



Engineers

## **PRECAST CONCRETE BEAM REPAIR**

### **WHISTLER PARKADES – LOT D**

Whistler, BC

### **BID DOCUMENTS, TECHNICAL SPECIFICATIONS, AND DRAWINGS**

Prepared for:

The Resort Municipality of Whistler  
4325 Blackcomb Way  
Whistler, BC V8E 0X5

Prepared by:

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## 1.0 Instructions

- .1 Before submitting a bid, Bidders shall:
  - .1 Examine and read the Bid Documents thoroughly.
  - .2 Examine the site and ascertain the extent and nature of all conditions, limitations, or building regulations affecting the performance of the Work. The site is open and available for review by the Bidders during normal business hours. Coordinate site access through the Consultant.
  - .3 Confirm all utility services in the vicinity of the Work that will require protection and maintenance during the course of the Work.
  - .4 Consider the effect of regulatory requirements applicable to the Work.
  - .5 Study and correlate Bidder's observations with the Bid Documents. All dimensions are to be confirmed by on-site measurement by the Bidder.
  - .6 Immediately notify Consultant of all perceived omissions and discovered conflicts, errors, and discrepancies in the Bid Documents.
  - .7 Be satisfied that Bidder understands the Bid Documents and is competent to undertake and complete the Work.
- .2 Bid shall include cost of all permits required (excluding the building permit), royalties, freight, government duties, and taxes where applicable. Owner will obtain and pay for building permit.
- .3 Partial structural drawings of the original project are available for viewing at the office of the Consultant for reference only.
- .4 The Owner reserves the right to add or delete items to be performed under this Contract before and after the Contract is awarded without any penalty. Any revisions to the submitted Contract Price as a result of these deletions are to be solely based on the unit prices (or lump sum prices) quoted by the Bidder for those items.
- .5 **The bid submission shall include a CCDC 11.**

- .6 The Bidder shall not engage in collusion of any sort and, in particular, shall ensure that no person or other legal entity other than the Bidder has an interest in the Bidder's bid. The bidder shall prepare the bid without any knowledge of, comparison of figures with, or arrangement with any other person or firm preparing a bid for the same work.
- .7 It is the Bidder's responsibility to provide all labour, material, equipment and supervision to complete the repairs outlined in these Bid Documents taking into account all site conditions, schedule and noise restrictions, work area restrictions, protection requirements, accessibility restrictions, etc. No extras will be entertained for inconveniences after award of the Contract.
- .8 If the Bidder is a joint venture, each party to the venture must execute the bid under seal in the manner appropriate to such party.

## **2.0 Site**

- .1 The Work is to be performed at the Whistler Village Parkade Lot D

## **3.0 Contract Form**

- .1 The form of Contract between the accepted Bidder and Owner will be the Standard Construction Document CCDC 2 - 2020 Stipulated Price Contract, as amended by Section 00 73 00 – Supplementary Conditions.

## **4.0 Owner**

- .1 Owner: Resort Municipality of Whistler  
4325 Blackcomb Way  
Whistler, BC V8E 0X5
- .2 Owner's Representative: Marc Freno  
Telephone: 778-793-1670  
Email: mfreno@whistler.ca

## **5.0 Consultant**

- .1 Consultant: Read Jones Christoffersen Ltd.  
1285 West Broadway, Suite 300  
Vancouver BC V6H 3X8

- .2 Consultant's Representative: Jonathan Woo  
Telephone: 604-738-0048 Email:  
jwoo@rjc.ca

## 6.0 Bid Meeting

- .1 An optional bid meeting will be held on site at **13:00h** on November 22, 2023 for the benefit of all bidders. Bidders should meet outside the Lululemon at Mountain Square

## 7.0 Examination of Site

- .1 The onus shall be on the Bidders to investigate the project site and inform themselves before bidding of all physical and labour conditions and administrative practices prevailing at the project site.
- .2 The Bidder shall not claim at any time after the submission of their bid any misunderstanding of the terms and conditions of the Contract relating to the site conditions.
- .3 The Bidder shall make allowances as required for the installation of temporary exhaust, heating, and ventilators into and out of the work area. No extra for this item will be entertained after bids have closed.

## 8.0 Bid Submission

- .1 Completed Bid Forms with the required bid bond, consents of surety to provide project bonding, and all supplementary bid submission material shall be submitted to the Owner via email with reference to the Owner's project reference number (5330-02-1024).
- .2 Email all submissions to FCMcapitalprojects ([fcmcapitalprojects@whistler.ca](mailto:fcmcapitalprojects@whistler.ca)).
- .3 Bids will be opened by the Client. .
- .4 Fill out the provided Bid Form and have Bid Form signed in longhand by a duly authorized company official and sealed with the Bidder's corporate seal.

- .5 The Bid Form shall not be altered and all spaces for information shall be completed.
- .6 Telephone, or facsimile bid proposals or bid modifications will not be considered.
- .7 The Consultant may, after bid closing time and before Contract award, require any Bidder to submit, in a form prescribed by or acceptable to the Consultant, supplementary information about any aspect of the Bidder's bid that, in the Consultant's opinion, is necessary for bid evaluation purposes.

## **9.0 Bonding Requirements**

- .1 Any Reference to "Contract Price", with respect to any or all bonding requirements, refers to the largest Total Stipulated Contract Price of the alternatives.
- .2 Provide a bid bond bid deposit made payable to the Owner for 10% of the Contract Price.
- .3 Provide a consent of surety to provide the Owner with with a Performance Bond equal to 50% of the Contract Price and a Labour and Material Payment Bond equal to 50% of the Contract Price with the bid submission.
- .4 The cost of bonds is to be included in the bid lump sum prices.

## **10.0 Sufficiency of Bid**

- .1 The submission of a bid shall constitute an incontrovertible representation by the Bidder that:
  - .1 The Bidder has complied with all bid requirements.
  - .2 The Bidder is qualified and experienced to perform the Work in accordance with the Bid Documents.
  - .3 The bid is based upon performing the Work in accordance with the Bid Documents, without exception.

- .4 The price or prices stated in the bid cover all the Bidder's obligations under the Contract and all matters and things necessary for the performance of the Work in accordance with the Bid Documents.

## **11.0 Bid Irregularities**

- .1 At the discretion of the Owner, bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, or contain arithmetical errors, erasures, alterations, or irregularities of any kind may be accepted or declared informal.
- .2 At the discretion of the Owner, bids that fail to include or to comply with bid security, bonding, or insurance requirements may be accepted or declared informal.
- .3 Informal bids may or may not be considered at the sole discretion of the Owner.
- .4 The Owner may accept or waive a minor and inconsequential irregularity, or where practicable to do so, the Owner may, as a condition of bid acceptance, request a Bidder to correct a minor and inconsequential irregularity with no change in bid price.
- .5 The determination of what is or is not a minor and inconsequential irregularity, the determination of whether to accept, waive, or require correction of an irregularity, and the final determination of the validity of a bid shall be at the Owner's sole discretion.
- .6 Discrepancies between words and figures will be resolved in favour of words.

## **12.0 Bid Withdrawal and Acceptance**

- .1 The Owner reserves the right to reject any or all bids as the interests of the Owner may require, without stating reasons for rejection.
- .2 The lowest or any bid will not necessarily be accepted.
- .3 A Bidder who has already submitted a bid may submit a further bid at any time up to the official closing time. The last bid that is received shall supersede and invalidate all previously submitted bids by that Bidder for this Contract.

- .4 A bid may be withdrawn at any time before the bid closing time, provided the request is in the form of a signed letter on company letterhead received in hard copy at the office of the Consultant before the bid closing time.
- .5 Withdrawn bids may be resubmitted in accordance with these bidding requirements providing the resubmitted bid is received at the office of the Consultant before the bid closing time.
- .6 A bid may not be withdrawn at or after bid closing time and shall be open to acceptance by the Owner until whichever of the following occurs first:
  - .1 Another Bidder has entered into a Contract with the Owner for performance of the Work.
  - .2 30 calendar days after the bid closing time.
  - .3 Bid is released or rejected.
- .7 The 30-day acceptance period commences at midnight on the date of bid closing and terminates at midnight of the 30th day thereafter. If the 30th day falls on a statutory holiday, the statutory holiday will be deleted from the computation.
- .8 The 30-day acceptance period may be extended at the Consultant's request and subject to the Bidder's written agreement to the extension.
- .9 In the case of an error in addition, the correct sum of the amounts shown for each bid item shall be deemed to be the total bid price regardless of the total amount submitted by the Bidder.
- .10 Evaluation of Bid:

In evaluating the bids, the Owner may consider any criteria, with such consideration to be exercised by the Owner in its sole discretion, including the following:

  - .1 Bid Contract Price as determined from the base bid or alternate bid.
  - .2 Owner's budget for the Work.
  - .3 Contract Time.
  - .4 Bidder's ability to effectively manage and perform the Work and work with other Subcontractors.



- .5 Bidder's understanding of the Work.
  - .6 Bidder's Unit Prices, Allowances, and Separate Prices, if applicable.
  - .7 Bidder's ability to present cost saving opportunities that may be appropriate and acceptable to the Consultant and Owner.
  - .8 Bidder's experience, competence, and past performance in undertaking similar work, as well as that of its Subcontractors.
  - .9 Bidder's financial strength and capability.
  - .10 Experience, qualifications, and abilities of Bidder's supervisory personnel.
  - .11 Aesthetic changes resulting from Bidder's proposed approach to the Work.
  - .12 Other criteria that the Owner, in its sole discretion, may consider appropriate to its evaluation.
- .11 Acceptance of Bid
- .1 The lowest or any bid need not be accepted by the Owner. The Owner reserves the right to accept or reject any or all bids at their sole discretion on any basis at any time without further explanation or to accept any bids considered advantageous to the Owner.
  - .2 The Bidder acknowledges and agrees that the Owner will not be responsible for any costs, expenses, losses, damages, or liabilities incurred by the Bidder as a result of or arising out of participation in this bid process, submission of a bid, or due to the Owner's acceptance or non-acceptance of the bid.
  - .3 The Owner may also elect not to proceed with the Project.

### **13.0 Notification of Intent Not to Submit a Bid**

- .1 Prospective Bidders who have received Bid Documents but do not intend to submit a bid are requested to notify the Consultant at least 72 hours prior to bid closing.

#### **14.0 Addenda**

- .1 Direct all questions in writing to the Owner and the Consultant.
- .2 Answers to queries are only binding when confirmed by written addenda.
- .3 Clarifications requested by Bidders must be submitted in writing to the Consultant no less than five calendar days before the date set for receipt of the bids. Any reply will be in the form of an addendum, a copy of which will be forwarded to known Bidders before the date set for receipt of the bids.
- .4 Addenda may be issued by the Consultant during the bid period. Any addenda will be delivered by the Consultant via e-mail to all parties recorded by the Consultant as having received the Bid Documents.
- .5 All addenda become part of the Bid and Contract Documents and the costs arising from any addenda are to be included in the bid price.
- .6 Each Bidder shall ascertain before bid submission that all addenda issued by the Consultant have been received and the Bidder shall indicate in the Bid Form the addendum number(s) of all addenda received.

#### **15.0 Construction Schedule**

- .1 Schedule requirements are outlined in Section 01 10 01 - General Requirements.

#### **16.0 Alternative Materials or Equipment**

- .1 A base bid submission is to include only approved and/or specified products and methods of construction.
- .2 If a Bidder wants to submit substitutes to the material, equipment, or workmanship specified or indicated, they may include the substitutes as an unsolicited alternative, and this shall be stated as such in the Alternate Prices section of the Bid Form.

