

## **SUMMARY OF WORK**

### **01 11 00**

#### **1 GENERAL**

##### **1.1 Work of This Contract**

- .1 Work of this Contract comprises the following:
- .2 Construction of a new addition to the existing Campbellford Memorial Hospital, including, but not limited to related demolition works, renovations in the existing building, utilities and civil works. Municipal Address: 146 Oliver Rd, Campbellford, ON K0L 1L0
- .3 Legal Description: Healthcare Facility

##### **1.2 Division of Work**

- .1 The Specification has generally been divided into trade sections. It is not thereby intended to recognize, set, or define limits to any trade Sub-Contractor or to restrict the Contractor in letting subcontracts. Contractor is not relieved of responsibility for completion of the Contract whether or not portions of the Work are sublet.
- .2 Division of the Work among Subcontractors and Suppliers is solely Contractor's responsibility. Consultant and Owner assume no responsibility to act as an arbiter to establish subcontract limits between Sections or Divisions of the Work.

##### **1.3 Specifications Language and Style**

- .1 These specifications are written in the imperative mood and in streamlined form. The imperative language is directed to Contractor, unless stated otherwise.
- .2 Complete sentences by reading "shall", "Contractor shall", "shall be", and similar phrases by inference. Where a colon (:) is used within sentences and phrases, read the words "shall be" by inference.
- .3 Fulfill and perform all indicated requirements whether stated imperatively or otherwise.
- .4 When used in the context of a Product, read the word "provide" to mean "supply and install to result in a complete installation ready for its intended use".
- .5 Wherever the words "indicated", "shown", "noted", "listed" or similar words or phrases are used in the Specification they shall be understood, unless the context otherwise provides, to mean that material or item referred to is "indicated", "shown", "listed", or "noted", on the Drawings or in Specifications.
- .6 Where the word "listed" is used in conjunction with a product and a product certification standard (including but not limited to CSA, ULC, CGSB, BNQ, UL), it shall be understood to mean that the product is "listed" by an accredited 3rd party testing laboratory as being certified to the referenced product standard.
- .7 Wherever the words "approved", or similar words or phrases are used in the Specification they shall be understood, unless the context otherwise provides to mean that material or item referred to shall be "approved by" the Owner.
- .8 Wherever the words "satisfactory", "as directed", "submit", "permitted", "reviewed", or similar words or phrases are used in the Specification they shall be understood, unless the context otherwise provides to mean that material or item referred to shall be "satisfactory to", "as directed by", "submitted to", "permitted by", or "reviewed by" the Consultant.
- .9 The terms "Sub-Contractor" and "this Contractor" used in the technical Specifications shall mean the person or firm to whom that particular portion of the Work has been let or sublet.
- .10 The term "Inspection Engineer", "Inspection & Testing Company" used in the Specification covering the Work under the various trades, shall mean the person or firm, respectively, appointed by the Owner or Consultant to carry out the Inspection & Testing Work specified.

- .11 The terms "Proposed Change", "Notice of Change", "Contemplated Change" or similar words or phrases means the written description of a proposed change as described at GC 6.2.1.

#### **1.4 Provision of Contract Documents for Construction Purposes**

- .1 Owner will supply Contractor with a complete set of Contract Documents in electronic form before commencement of the Work. Contractor may print hard copies for construction purposes as required.

#### **1.5 Documents at the Site**

- .1 Keep the following documents at Place of the Work, stored securely and in good order and available to Owner and Consultant in hard copy and/ or electronic form:
- .1 Current Contract Documents, including Drawings, Specifications and addenda.
  - .2 Change Orders, Change Directives, and Supplementary Instructions.
  - .3 Reviewed Shop Drawings, Product data and samples.
  - .4 Field test reports and records.
  - .5 Construction progress schedule.
  - .6 Meeting minutes.
  - .7 Manufacturer's certifications.
  - .8 Permits, inspection certificates, and other documents required by authorities having jurisdiction.
  - .9 Current as-built drawings.
  - .10 Material Safety Data Sheets (MSDS) for all controlled Products.

#### **1.6 Contractor's Use of Premises**

- .1 Except as otherwise specified, Contractor has unrestricted use of Place of the Work from time of Contract award until Ready-for-Takeover.
- .2 Confine Construction Equipment, Temporary Work, storage of Products, waste products and debris, and all other construction operations to limits required by laws, ordinances, permits, and Contract Documents, whichever is most restrictive. Do not unreasonably encumber Place of the Work.

#### **1.7 Owner-Supplied Products**

- .1 Owner Responsibilities:
- .1 Order and pay for Owner-supplied Products not already in Owner's possession.
  - .2 Arrange and pay for delivery of Owner-supplied Products F.O.B. the site, within time frames required by Contractor's progress schedule. If delivered sooner than required by Contractor's latest progress schedule submitted to Owner, arrange and pay for delivery to a temporary storage location and subsequent delivery to the site.
  - .3 Where Owner-supplied Products consist of existing Products located in an existing building that is located within or immediately adjacent to the Project site, arrange to allow Contractor access to the equipment for inspection, disassembly and removal at a time consistent with the Contractor's progress schedule.
  - .4 Advise Contractor in writing of the value of Owner-supplied Products for Contractor's insurance purposes.
  - .5 Arrange and pay for delivery to Contractor of reviewed Shop Drawings, Product data, samples, and manufacturer's installation instructions.
  - .6 Inspect deliveries jointly with Contractor.

- .7 Submit claims for transportation damage.
- .8 Arrange for replacement of damaged, defective or missing items identified at time of delivery.
- .9 Arrange for manufacturer's field services.
- .10 Arrange for delivery of manufacturer's warranties to Contractor for inclusion in operation and maintenance manual.
- .2 Contractor Responsibilities:
  - .1 Designate in progress schedule, time frames for delivery of Owner-supplied Products to the site and for receipt of related submittals. If the site is not ready to receive delivery of Owner-supplied Products within the time frame indicated in the latest progress schedule submitted to Owner, arrange and pay for delivery to a temporary storage location and subsequent delivery to the site.
  - .2 Where Owner-supplied Products consist of existing Products located in an existing building that is located within or immediately adjacent to the Project site,
    - (a) coordinate with the Owner for times to inspect the Products prior to removal and relocation,
    - (b) coordinate times with the Owner for removal and relocation of the existing Products to suit Contractor's progress schedule,  
diss-assemble and disconnect services to existing Products; relocate the existing Products; and install, connect, adjust and finish the existing Owner-supplied Products so that they are in the same condition with similar services as existed prior to the relocation except where otherwise detailed on Drawings and Specifications.
  - .3 Review all required submittals and notify Consultant of any observed discrepancies or anticipated problems.
  - .4 Ensure that course of construction insurance is adequate to cover Owner-supplied Products.
  - .5 Receive and unload Owner-supplied Products at the site.
  - .6 Inspect deliveries jointly with Owner. Record and notify Owner and Consultant of shortages and visibly damaged or defective items.
  - .7 Handle Owner-supplied Products at site, including uncrating and storage. Dispose of waste materials and debris.
  - .8 Take appropriate precautions to protect Owner-supplied Products from loss or damage.
  - .9 Repair or replace items damaged on site.
  - .10 Assemble, install, connect, adjust, and finish Owner-supplied Products as specified.
  - .11 Arrange for inspections required by authorities having jurisdiction as specified.
  - .12 Arrange for or perform testing as specified.
  - .13 Workmanship warranty for installation.

## **1.8 Phasing**

- .1 Phase 0a – Procurement and Mobilization begins following award of the Contract and shall consist of the following:
  - .1 Commence procurement of all required supplies and materials
  - .2 Preparation of detailed methods of procedure for installation of new Generator, ATS, Switchboards EEA&EEB, and monitoring panel, indicating all required shutdowns including durations.
  - .3 Finalizing schedule.
  - .4 Mobilization.
- .2 Phase 0b – Enabling Work is the state of on-site construction and shall consist of the following:

- .1 Contractor to coordinate with CMH a suitable location for temporary power services and ensure all temporary power connections are protected during construction.
- .3 Phase 1 - Construction of New Electrical Room
  - .1 Demolition in existing Electrical Room to create doorway for entrance and exit of new, stacked, electrical penthouse
  - .2 Construction of new Electrical penthouse
  - .3 Installation of Stairs as a path of entrance and egress to and from the new electrical penthouse
- .4 Phase 2 - Installation of New Electrical Equipment in New Electrical Room
  - .1 Install the following equipment in the new electrical room:
    - (a) ATS #1
    - (b) ATS #2
    - (c) SWBD EEA
    - (d) SWBD EEB
    - (e) Lighting, power, and systems devices
    - (f) Outdoor cable tray from new electrical penthouse to approximate location of new outdoor generator. Installation to be coordinated with generator enclosure installation in Phase 3.
      - i) Prepare for tie-over into new services in Phase 3 and Phase 7
  - .2 Connect feeders to switchboard side
    - (a) Connect ATS #1 to SWBD EEA (Switchboard #1)
    - (b) Connect ATS #2 to SWBD EEB (Switchboard #2)
- .5 Phase 3 - Installation of New Generator
  - .1 In prepared outdoor space, install 450kW generator in exterior enclosure.
  - .2 Install panel LP-EJ in 450kW generator enclosure.
  - .3 Make connections to equipment, run conductors in outdoor cable tray to new electrical penthouse.
  - .4 Connect 450kW generator to new ATS #1 located in new electrical penthouse
  - .5 Commission new generator and put into service.**
- .6 Phase 4 – Create Temporary Connection to DP-EE
  - .1 Connect Switchboard EEA to existing panel DP-EE.

**Note: during this stage there will be an interruption of availability of emergency power to CMH while switchover is underway. Contactor to phase work so that impact on critical emergency power systems is minimal.**
  - .2 Normal and emergency power to panel DP-EE now fed from new Emergency Switchboard EEA.
- .7 Phase 5 - Refeed of Existing 175kW Generator
  - .1 Rack out existing ATS #2.
  - .2 Connect New ATS #2 to Existing 175 kW Generator located outdoors.
  - .3 Provide engine start signals to 175kW Generator from New ATS #2 in New Electrical Penthouse.
  - .4 Place new ATS #2 to automatic mode.

.8 Phase 6 - Refeed of Existing DP-EE Panel services

- .1 As much as possible, run conduit and feeders before disconnections and transfers to minimize disruption to CMH services.

**Note: There will be shutdowns of all transferred equipment during this phase. Coordinate with CMH to ensure all parties are aware and agree to when equipment will be unavailable.**

- .2 Install the following feeds into new SWBD EEB

- (a) IT Room
- (b) New Elevator or Kitchen Salad Prep
- (c) Fire Alarm
- (d) LP-EG
- (e) LP-ED
- (f) LP-2E
- (g) Diesel Room Fan
- (h) Pass. Elevator
- (i) LP-EQ Day Surgery
- (j) LP EH
- (k) Spare to Boiler Room
- (l) LP-1E
- (m) LP-E
- (n) LP-EX
- (o) Fire Doors/ Fan Relays

- .3 Remove existing DP-EE

- .4 Disconnect temporary connection to DP-EE

.9 Phase 7 - Refeed of Existing DP-E1 Panel

- .1 As much as possible, run conduit and feeders before disconnections and transfers to minimize disruption to CMH services.

**Note: There will be shutdowns of all transferred equipment during this phase. Coordinate with CMH to ensure all parties are aware and agree to when equipment will be unavailable.**

- .2 Install the following feeds into the New Generator

- (a) Lodge
- (b) LP-GE
- (c) EMCC #2
- (d) Power Factor Correction
- (e) Service Elevator
- (f) Panel ED-P1

- .3 Remove existing panel DP-E1

.10 Phase 8 – Demolition of existing generator located in generator room

- .1 Remove generator and remaining unused wire and conduit.

.11 Phase 9 – Project Completion is the final phase of construction and shall consist of the following:

- .1 Demolition of remaining unused services and disposal of materials.

- .2 Clean up of site and completion of close-out documents.

**End of Section**

## **ALLOWANCES**

### **01 21 00**

#### **1 GENERAL**

##### **1.1 Expenditure of Cash Allowances**

- .1 Owner, through Consultant, will provide Contractor with documentation required to permit pricing of a cash allowance item.
- .2 Owner, through Consultant, may request Contractor to identify potential Suppliers or Subcontractors, as applicable, and to obtain at least three competitive prices for each cash allowance item.
- .3 Owner, through Consultant, may request the Contractor to disclose originals of all bids, quotations, and other price related information received from potential Suppliers or Subcontractors.
- .4 Owner, through Consultant, will determine by whom and for what amount each cash allowance item will be performed. Obtain Owner's prior written approval in the form of a Change Order before entering into a subcontract, amending an existing subcontract, or performing own forces work included in a cash allowance. Upon issuance of the Change Order, the Contractor's responsibilities for a cash allowance item shall be the same as for other work of the Contract.

##### **1.2 Contingency Allowance**

- .1 Include in the *Contract Price* a contingency allowance in the amount of 5% of the bid price.

**End of Section**

## **SUBSTITUTION PROCEDURE**

### **01 25 00**

#### **1 GENERAL**

##### **1.1 Definition**

- .1 In this Section "Substitution" means a Product, a manufacturer, or both, not originally specified in Contract Documents by proprietary name but proposed for use by Contractor in place of a Product, a manufacturer, or both, specified by proprietary name.

##### **1.2 Substitution Procedure**

- .1 Contractor may propose a Substitution wherever a Product or manufacturer is specified by proprietary name(s), unless there is accompanying language indicating that Substitutions will not be considered.
- .2 Contractor may propose a Substitution wherever a Product or manufacturer is specified by proprietary name(s) and accompanied by language such as "or equal", "or approved equal", or other similar words. Do not construe such language as an invitation to unilaterally provide a Substitution without Consultant's prior acceptance in writing. Do not order or install any Substitution without a Supplemental Instruction or Change Order.
- .3 Submittals or other requests made by a manufacturer directly to the Consultant or the Owner will not be considered.
- .4 Where use of a Substitution involves redesign or changes to other parts of the Work, the Contractor shall be responsible for all such construction cost and time impacts. Any time and costs required by the Consultant to affect such redesign will be considered in evaluating the suitability of the proposed products.
- .5 Allow in the construction schedule for up to four (4) weeks for the Consultant and Owner to review each Substitution submittal. Substitution submittals consisting of multiple products, submitted concurrently or as one submission, will require a longer review period as determined by the Consultant.
- .6 Provided a proposed Substitution submission includes all of the information specified in this Section under Submission Requirements for Proposed Substitutions, Consultant will promptly review and accept or reject the proposed Substitution.
- .7 Consultant may accept a Substitution if satisfied that:
  - .1 the proposed substitute Product is the same type as, is capable of performing the same functions as, interfaces with adjacent work the same as, and meets or exceeds the standard of quality, performance and, if applicable, appearance and maintenance considerations, of the specified Product,
  - .2 the proposed substitute manufacturer has capabilities comparable to the specified manufacturer, and
  - .3 the Substitution provides a benefit to Owner.
- .8 If Contractor fails to order a specified Product or order a Product by a specified manufacturer in adequate time to meet Contractor's construction schedule, Consultant will not consider that a valid reason to accept a Substitution.
- .9 If Consultant accepts a Substitution and subject to Owner's agreement, the change in the Work will be documented in the form of either a Supplemental Instruction or Change Order as specified in Section 01 26 00 - Contract Modification Procedures.
- .10 If a Substitution is accepted in the form of a Supplemental Instruction or Change Order, Contractor shall not revert to an originally specified Product or manufacturer without Consultant's prior written acceptance.



- .11 Any time required by Consultant and/or Owner to review substitution requests shall not be deemed nor attributed to as a cause for delay in the construction schedule.

### **1.3 Substitution Procedure for Change of Product Model of Same Manufacturer**

- .1 Where a proposed Substitution is limited solely to a change in Product model than that is listed in the technical Specification (and from the same manufacturer listed therein), the Substitution request may be made by means of a shop drawing submittal ("Eligible Product Substitution"), provided the reason for the substitution is included in the submittal and is solely due to:
  - (a) the specified product name/product number has changed, but no material change has been made to the specified product,
  - (b) the specified product is no longer made, and the substitute product replaces the specified product and meets or exceeds the specification requirements.
- .2 The shop drawing shall include all the submittal requirements specified in article 1.4.
- .3 Upon submission of an Eligible Product Substitution, the Consultant at its sole discretion shall determine if the submittal is eligible for review as a shop drawing. If Consultant determines the substitution request not to be eligible, Consultant will reject the shop drawing as non-compliant, otherwise the Eligible Product Substitution will be reviewed as a shop drawing.
- .4 Where a substitute product is not eligible to be reviewed through the shop drawing review process, the substitute product shall be submitted in accordance with all the requirements as for a Substitution.

### **1.4 Submission Requirements for Proposed Substitutions**

- .1 Include with each proposed Substitution the following information:
  - .1 identification of the Substitution, including product name and manufacturer's name, address, telephone numbers, and web site,
  - .2 reason(s) for proposing the Substitution,
  - .3 a statement verifying that the Substitution will not affect the Contract Price and Contract Time or, if applicable, the amount and extent of a proposed increase or decrease in Contract Price and Contract Time on account of the Substitution,
  - .4 a statement verifying that the Substitution will not affect the performance or warranty of other parts of the Work,
  - .5 manufacturer's Product literature for the Substitution, including material descriptions, compliance with applicable codes and reference standards, performance and test data, compatibility with contiguous materials and systems, and environmental considerations,
  - .6 where classification, listing, or other certification to a recognized standard is a part of the technical Specification or as otherwise required by law, provide reports from the testing certification laboratory indicating certification to those standard(s). Product data sheets that only indicate a testing laboratory mark symbol is not sufficient; at a minimum, a certification listing report that references the required product standard is required.
  - .7 product samples as applicable,
  - .8 a summarized comparison of the physical properties and performance characteristics of the specified Product and the Substitution, with any significant variations clearly highlighted,
  - .9 availability of maintenance services and sources of replacement materials and parts for the Substitution, as applicable, including associated costs and time frames,
  - .10 if applicable, estimated life cycle cost savings resulting from the Substitution,
  - .11 details of other projects and applications where the Substitution has been used,

- .12 identification of any consequential changes in the Work to accommodate the Substitution and any consequential effects on the performance of the Work as a whole. A later claim for an increase to the Contract Price or Contract Time for other changes in the Work attributable to the Substitution will not be considered.

