2) weeks in advance, and accepted by the Departmental Representative
- .7 All work must be staged around existing tenancy, as such Work shall be planned to take place around existing office furniture, equipment and finishes; contractor must protect office furniture, equipment and finishes from damage, as well as protect from hazardous material as required, and perform a full clean-up at the end of each work shift.
- .8 All work that disturbs hazardous material (asbestos abatement and lead paint removal) in office areas and common corridors, must be done between the hours of 4pm-12am or 12am-8am Monday-Friday or on weekends. This work must be scheduled fifteen (15) business days in advance.
- .9 All work that disturbs hazardous material (asbestos and lead paint) in living units, must be done between the hours of 8am-4pm weekdays. This work must be scheduled fifteen (15) business days in advance.
- .10 All work in living units (Basement of Building 1, 2nd Floor of Building 4, Ground Floor of Building 4 Rooms 4-150, 4-147 & 4-145) including but not limited to activities that disturb hazardous material, must be done between the hours of 8am-4pm weekdays. This work must be scheduled fifteen (15) business days in advance.
- .11 In common corridors (where office workers or resident inmates are not present or are otherwise scheduled to not be present) it is acceptable to perform lead removal during normal work hours 8am-4pm Monday-Friday under the following conditions:
 - .1 Acceptable to perform disturbance of lead-based paints using heap-equipped power tools or non-powered hand tools, and;
 - .2 Acceptable to disturb lead-based paints using a chemical or gel paste
 - .1 All work relating to lead paint disturbance using chemical or gel paste must be done with colourless and odourless zero VOC solvents.
 - .3 If and when performing lead paint removals between 8am-4pm Monday-Friday, under the conditions stated above, the contractor shall erect a full-height temporary barricade (contractor not visible) that serves as a visual barrier from all angles, as well as follow the safety provisions included in the corresponding specification section.

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- .12 The following are manpower/congestion constraints that must be followed when performing the work so as to minimize disruption to operations
- .1 Basement of Building 2, Basement of Building 3 & Basement of Building 4 have no constraints on how much manpower the contractor can utilize within the constraints defined in the contract documents; contractor is free to mobilize as many crews as needed in these areas.
 - .2 All work in living units (Basement of Building 1, 2nd Floor of Building 4, Ground Floor of Building 4 Rooms 4-150, 4-147 & 4-145) must be performed with no more than 2 crews (2 people per crew) at any given time.
 - .3 Buildings 1, 2, 3 main floor and second floor must be performed with no more than 1 crew (2 people per crew) at any given time (if performing the work 8am-4pm Monday-Friday). If contractor wishes to perform work in these areas after normal work hours (4pm-12am or 12am-8am Monday-Friday or weekends), then contractor is free to mobilize as many crews as needed in these areas.
 - .4 Contractor, at all times while work is taking place, must allow for safe and secure 24/7 operations continued use and access of Room 4-114.
 - .5 Contractor, at all times while work is taking place, must allow for safe and secure 24/7 operations continued use and access of Room 1-002.
 - .6 Contractor shall schedule all work that takes place in rooms 4-138, 4-137, 4-136, 4-135, 4-133 to be performed between the hours of 6pm-4am.
- .13 For the duration of the project, when any work is taking place, the contractor must have a dedicated supervisor on site (Project Manager, Superintendent or no-tools-Foreman).
- .14 For the duration of the project, when any work is taking place on a regular work day between Monday-Friday, the contractor dedicated supervisor shall be on-site a minimum of one (1) hour prior to commencing the work day, to review the work areas with the Departmental Representative, to ensure provisions have been made, acceptable to both the contractor and the Departmental Representative, to provide access to the work area(s).
- .15 For the duration of the project, when any work is taking after hours (Monday-Friday 4pm-12am), the contractor dedicated supervisor shall allocate a minimum of one (1) hour prior to commencing the after hours' work, to review the work areas with the Departmental Representative, to ensure provisions have been made, acceptable to both the contractor and the Departmental Representative, to provide access to the work area(s).
- .16 For the duration of the project, when any work is taking after hours (Monday-Friday 12am-8am), the contractor dedicated supervisor shall allocate a minimum of one (1) hour prior to end of previous working day (i.e. Tuesday 3pm-4pm for work taking place Wednesday 12am-8am), to review the work areas with the Departmental Representative, to ensure provisions have been made, acceptable to both the contractor and the Departmental Representative, to provide access to the work area(s).
- .17 For the duration of the project, when any work is taking place on the weekend, the contractor dedicated supervisor shall allocate a minimum of one (1) hour prior to end of previous working day (i.e. Friday 3pm-4pm), to review the work areas with the Departmental Representative, to ensure provisions have been made, acceptable to both the contractor and the Departmental Representative, to provide access to the work area(s).

- .18 A minimum of five (5) days (working days) notice is to be provided to Departmental Representative for planned system shutdown and a second notice twenty-four (24) hours prior to the shutdown.
- .19 Prior to a fire alarm verification – Departmental Representative and Staff should be notified a minimum of ten (10) days prior to the work sequence.
- .20 Contractor to schedule any excessive noise generating commissioning (fire alarm system testing involving fire alarm ringing, etc.) to take place between 3pm-6pm during a normal business day. Departmental Representative and Staff should be notified a minimum of ten (10) days prior to the work sequence.

1.5 CONTRACTOR USE OF PREMISES

- .1 Coordinate use of premises under direction of Departmental Representative.
- .2 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .3 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .4 Repair or replace portions of existing work which have been altered during construction operations to match existing.
- .5 At completion of operations condition of existing work: equal to or better than that which existed before new work started.
- .6 The Contractor will have use of the Project Site for performance of the Work.
- .7 Refer to Section 01 35 13 - Security Requirements.
- .8 Coordinate use of premises as agreed to by Departmental Representative.
- .9 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .10 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Departmental Representative.
- .11 At completion of operations, restore condition of existing work to equal to or better than that which existed before new work started.

1.6 PARTIAL OWNER OCCUPANCY

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Cooperate with Departmental Representative in scheduling operations to minimize conflict and to facilitate Owner usage.

1.7 CONTRACTOR RESPONSIBILITIES

- .1 Contractor Responsibilities:
 - .1 Designate submittals and delivery date for each product in progress schedule.
 - .2 Review shop drawings, product data, samples, and other submittals. Submit to Consultant notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
 - .3 Receive and unload products at site.
 - .4 Inspect deliveries prior to receiving them; record shortages, and damaged or defective items.
 - .5 Handle products at site, including uncrating and storage.
 - .6 Protect products from damage, and from exposure to elements.
 - .7 Assemble, install, connect, adjust, and finish products.
 - .8 Provide installation inspections required by public authorities.
 - .9 Repair or replace items damaged by Contractor or Subcontractor on-site (under his control).

1.8 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to building operations, occupants, public and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.
- .2 Coordinate with Departmental Representative for approval for use of elevators in the existing in building for moving workers and material.
 - .1 Protect walls of passenger elevators.
 - .2 Accept liability for damage, safety of equipment and overloading of existing equipment.

1.9 EXISTING SERVICES

- .1 Notify Departmental Representative and utility companies of any intended interruption of services and obtain required permission well in advance (tailor this to suit project).
- .2 When applicable request and obtain written acceptance from Departmental Representative of alternative routes for personnel.
- .3 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .4 Provide temporary services when directed by Departmental Representative to maintain critical building systems.
- .5 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .6 Protect, relocate or maintain existing active services. Record locations of maintained, re-routed and abandoned service lines.
- .7 Construct barriers in accordance as required.

1.10 DOCUMENTS REQUIRED

- .1 Maintain at job site, one (1) copy each document as follows:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed Shop Drawings.
 - .5 List of Outstanding Shop Drawings.
 - .6 Change Orders.
 - .7 Other Modifications to Contract.
 - .8 Field Test Reports.
 - .9 Copy of Approved Work Schedule.
 - .10 Health and Safety Plan and Other Safety Related Documents.
 - .11 Other documents as specified.

PART 2 PRODUCTS

- .1 Not Used

PART 3 EXECUTION

- .1 Not Used

END OF SECTION

PART 1 GENERAL

1.1 ACCESS AND EGRESS

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.2 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Contractor must provide and maintain at least one sanitary facility that will remain outdoors, located in the exterior of the facility at a location agreed to by Departmental Representative. The sanitary facility shall be locked when not in use.
- .4 Contractor must not rely on being provided access to Departmental Representative sanitary facilities, though if permission granted, contractor must be respectful and keep clean any sanitary facilities provided temporarily for use. Miss use of facilities will result in removal withdrawal permission.
- .5 Contractor will be able to use a laydown area 8' x 10' inside the garage / maintenance area (basement of Building 2) for material and tools.
- .6 Closures: protect work temporarily until permanent enclosures are completed.

1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to occupants, building operations and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.

1.4 EXISTING SERVICES

- .1 Notify, Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, Departmental Representative forty-eight (48) hours of notice for service throughout course of work. Keep duration of interruptions minimum necessary interruption of electrical service throughout course of work. Keep duration of interruptions minimum.
- .3 Provide for pedestrian personnel and vehicular traffic.

1.5 SPECIAL REQUIREMENTS

- .1 All work will be performed under Departmental Representative Commissionaire escort.
- .2 Submit daily and weekly reports in accordance with Section 01 11 00 - Summary of Work.
- .3 Half-an-hour (0.5) allowance to be made for personnel at the beginning of the work shift, to be escorted to their area of work for Building 1, Building 2 and Building 3.
- .4 One-hour (1.0) allowance to be made for personnel at the beginning of the work shift, to be escorted to their area of work and allow for occupancy schedule coordination for Building 4:
 - .1 As a result of the high semi-permanent resident density coupled with relatively higher concentration of hazardous material present in Building 4 compared to the other buildings.

1.6 BUILDING SMOKING ENVIRONMENT

- .1 Smoking is not permitted anywhere on the property, including the parking lot.
- .2 Contractor must not have tobacco on their person while performing the work.

PART 2 PRODUCTS

- .1 Not used.

PART 3 EXECUTION

- .1 Not used.

END OF SECTION

PART 1 GENERAL COORDINATION

- .1 The Contractor will coordinate all construction activities as required to ensure efficient and orderly installation of each part of the Work.
- .2 If installation of one part of the Work is dependent on installation of other components, the Contractor will coordinate construction activities in the sequence required to obtain the best results.
- .3 If availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.

PART 2 ADMINISTRATIVE PROCEDURES

- .1 The Contractor will coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Administrative activities include, but are not limited to:
 - .1 Preparation of schedules (via Bar GANTT Chart – refer to Section 01 32 16.07);
 - .2 Installation and removal of temporary facilities;
 - .3 Delivery and processing of submittals;
 - .4 Progress meetings;
 - .5 Contract acceptance procedures.

PART 3 GENERAL INSTALLATION PROVISIONS

- .1 The Contractor will:
 - .1 Require the installer of each major component to inspect both the substrate and conditions under which Work is to be performed, and ensure unsatisfactory conditions have been corrected in an acceptable manner before the Work proceeds.
 - .2 Ensure compliance with manufacturer's installation instructions and recommendations, to the extent those instructions and recommendations are more explicit or stringent than requirements contained in the Contract.
 - .3 Inspect materials immediately upon delivery and prior to installation, rejecting damaged and defective items.
 - .4 Provide attachment and connection devices and methods necessary for securing the Work, ensuring it is secured true to line and level with allowance for expansion and building movement.
 - .5 Provide uniform joint widths in exposed Work, arrange joints in exposed Work to obtain the best visual effect and refer questionable choices to the Departmental Representative for final decision.
 - .6 Install each component during weather conditions and Project status that will ensure the best possible results.

- .7 Isolate each part of the completed construction from incompatible material, as necessary to prevent deterioration.
- .8 Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.
- .9 Install individual components at standard mounting heights recognized within the industry for the particular application indicated, unless indicated otherwise in the Drawings, referring questionable mounting height decisions to the Departmental Representative for final decision.
- .10 Supervise construction activities to ensure that no part of the Work, completed or in progress, is subject to harmful, dangerous, damaging or otherwise deleterious exposure during the construction period.
- .11 Obtain all required permits (building, electrical, etc.) required for construction.
- .12 The existing fire alarm system is to remain functional prior to final connection of the new fire alarm system. Downtime should be limited and fire watch should be allowed for in the bid during downtime of the fire alarm system.

PART 4 OPERATIONS CONTACT

- .1 Departmental Representative will appoint an Operations Contact to be the Contractor's contact regarding all facets of the work which directly or indirectly affect the function of the facility.
- .2 Contractor shall comply with all instructions and directions given by the Operations Contact so as to minimize disruption to the functions of the building.

END OF PROJECT COORDINATION

PART 1 PRE-CONSTRUCTION MEETING

- .1 The Contractor will schedule a pre-construction meeting to take place no more than ten (10) days after the date of commencement of the Contract and prior to commencement of activities at the Project Site.
- .2 This meeting will be chaired by Departmental Representative.
- .3 The location of the meeting will be determined by the Contractor to allow all stakeholders the maximum opportunity to participate.
- .4 Attendees
 - .1 Contractor: Senior management, project manager, site superintendent, representatives of major Subcontractors, and others as necessary.
 - .2 Departmental Representatives.
- .5 Agenda
 - .1 Introduction of Departmental Representatives and Contractor representatives and a review of their respective assignments.
 - .2 Review of the significant contractual / execution responsibilities and administrative and procedural requirements.
 - .3 Other business.

