Halifax Regional Centre For Education

Purchasing Division

TENDER # 3980

Heating Plant Upgrade-Shannon Park Elementary

Addendum #2

July 16th, 2018
10:30 A.M.

To: Bidders

From: Don Walpola, Buyer

Pages: 18 including cover

Phone: 464-2000(ext. 2223)

The bid documents shall be amended and new drawings and clauses added, and shall become part of the contract documents as follows:

DRAWINGS

1. Reference Drawing MH101
    1. Capped branch lines adjacent to the Band/Lunch/Excel room shall extend through the wall so that valves and caps are within the Band/Lunch/Excel room.
2. Reference Drawings MH101 and MH102
    1. Single 3" HWR express main running inside classrooms adjacent the corridor may be installed in the hallway from room "SLD 15" to storage room adjacent "Classroom 5".

SPECIFICATIONS

1. Reference Section 23 07 00 Mechanical Thermal Insulation
    1. Change Header title to read "Shannon Park Elementary", Delete "South Peninsula Elementary School"
    2. Add 2.2.1.4.3.2 (Steam Pipe Insulation Thickness)
       .2 50mm (2") on NPS 2-1/2 and above

2. Reference Section 23 22 14 Steam Specialties Add:

2.5 SHELL AND TUBE HEAT EXCHANGER

.1 General: water to glycol. Heating media in shell.
.2 Shell: steel 860kPa (125 psig) working pressure. Screwed inlet connection. Screwed outlet connection. Tappings for relief valve and drain.

.3 *Head: cast iron or fabricated steel, screwed inlet and outlet. Tapped connections for drain and vacuum breaker.*

.4 *Mounting supports: steel or cast iron support saddles.*

.5 *Tubes: NPS 3/4 O.D. copper.*

.6 *Fouling factor:*

- .1 *Tube: 0.00025*
- .2 *Shell: 0.00025*

.7 *Maximum Velocity:*

- .1 *Tube: 1.8 m/s (6 fps).*
- .2 *Shell: 1.2 m/s (4 fps).*

.8 *Maximum Pressure Drop:*

- .1 *Tube: 7 feet*
- .2 *Shell: 7 feet*

.9 *Capacity: as indicated on drawings.*

.10 *Standard of Acceptance:*

- .1 *Xylem Bell & Gossett as per drawings*

.11 *Acceptable Manufacturers:*

- .1 *S. A. Armstrong Ltd.*
- .2 *Taco Canada Ltd.*

CLARIFICATIONS

Q: What is the structure above drywall for hanging?

A: Roof structure are I-Beams running from outside wall, to the corridor wall. Based on site measurements, 9'-0" spacing was observed, contractors should expect spans ranging from 8'-0" to 10'-0".

Roof deck is formed using laminated wood planks. Contractors may use coach screws to hang pipe from wood structure. Contractor to verify screws will not exceed the thickness of the wood and alert the consultant if wood is less than standard 2x4.

Q: What is the last day for daytime work? A: September 3rd

Q: Is there a fire rating between the classroom and corridor? A: No fire rating, but penetrations are to be sealed.

Q: Do the wall/ceilings contain asbestos?
A: According to the attached Asbestos Survey dated February 15 1999, No.

Q: Do the pipe fittings contain asbestos?
A: According to the attached report – **some do**. It is the contractor's responsibility to safely remediate asbestos containing items that are identified in the report and need to be disturbed as part of this contract.

END OF MECHANICAL ADDENDUM

ASBESTOS SURVEY,
Shannon Park School
7 Iroquois Drive Dartmouth, N.S.,
B3A 1B4

Prepared by:

Maritime Testing (1985) Limited 116-900
Windmill Rd Dartmouth, N.S.

Prepared for:

Halifax Regional School Board 90
Alderney Dr., 3rd floor Dartmouth, N.S.
B2Y 4S8

February 15, 1999 NEO-

1256.34

INTRODUCTION

The Halifax Regional School Board has undertaken a mandate to conduct asbestos inventories in each of the schools in the School Board region. Maritime Testing (1985) Limited (MTL) was retained by the Board to conduct these inventories and prepare the asbestos survey reports. This report on Shannon Park School represents one of the schools surveyed as part of this comprehensive inventory.

METHODS

Each school was inspected for building materials that might be composed of asbestos containing minerals (ACMs). Types of materials examined and sampled as needed could include but not necessarily be limited to:

mechanical systems:	insulation on pipes, fittings, boilers, air conveyance systems, structural materials
flooring:	sheet flooring, vinyl tiles
ceilings:	suspended ceilings, rigid ceilings, texture coats
walls:	texture coats, wallboards, plasters building
exterior:	wall panels, panels under entrances

Please note the following limitations regarding these surveys:

1. Sampling and inspection was not conducted if permanent visible damage would result from these activities. In such circumstances, inference is made to the potential for ACMs to be present based upon other observations made in the building (for example, holes are not cut into wall cavities to determine if insulated pipe work is present).

2. In each school, every room that was accessible was surveyed. In cases where access to a room was not possible, inference on that room is made based on what was observed throughout the rest of the school.

All inspections were scheduled such that sampling could be conducted after normal school hours. This school was surveyed on January 13, 1999.

Samples collected at the school were examined under both stereo and polarised light microscopy to determine fibre types and relative percentages of each asbestos mineral if it was present. As well, any ACMs were further categorised into one of three categories as

noted below:

Priority 1: materials representing a potential health risk with normal routine building use and which require immediate removal. Such materials may include damaged ceiling tiles, damaged pipe insulation, damaged friable boiler insulation.

Priority 2: materials which do not pose a health risk under normal school usage but which pose a periodic risk to maintenance and custodial staff or which are currently undamaged but which might easily be damaged in the future; these materials require removal during the next suitable time (ie a major school break, next planned renovation project). Such materials may include undamaged ceiling tiles, damaged pipe insulation above ceilings, undamaged texture coats.

Priority 3: Non-friable materials or materials that are in good condition, are not generally accessible, and which currently pose no risk to any occupant. Such materials may include floor tiles, transite panels, mechanical insulation in good repair.

Refer to Appendix A for a summary of the Priorities of the ACMs.

Data are also available on an asbestos inventory data base, accessible from the school board offices prepared specifically by MTL for this project.

For a list of materials sampled, refer to Appendix B. Refer to Appendix C for a diagram of the school floor plan and sample locations. For a list of locations and quantities of asbestos containing materials, refer to Appendix D. Refer to Appendix E for a room by room account of ACM's. Refer to Appendix F for photos of Priority 1 ACMs.

INVENTORY RESULTS.

Mechanical Room: The Domestic Hot Water Tank is encased in steel with fibreglass insulation underneath. The pipes throughout the boiler room are insulated with fibreglass or an asbestos containing corrugated material (>90% chrysotile) known as aircell on the runs and asbestos containing cement (60% chrysotile). The asbestos pipe insulation is in good condition and a Priority 3.

Exterior: No materials contain asbestos.
Floors: Floors are covered with a combination of various coloured 9" tiles and seamless flooring. Various types of the 9" tiles throughout the school contain 10% chrysotile asbestos. The tiles are in good condition and a Priority 3.

Walls: None of the wall materials in this school contain asbestos.

Ceilings: None of the ceiling materials in this school contain asbestos.

Pipe Systems: The pipe runs throughout the school are mainly insulated with fibreglass with a few runs insulated with aircell (90% chrysotile). The elbows throughout the school are insulated with asbestos cement (50% chrysotile). Asbestos pipe insulation located above the ceiling is a Priority 3 and below the ceiling is a Priority 2.

Appendix A:

Summary: The following is a summary of Priorities of the various ACMs at this school:

Priority 1:	• none
Priority 2:	• throughout school, asbestos pipe insulation below the ceiling
Priority 3:	• Boiler Room, asbestos pipe insulation
	• throughout school, various 9" floor tile
	• throughout school, asbestos pipe insulation above the ceiling

Appendix B:

Samples taken and locations

#	Sample description	Location	ACM
	Boiler Room		
34.1	Pipe run on H/L line	Boiler Room	yes
34.2	Cement on pipe elbow	Boiler Room	yes
34.3	Pipe Run with cement over fibre glass	Boiler Room	yes
	Exterior		
	No ACM's		
	Floors		
34.20	9" Tile, Orange red with beige and black streaks	Room 101	yes
34.21	9" Tile, Medium beige with indian red and brown streaks	Room 101	yes
34.22	9" Tile, Dark brown with cream and red streaks	Room 101	yes
34.23	9" Tile, Black	Room 101	yes
34.24	9" Tile, White with black spots	Room 101	no
34.25	9" Tile, Light beige with brown and white streaks	Room 101	no
34.26	9" Tile, Very light grey with faded grey streaks	Room 101	no
34.27	9" Tile, Chocolate brown with white streaks	Room 101	no
34.28	9" Tile, Light beige with brown wood grain style	Room 101	no
34.29	9" Tile, Tan with white and brown streaks	Room 101	no
34.31	6' wide seamless, Light pink with white and black spots	Room 105	no
34.32	6' wide seamless, Light beige with white, brown, and grey spots	Room 104	no
32.33	6' wide seamless, Medium beige with brown and grey specks	Room 106	no

Appendix B:

Sample s taken and locations

#	Sample description	Location	ACM
32.34	9" Tile, Khaki with cream streaks	Room 114	yes
31.36	9" Green with white streaks	Main foyer closet, underneath stairway	yes
31.37	6' wide seamless, Medium beige	Gymnasium	no
34.38	6' wide seamless, beige marble	Stage	no
34.39	Seamless, greenish grey with ping and grey spots	Stage	no
34.41	9" Tile, Light green with white streaks	Room 35	no
34.42	9" Tile, Grey with white and black streaks	Room 35	yes
34.44	9" Tile, Medium beige with white and brown streaks	Room 34	no
34.45	9" Tile, Aqua with white streaks	Room 34	no
34.47	9" Tile, Light blue with white streaks	room 32	no
34.48	9" Tile, Light red with white and brown streaks	Room 31	yes
34.50	9" Tile, Medium beige with brown streaks	Room 36	no
34.51	12" Tile, Grey marble	Room 39	no
	Walls		
34.30	Plaster over cement/gyproc	Room 101	no
	Ceilings		
34.30	Plaster	Room 101	no
34.35	1' x 1' glued on tiles	Room 114	no
34.40	2' x 2' suspended ceiling tiles	Hallway by Room 34	no
34.43	2' x 2' suspended ceiling tiles	Room 35	no
34.46	2' x 2' suspended ceiling tiles	Girls washroom (1st floor)	no
34.49	2' x 2' suspended ceiling tiles	Boys washroom (1st floor)	no
	Pipes		

Appendix B:

Samples taken and locations

#	Sample description	Location	ACM
34.30	Insulation on pipe elbow, below / above ceiling	Back exit from room 101	yes
34.37	Cement over pipe elbow, below / above ceiling	girls change room, gymnasium	yes

Appendix D:

Quantity and locations of ACMs.

Boiler Room

Description	Locations	Quantity
Aircell pipe runs	Boiler Room	613 ft
Cement on pipe elbow	Boiler Room	100
Cement over fibre glass run	Boiler Room	10 ft

Exterior

No ACM's

Floors

Description	Locations	Quantity ($ft.^2$)
9" Tile, Orange red with beige and black streaks	Room 101	480
9" Tile, Orange red with beige and black streaks	Room 109	252
9" Tile, Orange red with beige and black streaks	Room 111	100
9" Tile, Orange red with beige and black streaks	Room 121	80
9" Tile, Orange red with beige and black streaks	Room 125	294
9" Tile, Orange red with beige and black streaks	Room 151	210
9" Tile, Medium beige with indian red and brown streaks	Room 101	1024
9" Tile, Medium beige with indian red and brown streaks	Room 112	140
9" Tile, Medium beige with indian red and brown streaks	Room 125	294
9" Tile, Dark brown with cream and red streaks	Room 101	480

Floors

Description	Locations	Quantity ($ft.^2$)
9" Tile, Dark brown with cream and red streaks	Room 125	20
9" Tile, Black	Room 101	14
9" Tile, Black	Room 109	60
9" Tile, Black	Room 111	10
9" Tile, Black	Room 112	10
9" Tile, Black	Room 121	60
9" Tile, Black	Room 125	20
9" Tile, Black	Room 151	20
9" Tile, Kaki with cream streaks	Room 114	210
9" Tile, Kaki with cream streaks	Main Foyer, closet under stairs	40
9" Green with white streaks	Main Foyer, closet under stairs	40
9" Tile, Grey with white and black streaks	Room 35	272
9" Tile, Grey with white and black streaks	Room 32	400
9" Tile, Grey with white and black streaks	Room 30	272
9" Tile, Grey with white and black streaks	Room 27	400
9" Tile, Grey with white and black streaks	Room 42	400
9" Tile, Grey with white and black streaks	Room 37	400
9" Tile, Grey with white and black streaks	Room 40	272
9" Tile, Light red with white and brown streaks	Room 31	272
9" Tile, Light red with white and brown streaks	Room 26	272

Floors

Description	Locations	Quantity (ft.^{2})
9" Tile, Light red with white and brown streaks	Room 36	272
9" Tile, Light red with white and brown streaks	Room 41	272

Walls

No ACM's

Ceilings

No ACM's

Pipes

Description	Locations	Quantity
Aircell pipe run, below ceiling	Girls change room	15 ft
Aircell pipe run, below ceiling	Back exit from room 101	10 ft
Aircell pipe run, below ceiling	Gymnasium	50 ft
Cement elbow, below ceiling	Girls change room	1
Cement elbow, below ceiling	Gymnasium	8
Aircell pipe run, above ceiling	Hallway by room 105	20 ft
Cement elbow, above ceiling	Room 35	10
Cement elbow, above ceiling	Room 34	10
Cement elbow, above ceiling	Boys Washroom (1st floor)	20
Cement elbow, above ceiling	Room 33	15
Cement elbow, above ceiling	Girls Washroom (1st floor)	3
Cement elbow, above ceiling	Room 26	8
Cement elbow, above ceiling	Room 32	8
Cement elbow, above ceiling	Room 27	8
Cement elbow, above ceiling	Room 31	8
Cement elbow, above ceiling	Room 28	8

Pipes

Description	Locations	Quantity
Cement elbow, above ceiling	Room 29	10
Cement elbow, above ceiling	Room 30	10
Cement elbow, above ceiling	Hallway from Room 29 to fire doors	35

Appendix E:

ACM's Room by Room (for quantities refer to Appendix D).

Room	ACMs
Boiler Room	Aircell pipe runs, cement pipe elbows, cement on pipe run
Main Foyer, closet under stairs	9" Floor tile, Kaki with cream streaks, 9" Floor tile, Green with white streaks
Room 26	9" Floor tile, Light red with white and brown streaks, cement elbows above ceiling
Room 27	9" Floor tile, Grey with white and black streaks, cement elbows above ceiling
Room 30	9" Floor tile, Grey with white and black streaks, cement elbows above ceiling
Room 31	9" Floor tile, Light red with white and brown streaks, cement elbows above ceiling
Room 32	9" Floor tile, Grey with white and black streaks, cement elbows above ceiling
Room 35	9" Floor tile, Grey with white and black streaks, cement elbows above ceiling
Room 36	9" Floor tile, Light red with white and brown streaks
Room 37	9" Floor tile, Grey with white and black streaks
Room 40	9" Floor tile, Grey with white and black streaks
Room 41	9" Floor tile, Light red with white and brown streaks
Room 42	9" Floor tile, Grey with white and black streaks
Room 101	9" Floor tile, Black, 9" Floor tile, Medium beige with indian red and brown streaks, 9" Floor tile, Dark brown with cream and red streaks, 9" Floor tile, Orange red with beige and black streaks, Aircell pipe run, below ceiling
Room 109	9" Floor tile, Orange red with beige and black streaks, 9" Floor tile, Black
Room 111	9" Floor tile, Orange red with beige and black streaks, 9" Floor tile, Black
Room 112	9" Floor tile, Black, 9" Floor tile, Medium beige with indian red and brown streaks

Appendix E:

Room	ACMs
Room 114	9" Floor tile, Kaki with cream streaks
Room 121	9" Floor tile, Black, 9" Floor tile, Orange red with beige and black streaks
Room 125	9" Floor tile, Dark brown with cream and red streaks
Room 125	9" Floor tile, Black, 9" Floor tile, Medium beige with indian red and brown streaks, 9" Floor tile, Orange red with beige and black streaks
Room 151	9" Floor tile, Orange red with beige and black streaks, 9" Floor tile, Black
Girls Change Room	Aircell pipe run, below ceiling, cement pipe elbow
Gymnasium	Aircell pipe run, below ceiling, cement pipe elbow
Hallway by Room 105	Aircell pipe run
Room 33	Cement elbows above ceiling
Room 34	Cement elbows above ceiling
Boys Washroom (1st floor)	Cement elbows above ceiling
Girls Washroom (1st floor)	Cement elbows above ceiling
Room 28	Cement elbows above ceiling
Room 29	Cement elbows above ceiling
Hallway by caretaker's room	Cement elbows above ceiling
Hallway from room 29 to fire doors	Cement elbows above ceiling

End of Addendum #2

PLEASE SIGN BELOW AND RETURN WITH BID DOCUMENTS:

_____ _____

Signature Company Name

Halifax Regional Centre For Education

Purchasing Division

TENDER # 3980

Heating Plant Upgrade-Shannon Park Elementary

Addendum #1

July 11th, 2018
1:45 P.M.

To: Bidders

From: Don Walpola, Buyer

Pages: 1 including cover

Phone: 464-2000(ext. 2223)

The bid documents shall be amended and new drawings and clauses added, and shall become part of the contract documents as follows:

Closing date of tender #3980 has been extended to 19th July, 2018 – 2:00:00 p.m.

End of Addendum #1

PLEASE SIGN BELOW AND RETURN WITH BID DOCUMENTS:

_____ _____

Signature

Company Name

HALIFAX REGIONAL CENTRE FOR EDUCATION

TENDER #3980

Heating Plant Upgrade
Shannon Park Elementary

Closing Date: **THURSDAY, JULY 12TH, 2018**
Closing/Opening Time: ***2:00 P.M.***

Closing Location:
Halifax Regional Centre for Education
33 Spectacle Lake Drive
Dartmouth, N.S. B3B 1X7

Substantial Completion Date:
November 30th, 2018

HRCE Contacts:
Don Walpola, Buyer
Tel: (902) 464-2000 #2223
Fax: (902) 464-0161
Email: dwalpola@hrsb.ca

School Location:
Shannon Park Elementary
75 Iroquois Dr
Dartmouth
B3A 4M5

Operations Contact:
Tyler Bell, Energy Manager
Tel: (902) 464-2000 Extension #5119
E-mail: tbell@hrsb.ca

A mandatory tenderers' site meeting is scheduled for *WEDNESDAY JULY 4th 2018 at 02:00 p.m., SHANNON PARK ELEMENTARY – Please meet at the front entrance of the school.*

To obtain documents:
Download tender documents in .pdf format from the HRCE's Website:
http://www.hrsb.ca/about-hrsb/financial-services/purchasing/tenders/tender-listing

SECTION 00 00 01 - TABLE OF CONTENTS

SECTION 00 00 01 - TABLE OF CONTENTS

SECTION 00 00 15 - DESCRIPTION OF WORK & LIST OF DRAWINGS

1. General

1.1 The work of this contract includes the provision of all materials, labour and equipment necessary to complete the **Heating Plant Upgrade** at **Shannon Park Elementary**, as noted on the drawings and specifications prepared by Dumac Energy Limited.

1.2 It is the HRCE's intent to have all work completed, to point of Substantial Performance, prior to **November 30th, 2018**. It is expected that an early award of this contract will enable the Contractor to facilitate shop drawing review and ordering of materials to allow commencement of work immediately following award of tender.

1.3 The whole of the work shall agree in all particulars with the levels, measurements and details contained in the drawings accompanying this specification and with such other drawings or information as may from time to time be supplied by the HRCE, or may be supplied by the Contractor and reviewed by the HRCE.

2. List Of Drawings

Drawing NO.	Drawing Title
MH101	PARTIAL MAIN FLOOR PLAN HEATING
MH102	PARTIAL MAIN FLOOR PLAN HEATING
MH103	PARTIAL LEVEL 2 FLOOR PLAN HEATING
MH401	HYDRONIC/STEAM PLANS AND SCHEMATICS
MH501	HEATING DETAILS
MH601	HEATING SCHEDULES
MC601	CONTROLS DETAILS

END OF SECTION 00 00 15

SECTION 00 05 00 - LIST OF CONSULTANTS

Owner: **HALIFAX REGIONAL CENTRE FOR EDUCATION**
33 SPECTACLE LAKE DRIVE, DARTMOUTH NS

Architect: **Chris Landry**
Dumac Energy Limited
Phone: (902) 802-6204
Email: Clandry@dumac.ns.ca

END OF SECTION 00 05 00

SECTION 00 21 13 – INFORMATION FOR TENDERERS

Invitation:

1. Bid Call

1.1. The HALIFAX REGIONAL CENTRE FOR EDUCATION (HRCE) will receive offers in the form of a bid from Contractors which is signed and received on or before the date and time specified on the cover sheet of this document. The HRCE deems the correct time to be the time indicated on the phone clock on the Receptionist's desk at at 33 Spectacle Lake Drive.

1.2. Offers submitted after the closing time/date shall be returned to the tenderer unopened.

1.3. Submit completed tender documents for above project in sealed envelope marked as follows: ***TENDER #3980, Heating Plant Upgrade –Shannon Park Elementary.***

1.4. Bids will be opened at the time indicated on the cover sheet of this document. As of April 1, 2014 Public tender openings are no longer held for any tenders relating to goods, services or construction for HRCE. A list of tenderers and bid amounts will be posted on the Procurement Services website (http://novascotia.ca/tenders/tenders/ns-tenders.aspx) shortly following the closing of the tender. All bid submissions are subject to evaluation after opening and before award of contract. The winning tenderer and award amount will be posted on the Procurement Services website (http://novascotia.ca/tenders/tenders/ns-tenders.aspx) after award.

1.5. In the event that the HALIFAX REGIONAL CENTRE FOR EDUCATION office is closed due to inclement weather or any other reason on the date and at the time of closing, the Closing Date and Time will be extended one (1) business day. Proponents should note that closure of Schools does not necessarily mean closure of the HRCE's Regional Office.

1.6. Amendments to the submitted offer will be permitted if received in writing prior to bid closing and if endorsed by the same party or parties who signed and executed the offer.

1.7. Emailed/Faxed Bid Submissions **will not** be accepted.

2. Intent

2.1. The intent of this bid call is to obtain an offer to perform all work associated with ***TENDER #3980, Heating Plant Upgrade,*** at ***Shannon Park Elementary*** for a Stipulated Price Contract in accordance with the Contract Documents.

3. Scope of work

3.1. Refer to Section 00 00 15 – Description of Work and List of Drawings.

4. Availability

4.1. Bid Documents can be obtained as per the directions on the cover sheet of this document.

4.2. Bid Documents are made available only for the purpose of obtaining offers for this project. Their use does not confer a license or grant for other purposes.

4.3. The HALIFAX REGIONAL CENTRE FOR EDUCATION is not responsible for accuracy of documents and project postings obtained from any other source.

5. Examination

5.1. Bid Documents are on display at the offices of the Nova Scotia Construction Association (CANS), Halifax, NS.

5.2. Upon receipt of Bid Documents verify that documents are complete; notify the HRCE's Buyer by email to dwalpola@hrsb.ca, should the documents be incomplete, or upon finding discrepancies or omissions in the Bid Documents.

5.3. Tenderers shall become fully aware of the content of all tender documents for the preparation of the Tenderer's offer.

5.4. Tenderers will be deemed to have familiarized themselves with the existing site and working conditions and all other conditions which may affect the performance of the work. No plea of ignorance of such conditions as a result of failure to make all necessary examinations will be accepted as a basis for any claims for extra compensation or an extension of time.

6. Clarification and Addenda

6.1. Notify Don Walpola, Buyer, by email to dwalpola@hrsb.ca no less than **five (5)** working days before Tender Closing regarding any questions, omissions, errors or ambiguities found in Contract Documents. If HRCE considers that correction, explanation or interpretation is necessary, a reply will be in the form of an addendum, a copy of which will be posted on the novascotia.ca/tenders and/or HRCE website as applicable, and it is the responsibility of the Tenderer to ensure all addenda are received and acknowledged.

6.2. Addenda will be issued no less than three (3) business days before tender closing date and time, and will form part of the Contract Documents.

6.3. Verbal answers to queries are not binding. Information must be confirmed by written addenda. The HRCE and its representatives shall not be bound by or be liable for any representation or information provided verbally. Information obtained by any other source is not official and will not bind the HALIFAX REGIONAL CENTRE FOR EDUCATION.

6.4. Complete tender form (section 00 41 13) acknowledging that addenda have been received.

7. Product/System Options

7.1. Alternatives to specified products and systems will only be considered during the bidding period in the manner prescribed below.

7.1.1. Where the Bid Documents stipulate a particular product, alternatives may be considered by the Consultant up to five (5) working days before tender closing date and time. Tenderers must forward their written requests by email to: dwalpola@hrsb.ca. The Buyer will relay the requests to the appropriate person(s) for review.

7.2. The submission must provide sufficient information to enable the Consultant to determine acceptability of such products. Request for an alternate must be accompanied with:

7.2.1. information about how the request affects other work in order to accommodate each alternate;

7.2.2. the dollar amount of additions to or reductions from the Bid Price, including revisions to other Work.

A later claim by the tenderer for an addition to the contract price because of changes in work necessitated by use of alternates shall not be considered.

7.3. When a request to substitute a product is made and pursuant to consultation with the Consultant, HRCE may approve or disapprove the substitution. The tenderer making the request will be notified of the HRCE's decision and if the alternate is approved, the HRCE will issue an Addendum.

7.4. Alternates must be submitted in above manner; otherwise, they will not be accepted.

8. Mandatory Tenderers' Site Meeting (Site Assessment)

8.1. Tenderers will be deemed to have familiarized themselves with existing project site and working conditions and all other conditions, which may affect performance of the Contract. No plea of ignorance of such conditions as a result of failure to make all necessary examinations will be accepted as a basis for any claims for extra compensation or an extension of time.

8.1.1. A Mandatory Tenderers' Site Meeting has been scheduled as per the information on the cover sheet of this document. All Tenderers are required to attend. Representatives of HRCE and the Consultant will be in attendance;

9. Tenderers Registration

9.1. The successful Contractor and Sub-contractors must comply with the Nova Scotia Corporations Registration Act or Partnerships and Business Name Registration Act, or equivalent, before a contract is awarded.

10. Qualifications

10.1. Sub-Contractors

10.1.1. HRCE reserves the right to reject a proposed sub-contractor for a reasonable cause.

10.1.2. Refer to Article GC 3.7.3 of CCDC-2 2008.

11. Bid Submission

11.1. Submissions

11.1.1. Tenderers shall be solely responsible for the delivery of their bids in the manner and time prescribed.

11.1.2. Bids must be submitted on the **Bid Form** provided by the HRCE (Section 00 41 13 – Bid Form). These forms are to be completely filled out in ink, with the signature in longhand, and corporate sealed as applicable, and the completed form shall be without interlineations, alterations or erasures. Electronic bid submissions sent by facsimile transmission or email will not be accepted.

11.1.3. Fully complete the Tender Bid Form and enter the contract price in both written words and numerals. Where this bid is requested in both words and numbers, and if the two (2) do not represent the identical amount, words shall prevail.

11.1.4. Submit the executed offer on the Bid Forms together with the required bid security in a closed opaque envelope, clearly identified with tenderer's name, project name and tender number on the outside.

11.1.5. Improperly completed information, irregularities in the bid security, may be cause to declare the bid informal.

12. Accuracy of Referencing

12.1. Indexing and cross-referencing are for convenience only.

13. Conditions of Tendering

13.1. Take full cognizance of content of all Contract Documents in preparation of Tender. Refer to Section 00 41 13 – Tender Form, Subsection 5.0 for a complete list of Contract Documents.

14. Preparation of Tender

14.1. Complete Tender Bid Form (section 00 41 13) provided with Contract Documents in ink. Tender all items and fill in all blanks. Have corrections initialed by person signing Tender. Tenderers' are required to provide all information as detailed.

15. Amendment or Withdrawal of Tender

15.1. Bids may be amended or withdrawn by post, hand or facsimile prior to date and time of closing.

15.2. A Tender Price Amendment Form is provided immediately following the Bid Form (section 00 41 73).

15.2.1.1. The Tender Price Amendment Form provided is the standard Master form for submission of all tender price amendments for this project.

15.2.1.2. Copy and complete form, as directed, for all tender price amendments submitted.

15.3. Amendments shall not disclose either original or revised total price.

15.4. Sign, execute and submit to the HRCE Office or by facsimile to (902) 464-0161 prior to time of Tender Closing.

16. Bid Ineligibility (reason for rejection)

16.1. HRCE may reject a bid which has been received prior to the closing time where:

16.1.1. The bid is not submitted on the required bid form (Section 00 41 13) included herein.

16.1.2. The bid is submitted by electronic transmission.

16.1.3. There are omissions of information that HRCE in its sole discretion deems to be significant.

16.1.4. The bid is not signed as required.

16.1.5. The bid has conditions attached which are not authorized by the invitation to bid.

16.1.6. The bid fails to meet one or more standards specified in the invitation to bid.

16.1.7. All addenda have not been acknowledged.

16.1.8. Any other defect which, in the opinion of the HRCE brings the meaning of the bid into question.

16.1.9. A major irregularity is a deviation from the bid request which affects the price, quality, quantity, or delivery of the project and is material to the award, and is a reason for rejection.

16.1.10. A minor irregularity is a deviation from the bid request which affects form, rather than substance. The effect on price, quality, quantity or delivery is not material to the award, and may be waived by the HRCE.

16.1.11. The required bid security in the required form is not provided.

16.1.12. Tenderer failed to attend Tenderers' Mandatory Site Meeting.

17. Communications Affecting Bids

17.1. Electronic Transmissions, including, but not limited to facsimile transmission:

17.1.1. Bid forms submitted by facsimile and/or e-mail etc. transmission are not acceptable and will be rejected.

17.1.2. Electronic transmissions (facsimile only) modifying tenderer supplied information are acceptable when signed by an authorized signatory of the original bid. Submission and receipt of such electronic transmissions is at the risk of the tenderer. HRCE assumes no liability for the receipt of the electronic transmission or for their proper inclusion with original bid. There is no requirement for HRCE to follow up upon receipt of an electronic transmission. Electronic submissions will be considered binding on both parties. Electronic submissions must be submitted and received prior to closing time and date specified in the bid documents. HRCE Procurement Department Date and Time stamps will prevail. **HRCE Procurement facsimile number is 902-464-0161.**

18. Right to Accept or Reject any Tender

18.1. The HRCE reserves the right to reject any bid in its sole and absolute discretion for any reason whatsoever.

18.2. The HRCE specifically reserves the right to reject all bids if none is considered to be satisfactory in the HRCE's sole and absolute discretion and, in that event, at its option, to call for additional bids.

18.3. Without limiting the generality of any other provision herein, the HRCE reserves the right to accept or reject any bid in accordance with bullet #16 above. (Bid Ineligibility)

18.4. Notwithstanding the above, the HRCE shall be entitled, in its sole and absolute discretion, to waive any irregularity, informality or non-conformance with these instructions in any proposal received by the HRCE. HRCE reserves the right to reject any or all tenders, or to accept any tender, or portion thereof, deemed in its best interest.

18.5. In the event that a number of Tenderers submit bids in substantially the same amount, the HRCE may, at its discretion, call upon those Tenderers to submit further bids or take into consideration any value added services being provide in determination of award.

18.6. No term or condition shall be implied, based upon any industry or trade practice or custom or in a practice or policy of the HRCE or otherwise, which is inconsistent or conflicts with the provisions contained in these Instructions.

19. Construction Contract Guidelines

19.1. The printed policies of the Nova Scotia Construction Guidelines, dated May 18, 2006 (or latest revisions) are applicable to these bid documents.

20. Bid and Security Forms – Signatures

20.1. All bid forms, bid security forms and performance assurance forms **must** bear the Tenderer's original signature and name HRCE as insured.

21. Bid Security

21.1. Submit with Bid one of the following: Bid security in the form of a Certified Cheque, Irrevocable Letter of Credit, or Bid Bond on CCDC Form 220, in the amount of ten percent (10%) of the Bid Price made payable to, or naming HRCE (as obligee), must accompany the tender.

21.2. Where bid bond is provided as bid security:

21.2.1. Provide bond on the standard CCDC Bid Bond Form, latest version, in the amount of not less than ten percent (10%) of the Bid Price.

21.2.2. Bid Bonds, submitted by the general contractor tenderer, signed and sealed by the principal (Contractor) and Surety and shall be with an established Surety Company satisfactory to and approved by HRCE.

21.2.3. Where Bid Bond is used as Bid Security, include the cost of providing the Bid Bond in the Bid Price.

21.3. Where certified cheque or bank draft is provided as bid security:

21.3.1. Provide a certified cheque or bank draft, endorsed in the name of HRCE, for a sum not less than ten percent (10%) of the amount of the Bid Price.

21.3.2. Where certified cheque or bank draft is used as Bid Security, include the cost in the Bid Price.

21.4. Where the Irrevocable Standby Letter of Credit is used as bid security:

21.4.1. Provide an Irrevocable Standby Letter, endorsed in the name of HRCE, for a sum not less than ten percent (10%) of the Bid Price

21.4.2. The Irrevocable Standby Letter of Credit shall be issued by a certified financial institution subject to the Uniform Custom and Practices for Documentary Credit (1993 revision or latest revision) International Chamber of Commerce (Publication No. 500).

21.4.3. Where Irrevocable Standby Letter of Credit is used as bid security, include the cost in the Bid Price.

21.5. Return of Bid Security:

21.5.1. The bid security of the unsuccessful tenderers will be returned to them after the contract has been signed, or previous to such time, at the discretion of HRCE.

21.5.2. The above shall apply provided a contract is awarded within ninety (90) days from the closing date of the bid.

21.5.3. If no contract is awarded, all bid security will be returned.

22. Contract Security (Performance Assurance)

22.1. All bid forms, bid security forms and performance assurance forms must bear the tenderer's original signature and name HRCE as insured.

22.2. Tenderer shall maintain performance assurance in force for a period of not less than twelve (12) months after the issue of the substantial performance certificate certified by HRCE and until completion of the contract.

22.3. Endorse Performance Assurance as specified for bid security.

22.4. Should it become apparent that the final cost of the project will exceed the total amount payable by more than 20%, the tenderer shall arrange to have their bonds reissued based on the projected final cost.

22.5. Refer to Section 00 72 13 – General Conditions GC11.2 and Section 00 73 00 – Supplementary General Conditions for form of Contract Security. Refer to project documents for amount of Contract Security and alternate type of Contract Security if applicable.

22.6. Submit as Performance Assurance one of the following:

22.6.1. Where a Bid Bond was used as bid security:

22.6.1.1. Within ten (10) days after notification of award of the Contract, provide a Performance Bond and a Labour & Material Payment Bond, each in an amount equal to fifty percent (50%) of the amount of the Contract, naming HRCE.

22.6.1.2. Performance Bond and Labour and Material Payment Bonds, submitted by the tenderers, shall be provided at the expense of the tenderer and shall be with an established Surety Company satisfactory to and approved by HRCE.

22.6.1.3. Include the cost of providing the Performance Bond and Labour and Material bond in the Contract price.

22.6.2. Where a Certified Cheque or Bank Draft is used as Contract Security:

22.6.2.1. The Certified Cheque or Bank Draft submitted during the bid period will be cashed and the amount retained by HRCE shall serve as Performance Assurance**,** including the payment of all obligations arising under the Contract.

22.6.2.2. The Certified Cheque or Bank Draft will be held in lieu of the Performance Bond and Labour and Material Bonds, providing that, at Contract award, the successful Tenderer shall supplement their Certified Cheque or Bank Draft to maintain an amount of ten (10%) of the total amount payable (Contract Price plus HST) under the contract.

22.6.2.3. The amount remaining will be returned without interest after a period of not less than twelve (12) months after the issue of the substantial performance certificate certified by HRCE and shall serve as performance assurance and not until completion of the contract.

22.6.2.4. Where certified cheque or bank draft is used as Performance Assurance, include the cost of providing the certified cheque in the Contract price.

22.6.3. Where an Irrevocable Standby Letter or Credit is used as Contract Security:

22.6.3.1. The Irrevocable Standby Letter of Credit submitted during the bid period will be retained by HRCE and shall serve as performance assurance, including the payment of all obligations arising under the contract. The irrevocable standby letter of credit shall be issued by a certified financial intuition subject to the Uniform Customs and Practices for Documentary Credit (1993 revision) International Chamber of Commerce (Publication No. 500).

22.6.3.2. Where irrevocable standby letter of credit is used as Performance Assurance, include the cost of providing and Irrevocable Standby Letter of Credit in the Contract Price. The contractor shall provide to HRCE documentation throughout the duration of the contract that the irrevocable standby letter of credit remains in full effect at all times as specified,

22.6.3.3. Upon expiry of the Irrevocable Standby Letter of Credit, a separate Irrevocable Standby Letter of Credit shall be provided for work requiring extended warranties for such amounts as are required by the contract.

22.6.3.4. The Irrevocable Standby Letter of Credit is to be in effect for a period of not less than twelve (12) months after the issue of the substantial performance certificate certified by HRCE and shall serve as performance assurance and not until completion of the contract.

23. Insurance

23.1. Refer to Section 00 72 13 -General Conditions of Contract, GC 11.1 – Insurance and Section 00 73 00 – Supplementary General Conditions for form of Insurance. Refer to project documents for amount of insurance, duration of coverage and alternate type of Insurance if applicable.

23.2. General Contractor shall secure and maintain at its expense during the term of the Insurance:

23.2.1. Workers' Compensation to meet Statuary requirements and/or Employers Liability.

23.2.2. Wrap Up liability Insurance must insure the general contractor(s) and all sub-contractors on this project:

23.2.2.1. including but not limited to, products liability and completed operations, contractual liability, owners and contractors liability, attached machinery extension endorsement, independent contractor, for a combined single limit of no less than $5,000,000.00 per occurrence.