**End of Section**

## CONTRACT MODIFICATION PROCEDURES 01 26 00

### 1 GENERAL

#### 1.1 Definitions

- .1 **Job Site Impact Multiplier** – a multiplier expressed as a decimal number that is included in the Labour Rate to account for special job site conditions that affect labour availability, labour productivity, procurement of materials, and materials management, that are specific to the project and site conditions.
- .2 **Indirect labour** – any labour that is neither journeyperson labour that directly performs the work nor labour that directly supervises journeypersons(s)..
- .3 **Labour Rate** – the actual fully burdened labour cost per hour of labour consumed by a trades person including statutory and regulatory burden, collective bargaining burden, and allowances for project indirect costs. For greater clarity, the labour rate includes but is not limited to the following:
  - (a) base wage rate,
  - (b) vacation and statutory holiday pay,
  - (c) union deductions and additional union charges,
  - (d) Legislated burdens including EHT, WSIB, EI, CPP, RST on H/W
  - (e) wage-based taxes,
  - (f) job site impact multipliers,
  - (g) expendable small tools charge,
  - (h) project insurance,
  - (i) financing of payroll,
  - (j) estimating,
  - (k) rest breaks and idle time,
  - (l) safety including training, safety meetings, WHMIS, fall protection, personnel protection equipment, and safety committees,
  - (m) preparation and handling of shop drawings and other submittals,
  - (n) preparation of as-built documents, including operation and maintenance manuals,
  - (o) labour warranties,
  - (p) site facilities,
  - (q) clean-up,
  - (r) parking.
- .4 **Foreperson** – a first level supervisory position having direct control over the work performed by journeypersons.
- .5 **Journeyperson** – a person working in a skilled construction trade which may be prescribed by regulation, and includes apprentices.
- .6 **Labour Unit** – the number of journeyperson labour hours or part thereof, required to perform a specific construction task, and includes but is not limited to:
  - (a) receiving, unloading, stockpiling, distribution and handling of materials and Products,
  - (b) rigging or erecting of materials or Products,
  - (c) fitting and joining of materials,
  - (d) pressure testing of piping and ductwork systems,

- (e) testing of Products and systems.
- .7 **Line materials** – Products that make up a distribution network for fluid, power, or electronic/digital information, and includes:
  - (a) piping, pipe fittings, valves (of all kinds), pipe strainers and other pipe mounted Products,
  - (b) ducting, duct fittings, duct balancing dampers and other duct mounted Products,
  - (c) conduit, cable tray, cable, conductors, and wiring,
  - (d) supports, hangers and restraints,
  - (e) vibration isolators and seismic restraints associated with line materials,
  - (f) instrumentation including gauges and sensors/transmitters,
  - (g) electrical, pneumatic, and hydraulic actuators for valves and dampers, and
  - (h) any coatings or other protective elements applied thereto including insulation and painting.
- .8 **Overhead** – administrative expenses of the Contractor's business and the project which are not included in a Labour Rate or Labour Unit. For greater clarity, overhead includes but is not limited to the following:
  - (a) company office, storage, and fabrication spaces, and associated maintenance, utilities, and expenses,
  - (b) project site office, fabrication and storage spaces, washrooms, break rooms, and associated maintenance, utilities, and expenses,
  - (c) company office equipment, furniture and supplies,
  - (d) project site office equipment, furniture and supplies,
  - (e) labour time for project managers and project assistants,
  - (f) project site security,
  - (g) project site clean-up, recycling and waste disposal,
  - (h) materials management,
  - (i) property taxes, business licenses, and auto insurance,
  - (j) dues and subscriptions,
  - (k) postage and courier,
  - (l) advertising, telephone, IT services and equipment,
  - (m) legal and accounting fees and expenses,
  - (n) sales and marketing,
  - (o) salaries and benefits for company indirect labour who do not provide labour to the project including company management, sales force, dispatchers, estimators, clerical staff, and at-office general (non-trades) labour.
  - (p) all other indirect labour.
- .9 **Senior Foreperson** – the second (and subsequent) level supervisory position having direct control over one or more Forepersons, where the number of Forepersons supervised is in accordance with local regulatory requirements or collective bargaining agreements. ("Superintendent" or "Supervisor" has the same meaning.

## 1.2 Valuations of Changes – General

- .1 The valuation method of a change instruction to the Work is to be determined by Consultant from the following:
  - .1 by labour and material when the change instruction is by a Change Directive,
  - .2 by unit prices set out in the Contract or subsequently agreed upon for other change instructions,

- .3 by a detailed quotation for other change instructions, or
- .4 by an Allowance Disbursement instruction.

### **1.3 Valuation of Products**

- .1 Material costs for Products are to be net of trade discounts. The discount to be applied to list prices for items shall not be less than:
  - .1 20% for line materials, and
  - .2 10% for other Products that are not line material.

### **1.4 Schedule of Labour Rates**

- .1 Except where schedules of labour rates were required to be submitted with the tender bid, prior to the first application for payment, submit for the Consultant's review a schedule of labour rates for all trades and classifications of trades, such as journeymen, apprentices, and foremen that will be employed in the Work. Provide a breakdown of payroll burden component of labour rates.
- .2 Labour rates shall reflect the salaries, wages, and benefits paid to personnel in the direct employ of the Contractor, Subcontractors, and sub-Subcontractors, stated as hourly rates, that will be used when:
  - .1 preparing price quotations for Change Orders, and
  - .2 determining the cost of work attributable to Change Directives.
- .3 Labour rates stated in the schedule of labour rates shall be consistent with base wage rates that will actually be paid, payroll burden costs that will actually be incurred, and allowances for project related burdens in the normal performance of the Work, during regular working hours. Labour rates shall not include any additional overhead and profit component.
- .4 Where collective agreements apply, the base wage rates shall not exceed those established by collective agreement.
- .5 Labour rates for Foreperson and Senior Foreperson shall be as per agreement, or in absence of such agreement shall be 1.15 times the journeyman labour rate. The maximum allowable labour hours for supervision are not to exceed:
  - .1 for a Foreperson, a maximum of 10% of the total calculated journeyman hours on a change, and
  - .2 for a Senior Foreperson of all levels, a maximum combined amount of 3% of the total calculated journeyman hours on a change.
  - .3 No other supervisory hours will be permitted.
- .6 Obtain the Owner's written acceptance of the schedule of labour rates before submitting the first Change Order quotation.
- .7 Upon execution of the Construction Contract, accepted schedule of labour rates will be used solely for evaluating Change Order quotations and cost of performing work attributable to Change Directives.
- .8 The Contractor may request amendments to the accepted schedule of labour rates if changes in the labour rates that will actually be paid, or payroll burden cost that will actually be incurred, in the normal performance of the Work can be demonstrated. Obtain the Owner's written acceptance of such changes.
- .9 The labour unit hour estimates shall be based on applicable published trade estimating resources as agreed by Consultant, or in their absence, Contractor's time estimates agreed by Consultant.

### **1.5 Premium Time**

- .1 Where a change instruction is solely for a change in Contract Time, but not contract scope, and results in requiring overtime work, only the difference between straight time base wage rate and the overtime

rate on top of the base wage rate is chargeable. There shall be no charge for additional burden on payroll or for overhead or profit.

## **1.6 Schedule of Construction Equipment Rates**

- .1 Prior to the first application for payment, submit for the Consultant's review a schedule of equipment rates for Contractor owned Construction Equipment.
- .2 Equipment rates shall reflect the rates that will be used when:
  - .1 preparing price quotations for Change Orders, and
  - .2 determining the cost of work attributable to Change Directives.
- .3 Equipment rates stated in the schedule shall be consistent with local equipment rental market rates and shall not include any additional overhead and profit component.
- .4 Obtain the Owner's written acceptance of the schedule of equipment rates before submitting the first Change Order quotation.
- .5 Accepted schedule of equipment rates will be used solely for evaluating Change Order quotations and cost of performing work attributable to Change Directives.
- .6 The Contractor may request amendments to the accepted schedule of equipment rates if changes in local equipment rental market rates can be demonstrated. Obtain the Owner's written acceptance of such changes.

## **1.7 Valuation of Changes Based on Agreed Unit Prices**

- .1 The Consultant may, at the outset of the Contract or at any other time, request the Contractor to submit unit prices anticipated to be required in valuing changes in the Work. These unit rates are in addition to any unit rate prices required to be submitted with the Tender bid.
- .2 The Contractor shall submit such unit prices promptly upon request.
- .3 The unit prices shall be valid for a specified duration.
- .4 The unit prices shall exclude all fees for overhead and profit and shall be subject to the percentage fees specified in this Section under Fees for Overhead and Profit - Change Orders.
- .5 The Consultant will evaluate the Contractor's quoted unit prices and, if accepted by the Owner in writing, the agreed unit prices shall be used to value subsequent proposed changes in the Work wherever they are applicable.

# **2 CHANGE INSTRUCTIONS**

## **2.1 Supplemental Instructions**

- .1 During construction, written instructions for clarification of the Contract Documents ("Supplementary Instructions") may be issued by Consultant.
- .2 Notify Consultant in writing where Contractor considers work described by a Supplementary Instruction involves changes to Contract Amount or Contract Time. Where Consultant agrees that the instruction involves such contract changes, Consultant will cancel the Supplementary Instruction and issue either a notice for proposed change to the Work or a Change Directive.
- .3 Failure to notify Consultant within seven (7) working days of receipt of a Supplementary Instruction that the instruction involves a change to the Contract Price or Contract Time will be taken as acceptance, by Contractor, of the "no change in contract amount" provisions inherent in the Supplementary Instruction process.
- .4 On acceptance of a Supplementary Instruction, the material content of the instruction shall be recorded, circled, and marked with the Supplementary Instruction number on Record Drawings.

## **2.2 Instructions for Proposed Changes to the Work**

- .1 Consultant may issue notices to Contractor that describe proposed changes to the Work ("Notice of Change").
- .2 A Notice of Change may originate as a result of a Supplemental Instruction, through requests for information generated by Contractor, or through some instruction to Consultant from Owner.
- .3 Contractor agrees that receipt of a Notice of Change describing proposed changes to the Work is notification to suspend execution of the affected portion of the Work, pending resolution of change in Contract Amount for the proposed change.
- .4 Issuance of a Notice of Change does not authorize the contractor to proceed with the change until such time as a Change Order or Change Directive is issued.

## **2.3 Instructions by Change Directives**

- .1 Consultant may issue Change Directives to Contractor that describe changes to the Work and instruct the Contractor to proceed with such changes prior to agreeing the change in Contract Price and Contract Time.
- .2 Contractor agrees to proceed promptly with changes to the Work as described, and to keep records of additions to and reductions in Contract Amount and Contract Time and to submit such accountings to Consultant not more than five (5) working days after completion of work.

## **2.4 Allowance Disbursement Instruction**

- .1 Consultant may issue instructions to the Contractor for work covered by a Cash Allowance or Contingency Allowance in accordance with Section 01 21 00 *Allowances*.
- .2 Contractor shall submit cost proposals for such work in accordance with the requirements for the method of contract price adjustment and procedures for Change Orders, except where a Change Directive is issued for the work.

# **3 CHANGE ORDERS**

## **3.1 Method of Contract Price Adjustment – Change Orders**

- .1 Unless otherwise agreed, the adjustment of the Contract Price on account of a proposed change in the Work shall be based on a quotation for a fixed price increase or decrease to the Contract Price regardless of the Contractor's actual expenditures and savings.

## **3.2 Proposed Change Procedures**

- .1 Upon issuance by the Consultant to the Contractor of a proposed change in the Work, and unless otherwise requested in the proposed change or unless otherwise agreed, the following procedure applies:
  - .1 Submit to the Consultant a fixed price quotation for the proposed change in the Work within 5 days after receipt of the proposed change in the Work.
  - .2 The adjustment in the Contract Price for a change carried out by way of proposed change or other similar instruction shall be determined on the basis of the cost of the Contractor's actual expenditures and savings attributed to the Proposed Change. For clarity and by example, savings for deductions of similar materials, equipment, labour or services shall be valued at the same amount as for expenditures for additions of same.
  - .3 Unless otherwise requested in the proposed change, provide a detailed breakdown of the price quotation including the following to the extent applicable, with appropriate supporting documentation:
    - (a) Estimated labour costs, including hours and applicable hourly rates based on the accepted schedule of labour rates.

- (b) Estimated Product costs, including Supplier quotations, estimated quantities and unit prices.
  - (c) Estimated Construction Equipment costs.
  - (d) Enumeration of all other estimated costs included in the price quotation.
  - (e) Estimated credit amounts for labour and Products not required on account of the proposed change.
  - (f) Fees, not exceeding the applicable percentages for overhead and profit as specified in this Section.
  - (g) Where applicable, Subcontractor quotations, also including a detailed breakdown of all of the above.
- .4 Include in the quotation the increase or decrease to the Contract Time, if any, for the proposed change, stated in number of days.
  - .5 Include in the quotation impact costs to maintain the Contract Time.
  - .6 Include in the quotation the number of days for which the quotation is valid.
  - .7 The quotation will be evaluated by the Consultant and the Owner and, if accepted by the Owner, be documented in the form of a signed Change Order.
  - .8 Where the quotation does not indicate any increase to the Contract Time, or does not indicate impact costs to maintain the Contract Time, then such time extension or costs is prohibited to be claimed at a later date. Any quotation that includes language to the effect that the Contractor reserves the right to make a claim at a future date for extension to Contract Time or for impact costs to maintain Contract Time are null and void.

### **3.3 Fees for Overhead and Profit – Change Orders**

- .1 Where the Contractor's price quotation for a Change Order results in a net increase to the Contract Price, the Contractor's entitlement to a fee for overhead and profit in the quotation shall be as follows, as applicable:
  - .1 For work to be performed by the Contractor's own forces, [15]% of the Contractor's price quotation before the Contractor's fee is applied.
  - .2 For work to be performed by a Subcontractor, [5]% of the Subcontractor's price quotation including the Subcontractor's fee.
- .2 Where a Subcontractor's price quotation for a Change Order results in a net increase to the Subcontractor's contract price, the Subcontractor's entitlement to a fee for overhead and profit in the quotation shall be as follows, as applicable:
  - .1 For work to be performed by the Subcontractor's own forces, [15]% of the Subcontractor's price quotation before the Subcontractor's fee is applied.
  - .2 For work to be performed by a sub-Subcontractor, [5]% of the sub-Subcontractor's price quotation including the sub-Subcontractor's fee.
- .3 Where the Contractor's or a Subcontractor's price quotation for a Change Order results in a net decrease in price before adjustment for fees for overhead and profit, such a price quotation shall be for the net decrease without any adjustment for fees for overhead and profit.

## **4 CHANGE DIRECTIVES**

### **4.1 Method of Contract Price Adjustment – Change Directive**

- .1 Unless the Owner and the Contractor reach an earlier agreement on the adjustment to the Contract Price by means of a Change Order that cancels the Change Directive, the adjustment in the Contract



Price for change carried out by way of a Change Directive shall be determined as specified in the General Conditions of Contract after the change in the Work is completed.

#### **4.2 Change Directive Procedures**

- .1 If a Change Directive is issued for a change in the Work for which a proposed change was previously issued, but no Change Order has yet been signed, the Change Directive shall cancel the proposed change and any Contractor quotations related to that change in the Work.
- .2 When proceeding with a change in the Work under a Change Directive, keep accurate records of daily time sheets for labour and Construction Equipment, and invoices for Product and Construction Equipment costs. Submit such records to the Consultant weekly, until the Change Order superseding the Change Directive is issued.
- .3 As soon as practical, Contractor shall submit a quotation for the complete change to the Work in accordance with the requirements for quotations for Change Orders. Once the quotation has been approved by the Owner, a Change Order shall be issued by Consultant for this change to the Work at which time all payments made under this time and material method will be credited against the agreed total cost for the change to the Work.

#### **4.3 Fees for Overhead and Profit – Change Directives**

- .1 The Contractor's entitlement to a fee for overhead and profit on the Contractor's expenditures and savings attributable to a Change Directive shall be as follows, as applicable:
  - .1 For work performed by the Contractor's own forces, [15]% of the Contractor's net increase in costs.
  - .2 For work performed by a Subcontractor, [5]% of the sum of the Subcontractor's net increase in costs plus the Subcontractor's fee.
- .2 A Subcontractor's entitlement to a fee for overhead and profit on the Subcontractor's expenditures and savings attributable to a Change Directive shall be as follows, as applicable:
  - .1 For work performed by the Subcontractor's own forces, [15]% of the Subcontractor's net increase in costs.
  - .2 For work performed by a Sub-subcontractor, [5]% of the sum of the Sub- subcontractor's net increase in costs plus the Sub-subcontractor's fee.
- .3 Where a Change Directive results in net savings on account of work not required to be performed and a net decrease in the Contractor's or Subcontractor's cost, the net savings to the Contractor or Subcontractor shall be calculated without any adjustment for fees for overhead and profit.

### **5 WHEN A CHANGE DIRECTIVE IS ULTIMATELY RECORDED AS A CHANGE ORDER, THERE SHALL BE NO ADDITIONAL ENTITLEMENT TO FEES FOR OVERHEAD AND PROFIT BEYOND THOSE SPECIFIED IN THIS ARTICLE.SUPPLEMENTAL INSTRUCTIONS**

- .1 The Consultant may issue Supplemental Instructions to provide clarifications to the Contract Documents, provide additional information, or make minor variations in the Work not involving adjustment in the Contract Price or Contract Time.
- .2 If the Contractor considers a Supplemental Instruction to require an adjustment in Contract Price or Contract Time, the Contractor shall promptly notify the Consultant and the Owner in writing and shall not proceed with any work related to the Supplemental Instruction pending receipt of a Change Order, a Change Directive, or, in accordance with the dispute resolution provisions of the General Conditions of Contract, a Notice in Writing of a dispute and instructions to proceed.

#### **End of Section**

## **REQUESTS FOR INTERPRETATION**

### **01 26 13**

#### **1 GENERAL**

##### **1.1 Request for Interpretation Procedures**

- .1 Contractor may submit written requests for interpretation of the Contract Documents ("RFI") to request clarification of design intent or design requirements.
- .2 Consultant shall review each RFI and provide a written response to the Contractor.
- .3 If Consultant determines that the response will require a change to the Work, the Consultant shall indicate this and issue separately a change instruction in accordance with specification Section 01 26 00 – Contract Modification Procedure.
- .4 Where Contractor believes the response results in a change to the Work, Contractor shall notify Consultant in writing to request a change instruction, upon which time Consultant shall review the request and determine if a change to the Work is warranted.
- .5 Allow 10 working days for Consultant's review of each RFI. Allow additional 5 working days where sub-Consultant review is required.

##### **1.2 Request for Interpretation Submittal**

- .1 RFI submittals shall include:
  - .1 date and revision dates,
  - .2 project title and number,
  - .3 Contractor's name and address,
  - .4 applicable Drawing or Specification reference,
  - .5 applicable trade sub-contractor raising the query,
  - .6 detailed description of the query,
  - .7 proposed resolution of the query.
- .2 As the proposed resolution provides additional information for Consultant to understand the Contractor's query, RFI's submitted without a proposed resolution may be returned by Consultant without review or may require additional time for Consultant to provide a response, depending on the clarity of Contractor's information provided in the RFI.