PART 2 Construction Progress Meetings

- .1 Unless otherwise directed by the Departmental Representative, the Contractor will schedule bi-weekly construction progress meetings during the course of the Work to monitor construction progress and identify problems, and decide actions required for their solution, to expedite the Work.
- .2 The location of the meeting will be the in a boardroom provided by the Departmental Representative.
- .3 Attendees
 - .1 Contractor: Project manager, site superintendent and, when requested by Departmental Representative, Subcontractors and other parties involved in the Work, all of whom will be qualified and authorized to act on behalf of the party each represents.
 - .2 Departmental Representatives.

- .4 Agenda:
 - .1 Review and approval of minutes of previous meeting.
 - .2 Review of items of significance that could affect progress.
 - .3 Other topics for discussion, as appropriate to the current status of the Work.
- .5 Contractor will record minutes and distribute copies to all attendees no more than five (5) days after the meeting.
- .6 Bi-weekly progress meetings are chaired by the Contractor.

PART 3 Warranty Meetings

- .1 Warranty meetings will be held on an 'as needed' basis between Substantial Performance of the Work and Total Performance of the Work to bring to Contractor's attention Deficiencies identified during warranty period, determine action required for their correction, and monitor progress of Contract Deficiency correction.
- .2 This meeting will be chaired by a Departmental Representative.
- .3 The location of these meetings will be as agreed between the Departmental Representative and the Contractor.
- .4 Attendees
 - .1 Contractor: Project manager, site superintendent and, when requested by Departmental Representative, Subcontractors and other parties involved in the Work, all of whom will be qualified and authorized to act on behalf of the party each represents.
 - .2 Departmental Representatives.
- .5 Agenda
 - .1 Review and approval of minutes of previous meeting.
 - .2 Review of progress of Deficiency correction.
 - .3 Identification of problems impeding Deficiency correction.
 - .4 Review of outstanding Deficiencies.
 - .5 Other business.
- .6 Departmental Representative will record minutes and distribute copies to all attendees no more than ten (10) days after the meeting.

END OF PROJECT MEETINGS

PART 1 GENERAL

1.1 DEFINITIONS

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars.
- .3 Generally, Bar Chart should be derived from commercially available computerized project management system.
- .4 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .5 Construction Work Week: Monday to Friday, inclusive, will provide five (5) day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .6 Duration: number of work periods (not including holidays or other non-working periods) required to complete activity or other project elements. Usually expressed as work days or work weeks.
- .7 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .8 Milestone: significant event in project, usually completion of major deliverable.
- .9 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
- .10 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.2 REQUIREMENTS

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Limit activity durations to maximum of approximately ten (10) working days, to allow for progress reporting.
- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Department Representative within seven (7) working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to Departmental Representative within five (5) working days of receipt of acceptance of Master Plan.

1.4 PROJECT MILESTONES

- .1 Project milestones form interim targets for Project Schedule. Indicate the following:
 - .1 Indicate the number of working days to complete each work area/phase and the start and end date. The work areas shown on the drawing are:
 - .1 Building 1 Install New Fire Alarm & Commission; Cap or Place signs for Decommissioned Existing Fire Alarm System.
 - .2 Building 2 Install New Fire Alarm & Commission; Cap or Place signs for Decommissioned Existing Fire Alarm System.
 - .3 Building 3 Install New Fire Alarm & Commission; Cap or Place signs for Decommissioned Existing Fire Alarm System.
 - .4 Building 4 Disable Fire Alarm and Install New Fire Alarm & Commission, Remove Old Fire Alarm.
 - .5 Building 3 Remove Old Fire Alarm.
 - .6 Building 2 Remove Old Fire Alarm.
 - .7 Building 1 Remove Old Fire Alarm.
 - .2 Within each work area/phase indicate the number of working days to complete each Fire Alarm and the start and end date.

1.5 MASTER PLAN

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 Departmental Representative will review and return revised schedules within seven (7) working days.
- .3 Revise impractical schedule and resubmit within five (5) working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.6 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Award.
 - .2 Permits.
 - .3 Mobilization.
 - .4 Pre-shut down confirmation review.
 - .5 Specific Work Area Phase
 - .1 Shop Drawings, Samples.
 - .2 Supplied equipment long delivery items.
 - .3 Area Preparation and Demolition
 - .4 Interior Architecture (Walls, Floors and Ceiling).
 - .5 Fire Alarm Systems
 - .6 Testing and Commissioning.
 - .1 Pre-function Checks
 - .2 Start-up
 - .3 Controls Functional Start up
 - .4 Functional Performance Verifications.
 - .7 Documentation
 - .8 Training
 - .9 Other supplied equipment required dates.

1.7 PROJECT SCHEDULE REPORTING

- .1 Update Project Schedule on a weekly 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.
- .3 Weekly Reports should include:
 - .1 Summary of weekly man hours spent the previous week, forecast of weekly man hours for the next week.
 - .2 Schedule forecast on areas of work for the week coming up and any major activities. Identify escort requirements to department representative for scheduling.

- .3 Material section: report on deliveries, forecasted deliveries in the weeks coming up.
- .4 Progress of work that has been completed that last week.
- .5 Commissioning milestones
- .6 Deficient items.
- .7 Forecasted inspections.
- .8 Weather issues.
- .9 RFI, SI, CCN, CO (forecasted or outstanding).
- .10 Any as-builts or pictures as required.

- .4 Communicate daily any deviations from the weekly report.

1.8 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 accepted dates shown on baseline schedule.

PART 2 PRODUCTS

- .1 Not used.

PART 3 EXECUTION

- .1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 ADMINISTRATIVE

- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 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 considered rejected.
- .6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are coordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .10 Keep one (1) reviewed copy of each submission on site.

1.2 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .3 Allow 10 business days for Departmental Representative's review of each submission.
- .4 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .5 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

- .6 Accompany submissions with transmittal letter, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .7 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .8 After Departmental Representative's review, distribute copies.
- .9 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .10 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .11 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within three (3) years of date of contract award for project.

- .12 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
- .13 Submit electronic copies of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .14 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .15 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .16 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
- .17 Delete information not applicable to project.
- .18 Supplement standard information to provide details applicable to project.
- .19 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .20 The review of shop drawings by Departmental Representative for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of Work of sub-trades.

1.3 SAMPLES

- .1 Submit for review samples in as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.4 PHOTOGRAPHIC DOCUMENTATION

- .1 Submit electronic copy of colour digital photography in jpg format, standard resolution monthly with progress statement and as directed by Departmental Representative.
- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Viewpoints and their location as determined by Departmental Representative.

1.5 CERTIFICATES AND TRANSCRIPTS

- .1 Submit transcription of insurance immediately after award of Contract.

PART 2 PRODUCTS

- .1 Not Used.

PART 3 EXECUTION

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 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.

1.2 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 \$25, when possessed by an inmate without prior authorization, and
 - .5 any item not described in paragraphs (1) to (4) that could jeopardize the security of a Penitentiary or the safety of persons, when that item is possessed without prior authorization.
- .2 "Unauthorized Smoking Items" means all smoking items including, but not limited to, cigarettes, cigars, tobacco, chewing or snuffing 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 "Construction employees" means persons working for the General Contractor, the sub-contractors, equipment operators, material suppliers, testing and inspection companies and regulatory agencies.
- .6 "Departmental Representative" means the Public Works and Government Services Canada (PWGSC) or the Correctional Service Canada (CSC) project manager depending on project.
- .7 "Perimeter" means the fenced or walled area of the institution that restrains the movement of the inmates.
- .8 "Construction zone" means the area as shown on the contract drawings where the contractor will be allowed to work. This area may or may not be isolated from the security area of the institution.

1.3 PRELIMINARY PROCEEDINGS

- .1 Prior to the commencement of work, the Contractor will meet with the Departmental Representative to:
 - .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 Contractor will:
 - .1 Ensure that all construction employees are aware of the rules of the institution.
 - .2 Ensure that a copy of the institutional rules is always prominently on display at the job site.
 - .3 Cooperate with institutional personnel in ensuring that the rules of the institution are observed by all construction employees.

1.4 CONSTRUCTION EMPLOYEES

- .1 Departmental Representative may request a list of the names with date of birth of all construction employees to be employed on the construction site and a CPIC clearance form for each employee. (*Institutional Access CPIC Clearance Request form CSC/SCC 1279.*)
- .2 If requested, allow for two (2) weeks for processing of security clearances. Construction employees will not be admitted to the institution without a valid CPIC clearance in place and a recent picture identification such as a provincial driver's license. CPIC clearances obtained from other CSC institutions are not valid at the institution where the project is taking place.
- .3 The Departmental Representative may require that facial photographs be taken of construction employees and that these photographs be displayed at appropriate locations in the institution or in an electronic database for identification purposes. The Departmental Representative requires that Photo ID cards be provided for all construction workers. ID cards will then be left at the designated entrance to be picked upon arrival at the institution and shall be displayed prominently on the construction employees clothing at all time while employees are at 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.

1.5 VEHICLES

- .1 All unattended vehicles on CSC property shall have windows closed; doors and trunks shall be locked and keys removed. The keys shall be securely in the possession of the owner or an employee of the company that owns the vehicle.
- .2 The Departmental Representative 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 shall 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 Commissionaires while in the institution.
- .4 If the Departmental Representative permits trailers to be left inside the secure perimeter of the institution, these trailer doors will be locked at all times. All windows will be securely locked when left unoccupied. All trailer windows shall be covered with expanded metal mesh. All storage trailers inside and outside the perimeter must be locked when not in use.

1.6 PARKING

- .1 There will be no site parking available on-site.

1.7 SHIPMENTS

- .1 All shipments of project material, equipment and tools shall be addressed in the Contractor's name to avoid confusion with the institution's own shipments. The Contractor must have his own construction employees on site to receive any deliveries or shipments. CSC staff will NOT accept receipt of deliveries or shipments of any material equipment or tools.

1.8 TELEPHONES

- .1 There will be no installation of telephones, Facsimile machines and computers with Internet connections permitted within the perimeter of the institution unless prior approval of the Departmental Representative is received.
- .2 The Departmental Representative 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 perimeter of the institution unless approved by the Departmental Representative. If wireless cellular telephones are permitted, the user will not permit their use by any inmate. Cellular telephones approved by the Departmental Representative must be signed in and out of the institution.
- .4 The Departmental Representative may approve and limit the use of two-way radios.

1.9 WORK HOURS

- .1 Work hours within the institution are: 8:00am to 6:00 pm, Monday to Friday.

1.10 OVERTIME WORK

- .1 Workers can work during the weekend outside of the building for longer hours subject to approval from the Departmental Representative.
- .2 Give a minimum twenty-four (24) hours advance notice when overtime work on the construction project is necessary and approved.
- .3 When overtime work, weekend statutory holiday work is required and approved by the Departmental Representative, extra staff members may be posted by the Departmental Representative or his designate, to maintain the security surveillance. The actual cost of this extra staff may be attributed to the contractor.

1.11 TOOLS AND EQUIPMENT

- .1 Tools brought in need to be counted every day and workers need to have a security briefing upon their initial arrival.
- .2 Maintain on-site a complete list of all tools and equipment to be used during the construction project. Make this inventory available for inspection when required.
- .3 Throughout the construction project maintain up-to-date the list of tools and equipment specified above.
- .4 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.
- .5 Store all tools and equipment in approved secure locations.
- .6 Lock all toolboxes when not in use. Keys to remain in the possession of the construction employees of the Contractor.
- .7 Scaffolding shall be secured and locked when not erected and when erected, shall be secured in a manner agreed upon with the Departmental Representative.
- .8 All missing or lost tools or equipment shall be reported immediately to the Departmental Representative.
- .9 The Departmental Representative 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 construction project.
 - .2 Weekly, when the construction project extends longer than a one week period.

- .10 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 (1) day's work. Used blades/cartridges will be returned to the Departmental Representative at the end of each day. The use of explosive-actuated tools is prohibited on site unless otherwise approved by the Departmental Representative. All broken blades and tools must be accounted for and broken tools are not to be thrown away. Particular attention must be given to power driven tools, files, saw blades, rod saws, wire, rope and ladders. Tool kits must be locked when the area is unattended.
- .11 If propane or natural gas is used for heating the construction, the institution will require that an employee of the contractor supervise the construction site during non-working hours.

1.12 PRESCRIPTION DRUGS

- .1 Employees of the Contractor who are required to take prescription drugs during the workday shall obtain approval of the Departmental Representative to bring a one (1) day supply only into the institution.

1.13 SMOKING RESTRICTIONS

- .1 Contractors and construction employees are not permitted to smoke inside correctional facilities or outdoors within the perimeter of a correctional facility and must not possess unauthorized smoking items within the perimeter of a correctional facility.
- .2 Contractors and construction employees who are 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 only permitted outside the perimeter of a correctional facility in an area to be designated by the Departmental Representative.

1.14 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 Departmental Representative.
- .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 CPIC 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 CPIC clearances for the driver of the vehicle.

1.15 SEARCHES

- .1 All vehicles and persons entering institutional property may be subject to search.
- .2 When the Departmental Representative suspects, on reasonable grounds, that an employee of the Contractor is in possession of contraband or unauthorized items, 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.

1.16 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 Departmental Representative.