23.2.3. Commercial Auto Liability insurance covering all owned, non-owned and hired vehicles for a minimum combined single coverage of $2,000,000.00 per occurrence.

23.2.4. Builders Risk – all risks – in the amount of the project contract stipulated bid price.

23.2.5. Deliver a certificate of insurance evidencing the above prior to work being performed. It is also agreed that the above insurance coverage is primary and must be kept in force during the term of this agreement. Furthermore, HRCE must receive, in writing, at least thirty (30) days' notice of cancellation or modification of the above insurances. All insurance policies or certification documents shall specify coverage being applicable to this contract. The Contractor shall not do or omit to do or suffer anything to be done or omitted to be done which will in any way impair or invalidate such policy or policies of insurance.

23.3. Primary Insurance- Supplier agrees that the insurance as required above shall be primary and non-contributory.

23.4. No limitation- Supplier is responsible for determining whether the above minimum insurance coverage's are adequate to protect its interests. The above minimum coverage's do not constitute limitations upon Supplier's Liability.

23.5. Endorsements – For the policies in para 23 above, there shall contain an endorsement naming HRCE and its Affiliates as an Additional Insureds, and eliminating and removing any exclusion of liability for:

23.5.1. injury, including bodily injury and death to an employee of the insured or of HRCE, or

23.5.2. any obligation of the insured to indemnify, hold harmless, defend, or otherwise make contribution to the HRCE because of damage arising out of injury, including bodily injury and death, to an employee of HRCE.

24. Proof of Competency of Tenderer

24.1. Any tenderer may be required to furnish evidence satisfactory to the owner that he and his proposed sub-contractors have sufficient means and experience in the types of work called for to assure completion of the contract in a satisfactory manner.

24.1.1. The successful tenderer **must** be a member in good standing with CRCA, RCANS; and

24.1.2. Nova Scotia Construction Safety Association or approved recognized association or program.

25. Bid Form Requirements

25.1. Bid Submission

25.1.1.1. Tenderers shall be solely responsible for the delivery of their bids in the manner and time prescribed.

25.1.1.2. Bids must be submitted on forms provided by the HRCE. These forms are to be completely filled out in ink or by typewriter, with the signature in longhand, and the completed form shall be without interlineations, alterations or erasures.

25.1.1.3. Submit the executed bid on the bid forms provided, signed and corporate sealed as applicable together with the required security in a closed opaque envelope, clearly identified with Tenderers name, project name on the outside.

25.1.1.4. Improperly completed information, irregularities, in required enclosures may be cause to declare the bid informal.

25.2. Bid Signing

25.2.1. The bid form **Must** be signed and under seal (as applicable) by a duly authorized signing officer(s) in their normal signatures.

25.3. Contract Time

25.3.1. The tenderer, in submitting an offer, agrees to achieve Substantial performance of the work by the date indicated in the contract documents. The Substantial Performance date in the agreement shall be as indicated on the cover sheet.

26. Offer Acceptance / Rejection

26.1. Duration of offer

26.1.1. Bids shall remain open to acceptance and shall be irrevocable for a period of ninety (90) days after the bid closing date.

26.2. Award/Selection/Acceptance of Offer

26.2.1. In the evaluation of a bid, HRCE will consider, but not be limited to, the following criteria:

26.2.1.1. Compliance with Bid requirements.

26.2.1.2. Bid price submitted.

26.2.1.3. The qualifications and experience of the tenderer with similar projects in size and scope.

26.2.1.4. References.

26.2.1.5. Gantt chart (schedule of proposed scope of work for various disciplines).

26.2.1.6. Completion date.

26.2.2. The Owner's evaluation of any and all bid submission(s) will be final.

26.3. HRCE reserves the right to accept or reject any or all offers or to accept any offer deemed most satisfactory, HRCE reserves the right to waive any informality in any or all bids.

26.4. After acceptance HRCE will issue to the successful tenderer, a written bid acceptance.

26.5. After acceptance by HRCE, the successful tenderer shall be notified in writing of acceptance of the bid and will be issued an official purchase order.

27. Agreement

27.1. After acceptance by HRCE and the successful tenderer will enter into a CCDC-2 –2008, standard form of contract for the execution of the work.

28. Post Bid Submissions

28.1. Provide after closing of bid period, but before award of Contract, when requested by HRCE, a copy of the following documents:

28.1.1. Current Certificate of Recognition or Letter of Good Standing:

28.1.1.1. Certificate of Recognition issued jointly by the Nova Scotia Department of Labour and an occupational health and safety organization approved by Nova Scotia Department of Labour, or a valid letter of Good Standing from an occupational health and safety organization approved by HRCE indicating the Contractor is in the process of qualifying for the Certificate of Recognition. Contractor shall remain in good standing for the duration of the contract. In the event that any such certification during

the term of the contract expires, the obligation remains with the contractor to provide the updated required certificates.

28.1.1.2. Worker's Compensation Coverage

28.1.1.2.1. Evidence of an account with the Workers' Compensation Board, coverage under the Workers Compensation Act, R.S.N.S. and a clearance certificate indicating the tenderer is in good standing and shall remain so for the duration of the contract. In the event that any such certification during the term of the contract expires, the obligation remains with the contractor to provide the updated required certificates.

28.1.1.3. Certificates of good standing with CRCA (Canadian Roofing Contractors Association) and RCANS (Roofing Contractors Association of Nova Scotia),

28.1.2. Submit Post-Bid Submissions requested by HRCE within forty-eight (48) hours of request in order to be eligible to receive award of contract.

28.1.3. Submit the following post award documents within ten (10) working days of notice of award:

28.1.3.1. Provide all required contract security and insurance documentation,

28.1.3.2. Schedule of Values,

28.1.3.3. Copy of safety plan,

28.1.3.4. Copy of Hot Work Permit system and procedures,

28.1.3.5. Shop drawings, as applicable, and

28.1.3.6. Applicable documentation as required by the Tender Documents.

28.1.4. All post bid submissions must be received by HRCE in the manner prescribed above, or prior to commencement of work and delivery of materials on-site, whichever occurs first.

29. Taxes

29.1. The General Conditions of the Contract state that the Contractor as of April 1, 1997 and thereafter, the Contractor is to pay all Harmonized Sales Tax.

29.2. HRCE is not exempt for Harmonized Sales Tax (HST) purposes. As a result, the aggregate amount of the bid for contracts is subject to HST, however, **prices submitted shall not include HST.**

29.3. The HST payable by the HRCE will be added as a separate item during the processing of progress payments and therefore **HST will not appear as a cost in the aggregate amount of the tender.**

29.4. Tenderers are advised that they may be eligible to claim an Input Tax Credit (ITC) for a portion of the HST paid in relation to the Contract requirement of the Government of Canada.

29.5. Tenderers are to note that prices indicated on the Bid Form and the appendices to the Bid Form shall not include Provincial Sales Taxes, the Federal Goods and Services Tax or the Harmonized Sales Tax.

29.6. Exclude Harmonized Sales Tax in Tender Contract Price, unless requested to do otherwise.

29.7. Refer to CCDC-2 - 2008 (Section 00 72 13) and Supplementary General Conditions (Section 00 73 00).

END OF SECTION 00 21 13

SECTION 00 41 13 - TENDER FORM

1. Salutation:

To: **HALIFAX REGIONAL CENTRE FOR EDUCATION**
33 SPECTACLE LAKE DRIVE, DARTMOUTH NS
Attn: DON WALPOLA, BUYER

For: ***#3980 Heating Plant Upgrade – Shannon Park Elementary***
From: _____
Address: _____
_____
E-Mail: _____
Phone: **Fax**: _____
Person Signing for Firm: _____
Position: _____

2. Tenderer Declares:

2.1. That this tender was made without collusion or fraud.
2.2. That the proposed work was carefully examined.
2.3. That the Tenderer was familiar with local conditions.
2.4. That Contract Documents and Addenda were carefully examined.
2.5. That all the above were taken into consideration in preparation of this Tender.

3. Tenderer Agrees:

3.1. To provide all necessary equipment, tools, labour, incidentals and other means of construction to do all the Work and furnish all the materials of the specified requirements which are necessary to complete the Work in accordance with the Contract and agrees to accept, therefore, as payment in full the Lump Sum Price stated in Subsection 6 hereunder.
3.2. Carefully examined the site of the work described herein; become familiar with local conditions and the character and the extent of the work; carefully examined every part of the proposed Contract and thoroughly understands its stipulations, requirements and provisions.
3.3. Determined the quality and quantity of materials required; investigated the location and determined the source of supply of the materials required; investigated labour conditions; and has arranged for the continuous prosecution of the work herein described
3.4. To be bound by the award of the contract and if awarded the contract on this bid to execute the required contract within ten (10) days after notice of award.
3.5. Noted that the Harmonized Sales Tax is excluded from his “Contract Price”.

3.6. School/Work site access control: Contractor's employees shall always report to the main office of a school, indicate who they are and state their purpose on site prior to starting any work in the school. Contractor is not permitted to work on the school site without the HRCE's assigned representative on site unless authorized by the HRCE Operations representative. Typical hours of work are daylight hours. Working in occupied schools will be determined by the Operations representative. No work shall be conducted on weekends or holidays without specific approval of the Operations Representative. Work in an occupied school will be limited to work that is not disruptive to the school. IE: No mechanical removals, no drilling, screwing or torch work during occupied hours without approval from HRCE.

3.7. Hours of work – ~~All work shall be carried out during regular business hours unless otherwise indicated below or in writing by the Manager of Operations or designate.~~ Hours of work shall comply with local ordinances and bylaws for each site. Loud or disruptive work will have to occur outside class hours. All other work can be carried out during regular business hours.

4. Owner Agrees

4.1. To examine this bid and in consideration, therefore, the tenderer hereby agrees not to revoke this bid:

4.1.1. until some other tenderer has entered into the contract with The HRCE for the performance of the work and the supply of the materials specified in the notice inviting bids; or in the Information to Tenderers, or

4.1.2. until ninety (90) days after the time fixed in the Information to Tenderers for receiving bids has expired,

4.1.3. Whichever first occurs; provided, however, that the tenderer may revoke this bid at any time before the time fixed in the Information to Tenderers for receiving bids has expired upon receipt by the HRCE from the tenderer of written notice of such revocation before said time has expired.

4.1.4. The Tenderer declares that he has obtained from the Subcontractors all Bid Security required to be provided by Subcontractors pursuant to the "Instructions to Tenderers".

5. Contract Documents include:

5.1.1. Cover Page
5.1.2. Table of Contents – Section 00 00 01
5.1.3. Description of Work & List of Drawings – Section 00 00 15
5.1.4. List of Consultants – Section 00 05 00
5.1.5. Information for Tenderers – Section 00 21 13
5.1.6. Tender Form – Section 00 41 13
5.1.7. Tender Price Amendment Form (if applicable) – Section 00 41 73
5.1.8. Agreement Between Owner and Contractor (CCDC 2 – 2008) – Section 00 52 00
5.1.9. Definitions (CCDC 2 – 2008) – Section 00 52 13
5.1.10. General Conditions of the Stipulated Contract Price (CCDC 2 -2008) – Section 00 72 13
5.1.11. Supplementary General Conditions – Section 00 73 00
5.1.12. HRCE General Terms & Conditions – Section 00 73 10
5.1.13. Specifications of Work (all applicable sections)
5.1.14. Drawing(s) – as applicable
5.1.15. Addendum/Addenda issued by HRCE.
5.1.16. Contract Sets (2)

6. Fee Submission - Contract Price:

6.1. The undersigned Tenderer, having carefully read and examined the aforementioned Contract Documents prepared by the Consultant, for the Halifax Regional Centre for Education, hereby accepts the same as part and parcel of the Contract herein referred to, and having carefully examined the locality and Site of Works and having full knowledge of the work required and of the materials to be furnished and used, does hereby Tender and offer to enter into a contract to perform and complete, the whole of the said works and provide all necessary labour, plant, tools, materials and equipment and pay all applicable taxes, as set forth and in strict accordance with the Specifications, Drawings and other Contract Documents and to do all therein called for on the terms and conditions and under the provisions therein set forth for the following:

6.2 LUMP SUM BID PRICE

_____ /100 Dollars ($_____) (HST Excluded)

Contract Price to be completed in written form on the lines provided above, with cents expressed as numerical fraction of a dollar. Contract price to be completed in numerical form on the line bounded by parenthesis above, with cents expressed as a decimal of a dollar. WHERE THERE IS A CONFLICT, WRITTEN WORD WILL GOVERN.

6.3 Breakout Prices: Breakout prices requested in the Tender Document, as detailed below, **SHALL BE INCLUDED IN THE LUMP SUM TENDER PRICE** above (6.1 - Contract Price) and deleted only on the instruction at the sole discretion of the Owner, for which a credit will be offered by the Contractor, equal to the breakout pricing detailed below (price excludes HST):

Item No.	Description	Unit of Measurement	Credit Amount
1.	_____n/a_____	_____	$_____
2.	_____	_____	$_____
3.	_____	_____	$_____
4.	_____	_____	$_____
5.	_____	_____	$_____

Total Credit Amount for ALL Breakout Items:

_____ /100 Dollars ($_____) (HST Excluded)

6.4 Separate Prices: Separate prices requested in the Tender Document, as detailed below **SHALL NOT BE INCLUDED IN THE LUMP SUM TENDER PRICE** above (6.1 - Contract Price) and added only on the instruction and at the sole discretion of the Owner, for which the contract will be adjusted, equal to the separate pricing detailed below (price excludes HST):

Listing of Separate Price Details Requested by HRCE:

Item No.	Description	Unit of Measurement	Unit Price
6.	_____n/a_____	_____	$_____
7.	_____	_____	$_____
8.	_____	_____	$_____
9.	_____	_____	$_____
10.	_____	_____	$_____

7. Completion Time:

7.1. Tenderer agrees to be substantially complete as follows:

7.1.1.1. ***November 30th,2018***

7.1.1.2. The undersigned Tenderer agrees if awarded the Contract on this Bid to achieve the Substantial Completion Date providing the contract is awarded within ten (10) business days of tender closing time.

7.2. Detailed breakdown of overall project specific phases (schedule of proposed scope of work for various disciplines) written and/or Gantt Chart to be provided with bid documents or within five (5) business days of tender award.

8. Addenda Acknowledgement

I/We have received and noted the following addenda ***for Tender #3980 Heating Plant Upgrade – Shannon Park Elementary***

Addendum #	**Dated**	**# of Pages**
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

9. Supporting Information

9.1. References: (Minimum of three)

Tenderer to furnish particulars of at least three (3) similar contracts successfully completed or currently being carried to completion. The projects quoted should preferably be approximate in nature to the work now tendered for and be of comparable or greater size. References are to be submitted with the bid prior to closing date and time.

Contact Name & Phone #	**Date**	**Contract Value**
_____	**From** _____ **to** _____	**$** _____
_____	**From** _____ **to** _____	**$** _____
_____	**From** _____ **to** _____	**$** _____
_____	**From** _____ **to** _____	**$** _____

9.2. Bid submission to include a minimum of two letters of endorsement from clients commenting upon the contractor's ability to deliver quality projects, similar in scope and size, which met schedule and budget.

10. Proof Of Competency Of Tenderer

10.1. Any tenderer may be required to furnish evidence satisfactory to the Owner that he and his proposed sub-contractors have sufficient means and experience in the types of work called for to assure completion of the Contract in a satisfactory manner.

10.1.1. The Tenderer acknowledges, as part of their bid submission, their responsibility and contract obligations to ensure that the proposed sub-contractors will fully perform the project requirements and meet the timings as detailed in this tender call.

10.2. Sub-Contractors: The Tenderer to provide the name and address of each major sub-contractor used in making up this tender. This list of sub-contractors is to be submitted with the bid prior to closing date and time. Only one sub-contractor shall be named for each part of the work to be sublet.

Subcontractor/Suppliers/Manufacturers	**Service/Material**
Site Works	
Electrical	
Mechanical	
Roof	

10.2.1. Project Personnel: The Tenderer to include below, the names, qualifications and previous experience of those people who will be directly involved with the project. The names shall, for example, include foremen, superintendent, project engineer and/or project manager, labourers and trade staff. This list of personnel is to be submitted with the bid prior to closing date and time.

Name	**Position**	**Qualifications/Experience**

Signature * The undersigned Tenderer declares that this bid is made without connection with any other person(s) submitting bids for the same work and is in all respects fair and without collusion or fraud.

SIGNATURE:

SIGNED AND DELIVERED
in the presence of:

_____
Witness

CONTRACTOR

_____
Company name

_____
Signature of Signing Officer

_____
Name and Title (printed)

_____
Date

HRCE is directly responsible for the safety of its students and staff. Should contractors be required to work in or on school property while children are present, it is a MANDATORY HRCE REQUIREMENT that contractors assign the work to employees and/or sub-contractors who DO NOT have a CRIMINAL RECORD and who ARE NOT LISTED ON THE CHILD ABUSE REGISTRY. Failure to comply with this requirement may result in immediate contract termination.

By checking the "Agreed" box you are confirming that you understand and will abide by this mandatory HRCE requirement.

Agreed □

Note: *Bids submitted **Must** be signed by a duly authorized officer or agent.*

END OF SECTION 00 41 13

SECTION 00 41 73 - TENDER AMENDMENT FORM

#3980 Heating Plant Upgrade - Shannon Park Elementary

Note: to be completed and forwarded for each Bid Price adjustment prior to bid closing time and date as detailed on the Cover Sheet of the tender document and related Addendum.

Lump Sum Price Adjustment – Section 00 41 13 Tender form, Article 6.1.1 Contract Price

Increase Bid by		**Decrease Bid By**	
Amount (excluding HST)	**$**	**Amount** (excluding HST)	**$**
HST	**$**	**HST**	**$**
Total Amount (including HST)	**$**	**Total Amount** (including HST)	**$**

It is the Tenderer's responsibility to ensure the table above is legible

Attachments included: **no** ☐ **yes** ☐ (✓ one)

If yes above, check ✓ and complete information regarding attachments

☐ **Revised Bid Form**: Dated _____ # of pages _____

☐ **Other, Specify** _____

Dated _____ # of pages _____

Total number of pages (including this form) _____

Submitted by:

_____

Company Name (please print as it appears on original tender envelope)

_____

Authorized Tenderer's Name (please print as it appears on Bid Form)

_____

Authorized Tenderer's Signature

END OF SECTION 00 41 73

SECTION 00 52 00 - AGREEMENT BETWEEN OWNER AND CONTRACTOR

CCDC 2 – 2008

(a copy of Section 00 52 00, Standard Construction Contract CCDC 2 – 2008 (5 pages) is available upon request, otherwise, will form part of the contract sets to the successful tenderer)

END OF SECTION 00 52 00

SECTION 00 52 13 - DEFINITIONS

CCDC 2 - 2008

(A copy of section 00 52 13, Standard Construction Contract CCDC 2 – 2008 (2 pages) is available upon request, otherwise, will form part of the contract sets to the successful tenderer)

END OF SECTION 00 52 13

SECTION 00 72 13 - GENERAL CONDITIONS
OF THE STIPULATED PRICE CONTRACT
CCDC 2 - 2008

(A copy of section 00 72 13, Standard Construction Contract CCDC 2 – 2008 (23 pages) is available upon request, otherwise, will form part of the contract sets to the successful tenderer)

END OF SECTION 00 72 13

SECTION 00 73 00 - SUPPLEMENTARY GENERAL CONDITIONS CCDC2 – 2008

The Canadian Standard Construction Document for Stipulated Price Contract (CCDC 2, 2008 version), Definitions and General Conditions governing same, shall be used by the project. The following Supplementary General Conditions are intended to supplement or amend the General Conditions, and where conflicts occur, the Supplementary Conditions shall take precedence.

Where a General Condition or paragraph of the General Conditions of the Stipulated Price Contract is deleted by these Supplementary Conditions, the numbering of the remaining General Conditions or paragraphs shall remain unchanged, and the numbering of the deleted item will be retained, unused.

ARTICLE A-5 PAYMENT

Delete paragraph 5.1 in its entirety and insert:

5.1 "Subject to applicable legislation and the provisions of the Contract Documents, and in accordance with legislation and statutory regulations respecting holdback percentages and, where such legislation or regulations do not exist or apply, subject to a holdback of ten percent (10%) including the HST (Harmonized Sales Tax), the Owner shall:"

.1 Make progress payments to the Contractor on account of the Contract Price (work performed) when due in the amount certified by the Consultant together with Value Added Taxes as may be applicable to such payments, and
.2 Upon Substantial Performance of the Work as certified by the Consultant, pay to the Contractor the unpaid balance of monies then due, excepting that amounts as certified by the Consultant to rectify deficiency items, or incomplete portions of individual work items may be retained by the Owner pending Total Performance of the work or other authorization for the release by the Consultant, and
.3 Upon Total performance of the Work as certified by the Consultant pay to the contractor the unpaid balance of monies due together with such Value Added Taxes as may be applicable to such payment.

Change 5.3.1 (1) to read: "1% per annum above the prime rate."

Delete 5.3.2 (2) in its entirety.

DEFINITIONS

Add subparagraph 19a to definitions:

19a. Submittals

Submittals are documents or items required by the Contract Documents to be provided by the Contractor, such as:

1 Shop Drawings, samples, models, mock-ups to include details or characteristics, before the portion of the Work that they represent can be incorporated into the Work; and
2 As-built drawings and manuals to provide instructions to the operation and maintenance of the Work.

GC 1.1 CONTRACT DOCUMENTS

Add to the end of subparagraph 1.1.2.2:

1.1.2.2 Except where the Consultant shall be indemnified as a third party beneficiary as provided in subparagraphs 9.2.7.4, 9.5.3.4 and in 12.1.3.

Add subparagraph 1.1.7.5:

1.1.7.5 Should conflicts occur between Contract Documents and any work is done without consulting the Consultant for his decision, the Contractor shall assume full responsibility.

Add subparagraph to 1.1.7.6:

1.1.7.6 In case of discrepancies, noted materials and annotations shall take precedence over graphic indications in the Contract Documents.

Delete paragraph 1.18 in its entirety and insert:

1.18 "The Contractor will be provided with up to a maximum of ten (10) copies, without charge, of the Contract Documents or parts thereof for the performance of the work. Extra copies may be obtained for cost of printing and mailing."

GC 2.4 DEFECTIVE WORK

Add new subparagraphs 2.4.1.1 and 2.4.1.2:

2.4.1.1 The Contractor shall rectify, in a manner acceptable to the Owner and the Consultant, all defective work and deficiencies throughout the Work, whether or not they are specifically identified by the Consultant.

2.4.1.2 The Contractor shall prioritize the correction of any defective work which, in the sole discretion of the Owner, adversely affects the day to day operation of the Owner.

GC 3.1 CONTROL OF THE WORK

Add new paragraph 3.1.3:

3.1.3 Prior to commencing individual procurement, fabrication, and construction activities, the Contractor shall verify, at the Place of work, all relevant measurements and levels necessary for proper and complete fabrication, assembly and installation of the Work and shall further carefully compare such field measurements and conditions with the requirements of the Contract Documents. Where dimensions are not included or contradictions exist, or exact locations are not apparent, the Contractor shall immediately notify the Consultant before proceeding with any part of the affected work.

GC 3.4 DOCUMENT REVIEW

Delete paragraph 3.4.1 in its entirety and substitute new paragraph:

3.4.1 The Contractor shall review the Contract Documents and shall report promptly to the Consultant and error, inconsistency or omission the Contractor may discover. Except for its obligation to make such review and report the result, the Contractor does not assume any responsibility to the Owner or to the Consultant for the accuracy of the Contract Documents. The Contractor shall not be liable for damage or costs resulting from such errors, inconsistencies, or omissions in the Contract Documents, which the Contractor could not have reasonably have discovered. If the Contractor does discover any error, inconsistency, or omission in the Contract Documents the Contractor shall not proceed with the work affected until the Contractor has received corrected or missing information from the Consultant.

GC 3.7 SUBCONTRACTORS AND SUPPLIERS

Add the following paragraph 3.7.7:

3.7.7 A copy of the agreement between Contractor and any subcontractor(s) shall be provided to the Consultant if so requested.

GC 3.8 LABOUR AND PRODUCTS

Add the following paragraph 3.8.4:

3.8.4 The Contractor is responsible for the safe on-site storage of Products and their protection (including Products supplied by the Owner and other contractors to be installed under the Contract) in such ways as to avoid dangerous conditions or contamination to the Products or other persons or property and in locations at the Place of the Work to the satisfaction of the Owner and the Consultant. The Owner shall provide all relevant information on the Products to be supplied by the Owner.

GC 3.10 SHOP DRAWINGS

Add the words "AND OTHER SUBMITTALS" to the Title after SHOP DRAWINGS in GC 3.10.

Add "and submittals" after the words "Shop Drawings" in paragraphs 3.10.1, 3.10.2, 3.10.4, 3.10.7, 3.10.8, 3.10.8.2, 3.10.9, 3.10.10, 3.10.11 and 3.10.12.

Delete 3.10.3 in its entirety and substitute new paragraph:

3.10.3 Prior to the first application for payment, the Contractor and the Consultant shall jointly prepare a schedule of the dates for submission and return of Shop Drawings and any Submittals.

Add the following subparagraph 3.10.6.1:

3.10.6.1 The following paragraph shall apply to each shop drawing and submittals reviewed in connection with the project. This review shall not mean that the Consultant approved the detailed design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same. The Contractor is responsible for information that pertains solely to fabricated processes or to techniques of construction and installation, and for coordination of the work of all sub trades.

Delete and insert the words in paragraph 3.10.12

3.10.12 "with reasonable promptness so as to cause no delay in the performance of the Work" and replace with "within ten (10) working days or such longer period as may be reasonably required"

PART 3 EXECUTION OF THE WORK

Add new GC 3.14 as follows:

GC 3.14 CONTRACTOR RESPONSIBILITY FOR WATER TIGHTNESS

GC 3.14.1 The drawings and specifications are not intended to depict each and every condition or detail of construction. As the knowledgeable party in the field, the contractor is in the best position to verify that all construction is completed in a manner which will provide a watertight structure. The contractor has the sole responsibility for ensuring the watertight integrity of the structure.

Add new GC 3.15 as follows:

GC 3.15 PERFORMANCE BY CONTRACTOR

GC 3.15.1 In performing its services and obligations under the Contract, the Contractor shall exercise a standard of care, skill and diligence that would normally be provided by an experienced and prudent contractor supplying similar services for similar projects. The Contractor acknowledges and agrees that throughout the Contract, the Contractor's obligations, duties and responsibilities shall be interpreted in accordance with this standard. The Contractor shall exercise the same standard of due care and diligence in respect of any products, personnel, or procedures which it may recommend to the Owner.

The Contractor further represents, covenants and warrants to the Owner that:

1. The personnel it assigns to the Project are appropriately experienced;
2. It has sufficient staff of qualified and competent personnel to replace its designated supervisor and project manager, subject to the Owner's approval, in the event of death, incapacity, removal or resignation.

GC 4.1 CASH ALLOWANCES

Delete paragraph 4.1.4 in its entirety and substitute:

4.1.4 Where cost under a cash allowance exceed the amount of the allowances, unexpended amounts from other cash allowances shall be reallocated at the *Consultant's* direction to cover the shortfall.

Delete paragraph 4.1.5 in its entirety and substitute:

4.1.5 The net amount of any unexpended cash allowances, after providing for any reallocations as contemplated in paragraph 4.1.4, shall be deducted from the Contract Price by Change Order.

Delete paragraph 4.1.7 in its entirety and substitute:

4.1.7 At the commencement of the work, the Contractor shall prepare for the review and acceptance of the Owner and the Consultant, a schedule indicating the times, within the construction schedule referred to in GC 3.5, that items call for under cash allowances and items that are specified to be Owner purchased and Contractor installed or hooked up are required at the site to avoid delaying the progress of the Work.

Add new paragraph 4.1.8:

4.1.8 The *Owner* reserves the right to call, or to have the Contractor call, for competitive bids for portions of the Work, to be paid for from cash allowances.

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

Delete section GC 5.1 in its entirety.

GC 5.2 APPLICATION FOR PROGRESS PAYMENT

Add the following at the end of paragraph 5.2.2:

5.2.2 Such applications shall be accompanied by one or more of the following documents: a Statutory Declaration Waiver of Lien or receipt stating that the holdback monies claimed have been paid to the particular party or parties so named or referred to in the Declaration. Form of Statutory Declaration shall meet the approval of the Consultant.

Add the following paragraph 5.2.8:

5.2.8 The reference to payment for products delivered to the place of work in Article 5.2.7 shall not be construed as covering day-to-day financing of the project. Products delivered to the place of work shall be construed to mean major items of equipment or quantities of items that are essential for the expedient conduct of the work.

GC 5.3 PROGRESS PAYMENT

Supplement paragraph 5.3.1 by adding the following:

5.3.1 A holdback percentage of ten (10) percent (%) shall apply to progress payments. The sworn statement by the Contractor for release of holdback monies shall be in the form of a Statutory Declaration meeting the approval of the Consultant. Amounts as certified by the Consultant to rectify deficiency items, or incomplete portions of individual work items, may be retained by the Owner after Substantial Performance has been obtained, pending Total Performance of the work or other authorization for release by the Consultant.

Amend subparagraph 5.3.1.3 as follows:

5.3.1.3 Delete "20" and replace with "30."

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

Add the following paragraph 5.4.4:

5.4.4 Before the Contractor submits his application for Substantial Performance of the Work, all Operations and Maintenance Manual materials shall be submitted in accordance with the Contract Documents. The Certificate of Substantial Performance will not be issued until this requirement is met.

GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF WORK

Add the following subparagraphs 5.5.1.3 and 5.5.1.4:

5.5.1.3 Submit a certificate from barrister stating that there are no Builders' Liens filed relating to the Contract Works.
5.5.1.4 Submit a clearance letter from the Workers' Compensation Board.

GC 5.7 FINAL PAYMENT

Add the following subparagraphs 5.7.1.1, 5.7.1.2, 5.7.1.3, 5.7.1.4 and 5.7.1.5:

5.7.1.1 Contractor's application for final payment is considered to be valid when the following have been performed:

1. Work has been completed and inspected for compliance with Contract Documents, and the Consultant is satisfied that all the requirements of the Contract have been fulfilled by the Contractor.
2. Defects have been corrected and deficiencies have been completed.
3. Equipment and systems have been tested, adjusted and balanced and are fully operational, and written reports as outlined in the Contract Documents have been provided to the Consultant.
4. Certificates required by Utility companies, manufacturer's representative and inspectors have been submitted.
5. Spare parts, maintenance materials, warranties and bonds have been provided.

5.7.1.2 If Work is deemed incomplete by Consultant, complete outstanding items and request re-inspection.

5.7.1.3 If in opinion of the Consultant, it is not expedient to correct defective work or Work is not performed in accordance with the requirements of the Contract, the Owner may deduct from Contract Price difference in value between work performed and that called for by Contract Documents, amount of which shall be determined by the Consultant.

5.7.1.4 If, within sixty (60) days after the issue by the Consultant of the Certificate of the Substantial Performance, the Contractor has not corrected all the deficiencies, the Owner will retain sufficient money to cover the cost of completing said deficiencies, as determined by the Consultant, in addition to holding monies retained in accordance with the Contract and subject to the provisions of the Builders' lien legislation of Nova Scotia.

5.7.1.5 Neither the final certificate nor the payment thereunder, nor any provision in the Contract Documents shall relieve the Contractor from responsibility for faulty material or workmanship which shall appear within a period of one (1) year from the date of Substantial Performance of the Work and he shall remedy any defects due thereto and pay for any damage to other Work resulting therefrom which shall appear within such period of one year. The Owner shall give notice of observed defects promptly. This article shall not be deemed to restrict any liability of the Contractor arising out of any law in force in the Province of Nova Scotia.

GC 6.2 CHANGE ORDER

Add the following paragraphs 6.2.3, 6.2.4, 6.2.5, 6.2.5, 6.2.6 and 6.2.7:

6.2.3 All contemplated changes in the work shall be issued by the Consultant on a "Contemplated Change Order" form.

6.2.4 For lump sum pricing, the Contractor shall, upon receipt of the Contemplated Change Order, submit to the Consultant for approval within seven (7) days, a quotation for changes in the work.

6.2.5 Quotation for changes shall be priced in sufficient detail (GC6.6 applies).

6.2.6 Consultant shall, within five (5) working days, notify the Contractor whether estimates are accepted by Owner or further information required. Acceptance of Owner shall be indicated by writing, and a signed copy of form (Change Order) returned to Contractor.

6.2.7 Contractor shall take reasonable measures to stop work or minimize the work in areas affected by or related to the contemplated changes.

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

Add new paragraph 6.4.5:

6.4.5 The *Contractor* confirms that, prior to bidding the *Project,* it carefully investigated the Place of the Work and applied to that investigation the degree of care and skill described in paragraph 3.15.1, given the amount of time provided between the issue of the bid documents and the actual closing of bids, the degree of access provided to the Contractor prior to submission of bid, and the sufficiency and completeness of the information provided by the Owner. The Contractor is not entitled to compensation or to an extension of the Contract Time for which could reasonably have been ascertained by the Contractor by such careful investigation undertaken prior to the submission of the bid.

GC 6.5 DELAYS

Delete the period at the end of paragraph 6.5.1 and substitute the following words:

6.5.1 ", but excluding any consequential, indirect or special damages."

Add new paragraph 6.5.6:

6.5.6 If the Contractor is delayed in the performance of the Work by any act or omission of the Contractor or anyone employed or engaged by the Contractor directly or indirectly, or by any

cause within the Contractor's control, then the Contract Time shall be extended for such reasonable time as the Consultant may decide in consultation with the Contractor. The Owner shall be reimbursed by the Contractor for all reasonable costs incurred by the Owner as the result of such delay, including all services required by the Owner from the Consultant as a result of such delay by the Contractor and, in particular, the cost of the Consultant's services during the period between the date of Substantial Performance of the Work stated in Article A-1 herein as the same may be extended through the provisions of these General Conditions and any later, actual date of Substantial Performance of the Work achieved by the Contractor.

Add new paragraph 6.5.7:

6.5.7 If the Contractor is delayed in the completion of the Work by any act or neglect of: The HRCE, any employee or either any other Contractor employed by The HRCE, changes ordered in the Work, strikes, lockouts, fire, unusual delay by common carriers, unavoidable casualties, any other cause of any kind whatsoever beyond the Contractor's control or by any cause within the Contractor's control which the Consultant shall decide as justifying the delay, then the time of completion shall be extended for such reasonable time as the Consultant may decide.

Add new paragraph 6.5.8:

6.5.8 No such extension shall be made for delay occurring more than seven (7) days before claim therefore is made in writing to the Consultant, provided however that in the case of a continuing cause of delay, only one (1) claim shall be necessary.

Add new paragraph 6.5.9:

6.5.9 If no schedule is made, no claim for delay shall be allowed on account of failure to furnish such schedule until two (2) weeks after demand for such schedule and not then unless such claim be reasonable.

Add new paragraph 6.5.10:

6.5.10 The Consultant shall not, except by written notice to the Contractor, stop or delay any part of the main Contract Work pending decisions or proposed changes.

GC6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE

Amend paragraph 6.6.5 as follows:

6.6.5 Add the words "as noted in paragraph 6.6.3" after the words "of the claim" and add the words "and the consultant", at the end.

GC 6.7 VALUATION OF CHANGES

Add the following Header and paragraphs 6.7.1, 6.7.2, 6.7.3 and 6.7.4 in their entirety:

GC 6.7 VALUATION OF CHANGES

6.7.1 The value of any change shall be determined in one or more of the following way as determined by the Consultant:

(a) By estimate and acceptance in a lump sum, submitted with sub-contractors' and suppliers' signed quotations and breakdown estimates including itemized material and labour lists.
For changes where the individual trade cost is anticipated to be less than $1000, the requirement for the detailed cost breakdown may be waived, but individual trade quotation must be supplied.

(b) By unit prices agreed upon or as listed in the contract.

(c) Cost of work and percentage or by cost and fixed fee.

6.7.2 In cases of additional work to be paid for under method "c", the Contractor shall keep and present in such form as the Consultant may direct, a correct account of the net cost of labour and materials, together with vouchers. In any case, the Consultant shall certify to the amount due to the Contractor including the profit and overhead. Pending final determination of value, payments on account of changes shall be made on the Consultant's certificate.

6.7.3 In determination of method ".1(a) or ".1(c) above, the labour costs to be calculated by the actual estimated hours at an hourly rate determined as follows:

The hourly labour rate to be total payroll costs including hourly wage, statutory contributions to UIC, WCB, CPP, Training Funds, Health Benefits and other applicable labour burdens paid directly by the employer such as vacation pay, holiday pay, pension plan etc.

The HRCE reserves the right to verify the payroll cost by independent audit.

To the total payroll cost the following percentage factors will be recognized.

- small tools/expenditures 5% (on payroll costs)
- site supervision 5% (on payroll costs)

(d) In determination of methods ".1(a)" and ".1(c)" above, the material costs to be calculated as follows:

Contractors net costs, including contractor discounts from suppliers, FOB the project site plus applicable taxes.

(e) In determination of methods ".1(a)" and ".1(c)" above, equipment rental costs for major pieces of equipment required will be at local industry rates.

(f) In determination of methods ".1(a)" and ".1(c)" above, overhead and fees shall be calculated as follows:

The cost of any authorized change shall be determined by the net total of labour and material or equipment as outlined in ".3(a)", ".3(b)" and ".3(c)" above on which the percentage markup shall be determined as follows:

<u>For Extras Up to $5,000:</u>

Sub- Contractors Own Work	- Overhead & Fee – 15% total
General Contractors Own Work	- Overhead & Fee – 15% total
General Contractors on Sub Contractors work	- 10% total
(no percentage markup shall be applied to deductions)	

<u>For Extras Above $5,000:</u>

Sub-Contractors Own Work	- Overhead & Fee – 10% total
General Contractors Own Work	- Overhead & Fee – 10% total
General Contractors on sub contractor's work	– 8% total
(no percentage markup shall be applied to deductions)	

6.7.4 Submit to the Consultant and The HRCE's representative detailed breakdown of the hourly labour rate as defined in paragraph ".3(a)".