##### **1.3 Request for Interpretation – Excessive Queries**

- .1 Where, in Consultant's opinion, the quantum of RFI's is excessive and/or the nature of the queries indicates that Contractor or their subcontractor may have failed to use competent staff with sufficient knowledge and/or experience to fully understand the Contract Documents and scope of Work, then Consultant may review the situation with Owner. Owner may take actions permitted under the Construction Contract concerning Contractor's and subcontractors qualifications of their competent representation.

**End of Section**

## **PAYMENT PROCEDURES**

### **01 29 00**

#### **1 GENERAL**

##### **1.1 Schedule of Values**

- .1 Prior to the first application for payment, submit for Consultant's review an initial schedule of values. Modify the initial schedule of values if and as requested by Consultant. Obtain Consultant's written acceptance of the initial schedule of values prior to the first application for payment.
- .2 Together with the first and all subsequent applications for payment, submit updated versions of the schedule of values to indicate the values, to the date of application for payment, of work performed and Products delivered to Place of the Work.
- .3 Provide the schedule of values in an electronic spreadsheet format that provides for inclusion of the following information:

- .1 Identifying information including title and location of the Work, name of Contractor, number and date of application for payment, and period covered by the application for payment.
- .2 A work breakdown structure based on:
  - (a) Contractor, Subcontractor and trades work,
  - (b) material and labour breakdown,
- .3 Include separate line items for closeout procedures including closeout submittals, demonstration and training, start-up and testing, and commissioning
- .4 Include a separate line item for "Interference and Coordination Drawings" and include a value that is the greater of:
  - (a) the value of the Work element, or
  - (b) 1% of the sum of the Work for Divisions 20 to 28.

Payment of the indicated amount will not be made until satisfactory evidence of completion of this work element has been received by Consultant. Where satisfactory documents are not received, a Change Order will be issued to delete this work element and the amount from the Contract Price.

- .5 Include a separate line item "As-Builts & Operating Manuals" and includes a value that is the greater of:
  - (a) the value of the Work element, or
  - (b) 1% of the sum of the Work for Division 20 to 28.

Payment of the indicated amount will not be made until satisfactory documents have been received by the Consultant. Where satisfactory documents are not received, a Change Directive will be issued to delete this work element and the amount from the Contract Price.

- .6 Provisions for approved Change Orders, allowances, unit price work, and assignable contracts so that the breakdown amounts indicated in the schedule of values aggregate to the current total Contract Price. Also provide for indicating the estimated value of Change Directives within the schedule of values, separately from the current total Contract Price.
- .7 For each item in the work breakdown structure, provide as a minimum the following information, under headings as indicated:
  - (a) Breakdown Amount: A dollar amount, including an appropriate pro rata portion of Contactor's overhead and profit.
  - (b) Performed to Date: The value of Work performed and Products delivered to Place of the Work up to the date of the application for payment, stated as a percentage of the Contract Price and in dollars.

(c) Previously Performed: The value of Work performed and Products delivered to the Place of the Work for which payment has been previously certified, stated as a percentage of the Contract Price and in dollars.

(d) Current Period: The value of Work performed and Products delivered to Place of the Work for which Contractor is currently applying for payment, stated as a percentage of the Contract Price and in dollars.

(e) Balance to Complete: The value of Work not yet performed and Products not yet delivered to Place of the Work, stated as a percentage of the Contract Price and in dollars.

- .4 Refer to the article "Attachments" at the end of this Section as an indicative example of the requirements for schedule of values.

## **1.2 Cash Flow Projection**

- .1 Prior to the first application for payment submit, for Consultant's review, a forecast of approximate monthly progress payments for each month of the Contract Time.
- .2 Submit revised cash flow forecasts when requested by Consultant.

## **1.3 Worker's Compensation Clearance**

- .1 Submit proof of workers' compensation clearance with each application for payment.

## **1.4 Statutory Declarations**

- .1 Submit a statutory declaration in the form of CCDC 9A - Statutory Declaration of Progress Payment Distribution by Contractor with each application for payment except the first.

## **1.5 Payment For Products Stored Off Site**

- .1 Owner may, due to extraordinary circumstances and at Owner's sole discretion, make payments for Products delivered to and stored at a location other than Place of the Work, subject to:
- .1 a request submitted by Contractor in writing, with appropriate justification, and
  - .2 whatever conditions Owner or Consultant may establish for such payments, as required to protect Owner's interests.
- .2 Such extraordinary circumstances are limited to the following:
- .1 lack of storage space for the Products at the location of the Work,
  - .2 necessity to take delivery of Products well before they are needed for installation, and
- .3 This provision does not apply to:
- .1 mechanical and electrical line materials including cables, conductors, conduit, cable tray, piping, pipe fittings and other pipeline mounted devices, ductwork and duct-mounted devices,
  - .2 equipment that does not have a traceable manufacturer's serial number.,

## **1.6 Release of Holdback**

- .1 Submit an application for payment of holdback no later than 28 days prior to the anticipated expiry of the lien preservation period following the date of substantial performance of the Work.
- .2 Contractor may submit applications for payment of holdback for any of the following conditions, subject to in all cases applicability requirements under the Construction Lien Act R.S.O. 1990, c.C.30:

- .1 where subcontract certified complete before substantial performance of the entire work,
- .2 release of basic holdback, or
- .3 release of finishing holdback.

## **2 ATTACHMENTS**

### **2.1 Schedule of Values Form**

- .1 Attached sample of the Schedule of Values form layout.

SCHEDULE OF VALUES

<<name of project>>  
Project Name:  
<<owner name>>  
Owner Name:  
<<name of trade contractor: mechanical, electrical, etc>>  
Contractor Name:  
<<i.e. 20, 21, 22...>>  
Division(s) of the Work:  
dd-mm-YYYY  
For the billing period ending:

This sheet is an example of a required schedule of values to be developed by the Contractor, to be submitted with each progress payment request.  
Specific level of detail for each work element to be approved by the Consultant.

Item	Base Contract Element	Contract Value	Complete to Date	Previously Billed	This Billing	Balance to Complete
		\$	%	\$	%	\$
1.1	<<work elements>>	1,000,000.00	65.9%	400,000.00	22.5%	175,000.00
1.2	<<work elements>>	250,000.00	16.5%	30,000.00	12.0%	25,000.00
1.3	<<work elements>>	125,000.00	8.2%	50,000.00	40.0%	28,000.00
X X	Itemized Price No. 1	25,000.00	1.6%	0.00	0.0%	0.00
X X	Separate Price No. 1	12,500.00	0.8%	5,000.00	40.0%	5,000.00
CAA.1	Cash Allowance Disbursements Summary	75,000.00	4.9%	34,000.00	0.0%	26,000.00
X X	Coordination drawings	15,000.00	1.0%	0.00	0.0%	0.00
X X	As-built documents and operating manuals	15,000.00	1.0%	0.00	0.0%	0.00
	<b>Original Contract Values</b>	1,517,500.00	100.0%	519,000.00	34.2%	259,000.00
CO.1	Approved Changes Summary	13,400.00		5,200.00	38.8%	3,200.00
	<b>Total Current Contract Values</b>	<b>1,530,900.00</b>		<b>524,200.00</b>	<b>34.2%</b>	<b>262,200.00</b>

Reference	Cash Allowance Disbursement	CA Value	Complete to Date	Previously Billed	This Billing	Balance to Complete
		\$	%	\$	%	\$
CAA_1	<<description of cash allowance>>	20,000.00	100.0%	8,000.00	40.0%	0.00
CAA_2	<<description of cash allowance>>	55,000.00	25.5%	-	0.0%	14,000.00
			0.0%		0.0%	0.00
Total		75,000.00	45.3%	8,000.00	10.7%	26,000.00

Reference	Approved Changes	Change Value	Complete to Date	Previously Billed	This Billing	Balance to Complete
		\$	%	\$	%	\$
CO_01	<<description of change of work>>	5,800.00	0.0%	-	0.0%	0.00
CD-01	<<description of change of work>>	7,600.00	68.4%	2,000.00	26.3%	3,200.00
			0.0%		0.0%	0.00
Total		13,400.00	38.8%	2,000.00	14.9%	3,200.00

Reference	Unquoted/Unapproved Changes	Status	Quotation
			\$
CCN-01	<<description of change of work>>	Waiting for approval	12,000.00
CCN-02	<<description of change of work>>	Unquoted	
Total			12,000.00

End of Section

## **PROJECT COORDINATION**

### **01 31 13**

#### **1 GENERAL**

##### **1.1 Coordination**

- .1 Coordinate work done by own forces with work done by subcontractors. Mechanical and electrical subcontractors will be required by conditions of Contract to work and co-operate to ensure that services are installed in the spaces allocated.
- .2 After award of Contract, meet with Consultant and present for approval, person or persons to be responsible for coordination work. Such persons to be appointed for the duration of the Contract and may not be released or replaced without prior approval from Owner.
- .3 In congested areas of the work inside the building, prepare interference drawings.
  - .1 Drawings inside building to use as-built structural conditions and show work of all trades.
  - .2 Produce interference drawings at 1:50 (1/4 in =1 ft) scale inside of building, and to be signed off by all trades prior to commencing installation of work.
  - .3 Work to be kept within spaces allocated on the drawings;
    - (a) above ceilings,
    - (b) within furrings,
    - (c) within casings or cabinets, or
    - (d) within shafts or pipe chases etc.
- .4 During coordination process, relocation or off-setting of any of the Work within 3.0 m (10 ft) of designated position shown on Contract Drawings, to be done without extra cost to Owner.
- .5 Any work erected without proper coordination and requires relocation shall be relocated without extra cost to Owner.
- .6 Check Drawings and Specifications and notify Consultant of any apparent discrepancies or dimensional ambiguities before proceeding with work.
- .7 Significant deviation from Specifications and Drawings involving increase or decrease in quantities or changes in quality of work to be drawn to the attention of Consultant for approval. Where changes to the Contract Price are anticipated, documentation will be issued using Contract Modification procedures.

##### **1.2 Examination of Previous Work**

- .1 Examine work upon which this Work is dependent, and report any defects prior to commencement of work. Commencement of work will be taken as acceptance of existing conditions and as a waiver of claims for weakness or unsatisfactory condition of surrounding and supporting work.

##### **1.3 Welding to Structural Steel**

- .1 Do not make any welded connection to any building structural steel member without written approval from Consultant.
- .2 Submit details of proposed connection to Consultant for review. Review will be for assessment of impact on building structural steel and not to determine the adequacy of proposed connection.
- .3 Persons performing welding operations must be certified.

**END OF SECTION**

## **PROJECT MEETINGS**

### **01 31 19**

#### **1 GENERAL**

##### **1.1 Construction Start-Up Meeting**

- .1 Promptly after Contract award, Consultant will establish the time and location of a construction start-up meeting to review and discuss administrative procedures and responsibilities. Consultant will notify Contractor at least five Working Days before the meeting.
- .2 Senior representatives of Owner, Consultant, and Contractor, including Contractor's project manager and site superintendent, and major Subcontractors, shall be in attendance.
- .3 Consultant's representative will chair the meeting and record and distribute the minutes.
- .4 Agenda will include following:
  - .1 appointment of official representatives of Owner, Contractor, Subcontractors, Consultant, and subconsultants,
  - .2 project communications,
  - .3 requests for information,
  - .4 contract Documents for construction purposes,
  - .5 documents at the site,
  - .6 contractor's use of premises,
  - .7 Owner-supplied Products
  - .8 work restrictions,
  - .9 Cash allowances,
  - .10 Substitution procedures,
  - .11 contract modification procedures,
  - .12 payment procedures,
  - .13 construction progress meetings,
  - .14 construction progress schedule, including long lead time items,
  - .15 submittals schedule and procedures,
  - .16 quality requirements, including testing and inspection procedures,
  - .17 contractor's mobilization,
  - .18 temporary utilities,
  - .19 existing utility services,
  - .20 construction facilities,
  - .21 temporary barriers and enclosures,
  - .22 temporary controls,
  - .23 field engineering and layout of work,
  - .24 site safety,
  - .25 site security,
  - .26 cleaning and waste management,



- .27 consultant field reviews,
- .28 deficiencies
- .29 testing,
- .30 commissioning,
- .31 training,
- .32 closeout procedures and submittals,
- .33 other items.

## **1.2 Construction Progress Meetings**

- .1 Schedule regular bi-weekly construction progress meetings for the duration of the Work. Contractor shall prepare meeting agendas, chair the meetings, and record and distribute the minutes.
- .2 Arrange for and provide physical space for meetings.
- .3 Record in the meeting minutes significant decisions and identify action items and action dates by attendees or the parties they represent.
- .4 Distribute copies of minutes within five Working Days after each meeting to meeting attendees and any affected parties who may not be in attendance.
- .5 Ensure that Subcontractors attend as and when appropriate to the progress of the Work.
- .6 Agenda for each meeting shall include the following, as a minimum:
  - .1 review minutes of previous meeting,
  - .2 work progress since previous meeting,
  - .3 field observations, including any problems, difficulties, or concerns,
  - .4 construction progress schedule,
  - .5 submittals schedule,
  - .6 proposed changes in the Work,
  - .7 requests for information,
  - .8 site safety issues,
  - .9 other business.

**End of Section**

## **CONSTRUCTION PROGRESS DOCUMENTATION**

### **01 32 00**

## **1 GENERAL**

### **1.1 Summary**

- .1 This Section specifies Contractor's responsibilities for preparation and submission of schedules and other documentation related to tracking construction progress.
- .2 The purpose of submitting progress schedules is to:
  - .1 inform Owner and Consultant of actual progress versus planned progress, and
  - .2 provide assurance that scheduling issues are being proactively identified and addressed in a timely manner, and that planned progress is being maintained as closely as possible.

### **1.2 Construction Progress Schedule**

- .1 Format and Content:
  - .1 Prepare schedule in the form of a Critical Path Method (CPM) Gantt chart using appropriate scheduling software.
  - .2 Provide a work breakdown structure identifying key activities, work packages, and major milestones, including long delivery Products, inspection and testing activities, shutdown or closure activities, demonstration and training activities, and similar items, at a sufficient level of detail to effectively manage construction progress.
  - .3 Indicate milestone date[s] for Ready-for-Takeover and Substantial Performance of the Work.
- .2 Submission:
  - .1 Submit initial schedule to Owner and Consultant within 15Working Days after Contract award.
  - .2 Submit schedule via e-mail as .pdf files.
  - .3 Consultant will review format and content of initial schedule and request necessary changes, if any, within 10Working Days after receipt.
  - .4 If changes are required, resubmit finalized initial schedule within 5Working Days after return of review copy.
  - .5 Submit updated progress schedule bi-weekly to Owner and Consultant, indicating actual and projected start and finish dates with report date line and progress, activity relationships, critical path, float, and baseline comparison to current progress.

### **1.3 Submittals Schedule**

- .1 Format and Content:
  - .1 Prepare schedule identifying all required Shop Drawing, Product data, and sample submissions.
  - .2 Prepare schedule in electronic format.
  - .3 Provide a separate line for each required submittal, organized by Specifications section names and numbers, and further broken down by individual Products and systems as required.
  - .4 For each required submittal, show planned earliest date for initial submittal earliest date for return of reviewed submittal by Consultant and latest date for return of reviewed submittal without causing delay.
  - .5 Allow time in schedule for resubmission of submittals, should resubmission be necessary.
- .2 Submission:

- .1 Submit initial schedule to Consultant within 20 Working Days after Contract award.
- .2 Submit schedule via e-mail as .pdf files.
- .3 Consultant will review format and content of initial schedule and request necessary changes, if any, within 10 Working Days after receipt.
- .4 If changes are required, resubmit finalized schedule within 5 Working Days after return of review copy.
- .5 Submit updated submittals schedule monthly to Owner and Consultant.

#### **1.4 Schedule Management**

- .1 A schedule submitted as specified and accepted by Consultant shall become the baseline schedule and shall be used as the baseline for updates.
- .2 At each regular progress meeting, review and discuss current construction progress and submittals schedules with Consultant and Owner, including activities that are behind schedule and planned measures to regain schedule slippage in key areas on or near the critical path.
- .3 Activities considered behind schedule are those with start or completion dates later than the dates shown on the baseline schedule.
- .4 Where work conditions or material and equipment deliverables interfere with completion dates, meet with Consultant and Owner to review the issues, revise work plans, determine how lost time will be made up, and resubmit revised construction schedule. Where a contract extension is agreed to by the Owner, the change in Contract Time shall be revised by a Change Order.

#### **1.5 Recording Actual Site Conditions on As-Built Drawings**

- .1 Obtain from Consultant an electronic copy of the construction Drawings for the purpose of creating as-built drawings. Record information in electronic form, clearly identifying as-built deviations from the originally obtained construction Drawings.
- .2 Clearly label each drawing as "AS-BUILT DRAWING". Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .3 Record actual construction including:
  - .1 measured depths of elements of foundation in relation to finish first floor datum,
  - .2 measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements,
  - .3 measured locations of pipes, ducts, conduits, outlets, fixtures, access panels, and appurtenances, referenced to visible and accessible features of construction,
  - .4 field changes of dimension and detail,
  - .5 changes made by Change Orders and Supplemental Instructions,
  - .6 references to Shop Drawings, where Shop Drawings show more detail,
- .4 Do not use as-built drawings for construction purposes.

#### **1.6 Progress Photographs**

- .1 Arrange for periodic digital photography to document and provide a photographic record of the progress of the Work.
- .2 Identify each photograph by project name and date taken.
- .3 Submission:

- .1 file type: .jpg format files in standard resolution,
- .2 file transfer method: via e-mail.
- .3 frequency: monthly.
- .4 Without limiting the extent of progress photographs, provide the following specific photographs:
  - .1 building services located in walls immediately prior to closing of walls,
  - .2 building services located within concrete floors prior to concrete pouring,
  - .3 buried building services prior to backfill, inside and outside the building,
- .5 Do not use progress or any other Project photographs for promotional purposes without Owner's written consent.