1.17 MOVEMENT OF VEHICLES

- .1 The Contractor shall advise the Departmental Representative twenty-four (24) hours in advance to the arrival on-site of heavy equipment such as concrete trucks, cranes, etc.
- .2 Vehicles being loaded with soil or other debris, or any vehicle considered impossible to search, must be under continuous supervision by CSC staff or Commissionaires working under the authority of the Departmental Representative.
- .3 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.
- .4 Vehicles shall be refused access to institutional property if, in the opinion of the Departmental Representative, they contain any article which may jeopardize the security of the institution.
- .5 Private vehicles of construction employees will not be allowed within the security perimeter of medium or maximum security institutions without the authorization of the Departmental Representative. Contractor's employees will park their vehicles in an area outside the perimeter of the institution.
- .6 With the approval of the Departmental Representative, 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 Departmental Representative may require that the equipment be secured with a chain and padlock to another fixed object.

1.18 MOVEMENT OF CONSTRUCTION EMPLOYEES ON INSTITUTIONAL PROPERTY

- .1 Subject to the requirements of good security, the Departmental Representative will permit the Contractor and his employees as much freedom of action and movement as is possible.
- .2 However, notwithstanding paragraph above, the Departmental Representative may prohibit or restrict access to any part of the institution.
- .3 The Departmental Representative will also require the following:
 - .1 Workers need to be escorted by Correctional Officers while working inside of the building.
 - .2 Workers need to be escorted by commissionaires while working outside of the building.
- .4 During the lunch and coffee/health breaks, all construction employees will remain within the construction site. Construction employees are not permitted to eat in the officer's lounge or the dining room of the institution.

1.19 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.

1.20 STOPPAGE OF WORK

- .1 The Departmental Representative may order at any time that the Contractor, his employees, sub-contractors and their employees to not enter or to 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 CSC staff member giving this instruction, the time of the request and obey the order as quickly as possible.
- .2 The contractor shall advise the Departmental Representative of this interruption of the work within twenty-four (24) hours.

1.21 CONTACT WITH INMATES

- .1 Unless specifically authorized, the contractor is not encouraged to come into contact with inmates, to talk with them, to receive objects from them or to give them objects. Any construction employee doing any of the above without permission will be removed from the site and his security clearance revoked.
- .2 It is to be noted that cameras are not allowed on CSC property except if required for photographic history of the project. In this case, the contractor will be asked to use a designated memory card for the project.
- .3 Notwithstanding the above paragraph, if the Departmental Representative approves of the usage of cameras, it is strictly 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.

1.22 TEMPORARY FENCES

- .1 Temporary fencing should be assumed as necessary around work area unless otherwise told by the Departmental Representative.
- .2 Refer to Section 01 50 00 - Temporary Barriers and Enclosures for other temporary fence requirements.

1.23 COMPLETION OF CONSTRUCTION PROJECT

- .1 Upon completion of the construction project or, when applicable, the takeover of a facility, the Contractor shall remove all remaining construction material, tools and equipment that are not specified to remain in the institution as part of the construction contract.

PART 2 PRODUCTS

- .1 Not used.

PART 3 EXECUTION

- .1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2 Province of Alberta
 - .1 Occupational Health and Safety Act, R.S.A.
 - .2 Bill C-30 <http://work.alberta.ca/occupational-health-safety/ohs-act-regulation-and-code.html>
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS)

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within seven (7) days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
- .3 Submit two (2) copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, weekly.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.
- .7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within seven (7) days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within seven (7) days after receipt of comments from Departmental Representative.
- .8 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .9 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.
- .10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.3 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.
- .2 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.4 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

1.5 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.6 REGULATORY REQUIREMENTS

- .1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

1.7 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.8 RESPONSIBILITY

- .1 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.
- .2 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.

1.9 COMPLIANCE REQUIREMENTS

- .1 Comply with Occupational Health and Safety Act, General Safety Regulation, Alberta Reg.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.10 UNFORSEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.

1.11 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.

1.12 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by Authority Having Jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.13 BLASTING

- .1 Blasting or other use of explosives is not permitted.

1.14 POWDER ACTUATED DEVICES

- .1 Use powder actuated devices only after receipt of written permission from Departmental Representative.

1.15 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

PART 2 PRODUCTS

- .1 Not used.

PART 3 EXECUTION

- .1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES

.1 Reference Standards:

.1 U.S. Environmental Protection Agency (EPA)/Office of Water

.1 EPA 832/R-92-005, Storm Water Management for Construction Activities, Chapter 3.

.2 EPA General Construction Permit (GCP) [2012].

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

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

.2 Submit electronic copies of WHMIS MSDS in accordance.

.3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review by Departmental Representative.

.4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.

.5 Address topics at level of detail commensurate with environmental issue and required construction task[s].

.6 Include in Environmental Protection Plan:

.1 Name[s] of person[s] responsible for ensuring adherence to Environmental Protection Plan.

.2 Name[s] and qualifications of person[s] responsible for manifesting hazardous waste to be removed from site.

.3 Name[s] and qualifications of person[s] responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

- .6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
- .7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
 - .1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.
- .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
 - .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
- .9 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- .10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- .11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
- .12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .13 Waste Water Management Plan identifying methods and procedures for management discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
- .14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.
- .15 Pesticide treatment plan to be included and updated, as required.

1.3 FIRES

- .1 Fires and burning of rubbish on-site is not permitted.
- .2 Where fires or burning is permitted, prevent staining or smoke damage to structures, materials or vegetation which is to be preserved.
 - .1 Restore, clean and return to new condition stained or damaged work.
- .3 Provide supervision, attendance and fire protection measures as directed.

1.4 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
 - .1 Provide temporary enclosures where directed by Departmental Representative.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.5 NOTIFICATION

- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
 - .1 Take action only after receipt of written approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

PART 2 PRODUCTS

- .1 Not Used.

PART 3 EXECUTION

3.1 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 23 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Bury rubbish and waste materials on-site where directed after receipt of written approval from Departmental Representative.
- .3 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
- .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 23 - Cleaning.
- .5 Waste Management: separate waste materials for recycling.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 DEFINITIONS

- .1 The following definition applies only to this section.
 - .1 "**Regulatory Requirements**" means laws, by-laws, ordinances, rules, regulations, codes, and orders of authorities having jurisdiction, and other legally enforceable requirements applicable to the Work and which are in, or come into, force during the Contract Time.

PART 2 GENERAL

- .1 The Contractor will comply with Regulatory Requirements, unless specifically directed otherwise in the Request for Bids.
- .2 Except as otherwise specified, the Contractor will apply for, obtain and pay all fees associated with permits, licenses, certificates and approvals required by Regulatory Requirements and the proposed Contract, based on:
 - .1 Regulatory Requirements and fees in force at Closing; and
 - .2 any change in Regulatory Requirements or fees scheduled to become effective after Closing and of which public notice has been given before Closing.
- .3 The Contractor shall give all notices required by Regulatory Requirements.

PART 3 HAZARDOUS MATERIAL DISCOVERY

- .1 Contractor to notify Departmental Representative for Hazardous Material Discovery. Ensure all procedures are followed as per Division 02.

PART 4 NATIONAL BUILDING CODE

- .1 The Contractor will conform to, and perform Work in accordance with, the National Building Code of Canada, except as otherwise indicated in the Request for Bids.

PART 5 PERMITS

- .1 Contractor to apply for, obtain, and pay for all required permits (building, electrical, etc.) required for the Work.
- .2 The Contractor shall display the building permit, and any other necessary permits, in a conspicuous location at the Project Site.

PART 6 OCCUPANCY PERMITS

- .1 Where required by an authority having jurisdiction, the Contractor shall apply for, obtain, and pay for occupancy permits, including partial occupancy permits.
- .2 Where Scope Document deficiencies are required to be corrected to obtain occupancy permits, including partial occupancy permits, the Departmental Representative will issue appropriate instructions to correct the Work.
- .3 The Contractor will turn occupancy permits over to Departmental Representative.

END OF REGULATORY REQUIREMENTS

PART 1 REFERENCE STANDARDS

- .1 Within the text of the Request for Bids, reference may be made to the following standards:
 - .1 ANSI - American National Standards Institute
 - .2 ASTM - American Society for Testing and Materials
 - .3 CGSB - Canadian General Standards Board
 - .4 CSA - Canadian Standards Association
 - .5 CAN - National Standard of Canada (published by CGSB)
 - .6 FM - Factory Mutual Engineering Corporation
 - .7 ULC - Underwriters Laboratories of Canada
 - .8 NBCC - National Building Code of Canada
 - .9 NFPA – National Fire Protection Association
- .2 The referenced standard, and any amendments in force at Closing, will be applicable to the Work during the duration of the Contract.

END OF REFERENCE STANDARDS

PART 1 INTENT

- .1 The Contractor will provide temporary facilities and controls specified in this section and as otherwise required for performance of the Work.

PART 2 FIELD OFFICES AND SHEDS

- .1 Contractor's office: During the entire period of performance of the Work, Contractor will be provided access to a basement garage in Building 4 – which can be used at the Contractor's own discretion as a site office. Contractor must provide site office furniture and equipment as would normally be required; Departmental Representative only providing space. If Contractor so wishes, they may mobilize their own site trailer for this purpose. It is mandatory for contractor to have a site office established on-site to store project drawings, specifications and other documents, and where all notices and instructions from Departmental Representative may be received and acknowledged.
- .2 Materials storage: Provide suitable weather and waterproof storage buildings on the Project Site for the storage and protection of Materials. These buildings will be secure and maintained in good condition until completion of the Work.

PART 3 UTILITIES

- .1 All utility services essential to Departmental Representative continuous occupation and operation of all areas outside the Project Site will be maintained in operation by Departmental Representative, who will have unfettered access to these services where they pass through the Project Site.
- .2 Contractor will bear costs of all temporary services required for the Project. The Contractor shall not disrupt any of the existing.
- .3 Sanitary Facilities
 - .1 During the entire period of performance of the Work, the Contractor can use Grierson Centre washrooms provided they are treated with respect and kept clean. In some instances, it will be cumbersome or impossible to reasonably use site facilities, as such, included in contractor scope is the mobilization and maintenance of at least one portable sanitary facility (porta-potty) which will be situated outside the building and kept locked at all times when not in use.
- .4 Water Supply
 - .1 The Contractor will provide a continuous supply of clean, potable water for all trades. Contractor must allow for the labour, equipment, and management of sourcing water from typical locations found in buildings.
- .5 Temporary Light and Power
 - .1 The Contractor will provide and pay all costs in connection with temporary light and power required for execution of the Work and will maintain this service in good working order.

PART 4 SITE HOARDING AND FENCING

- .1 Hoarding: Supply and erect hoarding at the Project Site as needed for safety purposes or as required by contract documents. Hoarding will be 2400 mm high, consisting of wood uprights set firmly in the ground, faced with new 12.5 mm fir, pine or poplar plywood, rough sheathing grade plywood, factory pre-treated, pre-stained green with wood preservative on both sides. Maintain hoarding in good condition during the Work. When hoarding is no longer required, it will be removed from the site. Demolished material will become property of Contractor.
- .2 Fencing: Supply and erect chain link fencing, 2400 mm high at locations if required.
- .3 The Contractor will supply, erect and maintain barricades, sidewalk sheds, catch platforms and accessories, as required by authorities having jurisdiction. When no longer required, remove from the Project Site, with demolished material becoming property of the Contractor.

PART 5 TEMPORARY ENCLOSURES

- .1 The Contractor will provide temporary barriers and enclosures, as required to ensure that construction Work may be carried out under temperature controlled conditions and continues unhampered by adverse weather conditions through to completion of the Work.
- .2 Cold Weather Conditions
 - .1 In advance of expected cold weather and freezing temperatures, Contractor will take necessary action to protect construction from adverse effects of weather and to maintain temperatures at specified levels.
 - .2 During storage, handling and installation, maintain Materials at specified temperatures, ensuring Materials are not allowed to freeze or become coated with ice and snow.

PART 6 PROTECTION OF THE PUBLIC AND FIRE SAFETY

- .1 Comply with requirements of the National Building Code of Canada, except as specified otherwise.

PART 7 ACTIVITIES GENERATING VIBRATION, NOISE OR SAFETY CONCERNS

- .1 Operations considered by Departmental Representative to generate vibration, noise or safety concerns include, but are not limited to:
 - .1 Noise generating activities (in excess of 80 db)
 - .2 Jack hammering
 - .3 Shot-blasting
 - .4 Sandblasting
 - .5 Cutting and coring of concrete
 - .6 Use of powder actuated fasteners

- .2 For these activities, the Contractor will:
 - .1 Provide the Operations Contact with forty-eight (48) hours advance notice for the planned activity and request approval to carry out this Work, scheduling timing of this Work with the Operations Contact.
 - .2 Stop Work generating vibration, noise or safety concerns, when instructed verbally or in writing by Departmental Representative or Prime Contractor for Safety. This stopped Work is not permitted to be resumed until authorized by the Operations Contact.

PART 8 ENVIRONMENTAL CONTROLS

- .1 All areas for performance of the Work must be maintained and abide Division 02 specifications.
- .2 The Contractor will provide all necessary dust, noise, fume and odour barriers to adequately protect the existing facilities from environmental effects of the Work.

PART 9 CLEANING DURING CONSTRUCTION

- .1 The Contractor will:
 - .1 At regular intervals during progress of Work, clean-up the Project Site. At the end of each work day, clean area entirely and completely, and dispose of waste material, rubbish, and debris.
 - .2 Not allow waste material, rubbish and debris to accumulate and become an unsightly or hazardous condition. The Project Site will be maintained in a clean and orderly condition.
 - .3 Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces and other closed or remote spaces, prior to enclosing the space.
 - .4 Not allow waste material, rubbish and windblown debris to contaminate adjacent properties.
 - .5 Sprinkle dusty debris with water, as required.
 - .6 Lower waste material in a controlled manner; not permitting waste material to be dropped or thrown from heights.
 - .7 Clean interior facility areas prior to commencement of painting and finishing operations and continue cleaning on an as-needed basis to eliminate dust until building is ready for occupancy.