#### **17.0 Alternate Bids**

- .1 A Bidder may, at the Bidder's discretion, submit an alternate bid ("Alternate Bid") that varies in some manner from the Bid Documents.

- .2 Alternate Bids may only be submitted in addition to, and not in substitution of, a bid that complies with the requirements of the specifications and drawings (the "Base Bid").
- .3 Products or systems identified in an Alternate Bid that vary from the products or systems described in the Bid Documents do not require pre-approval by the Consultant or Owner. An Alternate Bid should contain sufficient description and identification of any such varying products or systems to permit evaluation and review by the Consultant and the Owner.

### **18.0 Qualifications**

- .1 Persons of Bidders submitting bids for this Project shall be actively engaged and experienced in the type of work required by these Bid Documents and the Bidder shall provide, on request, a statement of similar work performed by those persons.
- .2 Submit a resume of key project personnel with the bid.

### **19.0 Damages Due to Delay in Work Schedule**

- .1 If the area of the work is not available for occupancy by the Owner after the date for Substantial Performance of the Work outlined in the Agreement and as modified by Change Order, the Contractor will be responsible for all damages resulting from the delay in the work schedule (i.e. the Owner's cost and reduced revenues associated with extended work schedule).

**END OF SECTION**

DATE: \_\_\_\_\_

SUBMITTED BY: \_\_\_\_\_  
(Company Name)

OF: \_\_\_\_\_  
(address) (telephone)

To: Resort Municipality of Whistler  
c/o Mike King  
c/o Read Jones Christoffersen Ltd.

Having examined the Project site, and having carefully examined the General Conditions of the General Contract CCDC 2 - 2020 as amended by Section 00 73 00 - Supplementary Conditions, the Specifications, and the Drawings, including Addenda \_\_\_ to \_\_\_ issued as supplements thereto, and having examined and complied with Section 00 21 00 - Instructions to Bidders, we hereby offer to perform the Work set forth in the aforesaid documents for the Estimated Contract Price, which includes any applicable taxes in force at this date.

Estimated Contract Price (NET)	\$ _____
Goods and Services Tax (5%)	\$ _____
Total Estimated Contract Price	\$ _____

NOTES:

- .1 Lump Sum Prices are included in the Contract Price (NET).
- .2 Lump Sum Prices include the Contractor's labour, material, equipment, material costs, overhead and profit, and all taxes and duties, and shall represent the cost to the Owner for such charges (does not include GST). In the event one or all Items 1.2 to 1.3 are deleted from the Contract, the price noted below represents the credit to the Contract.
- .3 Unit price item estimated total prices are included in the Estimated Contract Price.

- .4 Unit quantities are estimated. Contract Price to be reconciled using actual quantities measured and agreed upon by the Contractor and the Consultant and unit rates for Unit Price items.
- .5 Schedule requirements are outlined in Section 01 10 01. The Contractor shall review the schedule requirements with the understanding that Contract time is of the essence.

**1.0 Lump Sum Price Items**

ITEM	SPEC NO.	DESCRIPTION	LUMP SUM PRICE
1.1	Div. 01	General Requirements	\$ _____
1.2	Div. 01	Bonds	
	.1	Performance Bond	\$ _____
	.2	Labour and Material Payment Bond	\$ _____
1.3	Div. 03	Shoring	\$ _____

**2.0 Unit Price Items**

ITEM	SPEC NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	CONTRACT UNIT PRICE	ESTIMATED TOTAL PRICE
2.1	Div. 03	Beam delamination repairs. Range: 15 – 45	20	cu. ft.	\$ _____	\$ _____

**3.0 Schedule**

- .1 Available Start Date: \_\_\_\_\_, 20 \_\_\_\_.
- .2 Substantial Performance Date: \_\_\_\_\_
- .3 Ready-for-Takeover Date: \_\_\_\_\_
- .4 Total Performance Date: \_\_\_\_\_

**4.0 Submittals**

We enclose the following with our Bid:

- .1 Our Bid Security in the amount of ten percent (10%) of the Total Estimated Contract Price and Consent of Surety to provide Bonds in accordance with Section 01 78 36.
- .2 A complete list of Subcontractors we propose to use for this Contract, and the sections of the Work to be done by each of them.
- .3 Resume of personnel we propose to use in the capacity of Superintendent and Project Manager.
- .4 Project schedule in conformance with requirements of Section 01 10 01 – General Requirements. We understand that Contract time is of the essence.

## **5.0 Subcontractors**

- .1 We reserve the right to substitute another subcontractor in the event that a subcontractor should withdraw its bid or become bankrupt. All subcontractor substitutions are subject to the Owner's approval.
- .2 Any such substitution, in order to be considered for approval, is contingent on the submission of conclusive evidence of withdrawal, bankruptcy, or unsatisfactory performance.
- .3 We are responsible for all costs incurred as a result of substituting one subcontractor for another.

## **6.0 Acceptance**

- .1 This Bid is open to acceptance for a period of 30 days from the date of bid closing and is promised in consideration of the attached Bid Security. Failure to enter into a contract after contract award shall result in forfeiture up to the amount of the Bid Security.
- .2 We agree to execute a contract on the Standard Construction Document CCDC 2 - 2020, as amended by Section 00 73 00, the Specifications, and the Drawings, within seven days of written notification of contract award.
- .3 Submission of this Bid implies acceptance of the existing conditions at the site.
- .4 We understand that the lowest or any Bid will not necessarily be accepted, and that selected items may be deleted from the Project as represented in the Bid Form. The Owner may also elect not to proceed with the Project.

- .5 The Owner reserves the right to waive minor defects or irregularities in the bid.

Bidder:

\_\_\_\_\_  
*(Company Name)*

Signature

\_\_\_\_\_  
*(Authorized Officer)*

Signature

\_\_\_\_\_  
*(Authorized Officer)*

*(Seal)*

Date

\_\_\_\_\_

**END OF SECTION**

## 1.0 AGREEMENT SUPPLEMENT

The Agreement for the Standard Construction Document CCDC 2 – 2020, Stipulated Price Contract, is amended as follows:

### 1.1 Article A-1 The Work

.1 Paragraph 1.3:

.1 Replace the words “*Ready-for-Takeover*” with the words “*Substantial Performance of the Work*”.

.2 Add the following to the end of the paragraph:

“Ready-for-Takeover of the Work by the \_\_\_ day of \_\_\_\_\_ in the year \_\_\_\_\_ and Total Performance of the Work by the \_\_\_ day of \_\_\_\_\_ in the year \_\_\_\_\_ (as applicable and per the Contract).”

### 1.2 Article A-5 Payment

.1 Paragraph 5.2.1: Insert the chartered lending institution as “The Bank of Nova Scotia”

### 1.3 Article A-7 Language of the Contract

.1 Paragraph 7.1: Strike out the word “French” to select English as the prevailing language.”

## 2.0 SUPPLEMENTARY DEFINITIONS

Definitions used in the Standard Construction Document CCDC 2 - 2020, Stipulated Price Contract, are hereby amended as follows, and wherever the Definitions are referred to in the *Contract Documents*, it shall be understood that such reference means as amended by these Supplementary Definitions.

.1 Consultant: Add the following sentence to the end of the definition:

“The term *Consultant* means the *Consultant* or the *Consultant's* authorized representative.”

.2 Contract Time: Delete the following words:

“the time from commencement of the *Work* to the date of *Ready-for-Takeover*”



- .3 Contractor: Add the following sentence to the end of the definition:  
“The term *Contractor* shall be defined as the *Contractor* or the *Contractor's* authorized representative, but does not include the *Consultant*.”
- .4 Dictionary: Add the following new definition:  
“In case of dispute, The Concise Oxford Dictionary of Current English (current edition) shall prevail, except for those definitions given in CCDC 2 - 2020 and in various other places in the Contract Documents.”
- .5 Owner: Add the following sentence to the end of the definition:  
“The term *Owner* shall be defined as the *Owner* or the *Owner's* authorized representative, but does not include the *Consultant*.”
- .6 Provide: Add the following new definition:  
“*Provide* means to supply and install.”
- .7 Substantial Performance of the Work: Add the following sentence to the end of the definition:  
“If such legislation is not in force or does not contain such definition at the *Place of the Work*, *Substantial Performance of the Work* shall have been reached when the *Work* is ready for use or is being used for the purpose intended and is so verified by the *Consultant*.”
- .8 Total Performance: Add the following new definition:  
“With the exception of warranty obligations, *Total Performance* of the *Work* shall be achieved when the *Contractor* has fulfilled the requirements of the *Contract* in their entirety, including issuance of the Occupancy / Closeout Permit by the Authority having Jurisdiction if applicable; and is so verified by the *Consultant* through issuance of the final Certificate for Payment in accordance with GC 5.5.”
- .9 Total Performance Date: Add the following new definition:  
“The date in which *Total Performance* has been scheduled and/or attained in accordance with the *Contract*.”

### 3.0 SUPPLEMENTARY CONDITIONS

The General Conditions of Standard Construction Document CCDC 2 - 2020, Stipulated Price Contract, are hereby amended as follows and wherever the General Conditions are referred to in the *Contract Documents*, it shall be understood that such reference means as amended by the Supplementary Conditions.

#### 3.1 GC 1.1 Contract Documents

.1 Paragraph 1.1.4: Delete the words:

“shall not proceed with the work affected”,

and replace with the words:

“shall take all reasonable measures so as not to delay the work affected”.

.2 Paragraph 1.1.12: Add the following new paragraph:

"The *Owner* will provide the *Contractor*, without charge, two hard copies and one PDF copy of the *Contract Documents* to perform the Work. Additional copies of the *Contract Documents* or parts thereof required by the *Contractor* shall be provided at the *Contractor's* expense."

#### 3.2 GC 2.2 Role of the Consultant

.1 Paragraph 2.2.1: Delete entirely and replace with the following:

"The *Consultant* will provide administration of the *Contract* as described in the *Contract Documents* during construction until issuance of Final Certificate for Payment, and subject to GC 2.1 - Authority of the Consultant."

.2 Paragraph 2.2.3: Delete entirely.

#### 3.3 GC 2.3 Review and Inspection of the Work

.1 Paragraph 2.3.8: Add the following new paragraph:

"Where standards of performance are specified and the *Work* is not compliant, such deficiency shall be corrected as directed by the *Consultant*. Any subsequent testing (including re-testing by the *Owner*) to verify performance shall be done at the *Contractor's* expense."

### **3.4 GC 3.4 Construction Schedule**

- .1 Paragraph 3.4.1.1: Delete the words: "prior to the first application for payment",  
and replace with the words: "within one week of Contract award".

### **3.5 GC 3.6 Subcontractors and Suppliers**

- .1 Paragraph 3.6.7: Add the following new paragraph:  
  
"*Specifications* are arranged in Divisions and Sections for convenience. They shall be read as a whole. This arrangement places no responsibility upon the *Owner* or *Consultant* to settle disputes between *Subcontractors* and *Suppliers* or between the *Contractor* and *Subcontractors* and *Suppliers*."

### **3.6 GC 3.7 Labour and Products**

- .1 Paragraph 3.7.2: Delete the words: "The Contractor",  
and replace with the words: "Unless otherwise specified, the Contractor".