**End of Section**

## **SUBMITTAL PROCEDURES**

### **01 33 00**

#### **1 GENERAL**

##### **1.1 Administration**

- .1 Submit specified submittals to Consultant for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in the Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time or for Product substitutions or other deviations from the Drawings and Specifications.
- .2 Where required by authorities having jurisdiction, provide submittals to such authorities for review and approval.
- .3 Do not proceed with Work affected by a submittal until review is complete.
- .4 Present Shop Drawings, Product data, and samples in the metric or U.S. customary units as used in Contract Documents. Where both units of measure are shown, use the primary unit selection. Where items or information is not produced in metric, converted values are acceptable.
- .5 Review submittals, provide verified field measurements where applicable, and affix Contractor's review stamp prior to submission to Consultant. Contractor's review stamp represents that necessary requirements have been determined and verified, and that the submittal has been checked and coordinated with requirements of the Work and Contract Documents.
- .6 Verify field measurements and that affected adjacent work is coordinated.
- .7 Submittals not meeting specified requirements will be returned with comments.
- .8 Reproduction of construction Drawings to serve as background for Shop Drawings is permitted. If construction Drawings are used for this purpose, remove references to Consultant.
- .9 Do not propose Substitutions or deviations from Contract Documents via Shop Drawing, Product data and sample submittals.
- .10 Submit shop drawings by email to: [shopdrawings@hhangus.com](mailto:shopdrawings@hhangus.com), except where a project document management web-service is used.

##### **1.2 Shop Drawing and Product Data**

- .1 Indicate Products, methods of construction, and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of the Work.
- .2 Where Products attach or connect to other Products, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross-references to Drawings, Specifications and other already reviewed Shop Drawings.
- .3 Accompany submittals with a transmittal information (refer to sample at the end of this section) including:
  - .1 Client name,
  - .2 Project Name,
  - .3 Consultant's project number,
  - .4 Date.
  - .5 Contractor's name,
  - .6 Contractor's reference (tracking) number,
  - .7 Manufacturer name,

- .8 Product type (description),
- .9 Specification section number
- .10 Contractor trade: architectural, structural, conveying equipment, user equipment, mechanical, electrical, telecommunications, civil or other.
- .11 If a re-submission, the Consultant's previous submittal reference number.
- .4 Shop Drawing submittals shall include:
  - .1 date and revision dates,
  - .2 project title and number,
  - .3 name and address of:
    - (a) Subcontractor.
    - (b) Supplier.
    - (c) Manufacturer.
  - .4 Contractor's stamp, date, and signature of Contractor's authorized representative responsible for Shop Drawing review, indicating that each Shop Drawing has been reviewed for compliance with Contract Documents and, where applicable, that field measurements have been verified,
  - .5 details of appropriate portions of the Work as applicable:
    - (a) Fabrication.
    - (b) Layout, showing dimensions, including identified field dimensions, and clearances.
    - (c) Setting or erection details.
    - (d) Capacities.
    - (e) Performance characteristics.
    - (f) Standards.
    - (g) Operating weight.
    - (h) Wiring diagrams.
    - (i) Single line and schematic diagrams.
    - (j) Relationships to other parts of the Work.
- .5 Product data submittals shall include material safety data sheets (MSDS) for all controlled Products.
- .6 Submit electronic copy of Shop Drawings where specified in the technical Specifications.
- .7 Submit electronic copy of Product data sheets or brochures where specified in the technical Specifications.
- .8 Where a submittal includes information not applicable to the Work, clearly identify applicable information and strike out non-applicable information.
- .9 Supplement standard information to include details applicable to Project.
- .10 Allow 10 working days for Consultant's review of each submittal. Allow additional 5 working days where sub-Consultant or commissioning agent review is required.
- .11 Where any submission is of a size and/or complexity that would prevent the Consultant to review the submission in the defined time period, Consultant shall notify Contractor of the necessity to increase the review time duration.
- .12 If upon Consultant's review no errors or omissions are discovered, or if only minor corrections are required as indicated, submittal will be returned and fabrication or installation of Work may proceed.

- .13 If upon Consultant's review significant errors or omissions are discovered, a so noted copy will be returned for correction and resubmission. Do not commence fabrication or installation.
- .14 Consultant's notations on submittals are intended to ensure compliance with Contract Documents and are not intended to constitute a change in the Work requiring change to the Contract Price or Contract Time. If Contractor considers any Consultant's notation to be a change in the Work, promptly notify Consultant in writing before proceeding with the Work.
- .15 Resubmit corrected submittals through same procedure indicated above, before any fabrication or installation of the Work proceeds. When resubmitting, notify Consultant in writing of any revisions other than those requested by Consultant.
- .16 The effect of a Consultant's review of shop drawings, Product data and/or submittals is to satisfy the Consultant that the Contractor understands the scope of Work and that construction of the Work is in general conformance with the Contract Documents. The Consultant's review of such documents does not constitute a quality control process for the Contractor or the Owner.

### **1.3 Samples**

- .1 Submit samples for Consultant's review in duplicate where specified in the technical Specifications. Label samples as to origin, Project name, and intended use.
- .2 Deliver samples prepaid to Consultant's business address.
- .3 Notify Consultant in writing of any deviations in samples from requirements of Contract Documents.
- .4 Where a required colour, pattern or texture has not been specified, submit full range of available Products meeting other specified requirements.
- .5 Consultant selection from samples is not intended to change the Contract Price or Contract Time. If a selection would affect the Contract Price or Contract Time, notify Consultant in writing prior to proceeding with the Work.
- .6 Resubmit samples as required by Consultant to comply with Contract Documents.
- .7 Reviewed and accepted samples will establish the standard against which installed Work will be reviewed.

### **1.4 Effect of Consultants Review of Submittals**

- .1 Consultant's review of shop drawings is performed on a sampling basis only, to confirm to Consultant's satisfaction that the Contractor understands the Work to be performed and is interpreting the design documents correctly, and such reviews are performed for the benefit of the Owner.
- .2 For greater certainty, the review of shop drawings by Consultant does not constitute a quality control function for the benefit of Contractor, nor does such a review relieve Contractor of their responsibility for complying with the Contract documents.

### **1.5 Attachments**

- .1 Sample shop drawing submittal sheet.



Toronto Montreal Vancouver Dallas Chicago

## SHOP DRAWING SUBMITTAL

***Include this cover page with each shop drawing submission.  
Submissions without this form will be returned without review.  
Submit one submittal form per shop drawing; do not group under one submittal sheet***

Client/Architect: Click or tap here to enter text.

Project Name: Click or tap here to enter text.

HHA Project No: Click or tap here to enter text.

**Contractor to complete the following for each submission.**

Date: \_\_\_\_\_

Contractor Name: \_\_\_\_\_ Ref. No: \_\_\_\_\_

Manufacturer Name: \_\_\_\_\_

Product Type/Description: \_\_\_\_\_

Specification section number: \_\_\_\_\_

Contractor Trade Category:

- |  |                                     |  |   |
|--|-------------------------------------|--|---|
| <input type="checkbox"/> Architectural | <input type="checkbox"/> Structural | <input type="checkbox"/> Conveying Equipment | <input type="checkbox"/> User Equipment |
| <input type="checkbox"/> Mechanical    | <input type="checkbox"/> Electrical | <input type="checkbox"/> Telecommunications  | <input type="checkbox"/> Civil          |
| <input type="checkbox"/> Other         |                                     |  |   |

If this is a resubmission, check here: ☐

Previous submission HHA reference no.: \_\_\_\_\_

hhangus.com



**END OF SECTION**





## **SPECIAL PROCEDURES FOR HEALTHCARE FACILITIES**

### **01 35 13**

#### **1 GENERAL**

##### **1.1 Summary of Work**

- .1 Comply with special procedures for Work in healthcare facilities as specified herein.
  - .1 In addition to the requirements of this Section, refer to specification Section 01 35 33 - Infection Control During Construction.

##### **1.2 Operational Limitations**

- .1 The existing hospital facility:
  - .1 will remain in full use and occupancy throughout the Work, except for such parts of the building that have been vacated for the Work,
  - .2 is in operation 24 hours a day, 7 days a week. Coordinate construction activities so as not to adversely impact any hospital operations.
- .2 Contractor's use of the Place of the Work is limited to permit regular use of Owner's facilities to continue with the least amount of interference possible.
- .3 Comply with the designated entry and exit procedures, where applicable, as identified by the Owner. This may include signing-in and signing-out with the Owner's security personnel when entering and exiting the hospital premises.
- .4 In consultation with the Owner, designate an entrance and a circulation route for Workers access to the site.
- .5 Do not enter areas of the existing building outside of the area of the Work except with express written consent of the Owner.
- .6 Assigned access to the Place of the Work and access routes through occupied areas of the existing building shall be as mutually agreed with the Owner in advance of a specific stage of work.
- .7 Contact the Owner if access is required to existing mechanical or electrical rooms. Submit detailed explanation of work to be completed in such areas. Arrange access to the mechanical and electrical rooms with the Owner, who may accompany the Contractor during such access.
- .8 In areas designated by the Owner, wear infection-control protective clothing as directed by the Owner. Remove protective clothing upon exiting designated areas.

##### **1.3 Missing Patient Search**

- .1 In the event that the Owner is required to undertake a missing patient search, undertake a detailed search of the area of the Work under the direction of the Owner.

**End of Section**

## **HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES**

### **01 35 29**

#### **1 GENERAL**

##### **1.1 Health and Safety**

- .1 Comply with the applicable health and safety legislation concerning construction work, the General Conditions of the Construction Contract, and as specified herein.

##### **1.2 Prohibitions on Alcohol and Drugs**

- .1 In this article, "recreational drugs" means those controlled drugs or substances that are legally permitted to be consumed on a recreational basis in the provincial jurisdiction of the Work.
- .2 The following activities or conditions are prohibited at the Place of the Work and on the Owner's premises or property:
  - .1 being unfit for any scheduled work, due to the use or the after-effects of alcohol, recreational drugs, or illegal drugs, or the misuse of medications;
  - .2 possession, consumption, distribution, offering, use or sale of alcoholic beverages, recreational drugs, or illegal drugs;
  - .3 possession of prescribed medications without a legally obtained prescription, and the unauthorized distribution, offering, or sale of prescription medications;
  - .4 use of medications, both prescribed and over-the-counter medications, not as it has been prescribed or intended, or using someone else's prescription medication.
- .3 Workers suspected of being under the influence of alcohol, recreational drugs, medications and/or illegal drugs shall be stopped from working and arrangements made with their employer to have such individuals removed from the Place of the Work and the Owner's premises.

##### **1.3 Fire Plan**

- .1 In existing buildings, before commencement of the Work, coordinate with the Owner to revise and implement temporary measures for the existing building fire safety plan in accordance with the requirement of the provincial fire code, but such temporary provisions shall include as a minimum:
  - .1 temporary alternate measures for the safety of occupants during the Work,
  - .2 temporary procedures to control fire hazards associated with the Work, including procedures to mitigate risks to adjacent buildings or portions of buildings.
- .2 Review with the Owner posted emergency route plans, telephone locations, emergency numbers, fire alarm systems, and emergency exits prior to commencement of the Work at the Place of the Work. Subsequently, review such information with Workers prior to their commencement of work at the Place of the Work and post instructions to this effect.
- .3 Understand and comply with the Owner's emergency procedures plan and all emergency numbers.
- .4 Immediately implement any request or instruction made by the facilities Fire Safety Plan Officer, or in their absence the Owner.
- .5 Coordinate the work carefully with the Owner in order to ensure no disruption to the existing fire detection and annunciation systems. Failure to provide such coordination shall result in the Contractor incurring the responsibilities and expenses associated with disruption to the existing fire detection and annunciation systems at no increase in the Agreed Cost.
- .6 Coordinate the work carefully in order to prevent unapproved disruptions to the existing sprinkler system, standpipe system, or other fire protection systems.

#### **1.4 Existing Emergency and Fire Protection Equipment**

- .1 Determine the location of existing emergency and fire protection equipment and rules governing their use. Report use of existing emergency and fire protection equipment to the Owner's security personnel immediately.
- .2 Do not cover or block existing emergency and fire protection equipment.
- .3 Only use existing emergency and fire protection equipment in an emergency situation.
- .4 Do not remove existing fire protection equipment.
- .5 If any existing fire protection equipment is used or interfered with in any way, retain and pay for the services of the Owner's fire equipment inspector to inspect, test, recharge, and otherwise repair such equipment.

#### **1.5 Maintaining Fire Safety**

- .1 Do not obstruct driveways, corridors, stairways, or doorways.
  - .1 Maintain exits, including stairways and exterior doors serving existing building, accessible in its intended state.
  - .2 Where an exit is blocked, provide alternative exit.
  - .3 Where an exit leads through construction area, provide clearly defined protected route separated from construction area with smoke tight fire separation with  $\frac{3}{4}$  hour fire-resistance rating.
- .2 Provide a fire watch for any Work involving an existing exit or access to an exit.
- .3 Provide/maintain Fire Department access.
  - .1 Do not obstruct access route designated for fire department equipment.
  - .2 Provide temporary access roadways designated for fire department equipment to be routed clear of building additions and construction activity, and obtain approval from the municipal fire department.
  - .3 Where previously existing access roads are deleted or obstructed, provide alternative routes acceptable to fire department, prior to commencement of construction.
- .4 Control combustible materials within construction site.
  - .1 Stockpiling combustible materials adjacent to existing, occupied buildings is prohibited where storage of materials create a fire hazard.
  - .2 Combustible materials to be piled in limited quantities in accordance with regulations under the provincial fire code.
  - .3 Locate open flame portable heating appliances clear of combustible materials and finishes so as to pose no fire hazard.

#### **1.6 Temporary Shut-Down of Fire Protection and Life Safety Systems**

- .1 This article applies to the following fire protection and life safety systems:
  - .1 automatic sprinkler systems,
  - .2 other automatic fire suppression systems,
  - .3 standpipe systems,
  - .4 fire alarm systems,
  - .5 smoke control systems.

- .2 Where it is necessary to temporarily shut-down a fire protection or life safety system to accommodate the Work, develop a work plan to minimize the shut-down of the system to the shortest duration possible. Coordinate with the Owner to schedule the times for each shut-down.
- .3 Provide a fire watch when existing fire detection and annunciation systems are not operational or on bypass.
- .4 Whenever a shut-down or changeover time occurs on an active fire alarm system, including when only a portion of the fire alarm system is affected, notify the municipal fire department of the temporary shutdown and devise and implement alternative safety measures acceptable to the Owner.
- .5 Where an existing fire alarm system automatically notifies the fire department of alarm events, notify the fire department prior to any work that may cause a false alarm on the fire alarm system, including but not limited to work activities that could cause an alarm on a single stage fire alarm system, or a 2<sup>nd</sup> stage alarm on a two-stage fire alarm system, or activation of a waterflow indicating device that is monitored by the fire alarm system.
- .6 Where an automatic sprinkler system or portion thereof is to be shut-down,
  - .1 develop and implement an emergency response plan to detect, report and respond to fires in an unprotected work area,
  - .2 provide at least five (5) 9.1 L (2 gal) type 2-A pressurized portable fire extinguishers in the work area during times the work area is unprotected,
  - .3 provide a fire watch by a competent person in the work area during times it is unprotected when the affected work area is unattended by the sprinkler subcontractor.

#### **1.7 Hot Work; Permits**

- .1 In this article, "hot work" means any Work activity that creates an open flame or other source of ignition including but no limited to welding, flame cutting, cutting or grinding operations that contain sparks.
- .2 Where hot work is required, provide safety control measures suitable to the type of work involved to protect against the risk of fire or explosion.
- .3 Remove combustible materials from the place where hot work is to be performed, or provide suitable barriers between these materials and the hot work to prevent the risk of fire or explosion.
- .4 Gas hoses, backflow preventers, fire resistive tarpaulins, curtains and other cutting and welding equipment must be in good repair before the permit is issued.
- .5 Obtain 'Hot Work Permit' from the Owner prior to hot work operation or which may cause the building's fire alarm system to be activated. The prevention of fires and false fire alarms caused by hot work operations are the primary goals of this procedure.

**End of Section**

## **INFECTION CONTROL PROCEDURES - HEALTHCARE**

### **01 35 33**

#### **1 GENERAL**

##### **1.1 Scope**

- .1 Develop an infection control plan and provide infection control measures to isolate construction work from existing hospital areas, and for new construction.
- .2 In the CAN/CSA Z317.13 standard where functions are stated to be performed by either of: (a) engineering, (b) operations and maintenance, or (c) the Constructor, then Contractor is responsible for providing these functions unless otherwise shown herein.

##### **1.2 Applicable Codes and Standards**

- .1 Comply with:
  - .1 CAN/CSA Z317.13 Infection control during construction, renovation, and maintenance of health care facilities.

##### **1.3 Definitions and Abbreviations**

- .1 Definitions:
  - .1 **Adjacent areas:** has the meaning as defined in CAN/CSA Z317.13
  - .2 **Construction Zone:** new build or a renovation area within the existing hospital which is under control of the Constructor and in which there are no normal hospital operations occurring during construction.
  - .3 **Construction Space:** renovation work area within the existing hospital of short duration such as evening shut-down work in which hospital operations continue to function during construction.
  - .4 **Long Term Infection Control Barrier:** an infection control physical barrier which will be in place for greater than one day, and is used for Preventative Measures III and IV.
  - .5 **Short Term Infection Control Barrier:** an infection control physical barrier which can be installed and removed in the same work shift, and is used for Preventative Measure II
- .2 Where the term "Constructor" is used in CAN/CSA Z317.13 it shall be read as meaning Contractor under the Construction Contract.

##### **1.4 Submittals**

- .1 Submit an infection control plan for approval by Owner which includes;
  - .1 marked-up floor plans indicating location of isolation barriers and indicate time periods of use for;
    - (a) Long Term Infection Control barriers, and
    - (b) Short term Infection Control barriers,
  - .2 details of negative exhaust venting and use of HEPA filtered equipment,
  - .3 names and contact details of Constructor's staff assigned to supervise infection control activities.
- .2 Submit the infection control plan at least fifteen (15) working days prior to commencement of the work in site.

##### **1.5 Quality Control**

- .1 During construction, the Owner will monitor the Constructor's compliance with the infection control plan. Such monitoring is not a replacement of the Constructor's quality control program.

- .2 Correct compliance defects immediately upon notification. If defects are not remedied, the Owner may require the Constructor to stop work until such time as the defects are corrected and the Constructor shall have no claim against the Owner for such stoppage of the Work.
- .3 Environmental-biological air testing, if required, will be conducted by the Owner.
- .4 Monitoring of potable water supplies for Legionella bacteria, if required, will be conducted by the Owner.

## **2 PRODUCTS**

### **2.1 Walk-Off Mats**

- .1 Temporary floor mats for the removal of:
  - .1 sand and grit,
  - .2 sticky surface mats for removal of dust, and
- .2 Antimicrobial type with waterproof frames for holding of antibacterial solutions.

### **2.2 Portable Ventilation Fans**

- .1 Portable ventilation fans equipped with:
  - .1 fans and motor starters at 208 and/or 600 VAC as applicable,
  - .2 HEPA filters, certified at start of construction and recertified annually,
  - .3 filter pressure gauges and alarm.

### **2.3 Vacuum Cleaners**

- .1 Commercial grade complete with HEPA filters.