PART 10 WASTE DISPOSAL REQUIREMENTS

- .1 The Contractor will:
- .1 comply with Laws pertaining to disposal operations;
 - .2 provide on-site metal containers with lids for collection and temporary storage of waste material, rubbish and debris;
 - .3 dispose of waste material, rubbish and debris at disposal areas away from the Project Site;
 - .4 not burn or bury waste material, rubbish or debris at the Project Site, or dispose of wastes into brooks, streams, rivers, waterways, lakes or ponds; and
 - .5 not dispose of volatile wastes, such as mineral spirits, oil or paint thinner, in storm or sanitary drains.

PART 11 CLEANING OF STREETS AND SIDEWALKS

- .1 At the end of each work day, clean area entirely and completely; dispose of waste material, rubbish and debris accordingly.
- .2 The Contractor will take precautions to prevent depositing of mud or debris on roadways, sidewalks and paved areas, promptly cleaning up any mud or debris so deposited.
- .3 Neglect of these requirements will cause Departmental Representative to have necessary clean-up work carried out and to charge all costs to the Contractor.

END OF TEMPORARY FACILITIES AND CONTROLS

PART 1 RELATED SECTIONS

- .1 This section pertains to final cleaning of the facilities only. Cleaning during construction and waste disposal are described in Section 01 50 00 – Temporary Facilities and Controls.

PART 2 DELIVERY, STORAGE AND HANDLING

- .1 The Contractor will:
 - .1 protect packaging during delivery, storage and handling to prevent development of mould and mildew on packaging and on products.
 - .2 request that suppliers provide cleaning materials which minimize packaging and equipment and deliver cleaning materials in recyclable or reusable packaging, such as cardboard, wood paper or reusable blankets, which will be reclaimed by supplier or manufacturer for recycling.

PART 3 CLEANING MATERIALS

- .1 Use only cleaning materials recommended by the manufacturer of the Material to be cleaned.
- .2 Use cleaning materials only on the surfaces recommended by cleaning material manufacturer, following manufacturers' printed instructions and ensuring that cleaning agents and methods do not remove finishes and permanent protective coatings on surfaces being cleaned.

PART 4 FINAL CLEANING

- .1 Perform final cleaning operations prior to request for inspection for Facility Takeover.
- .2 Use a professional cleaning firm for final cleaning operations.
- .3 Remove grease, paint spots, dirt, dust, stains, labels, fingerprints and other foreign matter from interior and exterior surfaces; vacuum and dust behind grilles, electrical outlets and boxes, louvres and screens; wash floor surfaces not otherwise finished; clean metal doors and frames; clean metal work; clean equipment; clean hardware; clean and polish glass on both sides and clean and polish mirrors.
- .4 Repair, patch and touch-up marred surfaces to match adjacent finishes.
- .5 Replace cracked and broken glass.
- .6 Replace all dirty, stained or broken lay-in ceiling tiles.
- .7 Broom clean or remove snow and ice from all exterior paved areas designed for pedestrian or vehicular traffic, including parking areas.
- .8 Thoroughly reclean all affected surfaces during correction of Deficiencies.
- .9 Leave all surfaces in perfectly clean and unsoiled condition to Departmental Representative's satisfaction.
- .10 Remove all waste generated during cleaning operations from the Project Site.

END OF FINAL CLEANING

PART 1 GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Departmental Representative inspection.
 - .2 Departmental Representative Inspection:
 - .1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Equipment and systems: tested, adjusted, balanced and fully operational.
 - .4 Certificates required by Fire Commissioner and City of Edmonton: submitted.
 - .5 Operation of systems: demonstrated to Owner's personnel.
 - .6 Commissioning of mechanical systems: completed in accordance with Division 01, other related specifications and drawings, and Departmental Representative requests. Copies of final Commissioning Report submitted to Departmental Representative.
 - .7 Work will not be accepted until Commissioning Requirements are met.
 - .8 Operation of systems: Training to Department Representative's personnel.
 - .9 Work: complete and ready for final inspection.
 - .10 Completion must be signed off by two (2) Authorized Department Representatives.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Departmental Representative.
 - .2 When Work incomplete according to Departmental Representative complete outstanding items and request re-inspection.

- .5 Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
- .6 Final Payment:
 - .1 When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
- .7 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.2 FINAL CLEANING

- .1 Clean in accordance with Section 01 74 23 - Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: separate waste materials for recycling.

PART 2 PRODUCTS

- .1 Not Used.

PART 3 EXECUTION

- .1 Not Used.

END OF SECTION

PART 1 INTENT

- .1 The Contractor shall obtain all specified operation and maintenance data, and using this data, shall prepare and submit three (3) hard copy sets of operation and maintenance manuals, as well as one (1) electronic copy in PDF format.

PART 2 DESCRIPTION OF TYPES OF OPERATION AND MAINTENANCE DATA

- .1 Data on Contractor-supplied equipment and systems, including:
 - .1 system design criteria;
 - .2 system and controls descriptions;
 - .3 system and controls schematics; and
 - .4 operating instructions.
- .2 Installation instructions: manufacturer's printed instructions describing manufacturer's recommended installation procedures.
- .3 Operating instructions: manufacturer's printed instructions describing proper operation.
- .4 Equipment identification: name plate information for each piece of equipment.
- .5 Maintenance instructions: manufacturer's printed instructions describing manufacturer's recommended maintenance.
- .6 Spare parts lists: parts lists and manufacturer's recommended spare parts.
- .7 Suppliers and Subcontractors list: list of Subcontractors and suppliers who supplied and installed equipment, systems, materials or finishes, organized by division and system, and including company name, address and telephone number.
- .8 Tag directories: directory identifying tag number and equipment description and location.
- .9 Drawings.
- .10 Shop Drawings: final reviewed/stamped shop drawings.
- .11 Product data: manufacturer's product data for equipment, systems, Materials and finishes.
- .12 Certifications, including:
 - .1 Copies of inspection reports prepared by authorities having jurisdiction;
 - .2 Certified copies of test reports prepared by independent testing agencies; and
 - .3 Any other certificates required by the Contract.
- .13 Warranties and bonds: Departmental Representative's copy of manufacturer's warranties, maintenance bonds and service contracts.
- .14 Reports: including, as required by the Contract:
 - .1 Reports documenting system performance testing methods and results; and
 - .2 Documentation of other Materials, equipment or system related information.

PART 3 GENERAL ORGANIZATION OF CONTRACTOR PREPARED OPERATION AND MAINTENANCE MANUALS

- .1 The Contractor will include the following in each volume:
 - .1 Title page.
 - .2 Table of contents. Identify volume number where listed information is located.
 - .3 Ten (10%) percent free space for additional data.
- .2 Textual information, schematics and data will be presented on 21.5cm x 28cm, 75g/m², white bond paper.
- .3 Document Binding Methods:
 - .1 Standard 21.5cm x 28cm sheets: punch sheets to fit binder.
 - .2 Sheets up to 28cm x 41.5cm: punched and neatly folded to allow use without removing from binder.
 - .3 Drawings larger than 28cm x 41.5cm: insert drawings in sturdy vinyl envelopes with reinforced binding holes, open on one side and overall folded size not exceeding 21.5cm x 28cm. Do not punch holes in drawings.
- .4 Binders:
 - .1 Commercial quality, fabric coated, hard covers attached to spine with metal piano hinges, three post, designed to accommodate 21.5cm x 28cm paper. Maximum 100 mm thick.
 - .2 Silk-screen Project title and identification, in white on front cover and spine of binder.
 - .3 Binder fabric and colour:
 - Electrical: blue
- .5 Divider Tabs:
 - .1 Light card stock, mylar laminated with tab number and title printed on tab
 - Main divisions: white tabs, labelled with division name, two bank tab length.
 - Sections of a main division: colour coded tabs, labelled with section name, four bank tab length.
 - Subsections: tabs of same colour as section, printed label, eight bank tab length.
 - .2 Coordinate tab colour codes and labeling format with Departmental Representative.

PART 4 MANUAL CONTENTS ORGANIZATION

- .1 For each major equipment, system, Materials or finishes area, organize operation and maintenance data as follows:
 - .1 Operation division: include the following, as applicable:
 - System design criteria.
 - System and controls descriptions.
 - System and controls schematics.
 - Operating instructions.
 - Equipment data.
 - .2 Maintenance division: include the following, as applicable:
 - Maintenance tasks and schedules.
 - Spare parts.
 - Suppliers and Subcontractors.
 - Tags and directories.
 - .3 Contract division: include the following, as applicable:
 - Record Drawings (including but not limited, for new and old conduit (re-used) with wire pulled).
 - Shop Drawings and product data.
 - Certifications.
 - Warranties and bonds.
 - Maintenance brochures.
 - Reports.

PART 5 SUBMISSION OF OPERATION AND MAINTENANCE MANUALS

- .1 Prior to Substantial Performance of the Work submit three (3) hard copies of the completed operation and maintenance manuals, and one (1) electronic copy in PDF format, to the Departmental Representative for review. **Substantial Performance of the Work will not be ratified until all complete sets of manuals are approved by the Departmental Representative.**

END OF OPERATION AND MAINTENANCE DATA AND MANUALS

PART 1 INTENT

- .1 The Contractor shall continuously maintain and update a marked-up, accurate, hard-copy record of:
 - .1 all changes from the initial Drawings made during construction; and
 - .2 the location of concealed systems.

PART 2 DESIGNATION OF PROJECT RECORD DOCUMENTS

- .1 At commencement of the Work, the Contractor will request from the Departmental Representative the following documents, to be designated and retained as the Project record documents:
 - .1 One (1) copy of the Request for Bids;
 - .2 Two (2) complete sets of Drawings; and
 - .3 One (1) set of all Addenda issued.

PART 3 MAINTENANCE OF PROJECT RECORD DOCUMENTS

- .1 Store the Project record documents in the site office apart from sets of documents used for construction.
- .2 Label each document "PROJECT RECORD" in neat, large printed letters.
- .3 Maintain record documents in a clean, dry and legible condition. Do not use record documents for construction purposes.
- .4 Keep record documents continuously available for review by the Departmental Representative upon request.

PART 4 RECORDING INFORMATION ON PROJECT RECORD DRAWINGS

- .1 Record changes to, and variations from, the Drawings concurrently with construction process. Do not conceal any construction Work until the required information, including all information contained in Change Orders and all other physical changes to the Work, is recorded.
- .2 Legibly mark one (1) set of the hard-copy Project record drawings to record actual construction, including:
 - .1 Measured depths of foundation elements in relation to finished first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances. Reference locations to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances concealed in construction. Reference to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes to equipment layout and services, including changes to accommodate substituted equipment.
 - .6 All items contained in Site Instructions issued during the Work (not just references to Change Orders, etc.).

- .3 Record information as follows:
 - .1 Use coloured erasable pencils to record information; and
 - .2 Use a unique colour to record the information pertaining to each major system Drawings (including but not limited, for new and old conduit (re-used) with wire pulled.

PART 5 RECORD DOCUMENTS REVIEW AT CONSTRUCTION PROGRESS MEETINGS

- .1 The Contractor shall bring the current set of the record drawings to each regular construction progress meeting for review with the Departmental Representative(s) at the meeting.

PART 6 SUBMISSION OF PROJECT RECORD DOCUMENTS

- .1 Submit completed Project record documents to the Departmental Representative for review and approval before, or with the, application for Substantial Performance of the Work. **Substantial Performance of the Work will not be ratified until documents gain Departmental Representative approval.**
- .2 Each submission will include a covering letter, stating:
 - .1 date of submission;
 - .2 Project title, plan no. and centre code;
 - .3 Contractor's name, address and telephone number;
 - .4 number and title of each record document; and
 - .5 signature of authorized representative of the Contractor.

END OF PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 SUMMARY

.1 Section includes:

.1 General requirements relating to commissioning of project's components and systems, specifying general requirements to PV of components, equipment, sub-systems, systems, and integrated systems.

.2 Acronyms:

- .1 BMM - Building Management Manual.
- .2 Cx - Commissioning.
- .3 EMCS - Energy Monitoring and Control Systems.
- .4 O M - Operation and Maintenance.
- .5 PI - Product Information.
- .6 PV - Performance Verification.
- .7 TAB - Testing, Adjusting and Balancing.

1.2 GENERAL

.1 Contractor is responsible for proper performance of Work.

.2 Provide all labour, materials, Products, equipment and services for commissioning of all building systems to ensure building is operating according to requirements of Contract Documents.

.3 Cx is a planned program of tests, procedures and checks carried out systematically on systems and integrated systems of the finished Project. Cx is performed after systems and integrated systems are completely installed, functional and Contractor's Performance Verification responsibilities have been completed and approved. Objectives:

- .1 To support quality management through monitoring and checking of the installation.
- .2 To verify system performance through testing and commissioning of the completed installation.
- .3 To move the completed facility from the "static completion" state to the optimal "dynamic" operating state.
- .4 To transfer the project from the Contractor in such a manner that provision of a quality project to the Departmental Representative has been assured.
- .5 To optimize operating and maintenance through delivery of comprehensive quality training and instruction to the Departmental Representative.