### **3.7 GC 3.8 Shop Drawings**

- .1 Paragraph 3.8.7: Delete the words:  
  
"in accordance with the schedule agreed upon, or in the absence of such schedule, with reasonable promptness so as to cause no delay in the performance of the *Work*",  
  
and replace with the words:  
  
"to *Contractor* within 10 working days of receipt".

### **3.8 GC 3.9 Documents at the Site**

- .1 Add the following section:  
  
"GC 3.9 DOCUMENTS AT THE SITE  
  
3.9.1 The *Contractor* shall keep one copy of current *Contract Documents*, submittals, reports, and records of meetings at the *Place of the Work*, in good order and available to the *Owner* and the *Consultant*."

### **3.9 GC 4.1 Cash Allowances**

- .1 Paragraph 4.1.7:
  - .1 Delete the words: “and the”  
and replace with the words: “in consultation with”.
  - .2 Delete the word “jointly”.

### **3.10 GC 5.1 Financing Information Required of the Owner**

- .1 Paragraphs 5.1.1 and 5.1.2: Delete entirely.

### **3.11 GC 5.2 Applications for Payment**

- .1 Paragraph 5.2.3: Delete the words:  
"and *Products* delivered to the *Place of the Work*",  
and insert the following sentence to the end of the paragraph:  
"Payment will not be made for *Products* delivered to the *Place of the Work*  
but not yet incorporated into the *Work*."
  - .2 Paragraph 5.2.5: Delete entirely and replace with the following:  
“The schedule of values shall be made out in such form as specified in the *Contract* and supported by such evidence and possible modification as the *Consultant* may reasonably require until accepted by the *Consultant*.”
  - .3 Paragraph 5.2.9: Add the following new paragraph:  
“Upon establishing that the *Work*, or a portion of the *Work*, has been Completed (as per the governing Builder’s Lien Legislation), the *Contractor’s* applications for payment for those portions of the *Work* deemed Complete, shall reflect the balance of the *Contract* price less:
    - .1 the aggregate amount, if any, determined in accordance with GC 5.4.1 multiplied by two, and
    - .2 the amount, if any, determined in accordance with GC 5.6 - Deferred Work.

Until all of the deficient and incomplete work for which amounts are withheld pursuant to subparagraphs .1 and .2 of this Paragraph 5.2.9 are rectified and completed to the satisfaction of the *Consultant*, the *Owner* may withhold the full amounts set out in Subparagraphs .1 and .2 of this Paragraph 5.2.9 respectively.”

- .4 Paragraph 5.2.10: Add the following new paragraph:

“The *Contractor* shall complete the deficient and incomplete work in a timely manner in accordance with the *Contract*. Acceptance of the *Work* or occupancy of the *Project* or any portion thereof shall not relieve the *Contractor* from the obligation of correcting deficiencies which are not identified at the time of establishing the list of deficient and incomplete items of work.”

- .5 Paragraph 5.2.11: Add the following new paragraph:

“Unless all independent material testing results of *Products* supplied to the site have been received, or if the deficiency review process has not yet commenced, the maximum percent of work completed that can be claimed by the *Contractor* and certified by the *Consultant* for any item of work is 90%.”

### 3.12 GC 5.3 Payment

- .1 Paragraph 5.3.1: Delete the words “and the Owner”.

- .2 Paragraph 5.3.1.1:

- .1 Add the following words after “receipt of the application for payment”:

“that is complete and in conformance with the *Contract*”.

- .2 Add the following words after “or part thereof,”:

“, the *Consultant* in consultation with”.

- .3 Add the following sentences to the end of the paragraph:

"In addition to the statutory lien holdback, Certificates for Payment may provide for retention of amounts, as determined by the *Consultant*, to account for deficient or incomplete work, until the items in question have been addressed and are determined to be in general conformance with the *Contract*."

- .3 Paragraph 5.3.1.2: Delete the words: “by the *Owner* and the *Consultant* of the application for payment”
- and replace with the words: “of the Certificate for Payment by the *Consultant*”.
- .4 Paragraph 5.3.2: Add the following new paragraph:
- “The *Owner*, in consultation with the *Consultant* and as verified through a Certificate for Payment, may withhold total or partial payments at any point after Contract award to cover third party liability claims related to the *Contractor’s* operations or actions. The withheld payment amounts shall be used by the *Owner* to cover third party liability claims when there is a dispute between the *Owner* and the *Contractor* regarding responsibility for the claim. These funds are intended to ensure that third parties receive compensation promptly.
- .1 Payments to the third parties are to be released immediately and unresolved disputes between the *Owner* and the *Contractor* shall be addressed in accordance with the *Contract*.
- .2 Receipts for payments to cover third party liability claims for damages shall be provided to the *Contractor* as requested or required in accordance with the *Contract*.”

### **3.13 GC 5.4 Substantial Performance of the Work and Payment of Holdback**

- .1 Paragraph 5.4.1: Delete entirely and replace with the following:
- “When the *Contractor* considers the *Work* to be substantially performed and in accordance with any applicable lien legislation requirements, the *Contractor* shall submit to the *Consultant* and the *Owner* a written application for *Substantial Performance of the Work*, which shall include a declaration stating that the *Contractor* has attained *Substantial Performance of the Work*, a comprehensive list of items to be completed or corrected, and a request for the *Consultant* to review the claim. The *Consultant* will review the *Work* to certify or verify the validity of the application and, in accordance with applicable lien legislation, or in the absence of such legislation, no later than 10 calendar days after receipt of the *Contractor’s* application:
- .1 advise the *Contractor* in writing that the *Work* or the designated portion of the *Work* is not substantially performed and give reasons why, or

- .2 Issue or request the required documents for *Substantial Performance of the Work* in accordance with applicable lien legislation, or in the absence of such legislation, issue the Certificate of Completion.”
  
- .2 Paragraph 5.4.7: Add the following new paragraph:

“No later than five calendar days following the issuance of the Certificate of Completion, the *Contractor*, in consultation with the *Consultant*, shall establish a reasonable date for attaining *Ready-for-Takeover* and/or *Total Performance*. Where applicable, as the project may require and as confirmed by the *Consultant*, the dates for *Ready-for-Takeover* and *Total Performance* may be the same day. Should an independent earlier *Ready-for-Takeover* date apply, the base provisions of Part 12 of the *Contract* shall be followed, including Clause 12.1.5 which shall be intended to establish a *Total Performance Date*. The established *Ready-for-Takeover* and/or *Total Performance* dates shall be incorporated into the *Contract* through a *Change Order*. If the *Contractor* does not fulfill all requirements of the *Contract* by the established *Substantial Performance*, *Ready-for-Takeover*, and/or *Total Performance* dates, the *Contractor* may be considered in default of the *Contract*. The *Ready-for-Takeover* and *Total Performance* dates are directly linked to section GC 5.5 – FINAL PAYMENT.”

### 3.14 GC 5.5 Final Payment

- .1 Paragraphs 5.5.2, 5.5.3, and 5.5.4: Delete entirely.
  
- .2 Paragraphs 5.5.2 and 5.5.3: Add the following new paragraphs:
  - 5.5.2 All parties are to process in accordance with Part 5 – PAYMENT.
  
  - 5.5.3 The *Consultant* will not consider the application for final payment valid until all applicable materials installed are tested and the *Contractor* has fulfilled the project closeout requirements that include, but are not limited to, GC 5.4 and Part 12 – Owner Takeover.”

### 3.15 GC 6.1 Owner's Right to Make Changes

- .1 Paragraph 6.1.2: Add the following to the paragraph:

"The valuation for the change shall include the following maximum adjustments for overhead and profit based on the actual costs:

- .1 For Subcontractors - 10% for overhead and 5% for profit on the cost of their work.
- .2 For Contractor - 2.5% for overhead and 2.5% for profit on the cost of the Subcontractors' work.
- .3 For Contractor - 10% for overhead and 5% for profit on the cost of their work.

Profit to be based on the value of work including overhead."

### 3.16 GC 6.2 Change Order

- .1 Paragraph 6.2.1: Delete entirely and replace with the following:

"When a change in the *Work* is proposed or required, the *Consultant* will provide the *Contractor* with a written description of the proposed change in the *Work*. The *Contractor* shall prepare and submit to the *Consultant*, in a form required by the *Consultant* to permit evaluation, the adjustment in *Contract Price*, if any, and adjustment in *Contract Time*, if any, for the proposed change in the *Work*. Time is of the essence with respect to changes and the *Contractor* shall submit requested *Change Order* documents within a reasonable timeframe commensurate with the requirements of the *Change Order*, and as required to not cause a delay in the contract schedule."

- .2 Paragraph 6.2.2: Delete the words "be effective immediately and shall be recorded in a *Change Order*"

and replace with the words "be recorded in a *Change Order* and shall take effect when the *Change Order* is fully signed by the required parties"



- .3 Paragraph 6.2.3: Add the following new paragraph:

“The *Contractor* shall ensure that all adjustments in *Contract Price* and *Contract Time* associated with bonding are included in all *Change Orders* and *Change Directives*. The *Contractor* remains responsible to ensure bonding of the work is not jeopardized. Upon request by either the *Owner* or the *Consultant*, the *Contractor* shall provide proof that the Surety Company is being notified and kept apprised of the status of the *Contract* and any changes. The *Contractor* shall also provide, upon request by the *Owner* or *Consultant*, written confirmation from the Surety Company of any increases to bonding costs.”

### 3.17 GC 6.3 Change Directive

- .1 Paragraph 6.3.6.2: Delete entirely and replace with the following:

“If an *Owner* requested change results in a net decrease in the *Contractor’s* cost, the *Contract Price* shall be decreased by the amount of the net decrease on the *Contractor’s* costs, excluding the typical adjustment for the *Contractor’s* percentage fee. If a *Contractor* requested change results in a net decrease in the *Contractor’s* cost and is not required to maintain the primary design performance or intent of the *Project* as interpreted by the *Consultant*, the *Contract Price* shall be decreased by the amount of the net decrease in the *Contractor’s* cost, including the adjustment for the *Contractor’s* percentage fee.”

### 3.18 GC 6.5 Delays

- .1 Paragraph 6.5.2: Delete the words:

"attain *Ready-for-Takeover* by the date stipulated in Article A-1 of the Agreement – THE WORK ",

and replace with the words:

"maintain the schedule in accordance with the Contract".

- .2 Paragraph 6.5.3: Revise as follows:

- .1 In Sentence .4, insert the phrase, “except lack of funds or breakdown of Construction Equipment, and,” after the word “control”.
- .2 In Sentence .4, replace “one” with “ones”.
- .3 Starting at “then the *Contract Time* shall be extended...”, reduce indent so that the clause applies to Items 6.5.3.1 through 6.5.3.4.

### **3.19 GC 6.6 Claims for a Change in Contract Price**

- .1 Paragraph 6.6.1: Delete entirely and replace with:

"If the *Contractor* intends to make a claim for an increase to the *Contract Price*, or if the *Owner* intends to make a claim against the *Contractor* for a credit to the *Contract Price*, the party that intends to make the claim shall provide *Notice in Writing* of intent to claim to the other party and to the *Consultant* no later than 10 working days after discovery of the condition or event giving rise to the claim. Should either party fail to submit proper notice within the required time frame, the responding party, in conjunction with the *Consultant*, reserves the right to reject the claim."