### **2.4 Mobile Containment System**

- .1 Adjustable aluminum frame, vinyl enclosure with pressure porthole, wheel base platform, and disposable plastic liner, and sized as required.
- .2 Suitable for ceiling heights between 2100 - 3000 mm (7 - 10 ft).
- .3 HEPA filter and fan unit with manometer.

#### *Standard of Acceptance*

- ° Fiberlock Technologies Inc - Kontrol Kube Topsider or Kontrol Kube Topsider Jr.

## **3 EXECUTION**

### **3.1 General**

- .1 Provide and implement an infection control program in conformance to CSA Z317.13 and as shown. Where items specified herein relate to requirements in the CSA standard, they are provided for clarification only and do not otherwise restrict compliance to the standard for this or any other requirement of the standard.
- .2 Arrange and pay for the services of an industrial hygienist to instruct personal on the handling of mould, asbestos and other hazardous materials designated within the workspace.
- .3 Coordinate with the Hospital's infection control staff for isolation of Construction Space work areas. Confirm schedule times and durations for each Construction Space, including time to install and remove Short Term barriers for each work shift.

- .4 Where required by the Owner, ensure construction personnel wear infection-control personnel protection equipment and comply with other personnel infection control measures.

### **3.2 Owners Responsibilities**

- .1 The Owner shall be responsible for ensuring that the Contractor is familiar with the Owner's construction-related infection control procedures, and for providing training in infection prevention and control procedures.
- .2 The Owner shall be responsible for coordinating the relocation of affected patients and pedestrian traffic routes to areas where there exists less potential for exposure to airborne contaminants.
- .3 The Owner shall be responsible for coordinating the preparation of the parts of the Place of the Work inside the existing building prior to the commencement of the Contractor's work in the affected area for:
  - .1 removal of medical supplies, waste, and equipment, and
  - .2 decontamination of existing areas where there may be a residual biological hazard.

### **3.3 Training**

- .1 Coordinate training for all construction workers, who will be engaged in the Work at the Place of the Work or on the Owner's premises, in infection prevention and control procedures as provided by the Owner.
- .2 At construction kick-off meeting, at meetings convened prior to the start of each Phase of the Work, at pre-installation meetings, and at regular progress meetings, review infection prevention and control procedures. The Owner's infection control representative shall attend such meetings when necessary. Subjects to be reviewed include, but are not limited to, the following:
  - .1 general information on infection control procedures,
  - .2 identification of patient populations that may be at risk,
  - .3 prevention measures for essential services that may be disrupted,
  - .4 the integrity of the facility's exterior structure, spatial separations, ventilation and water supplies for any infection control problems,
  - .5 methods for dust containment and removal of construction debris,
  - .6 traffic patterns for construction workers and supply delivery routes to minimize risks to patients, staff and visitors,
  - .7 the need for increased filter changes during the Work,
  - .8 the need to close down dampers temporarily to reduce circulation of contaminated air or fumes,
  - .9 systems that can provide the required air exchange rates and pressure relationships in critical areas near construction activity,
  - .10 schedule of inspections by the Owner's infection control representative.

### **3.4 Prevention Measures Summary**

- .1 The preventative measures analysis has been completed by the Owner and the applicable measures are summarized in the following table for work adjacent to existing areas:
  - .1 Adjacent area includes areas not within a construction zone, as well as areas within a construction space.
  - .2 "Population Risk Group" has the meaning as used in CSA Z317.13.
  - .3 "Construction Activity" has the meaning as defined and used in CSA Z317.13.
  - .4 "Preventative Measure" has the meaning as defined and used in CSA Z317.13.



Adjacent Area	Floor	Population Risk Group	Construction Activity	Preventative Measure
Service Rooms	All	1	C	II
Public Areas	Ground	1	B	II
Work above ceilings	All	2, 3, 4	C	III
Work above ceilings	All	1	C	II

### 3.5 Long Term Infection Control Barriers

- .1 Construct Long Term Infection Control barriers in accordance with CAN/CSA Z317.13.
- .2 In addition to the requirements of CSA Z317.13, where a Long Term Infection Control barrier is to be installed in an existing fire separation having a fire resistance rating, construct such barriers with a one (1) hour fire resistance rating complete with doors and frames having 3/4 hour fire resistance ratings:
  - .1 92 mm (3-5/8") 0.5 mm (25 Ga) steel studs at 610 mm (24") on centre, with 2 rows of bracing between studs and additional bracing for gypsum board finish.
  - .2 one (1) layer of 15.9 mm (5/8") thick square edge fire resistant gypsum board on both side of partition. Seal joints with drywall tape and one coat of drywall compound.
  - .3 weather seals on sides and top of door frame, and rubber stripping on the bottoms of doors.
- .3 Paint sides of Long Term barrier partitions exposed to Adjacent Areas of the existing building, colour to match existing walls.
- .4 Provide "Construction Zone - Authorized Access Only" signage outside barriers manufactured with minimum 75 mm (3") letters.

### 3.6 Short Term Infection Control Barriers

- .1 Construct Short Term Infection Control barriers:
  - .1 to CSA Z317.13, Preventative Measure II, or
  - .2 use a mobile containment system.

### 3.7 Permanent HVAC Systems

- .1 Temporarily blank-off ventilation duct systems serving adjacent areas and a construction zone as shown.

Floor/Area	Location	Fan System Reference
N/A		

### 3.8 Temporary Ventilation for Construction

- .1 Do not use existing or new building exhaust ventilation systems for construction ventilation.

- .2 Provide temporary exhaust ductwork for portable construction exhaust fans and route ductwork outside of the building through temporary openings. Obtain approval from the Owner for location of discharge points.

### **3.9 Work in Ceiling Spaces and Concealed Spaces**

- .1 Thoroughly clean mechanical and electrical services above dropped ceilings, ceiling spaces and other confined spaces with a HEPA filter vacuum cleaner including;
  - .1 services which will be worked on, and
  - .2 adjacent services within a 600 mm (24 in) radius of any ceiling opening into the work area.
- .2 Where services are to be removed, HEPA vacuum the entire surface of the service prior to its removal.

### **3.10 Access To/From Existing Building**

- .1 Keep dust tight enclosure and partition doors at openings to the existing hospital closed.

### **3.11 Preventative Measures Dust Control Testing**

- .1 Conduct visual checks of isolation barriers prior to testing and correct any identified defects.
- .2 Test negative pressure is maintained at a pressure differential of 7.5 Pa (0.03 in wc.) between adjacent areas (high pressure) and a construction zone or construction area (low pressure) prior to start of construction.
  - .1 Retest pressure differentials at Long Term Infection Control barriers on at least a monthly basis or more frequent as agreed with the Owner.
  - .2 Test pressure differentials at Short Term Infection Control barriers on a daily basis prior to use.

### **3.12 Air Sampling and Monitoring**

- .1 At the end of construction and before the dust control barriers are removed, conduct baseline air quality measurements in Adjacent Areas and within the work area. Continue to run the ventilation system for the work area until the measured particle count is not more than the Adjacent Areas measurement as follows:
  - .1 Preventative measures I and II: not more than 5% higher than Adjacent Area.
  - .2 Preventative measures III and IV: not more than 3% higher than Adjacent Area.
  - .3 For greater clarity, this testing is not environmental-biological testing.

### **3.13 Plumbing Systems**

- .1 For portions of domestic water piping systems which are shut-down or de-pressurized during construction, sanitize water systems by hyper-chlorination to achieve residual chlorine concentration of 50 ppm for 24 hours.
- .2 Install an NPS ½ branch or tee with isolation valve for the chlorine injection as close as possible to the downstream side of the branch isolation valve used to isolate the piping system.
- .3 After successful sanitization, open isolation service valves and flush water to drain through all fixtures.

### **3.14 Cleaning**

- .1 Provide site maintenance functions for cleaning and debris removal in accordance with the applicable measures of CAN/CSA Z317.13.
- .2 Maintain areas of the existing building adjacent to the Construction Zone or Construction Space affected by the Work, including circulation and access routes, in a clean state equivalent to the level of cleanliness maintained in the existing building, and as follows:

- .1 clean and vacuum the Place of the Work and areas surrounding the Place of the Work daily or more frequently as required.
  - .2 provide chemically-treated walk-off mats on the construction area side of access doors to the Place of the Work so that workers can remove dust and debris from their footwear when exiting the Place of the Work. Replace or clean walk-off mats daily, or more frequently as required.
  - .3 wet mop floor areas in vicinity of access doors to the Place of the Work daily, or more frequently as required.
  - .4 vacuum carpeted areas daily or more frequently as required using a HEPA filtered vacuum cleaner.
  - .5 wet clean carpets in accordance with manufacturer's recommendations once work in such areas is complete.
  - .6 remove dust from body, footwear, and clothing by vacuum cleaning with a HEPA filtered vacuum cleaner prior to traversing patient care areas or exiting the Place of the Work through operating part(s) of the hospital.
  - .7 thoroughly clean infection control barriers prior to their removal with a HEPA filter vacuum cleaner.
3. Change HEPA filters as recommended by the manufacturer or required by use. Maintain a filter change log at the Place of the Work, available for review by the Consultant
  4. Where permanent building return air or exhaust air ductwork is used for construction exhaust and temporary filters were not installed on the return/exhaust air grilles, HEPA vacuum clean the interior of the ductwork at the end of construction prior to hand-over.
  5. Provide a final construction clean using HEPA filtered vacuum cleaner and wet mop as applicable, and wipe clean all surfaces with a hospital grade disinfectant, except where such disinfectants can affect the finish or function of a device.

### **3.15 Waste Protection and Removal**

- .1 Provide waste management and disposal of waste in accordance with the applicable measures of CSA Z317.13.
- .2 Transport waste in containers with tightly fitting lids or cover waste with a wet sheet.
- .3 Remove waste as it is created. Contain and cover debris if it cannot be removed immediately.
- .4 Do not transport waste through occupied areas of existing building.
- .5 Remove waste at the end of each Working Day through construction access routes.

### **3.16 Project Hand-Over**

- .1 Submit laboratory test reports of successful hyper-chlorination of potable water systems at a level of at least 50 ppm prior to being placed back into service.
- .2 Obtain a copy of the infection control checklist from the Owner, and check off all items as having been completed and ready for inspection prior to application for Ready-for-Takeover.

**End of Section**

## **SECURITY PROCEDURES**

### **01 35 53**

## **1 SECURITY PROCEDURES**

### **1.1 General**

- .1 Be responsible for the security of the Place of the Work and for construction machinery, equipment and materials for the duration of the Work.
- .2 Provide security for the Place of the Work by methods compatible with the security system for the existing building.
- .3 Where existing building's security system is breached due to Contractor's negligence, be responsible for any damage or theft of property, regardless if area where damage or theft occurred is under Contractor's control or not.
- .4 Understand and comply with the Owner's existing security policy and procedures in force at the existing building affecting the Place of the Work or the Work, a copy of which is appended to this Section.

### **1.2 Security Guard Services**

- .1 Determine requirements, arrange, and pay for security guard services as necessary to secure the Work. The Owner shall not provide security services or personnel for the contractor's equipment or materials.
- .2 Notwithstanding the foregoing, at commencement of finishing trades Work, employ and pay for security guard service to attend the Place of the Work after working hours until date of Ready-for-Takeover of the Work.

### **1.3 Physical Security Barriers**

- .1 Provide physical security barriers to protect the Work to the extent necessary as determined by Contractor, except where otherwise specified herein and in accordance with specification Section 01 46 00 – Temporary Barriers and Enclosures.
- .2 Review the planned location of physical security control barriers with Owner. On completion of the barrier, inspect the perimeter of the security control barrier(s) with the Owner to satisfy the Owner that there are no unacceptable interferences with the Owner's continued use of the existing building.
- .3 Provide and maintain temporary locks. The Work area to be locked after working hours. Provide a copy of keys to the Owner's security department.

### **1.4 Existing Building Electronic Security**

- .1 Coordinate the Work carefully with the Owner in order to ensure no disruption to the existing building's electronic security system.

### **1.5 Security Passes**

- .1 All workers under control of the Contractor shall wear a contractor's pass, as provided by the Owner, clearly displayed at all times while at the Place of the Work on Owner's premises.

**End of Section**

## **QUALITY REQUIREMENTS**

### **01 40 00**

## **1 GENERAL**

### **1.1 Reference Standards**

- .1 "Reference standards" means consensus standards, trade association standards, guides, and other publications expressly referenced in Contract Documents.
- .2 Where an edition or version date is not specified, referenced standards shall be deemed to be the latest edition or revision issued by the publisher at the time of bid closing. However, if a particular edition or revision date of a specified standard is referenced in an applicable code or other regulatory requirement, the regulatory referenced edition or version shall apply.
- .3 Reference standards establish minimum requirements. If Contract Documents call for requirements that differ from a referenced standard, the more stringent requirements shall govern.
- .4 If compliance with two or more reference standards is specified and the standards establish different or conflicting requirements, comply with the most stringent requirement. Refer uncertainties to Consultant for clarification.
- .5 Within the Specifications, reference may be made to the following standards development, testing, or certification organizations by their acronyms or initialisms:
  - (a) AA - Aluminum Association
  - (b) ACI - American Concrete Institute
  - (c) AISC - American Institute of Steel Construction
  - (d) ANSI - American National Standards Institute
  - (e) ASME - American Society of Mechanical Engineers
  - (f) ASTM - American Society for Testing and Materials
  - (g) AWMAC - Architectural Woodwork Manufacturers Association of Canada
  - (h) AWWA - American Wire Producers Association
  - (i) CaGBC - Canadian Green Building Council
  - (j) CGSB - Canadian General Standards Board
  - (k) CISC - Canadian Institute of Steel Construction
  - (l) CPCI - Canadian Prestressed Concrete Institute
  - (m) CSA - Canadian Standards Association
  - (n) CSSBI - Canadian Sheet Steel Building Institute
  - (o) CWB - Canadian Welding Bureau
  - (p) ICEA - Insulated Cable Engineers Association
  - (q) IEEE - Institute of Electrical and Electronics Engineers
  - (r) IGMAC - Insulating Glass Manufacturers Association of Canada
  - (s) LEED - Leadership in Energy and Environmental Design
  - (t) MPP - Master Painters Institute
  - (u) MSS - Manufacturers Standardization Society of the Valve and Fittings Industry
  - (v) NAAMM - National Association of Architectural Metal Manufacturers
  - (w) NEMA - National Electrical Manufacturers Association
  - (x) NFPA - National Fire Protection Association
  - (y) NHLA - National Hardwood Lumber Association
  - (z) NLGA - National Lumber Grades Authority

- (aa) SSPC - The Society for Protective Coatings
- (bb) TTMAC - Terrazzo, Tile and Marble Association of Canada
- (cc)ULC - Underwriters' Laboratories of Canada

## **1.2 Independent Inspection and Testing Agencies**

- .1 Except as otherwise specified, Owner will retain and pay for independent inspection and testing agencies to inspect, test, or perform other quality control reviews of parts of the Work.
- .2 Retain and pay for inspection and testing that is for Contractor's own quality control or is required by regulatory requirements.
- .3 Employment of inspection and testing agencies by Contractor or Owner does not relieve Contractor from responsibility to perform the Work in accordance with Contract Documents.
- .4 Allow and arrange for inspection and testing agencies to have access to the Work, including access to offsite manufacturing and fabrication plants.
- .5 For inspection and testing required by Contract Documents or by authorities having jurisdiction, provide Consultant and inspection and testing agencies with timely notification in advance of required inspection and testing.
- .6 Submit test samples required for testing.
- .7 Provide labour, Construction Equipment and temporary facilities to obtain and handle test samples on site.

## **1.3 Inspection and Testing Agency Reports**

- .1 For inspection and testing required by Contract Documents or by regulatory requirements, and performed by Contractor retained inspection and testing agencies, submit to Consultant and Owner copies of reports. Submit within five (5) days after completion of inspection and testing.
- .2 For inspection and testing performed by Owner retained inspection and testing agencies, copies of inspection and testing agency reports will be provided to Contractor.

## **1.4 Mock-Ups**

- .1 Prepare mock-ups of Work as specified in the technical Specifications. If a mock-up location is not indicated in the Drawings or Specifications, locate where directed by Consultant.
- .2 Modify mock-up as required until Consultant approval is obtained.
- .3 Approved mock-ups establish an acceptable standard for the Work.
- .4 Protect mock-ups from damage until the Work they represent is complete.
- .5 Unless otherwise specified in the technical Specifications, approved mock-ups forming part of the Work may remain as part of the Work.
- .6 Remove mock-ups only when the Work they represent is complete or when otherwise directed by Consultant.

**End of Section**

## **TEMPORARY UTILITIES**

### **01 51 00**

#### **1 GENERAL**

##### **1.1 Existing Building Heating, Ventilation, Power, and Lighting**

- .1 Existing building heating, ventilation, power, and lighting may be relied upon and used during construction .
- .2 Coordinate and make arrangements with the building operator and pay any costs required.
- .3 Connect to and use Owner's existing electrical supply for temporary use during construction. Reimburse Owner's utility costs based on metered usage. Install a sub-meter for this purpose at Contractor's cost.
- .4 Provide temporary protection to prevent dust, drywall dust, and other particulate matter from entering a return duct system that forms part of a recirculating air handling system.
- .5 Do not use the building ventilation system to exhaust fumes, vapours, gases and other noxious into a return duct system that forms part of a recirculating air handling system.
- .6 Do not use the building ventilation system to exhaust hazardous gases or vapours, including but not limited to combustible or flammable vapours, toxic gases, or volatile substances, unless the exhaust system is designed and operated to exhaust such contaminants.

**End of Section**

## **COMMON PRODUCT REQUIREMENTS**

### **01 61 00**

#### **1 GENERAL**

##### **1.1 Common Product Requirements - General**

- .1 Provide Products that are not damaged or defective, and suitable for purpose intended, subject to specified requirements. If requested by Consultant, furnish evidence as to type, source and quality of Products provided.
- .2 Unless otherwise specified, maintain uniformity of manufacture for like items throughout.
- .3 Permanent manufacturer's markings, labels, trademarks, and nameplates on Products are not acceptable in prominent locations, except where required by regulatory requirements or for operating instructions, or when located in mechanical or electrical service rooms or where products are otherwise concealed from view.

##### **1.2 Product Options**

- .1 Subject to the provisions of Section 01 25 00 -Substitution Procedures:
  - .1 wherever a Product or manufacturer is specified by a single proprietary name, provide the named Product only,
  - .2 wherever more than one Product or manufacturer is specified by proprietary name for a single application, provide any one of the named Products.
- .2 Wherever a Product is specified by reference to a standard only, provide any Product that meets or exceeds the specified standard. If requested by Consultant, submit information verifying that the proposed Product meets or exceeds the specified standard.
- .3 Wherever a Product is specified by descriptive or performance requirements only, provide any Product that meets or exceeds the specified requirements. If requested by Consultant, submit information verifying that the proposed Product meets or exceeds the specified requirements.