- .6 To assure provision of accurate and useful historical records, such as, as-builts drawings, test certificates, etc. to the Departmental Representative. Such records provide important data for operating and maintaining the systems as well as for future system testing, maintenance or renovations and to trouble shoot and repair the components of the systems.
 - .1 Contractor to as-built new conduit/wire for Building 1, 2, 3. Contractor to as-built all new wire in existing conduit for Building 4.
- .7 To extend the commissioning into operational phase in order to verify performance levels under a range of operating conditions; such as change of seasons. This process will help to avoid unforeseen or hidden operating and maintenance expenses that may develop later on.
- .8 Monitor the operation, performance and maintenance programs; optimize system's performance under normal operating conditions and partial and full occupancy, under the direction and review of the Commissioning Authority/Departmental Representative. This phase lasts throughout the warranty period. It may, however, involve activities so as to ensure completion of:
 - .1 System debugging and optimization.
 - .2 Completion of training and instruction for the operating and maintenance personnel.
 - .3 Completion of all commissioning activities on defective, seasonally-sensitive systems, for varying modes and periodic simulated emergency conditions.
- .9 Commissioning shall be considered complete when all of the objectives of commissioning, as specified herein, have been achieved.
- .10 Ensure appropriate documentation is compiled into the BMM.
- .4 Contractor assists in Cx process, operating equipment and systems, troubleshooting and making adjustments as required.
 - .1 Systems to be operated at full capacity under various modes to determine if they function correctly and consistently at peak efficiency. Systems to be interactively with each other as intended in accordance with Contract Documents and design criteria.
 - .2 During these checks, adjustments to be made to enhance performance to meet environmental or user requirements.
- .5 Design Criteria: as per client's requirements or determined by designer. To meet Project functional and operational requirements.

1.3 REFERENCES

- .1 CSA Z320-11 - Building Commissioning.
- .2 ASHRAE Guideline 0-2005 - The Commissioning Process.
- .3 ASHRAE Guidelines 1-19 - Guidelines for Commissioning of Specific Systems.
- .4 Alberta Building Code - Latest version of Alberta Building Code.

1.4 COMMISSIONING SUMMARY

- .1 Section 01 91 31 - Commissioning (Cx) Plan.
- .2 For Cx responsibilities refer to Section 01 91 31 - Commissioning (Cx) Plan.
- .3 Cx to be a line item of Contractor's cost breakdown.
- .4 Cx activities supplement field quality and testing procedures described in relevant technical sections.
- .5 Cx is conducted in concert with activities performed during stage of project delivery. Cx identifies issues in Planning and Design stages which are addressed during Construction and Cx stages to ensure the facility is constructed and proven to operate satisfactorily under weather, environmental and occupancy conditions to meet functional and operational requirements. Cx activities includes transfer of critical knowledge to facility operational personnel.
- .6 Departmental Representative will issue Substantial Completion Certification when:
 - .1 Completed Cx documentation has been received, reviewed for suitability and approved by Departmental Representative for all four buildings.
 - .2 Equipment, components, systems, and integrated systems have been fully commissioned and functional as per design intent within the context of the Owner Requirement for all four buildings.
 - .3 Final O&M and Training Manual has been received, reviewed, and approved by Departmental Representative for all four buildings.
 - .4 Completion of Training session to Operational and Maintenance staff for all four (4) buildings.
- .7 Perform commissioning activities in accordance with requirements of Contract Documents. Activities include, but are not limited to following:
 - .1 Commissioning process shall be performed by Contractor, in accordance with Contract Documents. Contractor shall fully cooperate with Commissioning Authority/Departmental Representative. Commissioning shall be demonstrated to satisfaction of Commissioning Authority/Departmental Representative. Commissioning work will be divided into the following phases:
 - .1 Stage 1: Commissioning performed by Contractor on all building items, components, equipment and systems unless otherwise stated, which is a prerequisite requirement for Substantial Performance application. It includes, without limitation, activities such as startup, pre-verification, verification, adjusting and balancing, demonstration and instructions of Departmental Representative(s) or other personnel designated by Consultant or Commissioning Authority/Departmental Representative regarding each building system.
 - .2 Stage 2: Commissioning performed by Contractor after Substantial Performance, which includes without limitation activities such as **training and fine tuning** of building systems through **all seasonal** occupancy, or other operational conditions to achieve requirements of Contract Documents during twelve (12) months following Substantial Performance to end of Work.

- .2 Commissioning includes systematic testing, documentation of system in all scope of operations and providing performance data. Provide complete description of all systems operation as well as equipment and material information. Perform additional testing as requested by Departmental Representative or Commissioning Authority/Departmental Representative to verify results without any extra cost to the project.

1.5 NON-CONFORMANCE TO PERFORMANCE VERIFICATION REQUIREMENTS

- .1 Should equipment, system components, and associated controls be incorrectly installed or malfunction during Cx, correct deficiencies, re-verify equipment and components within the dysfunctional system, including related systems as deemed required by Departmental Representative, to ensure effective performance.
- .2 Costs for corrective work, additional tests, inspections, to determine acceptability and proper performance of such items to be borne by Contractor. Above costs to be in form of progress payment reductions or hold-back assessments.

1.6 PRE-CX REVIEW

- .1 Before Construction:
 - .1 Review contract documents, confirm by writing to Departmental Representative.
 - .2 Adequacy of provisions for Cx.
 - .3 Aspects of design and installation pertinent to success of Cx.
- .2 During Construction:
 - .1 Coordinate provision, location and installation of provisions for Cx.
- .3 Before start of Cx:
 - .1 Have completed Cx Plan up-to-date.
 - .2 Ensure installation of related components, equipment, sub-systems, systems is complete.
 - .3 Fully understand Cx requirements and procedures.
 - .4 Have Cx documentation shelf-ready.
 - .5 Understand completely design criteria and intent and special features.
 - .6 Submit complete start-up documentation to Departmental Representative.
 - .7 Have Cx schedules up-to-date.
 - .8 Ensure systems have been cleaned thoroughly.
 - .9 Complete TAB procedures on systems, submit TAB reports to Departmental Representative for review and approval.
 - .10 Ensure "As-Built" system schematics are available.
- .4 Inform Departmental Representative in writing of discrepancies and deficiencies on finished works.

1.7 CONFLICTS

- .1 Report conflicts between requirements of this section and other sections to Departmental Representative before start-up and obtain clarification.
- .2 Failure to report conflict and obtain clarification will result in application of most stringent requirement.

1.8 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit no later than four (4) weeks after award of Contract:
 - .1 Name of Contractor's Cx agent.
 - .2 Draft Cx documentation.
 - .3 Preliminary Cx schedule.
 - .2 Request in writing to Departmental Representative for changes to submittals and obtain written approval at least eight (8) weeks prior to start of Cx.
 - .3 Submit proposed Cx procedures to Departmental Representative where not specified and obtain written approval at least eight (8) weeks prior to start of Cx.
 - .4 Provide additional documentation relating to Cx process required by Departmental Representative.

1.9 COMMISSIONING DOCUMENTATION

- .1 Refer to Section 01 91 33 - Commissioning (Cx) Forms: Installation Check Lists and Product Information (PI) / Performance Verification (PV) Forms for requirements and instructions for use.
- .2 Departmental Representative to review and approve Cx documentation.
- .3 Provide completed and approved Cx documentation to Departmental Representative.

1.10 COMMISSIONING SCHEDULE

- .1 Provide detailed Cx schedule as part of construction schedule.
- .2 Provide adequate time for Cx activities prescribed in technical sections and commissioning sections including:
 - .1 Approval of Cx reports.
 - .2 Verification of reported results.
 - .3 Repairs, retesting, re-commissioning, re-verification.
 - .4 Training.

1.11 COMMISSIONING MEETINGS

- .1 Contractor to coordinate Cx meetings throughout the project.
- .2 Purpose: to resolve issues, monitor progress, identify deficiencies, relating to Cx.
- .3 Continue Cx meetings on regular basis until commissioning deliverables have been addressed.
- .4 Thereafter Cx meetings to be held until project completion and as required during equipment start-up and functional testing period.
- .5 Meeting will be chaired by Commissioning Authority/Departmental Representative, who will record and distribute minutes.
- .6 Ensure subcontractors and relevant manufacturer representatives are present at 60% and subsequent Cx meetings and as required.
- .7 Contractor shall include the commissioning plan and shall schedule for all tests and equipment start-up in the construction schedule.
- .8 Commissioning meetings shall be scheduled as required. The meetings shall address commissioning related responsibilities as well as all specified testing, documentation, O&M manuals, training, and post construction requirements. The testing schedules and results of all tests shall be reviewed at the meetings.
- .9 Where construction may be completed in phases, allow for the frequency of meetings to correspond to the varying stages of construction of each phase.
- .10 The Contractor shall attend commissioning meetings at regular intervals, as called by the Commissioning Authority/Departmental Representative
- .11 The Contractor shall schedule work to include specified Commissioning related tasks. Cooperate with the Departmental Representative Commissioning Authority/Departmental Representative, and coordinate subtrades as required, to successfully demonstrate and verify commissioning related tests.
- .12 The Contractor shall schedule work to include specified Commissioning related testing prior to Departmental Representative's demonstration and Departmental Representative's training.

1.12 STARTING AND TESTING

- .1 Contractor assumes liabilities and costs for inspections. Including disassembly and re-assembly after approval, starting, testing and adjusting, including supply of testing equipment.

1.13 WITNESSING OF STARTING AND TESTING

- .1 Provide fourteen (14) days' notice prior to commencement.
- .2 Departmental Representative to witness of start-up and testing.
- .3 Contractor's Cx Agent to be present at tests performed and documented by sub-trades, suppliers and equipment manufacturers.

1.14 PROCEDURES

- .1 Verify that equipment and systems are complete, clean, and operating in normal and safe manner prior to conducting start-up, testing and Cx.
- .2 Conduct start-up and testing in following distinct phases:
 - .1 Included in delivery and installation:
 - .1 Verification of conformity to specification, approved shop drawings and completion of PI report forms.
 - .2 Visual inspection of quality of installation.
 - .2 Start-up: follow accepted start-up procedures.
 - .3 Operational testing: document equipment performance.
 - .4 System PV: include repetition of tests after correcting deficiencies.
 - .5 Post-substantial performance verification: to include fine-tuning.
- .3 Correct deficiencies and obtain approval from Departmental Representative after distinct phases have been completed and before commencing next phase.
- .4 Documents require tests on approved PV forms.
- .5 Failure to follow accepted start-up procedures will result in re-evaluation of equipment by an independent testing agency selected by Departmental Representative. If results reveal that equipment start-up was not in accordance with requirements, and resulted in damage to equipment, implement following:
 - .1 Minor equipment/systems: implement corrective measures approved by Departmental Representative.
 - .2 Major equipment/systems: if evaluation report concludes that damage is minor, implement corrective measures approved by Departmental Representative.
 - .3 If evaluation report concludes that major damage has occurred, Departmental Representative shall reject equipment.
 - .4 Rejected equipment to be remove from site and replace with new.
 - .5 Subject new equipment/systems to specified start-up procedures.

1.15 START-UP DOCUMENTATION

- .1 Assemble start-up documentation and submit to Departmental Representative for approval before commencement of commissioning.
- .2 Start-up documentation to include:
 - .1 Factory and on-site test certificates for specified equipment.
 - .2 Pre-start-up inspection reports.
 - .3 Signed installation/start-up check lists.
 - .4 Start-up reports,
 - .5 Step-by-step description of complete start-up procedures, to permit Departmental Representative to repeat start-up at any time.

1.16 OPERATION AND MAINTENANCE OF EQUIPMENT AND SYSTEMS

- .1 After start-up, operate and maintain equipment and systems as directed by equipment/system manufacturer.
- .2 With assistance of manufacturer develop written maintenance program and submit to Departmental Representative for approval before implementation.
- .3 Operate and maintain systems for length of time required for commissioning to be completed.
- .4 After completion of commissioning, operate and maintain systems until issuance of certificate of interim acceptance.

1.17 TEST RESULTS

- .1 If start-up, testing and/or PV produce unacceptable results, repair, replace or repeat specified starting and/or PV procedures until acceptable results are achieved.
- .2 Provide manpower and materials, assume costs for re-commissioning.

1.18 START OF COMMISSIONING

- .1 Notify Departmental Representative at least twenty-one (21) days prior to start of Cx.
- .2 Start Cx after elements of building affecting start-up and performance verification of systems have been completed.

1.19 INSTRUMENTS / EQUIPMENT

- .1 Submit to Departmental Representative for review and approval:
 - .1 Complete list of instruments proposed to be used.
 - .2 Listed data including, serial number, current calibration certificate, calibration date, calibration expiry date and calibration accuracy.
- .2 Provide the following equipment as required:
 - .1 2-way radios.
 - .2 Ladders.
 - .3 Equipment as required to complete work.
- .3 Contractor and manufacturer shall provide all instrumentation and test equipment necessary to conduct the tests specified during the commissioning process. The Contractor shall submit a list of equipment to be used and copies of latest equipment calibration certificates to the Commissioning Authority/Departmental Representative and Departmental Representative for approval.

1.20 COMMISSIONING PERFORMANCE VERIFICATION

- .1 Carry out Cx:
 - .1 Under actual operating conditions, over entire operating range, in all modes.
 - .2 On independent systems and interacting systems.
- .2 Cx procedures to be repeatable and reported results are to be verifiable.
- .3 Follow equipment manufacturer's operating instructions.
- .4 EMCS trending to be available as supporting documentation for performance verification.

1.21 WITNESSING COMMISSIONING

- .1 Departmental Representative to witness activities and verify results.