### **3.20 GC 7.2 Contractor's Right to Suspend the Work or Terminate the Contract**

- .1 Paragraph 7.2.3.1: Delete entirely.
- .2 Paragraph 7.2.4: Replace the words "5 *Working Days*" with "10 *Working Days*".
- .3 Paragraph 7.2.6: Add the following new paragraph:

"Withholding of payments to the *Contractor* shall remain in effect and may be implemented despite the requirements of GC 7.2. As deemed required by the *Consultant*, amounts may be retained for the *Contractor's* failure to pay all just claims and invoices in accordance with the *Contract*. Furthermore, at the discretion of the *Consultant*, registration or notice of a project-related lien against the *Owner's* property may also result in funds being retained pursuant to provincial lien legislation at the *Place of the Work*."

### **3.21 GC 8.3 Negotiation, Mediation, and Arbitration**

- .1 Paragraph 8.3.8.1(1): Delete entirely and replace with the following:  
"*Total Performance*,"

### **3.22 GC 10.4 Workers' Compensation**

- .1 Paragraph 10.4.2: Add the following new paragraph:

"The *Contractor* shall indemnify and hold harmless the *Owner* from and against all claims, demands, actions, suits, or proceedings by any of the employees of the *Contractor* or *Subcontractors* with respect to worker's compensation insurance. This indemnity shall survive the completion of the *Work* or termination of the *Contract* for any reason."

### **3.23 GC 12.1 Ready-for-Takeover**

- .1 Paragraph 12.1.1: Add the following new paragraph before the sentence “The prerequisites to attaining *Ready-for-Takeover* of the *Work* are limited to the following”:

“Please refer to the Supplemental Conditions of GC 5.4.7 for contractual requirements associated with establishing the *Ready-for-Takeover* and *Total Performance* dates, and their relationship to one another. For certain projects, and/or if the *Owner* requests Early Occupancy pursuant to GC 12.2, the *Ready-for-Takeover* date may be separate from the *Total Performance* date. In other circumstances, *Ready-for-Takeover* and *Total Performance* dates may be the same and shall be confirmed and captured through a *Change Order* process.”

- .2 Paragraph 12.1.5: Delete entirely and replace with the following:

“No later than five days following the confirmation of the date of *Ready-for-Takeover*, the *Contractor*, in consultation with the *Consultant*, shall establish a reasonable *Total Performance* date which shall be confirmed and captured through a *Change Order*.”

### **3.24 GC 12.2 Early Occupancy by the Owner**

- .1 Paragraph 12.2.4: Delete the words “complete the *Work* in a timely manner”, and replace with the words “achieve *Total Performance* in accordance with the *Contract*.”

### **3.25 GC 12.3 Warranty**

- .1 Paragraph 12.3.1: Replace the words “one year” with the words “as specified, or where not specified elsewhere, one year”.
- .2 Paragraph 12.3.3: Delete the words “through the Consultant,”.
- .3 Paragraphs 12.3.3, 12.3.4, and 12.3.6: Replace the words “one year” with the word “specified”.
- .4 Paragraph 12.3.6: Delete the following sentences:

“The *Contractor*’s responsibility with respect to extended warranties shall be limited to obtaining any such extended warranties from the warrantor. The obligations under such extended warranties are solely the responsibilities of the warrantor.”

### 3.26 GC 13.1 Indemnification

- .1 Paragraph 13.1.1: Insert the following before Paragraph 13.1.1:

“The *Contractor* and the *Owner* shall indemnify and hold harmless each other, and their respective agents and employees from and against all claims, demands, losses, costs or damages of third parties arising or alleged to arise directly, indirectly or incidentally by reason of the operations of the party from whom indemnification is sought in the carrying out of the *Contract*. This indemnification shall survive completion of the *Work* or termination of this *Contract* for any reason.

The *Contractor* shall indemnify and hold harmless the *Consultant* and their respective agents and employees from and against all claims, demands, losses, costs or damages of third parties arising or alleged to arise directly, indirectly or incidentally by reason of the operations of the *Contractor*, his *Subcontractors* and their respective agents or employees, in the carrying out of the *Contract*. This indemnification shall survive completion of the *Work* or termination of this *Contract* for any reason.”
- .2 Paragraph 13.1.2.2: Replace the value “\$2,000,000” with the value “\$5,000,000”.
- .3 Paragraph 13.2.5.4: Replace the words “*Notice is Writing*” with the words “*Notice in Writing*”.

**END OF SECTION**

## **1.0 GENERAL**

### **1.1 Description of Work**

- .1 The Work includes, but is not necessarily limited to, the following:
  - .1 Structural repair of concrete deterioration due to corrosion of reinforcing steel (delamination repairs) where directed by Consultant.
  - .2 Painting of repaired concrete to best match colour and appearance of surrounding structural elements.

### **1.2 Work Sequence**

- .1 The Work areas will be available as of December 1, 2023 at 08:00h. Contractor to confirm start date.
- .2 All parking areas within 1 column bay of the beam for all levels will be closed as of the Contractor's proposed start date for the duration of the Contract. Access to areas outside the designated work areas must be maintained in accordance with phasing requirements.
- .3 Time and time limits stated within Bid submittal and Contract Documents are of the essence to the Contract. Perform work expeditiously and with adequate forces to complete the Contract Work within the time specified.

### **1.3 Schedule**

- .1 In conjunction with and in a form acceptable to the Consultant and Owner, provide within one week of contract award a schedule indicating phasing and procedures required to complete the Work within the submitted time frame.
- .2 Construction schedule shall reflect completion of all work under the Contract within the time specified and in accordance with these Specifications.
- .3 Submit a revised schedule to the Consultant if, after commencing the Work, the schedule fails to reflect actual progress or the Contractor wishes to make a major change to their approach. Submit a revised construction schedule in advance of beginning a revised approach.

#### **1.4 Contractor's Use of Site**

- .1 Use of all equipment is to be restricted in accordance with noise by-laws. Contractor has access to the work areas with quiet work proceeding around the clock if desired.
- .2 Noise or dust generating work is to be performed between 0800 and 1700, Monday to Friday. Work outside of these hours must be approved by the Owner.
- .3 Contractor has 24-hour access to site; however, use of premises will be restricted due to user occupancy.
- .4 Schedule operations to minimize interruption of the normal use of the site and building, and to comply with laws, ordinances, rules, and regulations relating to Work.
- .5 Building is to remain open and operational through the Contract. It is the Contractor's responsibility to ensure the building remains operational and that areas outside those designated for closure remain available and safely accessible at all times.
- .6 Confine construction equipment, temporary work, storage of products, waste products and debris, and operations of employees and subcontractors to limits indicated by laws, ordinances, permit, or Contract Documents and do not unreasonably encumber the Place of Work.
- .7 Construction-related debris shall not be permitted to accumulate on site where visible to users. Remove daily if necessary.
- .8 Do not overload the structure.
- .9 Do not close, obstruct, or store materials in roadways, sidewalks, or passageways without prior approval from the Owner. Do not interfere with safe passage to and from building and adjacent public sidewalks and roads. Move stored products or equipment that interfere with building operations.
- .10 Take all precautions and provide all required protection to maintain the safety of the general public.
- .11 No storage of materials or equipment is allowed outside designated work areas without Owner approval.

- .12 During transportation of materials or equipment through occupied areas, protect the public, property, and finishes from damage. All damage caused by the Contractor is to be repaired or rectified at the Contractor's expense.
- .13 Propane powered equipment not permitted within interior areas.
- .14 Maintain work areas and the vicinity clean and tidy to the satisfaction of the Owner and Consultant.
- .15 Obtain and pay for all permits required for completion of the Work, excluding the Building Permit. Do not start construction until the Building Permit has been issued. Provide copies of permits to Consultant and post on-site where required.

### **1.5 Temporary Lighting**

- .1 Provide and maintain temporary lighting as required for safe demolition and working conditions, in accordance with British Columbia Occupational Health and Safety Regulations.

### **1.6 Temporary Heating and Ventilation**

- .1 Provide and maintain supplementary heating as required to maintain sufficient application and curing temperatures.
- .2 Provide and maintain supplementary ventilation as required. Ventilation requirements shall conform to British Columbia Occupational Health and Safety Regulations. Do not modify base building systems without coordination and approval of the Owner.
  - .1 Maintain existing ventilation rates and building's interior air quality, including but not necessarily limited to reasonable retention of interior heat, dust, and other contaminant control. If sealing building openings, such as vent exhausts and windows as a means of dust control, an alternate means of interior ventilation must be established to maintain the existing ventilation rate and indoor air quality.
  - .2 If alternate means of ventilation is required, provide Owner and Consultant with pre- and post-modification indoor air quality monitoring results. Should a permanent modification occur to the original ventilation system, indoor air quality testing is required to confirm that indoor air quality is equal to or better than pre-modification results.

- .3 Temporary heating and ventilation used during construction -- including the cost of installation, fuel, operation, maintenance and removal of equipment -- shall be paid for by the Contractor. Use of direct-fired heaters discharging waste products into enclosed work areas is not permitted.

### **1.7 Electrical Power**

- .1 Discuss available power with the Owner prior to bidding.
- .2 Contractor shall pay for any alternations to the electrical system needed to accommodate the Contractor's equipment. Coordinate any required alterations with the Owner. Reinstate system to its original condition upon completion of the Work.
- .3 Owner will pay for electrical consumption from building sources made available by the Owner.

### **1.8 Water Supply**

- .1 Contractor shall pay for the cost of any temporary water connections or alterations required to perform the Work. Reinstate system to its original condition upon completion of the Work.
- .2 Owner will pay for water consumption from building sources made available by the Owner.

### **1.9 Sanitary Facilities**

- .1 Provide portable washrooms at time of initial mobilization and maintain throughout the course of work where washroom facilities are not available on-site for the Contractor's use. Locate where agreeable to the Owner.

### **1.10 Traffic Control and Signage**

- .1 Provide all signage necessary to protect the public from the construction and work area, control pedestrian and vehicular traffic flow, and to inform users that construction activity is in progress. Signage to be of professional quality to the Consultant's satisfaction.
- .2 Provide flaggers and/ or traffic control lights as necessary to maintain safe traffic flow through work areas.



### **1.11 Protection of Work and Property**

- .1 Take all reasonable precautions necessary to protect the Work and property from damage during performance of the Contract, and rectify any damage to the Work or property caused by the Contractor or its Subcontractors.
- .2 Protect all property from dust and damage. Clean interior areas that require access outside of working hours at the end of each work shift to provide a functional environment for the user.
- .3 Contain dust, dirt, construction debris, water, and fumes from the Work so as to not affect areas remaining in operation outside designated work areas. Damage to all property, mechanical equipment, motors, elevator equipment, fixtures, air intakes, etc. resulting from contamination is the responsibility of the Contractor.
- .4 Completely enclose and ventilate work areas (fresh air in and exhaust out) without allowing dust to escape from the work area. Exhaust system must filter dust out of the air before it is released into the atmosphere. All exhaust systems must be filtered and directed to the outside through ducting, which is to be installed in a manner acceptable to the Owner and Consultant. Clean and replace filters regularly.
- .5 Provide protection for all entrance and exit-ways, floors, walls, standing fixtures, air intakes, and equipment rooms.
- .6 Use temporary vestibules to hoard areas that are to be protected but still require access, such as elevator lobbies and stairs. Adjust pressurization (by providing necessary fans) to prevent dust from entering these areas.
- .7 Patch and repair all finishes or painted surfaces damaged during the course of the Work, including surfaces damaged by tape, fasteners, or similar materials during hoarding and protection.
- .8 Do not keep secure doors open for extended periods without the Owner's permission. Any resulting damage caused to building finishes or equipment, and any resulting property losses due to compromised building security, shall be the responsibility of the Contractor.