GC 8.2 NEGOTIATION, MEDIATION, AND ARBITRATION

<u>Add</u> the following paragraphs 8.2.9, 8.2.10, 8.2.11, 8.2.12, 8.2.13, 8.2.14, and 8.3:

8.2.9 Within five days of receipt of the notice of arbitration by the responding party under paragraph 8.2.6, the Owner and the Contractor shall give the Consultant a written notice containing:

a) a copy of the notice of arbitration;
b) a copy of supplementary conditions 8.2.9 to 8.2.14 of this contract, and;
c) any claims or issues which the Contractor or the Owner, as the case may be, wishes to raise in relation to the Consultant arising out of the issues in dispute in the arbitration.

8.2.10 The Owner and the Contractor agree that the Consultant may elect, within ten days of receipt of the notice under paragraph 8.2.9, to become a full party to the arbitration under paragraph 8.2.6 if the Consultant:

a) has a vested or contingent financial interest in the outcome of the arbitration;

b) gives the notice of election to the Owner and the Contractor before the arbitrator is appointed;

c) agrees to be a party to the arbitration within the meaning of the rules referred to in paragraph 8.2.6, and;

d) agrees to be bound by the arbitral award made in the arbitration.

8.2.11 If an election is made under paragraph 8.2.10, the Consultant may participate in the appointment of the arbitrator and, notwithstanding the rules referred to in paragraph 8.2.6, the time period for reaching agreement on the appointment of the arbitrator shall begin to run from the date the respondent receives a copy of the notice of arbitration.

8.2.12 The arbitrator in the arbitration in which the Consultant has elected under paragraph 8.2.10 to become a full party may:

a) on application of the Owner or the Contractor, determine whether the Consultant has satisfied the requirements of paragraph 8.2.10, and;

b) make any procedural order considered necessary to facilitate the addition of the Consultant as a party to the arbitration.

8.2.13 The provisions of paragraph 8.2.9 shall apply mutatis mutandis to written notice to be given by the Consultant to any sub-consultant.

8.2.14 In the event of notice of arbitration given by the Consultant to a sub-consultant, the sub-consultant is not entitled to any election with respect to the proceeding as outlined in 8.2.10, and is deemed to be bound by the arbitration proceeding.

8.3 An application for arbitration shall be accompanied by security in the amount of $1000 to apply to the cost of arbitration. Any claims of excess costs must be submitted in writing to the Consultant within two weeks of completion or alleged completion of the work. No claims shall be accepted after this date and, also, no claims shall be accepted for disputed work unless the Consultant has been notified as specified.

GC 9.1 PROTECTION OF WORK AND PROPERTY

Delete subparagraph 9.1.1.1 in its entirety and substitute the following new paragraph 9.1.1.1:

9.1.1.1 errors in the Contract Documents which the Contractor could not have discovered applying the standard of care described in paragraph 3.15.1.

Delete paragraph 9.1.2 in its entirety and substitute the following new paragraph 9.1.2:

9.12 Before commencing any Work, the Contractor shall determine the locations of all underground utilities and structures indicated in the Contract Documents, or that are discoverable by applying to an Inspection of the Place of Work exercising the degree of care and skill described in paragraph 3.15.1.

GC 9.2 TOXIC AND HAXARDOUS SUBSTANCES

Add in paragraph 9.2.6 after the word “responsible”, the following new words:

9.2.6 Or whether any toxic or hazardous substances or materials already at the Place of Work (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the Contractor or anyone for whom the Contractor is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damage to the property of the Owner and others,

Add in subparagraph 9.2.7.4:

9.2.7.4 “and the Consultant” after “Contractor”:

Add in paragraph 9.2.8 after the word “responsible”, the following new words:

9.2.8 or that any toxic or hazardous substances or materials already at the Place of the Work (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the Contractor or anyone for whom the Contractor is responsible in a manner which does not comply with legal and regulatory requirement, or which threatens, humane health and safety or the environment, or material damage to the property of the Owner or others.

GC 9.5 MOULD

Add in subparagraph 9.5.3.4:

9.5.3.4 "and the Consultant" after "Contractor"

GC 10.1 TAXES AND DUTIES

Add the following paragraph 10.1.3:

10.1.3 The Contractor shall indicate on each application for payment as a separate amount, the appropriate Harmonized Sales Tax the Owner is legally obliged to pay. This amount will be paid to the Contractor in addition to the amount certified for payment under the Contract.

GC 10.2 LAWS, NOTICES, PERMITS AND FEES

Delete from the first line of paragraph 10.2.5 the word, "The" and substitute the words:

10.2.5 "Subject to paragraph 3.15.1, the"

GC 10.4 WORKERS' COMPENSATION

Add the following paragraphs 10.4.3, 10.4.4, and 10.4.5:

10.4.3 The contractor is referred to regulations, as applicable, under the Worker's Compensation Act of Nova Scotia.

10.4.4 Registration with Worker's Compensation Board shall be continuous during the contract. Should registrations be scheduled to expire during the contract period, the Contractor shall submit a copy of registration renewal one month prior to the expiration of the current certificate.

10.4.5 The Contractor shall furnish evidence of coverage under the Worker's Compensation Act, R.S.N.S. and a clearance Certificate providing proof of registration with Worker's Compensation Board prior to commencement of work. (A photocopy of the Contractors registration certificate is acceptable proof). On-going proof of good standing with the Worker's Compensation Board during the term of the contract is required.

GC 11.1 INSURANCE

Delete sentences and replace with the following in subparagraph 11.1.1.1:

11.1.1.1 "General liability insurance shall be maintained from the commencement of the work until one year from the date of Substantial Performance of the Work. Liability coverage shall be provided for completed operations hazards from the date of Substantial Performance of the Work, as set out in the certificate of Substantial Performance of the Work, on an ongoing basis for a period of 6 years following the Substantial Performance of the Work**" and replace with:** " General Liability Insurance or Wrap- Up Liability Insurance, (as detailed in the Information to Tenders section under "Insurance Requirements"), shall be maintained from the commencement of the work until final completion and acceptance of the work including the making good of faulty work or materials, except that coverage of completed operations liability shall in any event be maintained for twelve (12) months from date of Substantial Performance of the work as certified from the Consultant, and approved by the Owner".

Add the following subparagraphs 11.1.1.1.1, 11.1.1.1.2, and 11.1.1.2.1:

11.1.1.1.1 The general liability insurance to be maintained by the Contractor shall include Commercial General Liability Insurance covering Premises and Operations Liability, elevators, board form property damage, board from automobile, owners and contractors protective, blanket contractual, personal injury, completed operations liability contingent employers liability, cross liability clause, non-owned automobile liability, and a 30 day notice of cancellation clause.

11.1.1.1.2 All liability insurance policies shall be written in such terms as will fully protect the Contractor and
The Halifax Regional Centre for Education as an additional named insured.

11.1.1.2.1 Liability coverage of not less than two million dollars ($2,000,000) is required with regard to operations of owned automobiles.

Delete subparagraph 11.1.1.4 in its entirety and insert the following subparagraphs:

11.1.1.4 Broad Form (All Risks) Builders Risk Coverage - Prior to the commencement of any Work the Contractor shall maintain and pay for Broad Form (All Risks) Builders Risk Coverage in the joint names of The HRCE and the Contractor totaling not less than one hundred percent (100%) of the total value of the Work done and materials delivered on the site (contract value), so that any loss under such policies of insurance will be payable to The HRCE and the Contractor as their respective interests appear. The Builders Risk Insurance shall include all materials related to the work while in transit or at other locations.

11.1.1.4.1 Should a loss be sustained under the Builders Risk Coverage, the Contractor shall act on behalf of The HRCE and Contractor for the purpose of adjusting the amount of such loss with the insurance companies. As soon as such adjustment has been satisfactorily completed, the Contractor shall proceed to repair the damage and complete the Work and shall be entitled to receive from The HRCE in addition to any sum due under the Contract, the amount at which The HRCE interest has been appraised in the adjustment made with the insurance companies as referred to above, said amount to be paid to the Contractor as the Work of restoration proceeds. Any loss or damage which may occur shall not affect the rights and obligations of either party under the Contract except as aforesaid and except that the Contractor shall be entitled to a reasonable extension of time for the performance of the Work, as The HRCE may decide.

11.1.1.4.2 Upon approval by The HRCE of the Substantial Performance certificate issued by the Consultant, the Contractor's obligation to maintain Builder Risk Insurance shall cease and The HRCE shall assume full responsibility for insuring the whole of the Work against loss or damage.

11.1.1.4.3 "Broad form" property insurance in the joint names of the *Contractor,* the *Owner* and the *Consultant.* The policy shall include as insureds all *Subcontractors* The Broad form" property insurance shall be provided from the date of commencement of the *Work* until the earliest of:

11.1.4.3.1 Ten (10) Calendar days after the date of *Substantial Performance of the Work;*

11.1.4.3.2 on the commencement of use or occupancy of any part or section of the *Work* unless such use or occupancy is for construction purposes, habitational, office, banking, convenience store under 465 square meter in area, or parking purposes, or for the installation, testing and commissioning or equipment forming part of the *Work*; and

11.1.4.3.3 when left unattended for more than thirty (30) consecutive calendar days or when construction activity has ceased for more than thirty (30) consecutive calendar days.

Paragraph 11.1.2 is clarified as follows:

11.1.2 Submit certified true copies of each insurance policy to the Owner's Contract Authority within seven (7) working days after notification of award or in any event prior to payment of the first progress claim. Such copies shall be exclusive of information pertaining to premium or premium bases used by the insurer to determine the cost of the insurance. Prior to the commencement of any work, the Contractor shall file with the Owner a certified copy of each insurance policy and certificate required.

Delete 11.1.5 in its entirety and replace with the following:

11.1.5 Insurance contracts shall be procured from and the premiums paid to a resident agent of an insurance Company licensed to underwrite insurance in the Province of Nova Scotia.

Add the following paragraph 11.1.9:

11.1.9 All of the insurance policies shall contain a clause stating that no change in terms and conditions or cancellation may at any time be made without the full knowledge and consent of the owner.

GC 11.2 CONTRACT SECURITY

Add the following subparagraph 11.2.2.1:

11.2.2.1 "Bonds shall be procured from a Nova Scotia resident agent of an insurance company licensed to do business in Nova Scotia and shall be maintained in good standing and held by the Owner until one (1) year after Substantial Performance of the Work.

Add the following paragraph 11.2.3:

11.2.3 If a Certified Cheque is held as contract security it shall be in an amount equal to ten (10) percent (%) of the Contract Price. Supplement the Certified Cheque as necessary to maintain the amount equal to ten (10) percent (%) of the total amount payable (Contract Price plus HST).

.1 The Certified Cheque will be deposited at the chartered bank holding The HRCE deposits.
.2 The HRCE will return the cheque amount to the Contractor upon satisfactory completion of the contract and duration as specified in the Tender documents.
.3 Should Contractor default, total amount payable under the Certified Cheque will be the face value of the cheque plus all accrued interest.
.4 Payment for completion of work, due to failure of performance of the Contractor, shall include all reasonable obligations under the Contract, including architectural and engineering costs arising because of the default of the Contractor.
.5 Payment for labour and materials shall be limited to those who have a direct contract with the Contractor for the provision of labour and/or material (which includes equipment rental).

GC 12.3 INDEMNIFICATION

Add the following paragraph 12.1.1.3:

12.1.1.3 The Contractor shall indemnify and hold harmless the Consultant, its agents and employees from and against claims, demands, losses, costs, damages, actions, suits, or proceeding by third parties that arise out of, or are attributable to, the Contractor's performance of the Contract, provided such claims are attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property, and caused by negligent acts or omissions of the Contractor or anyone for whose acts the Contractor may be liable, and made in writing within a period of six (6) years from the date of Substantial Performance of the Work, or within such shorter such period as may be prescribed by any limitation statute or the province or territory of the Place of Work.

GC 12.3 WARRANTY

Delete from the first line the word, "The" and substitute the words in paragraph 12.3.2:

12.3.2 "Subject to paragraph 3.15.1, the…"

Add the following paragraph 12.3.7:

12.3.7 Warranty repairs or replacements which arise during warranty period which affect the operation of the system shall be attended to immediately upon notification from the Consultant.

END OF SECTION 00 73 00

SECTION 00 73 10 - HRCE GENERAL TERMS & CONDITIONS

1. General

1.1. These Terms and Conditions, shall apply only to those documents (Quotations, Request for Proposals and Tenders, herein referred to as Public RFX or RFX) that reference them specifically. In the event of any conflict or disagreement between these Terms and Conditions and the RFX documents, the RFX documents have precedence and will be assumed to be correct.

1.2. These Terms and Conditions are intended to cover a wide range of procurements, including goods and services. As such, not all clauses will be applicable in all situations. If Suppliers have questions regarding any of these Terms and Conditions, they should contact the Halifax Regional Centre for Education (HRCE) Procurement Division. To satisfy special requirements, supplementary Terms and Conditions may also apply to some acquisitions. If this is the case, the RFX documents will reference any such documents, in addition to these Terms and Conditions.

1.3. For the purpose of these Terms and Conditions HRCE intends to only contract with responsible Suppliers who are in the business of providing the goods and/or services submitted upon, and can provide proof that they can furnish satisfactory performance based on past work experience with HRCE, other companies, or government agencies and have the financial managerial, and resource capabilities for the size of project bid upon. Satisfactory performance includes meeting all of the requirements of the various federal and provincial regulations and agencies for the completion of work and making payment to sub-contractors in a timely basis.

1.4. All of the terms, conditions and/or specifications stated or referenced in the Solicitation are assumed to be accepted by the Tenderer and incorporated in the Bid.

2. RFX Documents

2.1. RFX Documents should be obtained as indicated on the Cover Sheet of the tender document.

2.2. While HRCE has tried to ensure accuracy in the RFX documents, it is not guaranteed or warranted by HRCE to be accurate, nor is it necessarily comprehensive or exhaustive.

2.3. HRCE cannot ensure the accuracy of RFX documents obtained from any other source. (i.e. Construction Association of Nova Scotia (CANS), Nova Scotia Electronic Tendering Bulletin Board, Project Consultants, etc.).

2.4. All inquiries to this RFX are to be directed, in writing, to HRCE Procurement Division representative indicated in the RFX documents. Information obtained from any other source is not official and will not bind HRCE.

2.5. HRCE will assume that all Suppliers have resolved any questions they might have about the RFX and have informed themselves as to existing conditions and limitations, site restrictions, etc. before providing a RFX submission.

2.6. Nothing in the RFX is intended to relieve Suppliers from forming their own opinions and conclusions with respect to the matters addressed in the RFX or its associated documents.

2.7. In the event that HRCE Regional Office (33 Spectacle Lake Drive, Dartmouth) is closed (this includes partial day closures) due to inclement weather on the date and time of the RFX closing, the closing date and time will be extended one (1) business day. Tenderers should note that closure of Schools does not necessarily mean the closure of the HRCE's Regional Office. Closures are detailed on HRCE website.

3. Verbal instructions: Any changes to RFX call, specifications, terms and conditions shall be stated in writing. Verbal statements made by employees or representatives of HRCE, whether or not they appear to have the proper authority, shall not be binding on HRCE.

4. Addenda: HRCE reserves the right to modify the terms of the RFX documents prior to closing, at its sole discretion by addenda.

4.1. HRCE Procurement Division will make every effort to ensure the information provided on hrsb.ca is complete and accurate, please report any omissions or discrepancies to the Procurement Division immediately. **Any questions or requests for clarification arising from omissions, discrepancies, or ambiguities, must be made in writing no later than five(5) working days prior to the closing date, not including the closing date**. Replies to requests for clarification, if required, will be made in the form of written addenda, copies of which will be

posted on www.hrsb.ca/tender no later than three (3) working days prior to the date of closing, not including the closing date.

4.2. By downloading files from the www.hrsb.ca, you will automatically become registered for the applicable RFX. HRCE Procurement Division will make reasonable efforts, strictly as a courtesy, to directly inform registered Suppliers of any addenda, **however it is the sole responsibility of each registered Supplier to ensure that they have all the documents associated with any RFX and, to this end, every registered Supplier should review HRCE Tender Web Site daily**. These documents must be downloaded from the www.hrsb.ca/tender or obtained from HRCE Procurement Division, as applicable. Suppliers must acknowledge receipt of all addenda(s) with their RFX Submission.

5. Suppliers Responsibility: Suppliers are solely responsible for their own expenses in preparing, delivering or presenting a RFX and for subsequent negotiations, if any, with HRCE. It will be the responsibility of the Supplier to acquire at the Suppliers cost, any RFX documents as indicated on the Cover Sheet of the tender document.

6. Existing Conditions: Suppliers will be deemed to have familiarized themselves with the existing conditions which may affect the performance of required goods, services and construction. No plea of ignorance of such conditions as a result of failure to make all necessary examinations will be accepted as a basis for any claims for extra compensation or an extension of time. Suppliers are to ensure that they understand the expected use for the requested goods, service and construction and submit their RFX submission accordingly.

7. RFX Submissions

7.1. RFX will close at the time, date and location specified in the RFX documents (Atlantic Time Zone).

7.2. All RFX submissions must be received in their entirety on or before the closing time specified. Suppliers are responsible for ensuring that their RFX submission, however submitted, is received on time and at the location specified.

7.3. RFX Submissions must be submitted on the forms provided or in such format as directed in the RFX documents. These forms must be legible, complete, filled out in ink, or by typewriter, with the signature in longhand and the completed form shall be without interlineations, alterations or erasures.

7.4. If an electronic transmission (i.e. Facsimile, e-mail or hrsb.ca upload) can be accepted, as detailed in the applicable RFX documents, it is the responsibility of the Supplier:

7.4.1. to ensure that the submissions are delivered on or before the closing time and date shown on the RFX documents;

7.4.2. that the correspondence is legible and properly transmitted; and

7.4.3. that the name and number of the RFX is clearly displayed.

7.5. Electronic transmission of a RFX submission cannot be used where original documents are required, e.g. bid bonds, certified cheques, samples, etc., or as may be otherwise stated in the RFX documents.

7.6. **Sealed RFX submissions** must be delivered to HRCE Receptionist, 1st floor, 33 Spectacle Lake Drive, Dartmouth, Nova Scotia, on or before the closing time and date shown on the RFX documents. The RFX Submission is to be submitted on the provided forms, signed (together with the required RFX security as applicable) in a sealed opaque envelope, clearly identified with Suppliers name, RFX identification number and name, and closing date on the outside of the envelope. RFX Submissions are date and time stamped upon receipt at the Procurement Division (not at any other location) by the Procurement date time stamp. Any submission received after the closing date and time shown on the RFX documents will not be accepted and will be returned to the Supplier unopened and deemed non-compliant.

7.7. **Facsimile submissions** received are date and time stamped by the Procurement Division Facsimile, no other time stamp will be considered. A facsimile submission received after the closing date and time shown on the RFX documents will not be accepted and shall be deemed non-compliant. **The facsimile number for the Procurement Department of HRCE is (902) 464-0161. Do not send RFX correspondence to any other fax number.**

7.7.1. Where specified, facsimile submissions are accepted for the convenience of the Supplier; HRCE cannot ensure the confidentiality or error-free receipt of facsimile submissions.

7.8. Amendments/Withdrawn Submissions

7.8.1. Submissions may be withdrawn or amended by written request (on company letterhead or equivalent), prior to RFX closing date and time, but cannot be altered or changed in any way after the RFX closing.

7.8.2. Facsimile transmissions modifying supplier provided information are acceptable when signed by a duly authorized officer or agent. Submission of such electronic transmissions is at the risk of the Supplier. HRCE assumes no liability for the receipt of the electronic transmissions or their proper inclusion with original RFX submission. An electronic submission must be submitted prior to closing time and date specified in the RFX documents.

7.8.3. An amendment to a RFX submission replaces any other RFX submission amendment previously submitted by the supplier; only the last of any RFX submission amendment received will be accepted.

7.9. All RFX submissions must be signed by an authorized representative of the entity.

7.10. HRCE's time clocks will be assumed to be correct in the event of dispute.

7.11. HRCE reserves the right in its sole discretion to clarify any RFX submission after closing by seeking further information from that Supplier, without becoming obligated to clarify or seek further information from any or all other Supplier. However, Suppliers are cautioned that any clarifications sought will not be an opportunity either to correct errors or change their Bids in any substantive manner.

8. Brand Name: Some terminology may be used that would imply or denote a particular supplier. Brand names may be utilized to designate the type and quality of the product requested. Such usage shall not to be construed as restrictive in any way. Suppliers must be prepared to provide samples if required.

9. Substitute

9.1. If the Supplier is offering an equivalent (similar) substitute product to those specified, unless a specific product is requested, the supplier must clearly identify this substitution and supply the manufacturer's name, product number and provide any technical information required so that HRCE can determine the acceptability of the substitute.

9.2. HRCE reserves the right to inspect or test any product bid to determine equivalency, and may require demonstrator or sample items in order to be able to evaluate the items proposed.

9.3. HRCE shall be the sole judge of the acceptability of any substitute or proposed equivalent.

9.4. Specifications may, for technical or logistical reasons, require that the items specified be supplied without substitution.

10. Warranty

10.1. The supplier must describe the duration, type (e.g. on-site, depot, ship-in or carry-in) and terms of the manufacturer's warranty on all goods. If the supplier provides any additional/supplementary warranty coverage, describe this as well.

10.2. If warranties can be upgraded or extended, identify the upgrade costs separately. Do not include warranty upgrade or extension costs in the price unless the RFX documents specifically states that the upgrade is a mandatory requirement.

11. Pricing

11.1. All prices must be extended and totaled, where practical to do so. RFX Submission may be rejected as incomplete if total figures are not provided. In the case of an error in the extension of prices, the unit prices shall prevail.

11.2. Prices must be in Canadian funds, and shall include all shipping, handling, freight, offloading, duty, insurance and any other charges, which are applicable at time RFX is awarded (FOB – Destination). HRCE will not assume responsibility for any goods or services until they have been delivered to the destination(s) specified in the Solicitation. It is the responsibility of the Supplier to find out from the appropriate authorities what rates and charges are applicable to this RFX. No extra charges will be paid by HRCE.

11.3. In the event that a number of Suppliers provide submission in substantially the same amount, HRCE may, at its discretion, call upon those Suppliers to submit further bids.

12. **Permits and Taxes:** It is the responsibility of the Supplier to ensure that quotations include all taxes, permits, and other charges required to supply the goods, services and construction. The successful Supplier is to comply with all codes, regulations, and by-laws and all government and applicable standards pertaining to the work and job-site including, and not limited to, the Nova Scotia Occupational Health and Safety Act and Regulations. HRCE is required to pay a Harmonized Sales Tax (HST) at a rate specified by the Province of Nova Scotia. This tax is to be shown as a separate line item.

13. **Standards**
    - **13.1.** All goods, services and construction supplied to HRCE shall, when standards are available, be certified in accordance with the applicable code(s), but not limited to:
      - 13.1.1. Canadian Standards Association;
      - 13.1.2. Canadian Government Standards Board;
      - 13.1.3. Underwriters Laboratories of Canada; and
      - 13.1.4. And all applicable Federal, Provincial and Municipal regulations and acts.
    - **13.2.** HRCE reserves the right to discontinue the purchase of any product/service that does not continue to meet the applicable standard(s).

14. **Inspection:** HRCE reserves the right to inspect any goods, services or construction supplied either during or after manufacture and delivery, and shall be the sole judge as to the acceptability of goods, services and construction to meet the needs of HRCE and fulfills the requirements as specified.

15. **Rejection of RFX Submissions/Compliance:**
    - **15.1.** Failure to comply with any of the mandatory terms or conditions contained or referenced in the RFX documents shall result in the rejection of the RFX submission.
    - **15.2.** HRCE specifically reserves the right to accept or reject any or all RFX submission and implies no obligation on HRCE to accept any RFX submission, a portion of any RFX submission or any RFX submission. HRCE reserves the right to cancel any RFX in its entirety and shall not be responsible, in any manner, for expenses incurred by the Supplier for preparing a RFX submission. HRCE may award all or a portion of the work to one or more Suppliers. Without limiting the generality or any other provision hereof, HRCE reserves the right to reject or accept any RFX submission:
      - 15.2.1. that contains any irregularity or informality;
      - 15.2.2. that is not accompanied by the security documents required;
      - 15.2.3. that contains an alteration in the quoted price that is not initialed by the or on behalf of the Supplier;
      - 15.2.4. that is incomplete or ambiguous;
      - 15.2.5. contains clauses additional to the RFX that are "qualified" or "conditional"; and/or
      - 15.2.6. that does not strictly comply with the requirements contained in these instructions.
    - **15.3.** HRCE reserves the right to waive minor non-compliance where such non- compliance is not of a material nature in its sole and absolute discretion, or to accept or reject in whole or in part any or all RFX submissions, with or without giving notice. Such minor non-compliance will be deemed substantial compliance and capable of acceptance. HRCE will be the sole judge of whether a RFX submission is accepted or rejected.
    - **15.4.** HRCE reserves the right to accept or reject any or all RFX submission, not necessarily accept the lowest priced RFX submission, or to accept any RFX submission which it may consider to be in its best interest.

16. **Evaluation criteria:** If applicable, award of the RFX will be based on “Best Value” (which includes, but not limited to; price, discounts, product specifications, warranty, delivery, reference checks, etc.

17. **Cancellation/no award**
    - **17.1.** Issuing a RFX implies no obligation on HRCE to accept any submission, or a portion of any submission. The lowest or any RFX submission will not necessarily be accepted.
    - **17.2.** RFX’s may be cancelled in whole or in part by HRCE in its sole discretion when:
      - 17.2.1. the RFX submission price exceeds the funds allocated for the purchase;

17.2.2. there has been a substantial change in the requirements after the RFX has been issued;
17.2.3. information has been received by the RFX after the RFX has been issued that the RFX believes has substantially altered the procurement;
17.2.4. there was insufficient competition in order to provide the level of service, quality of goods or pricing required.

17.3. If no compliant RFX submission is received in response to a RFX, the HRCE reserves the right to enter into negotiations with one or more suppliers in order to complete the procurement.

17.4. HRCE will be the sole judge of whether there is sufficient justification to cancel any RFX.

17.5. No action or liability will lie or reside against HRCE in its exercise of its rights under this section.

18. Eligibility and Conflict of Interest

18.1. A RFX Submission may not be eligible for acceptance if current or past corporate or other interests of the Tenderer may, in HRCE's opinion, give rise to a conflict of interest in connection with a project.

18.2. Suppliers are cautioned that acceptance of their RFX submission may preclude them from submitting a response on subsequent phases where a conflict of interest may arise. Suppliers should study the project implementation strategy to determine whether or not they plan to submit response on subsequent phases.

18.3. If the RFX submission covers the first phase of what may prove to be a multi-phased project, the successful Supplier on the initial phase may be permitted to respond on subsequent phases as long as, in HRCE's opinion, no conflict of interest would be created in performance of the work by that Supplier.

18.4. Sub-contracting to any firm or individual whose current or past corporate or other interests may, in HRCE's opinion, give rise to a conflict of interest in connection with this bid will not be permitted. This includes, but is not limited to, any firm or individual involved in the preparation of the RFX documents.

19. Disputes: In case of dispute as to whether or not an item or service quoted or delivered meets RFX requirements, the decision of HRCE, or its authorized representative, shall be final and binding on all parties.

20. Exceptions: A RFX submission shall be considered an agreement to all terms and conditions provided herein and in various RFX documents, unless specifically noted otherwise in the RFX documents.

21. Irrevocable Offer: A RFX submission represents an irrevocable offer, unless otherwise stated in the RFX documents and shall be valid for a period of ninety (90) days following the closing date for RFX submissions.

22. Patent right and royalties: The successful Supplier shall pay all royalties and patent license fees required for the performance of the work. The successful Supplier shall hold HRCE harmless from and against claims, demands, losses, costs, damages, action suits or proceedings arising out of the successful Supplier's performance of the Contract which are attributable to an infringement or an alleged infringement of a patent of invention by the successful Supplier or anyone for whose acts the successful Supplier may be liable.

23. Assignment: The successful Supplier shall not assign the Contract (or portion thereof) nor sub-contract without the prior written consent of HRCE, consent shall not be unreasonably withheld.

24. Purchase Order: Work by the Supplier will begin only with the issuance of HRCE's official purchase order and/or any Contract Documents as applicable. The purchase order number must appear on any/all invoices covering same. No work is authorized until the successful Supplier has received an official HRCE purchase order and/or required Contract Documents. HRCE accepts no responsibility for any work performed prior to the issuance of a purchase order and/or required Contract Documents.

25. Delivery

25.1. Where the RFX Document includes a mandatory delivery schedule, HRCE will assume that the Supplier can meet the requested schedule and is satisfied that the goods or services required will be available for delivery on the requested date(s).

25.2. If Suppliers wish to specify a delivery schedule different from that requested in the RFX document, they must provide specific delivery dates or a schedule in calendar days from the date a Purchase Order is issued. RFX Submission that do not meet the delivery schedule as requested in the RFX documents may be rejected.

25.3. Time is of the essence, and supplier's delivery schedule is legally binding. HRCE reserves the right to assess penalties or cancel awards to Suppliers who fail to meet their stated delivery or completion dates.

26. Invoices

26.1. All invoices are to be submitted quoting the Purchase Order number (as applicable). The H.S.T. number must be shown on each invoice. Invoices must include a description of the goods, services and construction provided with HRCE Work Order Numbers (where applicable). Invoices must also clearly indicate list price, discounts offered and net price, if applicable. All invoices are to be forwarded to:

Halifax Regional Centre for Education
33 Spectacle Lake Drive
Dartmouth, NS, B3B 1X7
Attn: Accounts Payable

26.2. All Suppliers are required to maintain their tax status in good standing. In this regard, Suppliers are advised that verification of good standing with the Nova Scotia Minister of Finance and Revenue Canada (GST/HST) may be carried out prior to the award of a contract to a successful Supplier.

26.3. In order to maximize efficiencies, as well as to be more environmentally friendly, vendor payments are now being paid via EFT (Electronic Funds Transfer) direct deposit to vendor bank accounts. A vendor direct deposit form must be filled out with banking information for EFT payments.

27. Payment:

27.1. HRCE's normal payment terms are thirty (30) days from acceptance that the goods, services and construction meet the specifications. Alternative payment schedules may be proposed and are to be shown as an option and list any additional discounts to HRCE. Early payment discount terms (minimum period ten (10) days) may be considered in the evaluation of the RFX response. Payment of term discount invoices will be calculated from the date of the invoice or goods have been received, whichever is later. Discount terms must appear on the invoice.

27.2. The Supplier shall make application for payment at least monthly with the application based on progress or services provided during that month. HRCE will hold back ten percent (10%) of any payment until the lien periods have expired and the Supplier has provided HRCE with a complete release of any lien registered as a result of any work carried out by the Supplier, or any sub-contractor or supplier to the Supplier.

28. Right to offset: The successful Supplier agrees that HRCE may apply payments for goods, services and construction to any amount owing to HRCE by the Supplier or supplier including any related administration fees.

29. Confidentiality: The Supplier shall keep private, treat as being confidential, and not make public or divulge during, as well as after, the term on this Agreement, any information or material to which the Supplier or staff becomes privy as a result of acting under this Agreement without having first obtained HRCE's consent in writing.

30. Freedom of Information and Protection of Privacy (FOIPOP) Act and Personal Information International Disclosure Protection Act (PIIDPA)

30.1. As a public body, HRCE is subject to provincial legislation, Freedom of Information and Protection of Privacy (FOIPOP) Act. RFX submissions and associated documents are subject to disclosure and protection under this legislation. In the event an application for disclosure of information is made under FOIPOP, HRCE is subject to the disclosure and protection of information in accordance with that legislation. Suppliers are recommended to visit the following websites for more information on the Act: http://www.gov.ns.ca/just/IAP/default.asp and http://www.foipop.ns.ca/

30.2. The Province of Nova Scotia is required to comply with the Personal Information International Disclosure Protection Act (PIIDPA) (S.N.S 2006, c.3). The act creates obligations for the Province of Nova Scotia and its service providers when personal information is collected, used or disclosed. Requirements include limiting storage, access and disclosure of personal information to Canada, except as necessary or otherwise required by law. Suppliers are recommended to visit the following PIIDPA websites for more information on the Act: http://nslegislature.ca/legc/bills/60th_1st/3rd_read/b019.htm and http://www.gov.ns.ca/just/IAP/PIIDPAquest.asp#p01

30.3. The Supplier acknowledges and confirms that it is a "service provider" as defined in the Personal Information International Disclosure Protection Act, SNS 2006 c. 3 ("PIIDPA"), that the Supplier has read and understands its obligations as a service provider thereunder and that as a service provider It is legally bound by the obligations imposed on it by PIIDPA. It is a condition precedent to HRCE entering into the Agreement with the Supplier that the Supplier irrevocably undertakes covenants and agrees to be bound by and comply with the obligations imposed on it as a service provider under PIIDPA.

30.4. The Supplier further covenants, warranty and represents to HRCE that it will not at any time provide or allow the release of personal information to which it has access in its capacity as a service provider to HRCE in response to any "foreign demand for disclosure" or permit or allow the "unauthorized disclosure of personal information" as each of those terms are defined in PIIDPA.

30.5. The Supplier shall implement and strictly enforce security arrangements that will ensure that all personal information that it collects or uses on behalf of HRCE is protected at all times from unauthorized access or disclosure and shall confirm in writhing to HRCE, upon request, the details of such security arrangement. The Supplier also agrees to implement and enforce any additional security procedures as may be required by HRCE from time to time to protect the personal information that the Supplier collects on behalf of HRCE. HRCE shall be authorized, upon giving prior written notice to the Supplier, to enter the premises of the Supplier during normal business hours for the purpose of conducting an audit of the security arrangement referenced herein.

30.6. All personal information that the Supplier obtains or becomes aware of while providing services to HRCE is not and shall not be or be deemed to be the property of the Supplier. The Supplier acknowledges and agrees that it will not, either directly or indirectly, acquire any rights to use or own any such information other than the right to use it for the sole purpose of fulfilling its obligations to HRCE under the Agreement.

30.7. All RFX submissions become the property of HRCE. By providing a RFX submission, the supplier hereby grants HRCE a license to distribute, copy, print or translate the RFX submission for the purposes of the RFX. Any attempt to limit HRCE's right in this area may result in rejection of the RFX submission.

30.8. Suppliers RFX submission may be subject to disclosure under the Province's "freedom of information" legislation. By submitting a RFX submission, the Supplier agrees to the appropriate disclosure of the information supplied, subject to the provisions of the governing law. HRCE cannot guarantee the confidentiality of the complete content of any RFX submissions after the procurement has been awarded to the successful supplier.

30.9. During the delivery and installation of goods and/or services, the supplier or supplier's staff may have access to confidential information belonging to HRCE. Should this occur, the supplier must ensure that such information is not released to any third parties or unauthorized individuals; failure to comply may result in legal action being taken and/or the supplier's disqualification from any further RFX's issued by HRCE.

31. Indemnification: The Supplier shall indemnify and hold harmless HRCE, their agents, representatives and employees from and against all claims, demands, losses, costs, damages, actions, suits or proceedings arising out of, or resulting from the performance of this work, provided that any such claim is caused in whole or in part by the negligent act or omission of the Supplier, and sub-contractor, supplier, licensee, anyone directly or indirectly employed by any one of them or anyone for whose act any of them is liable, regardless of whether or not it is cause in part by a party indemnified hereunder.

32. Insurance: Unless otherwise stated, Commercial General Liability Insurance with policy limits of not less than five (5) million dollars ($5,000,000.00) must be filed with the Procurement Department of HRCE; such insurance shall be in the name of the Supplier and HRCE. The insurance must include non-owned automobile liability with policy limits of not less than two (2) million dollars ($2,000,000.00). All insurances are to be maintained in good standing for the duration of the Contract.

33. **Termination for convenience:** HRCE may terminate a contract, in whole or part, whenever HRCE determined that such termination is in the best interest of HRCE, without just cause giving sixty (60) days written notice to the proponent. However, in no event shall the proponent be paid an amount that exceeds the submitted price for the work performed.

34. **Termination for default:** When the proponent has not performed or has unsatisfactorily performed the contract, HRCE may terminate the contract for default. Upon termination for default, outstanding payment will be withheld at the discretion of HRCE. Failure on the part of the proponent to fulfill the contract obligations shall be considered just cause for termination of the contract. The proponent will be paid for work satisfactorily performed prior to termination, less any excess costs incurred by HRCE in re-procuring and completing the work.

35. **Workers Compensation:** Prior to commencing the work, the Supplier shall provide a current clearance letter from the Workmen's Compensation Board (WCB) and must maintain this coverage during the whole term of the Contract.

36. **WHMIS:** All controlled products supplies to HRCE must have approved Workplace Hazardous Materials Information System (WHMIS) supplier labels; Material Safety Data Sheets must also be supplied. Failure to comply with this requirement may result in rejection of any shipment, and may result in cancellation of the order and the return of goods to the supplier at the supplier's expense.

37. **Health and Safety Act:** The Supplier shall take every precaution to ensure that every employee, self-employed person and employer performing work in respect of the project complies with the latest revisions of the Nova Scotia Occupational Health and Safety Act and the Regulations, HRCE Occupational Health and Safety Policy BP 303.1, and all other safety measures as required by authorities having jurisdiction.

38. **Site Safety Plan:** Before being permitted access to the site to commence construction the Supplier may be requested provide HRCE with a written Project Specific Site Safety Plan. The Site Safety Plan provided shall be a written course of action that, through a pre-job evaluation, identifies and sets out specific actions to be taken to eliminate or control hazards associated with the work to be performed and to also deal with concerns or hazards that may develop during the course of the project. This Plan shall include, but not be limited to, identification of safety hazards anticipated during the project, solutions to those hazards, safety procedures, identification of designated safety officers and provision for safe access to the site for HRCE staff and or Consultants. Receipt and acceptance of the safety plan shall be mandatory prior to commencement of work.