1.22 AUTHORITIES HAVING JURISDICTION

- .1 Where specified start-up, testing or commissioning procedures duplicate verification requirements of authority having jurisdiction, arrange for authority to witness procedures so as to avoid duplication of tests and to facilitate expedient acceptance of facility.
- .2 Obtain certificates of approval, acceptance and compliance with rules and regulation of authority having jurisdiction.
- .3 Provide copies to Departmental Representative within five (5) days of test and with Cx report.

1.23 EXTENT OF VERIFICATION

- .1 Number and location to be at discretion of Departmental Representative.
- .2 Conduct tests repeated during verification under same conditions as original tests, using same test equipment, instrumentation.
- .3 Review and repeat commissioning of systems if inconsistencies found in more than 20% of reported results.
- .4 Perform additional commissioning until results are acceptable to Departmental Representative.

1.24 REPEAT VERIFICATIONS

- .1 Contractor to assume costs incurred by Departmental Representative for subsequent verifications where:
 - .1 Initial Verification of reported results fail to receive Departmental Representative's approval.
 - .2 Repetition of second verification again fails to receive approval.
 - .3 Departmental Representative deems Contractor's request for second verification was premature.

1.25 SUNDRY CHECKS AND ADJUSTMENTS

- .1 Make adjustments and changes which become apparent as Cx proceeds.
- .2 Perform static and operational checks as applicable and as required.

1.26 DEFICIENCIES, FAULTS, DEFECTS

- .1 Correct deficiencies found during start-up and Cx to satisfaction of Departmental Representative.
- .2 Report problems, faults or defects affecting Cx to Departmental Representative in writing. Stop Cx until problems are rectified. Proceed with written approval from Departmental Representative.

1.27 COMPLETION OF COMMISSIONING

- .1 Upon completion of Cx leave systems in normal operating mode.
- .2 Except for warranty and seasonal verification activities specified in Cx specifications, complete Cx prior to issuance of Interim Certificate of Completion.
- .3 Cx to be considered complete when contract Cx deliverables have been submitted and accepted by Departmental Representative.

1.28 ACTIVITIES UPON COMPLETION OF COMMISSIONING

- .1 When changes are made to baseline components or system settings established during Cx process, provide updated Cx form for affected item.

1.29 TRAINING

- .1 In accordance with Section 01 91 41 - Commissioning (Cx) - Training.

1.30 MAINTENANCE MATERIALS, SPARE PARTS, SPECIAL TOOLS

- .1 Supply, deliver, and document maintenance materials, spare parts, and special tools as specified in contract.

1.31 INSTALLED INSTRUMENTATION

- .1 Use instruments installed under Contract for TAB and PV if:
 - .1 Accuracy complies with these specifications.
 - .2 Calibration certificates have been deposited with Departmental Representative.
- .2 Calibrated EMCS sensors may be used to obtain performance data provided that sensor calibration has been completed and accepted.

1.32 PERFORMANCE VERIFICATION TOLERANCES

- .1 Application tolerances:
 - .1 Specified range of acceptable deviations of measured values from specified values or specified design criteria. Except for special areas, to be within +/-10% of specified values.
- .2 Instrument accuracy tolerances:
 - .1 To be of higher order of magnitude than equipment or system being tested.
- .3 Measurement tolerances during verification:
 - .1 Unless otherwise specified actual values to be within +/-2% of recorded values.

1.33 DEPARTMENTAL REPRESENTATIVE'S PERFORMANCE TESTING

- .1 Performance testing of equipment or system by Departmental Representative will not relieve Contractor from compliance with specified start-up and testing procedures.

1.34 DEPARTMENTAL REPRESENTATIVE'S VALUATION OF COMMISSIONING WORK

- .1 Departmental Representative will not grant "Substantial Completion" until the Commissioning Authority/Departmental Representative submits a commissioning report with a recommendation for interim acceptance.
- .2 Departmental Representative will withhold payment of a portion of funds in proportion to unfinished commissioning work, as detailed by the Commissioning Authority/Departmental Representative.

1.35 DEMONSTRATION AND TRAINING

- .1 Refer to specification Section 01 91 41 – Commissioning Training.

1.36 OPERATION AND MAINTENANCE

- .1 Contractor shall not be reimbursed for repairs or replacements performed in connection with provisions of GC 3.13, Warranty.

1.37 RECONSTRUCTION

- .1 Provide necessary renovation and reconstruction of existing facilities as required in Contract Documents.

END OF SECTION

PART 1 GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The General Conditions of the Contract.
 - .2 Comply with Division 01 requirements and documents referred to herein.

1.2 DEFINITIONS

- .1 Validate: for tests and demonstrations: to witness and validate successful performance demonstration or record deficiencies; to validate after correction successful demonstration; these validations of the tests become references for the Departmental Representative's certification.
- .2 Certify: for documents including as-built drawings: Review for accuracy and completeness or record deficiencies.
- .3 Witness: the Commissioning Authority/Departmental Representative will observe as required and record summary of test results.

1.3 REFERENCES

- .1 Section 01 91 13 - Facility Commissioning – General.
- .2 CAN/CSA C282-05 - Emergency Electrical Power Supply for Buildings.
- .3 CAN/ULC-S524-14 - Installation of Fire Alarm Systems.
- .4 CAN/ULC-S537-13 - Verification of Fire Alarm Systems.
- .5 Alberta Building Code - Latest edition of Alberta Building Code.

1.4 DOCUMENTS

- .1 In case of discrepancies or conflicts between the documents, the documents will be governed in the order specified in Division 01.

1.5 COMMISSIONING OBJECTIVES

- .1 Refer to specification Section 01 91 13.

1.6 WARRANTY

- .1 Involvement of Commissioning Authority/Departmental Representative shall not void any guarantees or warranties nor shall it relieve Contractor of any contractual responsibilities.

1.7 RESPONSIBILITIES OF COMMISSIONING AUTHORITY/DEPARTMENTAL REPRESENTATIVE

- .1 Responsibilities of Commissioning Authority/Departmental Representative are as follows:
 - .1 Design Phase:
 - .1 Participate in design team meetings. Obtain project requirements and Departmental Representative's philosophy and intent and expected system performance. This will form the basics of the testing and commissioning documents.
 - .2 Provide input and feedback to the design team with emphasis on testing, commissioning, operation and maintenance of the proposed system and equipment.
 - .3 Provide commissioning document to form part of the Bid documents.
 - .2 Bid Phase:
 - .1 Review Bid documents, design Drawings and specifications.
 - .2 Provide testing and commissioning related reviews for incorporation in Contract Documents to ensure documents have included all required testing and commissioning requirements.
 - .3 Provide commissioning related comments for incorporation in Contract Documents.
 - .4 Participate in Bid review meetings to ensure Bidders are aware of the testing and commissioning requirements.
 - .3 Construction Phase:
 - .1 Review Contractor's approved shop drawing submission for commissioning related issues.
 - .2 Review Contractor's commissioning plan to ensure proposed tests, sequences and the methods of tests conform to Contract requirements; ensure ample time is schedule for the testing and commissioning.
 - .3 Monitor, check and inspect installation throughout the construction stages.
 - .4 Supervise the commissioning, including scheduling.
 - .5 Issue deficiencies reports noting any issues that may have an impact on the commissioning of the equipment and system.
 - .6 Attend construction site meetings as required to discuss commissioning related items and any impact on the project schedule.
 - .7 Set-up and chair commissioning meetings.
 - .8 Witness and validate tests; note deficiencies and issue progress reports.
 - .9 Work with Project team to expeditiously resolve any problems that may arise due to site conditions.
 - .10 Prepare Systems Description Manual.
 - .11 Coordinate with Departmental Representative training and instructions provided by Contractors, Manufacturers and Suppliers.

.4 Post-Construction Phase:

- .1 Prepare final report on commissioning, identifying any deficiencies that may be outstanding.
- .2 Recommendation of any additional training and/or instruction of operating and maintenance personnel deemed necessary over and above that already provided.
- .3 Complete system checks with the Contractor.

1.8 RESPONSIBILITIES OF CONTRACTOR

.1 Responsibilities of the Contractor are as follows:

.1 Construction Phase:

- .1 To manage and ensure the entire installation comply with the requirements of the Contract Documents.
- .2 Submit shop drawings complete with Contractor's Stamp of Review.
- .3 Submit working detail (interference or installation) drawings, as required.
- .4 Complete commissioning data test forms.
- .5 Submit installation method statement. This generally includes:
 - .1 Method of equipment delivery to the installation location on site.
 - .2 Prerequisite preparation for delivery, such as completion of the factory testing and the completion of site work to accept this equipment.
 - .3 Installation method and sequences of installing the equipment and the associated connections to the equipment.
- .6 Submit an installation schedule. This schedule includes:
 - .1 Time schedule of each activity, with lead and lag time allowed and indicated.
 - .2 Shop drawings and working detail drawings submission.
 - .3 Major equipment delivery and factory testing dates.
 - .4 Coordinated installation activities and sequences in compliance with the General Contractor's Project schedule and other trade's installation schedule.
 - .5 Schedule of testing and commissioning of the systems and major equipment.

- .7 Submit a commissioning schedule. This schedule includes:
 - .1 Time schedule for system and equipment commissioning which are in compliance with the timing and sequences of installation schedule stated above. In this schedule allow for additional time for testing and commissioning, such that re-test of the equipment can be performed in a timely manner if required without impacting the overall Project schedule or cause delay to the project completion.
 - .2 Dates for completion of required factory tests prior to equipment delivery to the site shall be indicated in the schedule.
 - .3 Prepare and submit testing and commissioning method statements for review and approval.
 - .4 Prepare and submit testing and commissioning record or report forms for review and approval.
- .8 Attend progress and commissioning meetings.
- .9 Promptly rectify or replace reported deficiencies and defects.
- .10 Where required by codes and/or specification, retain manufacturers and/or independent third parties to provide service for testing and certification of the systems and training of Department's personnel.
- .11 Provide training and instruction to the Department's operating personnel.
- .12 Pay for and retain the services of Independent Third Party Testing Agent (ITPTA) and manufacturer as required to perform testing and commissioning of equipment and systems to satisfaction of Departmental Representative and Commissioning Authority/Departmental Representative as stated in approved schedule and method described above. Testing and commissioning will be witnessed by the Commissioning Authority/Departmental Representative as required. Contractor or his retain agents shall also record procedure and finding in approved test and record forms. Submit test and record forms with the signature of the tester for review and approval to the Departmental Representative and Commissioning Authority/Departmental Representative.
- .13 Pay for and be responsible for all inspections required by codes, specification and Authorities having Jurisdiction. Obtain and submit all Certificate of Approval for such inspections and verifications.
- .14 Submit for review as-built drawings including those for location of control devices and wiring and operating and maintenance manuals for each equipment as per the specification requirements.

- .15 Provide Operating and Maintenance Manuals for review by the Commissioning Authority/Departmental Representative with all the testing and commissioning results and reports incorporated.
 - .16 Obtain, issue, and assign warranties for equipment and systems to the Departmental Representative.
 - .17 Provision of all necessary test equipment shall be the responsibility of Contractor. Provide recently validated calibration certificate for all equipment to be used for verification prior to testing and commissioning commencement.
- .2 Post-Construction Phase:
- .1 Optimize operation according to occupant's needs, using the System Operation Manual prepared by the Commissioning Authority / Departmental Representative as reference points.
 - .2 Complete all commissioning procedures and activities and performance verification procedures which were delayed or not concluded during the commissioning phase.
 - .3 Complete system checks.
 - .4 Complete rectification of all deficiencies revealed by these checks. Equipment manufacturers involved in commissioning shall participate in systems checks.
 - .5 Revise all "as-built" and operating and maintenance documents to reflect all changes, modifications, revisions and adjustment upon completion of commissioning.
 - .6 Schedule a question and answer session for the operating and maintenance personnel three (3) months after handover of the facility with the Departmental Representative. The duration of this session or sessions will be dictated by the number of questions or concerns that shall be addressed.

1.9 COMMISSIONING INVOLVEMENT

- .1 Commissioning Authority/Departmental Representative shall witness and validate as required; and Contractor and/or his Suppliers or retained Independent Third Party Agents shall perform the following:
 - .1 Check and ensure installation of the systems and equipment to ensure installations are completed and in a proper and safe state ready for testing and commissioning.
 - .2 Run and test the systems and equipment through their design parameters to verify their capabilities in performance, sequencing, safety protection and alarms annunciation.
 - .3 Ensure deficiencies and defects found are rectified and replaced and the systems and equipment re-tested as required.
 - .4 Arrange and provide demonstration and training of Department's personnel.
 - .5 Issue Operating and Maintenance Manuals for systems and equipment.

1.10 SYSTEMS TO BE COMMISSIONED

- .1 Electrical systems shall include but not limited to following:
 - .1 Fire alarm system and smoke control.

1.11 COMMISSIONING PROCESS

- .1 Commissioning Authority/Departmental Representative: to perform and complete all work as specified in the "GENERAL" Section of this specification "Responsibilities of Commissioning Authority/Departmental Representative".
- .2 Contractors: To perform and complete all works as specified in the "GENERAL" Section of this specification "Responsibilities of Contractor". In general, it shall include complete activation of all systems; calibration, test, and verification of performance of all components, equipment and systems; verification of performance of all systems through all specified modes of control and sequence of operation; rectification of deficiencies; recording of test results for submission; demonstration, instruction and training of Department's operating and maintenance personnel; follow-up during first year of operation for fine tuning and building service monitoring.
- .3 Equipment verification: The Contractor shall complete the equipment verification forms for each piece of equipment. The forms shall be included in the commissioners System Description Manual. The equipment data shall include, but is not limited to:
 - .1 Manufacturer's name, address and telephone number.
 - .2 Distributors' name, address and telephone number.
 - .3 make, model number and serial number, year built.
 - .4 voltage, ampere rating, fault rating, frequency, breaker size, fuse size, overload size.
 - .5 equipment enclosure type.
 - .6 any other special characteristics.