### **1.12 Construction Barriers and Enclosures**

- .1 All work areas are to be completely enclosed by hoarding and dust protection and only accessible to the Contractor, Owner, and Consultant.

- .2 Supply and construct hoarding, barriers, and enclosures as indicated in these Specifications, on Drawings, and as directed by the Consultant or Owner as construction progresses.
- .3 No extras will be entertained for hoarding, barriers, and enclosures after bid closing unless the scope of work significantly changes.
- .4 The following types of enclosures / hoarding systems will be required for this construction project:
  - .1 Full Height Dust Protection

This system consists of full height poly-weave tarping fastened to the slab surface and soffit with 2" x 4" construction grade wood nailers wedged tight to the slab surface and soffit with 2 x 4 studs or post shores at 4'-0" c.c. The seams of the poly-weave tarping, if any, are to be fastened together with duct tape.

    - .1 Main purpose of this system is to control dust and keep it from escaping work area, thus it must be dust tight.
- .5 All seams in poly-weave tarping are to be taped together to provide dust tight enclosure.
- .6 Repair anchor holes after construction hoarding is removed. Repair all finishes and painted surfaces damaged by fastening materials used as part of hoarding and protection systems.
- .7 Simple barriers required to control traffic (i.e., not enclosing work areas) are to consist of screw jacks at maximum 8'-0" centres with nylon webbing (4'-0" high snow fence) between each screw jack. Jacks are to be fully tightened to plywood spacers at the slab surface and soffit, and nylon webbing is to be securely fastened to all jacks. Directional signs are required.
- .8 Restrict access for unauthorized personnel by placing barricades or posting guards around areas of the Work. Unauthorized personnel means the public and anyone not directly involved with execution, supervision, or inspection.

### **1.13 Protection of Existing Exposed Facilities / Services**

- .1 Make allowance in price to cover all costs of temporary removal and replacement and/or relocation of existing electrical wiring and hardware required for completion of the Work.

- .2 Protect exposed conduit, fixtures, attached devices, wet sprinkler fire system plumbing, mechanical system components, louvers, and ducts or correct damages at own expense. Promptly report any damage to the Owner and Consultant.
- .3 Prior to commencing the Work, contact the Owner to locate all protective or alarm systems and sensors. Protect services against damage or interruption. Provide Owner with 48 hours minimum advance notice of any necessary interruption. All claims resulting from damage are the responsibility of the Contractor.
- .4 Restore landscaping beds in area of work to their original plantable state after Work is complete. Owner will arrange to remove all landscaping, including plants, shrubs, trees, etc., impacted by the work and store for replanting.

#### **1.14 Walk-Through Inspection of Site**

- .1 Perform a thorough inspection of the site prior to the start of Work, and provide a written notice to the Consultant detailing all damaged property as well as all items that appear to be of poor working order or appearance (i.e. sign fixtures, dirt, etc.)
- .2 Upon receiving this notice, the Consultant and Owner will verify the validity of the items listed.
- .3 If written notice is not given within five days of commencement of Work, it will be assumed the Contractor reviewed the site and accepted the condition of the property as being free of damage.
- .4 Any damages not listed as part of the written notice of clause 1.14.1 above, found after completion of the Work will be the Contractor's responsibility to rectify. Complete rectifications in a timely and satisfactory manner.

#### **1.15 The Work, Work In Progress, Property, and Persons**

- .1 Protect the Work during construction from damage by weather.
- .2 Provide protection as required to protect work in progress and other property from damage and to provide suitable conditions for the progress of finishing work.
- .3 Take reasonable and required measures, including those required by authorities having jurisdiction, to protect the public and those employed on the Work from bodily harm.

- .4 Comply with requirements of the British Columbia Occupational Health and Safety Regulations and Regulations for Construction Projects.
- .5 Be prepared to provide respirators, dust protection, ear protection, hard hats, etc. for those employed by the Consultant and Owner on-site.
- .6 Direct all Subcontractors to protect their own work, existing property, adjacent public and private property, and work of other Sections from damage while working.

#### **1.16 Location of Existing Utilities**

- .1 Locate all existing utilities prior to construction and protect them during construction.

#### **1.17 Work Site Safety – Contractor is “Prime Contractor”**

- .1 Contractor shall, for the purposes of the British Columbia Occupational Health and Safety Regulations, and for the duration of the Work and Contract:
  - .1 Be designated as “Prime Contractor” pertaining to safety at the “Work site”.
  - .2 Do everything reasonably practicable to establish and maintain a system or process for compliance with the Act and its regulations, as required to maintain the health and safety of all persons at the “Work site”.
- .2 Direct all subcontractors, workers, and any other persons at the “Work site” on safety related matters, to the extent required to fulfill its “Prime Contractor” responsibilities pursuant to the Act.

#### **1.18 Material and Equipment**

- .1 Unless otherwise specified, provide, maintain, and pay for all materials, tools, machinery, equipment, temporary facilities, controls, and conveniences necessary for execution of the Work. All materials shall be new, of merchantable quality, and suitable for the intended purpose.
- .2 Unless otherwise specified, comply with manufacturer’s latest printed instructions for materials and installation methods. Notify the Consultant in writing of any conflict between Contract Documents and manufacturer’s instructions. Deliver, store, and maintain packaged materials with manufacturer’s seals and labels intact.

### **1.19 Cutting and Remedial Work**

- .1 Perform cutting and remedial work required to make affected parts of the Work come together properly.
- .2 Coordinate the Work so that cutting and remedial work are kept to a minimum.
- .3 Cutting and remedial work shall be performed by specialists familiar with the Products affected and in a manner that neither damages nor endangers the Work.

### **1.20 Waste Removal and Cleaning**

- .1 Maintain the Place of the Work free from unsightly or hazardous accumulations of waste materials and rubbish, and perform all required cleaning during the Work.
- .2 Provide on-site containers for collection of waste materials and rubbish.
- .3 Remove wastes that create hazardous conditions from the premises daily.
- .4 Dispose of waste products in strict accordance with product manufacturer Safety Data Sheets (SDS) and provincial waste control regulations. Drainage systems shall not be used to dispose of project wastes and materials.
- .5 Remove moisture sensitive equipment (i.e. exposed electrical and mechanical systems, etc.) or protect against moisture infiltration during washing and dust-generating activities.
- .6 Remove all construction-related grease, dust, dirt, stains, labels, fingerprints, over-spray, and other foreign materials immediately prior to Consultant's final review. Return all adjacent areas, equipment, duct work, etc. to the Owner in a dust-free condition. Leave site in a neat and tidy condition at completion of the Work.

### **1.21 Superintendence**

- .1 Provide a full time on-site Superintendent who is responsible for quality, control, organization, and coordination of the Work.
- .2 Superintendent shall attend all site meetings.

- .3 Superintendent shall have a cell phone.
- .4 Superintendence shall be satisfactory to the Owner and Consultant.
- .5 Superintendence shall be deemed unsatisfactory and changes or additions to superintendence can be demanded by the Owner or Consultant when control, organization, or coordination of the Work is not adequate, quality of the Work does not meet Contract Document requirements, directions given in accordance with Contract Documents are not followed, or progress is behind schedule.
- .6 =

### **1.22 Pre-Construction Meeting**

- .1 After award of Contract, a meeting of all parties in the Contract shall be held to discuss and resolve administrative procedures and responsibilities.
- .2 Representatives of the Owner, Consultant, Contractor, major Subcontractors, and construction review personnel will attend.
- .3 Consultant will establish a time and location for the meeting and notify concerned parties at least five days before the meeting.

**END OF SECTION**

## **1.0 GENERAL**

### **1.1 Substitution of Materials Prior to Bid Closing**

- .1 Substitution of specified products or systems is permitted only when alternatives have been approved by the Consultant, in writing, prior to bid closing.
- .2 Inform the Consultant in writing when specified products or systems are not anticipated to be available at the Place of the Work during construction. The Consultant will advise Bidders of alternatives.
- .3 If specified products or systems are not available and the Consultant was not notified prior to bid submission, the Consultant will choose a suitable substitute product at the time of construction.

### **1.2 Request for Approval of Alternatives**

- .1 A Bidder or Supplier of a product or system may apply for approval of their product or system as an alternative up to five calendar days prior to bid closing. The Consultant will advise applicants of the status of their request prior to bid closing.
- .2 Provide the Consultant with sufficient information to review the alternative. This information may include:
  - .1 Project name and number
  - .2 Specification sections affected by the proposed alternative
  - .3 Product technical data sheets
  - .4 Supplier installation instructions and requirements
  - .5 Supplier warranty and warranty requirements
  - .6 Product application sample at specified material thickness and finish on sample substrate
  - .7 Installation history, including:
    - .1 Installation locations, dates, project sizes, project values
    - .2 Description of project and product usage
    - .3 Owner and consultant
  - .8 Test data

### **1.3 Approval of Alternatives**

- .1 The Consultant reserves the right to reject any requests for approval of alternatives.
- .2 The Consultant will outline approved alternatives by addenda issued prior to bid closing. The addenda will indicate the alternative Product or system, where and how it may be used, and limitations. If an addendum is not issued, the bid is to be based on use of the specified Product or system.
- .3 The Contractor assumes full responsibility and bears all associated costs where an alternative Product or system is incorporated into the Work. Claims for increases to the Contract Price or for changes to the Date for Substantial Performance of the Work due to changes in the Work that are necessitated by the use of an alternative will not be considered. All associated costs are to be included in the bid.
- .4 The Contractor is to reimburse the Owner for their additional costs associated with incorporating alternatives into the Work. This may include additional consulting costs billed to the Owner to accommodate changes to the Contract Documents necessitated by the change.
- .5 Contractor cost savings arising from approval of alternatives are to be reflected in the Contract Price.

**END OF SECTION**



## **1.0 GENERAL**

### **1.1 Project Coordination**

- .1 The Contractor is responsible for coordination of trades. Lines of demarcation between Contractor and trades or trade and trade are solely the responsibility of the Contractor.
- .2 Contractor is responsible for coordination with the Owner for on-site activity as it affects the operation of the building.

### **1.2 Notification for Field Review**

- .1 Notify the Consultant at least 3 working days in advance for field review. No work shall be covered or concealed until reviewed by the Consultant unless informed that a field review will not be performed. Such review does not absolve the Contractor from their responsibility to perform the work in accordance with the Contract Documents.
- .2 The Contractor shall notify the designated testing company for material sampling and testing.
- .3 Provide the Consultant with safe access to any part of the Work requiring field review.
- .4 The Owner may be present during field review at the Owner's discretion.

### **1.3 Superintendence**

- .1 Provide a full time Superintendent who is to be on-site on a continuous basis during the execution of the work. Superintendent shall have a mobile phone at all times during working hours to allow for communication with the Consultant or Owner.
- .2 Superintendent shall have facility with the English language both written and verbal.
- .3 Superintendent shall be satisfactory to the Owner and the Consultant, and shall not be changed without the Consultant or Owner's consent.
- .4 Superintendence shall be deemed unsatisfactory and changes or additions to superintendence may be demanded when control, organization, or coordination of the Work is not satisfactory, quality of the Work does not meet requirements of the Contract Documents, directions given in accordance with the Contract Documents are not followed, or progress is behind schedule.