39. **Extension to the Broader Public Sector**
    - **39.1.** HRCE may choose to allow the Broader Public Sector to purchase goods or services from some RFX's. The Broader Public Sector are generally permitted to purchase from "Standing Offers", which are contracts resulting from a RFX. Other RFXs may also be available to the Broader Public Sector; if so, the Solicitation documents will state this.
    - **39.2.** By submitting a response to a RFX, the Supplier agrees to extend the same pricing to other eligible Broader Public Sector institutions as per the terms and specifications in the Solicitation

40. **Governing Laws and Trade Agreements**
    - **40.1.** Unless the RFX documents specifically state otherwise, the RFX, all submissions, and any subsequent contracts will be construed and interpreted in accordance with the laws of the Province in which the Solicitation was issued.
    - **40.2.** RFX's subject to the Atlantic Procurement Agreement, the Agreement on Internal Trade, any other inter-provincial trade agreements, or any international trade agreements, will be specifically identified as such in the public notice and/or the Solicitation documents.
    - **40.3.** Information of any applicable trade or procurement agreements and/or legislation can be obtained by contacting HRCE Procurement Department.
    - **40.4.** Suppliers agree to comply with all applicable laws, regulations and standards, including all labour, occupational health & safety, and worker compensation requirements of the Province.

40.5. HRCE may consider and evaluate any RFX submission from other jurisdictions on the same basis that the purchasing authorities in those jurisdictions would treat a similar RFX submission from a supplier located in this Province. HRCE will be the sole judge of whether these conditions will be used and the extent to which they will be applied.

40.6. Suppliers registered to do business in any Atlantic Province can bid on RFX issued by any other Atlantic Province without having to satisfy any local registration or residency requirements.

40.7. Under Canadian law (and international agreements), your RFX submission must be arrived at separately and independently, without conspiracy, collusion or fraud; see: http://www.competitionbureau.gc.ca/internet/index.cfm?itemid=1243&lg=e for further information.

41. Other General Conditions

41.1. No RFX submissions shall be accepted from any person or corporation who, or which, has a claim or has instituted a legal proceeding against HRCE or against whom HRCE has a claim or has instituted a legal proceeding with respect to a previous contract, without prior approval of HRCE.

41.2. The Supplier shall perform the obligations of this Contract in a good and workmanlike manner in compliance with all applicable legislation in effect in Nova Scotia, and in accordance with industry standards and practice.

41.3. The Supplier shall be solely responsible for all means, methods, techniques and procedures necessary for performing the work required under this Contract.

41.4. All Suppliers must comply with the Nova Scotia Corporations Registration Act (CRA) or the Partnerships and Business Names Registration Act (PBNRA) as one of the conditions of doing business with the Province of Nova Scotia. In this regard, Suppliers are advised that verification of registration and good standing may be carried out prior to the final award of a contract to a successful Supplier. Suppliers residing outside Nova Scotia (which are not otherwise carrying on business in Nova Scotia) are expected to be registered in an equivalent manner in their respective jurisdictions.

41.5. Unless otherwise specified, all materials installed by the Supplier as part of this Contract shall be new and shall comply with the specifications and any applicable building codes. The Supplier is, at all times, responsible for correcting any defective work or materials at the Supplier's cost, and payment by HRCE to the Supplier does not relieve the Supplier of that responsibility.

41.6. Where applicable, the end user must be provided with complete operation manuals, warranty registration forms, user licenses/ authentications and/or other associated documentation normally provided by the manufacturer, reseller, installer and/or consultant.

41.7. The Supplier shall, at all times, keep HRCE premises free from accumulations of waste and rubbish. Disposal of all waste and rubbish shall be at approved waste disposal sites.

41.8. If the Supplier files for bankruptcy, becomes insolvent or fails to perform the Supplier's obligations under this Contract in a timely and workmanlike manner, HRCE may, by written notice, immediately terminate the employment of the Supplier and the Supplier shall be entitled only to the value of work performed and materials supplied up to the date of the termination.

41.9. The Supplier shall not permit smoking by any of its employees or sub-contractors on HRCE property and will act in accordance to the HRCE policy BP101.3 Tobacco-Free Schools and Workplaces.

41.10. The Supplier warrants its work and materials for a minimum of twelve (12) months after the date of substantial completion.

41.11. The Supplier, if performing work on HRCE property may be required to provide a safety program certified with the Nova Scotia Construction Safety Association or with an approved alternate safety association and/or program.

41.12. HRCE reserves the right to split an award amongst Suppliers as deemed in the best interests of HRCE.

END OF SECTION 00 73 10

SECTION 01 11 00 - HRCE SUMMARY OF WORK

1. Project Location & General Scope

1.1. ***Shannon Park Elementary,***
75 Iroquois Dr, Dartmouth, NS B3A 4M5

1.2. Scope: Refer to Section 00 00 15 for scope and schedule information.

2. Contract Documents

2.1. Work will be performed under CCDC-2, 2008 contract.

3. General Conditions

3.1. Halifax Regional Centre for Education and CCDC-2, 2008, form an integral part of this Project Manual, a copy of which is bound herein.

4. Project Manual

4.1. Sections of the Project Manual are numbered in conformance with the Master List of Section Titles and Numbers, CSC Document 004E, published jointly by Construction Specifications Canada and The Construction Specifications Institute (USA). Sections are arranged in their standard format.

4.2. Sections are written as units of the Work which have been assigned numbers in conformance with the CSC/CSI system. They are arranged in sequence for this Manual. Gaps in the order of numerical sequence do not indicate that a section has been inadvertently omitted from this Manual, but, rather that a Section is not required for completion of the Work.

4.3. Wherever the project location building name occurs in the Contract Documents it shall be taken to mean all work included in the Contract.

4.4. Wherever in the Contract Documents the words "approval", "approved", "direction", "directed", "selection", "selected", "request", "requested", "report", and similar words are used, such approvals, directions, selections, requests and reports shall be given by the HRCE unless specifically stated otherwise.

4.5. Wherever in the Contract Documents the word "provide" is used in any form, it shall mean that the Work concerned shall include both supply and installation of the products required for completion of that part of the Work.

4.6. Wherever in this Project Manual it is specified that Work is to proceed or to meet approval, direction, selection or request of jurisdictional authorities or others, such approval, direction,

selection or request shall be in writing.

5. Errors & Omissions

5.1. If errors or omissions are observed in the Contract Documents, immediately notify the HRCE Procurement in writing of all such errors or omissions. In the event no such notice is given, the Contractor will be held responsible for the results of any such error or omission and the cost of rectifying the same.

6. Division 1

6.1. The provisions of all Sections of **Division 1** shall apply to each Section of this Specification**.**

7. Wage Rates

7.1. Pay all employees engaged on the Work a wage not less than the minimum wage per hour as set out by the Province of Nova Scotia. For overtime work beyond 48 hours in any one week, pay no employee at a rate of less than one and one-half times the minimum wage per hour noted above. Provide for these wage rates in tendered contract amount.

8. Work Performed Under Separate Contracts

8.1. Work not to be included in the Contract, as noted "NIC" on the Drawings, shall be governed by Article 37, Separate Contracts, of General Conditions of Contract.

8.2. Furniture installation will be carried out by others.

8.3. Computer installation will be carried out by others.

9. Project Schedule

9.1. Refer to Section 00 00 15 Description of Work.

9.2. Existing services (mechanical & electrical) will need to be maintained through the renovations.

9.3. During construction, all life safety systems as well as mechanical and electrical systems must be in active, usable condition to permit the school to operate or alternate methods used to ensure the safe operation of the school as directed by HRCE project representative.

9.4. As construction progresses revise the schedule to compensate for any delays or unforeseen activities so as to maintain the contract completion date. Each schedule submission is to be complete with a statement indicating the changes made, the reason they were changed and confirmation that the project completion date will not change. The above schedule information is to be submitted monthly or more often if necessary.

10. Site Progress Records

10.1. Maintain at site a permanent written record of progress of Work. Make the record available at all times with copies provided when requested. Include in record each day:

10.1.1. Commencement and completion dates of the Work of each trade in each area of Project.

10.1.2. Attendance of Contractor's and Subcontractor's Work forces at Project and a record of the work they perform.

10.1.3. Visits to site by representatives of the Owner, Engineer, jurisdictional authorities, Contractor, Subcontractors, and suppliers.

10.2. Maintain a progress chart in approved format. Show on chart proposed Work schedule and progress of Work by Contractor and Subcontractor.

11. Examination

11.1. Site:

11.1.1. Examine site, and ensure that site conditions have been examined, that all are fully informed on all particulars which affect Work thereon and at the place of construction, and in order that construction proceeds competently and expeditiously.

11.1.2. Ensure by examination that all physical features, and working restrictions and limitations which exist are known.

11.2. Previously Completed Work:

11.2.1. Verify dimensions of existing Work in place before construction of Work to be incorporated with it.

11.2.2. Verify that previously executed Work and surfaces are satisfactory for construction, and that performance of subsequent Work will not be adversely affected.

11.2.3. Commencement of Work will constitute acceptance of site conditions and previously executed Work as satisfactory.

11.2.4. Report to Engineer defects in prior Work which will affect quality of subsequent Work, or construction schedule.

11.3. Construction Measurements:

11.3.1. Before commencing installation of Work, verify that its layout is accurate in accordance with intent of Drawings, and that locations, elevations, and clearances to adjacent infrastructure are maintained.

11.3.2. If Work is installed in wrong location, rectify it before other Work concerned proceeds.

12. PROTECTION OF WORK, PROPERTY & PERSONS

12.1. Include in Work necessary methods, materials, and construction to ensure that no damage or harm to Work, materials, property and persons results from the Work of this Contract. Temporary facilities relating to protection are specified in Section 01 52 00.

12.2. Protect, and if damaged make good, adjacent private and public property.

12.3. Keep surfaces, on which finish materials will be applied, free from grease, oil, and other contamination which would be detrimental in any way to the application of finish materials.

12.4. Protect finished surfaces of completed Work from damage by restriction of access or by use of physical means suitable to the material and surface location. Establish with each Subcontractor the suitability of such protection in each case.

12.5. Protect existing underground infrastructure, mechanical, electrical, telephone and similar services from damage. If necessary, relocate active services to ensure that they function continuously in safety and without risk of damage.

12.6. Cap off and remove unused utility services encountered during Work after approval is given by the utilities concerned or jurisdictional authorities, whichever may apply. Relocation, removal, protection and capping of existing utility services shall be performed only by the applicable utility and of other services by licensed mechanics.

12.7. To prevent soiling or damage to finish flooring where pedestrian traffic occurs after the flooring has been installed, install and maintain 6 mil. polyethylene membrane or reinforced kraft paper temporary protection, secured in place and with joints sealed by reinforced pressure sensitive tape.

12.8. Install plywood panels of minimum ¼" thickness over completed finish flooring materials, on which further construction Work is performed by other trades or delivery of products is made, or both. Seal joints between panels with reinforced pressure sensitive tape.

12.9. Prevent spread of dust beyond the construction zone by wetting, or by other approved means, as it accumulates.

12.10. The outside work area shall be appropriately demarked and/or surrounded by rigid chain link panels or fencing to prevent unauthorized entry to the work area. Any area of roof having work completed is to be covered below with this fencing approximately 10' from the edge of the building. It is to be maintained at all times throughout the project. All waste disposal bins are to be fenced in using the same type of fencing as indicated above during working hours. After working hours, all waste disposal bins shall be located a minimum of 25 feet from any structure. Any windows where the debris chute is located are to be covered. All entrances below the roof area are to have covered scaffolding erected to ensure a safe travel path to a distance of ten feet from edge of building. All workers shall contain their activity to the work site area. Access to the school shall only be allowed as planned in coordination with HRCE Operations and the

school administration.

12.11. The contractor is responsible for security of all project materials and access to the project site and/or the school through the project site at all times until completion of work and acceptance of the finished project by HRCE. Such additional security costs for security personnel or other means of security as deemed necessary by the contractor will be the sole responsibility of the contractor. The HRCE will provide security personnel up to and including the Substantial Completion date as noted on the bid submission documents.

12.12. The contractor shall keep the work site free from accumulated debris caused by the employees or work and shall remove all debris at the end of each work shift. Debris shall not be deposited in HRCE controlled garbage and/or recycling containers.

12.13. All waste materials and debris created during demolition and/or construction shall be disposed of in a dumpster provided by the contractor, to be removed at the end of the construction project, using a methodology that is in compliance with the applicable HRM solid waste by laws. Otherwise, the material must be removed and disposed of off site at the end of each working day. The waste materials may not be stored on site unless they are held in an approved project dumpster no closer than twenty five (25) feet from any structure.

12.14. All temporary structures such as portable washroom facilities, materials storage trailer, work trailer, debris dumpster, vehicles, etc., shall be located a minimum of (25) twenty-five feet from the school building.

12.15. Where applicable, a hot work permit will be required to be completed prior to commencement of work and all conditions of the permit must be maintained until completion of hot work. A copy of the hot work permit signed by the contractor representative shall be provided to HRCE upon completion of each hot work session. Contractor must assign a designated fire watch as noted on the permit document who shall remain on site for three hours after completion of each hot work session.

12.16. A school washroom will be designated for use where appropriate. However, protection of the surfaces as indicated above must be maintained. It should also be noted that access to the building during summer months will be limited for security reasons. Contractor is responsible to provide temporary portable washroom facilities for general use of contractor staff.

12.17. Access to Interior of School - All interior access is to be scheduled with the PM. This will allow for notice to the school admin., custodial and possible scheduling of a security guard for after hour access.

12.18. Adhesives / Torch Work - All adhesive use and torch work must be completed after school hours.

13. Cleaning

13.1. Ensure that during and after construction the public streets and existing asphalt parking lot are cleaned as required.

14. Salvage

14.1. Unless otherwise specified, salvaged material resulting from construction, and surplus materials and construction debris shall become property of Contractor, who must dispose of it away from Site.

15. Site Limitations

15.1. Since the existing building will be occupied during the Work (in accordance with the Phasing Schedule) the Architect will designate the precise areas on the site which may be utilized for work and storage, and where personnel will be permitted to be present. Refer also to Drawings. Allow for hoarding to secure construction areas from occupied portions of the Building and Site.

15.2. All access to the construction site is to be coordinated with the Project Manager for HRCE and communicated at the pre-construction meeting.

15.3. Any Work carried out in the building is to be carried out during hours approved by the School Administration.

15.4. Any disruption to services within the building must occur during hours approved by School Administration.

15.5. Any Work which may have an adverse affect on the occupancy functions, must have prior approval of the School Administration and **may** require scheduling during off-hours.

16. Security Regulations

16.1. Perform Work in conformance to the security regulations of the building as directed by the Project Manager for HRCE.

17. Project Identification

17.1. No project sign is required on this Project.

18. Owner's Occupancy

18.1. The Owner reserves the right to occupy and use portions of the Project, whether partially or entirely completed, or whether completed on schedule or not, provided such occupancy does not interfere with the Contractor's continuing Work.

18.2. Partial occupancy or installation by the Owner of his equipment shall not imply acceptance of the Project in whole, or in part, nor shall it imply acknowledgement that terms of the Agreement are fulfilled.

END OF SECTION 01 11 00

SECTION 01 11 25 - PRICES

1. General

1.1. Prices included in the Contract shall be complete for the applicable Work, and shall include for each price:

1.1.1. Expenditures for wages and for salaries of workmen, engineers, superintendents, draftsmen, foremen, timekeepers, accountants, expeditors, clerks, watchmen and such other personnel as may be approved, employed directly under the Contractor and while engaged on the applicable Work at the site and expenditures for travelling and HRCE allowances of such employees when required by location of the applicable Work or when covered by trade agreements and when approved; provided, however, that nothing shall be included for wages or salary of the Contractor if an individual, or of any member of the Contractor's firm if the Contractor is a firm or the salary of any officer of the Corporation if the Contractor is a corporation, unless otherwise agreed to in writing.

1.1.2. Expenditures for material used in or required in connection with the construction of the applicable Work including material tests and required by the laws or ordinances of any authority having jurisdiction and not included under Subparagraph .9.

1.1.3. Expenditures for preparation, inspection, delivery, installation and removal of materials, equipment, tools and supplies.

1.1.4. Temporary facilities as required for the applicable Work.

1.1.5. Travelling expenses properly incurred by the Contractor in connection with the inspection and supervision of the applicable Work or in connection with the inspection of materials prepared or in course of preparation for the applicable Work and in expediting their delivery.

1.1.6. Rentals of all equipment whether rented from the Contractor or others, in accordance with approved rental agreements including any approved applicable insurance premiums thereon and expenditures for transportation to and from the site of such equipment, costs of loading and unloading, cost of installation, dismantling and removal thereof and repairs or replacements during its use on the applicable Work, exclusive of any repairs which may be necessary because of defects in the equipment when brought to the Work or appearing within thirty (30) days thereafter.

1.1.7. The cost of all expendable materials, supplies, light, power, heat, water and tools (other than tools customarily provided by tradesmen) less the salvage value thereof at the completion of the applicable Work.

1.1.8. Assessments under the Workmen's Compensation Act, the Unemployment Insurance Act, Canada Pension Act, statutes providing for government hospitalization, vacations with pay or any similar statutes; or payments on account of usual vacations made by the Contractor to his employees engaged on the applicable Work at the site, to the extent to which such assessments or payments for vacations with pay relate to the Work covered by the specified price; and all sales taxes or other taxes where applicable.

1.1.9. The amounts of all Subcontracts related to the specified price.

1.1.10. Premiums on all insurance policies and bonds called for under this Contract as related to the specified price.

1.1.11. Royalties for the use of any patented invention on the applicable Work.

1.1.12. Fees for licenses and permits in connection with the applicable Work. No Building Permit is required for the project.

1.1.13. Duties and taxes imposed on the applicable Work.

1.1.14. Such other expenditures in connection with the applicable Work as may be approved.

1.1.15. Provided always that except with the consent of the Owner, the above items of cost shall be at rates comparable with those prevailing in the locality of the Work.

END OF SECTION 01 11 25

SECTION 01 11 41 - PROJECT COORDINATION

1. Requirements Included

1.1. Each Trade Contractor's responsibilities include the coordination of Work within his own Contract and with the Work of other Contracts.

2. Related Requirements

2.1. Project Meetings: Section 01 31 19

2.2. Submittals: Section 01 33 00

3. Description

3.1. Coordinate Work on which subsequent Work depends to facilitate mutual progress, and to prevent conflict between parts of the work.

3.2. Ensure that each Section makes known for the information of the Construction Manager and other Sections, the environmental and surface conditions required for the execution of its Work, and the sequence of others Work required installation of its Work.

3.3. Ensure that each Section, commencing Work, and that each Section is assisted in the execution of its preparatory Work by Sections depending upon its preparation.

3.4. Deliver materials supplied by one Section to be installed by another well before the installation begins.

3.5. Sections giving installation information in error, or too late to incorporate in the Work, shall be responsible for having Work done which was thereby additionally made necessary.

3.6. Coordinate warranty conditions of interconnected Work to ensure that full coverage is obtained.

3.7. Remove work installed in error which is unsatisfactory for subsequent Work.

4. Cutting And Patching

4.1. Include under Work of this Section all cutting and patching of asphalt required by the Work.

4.2. Finish new surfaces flush with existing surfaces.

4.3. Cut and patch as required making work fit.

4.4. Make cuts with clean, true, smooth edges.

4.5. Patching of existing or new asphalt shall be performed only by workmen with expertise in that particular trade and who normally perform that Trade.

4.6. Replace, and otherwise make good, damaged or defective Work. If required by the Construction Manager.

4.7. Do not endanger Work or property by cutting, digging, or similar activities. No Section shall cut or alter the Work of another Section unless approved by the Section which has installed it.

4.8. Cut and drill with true smooth edges and to minimum suitable tolerances.

4.9. If required, before cutting, drilling, or sleeving structural load bearing elements, obtain approval of location and methods.

4.10. Cutting, drilling and sleeving of Work shall be done only by the Section which has installed it. The Section requiring drilling and sleeving shall inform the Section performing the Work of the location and other requirements for drilling and sleeving. The Contractor shall directly supervise performance of cutting and patching.

4.11. Cutting and Patching for Holes Required by Mechanical & Electrical Work:

4.11.1. Include under Work of Mechanical Divisions cutting or provision of holes up to 8" in diameter and related patching.

4.11.2. Include under Work of this Section holes and other openings required by the work of Mechanical Divisions which are larger than 8" in diameter or least dimension, and chases, bulkheads, furring and required patching. This Section shall be responsible for determination of Work required for holes in excess of 8" diameter or least dimension.

4.11.3. Include under the Work of Electrical Divisions all cutting or provision of holes and related patching for the Work of that Division.

4.12. Include under Work of this Section all other cutting and patching required by the Work except as described in Clause .11 above.

4.13. Patching or replacement of damaged Work shall be done by the Subcontractor under whose Work it was originally executed, and at the expense of the Subcontractor who caused the damage.

4.14. Make patches invisible in final assembly.

5. Quality Assurance

5.1. Requirements of Regulatory Agencies:

5.1.1. Make known and coordinate the requirements of jurisdictional authorities, as made explicit by the Contract Documents, and by representatives of such authorities

5.2. Source Quality Control:

5.2.1. Ensure that Work meets specified requirements

5.2.2. Schedule, supervise and administer inspection and testing as specified in Section 01 45 00.

5.3. Job Records:

5.3.1. Maintain job records and ensure that such records are maintained by subcontractors.

Submittals

5.4. Prepare a Project schedule in accordance with Section 01 33 00, and ensure that all subcontractors and suppliers are aware of the details of this schedule, and progressively of their general compliance with the schedule.

5.5. Become aware of the required submittals specified in each Section, and expedite submission of such submittals so as not to hinder the Project Schedule.

5.6. Review submittals and make comments as specified in Section 01 33 00.

6. Job Conditions

6.1. Ensure that Work proceeds under conditions meeting specified environment and job safety requirements

6.2. Ensure that protection of adjacent property and the Work is adequately provided and maintained to meet specified requirements.

7. Product Delivery, Storage And Handling

7.1. Site has limited spaces for storage, only delivery of materials agreed upon by the Construction Manager will be allowed. Comply with Construction Manager's allocations. Any requirement for modifications to the building in order to allow delivery and storage of the materials to complete this work is the responsibility of the contractor.

7.2. Schedule delivery of products & removal of material with Construction Manager.

7.3. Make available areas for storage of products and construction equipment to meet specified requirements, and to ensure a minimum of interference with progress of the Work and relocations.

7.4. Trade Contractor to provide flag persons, traffic signals, barricades and Flares/lights/lanterns as required to perform the Work and to protect the public.

7.5. Material and Waste - Deliveries and Removals - Must be coordinated to be completed 30 minutes after school dismissal where applicable.

END OF SECTION 01 11 41

SECTION 01 31 19 – PROJECT MEETINGS

1. Pre-Award Meeting

1.1. A Pre-award meeting will be held at which time the following will be addressed:

1.1.1. Owner and HRCE's functions.
1.1.2. The Consultant and the Consultant's functions.
1.1.3. The General Contractor and the General Contractor's functions.
1.1.4. Documentation requirements from the General Contractor.
1.1.5. Obligee for Performance and Payment Bonds from Sub-contractors.
1.1.6. Progress Claims.
1.1.7. CO's & CCO's.
1.1.8. Construction Schedule.
1.1.9. Project Start-up.
1.1.10. Job Meetings.
1.1.11. Superintendent – General Contractor's Representative.
1.1.12. Design / Administration authority.
1.1.13. Owner's Representative.
1.1.14. Special Consultants.
1.1.15. Quality of Workmanship.
1.1.16. Accountability.
1.1.17. Harmonized Sales Tax.
1.1.18. Contract Close-out Documentation.

2. Preconstruction Meeting

2.1. Within fifteen (15) days after award of Contract, arrange a meeting between the, Consultant, Subcontractors, Project Superintendents, Inspection and Testing Company Representatives, and representatives of others whose coordination is required during construction.

2.2. Discuss at the meeting the means by which full cooperation and coordination of the participants during construction can be achieved.

2.3. Document the responsibilities and necessary activities of the participants during construction as discussed, and distribute to each participant.

2.4. Establish procedures for maintenance and completion of Project record drawings specified in Section 01 77 00.

2.5. Review and establish methods of maintaining life safety and egress for the school occupants. Communicate these methods thoroughly with the School Principal.

3. Progress Meeting

3.1. Invite representatives of HRCE, to attend twice monthly site meetings called by the Contractor during the progress of the Work.

3.2. Inform HRCE of each meeting and of proposed agenda a minimum of five (5) days before meeting.
3.3. Submit proposed schedule of site meetings to Engineer and Owner.
3.4. Record, prepare and distribute minutes of each meeting to HRCE and to each other participant within 72 hours of meeting.
3.5. Ensure that all representatives who attend meetings have the authority to conduct business on behalf of firms they represent.
3.6. Details of Progress Meetings to be discussed at the project start-up meeting.

4. Suggested Agendum (Preconstruction Meeting)

4.1. Distribution and discussion of:
4.1.1. List of major subcontractors and suppliers.
4.1.2. Projected Construction Schedules.
4.2. Critical work sequencing.
4.3. Major equipment deliveries and priorities.
4.4. Project Coordination:
4.4.1. Designation of responsible personnel.
4.5. Procedures and Processing of:
4.5.1. Field decisions
4.5.2. Proposal requests
4.5.3. Submittals
4.5.4. Change orders
4.5.5. Applications for Payment.
4.6. Adequacy of distribution of Contract Documents.
4.7. Procedures for maintaining Record Documents.
4.8. Use of premises:
4.8.1. Office, work and storage areas.
4.8.2. Owner's requirements.
4.9. Construction facilities, controls and construction aids.
4.10. Safety/Tool Box Meetings.
4.11. Security procedures.
4.12. Housekeeping procedures.
4.13. Egress/life safety procedures

5. Suggested Agendum (Progress Meetings)

5.1. Review and approval of minutes of previous meeting.
5.2. Safety meeting minutes.
5.3. Review of work progress since previous meeting.
5.4. Field observations, problems, conflicts.
5.5. Problems which impede Construction Schedule.
5.6. Review of off-site fabrication, delivery Schedules.

5.7. Corrective measures and procedures to regain projected schedules.
5.8. Revisions to Construction Schedules.
5.9. Maintenance of quality standards.
5.10. Pending changes and substitutions and effect on Construction Schedule.
5.11. Other Business.

6. Attend, with representatives of HRCE weekly meetings with the School Administration to review construction activities and concerns of Building Occupants.
7. Quarterly meetings with Contractor and the HRCE / User during Warranty Period including major sub-trade contractors.
8. Dates for meetings will be set at time of completion.

END OF SECTION 01 31 19

SECTION 01 33 00 – SUBMITTAL PROCEDURES

1. General Requirements

1.1. Make submittals specified in this Section to Consultant unless otherwise specified, with additional submissions made, in manner he directs, to other parties involved with construction of the Project as their interests are concerned. These parties are, but shall not be restricted to, consultants, jurisdictional authorities, and Subcontractors whose Work must be coordinated with Work related to Submittals.

1.2. Ensure that submissions are made to allow sufficient time for review without the construction schedule being delayed.

2. Document Submissions Required

2.1. At Commencement of Contract:

- **2.1.1.** Performance and Payment Bonds.
- **2.1.2.** Public Liability and Property Damage Insurance Certificates.
- **2.1.3.** List of Subcontractors by firm name.
- **2.1.4.** Construction Schedule and other required schedules and estimates.
- **2.1.5.** Site Specific Safety Plan/Safety Policy.
- **2.1.6.** Workers' Compensation Board status.

2.2. During Construction:

- **2.2.1.** Weekly progress reports.
- **2.2.2.** Job meeting reports and minutes.
- **2.2.3.** Updated construction schedules.
- **2.2.4.** Shop drawings as required.
- **2.2.5.** Inspection and test reports.
- **2.2.6.** Daily communication of Hot Work Permits as needed.

2.3. Submissions at completion of Work are specified in Section 01 77 00, Contract Closeout.

3. Administrative

3.1. Submit to Consultant submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time no claim for extension by reason of such default will be allowed.

3.2. Do not proceed with Work affected by submittal until review is complete.

3.3. Present shop drawings, product data, samples and in Imperial units.

3.4. Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has

been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

3.5. Notify Consultant in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

3.6. Verify field measurements and affirm that affected adjacent work is coordinated.

3.7. Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.

3.8. Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant's review.

3.9. Keep one review copy of each submission on site.

4. Construction Schedules

4.1. Submit proposed construction schedule at beginning of Project, as specified in Project Documents.

4.2. As construction progresses, submit up-dated construction schedules as specified in Project documents.

5. Shop Drawings And Product Data

5.1. The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

5.2. Submit drawings stamped and signed by professional consultant registered or licensed in Province of Nova Scotia of Canada.

5.3. Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

5.4. Allow seven (7) days for Consultant's review of each submission. Do not proceed with work involving relevant products until completion of shop drawing review.

5.5. Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of work, state such in writing to Consultant prior to proceeding with work.

5.6. Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested.

Accompany submission with transmittal letter, in duplicate, containing:

5.6.1. Date

5.6.2. Project title and number

5.6.3. Contractor's name and address

5.6.4. Identification and quantity of each shop drawing, product data and sample.

5.6.5. Other pertinent data.

5.7. Submission to include:

5.7.1. Date and revision dates.

5.7.2. Project title and number.

5.7.3. Name and address of:

5.7.3.1. Subcontractor.

5.7.3.2. Supplier.

5.7.3.3. Manufacturer.

5.7.4. Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.

5.7.5. Details of appropriate portions of Work as applicable:

5.7.5.1. Fabrication.

5.7.5.2. Layout, showing dimensions, including identified field dimensions, and clearances.

5.7.5.3. Setting or erection details.

5.7.5.4. Capacities.

5.7.5.5. Performance characteristics.

5.7.5.6. Standards.

5.7.5.7. Relationship to adjacent work.

5.8. After Consultant's review, distribute copies.

5.9. Submit for review one electronic copy in PDF file format of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.

5.10. Submit electronic copies of product data sheets for brochures for requirements requested in specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.

5.11. Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Consultant.

5.11.1. Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

5.11.2. Testing must have been within three (3) years of date of contract award for project.

5.12. Documentation of testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

5.13. Delete information not applicable to project.

5.14. Supplement standard information to provide details applicable to project.

5.14.1. If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of work may proceed.

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

5.15. Shop Drawings are specified for submission under the following:

Section 03 20 00 Concrete Reinforcement
Section 05 12 23 Structural Steel
Section 05 31 00 Steel Deck
Section 05 50 00 Metal Fabrications
Section 06 10 11 Rough Carpentry
Section 06 40 00 Architectural Woodwork
Section 07 41 43 Aluminum Composite Panels
Section 07 46 13 Preformed Metal Siding
Section 07 55 00 Modified Bitumen Roofing System & Flashing
Section 07 84 00 Fire Stopping and Smoke Seals
Section 08 11 14 Steel Doors & Frames
Section 08 11 16 Aluminum Doors & Frames
Section 08 14 10 Wood Doors
Section 08 50 50 Aluminum Windows
Section 08 62 11 Vinyl Windows
Section 08 71 10 Door Hardware
Section 09 22 16 Non-Load Bearing Wall Framing
Section 09 30 13 Ceramic Tile
Section 10 11 13 Communication Boards
Section 10 11 23 Tackboards
Section 10 14 53 Traffic Signs
Section 10 28 10 Toilet & Bath Accessories
Section 10 50 00 Miscellaneous Specialties
Section 11 40 11 Food Services Catalogued & Custom Equipment
Section 12 21 13 Horizontal Blinds
Section 12 21 16 Roller Shades

Section 14 42 13 Wheelchair Platform Lift

All pre-manufactured Mechanical & Electrical items as noted in Mechanical & Electrical Divisions.

6. SAMPLES

6.1. Submit for review samples in duplicate as requested in respective specification Sections, as requested by the Consultant. Label samples with origin and intended use.

6.2. Deliver samples prepaid to Consultant's business address.

6.3. Notify Consultant in writing, at time of submission of deviations in samples from requirements of Contract Documents.

6.4. Adjustments made on samples by Consultant are not intended to change.

6.5. Make changes in samples which Consultant may require, consistent with Contract Documents.

6.6. Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.

6.7. Samples are specified for submission under the following Sections:

Section 07 41 43 Aluminum Composite Panels
Section 07 46 13 Preformed Metal Siding
Section 08 14 10 Wood Doors
Section 08 50 50 Aluminum Windows
Section 09 30 13 Ceramic Tile
Section 09 51 13 Acoustical Ceiling Units
Section 09 65 19 Resilient Tile Flooring
Section 12 21 13 Horizontal Blinds
Section 12 21 16 Roller Shades
Refer to Mechanical & Electrical Divisions for sample requirements in those Trades.

7. Record Drawings

7.1. Record, as the Work progresses, changes and deviations in the location of Work concealed by the finished Work, and such other approved changes that occur during progress of Work, to ensure that an accurate record is provided for future maintenance and alterations.

7.2. White prints will be provided by the HRCE for use in preparing record drawings. Record changes in the Work on these prints in red ink.

7.3. Dimension location of concealed Work in reference to building walls, and elevation in reference to floor elevation. Indicate at which point dimension is taken to conceal Work. Dimension all terminations and offsets of runs of concealed work.

7.4. Record work constructed differently than shown on Contract Documents, changes in the work caused by site conditions, by Owner, Consultant, Contractor and Subcontractor

originated changes, and by site instructions, supplementary instructions, field orders, change orders, addenda, correspondence and directions of jurisdictional authorities.

7.5. Record location of mechanical and electrical services, piping, valves, conduits, pull boxes, junction boxes and similar work not clearly in view, and position of which is required for maintenance, alteration work and future additions. Do not conceal critical work until its location has been recorded.

7.6. Identify record drawings as a "Project Record Copy". Maintain in good condition, do not use for construction purposes and make available to Consultant at all times.

7.7. Submit record drawings at completion of Work. Final acceptance of the Work will be predicated on receipt and approval of record drawings.

8. Extra Stock

8.1. Supply extra stock at completion of Project as specified in other Sections of the Project Manual.

8.2. Deliver extra stock as directed by the Architect to location he designates.

8.3. Extra stock is specified to be supplied in the following Sections:

Section 09 30 13 Ceramic Tile
Section 09 51 13 Acoustical Ceiling Units
Section 09 65 19 Resilient Tile Flooring
Section 09 91 23 Painting
Refer to Mechanical & Electrical Divisions for Extra Stock requirements in those Trades.

9. Maintenance Manual & Operating Instructions

9.1. Submit three (3) copies of Maintenance Manual with application for completion certificate.

9.2. Include in Maintenance Manual one (1) copy of each final approved shop drawing issued for Project on which have been recorded changes made during fabrication and installation caused by unforeseen conditions.

9.3. Submit extended guarantees together in one (1) report binder.

9.4. The Manuals shall:

9.4.1. Consist of a hard-cover, black, vinyl-covered, loose-leaf, letter-size binder.

9.4.2. Have a title sheet, or sheets preceding data on which shall be recorded Project name, Project number, date, list of contents, and Contractor's and Subcontractors' names.

9.4.3. Be organized into applicable Sections of Work with each Section separated by hard paper dividers with plastic covered tabs marked by Section.

9.4.4. Contain only typed or printed information and notes, and neatly drafted drawings.

9.4.5. Contain maintenance and operating instructions on all building, and mechanical and electrical equipment.

9.4.6. Contain maintenance instructions as specified in various Sections.

9.4.7. Contain brochures and parts lists on all equipment.

9.4.8. Contain sources of supply for all proprietary products used in the Work.

9.4.9. Contain lists of supply sources for maintenance of all equipment in Project of which more detailed information is not included above.

9.4.10. Contain finished hardware schedule.

9.4.11. Contain charts, diagrams and reports specified in Mechanical & Electrical Divisions.

10. Extended Warranties

10.1. Submit the extended warranties listed in this Article and as specified in each applicable Section of this Project Manual.

10.2. Extended warranties shall commence on termination of the standard one-year warranty granted in this Contract.

10.3. Submit each extended warranty on a standard Form of Warranty, a sample of which is included in this Section.

10.4. Secure each extended Warranty by a Maintenance Bond in an amount indicated.

10.5. Submit extended warranties for:

Section 06 40 00 Architectural Woodwork – extended 4 years
Section 07 41 43 Aluminum Composite Panels – extended 10 years (panel finish)
Section 07 55 00 Modified Bitumen Roofing System & Flashing:

- 2 year CRCA materials and workmanship against leaks and blow off
- 10 year material warranty the membrane will perform as a roofing material
- 1 year CRCA warranty against defects of materials and workmanship for the sheet metal work.

Section 07 92 10 Joint Sealants – extended 5 years
Section 08 11 16 Aluminum Doors & Frames – extended 4 years
Section 08 14 10 Wood Doors – extended 4 years
Section 08 50 50 Aluminum Windows – extended 4 years
Section 08 62 11 Vinyl Windows – extended 5 years
Section 08 71 10 Door Hardware – various, refer to that Section
Section 09 30 13 Ceramic Tile – extended 4 years
Section 09 51 13 Acoustical Ceiling Units – extended 4 years
Section 09 65 19 Resilient Tile Flooring – extended 4 years
Section 10 11 13 Communication Boards – extended 24 years
Section 10 11 23 Tackboards – extended 9 years
Section 12 21 13 Horizontal Blinds – extended 5 years
Section 12 21 16 Rollers Shades – extended 5 years

Section 14 42 13 Platform Lift – extended 5 years
Refer to Mechanical & Electrical Divisions for extended Warranty requirements in those trades.

11. Inspection Laboratory Reports

11.1. Submit copies of inspection and test reports obtained by the Contractor and Subcontractors for their Work or for Jurisdictional Authorities, if requested by Consultant.

11.2. Submit reports in accordance with requirements specified in Section 01 41 00.

12. Documentation On Suppliers & Manufacturers

12.1. Provide information under headings identifying the following: Associated Technical Section, Manufacturer, Supplier, Contact Name, and Phone Numbers.

SAMPLE FORM OF WARRANTY FOLLOWS THIS PAGE

Sample Form for Warranty

Date .....