##### **1.3 Product Availability and Delivery Times**

- .1 Promptly upon Contract award and periodically during construction, review and confirm Product availability and delivery times. Order Products in sufficient time to meet the construction progress schedule and the Contract Time.
- .2 If a specified Product is no longer available, promptly notify Consultant. Consultant will take action as required.
- .3 If delivery delays are foreseeable, for any reason, promptly notify Consultant.
- .4 If a delivery delay is beyond Contractor's control, Consultant will provide direction.
- .5 If a delivery delay is caused by something that was or is within Contractor's control, Contractor shall propose actions to maintain the construction progress schedule for Consultant's review and acceptance.

##### **1.4 Storage, Handling, and Protection**

- .1 Store, handle, and protect Products during transportation to Place of the Work and before, during, and after installation in a manner to prevent damage, adulteration, deterioration and soiling.
- .2 Comply with manufacturer's instructions for storage, handling and protection.
- .3 Store packaged or bundled Products in original and undamaged condition with manufacturer's seals and labels intact. Do not remove from packaging or bundling until required in Work.



- .4 Comply with the requirements of the workplace hazardous materials information system (WHMIS) regarding use, handling, storage, and disposal of hazardous materials, including requirements for labeling and the provision of material safety data sheets (MSDS).
- .5 Store Products subject to damage from weather in weatherproof enclosures.
- .6 Store sheet Products on flat, solid, supports and keep clear of ground. Slope to shed moisture.
- .7 Remove and replace damaged Products.

**End of Section**

## **EXAMINATION AND PREPARATION**

### **01 71 00**

#### **1 GENERAL**

##### **1.1 Surveyor Qualifications**

- .1 Engage a registered land surveyor, licensed to practice in Place of the Work.

##### **1.2 Submittals**

- .1 Submit name and address of registered land surveyor performing survey work.
- .2 Submit to Owner and Consultant the survey of the Work prepared and issued by a registered land surveyor as required by authorities having jurisdiction and on completion of the Work.

##### **1.3 Survey Reference Points**

- .1 Locate and confirm permanent reference points prior to starting site work. Preserve and protect permanent reference points on site during construction.
- .2 Do not change or relocate reference points without prior written notice to Consultant.
- .3 Report to Consultant when a reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations. Require registered land surveyor to replace reference points in accordance with original survey.

##### **1.4 Survey Requirements**

- .1 Establish sufficient permanent benchmarks on site, referenced to established benchmarks by survey control points.
- .2 Confirm that existing survey reference points are in accordance with Owner's survey and property limits.
- .3 Establish initial lines and levels for building layout.
- .4 Maintain a complete, accurate log of control and survey work as it progresses. Record locations with horizontal and vertical data in project record documents.

##### **1.5 Existing Utilities**

- .1 Before commencing excavation, drilling or other earthwork, establish or confirm location and extent of all existing underground utilities and structures in work area.
- .2 Promptly notify Consultant if underground utilities, structures, or their locations differ from those indicated in Contract Documents or in available project information.
- .3 Consultant will provide appropriate direction.
- .4 Record locations of maintained, re-routed and abandoned utility lines.

**End of Section**

## **EXECUTION**

### **01 73 00**

## **1 GENERAL**

### **1.1 Summary**

- .1 Except where otherwise specified in technical Specifications or otherwise indicated on Drawings, comply with requirements of this Section.

### **1.2 Manufacturer's Instructions**

- .1 Install, erect, or apply Products in strict accordance with manufacturer's instructions.
- .2 Notify Consultant, in writing, of conflicts between Contract Documents and manufacturer's instructions where, in Contractor's opinion, conformance with Contract Documents instead of the manufacturer's instructions may be detrimental to the Work or may jeopardize the manufacturer's warranty.
- .3 Do not rely on labels or enclosures provided with Products. Obtain written instructions directly from manufacturers.
- .4 Provide manufacturer's representatives with access to the Work at all times. Render assistance and facilities for such access so that manufacturer's representatives may properly perform their responsibilities.

### **1.3 Concealment**

- .1 Conceal pipes, ducts, and wiring in floors, walls and ceilings in finished areas:
  - .1 after review by Consultant (except where the Consultant declines to review any particular portion of the Work),
  - .2 after inspection by authority having jurisdiction, and
  - .3 where locations differ from those shown on Drawings, after recording actual locations on as-built drawings.
- .2 Provide incidental furring or other enclosures as required.
- .3 Notify Consultant in writing of interferences before installation.

### **1.4 Fastenings - General**

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials.
- .2 Prevent electrolytic action and corrosion between dissimilar metals and materials by using suitable non-metallic strips, washers, sleeves, or other permanent separators to avoid direct contact.
- .3 Use non-corrosive fasteners and anchors for securing exterior work and in spaces where high humidity levels are anticipated.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Do not use fastenings or fastening methods that may cause spalling or cracking of material to which anchorage is made.

### **1.5 Fastenings - Equipment**

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Bolts shall not project more than one diameter beyond nuts.

**1.6 Fire Rated Assemblies**

- .1 When penetrating fire rated walls, ceiling, or floor assemblies, completely seal voids with fire-stopping materials, smoke seals, or both, in full thickness of the construction element as required to maintain the integrity of the fire rated assembly.

**1.7 Demolition, Storage, and Removal of Materials**

- .1 Demolish obsolete work and prepare existing areas ready for new Work.
- .2 Demolished materials, unless otherwise specified to be relocated or retained and handed over to Owner, will become the property of Contractor and are to be removed from site.
- .3 Store items and materials retained by Owner in location directed by Owner.

**1.8 Location of Fixtures, Outlets and Devices**

- .1 Consider location of fixtures, outlets, and devices indicated on Drawings as approximate.
- .2 Locate fixtures, outlets, and devices to provide minimum interference, maximum usable space, and as required to meet safety, access, maintenance, acoustic, and regulatory, including barrier free, requirements.
- .3 Promptly notify Consultant in writing of conflicting installation requirements for fixtures, outlets, and devices. If requested, indicate proposed locations and obtain approval for actual locations.

**1.9 Verification of Existing Conditions**

- .1 Where work specified in any Section is dependent on the work of another Section or Sections having been properly completed, verify that work is complete and in a condition suitable to receive the subsequent work. Commencement of work of a Section that is dependent on the work of another Section or Sections having been properly completed, means acceptance of the existing conditions.
- .2 Verify that ambient conditions are suitable before commencing the work of any Section and will remain suitable for as long as required for proper setting, curing, or drying of Products used.
- .3 Ensure that substrate surfaces are clean, dimensionally stable, cured and free of contaminants.
- .4 Notify Consultant in writing of unacceptable conditions.

**1.10 Protection of Completed Work and Work in Progress**

- .1 Adequately protect parts of the Work completed and in progress from any kind of damage.
- .2 Promptly remove, replace, clean, or repair, as directed by Consultant, work damaged as a result of inadequate protection.
- .3 Do not load or permit to be loaded any part of the Work with a weight or force that will endanger the safety or integrity of the Work.

**1.11 Remedial Work**

- .1 Notify Consultant of, and perform remedial work required to, repair or replace defective or unacceptable work. Ensure that properly qualified workers perform remedial work. Coordinate adjacent affected work as required.

**2 WORK IN EXISTING BUILDINGS****2.1 General**

- .1 This Work includes substantial interior renovation work to the extent as shown on Drawings, and specified. Such work to be carried out in accordance with Specification and best industry practice.

- .2 Condition of areas of existing building to be ascertained at time of tendering by inspection of premises.
- .3 Where piece of equipment, items, or material, is indicated to be removed, relocated, or is required to be temporarily removed and reinstalled, the respective trade subcontractor's shall remove, relocate, or temporarily remove and reinstall equipment, item or material.
- .4 Separate exterior access, work and storage areas from Owner occupied existing areas, with fencing and hoarding. Rearrange fencing/hoarding as Work progresses to suit extent and configuration of the Work.

## **2.2 Coordination of Work in Existing Facilities**

- .1 It is essential that on-going operations of Owner be maintained with minimal disruption during period of new construction, renovations, and alterations to existing building.
- .2 Co-operate fully with other contractors on Work and proceed with this work as rapidly as job conditions permit.
- .3 Supply items to be built-in, in ample time to be incorporated into work of other trades, together with measurements, templates, or dimensioned sketches.

## **2.3 Protection of Existing Buildings**

- .1 Document condition of the existing building in areas immediately adjacent to the Place of the Work by means of construction photographs.
- .2 Protect existing work from damage. Make good any damage caused. The onus is on the Contractor to substantiate that damage existed prior to commencement of the Work.
- .3 Do not overload the existing structure due to the Work.
- .4 Take special measures to protect existing work from damage when moving heavy loads or equipment. Protect areas used as passageways or through which materials are moved. Use resilient tired conveyances only when moving materials and equipment inside building. Provide coverings as required to protect existing work from damage.
- .5 Protect existing building components and contents from damage by weather, when executing Work affecting integrity of the building envelope.
- .6 Protect existing occupied areas from exposure to construction in progress. Cover glazing with 15 mm (5/8 in,) gypsum board on suitable framing for duration of construction.
- .7 Make good existing building components and contents damaged by weather resulting from inadequate temporary protection measures.
- .8 Where existing exterior and interior doors are used on a daily basis for the transport of materials and equipment, or for dedicated access for construction workers, temporarily remove existing doors and install temporary solid-core wood doors or hollow steel doors. At completion of the Work, reinstall existing doors and make-good any damage to door frames.

## **2.4 Finishes or Materials Altered During the Course of the Work**

- .1 Make-good finishes or materials altered as part of the Work, and refinish to match existing quality and appearance to the satisfaction of Consultant. Repaired, replaced and/or refinished finishes or materials shall not be discernible from existing materials or finishes when judged by Consultant from a viewing distance of 1800 mm (6').

**End of Section**

## **CUTTING AND PATCHING**

### **01 73 29**

#### **1 GENERAL**

##### **1.1 Request for Cutting, Patching and Remedial Work**

- .1 Submit written request in advance of cutting, coring, or alteration which affects or is likely to affect:
  - .1 structural integrity of any element of the Work,
  - .2 integrity of weather-exposed or moisture-resistant elements,
  - .3 efficiency, maintenance, or safety of any operational element,
  - .4 visual qualities of sight-exposed elements,
  - .5 Work of Owner or other contractors,
  - .6 warranty of Products affected.
- .2 Include in request:
  - .1 identification of Project,
  - .2 location and description of affected work, including drawings or sketches as required,
  - .3 statement on necessity for cutting or alteration,
  - .4 description of proposed work, and Products to be used,
  - .5 alternatives to cutting and patching,
  - .6 effect on work of Owner or other contractors,
  - .7 written permission of affected other contractors,
  - .8 date and time work will be executed.

##### **1.2 Products**

- .1 Unless otherwise specified, when replacing existing building elements or previously installed Products in the course of cutting and patching work, use replacement Products of the same character and quality as those being replaced.
- .2 If an existing or previously installed Product must be replaced with a different Product, submit request for substitution in accordance with Section 01 25 00 - *Substitution Procedures*.

##### **1.3 Preparation**

- .1 Inspect existing conditions in accordance with Section 01 71 00 - *Examination and Preparation*.
- .2 Provide supports to ensure structural integrity of surroundings; provide devices and methods to protect other portions of the Work from damage.
- .3 Provide protection from elements for areas that may be exposed by uncovering work.

##### **1.4 Existing Utilities**

- .1 When breaking into or connecting to existing services' utilities, execute the Work at times directed by local governing authorities, with a minimum of disturbance to the Work, pedestrian and vehicular traffic, and ongoing Owner operations.
- .2 Maintain excavations free of water.
- .3 Keep duration of interruptions to a minimum.

- .4 Carry out interruptions after regular working hours of occupants, preferably on weekends, unless Owner's prior written approval is obtained.
- .5 Protect and maintain existing active services. Record location of services, including depth, on as-built drawings.
- .6 Construct or erect barriers in accordance with Section 01 56 00 - *Temporary Barriers and Enclosures* as required to protect pedestrian and vehicular traffic.

### **1.5 Cutting, Patching, and Remedial Work**

- .1 Coordinate and perform the Work to ensure that cutting and patching work is kept to a minimum.
- .2 Perform cutting, fitting, patching, and remedial work including excavation and fill, to make the affected parts of the Work come together properly and complete the Work.
- .3 Provide openings in non-structural elements of the Work for penetrations of mechanical and electrical work;
- .4 Each trade subcontractor is responsible for laying out required holes in partitions, roofs, smoke curtains, metal deck or siding and for providing sleeving, fireproofing, and smoke-stopping.
- .5 Where openings are to be made in finished work, accurately saw-cut floors, walls and ceilings. Provide holes and openings no larger than necessary to minimize damage. Core drill circular holes in concrete. Accurately cut new openings for electrical outlets and other recessed items in walls.
- .6 Where holes are to be cut through exterior walls, roofs, and metal deck, closure to be maintained until after equipment/duct or pipe is in place to minimize rain entering building.
- .7 Provide temporary supports during cutting and coring.
- .8 Provide for removal and reinstallation of accessible ceilings in existing buildings to accommodate the Work of building services.
- .9 Perform cutting by methods to avoid damage to other work.
- .10 Provide proper surfaces to receive patching, remedial work, and finishing.
- .11 Perform cutting, patching, and remedial work using competent and qualified specialists familiar with the Products affected, in a manner that neither damages nor endangers the Work.
- .12 Do not use pneumatic or impact tools without Consultant's prior approval.
- .13 Ensure that cutting, patching, and remedial work does not jeopardize manufacturers' warranties.
- .14 Refinish surfaces to match adjacent finishes. For continuous surfaces refinish to nearest intersection. For an assembly, refinish entire unit.
- .15 Fit work to pipes, sleeves, ducts, conduit, and other penetrations through surfaces with suitable allowance for deflection, expansion, contraction, acoustic isolation, and firestopping.
- .16 Maintain fire ratings of fire rated assemblies where cutting, patching, or remedial work is performed. Completely seal voids or penetrations of assembly with firestopping material to full depth or with suitably rated devices.

**End of Section**

## **CLEANING AND WASTE MANAGEMENT**

### **01 74 00**

#### **1 GENERAL**

##### **1.1 Regulatory Requirements**

- .1 Comply with applicable regulatory requirements when disposing of waste materials.
- .2 Obtain permits from authorities having jurisdiction and pay disposal fees where required for disposal of waste materials and recyclables.
- .3 Collect waste materials and separate into appropriate recyclable materials for collection as a recoverable resource.

##### **1.2 General Cleaning Requirements**

- .1 Provide adequate ventilation during use of volatile or noxious substances. Do not rely on building ventilation systems for this purpose.
- .2 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .3 Prevent cross-contamination during the cleaning process.
- .4 Notify the Consultant of the need for cleaning caused by Owner or other contractors.

##### **1.3 Progressive Cleaning and Waste Management**

- .1 Maintain the Work in a tidy and safe condition, free from accumulation of waste materials and construction debris.
- .2 Provide appropriate, clearly marked, containers for collection of waste materials and recyclables. Locate containers as necessary to suit the progress of the work, and where otherwise indicated on Drawings.
- .3 Remove waste materials and recyclables from work areas, separate, and deposit in designated containers at end of each Working Day. Collect packaging materials for recycling or reuse.
- .4 Remove waste materials and recyclables from Place of the Work at regular intervals.
- .5 Clean interior building areas prior to start of finish work and maintain free of dust and other contaminants during finishing operations.
- .6 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly finished surfaces nor contaminate building systems.

##### **1.4 Final Cleaning**

- .1 Before final cleaning, arrange a meeting at Place of the Work to determine the acceptable standard of cleaning. Ensure that Owner, Consultant, Contractor and cleaning company are in attendance.
- .2 Remove from Place of the Work surplus Products, waste materials, recyclables, Temporary Work, and Construction Equipment not required to perform any remaining work.
- .3 Provide professional cleaning by a qualified, established cleaning company.
- .4 Lock or otherwise restrict access to each room or area after completing final cleaning in that area.
- .5 Re-clean as necessary areas that have been accessed by Contractor's workers prior to Owner occupancy.



- .6 Remove stains, spots, marks, and dirt from finished surfaces, electrical and mechanical fixtures, furniture fitments, walls, and floors.
- .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and all other finished surfaces, including mechanical and electrical fixtures. Replace broken, scratched or otherwise damaged glass.
- .8 Remove dust from lighting reflectors, lenses, lamps, bulbs, and other lighting surfaces.
- .9 Vacuum clean and dust exposed wall, floor, and ceiling surfaces, behind grilles, louvres and screens .
- .10 Clean mechanical, electrical, and other equipment. Replace filters for mechanical equipment if equipment is used during construction.
- .11 Remove waste material and debris from crawlspaces and other accessible concealed spaces.
- .12 Remove stains, spots, marks, and dirt from exterior facades.
- .13 Clean exterior and interior window glass and frames.
- .14 Clean and sweep roofs, clear roof drains, clean gutters and downspouts, and sunken wells,
- .15 Sweep clean and power wash new exterior sidewalks, steps, driveways, roads, parking lots, and other paved surfaces.
- .16 Remove snow and ice from new exterior sidewalks, steps, driveways, roads, parking lots, and other paved surfaces.
- .17 Use leaf blowers to clean landscaped surfaces.

#### **1.5 Waste Management and Disposal**

- .1 Dispose of waste materials and recyclables at appropriate municipal landfills and recycling facilities in accordance with applicable regulatory requirements.
- .2 Do not burn or bury waste materials at Place of the Work.
- .3 Do not dispose of volatile and other liquid waste such as mineral spirits, oil, paints and other coating materials, paint thinners, cleaners, and similar materials together with dry waste materials or on the ground, in waterways, or in storm or sanitary sewers. Collect such waste materials in appropriate covered containers, promptly remove from Place of the Work, and dispose of at recycling facilities or as otherwise permitted by applicable regulatory requirements.
- .4 Cover or wet down dry waste materials to prevent blowing dust and debris.

**End of Section**

## **STARTING, ADJUSTING AND TESTING**

### **01 75 00**

#### **1 CHECKOUT**

- .1 Conduct visual inspection of equipment and systems to verify that their installation is complete in accordance with the Contract Documents and manufacturer installation requirements.
- .2 Confirm that temporary fixtures and fittings have been removed, including shipping straps and hold-down bolts, before equipment is started. Confirm all required equipment guards and other safety features are installed before starting the equipment.
- .3 Where the manufacturer includes a written pre-start checklist, include a copy of the completed checklist with the operating and maintenance manuals.