**END OF SECTION**

## **1.0 GENERAL**

- .1 This Section specifies general requirements and procedures for shop drawing, product data, sample, and mock-up submissions for Consultant's review. Additional specific submission requirements may be specified in other Sections.
- .2 Do not proceed with Work until relevant submissions are reviewed by Consultant.
- .3 Present shop drawings, product data, samples, and mock-ups in imperial units. Where items or information is not produced in imperial, converted values are acceptable.
- .4 Contractor's responsibility for errors or omissions in any submission is not relieved by Consultant's review of the submission.
- .5 Notify Consultant, in writing at time of submission, of any deviations from the requirements of Contract Documents that form part of submissions. Also, indicate the reasons for the deviations.
- .6 Contractor's responsibility for deviations from the requirements of the Contract Documents in submissions is not relieved by Consultant's review of the submissions unless Consultant provides written acceptance of the identified deviations.
- .7 Make any changes in submissions that Consultant may require consistent with the Contract Documents and resubmit where directed by Consultant.
- .8 Notify Consultant in writing of any revision other than those requested by Consultant when resubmitting.

### **1.1 Submission Requirements**

- .1 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.
- .2 Submit electronic copies of product data, manufacturer's catalogue sheets, brochures, literature, performance charts, and diagrams.
- .3 Comply with the following requirements in regards to submission of product data:
  - .1 Delete information not applicable to project.

- .2 Supplement standard information to provide details applicable to project.
- .3 Provide certification of compliance to applicable codes.
- .4 Provide manufacturer's certification as to current production.
- .4 Allow 10 working days for Consultant's review of each submission.
- .5 Accompany submissions with an electronic transmittal letter that contains:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data, and sample.
  - .5 Other pertinent data.
- .6 Submission shall include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
  - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions of Work as applicable:
    - .1 Fabrication.
    - .2 Layout, showing dimensions, including identified field dimensions and clearances.
    - .3 Setting or erection details.

- .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.
- .6 After Consultant's review, distribute electronic copies to relevant affected subcontractors.

## 1.2 Shop Drawings

- .1 Provide electronic copies of shop drawings pertaining to installations and fabrications required by the Contract for Consultant review prior to commencing work. Provide full-size hard copy submissions if requested by Consultant. Unless noted otherwise, submit shop drawings for the following:
  - .1 Temporary shoring
- .2 As part of RJC's field services, RJC will review shop drawings pertaining to work shown on RJC's drawings by means of an appropriate rational sampling procedure and will comment on the accuracy with which the Contractor prepared the shop drawings.
- .3 Review of shop drawings is for the sole purpose of ascertaining conformance with the general design concept and is not an approval of the detail design inherent in the shop drawings. Design responsibility remains with the Contractor submitting the shop drawings.
- .4 Review of shop drawings does not relieve Contractor of their responsibility for errors and omissions in shop drawings or for meeting all requirements of the Contract Documents.
- .5 Contractor is solely responsible for information pertaining to fabrication process, techniques of construction and installation, and coordination of subcontractors.
- .6 Cross-reference shop drawing information to applicable portions of Contract Documents.

- .7 Shop drawings that require approval of any legally constituted authority having jurisdiction shall be provided by the Contractor to such authority for approval.

### **1.3 Product Data**

- .1 Product Data: Manufacturer's catalogue sheets, brochures, literature, performance charts, and diagrams, used to illustrate standard manufactured products.
- .2 Submit electronic copies of product data.
- .3 Sheet Size: 215 x 280 mm.
- .4 Delete information not applicable to project.
- .5 Supplement standard information to provide details applicable to project.
- .6 Cross-reference product data information to applicable portions of Contract Documents.

### **1.4 Samples**

- .1 Samples: Examples of materials, equipment, quality, finishes, workmanship.
- .2 Where colour, pattern, or texture is criterion, submit full range of samples.
- .3 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be reviewed.

### **1.5 Mock-Ups**

- .1 Mock-Ups: Field-erected examples of work complete with specified materials and workmanship.
- .2 Erect mock-ups at locations acceptable to Consultant.
- .3 Reviewed and accepted mock-ups will become standards of workmanship and material against which installed work will be reviewed.

**END OF SECTION**

## **1.0 GENERAL**

### **1.1 Bonds**

- .1 Bonding costs, including expense of getting bonds executed, shall be borne by Contractor.
- .2 Provide Owner with the following surety bonds within 14 days after Contract Award:
  - .1 A Performance Bond to secure due and proper performance of Contractor's obligations under Contract in an amount equal to 50% of Contract Price.
    - .1 Performance bonding period commences on date of contract execution and ends two years from date of Substantial Performance.
  - .2 A Labour & Material Payment Bond in an amount equal to 50% of Contract Price to secure:
    - .1 Due and proper payment of those having direct contracts with Contractor for labour, material, and/or services.
    - .2 Full reimbursement to Owner for all liability and payments to those having direct contracts with Contractor for labour, material, and/ or services in connection with the Contract.
- .3 If a lien claim is filed against the title of lands on which the work or any part thereof is performed in relation to the Contract by an entity other than Contractor, provide a Lien Bond to remove registered lien claims and/or certificates of action.
- .4 Bonds are to be in favour of Owner in a form satisfactory to Owner.
- .5 Bonds are to name Owner as Obligee. Obligors are Contractor and a Guarantee Surety Company unobjectionable to Owner and not insolvent, bankrupt, nor in receivership or winding-up proceedings.
- .6 Guarantee Surety Company is to be a properly licensed surety company registered and duly authorized to transact business of suretyship in Province of British Columbia.

### **1.2 Warranty / Guaranty Period**

- .1 Provide a two-year minimum warranty for all Work of Contract commencing on date of Ready-for-Takeover.

- .2 Warranty shall be secured by a Performance Bond for two years, in accordance with Article 1.1.2.1.
- .3 Extended and/or product warranties beyond the minimum period are outlined below.

### **1.3 Remedial Work Under Guaranty/Warranty**

- .1 Perform any warranty repair work required during the warranty period at no extra cost. Refer to 1.3.3 for additional information on costs.
- .2 Owner will notify Contractor within 30 days of discovery of any suspected warrantable defect in the Work. Immediately take necessary steps to protect area against further damage and take corrective action to bring defect into conformance with Contract Documents and rectify any damage incurred. Schedule repair work with Owner and make every attempt to correct defects within three weeks of notice.
- .3 In event of a valid warranty claim resulting in corrective work, Contractor and Owner shall contact Consultant to determine what level of involvement, including but not limited to field review, may be necessary. Should Consultant determine that field reviews are required during warranty repair work, Contractor shall be responsible for Consultant fees.
- .4 Remedy is at no cost to Owner and includes all labour, material, equipment, supervision, and field review necessary to correct defective areas of the Work and any damages incurred to obtain access to defective areas.
- .5 Reimburse Owner for resulting assessment costs, including fees associated with Consultant involvement, incurred to define extent of defect and for testing costs incurred to confirm acceptability of repairs.
- .6 Warranty periods for areas requiring repair are to be extended by amount of time elapsed between issuance of notice and completion of remedial work. Warranty/ guaranty period will re-commence upon completion of remedial work.
- .7 Warranties are not to be deemed to restrict liability of Contractor arising out of applicable law.

**END OF SECTION**

## **1.0 GENERAL**

### **1.1 Work Included**

- .1 Provide all labour, materials, equipment, and supervision necessary to prepare slab surface, slab soffit, column, wall, and beam repair areas and place new concrete repair material as outlined in this Section.
- .2 All repairs to painted surfaces are to be cleaned and repainted after the concrete repairs have been completed and sufficient time for concrete curing has elapsed.

### **1.2 Repair Quantity Determination**

- .1 Length and width shall be measured to the nearest 25 mm (1"). Depth, if applicable, shall be measured to the nearest 25 mm (1 inch).

### **1.3 References**

- .1 All referenced Standards are latest editions referenced by the Building Code in the Place of the Work, or latest editions if not reference by Code.
- .2 British Columbia Building Code
- .3 CSA A23.1/CSA A23.2 Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete
- .4 CSA A3000 Cementitious Materials Compendium
- .5 CSA S413 Parking Structures
- .6 ASTM C260/C260M Standard Specification for Air-Entraining Admixtures for Concrete
- .7 ICRI 310.2R Selecting and Specifying Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair

### **1.4 Performance Requirements**

- .1 Concrete repair surfaces shall not scale or crack excessively.
- .2 Concrete repair materials shall not spall or debond from existing concrete.



## **1.5 Submittals**

- .1 Submit all mix designs, product specifications, and manufacturer's recommendations for Consultant review a minimum of two weeks prior to placement or use of products.
- .2 Submit details of proposed methods of concrete curing and provisions for weather protection for Consultant review a minimum of two weeks prior to placement.
- .3 Submit manufacturer's product data sheets for proposed curing compounds, admixtures, and corrosion inhibitors.
- .4 Do not commence placement of concrete until review is complete and proposed products and procedures are accepted by Consultant.

## **1.6 Qualifications**

- .1 Use only qualified concrete placers and finishers, with a minimum of two years' experience in similar work.

## **2.0 PRODUCTS**

### **2.1 Materials**

- .1 Portland Cement: Type GU to CSA A3000.
- .2 Aggregate: Natural stone to CSA A23.1.
- .3 Water: Potable and to CSA A23.1.
- .4 Air Entraining Agents: To ASTM C260/C260M.
- .5 Chemicals Admixtures: To CSA A3000. Calcium chloride is not permitted.
- .6 Pozzolanic Mineral Admixtures: To CSA A3000.
- .7 Curing Materials: To CSA A23.1.
- .8 Blended Hydraulic Cementing Material: Type 10SF to CSA A3000.
- .9 Supplementary Cementing Material: To CSA A3000.
- .10 Superplasticizing Admixture: To CSA A3000.

## 2.2 Surface and Through-Slab Delamination Repair Concrete Mix: Silica Fume

- .1 Normal weight “ready mixed” Portland cement/silica fume modified concrete mixed in accordance with CSA A23.1 class of exposure C-1 with the following requirements:

	<u>Description</u>	<u>Requirements</u>
.1	Compressive Strength (28 days)	<b>45 MPa minimum</b>
.2	Air Content	6.0% to 9.0%
.3	Aggregate Size	13 mm
.4	Slump	
	- Prior to Superplasticizer	50 mm maximum $\pm$ 20 mm
	- After Superplasticizer	125 mm maximum $\pm$ 25 mm
.5	Water/Cementing Materials Ratio	0.40 maximum
.6	Cement Content	335 kg/m <sup>3</sup> minimum
.7	Cement – Type GU	Normal Portland Cement
.8	Silica Fume – Type U	Minimum 7.5% Silica Fume by mass of cement (25 kg/m <sup>3</sup> )
.9	Fly Ash – Type F or Type CI	Maximum 15% by mass of cement (45 kg/m <sup>3</sup> ) for Type F and 10% by mass of cement (30 kg/m <sup>3</sup> ) for Type C
.10	Concrete Density	Normal weight (2,360 kg/m <sup>3</sup> )

- .2 The intent of this mix design is to provide a low permeability, high electrical resistivity concrete mix with a coulomb rating less than 1500 when 28-day samples are tested using rapid chloride permeability testing.
- .3 Non-chloride based plasticizers shall be used to facilitate concrete placement as required. Costs associated with the use of such materials shall be included in the contract price. Plasticizer shall be compatible with the air entrainment agent.
- .4 Note that although a maximum slump is specified, the Contractor shall endeavour to provide concrete at the minimum slump that permits placement and handling.
- .5 Mix design is the responsibility of the Contractor.
- .6 Do not add calcium chloride to concrete.