Client .....

Project .....

.....

Warranty .....
(title of work)

We hereby undertake to warrant all materials supplied and installed under our Contracts and include the providing of necessary materials and labour to cover the result of faulty materials or workmanship. Upon written notification from Client or the Architect that the above work is defective any repair or replacement work required shall be to the Architect's satisfaction at no cost to the Client. This Warranty shall not apply to defects caused by the work of others, maltreatment of materials, negligence or Acts of God. This Warranty shall remain in effect for the total period from the acceptance of the Work to (....date....), irrespective of the date of completion or the beneficial use by the Owner.

Signature .....

Authorized Signing Officer .....

Name of Firm .....

Address .....

END OF SECTION 01 33 00

SECTION 01 35 13 – APPENDIX A - SPECIAL PROJECT PROCEDURES

1. Introduction

1.1. School construction, renovation and maintenance projects are scheduled every year as a normal and necessary course of business by operations departments in each Nova Scotia Centre for Education. Building modifications, repairs and additions/demolitions to buildings may impact the school environment without appropriate controls. With increased controls based primarily on the CSA standards implementation, proper scheduling and clear communication on adequate controls can be put into place to eliminate/minimize the impact to all occupants.

1.2. Projects of this nature may generate varying levels of dusts, noises and odors. It is possible, unknown/unforeseeable environmental contaminants, such as spills, mould, fumes, lead or asbestos exposure maybe identified.

1.3. To successfully complete work within the school environment, it is necessary to plan and implement appropriate containment and control strategies. This document is developed to provide a minimum standard for contaminant controls for various types of projects in schools. These standards are in addition to and should complement all legislated protocols for working with regulated materials such as asbestos, lead paints, PCB's etc.

1.4. Executing a successful project will depend primarily on clear, concise communication. This may involve a number of parties (Project Manager, Operations staff, School Administration and Health & Safety staff and Joint Occupational Health & Safety Committee).

2. Communication Plan

2.1. The most critical element of any project management plan is effective communication between all stakeholders. Communication between the Operations project manager/supervisor, the contractor and school administrators before the start of a project is very important. This meeting is meant to explain the scope, schedule and risk assessment for the project. The meeting will also help establish clear expectations when managing planned and unplanned exposure risks associated with contaminant controls.

2.2. The communication plan shall include:

2.2.1. A description of potential contaminants, which may include but is not limited to:

2.2.1.1. Particulates (dirt, concrete/silica, steel, fiberglass, wood dust, ash, cellulose, etc.)

2.2.1.2. Moisture: external water infiltration, internal system leaks (domestic water, sanitary, storm, sprinkler)

2.2.1.3. Noise from equipment/tool operation,

2.2.1.4. Fumes/odors from equipment exhaust, boiler exhaust, septic waste, chemical/adhesives, etc.

2.2.1.5. Hazardous materials including, asbestos, PCB, mercury, lead, fuel oil, fungi/mould, etc.

2.2.1.6. Excessive heat/cold

2.2.2. A description of the control measure which may include but not be limited to:

2.2.2.1. Isolation within an enclosure (water, noise, hazardous materials)

2.2.2.2. Ventilation and filtration

2.2.2.3. Dehumidifiers/blowers (moisture)

2.2.2.4. Personal protective equipment

2.2.2.5. Schedule outside or inside school hours

2.2.2.6. Sound dampeners

2.2.2.7. Monitoring

2.2.2.8. Security

2.2.3. Other Hazards created by the work, including but not limited to fire safety and the need to alter fire safety plans.

2.3. For small routine work orders the communication plan may only involve one tradesperson and the school principal or designate. This communication is equally as important for management of contaminant controls.

3. Contaminant Control Management

3.1. Regardless of the contaminant or control measure used, the following procedures shall apply for every project:

3.1.1. Every project, including all routine work requests, shall be assessed, as per this document, by appropriate personnel for potential contaminant risk.

3.1.2. Clear lines of communication must be established between project personnel, site supervisor or project manager and the school administration.

3.1.3. Control strategies as per this document, shall be, communicated to workers as well as the site JOHSC and implemented prior to starting the work.

3.1.4. Where isolation is used as a control, all entry points must be clearly posted to describe the purpose of the enclosure and limitations of access.

3.1.5. During the execution of the project, the control measures must be regularly inspected and maintained before the start of each work shift, and throughout the shift as required.

3.1.6. A process for stop work and remediation orders must be established to ensure the project manager; site supervisor and school administrator have a means to cease project operations when a contaminant control breach may impact the school environment. Breached control measures must be reported immediately to HRCE project manager upon discovery. He/she will be responsible to communicate to the school principal or designate. Work shall be stopped immediately until the control measures are re-established.

3.1.7. Access to the controlled work site is only permitted by authorized personnel. The project supervisor or designate shall determine appropriate personal protective equipment (PPE) and necessary worker orientation.

4. Particulate Control

4.1. Exposure to minimal levels of dust is a normal condition in most outdoor and indoor environments and is typically controlled inside a building through building ventilation, filtration and routine housekeeping measures. However, as noted, construction projects generally create elevated dust levels in work areas, whether inside or outside of a building.

4.2. Operational Services Managers must ensure maintenance staff and contracted service providers implement dust control measures appropriate for the type and scope of work being performed. This will include assessing the type and amount of dust being created as well as the location of the work being conducted.

4.2.1. Interior Construction Projects:

4.2.2. Construction projects may be described as projects that may include window replacement, wall creation/demolition, etc.

4.3. As a minimum for these types of construction projects, all interior entry points into a construction zone must be effectively sealed. The barrier must prevent contaminants from the work area to be distributed to other areas of the school. Appropriate signage must be posted to indicate only authorized persons are permitted access.

4.4. Entrance design could range from a two flap plastic tarp door to a fully constructed sealed entry door with negative hepa-filtered ventilation on the construction side of the barrier.

4.5. Exterior Construction Projects:

4.5.1. Exterior work shall be performed so as not to affect the safety of building occupants. It will also provide controls to avoid impact to adjacent properties. Depending up on the results identified in the risk assessment, at a minimum consideration must be given to prevent dust from entering into the school environment. This may be controlled through isolation, dampening application, closing building AHU and window/door openings.

5. Noise Control

5.1. Hearing plays an essential role in communication, speech and language development and learning within a school environment. During construction the contractor is responsible for ensuring acceptable noise levels will be adhered to for the HRCE staff and students within the building. Noise related to a project may prove to be very distracting for staff and students. To minimize distractions and interruptions in student learning the following are important to consider:

5.1.1. Contractors are responsible to ensure appropriate noise control measures are taken

5.1.2. "No work" periods may need to be incorporated into construction schedules

5.1.3. Work causing a noise disruption may need to take place during unoccupied times and/or during pre-determined acceptable times of the day (i.e. before and after class times)

5.1.4. It may be necessary for the School Administrator to make a request to the HRCE Project Manager or the Contractor to exclude undertaking certain noisy activities during particular periods and/or activities.

6. Moisture Control

6.1. Moisture levels are to be controlled during construction and maintenance activities. Moisture levels above normal may impact the air in the room and/or building and may also penetrate building materials giving the potential to lead to mould growth.

6.2. Certain activities (i.e. tape and mud of drywall, painting, pressure washing, concrete cutting with water or other water based dust-suppression) introduce high amounts of moisture into the room environment and ventilation and or drying is required to control local moisture.

6.3. An enclosure properly set-up to contain other contaminants will similarly contain/control high levels of airborne moisture. A wet-vac should be available on-site for activities which have a risk of water spillage of more than 5 gallons at any instance.

6.4. Standing and or stagnate water must be avoided on construction sites, for a number of reasons, including, but not limited to; insects breed in these bodies of water, the water may give off odours, it is a nuisance to walk through, and it may be an ice hazard in cold weather.

6.5. It is important that all water leaks and flooding are reported immediately to the HRCE's project manager and building supervisor. Where works to existing "plumbing" is to occur the water lines (potable, heating, fire suppression) must be isolated and drained (de-energized/de-pressurized) following Lock Out - Tag Out procedure. Adequate supplies such as buckets and absorbents should be present when drains are not available to drain a line.

6.6. When an interruption to the water supply, potable or service, is to occur then the "owner's representative" and building supervisor should be notified 24 hours in advance. Bottled water provision may be required.

6.7. Materials used in the construction and or maintenance activities are to be stored in dry areas. The introduction of materials to the activities with moisture levels above the acceptable (XXX%)CNBC states for wood, on dry weight basis, a max of 19%, I can't find info on drywall but assume it is much lower range is prohibited as these materials are highly susceptible to colonization by mould spores.

7. Fumes

7.1. Fumes may be produced on a project site for a variety of reasons such as use of motorized equipment, off gassing of sealants, adhesives and finish products, cutting/torching processes, exposure of sanitary systems, process ignition gases such as propane and acetylene, proximity of project temporary washrooms, radon, etc.

7.2. The impact of fumes on occupants may range from discomfort to health risk, to life safety risk.

7.3. The project manager or supervisor must ensure that all potential fume sources are identified and remedial or control measures included in the scope of work by the contractor.

7.4. Monitoring equipment may be required to determine for example radon exposure or safety of confined space access.

8. Activity Assessment

8.1. Activities that may produce contaminants which require control may be considered as low, medium and high impact.

8.2. Low impact activities include routine maintenance and repairs that may create localized dust or odors or brief periods of noise which are not considered harmful to occupants but may be a nuisance which requires minimal control. These may include activities such as opening ceiling tiles or gyproc walls, replacing a plumbing fixture, paint touch ups, drilling through a wall, etc.

8.3. Medium impact activities include larger repair jobs or longer duration projects that will create more wide spread levels of contaminant which must be controlled to prevent exposure to building occupants. Boiler cleaning, ceiling replacement, long periods of hammer drilling, etc.

8.4. High impact activities include large demolition and construction projects, or jobs with exposure to contaminants that are a risk to health or life safety such as asbestos remediation, mould abatement, lead paint clean up, etc.

9. Hazard Assessment

9.1. A hazardous assessment is required to be completed for each job to ensure hazards are identified and corresponding controls are implemented. Depending upon the circumstances at the site it may be necessary to upgrade and/or add other precautions.

9.2. Determine the most appropriate hazard classification and apply the corresponding protocols. The attached hazard assessment identifies the minimum controls that must be in place during the corresponding activities. Depending on the specific circumstances at a site further controls may be required. When the hazards are deemed to be in the C or F category the form including specific controls must be submitted to the HRCE for review, prior to commencing work. The contractor may still be required to complete their own hazard assessment of the job/work.

10. Contaminant Controls Procedure for initiating work for all Contaminant Controls:

10.1. Contaminant Control I

10.1.1. The tradesperson or project manager for the HRCE will discuss the details, including the scope and any impacts of the job/project with the principal.

10.1.2. Ensure fire exiting requirements and life safety systems are addressed or adequate mitigating plans are implemented for the building, construction staff and building occupants.

10.1.3. Presence of lead paint or ACM's (Asbestos Containing Materials) must be determined prior to the start of any job. Specific protocols or Codes of Practice may apply.

10.1.4. Consideration will be given for work that is anticipated to generate significant noise, odours or VOC's (Volatile Organic Compounds) and this will be scheduled outside of school hours or during times when the noise will not disrupt occupant activities. This will require coordination with the Principal.

10.1.5. The work area shall be isolated where possible. This may be achieved at varying levels, by closing doors and opening outside windows for ventilation or by installing appropriate hoarding and negative pressure units to ensure contaminants are not circulated throughout the school causing further health and safety concerns.

10.1.6. Dust shall be minimized during the activity. When drilling, sanding or cutting is taking place, wetting the area may be necessary to reduce dust.

10.1.7. Good housekeeping practices shall be maintained at all times on the work site. Bag and remove dust and debris from the building as soon as possible.

10.1.8. Possible environmental impacts shall be managed and minimized. If work uncovers environmental contaminants or suspected contaminants such as oil spills (current or historic) or potentially friable asbestos materials (check the school asbestos audit) that may be disturbed, this information shall be brought to the attention of the HRCE's employee responsible for the project so that appropriate actions can be taken.

10.1.9. When the activity is completed the work area shall be inspected and cleaned. Dust and debris shall be removed from the area and all efforts will be made to return items to their pre-maintenance activity location.

10.1.10. The Principal shall be notified that the work is completed.

10.2. Contaminant Control II - All Contaminant Control I measures shall apply, as well as;

10.2.1. Cover furniture, bookshelves and teaching materials with plastic sheets.

10.2.2. Water misting while performing dust generating activities may be required.

10.2.3. Seal un-used doors. Seal wall penetrations, electrical outlets, or any other source of air leaks in the construction area.

10.2.4. Seal exhaust air vents in construction area and open the windows. If possible shut down air handling system in the area for duration of project.

10.2.5. A walk out mat at exterior of exit door to trap dust may be required.

10.3. Contaminant Control III - All Contaminant Control I and II measures shall apply, as well as;

10.3.1. Install an impermeable dust barrier from the true ceiling to the floor consisting of two layers of 6 mil fire retardant polyethylene or solid wall and sealed door. The wall shall remain in place until the job is finished and the clean-up is completed.

10.3.2. Seal all wall penetrations

10.3.3. Seal off all return and supply air handling ducts and close all windows.

10.3.4. Turn off the air handling system in the area of construction.

10.3.5. Maintain negative air pressure in the construction area using HEPA filter equipped exhaust ventilation. The pressure differential between the project area of contamination and the building's occupied areas shall be demonstrable by a means approved by the HRCE employee responsible for the project.

10.3.6. Ensure that the air is exhausted directly outside and away from intake vents.

10.3.7. Vacuum all horizontal surfaces including drop cloths with a hepa vacuum.

10.3.8. Remove drop clothes

10.3.9. Vacuum again all horizontal surfaces with HEPA Vacuum.

10.3.10. Restore ventilation.

10.3.11. Remove enclosure and equipment.

10.4. Control IV: (External Work)

10.4.1. External work may impact building interior or occupants.

10.4.2. To reduce the impact to building interior or occupants, it may be necessary to contain the work area from impacting building interior. This may include closing or opening windows, tarping ceilings to capture debris or water, temporary relocation of occupants or ventilation controls.

10.4.3. The job supervisor shall consider weather conditions and forecast to reduce the effect of any weather impacts to the building materials or building occupants.

10.4.4. It may be necessary to use protective tarps and ground cover sheets below equipment and work areas to contain building debris such as paint chips, materials, dust or oil from equipment.

10.4.5. When the job is completed and the tarps have been lifted, inspect the ground around the job for debris and clean as necessary.

Fire Protection

10.5. Type V: General Fire Protection

10.5.1. Ensure fire exiting requirements and life safety systems are addressed or adequate mitigating plans are implemented for the building, construction staff and building occupants. Staff must be aware of temporary modifications to fire safety plans.

10.5.2. MSDSs for all materials to be used must be reviewed and available on site.

10.5.3. Construction materials stored outside must be a minimum distance of ten feet from the building and be in a secured area.

10.5.4. Flammable or Combustible liquids must be stored as per Fire Code requirements. All flammable and combustible liquids or materials must be kept in a secure area at all times.

10.6. Control VI: Fire Protection (minor hot work) - All Contaminant Control V shall apply as well as;

10.6.1. Notify the Principal that a risk of fire has increased and the area in which the hot work will occur.

10.6.2. Refer and implement the HRCE's hot work permit process. At a minimum the following should be considered;

10.6.2.1. Sweep the work area and remove all unnecessary materials in the vicinity; particularly all combustible and flammable materials and liquids shall be removed from the area (35 feet).

10.6.2.2. Have an appropriate size fire extinguisher available.

10.6.2.3. Inspect the work location for areas (such as a hole in the wall) where hot material or sparks could fall and smolder and close them off so that any hot debris can only fall within your field of view.

10.6.2.4. If it is possible that the flame will go past the object being welded or soldered and excessively heat a flammable or combustible material then either protect that material with a non-flammable material or wet the material and keep it wetted during the use of heat or grinding.

10.6.2.5. Remain in the area while the joint and/or heated materials cool to room temperature (ambient) while checking for the smell or appearance of smoke in the area.

10.6.2.6. Stay in the area for at least Y2 hour and then re-inspect for any smell or appearance of smoke.

10.6.2.7. Ask another staff person to inspect the area for the smell or appearance of smoke. Record who you asked to do the final inspection.

10.6.3. Type VII: Fire Protection (hot work w fire watch) - All Contaminant Control V and VI shall apply as well as;

10.6.4. Notify the Principal that a risk of fire has increased and the area in which the hot work will occur. If any life safety system components (sprinkler, detectors, fire alarms) are not function, hot work should not proceed until these systems are functioning unless fire watch procedures for life systems are followed. See Activation of Fire Watch for Life Safety Systems checklist. Appendix…XX

10.6.5. Refer and implement the HRCE's hot work permit process. At a minimum the following should be considered;

10.6.5.1. Cover all floor openings with fire stop material. Seal duct work openings with metal covers or blankets and close all doors.

10.6.5.2. Ensure that there are no potentially explosive atmospheres in the area.

10.6.5.3. Hot work on vessels, pressure tanks or boilers, use only contractors who are qualified by nationally or internationally recognized boiler and pressure vessel code.

10.6.5.4. Notify the local fire department of the type of work and the work schedule.

10.6.5.5. Before hot work is started, designate one employee responsible to complete the fire watch: while work is in progress, during lunch breaks and other breaks and for one hour after all flames are extinguished for the day and monitor the area for an additional two hours. After three hours after the last flame has been extinguished, have a second employee do a final survey of the area for smells or evidence of smoldering or fire and record the inspection.

APPENDIX
Fire Watch Activation Checklist

1. Documentation (identify locations to be checked on an hourly basis, provide contact information for relevant HRCE staff and outside agencies} HRCE provided template to be used for documentation.
2. Procedure reviewed with Custodian or individual responsible for fire watch. Any high risk areas shall be identified to be highlighted on the documentation page and checked during the rounds.
3. Staff working in the building have been notified of the Fire Watch and that they are responsible to monitor areas for signs of fire or smoke and have been reminded of required actions to take according to the school fire safety plan.
4. Staff responsible for fire watch have been trained in how to use a fire extinguisher. (PASS)
5. Staff responsible for the fire watch have a means of communication (cell phone or walkie-talkies)
6. Staff responsible for the fire watch are aware of the procedure for initiating fire alarm and what systems are functioning. i.e. systems (sprinklers, alarm panel or if school has monitoring company or if calling 911 is required)
7. The School Insurance Program (SIP) Emergency Information Line has been notified 1-902-448-2840
8. All relevant information has been documented in the school's fire books. Including date, time and reason for fire watch.

Fire Watch De-Activation Checklist

1. Document the date, time and actions taken to remedy the deficiency requiring the fire watch.
2. School Insurance Program (SIP) has been notified
3. Copy of the Fire Watch documentation is kept in the fire book and the original is sent to the HRCE Project Representative.

END OF SECTION 01 35 13

SECTION 01 35 29 - OCCUPATIONAL HEALTH & SAFETY REQUIREMENTS

1. References

1.1. CSA S269.1-1975 Falsework for Construction Purposes.

2. CONSTRUCTION SAFETY MEASURES

2.1. Observe construction safety measures of:

2.1.1. National Building Code 2010, Part 8

2.1.2. National Fire Code of Canada

2.1.3. Provincial Government, including but not limited to the:

2.1.3.1. Occupational Health & Safety Act revised Statutes of Nova Scotia 1996, Chapter 7 and regulations.

2.1.3.2. Workers' Compensation Act

2.1.3.3. Fire Protection Act

2.1.3.4. Dangerous Goods Transportation Act

2.2. In case of conflict or discrepancy the more stringent requirement shall apply.

2.3. Ensure that employees working on this specific project have met training requirements as legislated by the Nova Scotia Occupational Health & Safety Act and its regulations.

2.4. Where reference is made to jurisdictional authorities, it shall mean all authorities who have within their constituted powers the right to enforce the laws of the place of the building.

3. Equipment & Tools

3.1. Each user of equipment or tools shall be responsible to examine for sufficiency before use. Make equipment and tools safe if necessary.

4. WHMIS

4.1. Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets.

4.2. Have a copy of WHMIS data sheets available at the workplace on delivery of materials.

5. Hazardous Material

5.1. Should material resembling hazardous materials other than those identified with the Contract Documents, including but not limited to spray or trowel applied asbestos, be encountered in course of work; stop work immediately. Do not proceed until written instructions have been received from Consultant.

5.2. Where work entails use, storage, or disposal of toxic or hazardous materials, chemicals and or explosives, or otherwise creates a hazard to life, safety, health, or the environment; work shall be in accordance with the Jurisdictional Authority.

6. Site Cleaning

6.1. Except where special permission is obtained, maintain clear access on public sidewalks and roads.

6.2. Maintain walks and roads clear of construction materials and debris, including excavated material. Clean walks and roads as frequently as required to ensure that they are cleared of materials, debris and excavated material.

7. Fire Safety Requirements

7.1. Enforce fire protection methods, good housekeeping and adherence to local and Underwriter's fire regulations including, but not limited to, Fire Protection Act and the Provincial Building Code Act. Provide UL approved fire extinguishers, and other fire- fighting services and equipment, except where more explicit requirements are specified as the responsibility of individual Sections.

7.2. Smoking is not permitted on school property.

7.3. Advise Fire Chief in the area of Work of any work that would impede fire apparatus response, including but not limited to violation of minimum overhead clearance prescribed by the fire chief, erecting of barricades and digging of trenches and in areas where work is being done.

7.4. Ensure nothing subverts the integrity of fire protection provided for the building structure.

8. Reporting Fires

8.1. Know the location of the nearest fire alarm box and telephone, including the emergency phone number.

8.2. Report immediately all fire incidents to the fire department as follows:

8.2.1. Activate nearest fire alarm box, or

8.2.2. Telephone local fire department

8.2.3. Where fire alarm box is exterior to building, the person activating the fire alarm box shall remain at the box to direct Fire Department to scene of the fire.

8.2.4. When reporting a fire by telephone, give location of fire, name or number of building and be prepared to verify the location.

9. Safety Document Submission

9.1. Ensure Safety Document Submission applies to Work of this specific project and site.

9.2. Submit two (2) copies of Project Safety Document at the Pre-Construction Meeting. Do not commence Work nor deliver material on-site prior to submission.

9.3. Include in Safety Document submission specific information detailing the methods and procedures to be implemented ensuring adherence to the acts, regulations, codes and policies specified in this section and to:

9.3.1. Ensure the Health & Safety of persons at or near the Work; including, but not limited to, the Public.

9.3.2. Ensure the measures and procedures of the regulatory agencies specified are carried out.

9.3.3. Ensure every employee, self-employed person and employer performing Work under this contract complies with the regulatory agencies specified.

9.3.4. Where changes to the methods and procedures in the execution of work change submitted safety methods and procedures, modify submitted Safety Documentation and submit modifications, in writing to the Consultant and Owner prior to implementation.

10. Safety Document Organization

10.1. Organize information in the form of an instructional manual as follows:

10.1.1. Place in binders of commercial quality, accommodating 8½" x 11" paper size.

10.1.2. Cover: Identify binder with typed or printed title ‘Project Safety Document’ and list the title of project.

10.1.3. Provide tabbed fly leaf for each separate heading, with typed heading on tab.

10.1.4. Where drawings are within the safety document, provide with reinforced punched binder tab. Bind in with text; fold in larger drawings to size of text pages.

10.1.5. Arrange content under Safety Document headings specified herein.

11. Safety Document Headings

11.1. Employee Safety Training

11.1.1. Place, under this heading, a statement indicating employees working on this specific project have met specified training requirements, if required.

11.2. Company Safety Policy

11.2.1. Place, under this heading, information pertaining to the company's policy and commitment to Occupational Health & Safety, including the responsibilities of management, supervisors and workers.

11.3. Company Safety Rules in General Terms

11.3.1. Place, under this heading, information of a general, global nature, applying to every work environment where the company has staff and pertaining to rules directing compliance to policy. For example state company safety rules with respect to use of hard hats, safety glasses, safety foot ware, CSA approval on such items, and use of alcohol or non-prescription drugs.

11.4. Hazard Assessment

11.4.1. Place, under this heading, information identifying possible hazards specific to this project and identify safe methods and procedures for the execution of work to ensure safety in the work place.

11.4.2. Arrange contents of this heading by technical section number of the project manual.

11.5. Emergency Action Plan

11.5.1. Place, under this heading, information detailing action to be taken in the event of various emergencies.

11.5.2. Arrange content under the following sub-headings:

11.5.2.1. First Aid

11.5.2.1.1. Include information concerning establishment of a First Aid Station, related supplies, staff awareness of location and staff training in First Aid Care of Casualties.

11.5.2.2. Contact of Emergency Support Groups:

11.5.2.2.1. Include relative information including phone location for emergency use, the emergency telephone numbers and their location for the various organizations which must be contacted in case of an emergency, and staff training in procedures.

Cessation of Work:

11.5.2.2.2. Include relative information how work cessation during emergencies is handled and communicated to persons present on site.

11.6. Joint Occupational Health & Safety Committee/Representative:

11.6.1. Place under this heading information detailing membership and terms of reference.

OCCUPATIONAL HEALTH & SAFETY SUMMARY FOLLOWS THIS PAGE

Occupational Health & Safety Summary (to be submitted with each monthly Progress estimate)

The following information summarizes Occupational Health & Safety activities on the project conducted by the Contractor during the month and includes activities of Subcontractors. Activities include all matters prescribed by the Occupational Health & Safety Act and Regulations and the submitted Occupational Health & Safety Document for the Project.

Indicate the applicable # number below:

#_____new contractors on site,
#_____orientations
#_____toolbox talks
#_____safety meetings
#_____Joint Occupational Health and Safety Committee meetings
#_____hazard assessments
#_____formal written inspections
#_____warnings issued to employees or subcontractors
#_____other, explain_____

List new Contractors on Site below:

_____
_____
_____
_____
_____
_____

The Contractor certifies that the above noted activity list is accurate and that during the month:

Check

☐ All activities on the Project were found to be in compliance with the Occupational Health & Safety Act and Regulations

☐ Some activities on the Project were not found to be in compliance with the Occupational Health & Safety Act and Regulations but were adequately corrected in an appropriate time frame. Explain _____
_____

Prepared by

_____
(Contractor Project Manager)

Certified by

_____
(Contractor Senior Management)

END OF SECTION 01 35 29

SECTION 01 37 00 - SCHEDULE OF VALUES

1. Related Documents

1.1. General Conditions of Contract.

2. General

2.1. Submit to the Architect, and Owner, Schedule of Values, within twenty (20) days after signing Agreement.

2.2. Use Schedule of Values as basis for Contractor's Progress Claim.

3. Form Of Submittal

3.1. Form included at end of this Section.

3.2. **The form included below is a suggested guide but might not be appropriate for all projects. Contractors may submit their own template to the Owner for review/approval.**

4. Preparing Schedule Of Values

4.1. Itemize separate line item cost for work required.

4.2. Round off figures to nearest ten (10) dollars.

4.3. The sum of all values listed in the schedule shall equal the total contract sum.

5. Review And Submittal

5.1. After review by Architect and Owner, revise and resubmit Schedule as directed.

5.2. The form shall be completed and supported by such evidence as to its correctness as the Architect may reasonably direct.

Schedule of Values

Project Name ***#3980-Heating Plant Upgrade – Shannon Park Elementary***

Contract Number .....

Architect .....

Contractor .....

Date .....

Item	Description	Item Amount

1. **General Requirements**
   - **1.1.** Mobilization & Initial Expenses
   - **1.2.** Site Overhead & Fee
   - **1.3.** Bonds
   - **1.4.** Certificates
   - **1.5.** Testing
   - **1.6.** Construction Facilities & Temporary Controls
   - **1.7.** Other (Specify)

Total (Items 1.1 to 1.7) _____

2. **Excavation, Backfill, Sitework**

Total (Item 2.) _____

3. **Concrete**

Total (Item 3.) _____

4. **Masonry**

Total (Item 4.) _____

5. **Metals**

Total (Item 5.) _____

6. **Wood & Plastics**
   - **6.1.** Rough Carpentry
   - **6.2.** Finish Carpentry
   - **6.3.** Architectural Woodwork

Total (Items 6.1 to 6.3) _____

7. **Thermal & Moisture Protection**
   - **7.1.** Insulation
   - **7.2.** Air Vapour Barrier
   - **7.3.** Aluminum Composite Panels
   - **7.4.** Preformed Metal Siding
   - **7.5.** Fire Stopping
   - **7.6.** Roofing

Total (Item 7.1 to 7.6) _____

8. Doors And Windows

8.1. Metal Doors & Frames
8.2. Wood Doors
8.3. Hardware
8.4. Windows

Total (Items 8.1 to 8.4) _____

9. Finishes

9.1. Acoustic Ceiling Systems
9.2. Gypsum Board and Support Systems
9.3. Hard Tile
9.4. Resilient Tile
9.5. Painting

Total (Items 9.1 to 9.5) _____

10. Specialties

10.1. Tackboards, Communication Boards
10.2. Toilet & Bath Accessories
10.3. Manufactured Specialties
10.4. Food Service Equipment

Total (Items 10.1 to 10.4) _____

11. Mechanical

11.1. As per Sections — Total (Item 11.) _____

12. Electrical

12.1. As per Sections — Total (Item 12.) _____

TOTAL (Items 1 - 12) _____

END OF SECTION 01 37 00

SECTION 01 41 00 - REGULATORY AGENCIES

1. Jurisdictional Authorities

1.1. Where reference is made to jurisdictional authorities, it shall mean all authorities who have within their constituted powers the right to enforce the laws of the place of building.

2. Definitions

2.1. The "Constructor" named in the Construction Safety Act, Chapter 52, Revised Statutes of Nova Scotia, as amended by 1972, Chapter 25; and Construction Safety Regulations, pursuant to Chapter 52 R.S.N.S., including any amendments, shall mean the "Contractor" for the Work performed under this Specification.

3. Fire Prevention, Safety & Protection

3.1. General Construction Safety Measures:

3.1.1. Observe safety measures of the

3.1.1.1. National Building Code 2010, Part 8.

3.1.1.2. National Fire Code of Canada.

3.1.1.3. Provincial Government, including but not limited to the Occupational Health & Safety Act Revised Statutes of Nova Scotia 1996, Chapter 320, and the Construction Safety & Industrial Safety Regulations made pursuant to the Occupational Health and Safety Act, 1996.

3.1.1.4. Workers'/Workmen's Compensation Board.

3.1.2. In case of conflict or discrepancy the more stringent requirement shall apply.

3.1.3. Maintain clear emergency exit paths for personnel.

3.2. Except where special permission is obtained, maintain clear access on public sidewalks and roads.

3.3. Maintain walks and roads clear of construction materials and debris, including excavated materials. Clean walks and roads as frequently as required to ensure that they are cleared of materials, debris and excavated materials.

3.4. WHMIS:

3.4.1. Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada and Health & Welfare Canada.

3.4.2. Have a copy of WHMIS data sheets available at the workplace on delivery of materials.

Blockage of Roadways

3.5. Advise Fire Chief of any work that would impede fire apparatus response. This includes violation of minimum overhead clearance, as prescribed by fire chief, erecting of barricades and the digging of trenches.

4. Smoking Precautions

4.1. Observe, at all times, smoking regulations.

5. Rubbish And Waste Materials

5.1. Rubbish and waste materials are to be kept to a minimum.

5.2. The burning of rubbish is prohibited.

6. Flammable And Combustible Liquids

6.1. The handling, storage and use of flammable and combustible liquids are to be governed by the current National Fire Code of Canada.

6.2. Flammable and combustible liquids such as gasoline, kerosene and naphtha will be kept for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes, requires the permission of the Fire Chief.

6.3. Transfer of flammable and combustible liquids is prohibited within buildings or jetties.

6.4. Transfer of flammable and combustible liquids will not be carried out in the vicinity of open flames or any type of heat-producing devices.

6.5. Flammable liquids having a flash point below 38°C such as naphtha or gasoline will not be used as solvents or cleaning agents.

6.6. Flammable and combustible waste liquids, for disposal, will be stored in approved containers located in a safe ventilated area. Quantities are to be kept to a minimum and the Fire Department is to be notified when disposal is required.

7. Hazardous Substances

7.1. Work entailing the use of toxic or hazardous materials, chemicals and/or explosives, otherwise creates a hazard to life, safety or health, will be in accordance with the National Fire Code of Canada.

7.2. Where flammable liquids, such as lacquers or urethanes are to be used, proper ventilation will be assured and all sources of ignition are to be eliminated. The Fire Chief is to be informed prior to and at the cessation of such work.

8. Questions and/or Clarification

8.1. Direct any questions or clarification on Fire Safety in addition to above requirements to Fire Chief.

9. Fire Inspection

9.1. Site inspections by Fire Chief will be coordinated through HRCE Project Manager.

9.2. Allow Fire Chief unrestricted access to the work site.

9.3. Co-operate with the Fire Chief during routine fire safety inspection of the Work site.

9.4. Immediately remedy all unsafe fire situations observed by the Fire Chief.

10. Reference Standards

10.1. Where edition date is not specified, consider that references to manufacturer's and, published codes, standards and specifications are made to the latest edition, (revision) approved by the issuing organization, current at the date of this Specification.

10.2. Reference standards and specifications are quoted in this Specification to establish minimum standards. Work which in quality exceeds these minimum standards shall be considered to conform.

10.3. Should the Contract Documents conflict with specified reference standards or specifications the General Conditions of the Contract shall govern.

10.4. Where reference is made to manufacturer's directions, instructions or specifications they shall include full information on storing, handling, preparing, mixing, installing, erecting, applying, or other matters concerning the materials pertinent to their use and their relationship to materials with which they are incorporated.

10.5. Have a copy of each code, standard and specification, and manufacturer's directions, instructions and specifications, to which reference is made in this Specification, always available at construction site.

10.6. Standards, specifications, associations, and regulatory bodies are generally referred to throughout the specifications by their abbreviated designations:

AA	The Aluminum Association
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
ARI	Air Conditioning & Refrigeration Institute
ASTM	American Society for Testing & Materials
CCA	Canadian Construction Association
CGSB	Canadian General Standards Board
CSA	Canadian Standards Association
NSDTIR	Department of Transportation & Infrastructure Renewal, Province of Nova Scotia
IAO	Insurers Advisory Organization
NBC	National Building Code
NFPA	National Fire Protection Association
CANS	Construction Association of Nova Scotia
ULC	Underwriters Laboratories of Canada
WHMIS	Workplace Hazardous Materials Information System

END OF SECTION 01 41 00

SECTION 01 45 00 - QUALITY CONTROL

1. Section Includes

1.1. Inspection and testing, administrative and enforcement requirements

1.2. Tests and mix designs.

1.3. Mock-ups.

1.4. Mill tests.

1.5. Equipment and system adjust and balance.

1.6. Verification by affidavits and certificates that specified products meet requirements of reference standards: In applicable Sections of the Specification.

1.7. Testing, balancing and adjusting of equipment: In applicable Mechanical and Electrical Sections of the Specification.

1.8. Cutting & Patching: Section 01 11 41.

2. Related Sections

2.1. Section 01 33 00 Submittal Procedures: Submission of samples to confirm product quality.

2.2. Section 01 61 00 Material & Equipment: Material and workmanship quality – reference standards.

2.3. Section 01 77 00 Contract Closeout.

3. REVIEW OF WORK

3.1. The Owner shall have access to the Work. If part of the Work is in preparation at locations other than the Place of the Work, access shall be given to such work whenever it is in progress.

3.2. Give timely notice to the Owner's Representative, requesting review of the Work as indicated in the Contract Documents.

3.3. If the Contractor covers or permits to be covered Work that has been designated for review by the Owner before such is made, uncover such Work, have the review satisfactorily completed and make good such Work at no extra cost to Owner.

4. Inspection, Special Tests, Approvals

4.1. Engage the services of appropriate inspection testing agencies ensuring the Work meets codes, acts and regulations, and lows in force at the place of Work. Include such costs in the Contract Price.

4.2. Give timely notice requesting inspection to those required to provide inspections, special tests, or approvals, where Work is designated, by the Owner's instructions or the law of the place of Work, for special tests.

4.3. If the Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have the inspections or tests satisfactorily completed and make good such Work at no extra cost to the Owner.

4.4. The Owner may order any part of the Work to be examined if the Work is suspected to be not in accordance with the Contract Documents. If, upon examination such Work is found not in accordance with the Contract Documents, correct such Work and pay the cost of examination and correction. If such Work is found in accordance with the Contractor Documents, the Owner shall pay the cost of examination and replacement.

5. Independent Inspection Agencies

5.1. Independent Inspection/Testing Agencies may be engaged by the Owner for the purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Owner.

5.2. Provide access to the Work, and equipment required for executing inspection and testing by the appointed agencies.

5.3. Employment of inspection/testing agencies does not relax the Contractor's responsibility to perform Work, or carry out his own inspections and testing in accordance with the Contract Documents.

5.4. If defects are revealed during inspection and/or testing, the appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Owner at no cost to the Owner. Pay costs for retesting and reinspection.

6. Access To Work

6.1. Allow inspection/testing agencies access to the Work, off site manufacturing and fabrication plants.

6.2. Co-operate to provide reasonable facilities for such access.

7. Procedures

7.1. Notify the appropriate agency and Owner in advance of the requirement for tests, in order that attendance arrangements can be made.

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

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

8. Rejected Work

8.1. Remove defective Work, whether the result of poor workmanship, use of defective products or damage and whether incorporated in the Work or not, which has been rejected, including (but not limited to) defective Work rejected by the Owner as failing to conform to the Contract Documents. Replace or re-execute in accordance with the Contract Documents.

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

8.3. If in the opinion of the Owner, it is not expedient to correct defective Work or Work not performed in accordance with the Contract Documents, the Owner may deduct from the Contract Price the difference in value between the Work performed and that called for by the Contract Documents, the amount of which shall be determined by the Owner.

9. Reports

9.1. Submit four (4) copies of inspection and test reports to the Owner.

9.2. Provide copies to Contractor's Consultant and Subcontractor of Work being inspected or tested.

10. Tests and Mix Designs

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

10.2. The cost of tests and mix designs beyond those called for in the Contract Documents or beyond those required by law of the Place of Work shall be appraised by the Owner and may be authorized as recoverable.