#### **2 STARTING OF EQUIPMENT AND SYSTEMS**

- .1 Arrange and pay for services of manufacturer's factory service technician to supervise start-up of the installation, check, adjust, balance and calibrate components and equipment as further specified in the technical Specifications.
- .2 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with every aspect of the operation, care and maintenance thereof.
- .3 Arrange and pay for services of applicable manufacturer's factory service engineer or certified independent testing organization to supervise initial start-up of specialized portions of installation and to check, adjust, balance and calibrate components including related wiring and controls. Provide these services for such periods, and for as many visits as may be necessary to put applicable portion of the installation in complete working order. Provide a certificate indicating that the equipment is free and clear of deficiencies.
- .4 Assume responsibility for startup and operation of equipment until the Work or portion of the Work has been taken over by the Owner.

#### **3 TESTING OF EQUIPEMENT AND SYSTEMS**

- .1 Conduct testing of equipment and systems in accordance with the following general requirements and as further defined in the technical Specifications.
- .2 Conduct tests during progress of Work and at its completion to show equipment and systems meet the contract documents. When requested by Consultant, submit details of test methods in writing and obtain approval from Consultant before commencing work.
- .3 Supply test equipment, apparatus, gauges, meters and data recorders, together with skilled personnel to perform tests and log results.
- .4 Submit written notice 24 hours in advance of each test series unless other notice period is agreed, setting out the time, place and nature of the tests, to the Inspection Authority and personnel witnessing tests.
- .5 The Owner reserves the right to witness any test; any such witnessing activity shall not be construed as acceptance of the system or equipment by the Owner.
- .6 Conduct tests before application of any material that would otherwise conceal the equipment being tested.
- .7 Upon completion of work and testing of same, submit record logs to demonstrate that tests have been carried out satisfactorily. Repeat any tests if requested.

#### **4 ADJUSTMENT OF EQUIPMENT AND SYSTEMS**

- .1 Make adjustments to equipment as recommended by the manufacturer instructions and normal construction practices, to setup the equipment to operate in the intended state based on the results of the checkout inspection and testing results.

#### **5 TEMPORARY AND TRIAL USAGE**

- .1 Temporary and trial usage by Owner of any device, machinery, apparatus, equipment or any other work or materials before final completion and written acceptance is not to be construed as evidence of acceptance by Owner.
- .2 Owner shall have the privilege of such temporary and trial usage, as soon as that said work is claimed by Contractor to be completed and in accordance with the Contract Documents, for such reasonable length of time as is required to allow Owner to evaluate the performance of the equipment or system.
- .3 No claims will be considered for damage to or failure of any parts of such work so used which may be discovered during temporary and trial usage, whether caused by weakness or inaccuracy of structural parts or by defective materials or workmanship of any kind whatsoever.
- .4 Defects in workmanship and materials identified during temporary and trial usage are to be rectified under warranty.

**End of Section**

## **TESTING OF INTEGRATED FIRE PROTECTION AND LIFE SAFETY SYSTEMS**

### **01 75 11**

#### **1 GENERAL**

##### **1.1 Scope**

- .1 Provide testing of integrated fire protection and life safety systems and related equipment in accordance with CAN/ULC-S1001 except as modified in accordance with this specification section.
- .2 This specification is limited to testing of the interconnections between life safety and/or fire protection systems. Refer to separate technical specification sections for the individual testing and commissioning requirements for those systems.

##### **1.2 Related Sections**

- .1 Without limiting the scope of work or applicability of other specification sections, the work under this section directly integrates with or refers to the following specification sections:
  - .1 01 91 00 General Commissioning Requirements

##### **1.3 Definitions and Abbreviations**

- .1 The following definitions apply to this section.
  - .1 **Integrated testing coordinator\*** – The person, firm, corporation, or organization responsible for the development and implementation of the integrated testing plan. Where a firm, corporation, or organization is responsible for integrated fire protection and life safety systems testing, a representative of that firm, corporation, or organization shall be designated as the integrated testing coordinator. (\*as defined in CAN/ULC-S1001)
  - .2 **Integrated test plan\*** – A written specific document, prepared by the ITC, outlining the required tests and necessary functional results to conduct integrated fire protection and life safety systems testing. (\*as defined in CAN/ULC-S1001).
- .2 Abbreviations:
  - .1 **ITC** – Integrated testing coordinator.
  - .2 **FPLS** – Fire protection and life safety systems.

##### **1.4 Applicable Codes and Standards**

- .1 Installation codes and standards:
  - .1 CAN/ULC-S1001 Integrated Systems Testing of Fire Protection and Life Safety Systems

##### **1.5 Qualified Tradesperson**

- .1 Work to be performed by qualified, licensed and recognized firm with an established reputation in this field, using tradesperson holding applicable certificates of competency. The firm and its employees providing the ITC services shall be certified under the ULC-S1001 *Certification of Integrated Testing Service Providers* program.

##### **1.6 Submittals**

- .1 Submit the integrated test plan for review by the Consultant at least thirty (30) days prior to commencement of the first system integration test. The integrated test plan shall comply with the requirements of ULC-S1001 and as specified herein.

## **2 PRODUCTS**

- .1 Not used.

## **3 EXECUTION**

### **3.1 General Requirements**

- .1 Notwithstanding the preface to CAN/ULC-S1001, be responsible for the procurement, including selection, payment and management, of the ITC company or personnel. ITC personnel may be a direct employee of the General Contractor or Construction Manager as applicable.
- .2 Include all labor and material as required to manage, develop and implement the integrated fire protection and life safety testing process.
- .3 Coordinate and jointly prepare with the applicable trade contractors whose equipment or systems are subject to the testing under this specification section, to conduct complete and thorough testing and documentation of the systems interface and integration between various FPLS systems provided under those Divisions.
- .4 The applicable Divisions of the Work that are subject to the FPLS integration testing are:
  - .1 Division 08 Automatic fire shutters and fire doors
  - .2 Division 11 Kitchen grease hood and fire extinguishing systems
  - .3 Division 14 Vertical transportation
  - .4 Division 21 Fire protection systems, including fire pumps and water supplies
  - .5 Division 23 Smoke dampers, motorized fire dampers, smoke control and smoke venting equipment, fuel gas and liquid fuel safety interlocks, fuel systems for emergency generators, fire or explosion risk reduction control systems, freeze protection systems (for water-based fire protection piping)
  - .6 Division 25 Smoke control systems, smoke venting systems
  - .7 Division 26 Emergency power distribution systems, emergency lighting control systems
  - .8 Division 27 Audio-visual systems (where forming part of a notification system)
  - .9 Division 28 Fire alarm systems, smoke alarm systems, security systems, notification systems, door hold-open devices, magnetic door lock devices, hazardous protection monitoring
- .5 The testing requirements specified under this section are the minimum required for the purpose of obtaining an occupancy permit, and the successful completion of this testing program is a condition precedent for obtaining substantial performance/completion of the Work.
- .6 Where the project includes a commissioning program, the testing requirements under this specification section may be incorporated into the commissioning program, subject to meeting the preceding requirements concerning occupancy permit and substantial performance/completion of the Work.

### **3.2 Integrated Test Plan - Development**

- .1 Develop the integrated test plan as described in section 5 of CAN/ULC-S1001, including but not limited to the following elements:
  - .1 coordinate with and obtain from the applicable Consultants the required information concerning the design performance criteria for the integration of FPLS equipment and systems, including
    - (a) building floor plans,

- (b) control sequences between separate systems,
- (c) mechanical and electrical riser diagrams (if applicable),
- .2 obtain manufacturer's operating and testing instructions from the applicable trade contractors,
- .3 obtain any applicable alternate solutions to prescribed requirements of Code and Standards, from the applicable Consultant.
- .2 Prepare the integrated testing plan, which is to include, but is not limited to, the following elements:
  - .1 the functional objectives of the various system integrations,
  - .2 the sequence of operation of the integration elements of the FPLS systems including;
    - (a) operation under normal operating conditions,
    - (b) operation under fire conditions,
  - .3 a procedure for notifying occupants of integrated systems testing,
  - .4 safety management procedures, such as safety protocols and notifications, for ensuring occupant and worker safety during integrated system testing,
  - .5 where a building is to be tested in phases, additional procedure requirements for
    - (a) testing of each area in the building, with consideration that such areas will need to be tested at different points in time to support staged occupancy permits, and
    - (b) testing of the entire building once all stage areas are completed, including if any or all areas are concurrently occupied for any final testing.
- .3 Include as appendices or as a separate volume, the test procedure for each system-to-system integration test. Organize the test procedures into separate sections for each system-to-system integration test.
- .4 Include in the test plan a workflow diagram that illustrates dependencies between systems, to clearly identify predecessor and successor relationships between the various systems.
- .5 Include a testing schedule that coordinates and integrates with the overall construction schedule, identifying key dates where other parties may participate in witnessing any of the tests.
- .6 Submit a completed draft of the test plan for review by the Consultant(s). After review by the Consultant(s) and any required modifications made to the test plan, provide a revised draft of the test plan to the applicable authority having jurisdiction (as a minimum, this is the building department and the fire department).
- .7 Where revisions are made to the design of FPLS equipment or systems that impact the integration of those systems, update the integrated test plan and submit to the Consultant for review prior to its use.

### **3.3 Test Procedures**

- .1 At a minimum, develop test procedures and test forms in accordance with the requirements of section 6 and section 7 of CAN/ULC-S1001 and as specified herein or as specified in technical Division specifications.
- .2 Test procedures shall test the functional operation of the device or system, except simulation may be used tests would;
  - .1 involve activation of non-resettable devices to demonstrate the integration functions,
  - .2 result in harm to persons or damage to a device, system or a building.
- .3 Where acceptance testing of two or more FPLS systems include verifying of the integration between those systems in accordance with required codes and standards (such as between a fire alarm system and a sprinkler or standpipe system), then documented test reports demonstrating the efficacy of such integration will be considered as meeting the requirements of this specification section, subject to approval by the Consultant.

### **3.4 Integrated Test Plan - Implementation**

- .1 Implement the FPLS integrated testing program in accordance with section 6 and section 7 of CAN/ULC-S1001 requirements. Before commencing any test, **obtain** the required documentation regarding completed installation verification, acceptance testing, notifications, and any applicable authority inspections of individual FPLS equipment and systems.
- .2 Provide notification of the testing schedule to the applicable authorities having jurisdiction and invite their participation in any test.
- .3 Provide any temporary installation measures, including wiring-jumpers, control open-circuits, or other temporary measures required for any test. If temporary measures are used, create a log report identifying each temporary measure, and the date they were installed, and for which integration test they are provided.
- .4 If, during testing, there is a defect or failure of the integration element, correct the defect and retest the affected integration element or system. Record on the test report forms the occurrence of the defect, the date and how the defect was corrected, and re-test date.
- .5 After the successful completion of integrated FPLS testing, return all systems to their normal operating state. If temporary measures were used, remove all such devices and return the system to their normal operating condition. Update the temporary measure log report to include date the temporary devices were removed, and include this log report in the final test report.

### **3.5 Final Test Results Report**

- .1 Upon successful completion of the integrated FPLS systems testing, submit a final test report in accordance with section 7 of CAN/ULC-S1001, including
  - .1 the integrated testing plan,
  - .2 initial integration testing forms, filled-in with test results,
  - .3 re-test integration testing forms (if required), and
  - .4 supporting pre-integration testing verification documentation of applicable systems.
- .2 Submit copies of the final report as follows:
  - .1 one (1) hard-copy to each applicable authority having jurisdiction,
  - .2 one (1) hard-copy and one (1) PDF copy to the Consultant,
  - .3 two (2) hard-copies and two (2) PDF copies on separate portable media devices to the Owner.
- .3 In addition, provide one copy of the test plan and test procedures, unmarked, in PDF format to the Owner. Ownership and copyright of the unmarked test plan and procedures shall remain vested with the author of those documents; provide the Owner with a non-exclusive, transferrable, royalty-free license to reproduce and use these documents for the sole purpose of allowing the Owner to retest these systems in the future.

### **3.6 Demonstration and Training**

- .1 Demonstrate the operation of, and providing training on, the integration of FPLS systems to the Owners operations staff in accordance with the requirements of Division 1, the applicable technical specification sections, and as follows:
  - .1 the function of the integration,
  - .2 the method of integration – hardwired, network communication, operating protocols,
  - .3 the type of information – data, commands, monitoring,
  - .4 any temporary measures to be taken to retest in the future.

- .2 Document this training information and provide two (2) copies in PDF format on two separate removable media devices.

### **3.7 Schedules**

- .1 Schedule A – General Requirements for Testing Procedures.



## 4 SCHEDULE A

### SUMMARY OF FPLS SYSTEM INTEGRATION

#### 4.1 General

.1 This Schedule A summarizes the integration between various FPLS systems applicable to the project.

Originating System		Receiving System		
ULC-S1001 Section	Originating System	ULC-S1001 Section	Receiving System	Function
6.2	Fire Alarm	6.7	Notification	Audible/visual notification of fire condition
6.2	Fire Alarm	6.18	Building Automation Control	Fire alarm stage notification, Fire zone notification
6.5	Emergency Generators	6.2	Fire Alarm	Generator trouble and alarm conditions
6.5	Emergency Generators	6.4	Elevators	
6.5	Emergency Generators	6.6	Emergency Lighting	Emergency lights are functional on loss of power
6.5	Emergency Generators	6.10	Fire Pumps	Emergency power transfers to fire pumps
6.8	Automatic Sprinklers	6.2	Fire Alarm	Flow, pressure, and valve position trouble and alarm conditions [Note 1]
6.9	Standpipe	6.2	Fire Alarm	Flow, pressure, and valve position trouble and alarm conditions [Note 1]
6.18	Building Automation System	---	Smoke and Motorized Fire Dampers	Where controlled by the FAS
6.18	Building Automation System	6.18	Fire Fighters Smoke Control Station	Confirmation of fan and damper correction operating condition.

**Notes:**

[1] Separate integration testing is not required where such testing is included as part of fire alarm verification in accordance with CAN/ULC-S537 Verification of Fire Alarm Systems

**END OF SCHEDULE "A"**

**End of Section**

## **CLOSEOUT PROCEDURES**

### **01 77 00**

#### **1 GENERAL**

##### **1.1 Ready-for-Takeover**

- .1 The prerequisites to attaining Ready-for-Takeover of the Work are described in the General Conditions of the Contract.

##### **1.2 Inspection and Review Before Ready-For-Takeover**

- .1 Contractor's Inspection: Before applying for the Consultant's review to establish Ready-for-Takeover of the Work:
  - .1 ensure that the specified prerequisites to Ready-for-Takeover of the Work are completed,
  - .2 conduct an inspection of the Work to identify defective, deficient, or incomplete work,
  - .3 prepare a comprehensive and detailed list of items to be completed or corrected,
  - .4 provide an anticipated schedule and costs for items to be completed or corrected.
- .2 Consultant's Review:
  - .1 Upon receipt of the Contractor's application for review, together with the Contractor's list of items to be completed or corrected, the Consultant will review the Work.
  - .2 The Consultant will advise the Contractor whether or not the Work is Ready-for-Takeover and will provide the Contractor with a list of items, if any, to be added to the Contractor's list of items to be completed or corrected.
  - .3 Contractor to provide the Consultant with a copy of the Contractor's revised list.
- .3 Maintain the list of items to be completed or corrected and promptly correct or complete defective, deficient and incomplete work. The Contractor's inspection and Consultant's review procedures specified above shall be repeated until the Work is Ready-for-Takeover and no items remain on the Contractor's list of items to be completed or corrected.
- .4 When the Consultant determines that the Work is Ready-for-Takeover, the Consultant will notify the Contractor and the Owner in writing to that effect.

##### **1.3 Prerequisites to Final Payment**

- .1 After Ready-for-Takeover of the Work and before submitting an application for final payment in accordance with the General Conditions of Contract:
  - .1 correct or complete all remaining defective, deficient, and incomplete work,
  - .2 remove from the Place of the Work all remaining surplus Products, Construction Equipment, and Temporary Work,
  - .3 perform final cleaning and waste removal necessitated by the Contractor's work performed after Ready-for-Takeover, as specified in Section 01 74 00 - Cleaning and Waste Management.

##### **1.4 Partial User Occupancy**

- .1 If partial Owner occupancy of a part of the Work is required before the date of Ready-for-Takeover of the entire Work of the Contract, the provisions of this Section shall apply, to the extent applicable, to that part of the Work that the Owner intends to occupy.

## **1.5 Substantial Performance**

- .1 The prerequisites to, and the procedures for, attaining substantial performance of the Work, or similar such milestone as provided for in the Payment Legislation applicable to the Place of the Work, shall be:
  - .1 independent of those for attaining Ready-for-Takeover of the Work, and
  - .2 in accordance with the lien legislation applicable to the Place of the Work.
- .2 Where lien legislation requires the Work to be ready for Owner's use, or similar wording, as a prerequisite for attaining Substantial Performance (in addition to any other requirement), the following prerequisites shall be met as defining the requirements for ready for Owners use:
  - .1 evidence of compliance with the requirements for occupancy or occupancy permit as prescribed by the authorities having jurisdiction,
  - .2 the delivery to the Consultant of the draft operating and maintenance manuals for review,
  - .3 make available a copy of the as-built drawings completed to date on site,
  - .4 sub-contractor installation certificates for fire protection and life-safety systems, including automatic sprinkler systems, standpipe systems, fire alarm systems, and smoke-management systems, have been issued to the Consultant or Owner,
  - .5 inspection certificates or equivalent final inspection reports issued by the authority having jurisdiction for electrical safety, plumbing, HVAC, boiler and pressure vessel safety, and elevator safety,
  - .6 startup, testing required to allow occupancy, as required by the Contract Documents,
  - .7 commissioning of the building and building systems is complete, except for those commissioning tasks that must be deferred due to weather conditions or other reasons beyond control of the Contractor and agreed to by the Owner,
  - .8 demonstration and training, as required by the Contract Documents, is scheduled by the Contractor acting reasonably.

**End of Section**

## **OPERATION AND MAINTENANCE DATA AND MATERIALS**

### **01 78 23**

#### **1 GENERAL**

##### **1.1 Summary**

- .1 Except where otherwise specified in technical Specifications, comply with requirements of this Section.

##### **1.2 Operation and Maintenance Manual**

- .1 Prepare a comprehensive operation and maintenance manual, in the language[s] of the Contract, using personnel qualified and experienced for this task.
- .2 Submit an initial draft of the operation and maintenance manual for Consultant's review. If required by Consultant's review comments, revise manual contents and resubmit for Consultant's review. If required, repeat this process until Consultant accepts the draft manual in writing.
- .3 Submit final version to Owner in hard copy and electronic format. Provide four hard copies. Provide Consultant with one electronic format copy

##### **1.3 Operation and Maintenance Manual Format**

- .1 Organize data in the form of an instructional manual.
- .2 Binders: vinyl, hard covered, three D-rings, loose leaf, 216 x 279 mm, with spine and face pockets.
- .3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.
- .4 Cover: Identify each binder with typed or printed title "Operation and Maintenance Manual", name of Project or facility, and subject matter of contents.
- .5 Arrange content by Divisions of the Work, then by systems, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate Product or system, with typed description of Product and major component parts of equipment.
- .7 Text: Manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- .9 Provide two (2) electronic copies of the manual(s) in PDF format.
- .10 Provide electronic copy of Shop Drawings in manual as PDF format on USB flash drive or other electronic media acceptable to Owner.