- .7 Addition of water to the concrete mix shall not be permitted on-site. The Contractor shall be permitted to adjust only the quantities of superplasticizer and air entraining agent on-site.
- .8 No concrete shall be placed later than two hours after the time of batching. No re-tempered concrete shall be allowed.
- .9 The Contractor shall use superplasticizers to facilitate concrete placement and must demonstrate to the satisfaction of the Consultant that such admixtures will have no deleterious effect on the durability or strength of the proposed concrete mix (i.e. freeze/thaw durability).

### **2.3 Air Entrainment**

- .1 Air entraining chemical admixtures shall be according to ASTM C260. Ensure chemical admixtures are compatible with each other and that they will not negatively impact performance of the concrete.
- .2 The total fresh air content of air entrained concrete will be tested via the pressure method with an air meter prior to the placement of concrete in accordance with CSA A23.2.
- .3 Air content in hardened concrete shall meet the requirements of CSA A23.1 and this specification and, if directed by the Consultant, will be tested and determined in accordance with ASTM C457 as outlined in CSA A23.1.

## **3.0 EXECUTION**

### **3.1 Concrete Surface Preparation**

- .1 All concrete surfaces to receive new concrete shall have a minimum No. 6 CSP per ICRI 310.2R and be thoroughly abrasive-blast, sandblast, or shotblast prior to concrete placement, unless surfaces have received hydro-demolition acceptable to Consultant.
- .2 Clean all existing concrete surfaces to receive new concrete of foreign material, dust, debris, grease, and oil as directed by Consultant. Emulsifiers shall be required for surfaces containing grease or oil.
- .3 Notify Consultant to review surfaces prior to concrete placement.

### 3.2 Concrete Placement - Ready-Mixed Concrete

- .1 The patch area shall be thoroughly wetted for a minimum of three hours, and longer where required to achieve a saturated surface dry (SSD) state, prior to placing of concrete.
- .2 Puddles or free water shall be blown from the patch area and the surface permitted to dry to a saturated surface dry (SSD) state prior to application of cement slurry.
- .3 Pre-wet fabric, burlap, cotton mats, or pre-approved alternative shall be available on site prior to placement of concrete to allow for immediate placement overtop of new concrete patches after their initial set.
- .4 Addition of water shall conform to CSA A23.1. Do not add water after the initial introduction of mixing water at the plant unless the measured slump tested at the onset of discharge is less than specified requirements and less than 60 minutes have elapsed from the time of batching. Water may only be added in this circumstance under the on-site direction of the producer's Quality Control Inspector. In no instance shall more than 16 L of water be added per cubic metre of concrete. The resulting concrete must satisfy specified requirements. The responsibility for the product will remain with the Contractor.
- .5 On slab top surfaces, place new dense concrete thoroughly compacted and vibrated into place to ensure good bond.
  - .1 Ensure reinforcing steel is secured in place and is not disturbed during placement.
  - .2 Vibrators are to be used for consolidation purposes only and are not to be used to an extent that causes segregation of the concrete.
  - .3 Internal vibrators shall conform to CSA A23.1 Clause 7.2.5.2 and Table 19: Internal Vibrators for Various Applications.
  - .4 Vibrators shall be inserted into concrete perpendicular to concrete surface.
  - .5 Vibrators shall be inserted such that zones of consolidation always overlap.
- .6 Concrete surfaces to be flush with existing surfaces, free of voids and cracks, and have a uniform surface and transition to the existing surface.

- .7 Finish concrete in accordance with CSA A23.1/A23.2. Initial finish shall be completed before any bleeding or free water is present on the surface of the concrete. Final finishing shall commence after the bleed water has disappeared and when the concrete has stiffened sufficiently to prevent the working of excess mortar to the surface. Do not add water to finish.
- .8 Do not overwork concrete surface. Wood float finish is acceptable.
- .9 Do not use steel trowels with air-entrained concrete. For air-entrained concrete, the surface can be further leveled and consolidated with a magnesium bull float for larger repairs or a magnesium trowel for smaller repairs. One or more passes shall be made at suitable time intervals to obtain a level finish free of float marks. Do not work bleed water on the concrete surface into the concrete during finishing.
- .10 If mechanical floats are to be used for final finishing of larger air entrained concrete surfaces, the mechanical floating of the concrete surface shall commence as soon as the concrete surface has reached initial set and will support the weight of a power float machine equipped with magnesium float blades and the operator.
- .11 Cure concrete as outlined in this section.
- .12 Areas of concrete repair completely through the thickness of the slab shall be patched with concrete that is well consolidated and vibrated into place on smooth plywood forms with suitable release agents adequately shored from the slab below, to the approval of the Consultant. Once forms have been removed, edges of through slab repair are to be grinded, hand patched, etc. as required to produce smooth (form like) transition from new patch material to the existing slab.

### **3.3 Concrete Mixing and Placing**

- .1 Concrete shall be machine mixed. Mixing and placing shall be in accordance with CSA A23.1.
- .2 Concrete shall be conveyed from the mixer to the place of deposit by methods that will ensure the required quality of concrete. Equipment for conveying the concrete shall be of such size and design as shall ensure a practically continuous flow of concrete at the delivery end without separation of materials.
- .3 Concrete shall be deposited into patch repairs as near as practicable to its final position to avoid re-handling.

- .4 Depositing shall be continuous throughout each division and the concrete shall be placed and worked so that a uniform texture will be produced.
- .5 No concrete shall be placed later than one half hour after leaving the mixer. No re-tempered concrete shall be placed.

### **3.4 Compaction and Vibration**

- .1 Concrete shall be consolidated by means of sufficient vibrators of adequate size operated by competent workers.
- .2 The use of vibrators to transport concrete shall not be allowed.
- .3 Concrete shall be thoroughly worked around reinforcement, around embedded items, and into corners.
- .4 Compaction and vibration is to eliminate all air and stone pockets that may cause honeycombing, pitting, or planes of weakness.

### **3.5 Concrete Curing (Silica Fume)**

- .1 Incorporate fog-mist curing methods or evaporation retarder in order to prevent loss of moisture from concrete repair surfaces in all rapid drying conditions. In these conditions, fog-mist curing shall be initiated immediately after initial finishing, and continued until concrete is covered with wet-curing mats. Rapid-drying conditions may include any of the following:
  - .1 High concrete ambient temperatures
  - .2 Low humidity
  - .3 High winds
  - .4 Direct sunlight
  - .5 Heated interiors during cold weather.
- .2 Initiate surface concrete repair wet curing as soon as possible after the concrete has sufficiently set, and no later than 30 minutes after finishing.
  - .1 Minimum acceptable wet curing method on slab surfaces is installation of pre-saturated filter fabric, burlap, or cotton mats that are covered with soaker hoses and plastic sheeting. Overlap wet-curing mats 150 mm and ballast in place without marring the concrete surface.

- .2 Wet curing procedures are to keep the concrete surfaces continuously wet for a period of at least 10 consecutive days at a minimum temperature of 10°C. Do not permit water to evaporate completely from the concrete surfaces at any time within the wet cure period.
- .3 Prevent airflow in the space between the wet-curing mats and the plastic sheeting.
- .3 Continuous water curing of exposed beam and slab soffit repairs is not required; however, exposed concrete soffit surfaces shall be misted with a water spray on a daily basis during the wet-curing period, or as often as necessary to prevent surface dusting.
- .4 Provide the Consultant with proposed fog-curing and wet-curing procedures at least 2 weeks prior to concrete placement. Any revisions to the proposed procedures must be submitted to the Consultant for review a minimum of one week prior to concrete placement.
- .5 The use of chemical curing compounds is not permitted.
- .6 Protect concrete from the harmful effects of heat, cold, running or surface water, and mechanical shock.
- .7 Do not place concrete when air temperature is below 10°C, or without implementing provisions to ensure proper curing of concrete when -- in the opinion of the Consultant -- there is a possibility of air temperature falling below 10°C. These provisions shall be reviewed by the Consultant and conform to the requirements of CSA A23.1.
- .8 Maintain concrete material and forms between 15°C and 32°C until concrete placement whenever the surrounding air is below 5°C. No frozen material or material containing ice shall be used. All existing concrete, reinforcement, forms, and ground that the concrete will contact is to be free from frost.
- .9 **Maintain a curing temperature above 10°C for 10 days or longer to ensure proper concrete curing. Under no circumstances may dry heat be used. Provide means to humidify the air within the heated enclosure and ensure that moisture requirements for curing are maintained.**
- .10 Do not allow traffic onto patch until material has adequately cured to 75% of its specified 28-day compressive strength.

- .11 The Consultant will have cause to not certify payment for repairs undertaken without adequate wet-curing procedures or that become surface dry during the specified curing period.

### 3.6 Inspection and Testing

- .1 To conform to CSA A23.2.
- .2 Inspection and testing to be conducted by a testing agency designated by the Owner. The Owner will pay costs of inspection and testing described in this section.
- .3 Contractor to inform testing agency 24 hours in advance of concrete placement.
- .4 Testing **shall** include:
  - .1 Preparation and testing of concrete cylinders for compressive strength.
  - .2 Establishment of slump and the percentage of entrained air for each concrete truck, unless otherwise directed by Consultant.
  - .3 Review of concrete mix designs submitted by the Contractor.
  - .4 Bond testing of concrete repair patches to existing concrete where designated by the Consultant, if required.
  - .5 Submission of test results to the Owner, Consultant, and Contractor.
  - .6 A minimum of one set (4 cylinders) of concrete cylinders shall be taken for compressive strength testing of concrete patch material used each day unless otherwise directed by Consultant. Concrete cylinders are to be placed in an area with similar curing conditions to that of the cast concrete.
- .5 Testing procedures for concrete shall conform to the following requirements:
  - .1 Compression tests on concrete shall be carried out in accordance with CSA A23.2 and A23.1 except that a Strength Test shall consist of four test cylinders and one cylinder shall be tested at the age of 3 days, the second cylinder shall be tested at the age of 7 days, and the remaining two at an age of 28 days.



- .2 Slump and air entrainment test shall be conducted at the time of sampling concrete for compressive tests and shall be conducted in conformity with CSA A23.2. Slump and air entrainment tests shall be performed on all loads used each day.
- .6 The Contractor shall provide at no additional costs to the Owner:
  - .1 Samples of all material required for testing.
  - .2 Cooperation with the execution of concrete testing, which shall include protection against injury or loss of cylinders.
  - .3 Access for the testing agency to test and/ or inspect materials.
  - .4 Site storage facilities meeting requirements of CSA A23.2 for concrete test specimens prior to removal to laboratory.
- .7 Bond Strength:
  - .1 After the concrete repairs have cured, the testing agency may perform bond strength tests where requested by the Consultant.
  - .2 These cores are to be used for the evaluation of the bond strength of the new concrete to the existing by direct tensile force. Testing agency will perform the required drilling through patches selected by Consultant.
  - .3 Failure to achieve a minimum tensile bond strength of 0.9 MPa shall constitute failure of patches.
  - .4 Contractor to fill all core holes with non-shrink cementitious grout upon completion of the tests.
- .8 Contractor shall pay for costs of additional testing as follows:
  - .1 Additional standby time required due to late delivery by concrete supplier.
  - .2 Additional slump and/or air tests if first tests indicate that concrete properties are outside of specified requirements and the Contractor wishes to modify the mix and retest. All modifications are to be approved by the Consultant.
  - .3 If the Contractor fails to notify the testing agency of pour cancellation.