11. Mock-Up

11.1. Prepare mock-up for Work for each finish in the Work and other work specifically requested in the specifications. Include for Work of all Sections required to provide mock-ups.

11.2. Construct in all locations as specified in specific Section.

11.3. Prepare mock-up for Owner's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in the Work.

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

11.5. If requested the Owner will assist in preparing a schedule fixing the dates for preparation.

11.6. Mock-ups may remain as part of the Work, unless specified otherwise in the Contract Documents.

12. Mill Tests

12.1. Submit mill test certificates as may be requested.

13. Equipment And Systems

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

13.2. Refer to Contract Documents for definitive requirements.

END OF SECTION 01 45 00

SECTION 01 52 00 – CONSTRUCTION & TEMPORARY FACILITIES

1. General

1.1. Include in the Work construction and temporary facilities required as construction aids or by jurisdictional authorities or as otherwise specified. Install to meet needs of construction as Work progresses. Maintain construction and temporary facilities during use, relocate them as required by the Work, remove them at completion of need and make good adjacent Work and property affected by their installation.

1.2. Include in the Work construction and temporary facilities to provide for construction safety such as: fences, barricades, bracing, supports, storage, sanitation and first aid facilities, fire protection, stand pipes, electrical supply, construction equipment with its supports and guards, stairs, ramps, platforms, runways, ladders, scaffolds, guardrails, temporary flooring, rubbish chutes, and walkway, morality and guard lights, and as otherwise required of the Constructor by the Construction Safety Act, of the Province of Nova Scotia, as well as all other applicable regulations or jurisdictional authorities.

1.3. Construct temporary Work of new materials unless use of second-hand materials is approved.

1.4. Ensure that structural, mechanical, and electrical characteristics of temporary facilities are suitable and adequate for use intended. Be responsible that no harm is caused to persons and property by failure of temporary facilities because of placing, location, stability, protection, structural sufficiency, removal, or any other cause.

1.5. Locate temporary facilities as directed and coordinated with School Administration and HRCE.

1.6. Relocate construction and temporary facilities as required by the Progress of the Work, and remove at completion of Work.

1.7. Do not permit construction personnel to use new washroom and toilet facilities.

1.8. Interior work zones to be complete with temporary negative air ventilation units to be functioning at all times to control dust migration to occupied areas.

1.9. Refer also to HRCE Policies & Guidelines contained in Appendix A of Section 01 35 13.

2. Services

2.1. Temporary Electric Power:

2.1.1. The Contractor will provide a source of electric power for all construction purposes.

2.1.2. Coordinate with the Building Operator locations of power sources and arrange to connect under his direction.

2.1.3. Install electric service distribution conductors and necessary components. Determine anticipated demand which will be placed on service during normal peak

periods and obtain approval on this basis before making installation. Supply power of characteristics required by the Work. Install a power centre for miscellaneous tools and equipment for each major building floor area with distribution box, a minimum of four 20 amp grounded outlets, and circuit breaker protection for each outlet. Make connections available to any part of the Work within distance of a 100'-0" extension.

2.2. Temporary Lighting:

2.2.1. Install lighting for

2.2.1.1. emergency evacuation, safety and security throughout the Project at intensity levels required by jurisdictional authorities.

2.2.1.2. performance of Work throughout Work areas as required, evenly distributed, and at intensities to ensure that proper installations and applications are achieved.

2.2.1.3. performance of finishing Work in areas as required, evenly distributed and of an intensity of at least 15 foot candles.

2.2.2. Permanent fluorescent lighting may be used during construction, provided that fixtures, lamps and lenses are completely cleaned. Incandescent sources may be used during construction to the extent of 20% of the total. Electrical Division Contractor to provide 20% spare lamps to the Owner for replacement purposes.

2.3. Temporary Sanitary Facilities:

2.3.1. Provide sanitary facilities for persons on the Work site. Facilities in areas of the building are only to be used under extraordinary circumstances and with prior approval.

2.4. Maintain fire protection as required by jurisdictional authorities. The Contractor is responsible for de-activating and re-activating Fire Alarm zones as required by the Work of the Contract and to maintain protection in the existing building.

3. Construction Aids

3.1. Hoists & Cranes:

3.1.1. Select, operate and maintain hoisting equipment and cranes as may be required. Operate such equipment only by qualified hoist or crane operators. Make hoist available for Work of each Section.

3.2. Building Enclosure:

3.2.1. Include in Work temporary enclosure for building as required to protect it, in its entirety or in its parts, against the elements, to maintain environmental conditions required for Work. Design enclosures to withstand wind pressures required for the building by jurisdictional authorities. Erect enclosures to allow complete accessibility for installation of materials during the time enclosures remain in place.

3.3. Scaffolding:

3.3.1. Each user of scaffolding shall be responsible for its examination and testing for sufficiency before using it. He shall make it secure if necessary, or shall notify the Contractor in writing that he will not commence work until it is made secure; otherwise he will be held responsible for accidents due to its insufficiency.

4. Barriers

4.1. Install barricades for traffic control, and to prevent damaging traffic over exterior and interior finished areas, as well as safety barricades and otherwise, as may be required.

4.2. Construct hoardings and walkways as required by HRCE or jurisdictional authorities.

5. Protection

5.1. Protect roofs and podiums by substantial temporary construction to ensure that no damage occurs. Provide protection by materials of sufficient thickness to prevent all damage to structure and finish, and to waterproofing qualities of membranes, whenever each of these individual components are exposed. Damage shall include harm resulting from all construction work, such as falling objects, wheel and foot traffic, failure to remove debris, operation of machinery and equipment, and scaffolding and hoisting operations. Positively secure protection to prevent displacement from any cause.

5.2. Box with wood or otherwise protect from damage, by continuing construction, finished sills, jambs, corners, and the like.

END OF SECTION 01 52 00

SECTION 01 61 00 - MATERIAL & EQUIPMENT

1. General

1.1. Products refer to materials, manufactured components and assemblies, fixtures and equipment incorporated in the Work.

1.2. Use only products of Canadian manufacture unless such products are not manufactured in Canada, are specified otherwise, or are not competitive.

1.3. Products for use in the Project and on which the Tender was based shall be in production at that time, with a precise model and shop drawings available for viewing.

1.4. Where equivalent products are specified, or where alternatives are proposed under "substitution of products", these products claimed by the Contractor as equivalent shall be comparable in construction, type, function, quality, performance, and, where applicable, in appearance, as approved. Where specified equivalents are used in the tendered bulk sum price for the Work, they shall be subject to final approval.

1.5. Incorporate products in the Work in strict accordance with manufacturers' directions unless specified otherwise.

1.6. Products delivered to the Project site for incorporation in the Work shall be considered the property of the Owner. Maintain protection and security of products stored on the site after payment has been made for them.

1.7. Do not install permanently incorporated labels, trademarks and nameplates, in visible locations unless required for operating instructions or by jurisdictional authorities.

2. Specified Products

2.1. Products specified by manufacturer's name, brand name or catalogue reference shall be the basis of the bid and shall be supplied for the Work without exception in any detail, subject to allowable substitutions as specified.

2.2. Where several proprietary products are specified, any one of the several will be acceptable.

2.3. For products specified by reference standards, the onus shall be on the supplier to establish that such products meet reference standard requirements. The Architect may require affidavits from the supplier, as specified in Section 01 33 00, or inspection and testing at the expense of the supplier, or both, to prove compliance. Products exceeding minimum requirements established by reference standards will be accepted for the Work if such products are compatible with and harmless to Work with which they are incorporated.

3. Substitution Of Products During Progress Of Work

3.1. Products substituted for those specified or approved, or both, shall be permitted only if the listed product cannot be delivered to maintain construction schedule and if the delay is caused by conditions beyond the Contractor's control.

3.2. Obtain approval for substitutions. Application for approval of substitutions shall be made only by Contractor. Process proposals for substituted Work in accordance with procedures established for changes in the Work.

3.3. Submit, with request for substitution, documentary evidence that substituted products are equal to, or superior to, approved products, and a comparison of price and delivery factors for both specified or approved products, and proposed substitute.

3.4. Ensure that substituted products can be both physically and dimensionally incorporated in the Work with no loss of intended function, performance, space or construction time, and that spare parts and service are readily available. The Contractor shall be responsible for additional installation costs, including architectural and engineering fees, required by incorporation of substituted products, and for adaptations made otherwise necessary to ensure that above requirements are satisfied.

4. Product Handling

4.1. Manufacture, pack, ship, deliver and store products so that no damage occurs to structural qualities and finish appearance, nor in any other way detrimental to their function or appearance, or both.

4.2. Ensure that products, while transported, stored or installed, are not exposed to an environment which would increase their moisture content beyond the maximum specified.

4.3. Schedule early delivery of products to enable Work to be executed without delay. Before delivery, arrange for receiving at site.

4.4. Deliver package products, and store until use, in original unopened wrapping or containers, with manufacturer's seals and labels intact.

4.5. Label packaged products to describe contents, quantity and other information as specified.

4.6. Product handling requirements may be repeated and additional requirements specified, in other Sections.

5. Storage & Protection

5.1. Coordinate material delivery to ensure that areas within or on building are available to receive them.

5.2. Store manufactured products in accordance with manufacturer's instructions, when such instructions are attached to products or submitted by him.

5.3. Store finished products and woodwork under cover at all times.

5.4. Store and handle flammable liquids and other hazardous materials in approved safety containers and as otherwise prescribed by safety authorities. Store no flammable liquids or other hazardous materials in bulk within the Project.

5.5. Storage and special protection requirements may be repeated, and additional requirements specified, in other Sections.

6. Defective Products & Work

6.1. Products and Work found defective; not in accordance with the Specifications; or defaced or injured through negligence of the Contractor, his employees or subcontractors, or by fire, weather or any other cause will be rejected for incorporation in the Work.

6.2. Remove rejected products and Work from the premises immediately.

6.3. Replace rejected products and Work with no delay after rejection. Provide replacement products and execute replacement Work precisely as required by the Specification for the defective Work replaced. Previous inspection and payment shall not relieve the Contractor from the obligation of providing sound and satisfactory Work in compliance with this Project Manual.

7. Workers, Suppliers & Subcontractors

7.1. Assign Work only to workers, suppliers, and Subcontractors who have complete knowledge, not only of the conditions of this Project Manual, but of jurisdictional requirements, and reference standards and specifications.

7.2. Give preference to use of local workers, suppliers, and Subcontractors wherever possible.

8. Workmanship

8.1. Unless otherwise specified in a more detailed manner, workmanship shall be of the highest quality recognized by trade executing the Work in accordance with standard practices, by the best methods recommended by the manufacturer of the Product, and as approved by the Architect.

END OF SECTION 01 61 00

SECTION 01 77 00 – CONTRACT CLOSEOUT

1. Section Includes

1.1. Final cleaning.

1.2. Spare parts and maintenance materials.

1.3. Take over procedures.

2. Related Sections

2.1. Individual Specifications Sections: Specific requirements for operation and maintenance data.

3. Final Cleaning

3.1. Refer to the General Conditions of Contract.

3.2. Before final inspection, replace glass and mirrors broken, damaged and etched during construction, or which are otherwise defective.

3.3. In addition to requirements for cleaning-up specified in General Conditions of the Contract, include in Work final cleaning by skilled cleaning specialists on completion of construction.

3.4. Remove temporary protections and make good defects before commencement of final cleaning.

3.5. Remove waste products and debris other than that caused by the Owner, other contractors or their employees, and leave the Work clean and suitable for occupancy by Owner.

3.6. Remove surplus products, tools, construction machinery and equipment. Remove waste products and debris other than that caused by the Owner or other Contractors.

3.7. Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

3.8. Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors and ceilings.

3.9. Vacuum clean and dust building interiors, behind grilles, louvres and screens as affected by Work.

3.10. Wax, seal, shampoo, buff or prepare floor finishes, as recommended by the manufacturer. Use products compatible with products used by building maintenance staff.

3.11. Broom clean and wash all horizontal and vertical surfaces as affected by Work.

3.12. Clean up and make good exterior grades, lawns, planting and surfaces after removal of temporary access and facilities.

3.13. Removing of visible labels left on materials, components, and equipment.

3.14. Maintain cleaning until Owner has taken possession of building or portions thereof.

4. Spare Parts And Maintenance Materials

4.1. Spare parts and maintenance materials provided shall be new, not damaged or defective, and of the same quality and manufacture as Products provided in the Work. If requested, furnish evidence as to type, source and quality of Products provided.

4.2. Defective Products will be rejected, regardless of previous inspections. Replace products at own expense.

4.3. Store spare parts and maintenance materials in a manner to prevent damage, or deterioration.

4.4. Provide spare parts, special tools, maintenance and extra materials in quantities specified in individual specification Sections.

4.5. Provide items of same manufacture and quality as items in the Work.

5. Demonstration Of Systems & Equipment

5.1. Give a complete demonstration of all systems and equipment in the presence of the Consultant at the following times:

5.2. When each is 100% completed at the request of the Contractor.

5.3. At time of inspection to validate final completion.

5.4. At final completion for the benefit of the maintenance staff for the Project.

5.5. Responsible personnel representing the Subcontractor responsible for the Work being demonstrated shall be present at each demonstration.

6. Submittals

6.1. Submit with application for substantial performance certificate.

6.1.1. Certificate of substantial completion inspection report from electrical utility or inspection.

6.1.2. Certificate of verification of fire alarm system.

6.1.3. Certificate from the Fire Marshal's Office and I.A.O. of final inspection of sprinkler system.

6.1.4. Air balance reports.

6.1.5. Other reports required or specified.

6.1.6. Maintenance Manuals and Operating Instructions.

6.2. Submit with application for release of final payment:

6.2.1. Final project record drawings.

6.2.2. Extra stock.

6.2.3. Performance bonds which shall remain in effect for one (1) year after take-over date.

6.2.4. Completed Liability Insurance Policy extended for one (1) year from take-over date.

6.2.5. Written guarantee covering all workmanship and materials used in the Work.
6.2.6. Maintenance bonds as specified.
6.2.7. Extended Warranties as specified
6.2.8. Certificate from Workers' Compensation Board.
6.2.9. Certificate from Health Services Tax Division.

7. Final Inspection Procedures

7.1. Schedule, make arrangements for and administer final inspections and close out in the following stages.

7.2. Contractor's Inspection:

7.2.1. Determination that Project meets requirements for substantial performance and inspection is the responsibility of the Contractor.

7.2.2. The Contractor and all Subcontractors shall conduct an inspection of the work, identify deficiencies and defects; repair as required. Notify the Consultant in writing of satisfactory completion of the contractor's Inspection and that corrections have been made. Request a Consultant's Substantial Performance Inspection.

7.3. Consultant's Inspection: Consultants and the Contractor will perform an inspection of the Work to identify obvious defects or deficiencies. The contractor shall correct Work accordingly.

7.4. Substantial Performance Inspection:

7.4.1. When the items noted above are complete, request a substantial performance inspection of the Work by the Consultant, and the Contractor. If Work is deemed incomplete by the Consultant, complete the outstanding items and request a re-inspection.

7.4.2. Substantial performance inspections shall be scheduled to begin within eight working days of the Contractor's request.

7.4.3. Present at the substantial performance inspection will be:

7.4.3.1. The Consultant and his Sub-consultants that he requires and notifies.
7.4.3.2. The Owner's representatives, upon notification by the Consultant.
7.4.3.3. The Contractor and such Subcontractors that he considers are required.
7.4.3.4. The Contractor will compile a substantial performance deficiency list at this inspection and issue it to the Consultant and Owner.
7.4.3.5. The Contractor shall correct substantial performance deficiencies before a date agreed upon by the Contractor and Consultant.
7.4.3.6. Upon the Consultant's approval of substantial performance, the Contractor shall submit an application for a substantial performance certificate.
7.4.3.7. When the Contractor has satisfied himself that these corrections have been completed in a satisfactory manner by his inspection he shall schedule a

final Contractor's inspection by the Consultant, and the Owner's representatives if required, within five working days of the Contractor's request.

7.4.3.8. Upon the Consultant's approval of completion, the Contractor shall submit an application for a completion certificate.

8. Substantial Performance

8.1. The Consultant will issue a Certificate of Substantial Performance when satisfied outstanding deficiencies noted during inspections prior to the substantial completion inspection have been corrected, the Work is substantially complete and is so certified by the Owner.

8.2. A list of remaining deficiencies to be rectified before final acceptance will be attached to the Certificate of Substantial Performance.

8.3. Make submissions specified in Subparagraph 1.06 of this Section.

9. Certificate For Release Of Amount Due At Substantial performance

9.1. The Consultant will issue to the Owner a certificate for release of money in an amount equal to the amount due the Contractor under the Agreement providing he is satisfied the Work has been substantially completed.

9.2. The certificate shall indicate the date of substantial performance.

9.3. Payment shall be due upon date of substantial performance.

10. Completion Certificate

10.1. The Consultant will issue a Certificate of Completion (DSS Document DC670-92) when he is satisfied that outstanding deficiencies noted during inspections have been corrected and the Work is completed and is so certified by the Owner.

10.2. The date of the completion certificate will commence the required sixty (60) day period before release of final payment.

11. Certificate For Release Of Final Payment

11.1. The Consultant will issue to the Owner a certificate for release of final payment sixty (60) days after date of completion certificate providing he is satisfied the Work has been completed.

11.2. The certificate will be in an amount equal to the remaining money due the Contractor under the Contract, and shall indicate the date of final completion.

11.3. Payment shall be due upon date of final completion.

12. Warranties

12.1. Establishment of Warranties:

12.1.1. Warranties shall commence on date of substantial performance certificate.

12.2. Warranty Period:

12.2.1. The Owner will advise the Consultant of defects observed during warranty periods.

12.2.2. The Consultant will notify the Contractor of defects observed during warranty period and request him to remedy the defects in accordance with the Contractor documents.

12.2.3. Thirty (30) days before expiration of warranties the Owner's representatives, the Consultant and the Contractor will inspect the Work as arranged by the Contractor noting defects of products and workmanship.

12.2.4. The Contractor shall immediately remedy such noted defects.

END OF SECTION 01 77 00

CONTRACTOR'S CHECKLIST

Enclose the following documents with your bid:

□ ***Bid Security as required in section 21.1 (Information for Tenderers)*** **-** in the amount of 10% of the Contract Price (before HST).

□ ***Contract Security for bids over $100,000 as required in section 22.6.1.1 (Information for Tenderers)*** – required upon award.

□ ***Certificate of Insurance*** indicating a minimum of **$5,000,000** ***Commercial General Liability Insurance*** per occurrence and ***Commercial Auto Liability Insurance*** covering all owned, non-owned and hired vehicles for a minimum combined single limit of **$2,000,000** per occurrence and ***Builder's Risk Insurance*** in the amount of the contract price. ***Please comply with the insurance requirements as indicated in the sample insurance form (attached)***

□ ***Tentative Work Schedule (Timelines)*** – Subsequently, within five (5) business days of tender award the successful tenderer shall provide a schedule clearly indicating timelines for completion of all aspects of the project.

□ ***Workers' Compensation Board Letter*** of Good Standing

□ ***Certificates of good standing with CRCA*** **(**Canadian Roofing Contractors Association**)** ***and RCANS*** **(**Roofing Contractors Association of Nova Scotia**).**

□ ***Certificate of Recognition from one of the seven safety audit companies that jointly sign with the WCB***:

- East Coast Mobile Medical Inc.
- HSE Integrated
- Nova Scotia Construction Safety Association
- Nova Scotia Trucking Safety Association
- Occupational Health & Educational Services (2002) Inc.
- Safety Services Nova Scotia
- Stantec Inc.

This list can be found on WCB's website: www.wcb.ns.ca.

□ ***Completed HRCE Safety Plan***

□ ***Applicable Warranty Information***

CSIO

CERTIFICATE OF LIABILITY INSURANCE

This certificate is issued as a matter of information only and confers no rights upon the certificate holder and imposes no liability on the insurer. This certificate does not amend, extend or alter the coverage afforded by the policies below.

1. CERTIFICATE HOLDER - NAME AND MAILING ADDRESS		2. INSURED'S FULL NAME AND MAILING ADDRESS	
Halifax Regional Centre for Education		Contractors Name and Address	
33 Spectacle Lake Drive			
Dartmouth, NS	POSTAL CODE B3B 1X7		POSTAL CODE

3. DESCRIPTION OF OPERATIONS/LOCATIONS/AUTOMOBILES/SPECIAL ITEMS TO WHICH THIS CERTIFICATE APPLIES (but only with respect to the operations of the Named Insured)

Insured project details and address: (List specific Project details)

Policy Includes: Contractual Liability, Primary and Non-Contributory, Waiver of Subrogation, Broad Form Property Damage

4. COVERAGES

This is to certify that the policies of insurance listed below have been issued to the insured named above for the policy period indicated notwithstanding any requirements, terms or conditions of any contract or other document with respect to which this certificate may be issued or may pertain. The insurance afforded by the policies described herein is subject to all terms, exclusions and conditions of such policies.

LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS

TYPE OF INSURANCE	INSURANCE COMPANY AND POLICY NUMBER	EFFECTIVE DATE YYYY/MM/DD	EXPIRY DATE YYYY/MM/DD	LIMITS OF LIABILITY (Canadian dollars unless indicated otherwise)		
				COVERAGE	DED.	AMOUNT OF INSURANCE
COMMERCIAL GENERAL LIABILITY ☐ CLAIMS MADE OR ☑ OCCURRENCE ☑ PRODUCTS AND / OR COMPLETED OPERATIONS ☑ EMPLOYER'S LIABILITY ☑ CROSS LIABILITY ☑ TENANTS LEGAL LIABILITY ☑ POLLUTION LIABILITY EXTENSION	XX Insuance 123Binder (Wrap - Up Liability)	2017/11/20	2018/11/20	COMMERCIAL GENERAL LIABILITY BODILY INJURY AND PROPERTY DAMAGE LIABILITY - GENERAL AGGREGATE		$5,000,000
				- EACH OCCURRENCE		$5,000,000
				PRODUCTS AND COMPLETED OPERATIONS AGGREGATE		$5,000,000
				☐ PERSONAL INJURY LIABILITY OR ☑ PERSONAL AND ADVERTISING INJURY LIABILITY		$1,000,000
				MEDICAL PAYMENTS		$25,000
				TENANTS LEGAL LIABILITY		$1,000,000
				POLLUTION LIABILITY EXTENSION		$2,000,000
☑ NON-OWNED AUTOMOBILES ☐ HIRED AUTOMOBILES	XX Insurance 123 Binder	2017/11/20	2018/11/20	NON OWNED AUTOMOBILE		$2,000,000
AUTOMOBILE LIABILITY ☑ DESCRIBED AUTOMOBILES ☐ ALL OWNED AUTOMOBILES ☐ LEASED AUTOMOBILES ** ** ALL AUTOMOBILES LEASED IN EXCESS OF 30 DAYS WHERE THE INSURED IS REQUIRED TO PROVIDE INSURANCE	XX Insurance 123 Binder	2017/11/20	2018/11/20	BODILY INJURY AND PROPERTY DAMAGE COMBINED		$2,000,000
				BODILY INJURY (PER PERSON)		
				BODILY INJURY (PER ACCIDENT)		
				PROPERTY DAMAGE		
EXCESS LIABILITY ☐ UMBRELLA FORM ☐				EACH OCCURRENCE		
				AGGREGATE		
OTHER LIABILITY (SPECIFY) ☑ Builders Risk - All Risk	XX Insurance 123 Binder	2017/11/20	2018/11/20	Limit - (Project Limit)		
☐				Extra Expense		$1,000,000
☑ Professional Liability	XX Insurance 123 Binder	2017/11/20	2018/11/20	Limit of Liability - Per Claim		$5,000,000

5. CANCELLATION

Should any of the above described policies be cancelled before the expiration date thereof, the issuing company will endeavor to mail 30 days written notice to the certificate holder named above, but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or representatives.

6. BROKERAGE/AGENCY FULL NAME AND MAILING ADDRESS		7. ADDITIONAL INSURED NAME AND MAILING ADDRESS (but only with respect to the operations of the Named Insured)	
		Halifax Regional Centre for Education	
		33 Spectacle Lake Drive	
	POSTAL CODE		
BROKER CLIENT ID:		Dartmouth, NS	POSTAL CODE B3B 1X7

8. CERTIFICATE AUTHORIZATION

ISSUER	CONTACT NUMBER(S) TYPE	NO.	TYPE	NO.
AUTHORIZED REPRESENTATIVE	TYPE	NO.	TYPE	NO.
SIGNATURE OF AUTHORIZED REPRESENTATIVE	DATE 2017/11/20		EMAIL ADDRESS	

HALIFAX REGIONAL CENTRE FOR EDUCATION

Project Safety Plan Outline

During the planning of each project, environmental and occupational health and safety issues will be assessed like any other key project component.

Prior to beginning a new project, tendering contractors shall examine the work area to identify potentially hazardous site specific situations.

Once identified, these hazards should be prioritized on this Hazard Assessments/Project Safety Plan Outline and corrective *actions* noted to eliminate or control each hazard. The dates of when and names of the persons who are responsible for completing the *action* should also be assigned.

Copies of the completed Safety Plan Outline shall be submitted as part of the tender document submittal, sent to the HRCE Operations Services Regional Manager, made available on the job site and communicated to the workers.

Project Name: _____

Project Location: _____

Project Start date: _____

Project End date: _____

Company Name: _____

Completed by: _____
(Contractor's project manager)

Date: _____

Copy to: _____

PLANNING:

Does the Contractor's Occupational Health and Safety Program deal with the work activities associated with this project? ☐ Yes ☐ No

Describe tasks to be undertaken:_____

_____

_____

_____

HAZARDS ASSESSMENT:

Identify the hazards that could present themselves on this project (e.g. live electrical wires, over water, confined space, etc) and describe what steps will be taken to prevent an incident (e.g. cover up, de-energize, safe work practices, netting, etc). Prioritize from #1 as needing immediate action.

#	Hazard	Required Action	Completed by	Date
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

ENVIRONMENTAL ASSESSMENT:

Identify the environmental issues that could present themselves on this project (e.g. oil spills, asbestos, etc.) and describe the action that will be taken to eliminate or reduce the risk of occurrence (e.g. mop kits, air sampling, etc.)

#	Hazard	Required Action	Completed by	Date
1				
2				
3				
4				
5				

EMERGENCY RESPONSE:

In the event of an incident, pre-plan the response and write up the procedures. Minimally, the following list should be completed and posted on site:

Contact	Phone #	Contact	Phone #
Fire	911	Poison Control	428-8161
Ambulance	911	Dangerous Goods	1-800-565-1633
Doctor	911	Waste Disposal	
Police	911	Insurance	
HRSB Office	493-5110	Min/Dept of Labour	1-800-952-2687
Min./Dept.of Transport.		Min/Dept of Environment	1-800-565-1633

- Identify and arrange source of first aid, ambulance and rescue.
- Accidents will be reported to: _____
- Accidents will be investigated by: _____
- Back-up call to: _____
- HRCE # emergency/after hours: day 493-5110 after 4:00 pm 442-2476

SAFETY MEETINGS:

On this project, given the nature of the work and the anticipated size of the work force, the following frequency will apply:

Site meetings _____

Site Audits _____

Follow up with HRSB Manager: _____

SITE IMPLEMENTATION:

- Health and Safety Rep & Safety Committee:
  Establish liaison between HRSB, contractor, site administration
  First Aid, PPE, other safety items as required.

- Documentation:
  Applicable MSDS
  Safety program
  Applicable work procedures
  Permits
  First Aid Certification

TRAINING:

The following training/testing will be mandatory on site:

1) _____

_____

2) _____

_____

3) _____

_____

TENTATIVE SCHEDULE OF WORK:

1) Date Project Will Commence: _____

2) Number of Weeks to Complete Project: _____ weeks

NOTE:

Within one week of tender award the successful bidder shall provide a schedule clearly indicating timelines for completion of all aspects of the project.

1 General

1.1 GENERAL

.1 The General Conditions of the contract as well as provisions of Division 01 are part of and to be read in conjunction with this Section.

.2 This section covers items common to all sections of Division 20, 21, 22, 23, 24 and 25.

1.2 RELATED SECTIONS THAT ARE PART OF DIVISION 20 TO 25 WORK

.1 Section 25 05 01 BAS: General Requirements

.2 Section 25 30 02 BAS: Field Control Devices

1.3 INTENT

.1 It is the intent of these specifications to outline the method, materials, and quality of equipment to be furnished and installed hereinafter specified and/or shown on the drawings.

.2 The Mechanical Contractor shall be responsible for the installation of all equipment, materials, and accessories, and the labour required for the completion of this contract to the full satisfaction and acceptance of the Consultant. Misinterpretation of either the drawings or the specifications will not relieve the Contractor of responsibility.

1.4 DEFINITIONS

.1 "CONCEALED" - mechanical services and equipment in hung ceiling spaces and non-accessible chases and furred spaces.

.2 "EXPOSED" - will mean "not concealed" as defined herein.

.3 "Domestic Water" includes domestic cold water, domestic hot water, tempered hot water and domestic hot water recirculation.

.4 "Hydronic" includes hot water heating, chilled water and glycol supply and return piping.

.5 “Provide” will mean “Supply and install”.

1.5 REFERENCE STANDARDS

.1 The most stringent requirements of local municipal by-laws, provincial codes and following codes and standards shall be followed.

.2 In no instance shall the Standard established by the contract documents be reduced by the application of any other codes.

.3 General

- .1 Nova Scotia Building Code Regulations Effective April 1, 2017.
- .2 National Building Code of Canada - 2015.
- .3 National Fire Code of Canada - 2015.

.4 National Plumbing Code of Canada - 2015.
.5 National Energy Code of Canada for Buildings 2015.
.6 ANSI/ASHRAE Standard 135, BACnet®.
.7 The following standards/codes are referenced in the above codes:
  .1 CSA B139 Installation Code for Oil Burning Equipment.
  .2 CSA B140.7 Oil-Fired Steam and Hot Water Boilers for Commercial and Industrial Use.
  .3 CSA B51 Boiler, Pressure Vessel, and Pressure Piping Code.
  .4 CSA C22.1 Canadian Electrical Code, Part 1 Safety Standard for Electrical Installations.
  .5 CAN/CSA C390- Test methods, marking requirements, and energy efficiency levels for three-phase induction motors
  .6 CAN/ULC-S102 Test for Surface Burning Characteristics of Building Materials and Assemblies
  .7 TIAC Mechanical Insulation Best Practice Guide

1.6 EQUIPMENT INSTALLATION

.1 Unions or flanges: provide for ease of maintenance and disassembly.

.2 Space for servicing, disassembly and removal of equipment and components: provide as recommended by manufacturer or as indicated.

.3 Equipment drains: pipe to floor drains.

.4 Install equipment, rectangular cleanouts and similar items parallel to or perpendicular to building lines.

1.7 ANCHOR BOLTS AND TEMPLATES

.1 Supply anchor bolts and templates for installation by other divisions.

1.8 COORDINATION

.1 Closely coordinate the installation of Plumbing System piping and placement of Plumbing System equipment with other Trade Contractors, including but not limited to, Structural steel Contractor, Ceiling Contractor, Sprinkler Contractor, Heating Contractor, Air Distribution Contractor, Controls Contractor and Electrical Contractor

.2 Closely coordinate the installation of Heating System piping and placement of Heating System equipment with other Trade Contractors, including but not limited to, Structural steel Contractor, Ceiling Contractor, Sprinkler Contractor, Plumbing Contractor, Air Distribution Contractor, Controls Contractor and Electrical Contractor

.3 Closely coordinate the installation of Controls System and placement of Controls System equipment with other Trade Contractors, including but not limited to, Structural steel Contractor, Ceiling Contractor, Sprinkler Contractor, Plumbing Contractor, Heating Contractor, Air Distribution Contractor and Electrical Contractor.

1.9 ELECTRICAL

.1 Electrical work to conform to Electrical Contract including the following:

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

.2 Control wiring and conduit is specified in Electrical Contract except for conduit, wiring and connections which are related to mechanical control systems specified in Mechanical Contractor. Refer to Electrical Contract for quality of materials and workmanship.

.3 Power supply to boilers is by Electrical Contractor. Field wiring of boiler components is the responsibility of Mechanical Contractor.

.2 Coordinate with Electrical Contractor to ensure that all controlled equipment is correctly connected for operation in accordance with plans and specifications, including supplying all necessary electrical interconnection information and location to Electrical Contractor.

1.10 EXISTING SYSTEMS

.1 Connections into existing systems to be made at time approved by Consultant. Request written approval of time when connections can be made.

.2 Be responsible for damage to existing plant by this work.

.3 Ensure that all plumbing, heating, ventilation and other mechanical systems and services remain operational during the course of the renovation of the existing building and, if necessary, this Contractor shall be responsible for providing such temporary services by cutting off, altering, adapting, relocating and connecting existing services and disconnecting and removing such temporary or existing services upon providing new permanent services as detailed on all drawings. The site shall be examined to determine the extent of the temporary services and all co-ordination shall be made with the Owner's Representative. All costs shall be included in the Tender Price.

.4 Existing equipment, piping, ducting, etc. not being re-used under new schemes, shall be removed whether shown on drawings or not. The General Contractor shall repair all openings resulting from the removal of existing mechanical equipment and services. All costs shall be included in the Tender Price.

1.11 CUTTING AND PATCHING

.1 Refer to Division 01.

1.12 DRAWINGS

.1 The drawings accompanying this specification are to be considered as diagrammatic only and do not show all the structural and construction details. Any information involving measurements of the building shall be taken from the architectural and structural drawings, and at the building site. Make without additional charge any necessary changes or additions to the runs to accommodate structural conditions.

.2 The Mechanical drawings are not to be scaled.

.3 The drawings and the specifications shall be considered an integral part of the contract documents. Neither the drawings nor the specifications shall be used alone. Misinterpretation of any requirements of either plans or specifications shall not change the requirements of the specifications for proper completion of the work to the full approval of the Consultant.

.4 Except where dimensioned, indicate general Mechanical layouts only. Because of the small scale of Mechanical drawings, it is not possible to show all offsets, fittings and accessories which may be required. Investigate structural and finish conditions affecting this work and arrange work accordingly, providing such fittings, valves and accessories which are required to meet the conditions.

.5 The drawings indicate the general location and route to be followed by the pipes, ducts, conduits, etc., which are installed under this contract. Where the required conduit work, piping, ductwork, etc., is not shown on the plans or only shown diagrammatically, these shall be installed as tight as possible to structural members, concrete, ceilings, and walls to interfere as little as possible with the free use of the space through which they pass.

.6 The drawings and specifications are intended to supplement each other so that any details shown on the drawings are not mentioned in the specifications, or vice versa, shall be executed in the same manner as if contained in the specifications and shown on the drawings.

.7 Should any discrepancy appear between these specifications and the drawings to cause doubt as to the true meaning and intent of the drawings ad specifications, a ruling shall be obtained from the Consultant before submitting the tender. If this is not done it will be assumed that the more expensive alternative has been included in the contract.

.8 Layouts on the Mechanical drawings are based on the specified equipment, including mechanical and electrical connections and physical dimensions. Alternate equipment and systems proposed by the Contractor for use on this project, which necessitates changes in service connections to perform the specified functions may be considered by the Consultant, however, any required modifications or additions shall be done at no additional cost to the Owner. Furthermore, if it is found that the provisions made regarding space conditions and code required clearances are not met, the right is reserved by the Consultant to require installation of the equipment specified.

1.13 CONTRACT DOCUMENTS

.1 Before submitting tender for his work, each Contractor shall examine the contract documents (entire specifications, electrical drawings, structural drawings and architectural drawings) to ascertain that the work can be carried out as shown on these drawings and herein specified. No extra will subsequently be allowed to cover any omission and/or oversight for not having made a thorough inspection of the contract documents.

1.14 EXAMINE THE SITE AND CONDITIONS

.1 Each Contractor shall visit and examine the site and the local conditions affecting this work. No allowance will be made later for any expenses occurred through failure to make these examinations.

1.15 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with the Project Waste Reduction Workplan. Refer to Division 01.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Project Waste Management Plan

1.16 LOW VOC MATERIALS

.1 All site applied coatings, adhesives & sealants must conform to low VOC content requirements.

.2 Provide Material Safety Data Sheets for all products and materials of these types incorporated into the work.

2 Products

2.1 MATERIAL

.1 For the purpose of uniformity similar materials shall be by one manufacturer.

.2 Standard of Acceptance and/or Acceptable Material:
- .1 Means that item named and specified by manufacturer and/or catalogue number forms part of specification and sets standard regarding performance, quality of material and workmanship and when used in conjunction with a referenced standard, shall be deemed to supplement the standard.

.3 Acceptable Manufacturer:
- .1 Means that item manufactured by named and specified manufacturer, meeting the specification and referenced standard regarding performance, space constraints, electrical requirements, quality of material and workmanship shall be deemed acceptable.

.4 Refer to “Instruction to Bidders” for method of applying for Alternatives Products/Systems prior to close of tender.

2.2 ELECTRICAL DEVICES AND PANELS.

.1 All electrical equipment and devices to be CSA certified and manufactured to standard quoted.

.2 The assembly of combinations of electrical components, such as, relays, current transformers, BAS devices, transformers, fuse blocks, transducers or other certified components in an enclosure to form an overall electrical assembly shall be CSA certified.

.3 Where field modifications are made to certified electrical equipment, arrange and pay for field certification by CSA.

2.3 MOTORS

.1 Provide motors for mechanical equipment as specified.

.2 Service factor 1.15.

.3 Totally enclosed fan cooled (TEFC) where specified.

2.4 BELT DRIVES

.1 Fit reinforced belts in sheaves matched to drive. Multiple belts to be matched sets.

.2 Use cast iron or steel sheaves secured to shafts with removable keys unless otherwise specified.

.3 For motors under 7.5kW (10 HP): standard adjustable pitch drive sheaves, having plus or minus 10% range. Use mid-position of range for specified r/min.