##### **1.4 Operation and Maintenance Manual – General Content**

- .1 Table of contents for each volume.
- .2 Introductory information including:
  - .1 Date of manual submission.
  - .2 Complete contact information for Consultant, subconsultants, other consultants, and Contractor, with names of responsible parties.
  - .3 Schedule of Products and systems indexed to content of volume.
- .3 For each Product or system, include complete contact information for Subcontractors, Suppliers and manufacturers, including local sources for supplies and replacement parts.

- .4 Product Data: mark each sheet to clearly identify specific products, options, and component parts, and data applicable to installation. Delete or strike out inapplicable information. Supplement with additional information as required.
- .5 Reviewed Shop Drawings.
- .6 Permits, certificates, letters of assurance and other relevant documents issued by or required by authorities having jurisdiction.
- .7 Warranties.
- .8 Operating and maintenance procedures, incorporating manufacturer's operating and maintenance instructions, in a logical sequence.
- .9 Training materials as specified in Section 01 79 00 - Demonstration and Training.

### **1.5 Operation and Maintenance Manual – Equipment and Systems**

- .1 Each Item of Equipment and Each System: include description of unit or system and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Panel Board Circuit Directories: provide electrical service characteristics, controls, and communications.
- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide installed control diagrams by controls manufacturer.
- .11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.
- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .14 Include testing and balancing reports.
- .15 Include additional content as specified in technical Specifications sections.

### **1.6 Operation and Maintenance Manual – Products and Finishes Content**

- .1 Include Product data, with catalogue number, options selected, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured Products.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

- .3 Include an outline of requirements for routine and special inspections and for regular maintenance to ensure that on-going performance of the building envelope will meet the initial building envelope criteria.
- .4 Include additional content as specified in technical Specifications sections.

**1.7 Operation and Maintenance Manual – Warranties Content**

- .1 Separate each warranty with index tab sheets keyed to Table of Contents listing.
- .2 List each warrantor with complete contact information.
- .3 Verify that documents are in proper form and contain full information. Ensure that warranties are for the correct duration and are in Owner's name.
- .4 Include maintenance bond(s).

**1.8 Contractor's As-Built Drawings**

- .1 Submit final as-built drawings in the form specified in Section 01 32 00 - Construction Progress Documentation to Consultant for review.
- .2 Make revisions to as-built drawings based on comments provided by Consultant, and then submit final as-built drawings to the Owner.

**1.9 Spare Parts, Maintenance Materials, and Special Tools**

- .1 Supply spare parts, maintenance materials, and special tools in quantities specified in technical Specifications sections.
- .2 Ensure spare parts and maintenance materials are new, not damaged nor defective, and of same quality, manufacturer, and batch or production run as installed Products.
- .3 Provide tags for special tools identifying their function and associated Product.
- .4 Deliver to and store items at location directed by Owner at Place of the Work. Store in original packaging with manufacturer's labels intact and in a manner to prevent damage or deterioration.
- .5 Catalogue all items and submit to Consultant an inventory listing organized by Specifications section. Include Consultant reviewed inventory listing in operation and maintenance manual.

**End of Section**

## WARRANTIES 01 78 36

### 1 GENERAL

#### 1.1 Scope

- .1 Provide warranties for the Work in accordance with the Construction Contract and as specified herein.

#### 1.2 Related Sections

- .1 Without limiting the scope of work or applicability of other specification sections, the work under this section directly integrates with or refers to the following specification sections:
  - .1 01 77 00 Closeout Procedures
  - .2 In accordance with Specification sections of Divisions 02 through 33 for additional requirements for Warranties.

#### 1.3 Definitions

- .1 **Standard Product Warranties** - are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to Owner.
- .2 **Special Warranties** - are written warranties required by or incorporated into Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

#### 1.4 Product Warranties

- .1 Provide standard product warranties for all supplied products except where additional requirements are required in the technical Specification sections.
- .2 Product warranties specified in other Specification sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- .3 Product Warranties shall be written in Owner's name.

#### 1.5 Submittals

- .1 Submit warranty information on letter-size pages, bound in three-ring binders with plastic covers. Larger sheets may be used when folded to fit into binders and used as a pull out. Prepare binder cover with title "WARRANTIES AND BONDS", and title of Project and subject matter when multiple binders are needed;
  - .1 internally subdivide binder contents with permanent page dividers, logically organized as described below; with tabs titling clearly printed under reinforced laminated plastic tabs,
  - .2 quantity: provide two copies of each volume to Owner.
- .2 In addition, provide a copy of warranties in PDF format, bookmarked to provide a similar organization as the print copies.
- .3 Submittal requirements:
  - .1 submit documents to the Owner and Consultant within ten (10) days following the date of substantial performance of the Work, but no later than the date of application for Ready-for-Takeover of the Work,

- .2 when a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with Contractor during construction period, submit properly executed warranties to the Owner within 15 days of completion of that designated portion of Work,
- .3 when a special warranty is required to be executed by Contractor, or Contractor and a Subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by required parties. Submit a draft to Owner for review.

## **1.6 Warranty Requirements**

- .1 Written warranties made to the Owner are in addition to implied warranties and shall not limit duties, obligations, right and remedies otherwise available under law, nor shall warranty periods be interpreted as limitations on time in which Owner can enforce such other duties, obligations, rights, or remedies.
- .2 Manufacturer's disclaimers and limitations on product warranties shall not relieve Contractor of warranty on Work that incorporates products, nor shall it relieve suppliers, manufacturers, and Subcontractors required to countersign special warranties with Contractor.
- .3 Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval by the Owner before final execution. For specific warranty types;
  - .1 Manufacturer's Standard Form: modified to include Project-specific information and properly executed,
  - .2 Specified Form: when specified forms are included with the Specifications, prepare a written document using appropriate form properly executed,
  - .3 refer to Divisions 2 through 48 Sections for specific content requirements and particular requirements for submitting special warranties.

## **1.7 Warranty Procedures**

- .1 In event of Work covered by warranty has failed, correct by replacement or rebuilding to an acceptable condition in compliance with requirements of the Contract Documents at no additional cost to Owner.
- .2 Related damages and losses:
  - .1 When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that needs to be removed and replaced to provide access for correction of warranted Work.
- .3 Reinstatement of warranty:
  - .1 Upon correction of failed Work under a warranty, reinstate the warranty by written endorsement. Reinstated warranty shall be equal to original warranty with an equitable adjustment for depreciation.
- .4 Replacement cost:
  - .1 Contractor shall be responsible for cost of replacing or rebuilding defective Work regardless of whether Owner has benefited from use of Work through a portion of its anticipated useful service life.

## **1.8 Warranty Start Date**

- .1 Warranties shall become valid and operative upon the later date of the issuance of the certificate of substantial performance of the Work or the ready-for-takeover date.
- .2 For items of Work delayed beyond later of the date of Substantial Performance or ready-for-takeover, provide an updated schedule within 10 days after acceptance, listing date of acceptance as start of warranty.



- .3 Where equipment was tendered separately by the Owner and assigned to the Contractor, the warranty commencement date for such equipment will commence on the same date as the commencement date of the warranty for the complete Work.

## **2 PART 2 – PRODUCTS**

- .1 Not used.

## **3 PART 3 – EXCECUTION**

- .1 Not used.

**End of Section**

## **DEMONSTRATION AND TRAINING**

### **01 79 00**

#### **1 GENERAL**

##### **1.1 Summary**

- .1 Except where otherwise specified in technical Specifications, comply with requirements of this Section.
- .2 Demonstrate and provide training to Owner's personnel on operation and maintenance of equipment and systems prior to scheduled date of Ready-for- Takeover of the Work.
- .3 Owner will provide list of personnel to receive training and will coordinate their attendance at agreed upon times.
- .4 Coordinate and schedule demonstration and training provided by Subcontractors and Suppliers.

##### **1.2 Submittals**

- .1 Submit proposed dates, times, durations, and locations for demonstration and training of each item of equipment and each system for which demonstration and training is required. Allow sufficient time for training and demonstration for each item of equipment or system, or time as may be specified in technical Specifications.
- .2 Consultant and Owner will review submittal and advise Contractor of any necessary revisions.
- .3 Submit report(s) within 5 working days after completion of demonstration and training:
  - .1 identifying time and date of each demonstration and training session,
  - .2 summarizing the demonstration and training performed, and
  - .3 including a list of attendees.
- .4 Submit video record of demonstration and training together with report.

##### **1.3 Prerequisites to Demonstration and Training**

- .1 Testing, adjusting, and balancing has been performed in accordance with Contract Documents.
- .2 Equipment and systems are fully operational.
- .3 Copy of completed operation and maintenance manual is available for use in demonstration and training.
- .4 Conditions for demonstration and training comply with requirements specified in technical Specifications.

##### **1.4 Demonstration and Training**

- .1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment and system.
- .2 Review operation and maintenance manual in detail to explain all aspects of operation and maintenance.
- .3 Prepare and insert additional information in operation and maintenance manual if required.

**End of Section**

## GENERAL COMMISSIONING REQUIREMENTS 00 91 00

### 1 GENERAL

#### 1.1 Scope

- .1 Provide commissioning of facility systems.
- .2 Commission building elements in accordance with:
  - .1 Section 20 08 15 - Mechanical Commissioning
  - .2 Section 26 08 15 - Electrical Commissioning

#### 1.2 Definitions

- .1 **Major deficiency** - an item which if not corrected renders the equipment or system unsuitable or unsafe for use by the Owner.
- .2 **Minor deficiency** - an item which does not impact on the operation of the equipment or system and will allow the Owner to use the system safely.
- .3 **Performance Test** – a written commissioning test that evaluates the operating performance of equipment or a system.
- .4 **Systems Operating Manuals** – a manual that describes the design functionality of a system, and is distinct and separate from Operating and Maintenance manuals.
- .5 **Verification** – a written commissioning inspection that evaluates the installation of equipment or a system.

#### 1.3 Commissioning Agency

- .1 Contractor shall retain and pay for a commissioning agency to provide commissioning services for the Project.

#### 1.4 Contractor Responsibilities

- .1 Prepare each system ready for commissioning. Verify systems installation is complete and in operation.
- .2 Develop and integrate commissioning activities into the construction schedule, including;
  - .1 commissioning activities for each Division of the Work,
  - .2 equipment and systems start-up predecessors,
  - .3 time periods for pre-start and start up testing, verification and performance validation testing for each equipment and system.
- .3 Coordinate and manage commissioning activities and assist commissioning agency.
- .4 Perform and document verification, performance testing, adjusting, and balancing operations.
- .5 Cooperate with commissioning agency and provide access to equipment and systems.
- .6 Provide personnel, materials, and operate systems at designated times, and under conditions required for proper commissioning.
- .7 Provide equipment, materials, and labor as necessary to correct construction and/or equipment deficiencies found during the commissioning process.
- .8 Make instruments available to commissioning agency to facilitate spot checks during commissioning.
- .9 Participate in commissioning meetings.

- .10 Complete commissioning forms including recording of results and collection of related test reports.
- .11 Correct deficiencies identified in commissioning process.
- .12 Incorporate commissioning data into operation and maintenance manual.
- .13 Ensure that commissioning agency participates in demonstration and training as specified in Section 01 79 00 - Demonstration and Training.

#### **1.5 Commissioning Agency Responsibilities**

- .1 The commissioning agency will:
  - .1 prepare a commissioning plan, including systems to be commissioned, forms, checklists and responsibilities of commissioning team members.
  - .2 implement the commissioning plan and lead the commissioning team through start-up, verification, performance testing, training, and document preparation,
  - .3 convene, chair, prepare and distribute minutes of commissioning meetings,
  - .4 monitor commissioning activities,
  - .5 make periodic site visits for the purpose of selective checking of accuracy of commissioning form submissions, selective witness testing, and review of mock-ups,
  - .6 reviews commissioning test results,
  - .7 review content of operations and maintenance manual,
  - .8 prepare the final commissioning report and make recommendations to the Owner for acceptance.
  - .9 Provide instruments necessary for commissioning.

#### **1.6 Consultant Responsibilities**

- .1 Consultant will:
  - .1 participate in commissioning meetings,
  - .2 coordinate commissioning agency's involvement in Shop Drawing review process,
  - .3 review verification and performance test results and direct Contractor to correct defects or deficiencies in the Work,
  - .4 initiate Site Instructions, Change Orders or Change Directives identified as necessary by the commissioning process,
  - .5 Review final commissioning report.

#### **1.7 Owner Responsibilities**

- .1 Owner will:
  - .1 establishes acceptance criteria,
  - .2 assign operations and maintenance personnel to participate in meetings, and witnessing of demonstration, and training.
  - .3 designate a person to acknowledge receipt of reports and for final acceptance of commissioning results.

## **1.8 Commissioning of Assigned Equipment**

- .1 Commission equipment which has been pre-tendered, pre-purchased, or pre-ordered by the Owner or their Agent, and the value of which has been assigned to the Contractor and is included in the Contract Price.

## **1.9 Commissioning of Owner's Equipment**

- .1 Commission the mechanical and electrical services to the Owner's supplied equipment, but not the equipment itself, where the supply of the such equipment does not form part of the Contract Price.
- .2 Owner will commission or arrange to commission the Owner's supplied equipment.

## **1.10 Documentation Deliverables**

- .1 Identify documents including test documents, binder covers, etc. using equipment ID numbers provided on equipment schedules.
- .2 Submit three (3) copies of each completed and accepted Verification and Performance Test reports, both preliminary and final issues.
- .3 Collate final, accepted and signed test results in separate binders for each Division of the Work.
- .4 Scan original signed test reports, including verification and performance test reports, manufacturers service reports, etc. in PDF format. Include documentation bookmarking organized into Divisions and then Sections within a Division.
- .5 Provide three (3) electronic copies of commissioning documentation, on removable data storage devices.

## **1.11 Commissioning Prerequisites for Ready-for-Takeover**

- .1 Complete the following commissioning activities as a prerequisite to attaining Ready-for-Takeover of the Work, in addition to the requirements of the General and Supplementary Conditions of the Contract:
  - .1 commissioning Verification testing including submission of completed records,
  - .2 commissioning Performance Testing including submission of completed records, except for deferred commissioning activities,
  - .3 commissioning controls validation testing,
  - .4 correction of major deficiencies.

## **1.12 Deferred Commissioning Activities**

- .1 Deferred commissioning activities are:
  - .1 those commissioning activities that weather dependent and must be performed at a date after Ready-for-Takeover,
  - .2 correction of minor deficiencies, and
  - .3 as otherwise agreed between Contractor and the Owner.

## **1.13 Organization**

- .1 Complete all phases of work so that the systems can be started, tested, balanced, and owner's acceptance procedures be undertaken in a timely manner such that only one acceptance test is conducted at any one time.
- .2 Acceptance procedures may begin prior to completion of a system and/or sub-system. Start of acceptance procedures before system completion does not relieve the Contractor from completing those systems in accordance with the commissioning and construction schedule.

#### **1.14 Commissioning Meetings**

- .1 Conduct, chair, and record commissioning meetings.
- .2 Pre-construction
  - .1 conduct pre-construction meeting for commissioning team members, to familiarize parties with the commissioning process, and to ensure that the responsibilities of each party are clearly understood.
- .3 Construction and Post-Construction
  - .1 conduct commissioning meetings for the commissioning team members on an agreed periodic basis.
  - .2 conduct trade commissioning meetings as required, in addition to the regular commissioning team meetings,
  - .3 identify to the commissioning team problems relating to the commissioning schedule, identification of start-up issues, etc., and participate in the resolution of these problems.

#### **1.15 Commissioning Procedures**

- .1 Contractor's designated Commissioning Agency provides the commissioning procedures (checklists, etc.) for use by the contractor. Refer to sections of the Work for specific requirements and testing methodology.
- .2 Implement commissioning procedures, and repeat procedures until Owner accepts results.
- .3 Sign-off each completed commissioning procedure as follows:
  - .1 Contractor, for testing,
  - .2 Commissioning Agency, for review, and witnessing where applicable,
  - .3 Owner, for test acceptance.

#### **1.16 Problem Resolution**

- .1 In the event that additional work is required to either correct systems, misapplied equipment, and/or deficient performance under varying load conditions, assist the Owner and Commissioning Agency in developing an acceptable resolution to the problem, including the resources of equipment suppliers.
- .2 The Owner has final approval over any additional work required to achieve the required level of performance.
- .3 Complete corrective work in a timely fashion to permit the completion of the commissioning process.

#### **1.17 Acceptance**

- .1 Any identified deficiencies will be reviewed by the Consultant in conjunction with the Contractor to determine if correction of the deficiency is as a result of a defect in the equipment or installation.
- .2 If it is determined the performance deficiency is as a result of a defect in the equipment or its installation, rectify the deficiency and repeat the performance test until the required performance levels are achieved.
- .3 If it is determined the equipment or system has been constructed in accordance with the Contract Documents, the Owner will decide whether to accept the performance as is, or, direct the installation contractor to make changes to the system as required to obtain performance levels which meet the design intent, and retest the system.

**1.18 Seasonal Commissioning (Deferred Commissioning)**

- .1 Commence initial performance validation testing commissioning at the completion of the installation and verification testing phase. Conduct performance testing, which is weather dependent, as applicable to current seasonal conditions. Complete performance testing on non-weather dependent systems in accordance with the agreed commissioning plan schedule.
- .2 For out-of-season deferred performance testing, conduct initial performance tests to demonstrate off-peak load performance. Schedule peak load performance testing over the succeeding nine (9) months to ensure all equipment is tested at peak load prior to the expiry of the warranty period.
- .3 Alternatively, provide temporary equipment (load banks, etc.) to simulate full load conditions. Submit proposed methodology for review by the Commissioning Agency and Consultant.

**1.19 Additional Commissioning**

- .1 Additional commissioning activities may be required after completion of system performance testing. Include in the Contract Price a reasonable reserve to complete this work, including assistance from manufacturers' service technicians.

**1.20 Systems Operating Manuals**

- .1 System Operating Manuals, if required, will be provided by Commissioning Agency and/or Consultant.

**1.21 Training**

- .1 Provide training in accordance with Specification Section 01 79 00 – Demonstration and Training, and as specified in the technical Specification sections. Where the requirements of the trade Division Specifications exceed the requirements of Division 01, these requirements are in addition to those of Division 01.

**End of Section**