1.12 TESTING FOR ELECTRICAL SYSTEMS

- .1 All systems as specified in Division 26 of the specification.
- .2 Contractor to submit test reports for the test procedures, results of all items inspected, checked, measured and tested. Comments and deficiencies should also be noted in the reports.

1.13 OPERATING AND MAINTENANCE MANUAL

- .1 Contractor shall prepare and submit the Operating Manual as detailed in the specification to Departmental Representative six (6) weeks prior to the beginning of training.
- .2 Contractor shall re-submit the manual should Departmental Representative find deficiencies. Training shall not begin until the manual has been accepted by Departmental Representative.
- .3 One (1) copy of the manual shall be forwarded to Commissioning Authority/Departmental Representative in good quality, vinyl covered binders.

1.14 SYSTEMS DEMONSTRATION AND TURNOVER

- .1 System demonstration and turnover of the project shall occur when:
 - .1 Installation is complete.
 - .2 Acceptance test conducted by the Departmental Representative has been successfully completed.
 - .3 Commissioning Authority/Departmental Representative system testing has been successfully complete.
 - .4 Training and instruction has been completed.
 - .5 Operating and Maintenance Manual have been accepted.
 - .6 System Operating Manuals have been accepted.
 - .7 Shop drawings have been updated.
 - .8 As-built drawings have been completed.
- .2 Systems demonstration shall be conducted by Contractor and manufacturers. The demonstration shall cover all operation and maintenance requirements and a physical demonstration of equipment installation and operation.

1.15 TESTING FORMS

- .1 Contractor and manufacturers shall fill out the forms listed in this section and any other additional data sheets not included in this specification, but required for the electrical systems of this Project.
- .2 Independent Testing Agent/Manufacturer to submit test form for the Commissioning Authority/Departmental Representative's review. The test forms should contain the test procedures, and all the required testing and commissioning items.
- .3 Commissioning index form shall be maintained by the Commissioning Authority/Departmental Representative to track the progress of the commissioning requirements.
- .4 Electrical testing and verification forms to be completed are as follows wherever applicable, but not limited to:
 - .1 Commissioning index form.
 - .2 Equipment test form.
 - .3 System and equipment warranty dates form.
 - .4 System verification form.
 - .5 Test identification form.
 - .6 Testing and start-up schedule form.
 - .7 Fire alarm testing and verification form.

1.16 EQUIPMENT AND SYSTEM WARRANTIES

- .1 Equipment and system warranties shall not begin until the system demonstration and turnover has been conducted successfully and accepted by the Departmental Representative.
- .2 Contractor shall fill-out the warranty form listing the equipment and systems and the start and finishing dates for warranty.
- .3 Refer to the Division 01 and all Mechanical and Electrical divisions of the specification for the requirements during the warranty period.
- .4 Contractor shall re-visit the building during the warranty period with the Departmental Representative. During these visits the performance of the system shall be reviewed.
- .5 At these meetings Departmental Representative(s) and the Commissioning Authority/Departmental Representative shall review the performance of the systems. If performance is satisfactory then no further action need to be taken. If unsatisfactory then Contractor will be instructed to correct deficiencies, at his cost, to the satisfaction of Departmental Representatives.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- .1 Section includes:
 - .1 Description of overall structure of Cx Plan and roles and responsibilities of Cx team.

1.2 REFERENCES

- .1 National Fire Protection Association (NFPA).
- .2 Underwriters' Laboratories of Canada (ULC).
- .3 CSA-Z320-11 – Building Commissioning Standard.

1.3 GENERAL

- .1 Provide a fully functional facility:
 - .1 Systems, equipment and components meet user's functional requirements before date of acceptance, and operate consistently at peak efficiencies and within specified energy budgets under normal loads.
 - .2 O M personnel have been fully trained in aspects of installed systems.
 - .3 Optimized life cycle costs.
 - .4 Complete documentation relating to installed equipment and systems.
- .2 Term "Cx" in this section means "Commissioning".
- .3 Use this Cx Plan as master planning document for Cx:
 - .1 Outlines organization, scheduling, allocation of resources, documentation, pertaining to implementation of Cx.
 - .2 Communicates responsibilities of team members involved in Cx Scheduling, documentation requirements, and verification procedures.
 - .3 Sets out deliverables relating to O M, process and administration of Cx.
 - .4 Describes process of verification of how built works meet project design requirements.
 - .5 Produces a complete functional system prior to issuance of Certificate of Occupancy.
 - .6 Management tool that sets out scope, standards, roles and responsibilities, expectations, deliverables, and provides:
 - .1 Overview of Cx.
 - .2 General description of elements that make-up Cx Plan.
 - .3 Process and methodology for successful Cx.

.4 Acronyms:

- .1 Cx - Commissioning.
- .2 O M – Operation and Maintenance
- .3 BMM - Building Management Manual.
- .4 EMCS - Energy Monitoring and Control Systems.
- .5 MSDS - Material Safety Data Sheets.
- .6 PI - Product Information.
- .7 PV - Performance Verification.
- .8 TAB - Testing, Adjusting and Balancing.
- .9 WHMIS - Workplace Hazardous Materials Information System.

.5 Commissioning terms used in this Section:

- .1 Bumping: short term start-up to prove ability to start and prove correct rotation.
- .2 Deferred Cx - Cx activities delayed for reasons beyond Contractor's control due to lack of occupancy, weather conditions, need for heating/cooling loads.

1.4 CX PARTICIPANTS

.1 Employ the following Cx participants to verify performance of equipment and systems:

.1 Installation contractor/subcontractor:

- .1 Equipment and systems except as noted.

.2 Equipment manufacturer: equipment specified to be installed and started by manufacturer.

- .1 To include performance verification.

.3 Specialist subcontractor: equipment and systems supplied and installed by specialist subcontractor.

.4 Specialist Cx agency:

- .1 Possessing specialist qualifications and installations providing environments essential to client's program but are outside scope or expertise of Cx specialists on this project.

.5 Coordination with Departmental Representative for intrusion and access security systems.

1.5 EXTENT OF CX

- .1 Commission electrical systems and equipment to include but not limited to:
 - .1 Fire alarm systems, equipment:
 - .1 Annunciators.
 - .2 Control panels.
 - .3 Fire alarm battery banks.
 - .4 Fire alarm devices.
 - .5 Prior to carrying out site test, submit a fire alarm system operation matrix to the Departmental Representative and Commissioning Authority / Departmental Representative. This matrix shall include of operation of the fire alarm system and the operations of all systems interfaced with the fire alarm system.
 - .6 Check and record nameplate data.
 - .7 Check and report the panel enclosure is suitable for the environment in which it is installed.
 - .8 Check and verify system is installed to specification and S524 requirements.
 - .9 Perform system verifications and tests according to CAN/ULC-S537.
 - .10 Check and verify all system operations shown in the matrix.
 - .11 Perform system integration test to verify proper fire alarm system operation, and the proper operations of all systems interfaced with the fire alarm system.
 - .12 Submit verification reports and system operation verification reports.
 - .2 Power Distribution - Panels, conduit, cables, and breakers
 - .3 Patch, repair, and paint ceilings, walls, and penetrations.
 - .4 Repair fires spray and insulation.

1.6 DELIVERABLES RELATING TO O M PERSPECTIVES

- .1 General requirements:
 - .1 Compile English documentation.
 - .2 Documentation to be computer-compatible format ready for inputting for data management.

- .2 Provide deliverables:
 - .1 Warranties.
 - .2 Project record documentation.
 - .3 Inventory of spare parts, special tools and maintenance materials.
 - .4 Maintenance Management System (MMS) identification system used.
 - .5 WHMIS information.
 - .6 MSDS data sheets.
 - .7 Electrical Panel inventory containing detailed inventory of electrical circuitry for each panel board. Duplicate of inventory inside each panel.
 - .8 Preventative maintenance program.
 - .9 Standard Operating Procedures (SOP).
 - .10 Contractor's and sub-contractors' as built drawings.

1.7 DELIVERABLES RELATING TO THE CX PROCESS

- .1 General:
 - .1 Start-up, testing and Cx requirements, conditions for acceptance and specifications form part of relevant technical sections of these specifications.
- .2 Definitions:
 - .1 Cx as used in this section includes:
 - .1 Cx of components, equipment, systems, subsystems, and integrated systems.
 - .2 Factory inspections and performance verification tests.
- .3 Deliverables: provide:
 - .1 Cx Specifications.
 - .2 Startup, pre-Cx activities and documentation for systems, and equipment.
 - .3 Completed installation checklists (ICL).
 - .4 Completed product information (PI) report forms.
 - .5 Completed performance verification (PV) report forms.
 - .6 Results of Performance Verification Tests and Inspections.
 - .7 Description of Cx activities and documentation.
 - .8 Description of Cx of integrated systems and documentation.
 - .9 Training Plans.
 - .10 Cx Reports.
 - .11 Prescribed activities during warranty period.

1.8 PRE-CX ACTIVITIES AND RELATED DOCUMENTATION

- .1 Items listed in this Cx Plan include the following:
 - .1 Pre-Start-Up inspections: by Departmental Representative prior to permission to start up and rectification of deficiencies to Departmental Representative's satisfaction.
 - .2 Departmental Representative to use approved check lists.
 - .3 Departmental Representative will monitor some of these pre-start-up inspections.
 - .4 Include completed documentation with Cx report.
 - .5 Conduct pre-start-up tests: conduct pressure, static, flushing, cleaning, and "bumping" during construction as specified in technical sections. To be witnessed and certified by Departmental Representative and does not form part of Cx specifications.
 - .6 Departmental Representative will monitor some of these inspections and tests.
 - .7 Include completed documentation in Cx report.
- .2 Pre-Cx activities - ELECTRICAL:
 - .1 Fire alarm systems: test after other safety and security systems are completed. Testing to include a complete verification in accordance with ULC requirements. Departmental Representative has witnessed and certified report.

1.9 CX OF INTEGRATED SYSTEMS AND RELATED DOCUMENTATION

- .1 Cx to be performed by specified Cx specialist, using procedures developed by Departmental Representative.
- .2 Tests to be witnessed by Departmental Representative and documented on approved report forms.
- .3 Upon satisfactory completion, Cx specialist to prepare Cx Report, to be certified by Consultant and submitted to Departmental Representative for review.
- .4 Departmental Representative reserves right to verify percentage of reported results.
- .5 Integrated systems to include:
 - .1 Fire alarm systems.

1.10 CX SCHEDULES

- .1 Prepare detailed Cx Schedule and submit to Departmental Representative for review and approval same time as project Construction Schedule. Include:
 - .1 Milestones, testing, documentation, training and Cx activities of components, equipment, subsystems, systems and integrated systems, including:
 - .1 Design criteria, design intents.
 - .2 Pre-TAB review: twenty-eight (28) days after contract award, and before construction starts.
 - .3 Cx procedures: one (1) month after award of contract.
 - .4 Cx Report format: one (1) month after contract award.
 - .5 Notification of intention to start Cx: fourteen (14) days before start of Cx.
 - .6 Notification of intention to start Cx of integrated systems: after Cx of related systems is completed fourteen (14) days before start of integrated system Cx.
 - .7 Identification of deferred Cx.
 - .8 Implementation of training plans.
 - .9 Cx reports: immediately upon successful completion of Cx.
 - .2 Detailed training schedule to demonstrate no conflicts with testing, completion of project and hand-over to Property Manager.
- .2 After approval, incorporate Cx Schedule into Construction Schedule.

1.11 CX REPORTS

- .1 Submit reports of tests, witnessed and certified Departmental Representative who will verify reported results.
- .2 Include completed and certified PV reports in properly formatted Cx Reports.
- .3 Before reports are accepted, reported results to be subject to verification by Departmental Representative.

1.12 TRAINING PLANS

- .1 Refer to Section 01 91 41 - Commissioning (Cx) - Training.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

- .1 Section includes:
 - .1 Commissioning forms to be completed for equipment, system and integrated system.

1.2 INSTALLATION/START-UP CHECK LISTS

- .1 Include the following data:
 - .1 Product manufacturer's installation instructions and recommended checks.
 - .2 Special procedures as specified in relevant technical sections.
 - .3 Items considered good installation and engineering industry practices deemed appropriate for proper and efficient operation.
- .2 Equipment manufacturer's installation/start-up check lists are acceptable for use. As deemed necessary by Departmental Representative, supplemental additional data lists will be required for specific project conditions.
- .3 Use check lists for equipment installation. Document check list verifying checks have been made, indicate deficiencies and corrective action taken.
- .4 Installer to sign check lists upon completion, certifying stated checks and inspections have been performed. Return completed check lists to Departmental Representative. Check lists will be required during Commissioning and will be included in Building Maintenance Manual (BMM) at completion of project.
- .5 Use of check lists will not be considered part of commissioning process but will be stringently used for equipment pre-start and start-up procedures.

1.3 PRODUCT INFORMATION (PI) REPORT FORMS

- .1 Product Information (PI) forms compiles gathered data on items of equipment produced by equipment manufacturer, includes nameplate information, parts list, operating instructions, maintenance guidelines and pertinent technical data and recommended checks that is necessary to prepare for start-up and functional testing and used during operation and maintenance of equipment. This documentation is included in the BMM at completion of work.
- .2 Prior to Performance Verification (PV) of systems complete items on PI forms related to systems and obtain Departmental Representative's approval.