.4 For motors 7.5kW (10 HP) and over: sheaves with split tapered bushing and keyway having fixed pitch unless specifically required for item concerned. Provide sheaves of correct size to suit balancing.

.5 Minimum drive rating: 1.5 times nameplate rating on motor. Keep overhung loads within manufacturer's design requirements on prime mover shafts.

.6 Tension belts to manufacturer's recommendations before start-up and after first (100) hours of operation using calibrated belt tensioning gauge. Submit report showing the recommended and actual tension on all units.

2.5 EQUIPMENT SUPPORTS

.1 Equipment supports supplied by equipment manufacturer: specified elsewhere in Mechanical Contractor.

.2 Equipment supports not supplied by equipment manufacturer: fabricate from structural grade steel.

.3 Exterior supports to be hot dipped galvanized. Touch up field welds and bolt holes with cold galvanized paint

.4 Mount interior base mounted equipment on chamfered edge housekeeping pads, supplied by General Contractor.

- .1 Nominal 100 mm (4") high and minimum 100 mm (4") larger all around than equipment.
- .2 Slabs to be pinned to floor by General Contractor.
- .3 Provide detailed drawing to Others showing location of pads.
- .4 Ensure bases are level prior to placement of equipment.

2.6 PAINT

.1 Apply at least one coat of primer paint to ferrous supports, pipe hangers and site fabricated work.

.2 Primer to be The Master Painters Institute MPI #23 with VOC < 351 grains/L

2.7 PIPE PENETRATION THROUGH WALLS AND FLOOR

.1 Do not grout or bond sprinkler piping, drainage waste and vent piping, domestic water and hydronic pipes solid to walls or floors.

.2 Provide cast in place temporary collar, core drill slab or sleeve all sprinkler piping, drainage waste piping, plumbing vent piping, domestic water and hydronic pipes penetration through floors.

.3 Provide cylindrical Sleeve all sprinkler piping, drainage waste and vent piping, domestic water, hydronic pipes and control conduits through all mechanical room slabs above grade.

.4 For all sprinkler piping, drainage waste piping, plumbing vent piping, domestic water, hydronic pipes and control conduits through all masonry walls, provide cylindrical sleeves. Maintain a minimum uniform 1/4" (6 mm) clearance all around or as required for smoke seal, acoustic seal and/or fire stopping.

.5 For all sprinkler piping, drainage waste piping, plumbing vent piping, domestic water, hydronic pipes and control conduits through all drywall walls, coordinate with other trades to ensure there is minimum uniform 6 mm clearance all around or as required for smoke seal, acoustic seal and/or fire stopping.

.6 Insulation on domestic cold water piping and hydronic piping to be continuous through Walls and Floor.

.7 Ensure no contact between copper tube / pipe and ferrous sleeve or concrete.

.8 Coat exposed exterior surface of ferrous sleeves with heavy application of zinc rich paint to CAN/CGSB-1.181-92 coating, zinc-rich organic, ready mixed.

2.8 PIPE SLEEVES

.1 For floors into Mechanical Rooms, provide schedule 40 sleeves with annular fin continuously welded to sleeve. Extend 50 mm above finish floor.
  .1 Install sleeves prior to concrete installation.

.2 For floors other rooms, provide 1.6 mm (16 Ga.) galvanized round sleeves with tack welded longitudinal joints, retaining tabs, terminating flush with floor.

.3 For walls, provide 1.6 mm (16 Ga.) galvanized round sleeves with tack welded longitudinal joints.

.4 Center sleeves on centerline of pipe.

2.9 SMOKE SEAL AND/OR ACOUSTIC SEAL

.1 Firestop all pipe penetration through fire rated walls and fire rated floor.
  .1 Refer to Section 20 05 04 Firestopping for Mechanical

.2 Where non rated walls extend from floor to floor or floor to roof deck and non-rated floors.
  .1 Smoke seal and/or acoustic seal all pipes, both sides of wall/floor.
  .2 Smoke seal and/or acoustic seal between duct and wall, both sides of wall/floor.

2.10 FIRESTOPPING

.1 Firestopping material and installation within annular space between pipes, ducts, insulation and adjacent fire separation
- .1 Refer to Section 20 05 02 Mechanical Submittals for firestopping submittals.
- .2 Refer to Section 20 05 04 Firestopping for Mechanical and Section 07 84 00 Firestopping.

2.11 ESCUTCHEONS

.1 On pipes passing through walls, partitions, floors and ceilings in finished areas.

.2 Chrome or nickel plated brass or Type 302 stainless steel, split piece type.
- .1 Standard of Acceptance:
  - .1 Grinnell Fig 2 and 13.

.3 Outside diameter to cover opening or sleeve.

.4 Inside diameter to fit around finished pipe.

2.12 ACCESS DOORS

.1 Supply access doors to concealed mechanical equipment for operating, inspecting, adjusting and servicing.

.2 Size:
- .1 Sized to access concealed services
- .2 Minimum 600 x 600 mm (24" x 24") for body entry
- .3 Minimum 300 x 300 mm (12" x 12") for hand entry
- .4 Minimum 150 mm (6”) larger than access door in ductwork.
- .5 Unless otherwise noted.

.3 Door flush with frame.

.4 For unrated construction
- .1 Allen Key lock(es)
- .2 Flat door type
  - .1 Rounded safety corners
  - .2 One piece outer flange welded to mounting frame
  - .3 One piece concealed hinge
- .3 Formed door type

.5 For fire rated construction
- .1 Pull ring or raised knurled knob operated latch bolt
- .2 Interior latch release
- .3 Automatic closer
- .4 Hinged door
- .5 Flanged frame
- .6 For walls:
  - .1 1- 1/2 hour 'B' label
- .7 For ceiling membrane:
  - .1 1 hour label

.6 Material:
.1 Special areas such as tiled or marble surfaces: use stainless steel with brushed satin or polished finish as directed by Consultant.
.2 Remaining areas: use prime coated steel.

.7 Installation:
.1 Locate so that concealed items are accessible.
.2 Locate so that hand or body entry (as applicable) is achieved.
.3 Install in accordance with manufacturer's recommendation

.8 Acceptable material:

	Unrated Walls	**Fire Rated Walls**	**Fire Rated Ceilings**
Acudor	EB-2002 or UF-5000	FB-5050	FW-5050
Cendrex	AHD	PFI	
Mifab	UA	MPFR	MPFR

2.13 DIELECTRIC COUPLINGS

.1 Lead Free

.2 Compatible with and to suit pressure rating of piping system.

.3 Where pipes of dissimilar metals are jointed.

.4 Pipes NPS 2 and under: isolating unions.
.1 Acceptable material:
.1 Watts LF3000 Series

.5 Pipes NPS 2-1/2 and over: isolating flanges.

2.14 DRAINS VALVES

.1 In accordance with Section 23 05 23 Valves.

2.15 HANGERS AND SUPPORTS

.1 As per Section 23 05 29 Hangers and Supports.

2.16 IDENTIFICATION

.1 As per Section 23 05 53 Mechanical Identification.

2.17 INSULATION

.1 As per Section 23 07 00 Mechanical Thermal Insulation.

3 Execution

3.1 INSTALLATION

.1 Install all work in accordance with authorities having jurisdiction and manufacturer’s requirements. In case of conflicting requirements, the more stringent shall apply.

3.2 PROTECTION OF OPENINGS

.1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

.2 No fans to be started until the project has been cleaned to the satisfaction of the Consultant.

3.3 TESTS

.1 Give 4 working days written notice of date for tests.

.2 Insulate or conceal work only after testing by contractor and review by Consultant.

.3 Conduct tests in presence of Consultant or representative authorized by the Consultant.

.4 Bear costs including retesting and making good.

.5 Test domestic hot, recirculation and cold water piping at 1 1/2 times system operating pressure or minimum 860 kPa (125 psig), whichever is greater. Maintain test pressure without loss for a minimum of 2 hours otherwise specified.

.6 Test backflow preventers in accordance with manufacturer's recommendation and the requirements of the local water utility.

.7 Test fuel oil systems to CAN/CSA B139 Installation Code for Oil Burning Equipment and authorities having jurisdiction.

.8 Hydronic Piping:
- .1 Maintain test pressure without loss for 4 h unless otherwise specified.
- .2 Hydraulically test hydronic piping systems at 1 1/2 times system operating pressure or minimum 860 kPa (125 psig), whichever is greater.

.9 Equipment: test as specified in relevant sections.

.10 Prior to tests, isolate all equipment or other parts which are not designed to withstand test pressures of test medium.

.11 Provide signed copies of all tests within 2 weeks of completion of each test.

3.4 PAINTING

.1 Prime and touch up marred finished paintwork to match original.

.2 Restore to new condition, finishes which have been damaged too extensively to be merely primed and touched up.

.3 Paint the balancing damper handles where concealed.

3.5 ALTERNATIVES

.1 Refer to Division 1

END OF SECTION

1 General

1.1 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 In accordance with Division 01

.2 Shop Drawings to be Project Specific

.3 All Shop Drawings to be Metric.

.4 Prior to submitting shop drawings, the Mechanical Contractor to review the shop drawing to ensure that they meet the requirements of the contract documents in all respects, that they are clear and legible, all options are being provided are clearly indicated and that the dimensions, weights, power requirements, quantities and capacity are consistent with the requirements of the contract documents.

.5 Assembled in groups by **Specification Section** and bound in sets.

.6 On cover/front page indicate total number of pages in submission.

.7 Consecutively number each page.

.8 Shop Drawings to list components that are shipped loose.

.9 Shop Drawings to include **Project Specific** wiring diagrams.

.10 Shop Drawings for items with BACnet® control to include **Project Specific** list of BACnet® read/write variables. Also refer to Section 20 05 01 Mechanical General Requirements and Section 25 05 02 BAS: Submittals

.11 Attach a Mechanical Contractor's Shop Drawing Review Confirmation to each shop drawing confirming the following:

- .1 The mechanical shop drawings have been reviewed by the Mechanical Contractor and all items are in conformance with the contract documents __ Yes __ No
- .2 Project specific model numbers and/or options are indicated __ Yes __ No
- .3 Mechanical Contractor: _____
- .4 Mechanical Contractor Project Representative: _____
- .5 Mechanical Contractor Signature: _____
- .6 Item: _____
- .7 Specification Section and item number: _____
- .8 Drawing reference: _____

.12 Where specified in Division 01, submit electronic copies of shop drawings. In addition to the electronic shop drawing, submit one hard copy to the office of the mechanical consultant.

.13 Section 20 05 04 Through – Penetration Firestopping for Mechanical Systems

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

.2 Provide data showing firestopping method for mechanical services including but not limited to the following:
- .1 Cast iron pipe at wall
- .2 Cast iron pipe at floor.
- .3 Copper pipe at wall
- .4 Copper pipe at floor
- .5 PVC pipe at wall
- .6 PVC pipe at floor
- .7 Steel pipe at wall
- .8 Steel pipe at floor.
- .9 Under floor drains
- .10 Other site specific conditions.

.3 Name of qualified installer.

.4 Manufacturer's engineering judgment identification number and drawing details when no ULC or cUL system is available for an application. Consultant judgment must include both project name and contractor's name who will install firestop system as described in drawing.

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

.14 Section 22 42 01 Plumbing Specialties and Accessories.
- .1 Backflow Preventers.
- .2 Pressure Reducing Valve.

.15 Section 23 05 16 Expansion Fittings
- .1 Movement Handled, Axial, lateral, Angular and the Amount of Each.

.16 Section 23 05 19 Thermometers and Pressure Gauges
- .1 Direct reading thermometers.
- .2 Pressure Gauges.

.17 Section 23 05 23 Valves
- .1 Circuit Balancing Valves.
  - .1 Provide schedule showing size, flow and pressure drop.

.18 Section 23 05 29 Hangers and Supports
- .1 Upper attachments for ducts.
- .2 Upper attachments for pipes.
- .3 Pipe hangers
- .4 Description of where each type of upper attachment and hanger will be utilized

.19 Section 23 07 00 Mechanical Thermal Insulation
- .1 Each type of insulation
- .2 Canvas

.20 Section 23 21 23 Hydronic Pumps.
- .1 Pump Performance Curves.

.21 Section 23 21 13 Hydronic Systems
- .1 Roll groove coupling and fittings.
- .2 Press coupling and fittings.

.22 Section 23 21 14 Hydronic Specialties
- .1 Expansion Tanks.
- .2 Air Separators.

.23 Section 23 22 13 Steam & Condensate Piping

.24 Section 23 22 14 Steam Specialties

.25 Section 23 25 00 HVAC Water Treatment Systems.

.26 Section 23 52 02 Heating Boilers - Single Pass Cast Iron Sectional Boilers
- .1 Accessories
- .2 Oil Burner
- .3 Field wiring diagram specific to project.
- .4 Wiring Diagram specific to project showing control transformer, remote panel, etc. Submit manufacturer's detailed composite wiring diagrams for control systems showing factory installed wiring and equipment on packaged equipment or required for controlling devices or ancillaries, accessories, controllers.

.27 Section 23 51 00 Breeching, Chimneys and Stacks.

.28 Section 25 05 01 BAS: General Requirements.
- .1 Copy of Control Wiring Electrical Wiring Permit
- .2 Refer to submittal requirements in section 25 05 01

.29 Shop drawings and product data shall show:
- .1 Mounting arrangements.
- .2 Operating and maintenance clearances, e.g. access door swing spaces.

.30 Shop drawings and product data shall be accompanied by:
- .1 Detailed drawings of bases, supports, and anchor bolts.
- .2 Acoustical sound power data, where applicable.
- .3 Points of operation on performance curves.
- .4 Manufacturer to certify as to current model production.
- .5 Certification of compliance to applicable codes.
- .6 Wiring diagrams and electrical characteristics specified for unit supplied.

1.3 MATERIAL ON SITE

.1 Refer to General Conditions of Contract.

.2 All claims for material on site must be supported by supplier’s invoices showing supplier’s unit prices including taxes.

.3 Material on site shall not be claimed under the “work complete” portion of the claim.

.4 Material eligible to be claimed as “material on site” must be project specific equipment, such as plumbing fixtures, DHW tanks, pumps, radiation products, air handling equipment, exhaust fans, control panels, control valves, etc.

.5 General material which is not considered project specific such as piping, fittings, control conduit, control wire, ductwork, small tools, etc., are not eligible to be claimed as “material on site.”

.6 Project specific equipment may be claimed as "material on site" subject to the following:
- .1 Claim to show previous material on site and deduct the amount of previously claimed material that was incorporated into the work during the current month.
- .2 Claim to show material brought on site this month supported by a copy of the supplier's invoices showing supplier's unit prices including taxes.

.7 Invoices submitted for a "material on site" claim will not be considered by the engineer unless they are examined and initialed by both the mechanical contractor and the General Contractor.

1.4 PROGRESS ESTIMATES

.1 Refer to General Conditions of Contract.

.2 Submit monthly progress estimates broken down as follows:
- .1 Mechanical Contractor Mobilization
- .2 Section 20 05 03 Common Work Results for Mechanical Contract Closeout.
  - .1 Minimum 1% of mechanical contract for items included with application for Substantial Performance certificate.
  - .2 Minimum 1% of mechanical contract for items included with application for release of final payment
- .3 Section 22 11 16 Domestic Water Piping and Section 22 13 17 Drainage Waste and Vent Piping Rough-In
- .4 Section 23 07 00 Mechanical Thermal Insulation
- .5 Section 23 21 23 Hydronic Pumps and Section 23 21 14, Hydronic Specialties and Section 23 57 00 Heat Exchangers for HVAC.
- .6 Section 23 21 13 Hydronic Systems
- .7 Section 23 11 13 Facility Fuel Oil - Piping
- .8 Section 23 52 03 Heating Boilers and Section 23 51 00, Breeching, Chimneys and Stacks.
- .9 Section 24 05 93 Balancing of Mechanical Systems.
- .10 Section 25 05 01 BAS: General Requirements.
  - .1 BAS Control Rough-in.
  - .2 BAS Control Equipment and Installation
  - .3 BAS Control Programming and verification.
- .11 Maintenance Service during warranty period to be billed following each visit.

.3 The first mechanical progress estimate may be withheld until such time as the shop drawings, progress estimate break down and hourly labor rate are submitted.

.4 Claims for Material on Site to have itemized list which are updated monthly.

1.5 CONTRACT CHANGES

.1 Hourly Labor Rates
- .1 Refer to General Conditions of Contract.
- .2 Submit separate hourly labor rate for each of the following:
  - .1 Sprinkler Installer
  - .2 Insulator
  - .3 Plumber
  - .4 Heating Installer
  - .5 Sheet metal Installer.
  - .6 BAS Control Electrician.
  - .7 BAS Control Technician

.3 Total Payroll costs as follows:

Base Rate	$
Vacation and Holiday Pay	$
Apprentice Council	$
Promotion fund	$
Training and Union Fund	$
Pension	$
Safety Training	$
Health Benefits	$
Liability Insurance	$
Worker's Compensation Board	$
Employment Insurance	$
CPP	$
Safety Equipment	$
SUBTOTAL	$
Small Tools 5% of Subtotal	$
Site Supervision 5% of Subtotal	$
TOTAL	**$**

.4 Overhead and Fee as per General Condition of Contract.

.2 Contract Changes
- .1 Less than $1,000.00, provide lump sump price.
- .2 Over $1,000 provide breakdown showing the following:
  - .1 Labour hours times hourly labor rate.
  - .2 List of Materials with unit costs.
- .3 Provide breakdown for credit materials and labour.

1.6 PROJECT SCHEDULE

.1 Refer to General Conditions of Contract.

.2 In co-operation with General Contractor submit a mechanical schedule broken down as follows:
- .1 Hydronic Rough-In
- .2 Boilers and Chimney
- .3 BAS Control Rough-in.
- .4 BAS Control Equipment and Installation
- .5 BAS Control Programming and verification.
- .6 Testing Adjusting and Balancing (TAB) of Mechanical Systems
- .7 Submittal of Contract Close Out Documentation.

1.7 START UP REPORT MANUAL

.1 Custom designed and contain material pertinent to this project only and to provide full and complete coverage of subjects referred to in this section.

.2 Operating and maintenance manual to be approved by and final copies deposited with Consultant before final inspection.

.3 Organize by specification section.

.4 Conform to requirements of Division 01, supplemented and modified by requirements specified in this section.

.5 Start Up and Performance data to include:
- .1 Equipment manufacturer's performance data sheets with point of operation as left after commissioning is complete.
- .2 Start up and verification reports
- .3 Testing, adjusting and balancing reports as specified in Section 24 05 93, Testing, Adjusting and Balancing (TAB) of Mechanical Systems.

.6 Submittals:
- .1 Submit a copy of the complete Start Up Report Manual to Consultant for Review.
- .2 Start Up Report Manual Part 1
  - .1 Start up and verification reports as required with application for substantial performance certificate as per Section 20 05 03, Common Work Results for Mechanical Contract Closeout.
- .3 Start Up Report Manual Part 2
  - .1 Start up and verification reports as required with application for release of final payment as per Section 20 05 03, Common Work Results for Mechanical Contract Closeout.
- .4 Submission of individual data will not be accepted unless so directed by Consultant.
- .5 Make changes as required and re-submit as directed by Consultant.
- .6 Refer to Division 01 for quantity of Manuals (minimum 2).
- .7 Hard-back, 25 mm (1") 3 ring, D-ring binders.
- .8 Binders to be 2/3 maximum full.
- .9 Provide index to full volume in each binder.
- .10 Identify contents of each manual on cover and spine.
- .11 Include names, addresses, telephone numbers of each sub-contractor having installed equipment, local representative for each item of equipment, each system.
- .12 Provide full Table of Contents in each manual. Assemble each manual to conform to Table of Contents with tab sheets placed before instructions covering subject.

1.8 OPERATING AND MAINTENANCE (O&M) MANUAL

.1 Operating and maintenance manual to be reviewed by the Consultant and final copies deposited with Consultant before application for substantial performance certificate

.2 Organize by specification section.

.3 O&M Manuals to be custom designed and contain material pertinent to this project only and to provide full and complete coverage of subjects referred to in this section.

.4 Customize O&M data from manufacturer’s to suit this project.
- .1 Provide site specific manual or
- .2 Neatly cross out non applicable generic information in the manual.
- .3 In Manufacturer’s literature, highlight model supplied for this project.

.5 Provide Maintenance Program Schedule in table format (See Below) for each mechanical system and each piece of mechanical equipment including all items for which shop drawings have been submitted. Reference specification sections. List piece of equipment, items to be checked and frequency, tab in manual and page within section.

EQUIPMENT	ITEMS TO BE CHECKED	FREQUENCY	TAB & PAGE
Section 22 42 01 Plumbing Specialties	Clean and confirm flow from trap primer.	Monthly or as required.	22 42 01

.6 Conform to requirements of Division 01, supplemented and modified by requirements specified in this section.

.7 Project records and O&M manuals specified in this section are to be completely separate entity from those specified in Division 01.

.8 Operation data to include:
- .1 Control schematics for each system including environmental controls.
- .2 Description of each system and its controls.
- .3 Description of operation of each system at various loads together with reset schedules and seasonal variances.
- .4 Operation instruction for each system and each component.
- .5 Description of actions to be taken in event of equipment failure.
- .6 Valves schedule.
- .7 Color coding chart.

.9 Maintenance data shall include:
- .1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.
- .2 Data to include schedules of tasks, frequency, tools required and task time.

.10 Submittals:
- .1 Include a copy of all reviewed mechanical shop drawings.
- .2 Submit a copy of the complete O&M Manual to Consultant for Review.
- .3 Submission of individual data will not be accepted unless so directed by Consultant.
- .4 Make changes as required and re-submit as directed by Consultant.
- .5 Refer to Division 01 for quantity of Manuals (minimum 2).
- .6 Hard-back, 50 mm (2") 3 ring, D-ring binders.
- .7 Binders to be 2/3 maximum full.
- .8 Provide index to full volume in each binder.
- .9 Identify contents of each manual on cover and spine.
- .10 Include names, addresses, telephone numbers of each sub-contractor having installed equipment, local representative for each item of equipment, each system.
- .11 Provide full Table of Contents in each manual. Assemble each manual to conform to Table of Contents with tab sheets placed before instructions covering subject.

.11 Provide maintenance data for the following:
- .1 Section 22 42 01 Plumbing Specialties and Accessories.
  - .1 Backflow preventer
- .2 Section 23 11 13 Oil Piping
- .3 Section 23 21 23 Hydronic Pumps.
- .4 Section 23 25 00 HVAC Water Treatment Systems.
- .5 Section 23 52 03 Heating Boilers

.12 Prepare and insert into operation and maintenance manual, additional data when need for same becomes apparent during demonstrations and instructions specified above.

1.9 SPARE PARTS AND MAINTENANCE MATERIAL

.1 Section 23 21 23 Hydronic Pumps.
- .1 One set of mechanical seals for each size of pump.

1.10 AS BUILT DRAWINGS

.1 In accordance with Division 01.

.2 Site Records:
- .1 Make available for reference purposes and inspection at all times. Provide sets of white prints as required for each phase of the work. Mark thereon all changes as work progresses and as changes occur. This shall include change orders, site instructions, and changes to existing mechanical systems, control systems and low voltage control wiring.
- .2 Obtain AutoCAD drawing files from the consultant. The Contractor to update at his own expense the AutoCAD files to show the as-built conditions.
- .3 On a regular basis, transfer information to the AutoCAD files, revising drawings to show all work as actually installed. These AutoCAD files will at their completion, become the as-built drawings for this project.
- .4 Ensure that the modifications follow the same standard as the original file, that is, layer control, line weights, line types, etc.
- .5 Make available for reference purposes and inspection at all times.

.3 As Built Drawings:
- .1 Prior to start of Testing, Adjusting and Balancing (TAB), finalize production of As Built Drawings.
- .2 Identify each drawing in lower right hand corner in letters at least 13 mm (1/2") high as follows: -"AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (date).
- .3 Include on the As Built Drawings the identification number off all terminal units and as installed location.
- .4 Include on the As Built Drawings as installed location of all temperature sensors and/or thermostats
- .5 Submit to Consultant for approval and make corrections as directed.
- .6 TAB to be performed using as-built drawings.
- .7 Submit completed hard copy of as-built drawings with Operating and Maintenance Manuals.
- .8 Submit computer disk with the AutoCAD files to the consultant at the time specified in Division 01.
- .9 Include all sections shown on interference drawings.

.4 Where products are specified by manufacturer and/or model, update AutoCAD file to show installed manufacturer and model.

2 Products N/A

3 Execution N/A

END OF SECTION

1 General

1.1 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Common Work Results for Mechanical.

1.2 SUBMITTALS

.1 Start-up Report.
- .1 Provide start-up reports as listed below.
- .2 Reports to show model number, serial number, voltage and rated amperes.
- .3 If during start up there is an operation concern, repeat start-up after operation concern has been corrected.

.2 Section 20 05 02 Mechanical Submittals.
- .1 Maintenance Materials and Spare Parts.
- .2 Operation and Maintenance Manuals.
- .3 As Built drawings.

.3 Section 20 05 03 Common Work Results for Mechanical Contract Closeout.
- .1 Confirmation of Demonstration and Operating and Maintenance Instruction.

.4 Section 20 91 13 Mechanical Systems Testing and Verification
- .1 Form V-22 42 01 - Backflow Preventer
- .2 Form V-23 11 13 - Facility Fuel-Oil Piping and Storage Tank
- .3 Form V-23 21 23 - Hydronic Pumps
- .4 Form V-23 52 00 - Boiler

.5 Section 23 05 53 Mechanical Identification.
- .1 Valve Chart.
- .2 Fire Damper Chart

.6 Section 22 42 01 Plumbing Specialties.
- .1 Backflow Preventor Test Report.

.7 Section 23 52 03 Heating Boilers.
- .1 Factory Boiler Test Report.
- .2 On site Boiler Test Report.
- .3 Test boiler prior to installation of jacket at two (2) times the boiler back pressure.

.8 Section 24 05 93 Balancing (TAB) of Mechanical Systems.
- .1 TAB Report.

.9 Section 25 05 01 BAS: General Requirements.
- .1 BAS Point by Point verification report
- .2 BAS start-up report including all field programmable software settings including demand expand setpoint and schedules.
- .3 Letter confirming maintenance contract during warranty period.
- .4 Copy of program on disks.
- .5 Final Inspection certificate from Inspection Authority for Control Wiring Electrical Wiring Permit

.10 With application for substantial performance certificate
- .1 Section 20 05 02 Mechanical Submittals.
  - .1 Start Up Report Manual Part 1
  - .2 Operation and Maintenance Manuals.
- .2 Section 20 05 02 Mechanical Contract Closeout.
  - .1 Confirmation of Demonstration and Operating and Maintenance Instruction.
  - .2 Letter confirming testing and commissioning to satisfaction of Owner.
- .3 Section 20 91 13 Mechanical Systems Testing and Verification
  - .1 Form V-22 42 01 - Backflow Preventer
  - .2 Form V-23 11 13 - Facility Fuel-Oil Piping
  - .3 Form V-23 21 23 - Hydronic Pumps
  - .4 Form V-23 52 00 – Boiler
- .4 Section 22 42 01 Plumbing Specialties.
  - .1 Backflow Preventer Test Report.
- .5 Section 23 52 00 Heating Boilers.
  - .1 On site Boiler Test Report.
- .6 Section 24 05 93 Balancing (TAB) for Mechanical Systems.
  - .1 TAB Report.
- .7 Section 25 05 01 BAS: General Requirements.
  - .1 BAS Point by Point verification report
  - .2 BAS start-up report including all field programmable software settings including demand expand setpoint and schedules.
  - .3 Final Inspection certificate from Inspection Authority for Control Wiring Electrical Wiring Permit

.11 With application for release of final payment
- .1 Section 20 05 02 Common Work Results for Mechanical - Submittals.
  - .1 Start Up Report Manual Part 2
  - .2 Maintenance Materials and Spare Parts.
  - .3 AS Built drawings.
- .2 Section 20 91 13 Mechanical Systems Testing and Verification Forms not previously submitted.
- .3 Section 23 05 53 Mechanical Identification.
  - .1 Valve Chart.
- .4 Section 25 05 01 BAS: General Requirements.
  - .1 Letter confirming maintenance contract during warranty period.
  - .2 Copy of program on disks.

1.3 DEMONSTRATION AND OPERATING AND MAINTENANCE INSTRUCTIONS

.1 Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, trouble-shooting and servicing of all systems and equipment during regular work hours, prior to acceptance.

.2 Use operation and maintenance manual, as-built drawings, audio visual aids, etc. as part of instruction materials.

.3 Instruction duration time requirements at Substantial Performance as follows:
- .1 Heating: 4 hours.
- .2 Boilers: 4 hours
- .3 Controls: 4hours on site + 4hours tech support during warranty.

.4 Where deemed necessary, Owner may record these demonstrations on video tape for future reference.

1.4 EXTENDED WARRANTIES

.1 Section 23 52 00 Heating Boilers.
- .1 For boilers, the non prorated warranty period is extended to ten (10) years. Signed by authorized representative of the original manufacturer.
- .2 For burner, controls and other included equipment, the non prorated warranty period is extended to two (2) years. Signed by authorized representative of the original manufacturer.

2 Products N/A

3 Execution

3.1 CLEANING

.1 Clean mechanical (building) systems in accordance with Division 01.

.2 Clean all pipe systems strainers.

.3 Vacuum interior air handling units.

.4 Wipe down exterior of air handling units.

.5 Wash interior of air handling units.

.6 In preparation for final acceptance, clean and refurbish all equipment and leave in operating condition including replacement of all filters in all air and piping systems.

3.2 VERIFICATION

.1 In context of this paragraph "verify" to include "demonstrate" to consultant.

.2 Timing: commission only after start-up deficiencies rectified.

.3 Access doors: verify size and location relative to items to be services.

.4 Adjust to suit site conditions, including, but not necessarily limited to, following:
- .1 Backflow preventers, vacuum breakers:
  - .1 Verify installation of correct type to suit application.
  - .2 Adjust as necessary to ensure proper operation.
  - .3 Verify visibility of discharge.
- .2 Pressure regulators:
  - .1 Adjust settings to suit installed locations, required flow rates.

.5 Boilers: Refer to Section 23 52 00 Heating Boilers.

.6 Controls: Refer to Section 25 05 01 BAS: General Requirements.

.7 Verification reports:
- .1 Record all results on approved report forms.
- .2 Include signature of tester and supervisor.

.8 Verification:
- .1 Notify Consultant 24 hour before commencing tests.

END OF SECTION

1 General

1.1 GENERAL

.1 The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

1.3 DEFINITIONS

.1 Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in fire rated wall and floor assemblies.

1.4 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

.1 Penetrations for the passage of duct, piping, and other mechanical equipment through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.

1.5 RELATED WORK OF OTHER SECTIONS

.1 Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections, including:

.1 Section 23 07 00 Mechanical Thermal Insulation.

1.6 QUALITY ASSURANCE

.1 A manufacturer's direct representative to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.

.2 Firestop System installation must meet requirements of CAN4-S115-M or ULC S-115-M tested assemblies.

.3 Firestop materials and methods: conform to applicable governing codes having local jurisdiction.

.4 For those firestop applications that exist for which no ULC or cUL tested system is available through a manufacturer, a manufacturer's engineering judgment derived from similar ULC or cUL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Firestop Council.

1.7 INSTALLER QUALIFICATIONS

.1 Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer's products per specified requirements.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and ULC or cUL label where applicable.

.2 Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.

.3 Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements.

.4 Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

.5 Do not use damaged or expired materials.

1.9 PROJECT CONDITIONS

.1 Do not use materials that contain flammable solvents.

.2 Scheduling

.1 Schedule installation of Cast In Place firestop devices after completion of floor formwork, metal form deck, or composite deck but before placement of concrete.

.2 Schedule installation of other firestopping materials after completion of penetrating item installation but prior to covering or concealing of openings.

.3 Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

.4 Weather conditions: Install of firestop materials when temperatures are within the manufacturer's recommended limitations for installation printed on product label and product data sheet.

.5 During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

2 Products

2.1 FIRESTOPPING, GENERAL

.1 Use only firestop products that have been ULC or cUL tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

.2 Provide firestopping composed of components that are compatible with each other, the substrates forming openings and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.

.3 Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

2.2 ACCEPTABLE MANUFACTURERS

.1 Subject to compliance with through penetration firestop systems listed in U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory, provide products of the following manufacturers as identified below:
- .1 Hilti (Canada) Limited.
- .2 Other manufacturers listed in the U.L.C Fire Resistance Directory – Volume III or UL Products Certified for Canada (cUL) Directory

2.3 MATERIALS

.1 Sealants or caulking materials for use with non-combustible items including steel pipe, copper pipe and electrical metallic tubing (EMT).
- .1 Standard of Acceptance:
  - .1 Hilti FS-ONE Intumescent Firestop Sealant, Hilti CP 604 Self Leveling Firestop Sealant, Hilti CP 620 Fire Foam

.2 Intumescent sealants or caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed or cable bundles and plastic pipe.
- .1 Standard of Acceptance:
  - .1 Hilti FS-ONE Intumescent Firestop Sealant, Hilti CP 620 Fire Foam

.3 Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems) tested to 50 Pa. differential.
- .1 Standard of Acceptance:
  - .1 Hilti CP 642 Firestop Collar, Hilti CP 643 Firestop Collar, Hilti CP 645 Wrap Strips

.4 Materials used for large size/complex penetrations made to accommodate multiple steel and copper pipes.
- .1 Standard of Acceptance:
  - .1 Hilti FS 635 Trowel able Firestop Compound, Hilti FS 657 FIRE BLOCK, Hilti CP 620 Fire Foam

.5 Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate multiple steel and copper pipes.
- .1 Standard of Acceptance:
  - .1 Hilti FS 657 FIRE BLOCK

Fire Resistance Rating of Separation	**Required ULC or cUL "F" Rating of Firestopping Assembly**
30 minutes	20 minutes
45 minutes	45 minutes
1 hour	45 minutes

1.5 hours	1 hour
2 hours	1.5 hours
3 hours	2 hours
4 hours	3 hours

.6 For combustible pipe penetrations through a Fire Separation provide a firestop system with a "F" Rating as determined by ULC or cUL which is equal to the fire resistance rating of the construction being penetrated.

.7 For penetrations through a Fire Wall or horizontal Fire Separation provide a firestop system with a "FT" Rating as determined by ULC or cUL which is equal to the fire resistance rating of the construction being penetrated.

3 Execution

3.1 PREPARATION

.1 Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

.2 Verify penetrations are properly sized and in suitable condition for application of materials.

.3 Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.

.4 Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.

.5 Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.

.6 Do not proceed until unsatisfactory conditions have been corrected.

3.2 FIRE STOPPING

.1 Firestopping to include all Mechanical services including but not limited to the following:
  .1 PVC, cast iron or copper piping to floor drains above grade.

3.3 COORDINATION

.1 Coordinate location and proper selection of cast-in-place Firestop Devices with trade responsible for the work. Ensure device is installed before placement of concrete.

.2 Responsible trade to provide adequate spacing of field run pipes to allow for installation of cast-in-place firestop devices without interferences.

3.4 INSTALLATION

.1 Regulatory Requirements: Install firestop materials in accordance with ULC Fire Resistance Directory or UL Products Certified for Canada (cUL) Directory.

.2 Seal all holes or voids made by penetrations to ensure an air and water resistant seal.

.3 Consult with mechanical consultant, project manager and damper manufacturer prior to installation of ULC or cUL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.

.4 Protect materials from damage on surfaces subjected to traffic.

3.5 FIELD QUALITY CONTROL

.1 Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.

.2 Keep areas of work accessible until inspection by applicable code authorities.

.3 Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

.4 Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.

.5 Keep areas of work accessible until inspection by applicable code authorities.

.6 Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

.7 Install a warning card that is clearly visible adjacent to <u>all</u> openings. This card should contain the following information:

- .1 Warning that the opening has being fire stop protected
- .2 Indicate the fire stop system used (ULC or cUL)
- .3 F rating or FT rating
- .4 Fire stop product(s) used
- .5 Person to contact and phone number in case of modification or new penetration of fire stop system

3.6 FIRE STOPPING

.1 Firestopping to include all Mechanical services including but not limited to the following: PVC, cast iron or copper piping to floor drains above grade.

3.7 ADJUSTING AND CLEANING

.1 Remove equipment, materials and debris, leaving area in undamaged, clean condition.

.2 Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

END OF SECTION

1 General

1.1 GENERAL

The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

1.3 LEAD FREE

.1 In accordance with NSF/ANSI 372 Drinking water system components – Lead Content or California Health and Safety Code (Section 116875; commonly known as AB1953) or Vermont Bill S.152

2 Products

2.1 PIPING

.1 Domestic hot, tempered, cold and recirculation tubing, within building.
- .1 Above ground: copper tube, hard drawn, type L to ASTM B88.

2.2 FITTINGS FOR COPPER

.1 ASME/ANSI B16 Series

.2 Brass or bronze flanges and flanged fittings.

.3 Cast brass or bronze threaded fittings, Class 125 & 250.

.4 Cast bronze or wrought copper and bronze.
- .1 NPS 2 and under: Lead free solder to ASTM B32.
- .2 NPS 2 1/2 and over: Roll Grooved or Silfos.

.5 Press Fitting:
- .1 Copper and copper alloy press fittings conforming to material requirements of ASME B16.18 or ASME B16.22 and performance criteria of IAPMO PS 117.
- .2 EPDM sealing elements for press fittings.
- .3 Factory installed sealing elements.
- .4 Press ends with leakage path feature that assures leakage of liquids from inside the system past the sealing element of an unpressed connection. The function of this feature is to provide the installer quick and easy identification of connections which have not been pressed prior to putting the system into operation.
- .5 Acceptable Material: Viega Copper ProPress fittings.

2.3 JOINTS FOR COPPER

.1 Solder/brazing: lead free to ASTM B32.

.2 Press connections: Copper and copper alloy press connections in accordance with the manufacturer's installation instructions.

2.4 HANGERS AND SUPPORTS

.1 Support as per manufacturer's requirements and National Plumbing Code of Canada.

.2 Copper
.1 As per Section 23 05 29 Hangers and Supports.