### **3.7 Field Quality Control**

- .1 The Consultant shall evaluate bonding of fresh patch material to existing concrete after the fresh patch material has cured sufficiently.
- .2 The evaluation shall be performed by acoustical sounding, using a "chain-drag" or other techniques.
- .3 Hollow sounds detected in repair area provide reason to suspect inadequate bonding. Contractor to core these areas to determine bonding adequacy where requested by the Consultant.
- .4 Coring shall be through the new concrete and into the existing concrete. Core diameter shall be 75 mm, or as required by the Consultant. Length of cores shall be twice the core diameter or twice the thickness of new concrete, unless otherwise requested by the Consultant.
- .5 Scanning is to be completed prior to coring to avoid coring through embedded reinforcing, conduit, or other embedded items.
- .6 Cores will be visually inspected after removal and any further testing that is required will be determined by the Consultant.
- .7 Contractor to patch core holes.

### **3.8 Rejection of Defective Work**

- .1 The Consultant shall have the right to order additional concrete testing of any portion of repairs in accordance with CSA A23.1 if previous testing demonstrates non-conformance with specified requirements. The testing company shall be selected by the Consultant and shall deal directly with the Consultant. Payment for costs associated with the additional concrete testing will be at the Contractor's expense.
- .2 Where it is the Consultant's opinion that material or workmanship fails to meet the specified requirements, the work shall be replaced or repaired to the approval of the Consultant at no additional cost to the Owner.
- .3 Bond failure between repair material and the existing concrete, or failure to meet compressive strength requirements based on compression testing of concrete cylinders, will result in drilling of additional core samples at the Contractor's expense. Failure of these additional samples will require the work to be replaced or repaired to the approval of the Consultant at no additional cost to the Owner.

**END OF SECTION**

## **1.0 GENERAL**

### **1.1 Work Included**

- .1 Supply, install, and remove shores, scaffolding, and temporary steel beams as required to support the structure during delamination repairs
- .2 Structural shoring must be provided as indicated in shoring shop drawings prepared by a specialty Professional Engineer.
- .3 Structural shoring costs are included in Lump Sum Prices.

### **1.2 Submittals**

- .1 Provide shoring shop drawings that include a shoring design and layout designed by a specialty Professional Engineer licensed to practice in British Columbia a minimum of two weeks prior to starting demolition Work. Specialty Professional Engineer is to be retained by the Contractor at no additional cost to the Owner.
  - .1 Shoring shop drawings are to include shoring layouts for randomly located surface, soffit, through-slab, vertical concrete delamination repairs, and lateral wall bracing if required.
  - .2 Shoring layout and shop drawings shall depict arrangement of equipment for shoring, showing installation details, timber cribbing, member types, and spacing of connections.
  - .3 Shoring layout and shop drawings shall be designed, sealed, and signed by specialty Professional Engineer.
- .2 Shoring shop drawings are to be reviewed by the Consultant for the effect on the base structure and accepted prior to installation of shoring.
- .3 Shoring shop drawing submission excludes any shoring specifically detailed on the Drawings.
- .4 Submit documentation of field inspections and certifications required from specialty Professional Engineer, as specified by this Section, and Contract Documents.

### **1.3 Reference Standards**

- .1 All referenced Standards are latest editions referenced by the Building Code in the Place of the Work, or latest editions if not referenced by Code.

- .2 British Columbia Building Code
- .3 CSA S269.1 Falsework and Formwork
- .4 CSA S269.2 Access Scaffolding for Construction Purposes
- .5 CSA S350 Code of Practice for Safety in Demolition of Structures

## **2.0 PRODUCTS**

### **2.1 Equipment and Materials**

- .1 Unless otherwise specified by Contract Documents, use only commercially manufactured shoring and bracing systems.
- .2 Minimum capacity of commercially manufactured equipment as follows:
  - .1 Post shores with a minimum capacity of 24 kN at 2.5 m height
  - .2 Standard scaffold frames with a minimum capacity of 22 kN per leg.
  - .3 Heavy-duty scaffold frames with a minimum capacity of 44 kN per leg.
- .3 Manufactured shoring systems shall consist of pre-engineered steel or aluminium components, designed and produced specifically for structural shoring, and installed in accordance with manufacturer's recommendations.
- .4 Shoring members need not be new materials. Previously used materials are acceptable, provided that they are in good repair, unbent, and undamaged.
- .5 Use of "scaffolding" equipment (i.e. where not specifically intended for use as structural shoring of heavy loadings), wood shoring or bracing members, or tube-and-coupler assemblies require preapproval by the Consultant or Specialty Professional Engineer
  - .1 Use of wood materials shall be limited to wedges and shims, where not supporting vertical loading and where not subject to shrinkage or potential deterioration in wet conditions or long-term application.
- .6 Design of shoring members or structural steel members and components that are not of a pre-manufactured system shall be in accordance with provisions of governing Building Code and Standards for specific material of member.

- .7 Slabs are to be shored for a minimum of two levels or to the slab-on-grade level unless otherwise indicated on the approved shoring shop drawings or the Drawings.

### **3.0 EXECUTION**

#### **3.1 Structural Slab Shoring**

- .1 Support the structure during the Work. Supply and install all shoring and bracing [in accordance with approved shop drawings and necessary to prevent movement, settlement, or damage to the structure, services, and property.
- .2 Specialty Professional Engineer who designed shoring systems shall inspect installation and provide written certification that shoring and bracing systems and components, as installed, meets intent of their design and compliance with project criteria.
- .3 Provide additional shoring prior to concrete removal where the Consultant or specialty Professional Engineer deems it necessary to prevent movement, settlement, or damage to the structure, services, and property based on identified concrete delamination repair locations.
- .4 Provide additional shoring to support suspended sprinkler, piping and mechanical systems during the Work.
- .5 Provide additional shores at the Contractor's expense where it is necessary to support stockpiled rubble and equipment.
- .6 Formwork shoring requirements are in addition to structural shoring requirements.
- .7 Install and arrange slab shoring in a manner that prevents sharp projections that may cause personnel injury.
- .8 Modify the position of shores if requested by the Consultant or specialty Professional Engineer at no additional cost to Owner.
- .9 Manage and maintain shoring by regularly inspecting and checking installed shoring and bracing components to ensure that supports, fastenings, wedges, ties, and parts are secure.
- .10 Tighten all shores below the level being repaired prior to placement of new concrete repair material.

- .11 Do not strip shores until concrete repair material has reached 75% of design strength, and not sooner than seven days after concrete placement for full-depth slab repairs or three days for top surface delamination repairs.

**END OF SECTION**

## **1.0 GENERAL**

### **1.1 Work Included**

- .1 Remove sound and unsound concrete from slab surfaces, soffits, columns, and walls where directed by Consultant and as described herein.

## **2.0 PRODUCTS**

### **2.1 Equipment**

- .1 Provide hand-held jackhammers for concrete removal that are capable of efficiently removing sound and unsound concrete without causing excessive or unwanted removal.
- .2 Maximum jackhammer size is 15 kg. Light chipping hammers are to be used where the Consultant deems it necessary to reduce the amount of concrete breakage. Maximum light chipping hammer size is 7 kg. The use of light chipping hammers is at no additional cost to the Owner.
- .3 Equipment located outside shall be muffled or placed within an acoustic enclosure to produce maximum operating noise levels of 70 dBa at 3.0 m. Noise levels are also to be in accordance with all local and municipal by-laws and regulations.
- .4 Use "silenced" compressors.
- .5 Compressors and all diesel-powered equipment are to be fitted with a diesel exhaust scrubber.

## **3.0 EXECUTION**

### **3.1 Concrete Removal**

- .1 Actual concrete removal areas to be designated on site by the Consultant. Minimum depth of removal to be 50 mm at patch boundaries. Delamination sizes and locations as shown on the drawings are provided as general guidelines only.
- .2 All concrete removal to be achieved using light chipping hammers. All reasonable precautions are to be taken to ensure pre-stressed strands are not damaged during concrete removal. Do not expose pre-stressed strands to water.

- .3 Remove concrete within designated areas to obtain a minimum of 25 mm clearance around all exposed reinforcement within delamination repair. Minimum removal depth shall be 50 mm, which may include sound concrete. Do not remove concrete around pre-stressed strands unless noted otherwise by Consultant.
- .4 Upon exposure of visibly corroded or debonded reinforcement, additional concrete removal shall be performed until bars appear to be rust-free and well bonded for a distance of 75 mm and perimeter of designated area is sound, or until otherwise directed by the Consultant.
  - .1 This concrete removal shall not proceed until authorized by Consultant.
  - .2 Contractor shall not receive payment for concrete removals not authorized by nor considered necessary to Consultant.
- .5 Excess or unnecessary concrete removal to be at no extra cost to the Contract.
- .6 Outline patch area with a 13-mm deep vertical sawcut as close as possible to limits of concrete already removed. Reduce sawcut depth if necessary to avoid cutting reinforcement. Remove concrete to sawcut taking precautions to avoid damaging sawcut edge. Edges with spalls or chips will be rejected and shall be re-sawcut at Contractor's expense.
- .7 Call for review by Consultant to confirm acceptability of patch preparation prior to cleaning of reinforcement. After concrete removal has been complete, a final check adjacent to the areas shall be made by the Contractor to determine any additional spalling or delamination which may have occurred. Contractor shall mark out these areas and notify Consultant to make a review.
- .8 Remove additional concrete required to provide adequate development and/or lap for new reinforcing steel required as directed by the Consultant.
- .9 Where the Consultant deems that required concrete removal is excessive adjacent to vertical surfaces, a key is to be chipped into existing columns and walls prior to concrete placement. The key is to have a minimum depth of 40 mm into the vertical element. Install shoring and bracing as required.



### **3.2 Existing Exposed Electrical Services**

- .1 The Contractor shall perform temporary removal, replacement, or relocation of existing electrical wiring, conduit, equipment, fixtures, or hardware in designated concrete delamination repair areas as required for completion of the Work.
- .2 All exposed conduit, fixtures, attached devices, wet-sprinkler fire system piping, heads and pull stations, fire extinguishers, mechanical system components, louvers and ducts are to be protected or Contractor to correct damages at their own expense. The Contractor shall promptly report any damage to the Owner and the Consultant.
- .3 Prior to commencing the Work, the Contractor shall contact the Owner to locate all protective or alarm systems and sensors. All services shall be protected against damage or interruption. The Contractor shall provide the Owner with minimum 48 hours advance notice of any necessary interruption. All claims resulting from damage shall be the responsibility of the Contractor.

### **3.3 Existing Embedded Electrical Services**

- .1 It is the Contractor's responsibility to ensure that all potential areas of buried conduit be identified and that all high voltage systems located in the area of work are switched off to prevent possible injury. Coordinate requirements with Owner.
- .2 The Contractor shall take the utmost caution during concrete removal operations in order to prevent damage to embedded conduits. Any damage caused to such conduits will be immediately reported to the Owner and Consultant. In no instance will damaged or deteriorated conduits be covered up by the Contractor without specific approval from the Owner.
- .3 Contractor to repair or abandon damaged conduit within the slab at the discretion of the Consultant. Owner to pay for repairs provided that damage did not result from Contractor's negligence.
- .4 Contractor to coordinate required repairs with designated Electrical Sub-Contractor. [Owner][Contractor] shall designate Electrical Sub-Contractor for the Work.

**END OF SECTION**