1.4 PERFORMANCE VERIFICATION (PV) FORMS

- .1 PV forms to be used for checks, running dynamic tests and adjustments carried out on equipment and systems to ensure correct operation, efficiently and function independently and interactively with other systems as intended with project requirements.
- .2 PV report forms include those developed by Contractor records measured data and readings taken during functional testing and Performance Verification procedures.
- .3 Prior to PV of integrated system, complete PV forms of related systems and obtain Departmental Representative's approval.

1.5 SAMPLES OF COMMISSIONING FORMS

- .1 Departmental Representative will develop and provide to Contractor required project-specific Commissioning forms in electronic format complete with specification data.
- .2 Revise items on Commissioning forms to suit project requirements.
- .3 Samples of Commissioning forms will be attached to this section.

1.6 CHANGES AND DEVELOPMENT OF NEW REPORT FORMS

- .1 When additional forms are required, but are not available from Departmental Representative, develop appropriate verification forms and submit to Departmental Representative for approval prior to use.
 - .1 Additional commissioning forms to be in same format as provided by Departmental Representative

1.7 COMMISSIONING FORMS

- .1 Use Commissioning forms to verify installation and record performance when starting equipment and systems.
- .2 Strategy for Use:
 - .1 Departmental Representative provides Contractor project-specific Commissioning forms with Specification data included.
 - .2 Contractor will provide required shop drawings information and verify correct installation and operation of items indicated on these forms.
 - .3 Confirm operation as per design criteria and intent.
 - .4 Identify variances between design and operation and reasons for variances.
 - .5 Verify operation in specified normal and emergency modes and under specified load conditions.
 - .6 Record analytical and substantiating data.

- .7 Verify reported results.
- .8 Form to bear signatures of recording technician and reviewed and signed off by Departmental Representative.
- .9 Submit immediately after tests are performed.
- .10 Reported results in true measured SI unit values.
- .11 Provide Departmental Representative with originals of completed forms.
- .12 Maintain copy on-site during start-up, testing and commissioning period.

1.8 LANGUAGE

- .1 To suit the language profile of the awarded contract.

END OF SECTION



FIRE ALARM PANEL COMMISSIONING FORM

Unit ID.: _____
Type: _____
Manufacturer: _____
Model No.: _____
Zone Capacity: _____

Location: _____
Room Name: _____
Circuit No.: _____
Mounting: _____
Serial No.: _____

INDICATE ACCEPTANCE
WITH A (✓) MARK

INSTALLATION REVIEW

CONTRACTOR

CxA

COMMENTS

Equipment Conform to Shop Drawings	()	()
Nameplate Complete	()	()
Unit Identification Lamicoid	()	()
All Major Components are Identified	()	()
Mounting	()	()
Wiring Diagrams Provided	()	()
Equipment Cleanliness	()	()
System Reset	()	()
Alarm Acknowledge	()	()
Trouble Buzzer	()	()
Trouble Acknowledge	()	()
Systems Interface Complete:		
Sprinkler	()	()
Fan Shutdown	()	()
Elevator Tie-in	()	()
Security System	()	()
Door Control	()	()
BMCS / Smoke Damper	()	()
Emergency Generator	()	()
All Programming Complete	()	()
Annunciator Panels Installed	()	()
Auto Telephone Dialer Connected	()	()
FA Zoning Schedule Complete	()	()
Circuit Breaker Lock-On Device	()	()
Mfr. Pre-verification Report Reviewed	()	()

REMARKS

Include a copy of the fire alarm system verification report and a copy of the verification certificate.

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POSITION/ TITLE	SIGNATURE	DATE
Building Owner/Representative		
Building Operations and Maintenance Staff		
Cx Authority		
Design Consultants		
Contractors/Subcontractor		
Manufacture / Independent Testing Specialists		



ANNUNCIATOR PANEL COMMISSIONING FORM

Unit ID.: _____
 Type: _____
 Manufacturer: _____
 Model No.: _____

Location: _____
 Room Name: _____
 Zones: _____
 Mounting: _____

INDICATE ACCEPTANCE
 WITH A (✓) MARK

<u>INSTALLATION REVIEW</u>	<u>CONTRACTOR</u>	<u>CxA</u>	<u>COMMENTS</u>
Equipment Conform to Shop Drawings	()	()	
Nameplate Complete	()	()	
Unit Identification Lamicaid	()	()	
Mounting	()	()	
Equipment Cleanliness	()	()	
System Reset	()	()	
Alarm Acknowledge	()	()	
Trouble Buzzer	()	()	
Trouble Acknowledge	()	()	
FA Zoning Schedule Confirmed	()	()	
All Wiring & Interconnections Complete	()	()	

REMARKS.....

POSITION/ TITLE	SIGNATURE	DATE
Building Owner/Representative		
Building Operations and Maintenance Staff		
Cx Authority		
Design Consultants		
Contractors/Subcontractor		
Manufacture / Independent Testing Specialists		



FIRE ALARM DEVICES COMMISSIONING FORM

REF. NO.	DESCRIPTION	MANUFACTURER & MODEL NUMBER			COMMENTS
		SPECIFIED	SUBMITTED	INSTALLED	
Fire Alarm Control Panel					
Annunciator					
Audible Alarm					
Visual Alarm					
Room Smoke Detector					
Duct Smoke Detector					
Pull Stations					
Door Hold Open Devices					
Passive Graphic Devices					

REMARKS.....
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POSITION/ TITLE	SIGNATURE	DATE
Building Owner/Representative		
Building Operations and Maintenance Staff		
Cx Authority		
Design Consultants		
Contractors/Subcontractor		
Manufacture / Independent Testing Specialists		



FIRE ALARM SYSTEMS TESTING COMMISSIONING FORM

INDICATE ACCEPTANCE
WITH A (✓) MARK

<u>SYSTEM DEVICES & WIRING</u>	<u>CONTRACTOR</u>	<u>CxA</u>	<u>COMMENTS</u>
CAN/ULC-S524 Compliance	()	()	
Manufacturer Compliance	()	()	
Mounting Heights	()	()	

INTEGRATED SYSTEMS TESTING

Individual System Testing Complete	()	()
HVAC Systems	()	()
Fire Alarm Signal Reaction	()	()
Fire Alarm Cleared Reaction	()	()
Door Hold Open Devices	()	()
Fire Alarm Signal Reaction	()	()
Fire Alarm Cleared Reaction	()	()
Central Station Monitoring	()	()
Fire Alarm Signal Reaction	()	()
Fire Alarm Cleared Reaction	()	()
Electronic Security and Access Control	()	()
Fire Alarm Signal Reaction	()	()
Fire Alarm Cleared Reaction	()	()
CAN/ULC-S537 System Verification	()	()

REMARKS.....

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POSITION/ TITLE	SIGNATURE	DATE
Building Owner/Representative		
Building Operations and Maintenance Staff		
Cx Authority		
Design Consultants		
Contractors/Subcontractor		
Manufacture / Independent Testing Specialists		



WITNESS OF FIRE ALARM VERIFICATION

Project: Project **WSP Ref.:** Status

Date: Date **Client No.:**

FACP Location: **FACP Model No.:**

Location/Address:

Distribution:

VERIFICATION TESTING WITNESSED BY

Electrical Contractor

(_____)

Print Name

Signature

Manufacturer's Technician

- Siemens-Cerberus
- Simplex Grinnell
- Honeywell
- Chubb Edwards
- Total Integration
- Vipond
- Other: _____

Print Name

Signature

Owner's Representative

Print Name

Signature

Sprinkler Supplier

(_____)

Print Name

Signature

WSP

Print Name

Signature

COMMENTS:

1200, 10909 Jasper Avenue NW
Edmonton, AB, Canada T5J 3L9

Tel: 1 780 410-6740
Fax: 1 780 449-4050
wsp.com



FIRE ALARM BATTERY TEST REPORT

Project: Project

WSP Ref.: Status

Date: Date

Client No.:

To:

Location:

Power Supply (AC and DC) Tests

1. AC Panel name and circuit number(s):

Circuit breaker(s) painted red

Yes

No

Circuit breaker(s) locked on:

Yes

No

Circuit breaker(s) labelled:

Yes

No

2. DC Voltage with AC on (Note 1)

3. Charging Current

4. DC Voltage with AC Off (Note 2)

5. Supervisory Current

6. DC Voltage with AC off After ___ hours (Note 3)

7. Supervisory current

8. DC Voltage with AC off Under Full Load

9. Alarm Current

* After ___ min. (Note 4)

10. DC Voltage Re-charging (Note 5)

Recharging current

11. Battery Manufacturer and Capacity

12. Battery Location

13. Comments

1200, 10909 Jasper Avenue NW
Edmonton, AB, Canada T5J 3L9

Tel: 1 780 410-6740
Fax: 1 780 449-4050
wsp.com



Notes:

1. AC power should be connected for a minimum of 48 hours to ensure batteries are fully charged.
2. Indicates voltage of fully charged batteries.
3. AC power must be disconnected for 24 hours prior to performing load test.
4. Operate under full load for a minimum of 30 minutes before recording voltages; operate for 60 minutes for Type B Occupancies (Hospitals, jails, etc.). See Appendix D for silent and silence accelerated tests.
5. Battery charging current with AC re-connected after completion of load test.

*Full Load = all audible and visual signalling appliances in operation.

Issued by,

Author
Title
[email.address](#)

/typistinitials
Attachments

PART 1 GENERAL

1.1 SUMMARY

- .1 Section includes:
 - .1 This Section specifies roles and responsibilities of Commissioning Training.

1.2 TRAINEES

- .1 Trainees: personnel selected for operating and maintaining this facility. Includes Facility Manager, building operators, maintenance staff, security staff, and technical specialists as required.
- .2 Trainees will be available for training during later stages of construction for purposes of familiarization with systems.

1.3 INSTRUCTORS

- .1 Departmental Representative will provide:
 - .1 Descriptions of systems.
 - .2 Instruction on design philosophy, design criteria, and design intent.
- .2 Contractor and certified factory-trained manufacturers' personnel: to provide instruction on the following:
 - .1 Start-up, operation, shut-down of equipment, components and systems.
 - .2 Control features, reasons for, results of, implications on associated systems of, adjustment of set points of control and safety devices.
 - .3 Instructions on servicing, maintenance and adjustment of systems, equipment and components.
- .3 Contractor and equipment manufacturer to provide instruction on:
 - .1 Start-up, operation, maintenance and shut-down of equipment they have certified installation, started up and carried out PV tests.

1.4 TRAINING OBJECTIVES

- .1 Training to be detailed and duration to ensure:
 - .1 Safe, reliable, cost-effective, energy-efficient operation of systems in normal and emergency modes under all conditions.
 - .2 Effective on-going inspection, measurements of system performance.
 - .3 Proper preventive maintenance, diagnosis and trouble-shooting.
 - .4 Ability to update documentation.
 - .5 Ability to operate equipment and systems under emergency conditions until appropriate qualified assistance arrives.

1.5 TRAINING MATERIALS

- .1 Instructors to be responsible for content and quality.
- .2 Training materials to include:
 - .1 "As-Built" Contract Documents.
 - .2 Operating Manual.
 - .3 Maintenance Manual.
 - .4 Management Manual.
 - .5 TAB and PV Reports.
- .3 Project Manager, Commissioning Manager and Facility Manager will review training manuals.
- .4 Training materials to be in a format that permits future training procedures to same degree of detail.
- .5 Supplement training materials:
 - .1 Transparencies for overhead projectors.
 - .2 Multimedia presentations.
 - .3 Manufacturer's training videos.
 - .4 Equipment models.

1.6 SCHEDULING

- .1 Include in Commissioning Schedule time for training.
- .2 Deliver training during regular working hours. Provide a minimum of two (2) training sessions.
- .3 Training to be completed prior to acceptance of facility.

1.7 RESPONSIBILITIES

- .1 Be responsible for:
 - .1 Implementation of training activities,
 - .2 Coordination among instructors,
 - .3 Quality of training, training materials,
- .2 Departmental Representative will evaluate training and materials.
- .3 Upon completion of training, provide written report, signed by Instructors, witnessed by Departmental Representative.

1.8 TRAINING CONTENT

- .1 Training to include demonstrations by Instructors using the installed equipment and systems.
- .2 Content includes:
 - .1 Review of facility and occupancy profile.
 - .2 Functional requirements.
 - .3 System philosophy, limitations of systems and emergency procedures.
 - .4 Review of system layout, equipment, components and controls.
 - .5 Equipment and system start-up, operation, monitoring, servicing, maintenance and shut-down procedures.
 - .6 System operating sequences, including: step-by-step directions for starting up, shut-down, operation of valves, dampers, switches, adjustment of control settings and emergency procedures.
 - .7 Maintenance and servicing.
 - .8 Trouble-shooting diagnosis.
 - .9 Inter-Action among systems during integrated operation.
 - .10 Review of O&M documentation.
- .3 Provide specialized training as specified in relevant Technical Sections of the construction specifications.

1.9 VIDEO-BASED TRAINING

- .1 Manufacturer's videotapes to be used as training tool with Departmental Representative's review and written approval two (2) weeks prior to commencement of scheduled training.
- .2 On-site training videos:
 - .1 Videotape training sessions for use during future training.
 - .2 To be performed after systems are fully commissioned.
 - .3 Organize into several short modules to permit incorporation of changes.
- .3 Production methods to be high quality.

END OF SECTION