2.5 VALVES

.1 As per Section 23 05 23 Valves.

2.6 INSULATION

.1 As per Section 23 07 00 Mechanical Thermal Insulation

3 Execution

3.1 INSTALLATION

.1 Connect to fixtures and equipment in accordance with manufacturer's instructions unless otherwise indicated.

.2 Install pipes close to building structure to minimize furring, conserve headroom and space. Run piping parallel to walls. Group piping wherever possible.

.3 Install groups of piping parallel to each other, spaced to permit application of insulation, identification, and service access, on individual hangers or trapeze hangers.

.4 Cut square, ream and clean tubing and tube ends, clean recesses of fittings and assemble without binding.

.5 Wipe all pipes of soldering flux as the joint is completed.

.6 Assemble all piping using fittings manufactured to ANSI standards.

.7 Install DCW piping below and away from DHW and DHWR and all other hot piping so as to maintain temperature of cold water as low as possible.

.8 Where pipe sizes differ from connection sizes of equipment, install reducing couplings close to equipment. Reducing bushings are not permitted.

.9 Lay copper tubing so that it is not in contact with dissimilar metal and will not be kinked or collapsed.

.10 Use non-corrosive lubricant or Teflon tape applied to male thread.

.11 Provide di-electric couplings wherever piping of dissimilar metals are joined.

.12 Install swing or swivel joints to connect risers to mains.

.13 Buried water tubing and buried trap priming tubing:
- .1 Refer to Division 33 for bedding.
- .2 Buried water tubing
  - .1 Sleeves to be PVC drainage pipe with two 45° elbows for bends. Sleeve to be continuous.
  - .2 Bend tubing without crimping or constriction. Minimize use of fittings.
- .3 Buried trap priming tubing:
  - .1 Direct bury continuous without joints.

3.2 PRESS CONNECTION INSTALLATION

.1 In accordance with the manufacturer's installation instructions.

.2 Fully inserted tubing into the fitting and the tubing marked at the shoulder of the fitting.

.3 Check the fitting alignment against the mark on the tubing to assure the tubing is fully engaged (inserted) in the fitting.

.4 Pressed the joints using the tool(s) approved by the manufacturer.

END OF SECTION

1 General

1.1 GENERAL

The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

1.3 LEAD FREE

.1 In accordance with NSF/ANSI 372 Drinking water system components – Lead Content or California Health and Safety Code (Section 116875; commonly known as AB1953) or Vermont Bill S.152

2 Products

2.1 BACK FLOW PREVENTERS

.1 CSA B64.4 Certified.

.2 Reduced pressure zone backflow preventer.
- .1 NPS 3/4 to 2.
  - .1 Lead Free
  - .2 Bronze body construction.
  - .3 Quarter turn ball valve shut-offs.
  - .4 Bronze ball valve test cocks.
  - .5 Replaceable seats.
  - .6 Soft seat check valve
  - .7 Air gap piped to drain.
  - .8 Acceptable Material:
    - .1 Watts LF009 QT with 909 AG and LF601 Maxi-flo check valve.
    - .2 Wilkins 975XL with AG and 40XL In-Line Check Valve
    - .3 Apollo 4ALF with AGD and 61-100/200 In-Line Check Valve

2.2 WATER MAKE-UP

.1 Pressure reducing valve type complete with integral strainer.
- .1 Acceptable Material:
  - .1 Apollo 36C
  - .2 Watts N256.

3 Execution

3.1 BACK FLOW PREVENTERS

.1 Pipe discharge to nearest drain.

3.2 WATER MAKE-UP ASSEMBLY

.1 Pipe relief valve to nearest drain.

END OF SECTION

1 General

1.1 GENERAL

The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

2 Products

2.1 PIPE GUIDES

.1 Carbon steel guiding cylinder with base.

.2 Carbon steel fabricated spider.

.3 Allowable movement 100 mm (4").

.4 Acceptable Material:
- .1 Flexonics Pipe Alignment Guide.
- .2 Myatt 1267.
- .3 Anvil 256.
- .4 Keflex Series P.
- .5 Advanced Thermal Systems, Inc. Model GA.
- .6 Flex-Hose
- .7 MDC (Railmex).

2.2 PIPE ANCHORS

.1 Fabricated from angle iron sections and fastened to building structure.

2.3 FLEXIBLE HOSES

.1 Inner hose: stainless steel corrugated.

.2 Braided wire mesh stainless steel outer jacket.

.3 Size and end connection: line size.

.4 Complete unit suitable for working pressure of 1035 kPa (150 psi) and working temperature of 93° C.

.5 Capacity to absorb 150 mm (6") transverse movement with length across flexible portion not less than six diameters. Maximum length of hose: 600 mm (24").

.6 Acceptable Material:
- .1 Flexonics BS Flex-Con.
- .2 United Flexible PC.

.3 Keflex KFCS.
.4 Flex-Hose
.5 MDC (Railmex)

2.4 FLEXIBLE HOSE LOOP

.1 Consist of two equal lengths minimum 300 mm long (12") live length flexible hoses and four elbows

.2 Inner hose: stainless steel corrugated.

.3 Braided wire mesh stainless steel outer jacket.

.4 Line size.

.5 Complete unit suitable for working pressure of 1035 kPa (150 psi) and working temperature of 93° C.

.6 Capacity to absorb +/- 50 mm of axial movement.

.7 Standard of Acceptance:
.1 Flexonics BS series

.8 Acceptable Manufacturers:
.1 Flexonics
.2 United Flexible
.3 Keflex.
.4 MDC (Railmex)
.5 Flex-Hose Tri-Flex Loop.

3 Execution

3.1 PIPE GUIDES

.1 Expansion compensator or pipe expansion loop
.1 First unit at 4 pipe diameters from expansion compensator or loop.
.2 Second unit at 14 pipe diameters from first unit.

.2 Flexible hose loop
.1 First unit at 4 pipe diameters from expansion compensator or loop.

END OF SECTION

1 General

1.1 GENERAL

The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

2 Products

2.1 GENERAL

.1 Design point to be midpoint of scale or range.

.2 Dual Scale:
- .1 Water and Glycol Thermometers: 0 to 115° C, 30° to 240° F.
- .2 Pressure Gauges:
  - .1 Domestic water 0 to 700 kPa, 0 to 100 psi.
  - .2 Hydronic 0-400 kPa, 0 to 60 psi.

.3 Direct Reading Thermometers
- .1 Industrial variable angle type 225 mm (9") scale length.
- .2 Liquid filled or Solar powered
- .3 Aluminum case

.4 Thermometer Wells
- .1 Copper pipe: use copper or bronze. For steel pipe use stainless steel.
- .2 Steel Pipe:
  - .1 Open systems use stainless steel.
  - .2 Closed systems use brass.

.5 Pressure Gauges
- .1 100 mm (4 1/2") dial type: liquid filled having 1% accuracy unless otherwise specified.
- .2 Provide gauge cock. Ball valve in accordance with Section 23 05 23 Valves

.6 Acceptable Material

	Direct Reading Thermometers	**Pressure Gauges**
Trerice	BX 9140 or SX9140305	700 LFB
Weiss	A9VS9	NF4S-1
Winters	9IT with Aluminum case	100-4G
Weksler	EG5H-9 with Aluminum Case	EA14

3 Execution

3.1 GENERAL

.1 Provide thermometers and gauges so they can be easily read from floor or platform. If this cannot be accomplished, install remote reading thermometers and gauges.

.2 Provide between equipment and first fitting or valve.

.3 Increase pipe size at well to minimum NPS 2 to accommodate well.

.4 Well to extend 6 mm to 12 mm into the pipe.

3.2 DIRECT READING THERMOMETERS

.1 Provide in wells on all piping. Provide heat conductive material inside well.

.2 Provide in the following locations:
- .1 Heat exchangers inlets and outlets.
- .2 Programmed water control valves outlet.
- .3 In other locations as indicated.

.3 Use extensions where thermometers are installed through insulation.

3.3 PRESSURE GAUGES

.1 Provide in following locations:
- .1 Suction and discharge of pumps and circulators over 373 kW (1/2 hp).
- .2 For heating coils in air handling units, at inlet of coil pump, at outlet of coil pump and at outlet of coil
- .3 In other locations as indicated.

.2 Use extensions where pressure gauges are installed through insulation.

END OF SECTION

1.1 GENERAL

The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

1.3 MANUFACTURED ITEMS

.1 All valves of one type to be by one manufacturer.

2 Products

2.1 VALVES NPS 2 AND UNDER

.1 Lead Free Ball Valves NPS 2 and under soldered and screwed:
- .1 Application
  - .1 Section 22 11 16 Domestic Water Piping
  - .2 Section 23 21 13 Hydronic Systems
  - .3 Section 23 11 13 Oil Piping and Storage Tank.
- .2 Quarter-turn: 4130 kPa (600 psi) W.O.G., bronze, large port.

.2 Lead Free Swing Check Valves NPS 2 and under, soldered and screwed:
- .1 Application
  - .1 Section 22 11 16 Domestic Water Piping
  - .2 Section 23 21 13 Hydronic Systems
- .2 1380 kPa (200 psi) W.O.G., bronze body, bronze swing disc, screw in cap, regrindable seat.

.3 Swing Check Valves NPS 2 and under, screwed:
- .1 Application
  - .1 Section 23 11 13 Oil Piping and Storage Tank.
  - .2 Condensate
- .2 1380 kPa (200 psi) W.O.G., bronze body, bronze swing disc, screw in cap, regrindable seat.

.4 Acceptable material:

NPS 2 and under	Lead Free Ball	Lead Free Check
Apollo	77CLF-100/77CLF-200	161S-LF/161T-LF
Crane	LF9201/LF9202	LF37/LF1340
Milwaukee	UPBA150/ UPBA100	UP1509/UP509
Apollo	77CLF-100/77CLF-200	161S-LF/161T-LF
Nibco	S-685-80-LF /T -685-80-LF	S-413-Y-LF / T-413-Y-LF
Kitz	868/869	822T/823T
Watts	LFB6080/ LFB6081	LFCV/LFCVS

2.2 VALVES NPS 2 AND OVER FOR HYDRONIC

.1 Gate Valves NPS 2 1/2 and over, flanged
- .1 Application
  - .1 Section 23 21 13 Hydronic Systems
- .2 Rising stem: class 125, 1380 kPa (200 psi) W.O.G., FF flange, cast-iron body, OS&Y bronze trim.

.2 Check Valves NPS 2-1/2 and up, flanged:
- .1 Application
  - .1 Section 23 21 13 Hydronic Systems
  - .2 Condensate
- .2 Class 125, 1380 kPa (200psi) W.O.G., cast iron body, FF flange, renewable seat, bronze disc, bolted cap.

.3 NPS 2-1/2 to 10, lug wafer butterfly:
- .1 Application: Section 23 21 13 Hydronic Systems
- .2 200 CWP @ 93° C, cast iron body with uncoated bronze disc and 316 stainless steel stem, replaceable EPDM seat, locking handle, gear operators NPS 6 and over.

.4 Acceptable material:

NPS 2-1/2 and up Flanged	**Cast Iron Gate**	**Check**	**Lug Wafer Butterfly**
Crane Canada Inc.	465 1/2	373	44-BSZ-L/G
Jenkins Valves 92 Inc.	454J	587J	2231-ELJ/GJ
Kitz	72	78	6122EL/G
Red-White/Toyo	421 A	435A	
Milwaukee	F-2885-M	F2974M	CL2/3-24E L/G
Newman Hattersley	T504	T651	Series 45-313321/2
Nibco	FE-617-0	FE918B	LC2008-3/5
Bray	-	-	34-01/04
Keystone	-	-	F1020 CBE2

2.3 GROOVED END VALVES NPS 2 AND OVER FOR HYDRONIC

.1 Check Valves NPS 2 ½ to 4 for grooved end pipe:
- .1 Class 125, 860 kPa (125 psi), ductile iron body, stainless steel discs, stainless steel spring, stainless steel shaft, EPDM seat.

.2 Butterfly Valves NPS 2-1/2 and over grooved end body:
- .1 Housing: Ductile iron conforming to ASTM A-536, grade 65-45-12 or ASTM A-395, grade 65-45-15
- .2 Body: Carbon steel, electroplated
- .3 Seat/Liner: Grade “E” EPDM. Temperature range –34° C to +110° C.
- .4 ANSI/NSF 61 for cold +86°F/+30°C and hot 180°F/+82°C potable water service.
- .5 Stem-Upper/Lower: 416 stainless steel
- .6 Disc: Aluminum bronze
- .7 Locking handle, gear operators NPS 6 and over.

.3 Acceptable material:

NPS 2-1/2 and up Grooved	Check	Butterfly
Victaulic	Vic 716	Vic 300 MasterSeal
Anvil	7800	Series 7600
Nibco	-	GD-4765-3/5

2.4 DRAIN VALVES AND GAUGE COCKS

.1 Lead Free Drain Valves
- .1 Locate at low points of mains, branches and risers.
- .2 At domestic water branch isolation valves, provide drain unless branch can be drained through a fixture.
- .3 At hydronic branch isolation valves, provide drain unless branch can be drained through a hydronic unit.
- .4 At pumps locate drain between pump and suction diffuser. Don't use suction diffuser drain plug.
- .5 Equipment drain valves line size.
- .6 Minimum NPS 1/2 unless otherwise specified.
- .7 Ball valve with hose end male thread and cap with chain.

.2 Lead Free Gauge Cocks
- .1 NPS 1/4 screwed.
  - .1 Application
    - .1 Pressure Gauge
    - .2 Air vents
    - .3 Where indicated
- .2 Quarter-turn: 1725 kPa (250 psi) W.O.G., bronze.

.3 Acceptable material:

	Drain valves	Gauge Cocks
Apollo	77CLF-100-HC/77CLF-200-HC	77CLF-100/77CLF-200
Kitz	868/869 w/cap and chain.	868/869
Nibco	S-685-80-LF-HC /T -685-80-LF-HC	S-685-80-LF /T -685-80-LF
Watts	LFB6080/ LFB6081 w/cap and chain	LFB6080/ LFB6081
Milwaukee	UPBA150/ UPBA100 w/cap and chain	UP1509/UP509

2.5 CIRCUIT BALANCING VALVE

.1 Hydronic and Domestic Hot Water:
- .1 Lead Free
- .2 Y style globe valve, designed to provide precise flow measurement and control, with valved ports for connected to differential pressure meter.
- .3 Accuracy: Readout to be within plus or minus 2% of actual flow at design flow rate.
- .4 Flow control: At least four (4) full turns of handwheel with digital handwheel and tamperproof concealed mechanical memory.
- .5 Positive shut-off.
- .6 Memory stop.
- .7 Connections:
  - .1 Screwed or soldered: NPS ½ and NPS ¾
  - .2 Screwed: NPS 1 to NPS 2.
  - .3 Flanged or Grooved: NPS 2 1/2 and over.

.8 Standard of Acceptance:
- .1 S. A. Armstrong CBV.
  - .1 NPS ½ LF for 0.03 to 0.125 l/s (0.5 to 2.0 USgpm)
  - .2 NPS ¾ LF for 0.03 to 0.19 l/s (0.5 to 3.0 USgpm)
  - .3 Standard CBV for other flows

.9 Acceptable Material:
- .1 Hattersley 1710 and 737
- .2 Tour and Anderson STA-D/F.
- .3 Anvil Series GBV
- .4 Oventrop Hydrocontrol 106 Series
- .5 Victaulic 78 Series

2.6 STEAM & CONDENSATE

.1 NPS 2 and under, screwed gate:
- .1 Rising stem: Class 150, 1035 kPa (150 psi), steam, bronze body, solid wedge disc.
- .2 Acceptable Material:

.1	Crane Canada Inc.	431
.2	Jenkins Valves 92 Inc.	2810J
.3	Kitz	42
.4	Red-White/Toyo	298
.5	Milwaukee	1150
.6	Newman Hattersley	T607M
.7	Nibco	T-134

.2 NPS 2-1/2 and over, flanged gate:
- .1 Rising stem: Class 250, FF flange, cast-iron body, OS&Y bronze trim.
- .2 Acceptable Material:

.1	Crane Canada Inc.	7 1/2E
.2	Jenkins Valves 92 Inc.	204J
.3	Milwaukee	F-2894-M
.4	Newman Hattersley	C1482
.5	Nibco	F-667-0

.3 NPS 2 and under, screwed globe:
- .1 Class 150, 1035 kPa (150 psi) steam, bronze body, screwed over bonnet, renewable composition disc.
- .2 Acceptable Material:

.1	Crane Canada Inc.	14 1/2 P
.2	Jenkins Valves 92 Inc.	2032.
.3	Kitz	09
.4	Red-White/Toyo	221
.5	Milwaukee	591A
.6	Newman Hattersley	A50M
.7	Nibco	T-235-Y

.4 NPS 2 and under, screwed check:
- .1 Class 150, 1035 kPa (150 psi) steam, GFDS bronze body, bronze swing check, screw in cap, regrindable seat.
- .2 Acceptable Material:

.1	Crane Canada Inc.	137
.2	Jenkins Valves 92	4092J

.3	Kitz	29
.4	Red-White/Toyo	238
.5	Milwaukee	508
.6	Newman Hattersley	A60M
.7	Nibco	T-433-B

.5 NPS 2-1/2 and up, flanged check:

.1 Class 250, cast iron body, FF flange, renewable seat, bronze disc, bolted cap.

.2 Acceptable Material:

.1	Crane Canada Inc.	39E
.2	Jenkins Valves 92 Inc.	339RJ
.3	Milwaukee	F2970
.4	Newman Hattersley	C1982
.5	Nibco	F-968-B

3 Execution

3.1 GENERAL

.1 Install valves with stems upright or horizontal unless approved otherwise.

.2 Line size.

3.2 CIRCUIT BALANCING VALVES

.1 Maintain Manufacturer's recommended minimum straight pipe diameters.

END OF SECTION

1 General

1.1 GENERAL

The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

2 Products

2.1 GENERAL

.1 Support from structural members. Where structural bearing does not exist or inserts are not in suitable locations, provide supplementary structural steel members.

2.2 UPPER ATTACHMENTS

.1 Concrete:
- .1 Inserts for cast-in-place concrete: galvanized steel wedge to MSS-SP-58, type 18. ULC listed for pipe NPS 3/4 through NPS 8.

2.3 MIDDLE ATTACHMENT (ROD)

.1 Cadmium plated steel threaded rod:
- .1 Acceptable Material:
  - .1 Carpenter & Paterson Pipe Hangers Ltd. Fig. 94.
  - .2 CCTF/Hunt Fig. 99P.
  - .3 Anvil Fig. 146.

2.4 PIPE ATTACHMENT

.1 Protecting Shield:
- .1 Minimum 1.3 x 300 mm (18 Ga. x 12”) long for NPS 6 and under.
- .2 Minimum 1.6 x 450 mm (16 Ga. x 18") long for over NPS 6.
- .3 Shop fabricated or as per table below

.2 Adjustable clevis hanger: to MSS-SP69, type 1, ULC listed.

.3 Long adjustable clevis hanger: to MSS-SP69, Type 1 ULC listed.

.4 Copper plated or epoxy coated adjustable clevis hanger:

.5 Adjustable steel yoke pipe roll: to MSS-SP69, Type 43.

.6 Adjustable clevis hanger for cast iron pipe:
- .1 Application: Insulated and uninsulated cast iron pipe. All sizes.

.7 Black carbon steel riser clamp to MSS-SP69, Type 8, ULC listed.
.1 Application: Steel pipes and Cast iron pipe.

.8 Copper plated carbon steel to MSS-SP69, Type 8, ULC listed:
.1 Application: Copper pipes.

.9 Acceptable material:

	CCTF/ Hunt	**E. Myatt & Co**	**Taylor Pipe Supports**	**Anvil**	**Carpenter and Paterson Pipe Hangers Ltd.**
Protecting Shield	102		69H	167	
Protection Saddle	71	210 to 240	70 to 75	160 to 166	351 to 356
Adjustable clevis hanger	32N	124	24Z	260	100
Long adjustable clevis hanger	32U	124L	24L	300	286
Copper plated or epoxy coated clevis hanger	30C/E	151CT or 56	52	CT65	100CT
Adjustable steel yoke pipe roll	3436	258	93	181	140
Clevis hanger for cast iron pipe	33AC	126	27AC	590	
Black carbon steel riser clamp	40	183	82	261	126
Copper plated riser clamp	42C	150CT	85	CT121	126CT

.10 Double hook with double locking nut.
.1 Application: Insulated and uninsulated cast iron pipe: NPS 6 and under.
.2 Acceptable Material:
.1 Bibby Ste. Croix 6602 to 6606

3 Execution

3.1 PIPE SUPPORT SPACING

.1 Plumbing and Hydronic: Spacing and middle attachment (rod) diameter as specified in paragraphs below or as in table below, whichever is more stringent
.1 Plumbing piping: to National Plumbing Code of Canada.
.2 Authority having jurisdiction.
.3 Flexible joint roll groove pipe: in accordance with table below, but not less than one hanger at joints and not less than one hanger per pipe length over 1200 mm (4’0”).
.4 Within 300 mm (12") of each elbow.
.5 Risers at each floor.
.6 Minimum hanger rod size as per full size manufacturer's recommendation and table below, whichever is greater.

Pipe Size: NPS	**Rod Diameter**	**Maximum Spacing Steel**	**Maximum Spacing Copper**
up to ¾	10 mm (3/8")	2100 mm (7’0”)	1500 mm (5’0”)
1 to 1-1/4	10 mm (3/8")	2100 mm (7’0”)	1800 mm (6’0”)
1-1/2	10 mm (3/8")	2750 mm (9’0”)	2400 mm (8’0”)
2	10 mm (3/8")	3000 mm (10’0”)	2750 mm (9’0”)
2-1/2	10 mm (3/8")	3350 mm (11’0”)	3000 mm (9’10”)
3	13 mm (1/2")	3650 mm (12’0”)	3000 mm (9’10”)
4	13 mm (1/2")	4250 mm (14’0”)	3000 mm (9’10”)
6	20 mm (3/4")	4570 mm (15’0”)	3000 mm (9’10”)
Over 8	22 mm (7/8")	4570 mm (15’0”)	3000 mm (9’10”)

Pipe Size: NPS	Rod Diameter	Maximum Spacing Cast Iron	Maximum Spacing PVC
Up to 4	10 mm (3/8")	3000 mm (9'10")	1200 mm (4'0")
Over 4	13 mm (1/2")	3000 mm (9'10")	1200 mm (4'0")

.2 At Steel Joists
- .1 Locate hangers at panel points of OWSJ for piping perpendicular to OWSJ.
- .2 Locate steel support members at panel points of OWSJ for piping parallel to OWSJ.
- .3 For parallel runs of piping NPS 2 ½ and over.
  - .1 Where perpendicular to OWSJ support on alternating OWSJ.

3.2 PLUMBING AND HYDRONIC PIPE ATTACHEMENT APPLICATIONS

.1 Upper Attachment as noted above.

.2 Middle attachment as noted above.

.3 Pipe Attachment Application
- .1 Uninsulated steel pipe: All sizes.
  - .1 Adjustable clevis hanger.
- .2 Hot insulated steel pipe: NPS 4 and under.
  - .1 Long adjustable clevis hanger.
- .3 Hot insulated steel pipe: over NPS 4.
  - .1 Adjustable clevis hanger with protection saddle: Over NPS 4 with less than 25 mm (1") horizontal movement and with more than 300 mm (12") middle attachment (rod) length.
  - .2 Adjustable steel yoke pipe roll with protection saddle: Over NPS 4 with horizontal movement in excess of 25 mm (1") and with middle attachment rod 300 mm (12") or less.
  - .3 Insulate between saddle and pipe.
- .4 Uninsulated copper pipe: All sizes.
  - .1 Copper plated or epoxy coated adjustable clevis hanger.
- .5 Hot Insulated plumbing copper pipe: All sizes
  - .1 Copper plated or epoxy coated adjustable clevis hanger.
- .6 Cold Insulated plumbing copper pipe: NPS 1 ¼ and under.
  - .1 Copper plated or epoxy coated adjustable clevis hanger.
- .7 Cold insulated plumbing copper pipe: NPS 1 ½ and over.
  - .1 Adjustable clevis hanger with protection shield and P-5 insulation (Section 23 07 00) between shield and pipe.
- .8 PVC: All sizes.
  - .1 Adjustable clevis hanger.

3.3 MIDDLE ATTACHMENT (ROD)

.1 Trim excess threaded rod off within 13 mm (1/2") of attachment nut.

3.4 HANGER INSTALLATION

.1 Offset hanger so that rod is vertical in operating position.

.2 Adjust hangers to equalize load.

.3 Provide double nuts at middle attachment (rod) top and bottom.

.4 Where building structural members or inserts are not suitably located provide supplementary steel channels or angles, support these channels and angles only from the top of structural members. Drill holes in the channels and angles for insertion of hanger rods. If the holes are cut out with a torch, provide a back-up steel plates with drilled holes for inserting hanger rods. Secure each hanger rod to the channels and angles using a steel back-up plate where applicable and steel washers and a lock-nut system. All channels, angles and hanger rod upper supports shall have a load capacity of five (5) times the load to be supported from them.

END OF SECTION

1 General

1.1 GENERAL

The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

2 Products

2.1 MANUFACTURERS NAMEPLATES

.1 Provide metal nameplate on each piece of equipment, mechanically fastened complete with raised or recessed letters. Locate nameplates so that they are easily read. Do not insulate or paint over nameplates.

.2 Include registration plates (e.g. Pressure vessel, Underwriters' Laboratories and CSA Approval). Indicate size, equipment model, manufacturer's name, serial number, voltage, cycle, phase and power of motors.

2.2 SYSTEM NAMEPLATES

.1 Color:
- .1 Hazardous: white letters, red background
- .2 Elsewhere: black letters, white background (except where required otherwise by applicable codes).

.2 Construction:
- .1 2.4 mm (3/32") thick, laminated plastic or white anodized aluminum, matte finish, square corners, letters accurately aligned and machine engraved into core.

.3 Minimum Sizes:
- .1 Conform to following table:

Size 1	10 mm x 50 mm (3/8" x 2")	1 line	5 mm (0.2") high letters
Size 3	16 mm x 75 mm (3/4" x 3")	2 line	5 mm (0.2") high letters
Size 7	25 mm x 100 mm (1" x 4")	2 line	6 mm (1/4") high letters
Size 8	50 mm x 150 mm (2" x 6")	2 line	13 mm (1/2") high letters

- .2 Equipment type, number and service or area or zone of building it serves to be identified.
- .3 Use average of 25 letters/numbers (maximum) per nameplate.
- .4 Use Size 1.
  - .1 Control Components.
- .5 Use Size 3.
  - .1 Inline circulators.
  - .2 Backflow preventers
  - .3 Motorized valves

.6 Use Size 7.
- .1 Control panels.
- .2 Junction boxes.
- .3 Relay panels.

.7 Use Size 8.
- .1 Boilers.

.4 Mechanically fasten nameplates.

.5 Sequential number all Fire Dampers (FD-1, FD-2, etc.). Record sequential number on Fire Damper Chart.

.6 Sequential number all terminal units (TU-1, TU-2, etc.) and reheat coils (RH-1, RH-2, etc.). Record sequential number on as built drawings.
- .1 Coordinate numbering with control's contractor

2.3 PIPE IDENTIFICATION

.1 General: Identify medium by lettered legend, classification by primary and secondary colors, direction of flow by arrows.

.2 Primary color bands: 50 mm (2") wide.

.3 Secondary color bands: 50 mm (2") wide, 75 mm (3") in from one end of primary color band.

.4 Legend: block capitals to following table:

Outside Diameter of Pipe or Insulation	**Size of Letters**
Up to 1 1/4"	1/2"
1 1/2" to 2"	3/4"
2 1/2" to 6"	1 1/2"
Over 6"	2"

Outside Diameter of Pipe or Insulation	**Size of Letters**
Up to 30 mm	13 mm
38 mm to 50mm	20 mm
63 mm to 150 mm	38 mm
Over 150 mm	50 mm

.5 Arrows:
- .1 Outside diameter of pipe/insulation 75 mm (3") and greater: 150 mm long x 50 mm high. (6" long x 2" high.)
- .2 Outside diameter of pipe/insulation less than 75 mm (3"): 100 mm long x 50 high (4" long x 2" high.)
  - .1 Use double headed arrows where flow is reversible.

.6 Material:
- .1 Paint for Stencil: Low VOC and environmentally friendly
- .2 Color bands:
  - .1 Plastic coated cloth material with protective overcoating and waterproof contact adhesive undercoating, suitable for 100% RH and continuous operating temperature of 150° C and intermittent temperature of 200° C. Apply to prepared surfaces. Wrap tape around pipe or pipe covering with ends overlapping one (1) pipe diameter. Cut band to length, don't tear off.
  - .2 Acceptable Manufacturer:
    - .1 WH Brady Inc.
    - .2 Seton Name Plate Corp.

.7 Colors:
- .1 Where not covered by table below, submit legend, primary and secondary classification colors to Consultant for approval.

.8 Table: Pipe and valve identification.

Pipe Marker Legend	Valve Legend	Tag Primary Color	Secondary Color
Dom. Cold Water	DCW	Green	None
Vent (plumbing) -		Green	None
Fuel Oil #2	FO#2	Yellow	Orange
Hot Water Heating Supply	HWS	Yellow	Black
Hot Water Heating Return	HWR	Yellow	Black
Condensate Return	CR	Yellow	Black
Steam (Indicate Pressure)	S (PSI)	Yellow	Black

.9 Legend and arrows:
- .1 Black or white to contrast with primary color.

.10 Heating: Label zones.

2.4 VALVE TAGS

.1 38 mm (1 1/2") square laminated plastic with corner hole.

.2 Horizontal 13 mm (1/2") letters accurately aligned and machine engraved into core.

.3 Face color to match primary color of piping identification.

.4 Core color to match secondary color of piping identification.

2.5 BALANCING DAMPER

.1 Paint the balancing damper handles where concealed.

2.6 ELECTRICAL COMPONENTS SUPPLIED BY DIVISION 20 TO 25

.1 Identify electrically fed equipment supplied by Division 25 as per Section 25 05 03 BAS Identification.

2.7 WARNING SIGNS

.1 Equipment (e.g. motors, starters) under remote automatic control: provide orange colored signs warning of automatic starting under control of BAS.

.2 Sign to read: "Caution: This equipment is under automatic remote control of BAS" or equivalent to Consultant's approval.

3 Execution

3.1 GENERAL

.1 Provide ULC and CSA registration plates as required by Respective agency.

3.2 MANUFACTURERS NAMEPLATES

.1 Locate nameplates so that they are easily read.

.2 Do not insulate or paint over plates.

3.3 SYSTEM NAMEPLATES

.1 In conspicuous location to facilitate easy reading from operating floor to properly identify equipment and/or system.

.2 Provide stand-offs for nameplates on hot surfaces and insulated surfaces.

3.4 LOCATION OF PIPING AND DUCTWORK IDENTIFICATION

.1 On long straight runs in open areas in boiler rooms and equipment rooms, so that at least one is clearly visible from any one viewpoint in operating areas or walking isles and not at more than 50' intervals.

.2 In addition to above, label Non Potable Cold Water not at not more than 7.5 meter (25') intervals.

.3 Adjacent to all changes in direction.

.4 At least once in each small room through which piping passes.

.5 Both sides of visual obstruction or where run is difficult to follow.

.6 On both sides of any separation such as walls, floors and partitions.

.7 Where piping or ductwork is concealed in service chase, or other confined space, at entry and leaving points and adjacent to each access opening and not more than 15 meter (50') intervals.

.8 At beginning and end points of each run and at each piece of equipment in run.

.9 At point immediately upstream of major manually operated or automatically controlled valves or damper. Where this is not possible, place identification as close to valve or damper as possible, preferably on upstream side.

.10 Legend to be easily and accurately readable from usual operating areas and all readily accessible points.

.11 Plane of legend to be approximately at right angles to most convenient line of sight with consideration of operating positions, lighting conditions, reduced visibility of color or legends caused by dust and dirt and risk of physical damage.

.12 Stencil over final finish only.

.13 Beside each access door.

3.5 VALVE TAGS

.1 Secure tags to valve handle with non-ferrous chains or closed "S" hooks for valves except at plumbing fixtures and radiation.

.2 Provide one copy of valve schedule mounted in frame with non-glare glass where directed by Consultant. Provide one copy in each operating and maintenance instruction manual.

.3 Consecutively number valves in system.

3.6 DUCTWORK & PIPING

.1 In finished public areas where piping and ductwork are exposed (such as, Gym) ductwork and piping does not require identification.

END OF SECTION

1 General

1.1 GENERAL

The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

1.3 DEFINITIONS

.1 Refer to Section 20 05 01 Mechanical General Requirements.

.2 Legend
- .1 ASJ: All Service Jacket
- .2 SSL: Self-Sealing Lap
- .3 FSK: Foil-Scrim-Kraft; jacketing
- .4 PSK: Poly-Scrim-Kraft; jacketing
- .5 PVC: Polyvinyl Chloride

1.4 ENVIRONMENTAL REQUIREMENTS

.1 Maintain ambient conditions required by manufacturers of tapes, adhesives, mastics, cements and insulation materials.

.2 Follow manufacturer's recommended handling practices.

2 Products

2.1 GENERAL

.1 Components of insulation system to have maximum flame spread rating of 25 and maximum smoke developed rating of 50 in accordance with CAN/ULC-S102.

.2 Materials to be tested in accordance with ASTM C411.

2.2 PIPE INSULATION

.1 P-2 Formed Mineral Fiber with ASJ Vapour Barrier to 454° C
- .1 Application for piping, valves and fittings on:
  - .1 Domestic water piping
  - .2 Hydronic piping
  - .3 Steam.
  - .4 Condensate.
  - .5 Where indicated.
- .2 Material:
  - .1 CAN/CGSB 51.9 Mineral Fiber Thermal Insulation for Piping
  - .2 CGSB 51-GP-52 Vapour Barrier Jacket and Facing Material.
  - .3 Self-seal lap closure including ASJ butt strips.

.3 Thermal Conductivity "k" shall not exceed 0.034 W/m° C at 24° C mean temperature when tested in accordance with ASTM C335.
.4 Thickness:
.1 Domestic Cold Water and Non Potable Water
.1 13 mm (1/2") on NPS 1/2 pipe.
.2 25 mm (1") on NPS 3/4 and over.
.2 Hydronic: Interior of building
.1 25 mm (1") on NPS ¾ to NPS 2
.2 38 mm (1 ½") on NP NPS 2 1/2 and over.
.3 Steam:
.1 38 mm (1 ½") on NPS 2 and under pipe
.4 Condensate 38 mm (1 ½")
.5 All pipe insulation shall be by one manufacturer.
.6 Copper tube size for copper pipe.

.2 P-5 Insulation Support System
.1 Application at:
.1 Pipe Hangers.
.2 Thickness: As per adjacent insulation.
.3 Material for steel pipe NPS 6 and smaller:
.1 CAN/CGSB-51.2 Calcium Silicate Insulation.
.2 Buckaroo Insulation with ASJ Support System.
.4 Material for Steel Pipe NPS 8 and larger: Buckaroo Insulation Support System with ASJ.
.5 Material for Copper Pipe: Buckaroo Insulation Support System with ASJ.

.3 Acceptable Material:

	Owens-Corning	**Manson Insulation Inc.**	**Knauf Fiber Glass**	**Johns Manville Insulations**
P-2	Fiberglas SSL-II	Alley K-APT	ASJ-SSL	Micro Lok AP-T
P-5	Calcium Silicate	Calmax	Temperlite 1200	Thermo-12/Blue

2.3 EQUIPMENT INSULATION

.1 E-7 Basalt Wool 0° C to 645° C
.1 Application:
.1 Breeching
.2 Diesel Generator exhaust pipe and muffler.
.3 Diesel Fire Pump exhaust pipe and muffler.
.2 Thickness: 50 mm (2").
.3 Materials: CAN/CGSB 51-9 Mineral Fiber Thermal Insulation for Piping
.4 Thermal Conductivity "k" shall not exceed 0.081 W/m° C at 315° C mean temperature when tested in accordance with ASTM C335
.5 Acceptable Material: Fibrex Insulation, Inc. Coreplus 1200 Pipe insulation and Fibrex Pipe and Tank Insulation.

2.4 FASTENINGS

.1 Tape: self-adhesive, 100 mm (4") wide. ULC labeled for less than 25 flame spread and less than 50 smoke developed.
.1 Standard of Acceptance:
.1 S. Fattal Insultape.

.2 Fire resistive lap seal adhesive: quick-setting for joints and lap sealing of vapour barriers.
.1 Standard of Acceptance:
.1 Monsey Bakor Inc. 230-39.

.3 Fire resistive lagging adhesive: for cementing canvas lagging cloths to pipe insulation.
.1 Standard of Acceptance:
.1 Monsey Bakor Inc. 120-09.

.4 Fire restrictive contact adhesive: quick setting.
.1 Standard of Acceptance:
.1 Monsey Bakor 230-38.

.5 Pins:
.1 Weld pins 4 mm (5/32") diameter, with 32 mm (1 1/4") diameter head for installation through the insulation. Length to suit thickness of insulation.
.2 Standard of Acceptance:
.1 Duro Dyne, Clip-Pin
.3 Weld pins 4 mm (5/32") diameter, for installation prior to applying insulation. Length to suit thickness of insulation. Nylon retain clips 32 mm (1 1/4") round.
.4 Standard of Acceptance:
.1 Duro Dyne Spotter Pins with Spotter-Clips.

2.5 JACKETS

.1 Canvas.
.1 Plain weave, cotton fabric at 6.5 oz/yd² (220 g/m²).
.2 ULC label every 600 mm (2 ft.)
.3 Standard of Acceptance:
.1 S. Fattal Thermocanvas
.2 Application:
.1 Exposed insulated piping
.2 Steam Humidifier piping and elbows to Manifolds
.3 Heat exchanger.
.4 Air separator.
.5 Domestic hot water tanks.
.6 Exposed insulated ductwork

.2 PVC.
.1 CGSB 51-GP-53M PVC sheets.
.2 0.4 mm (0.015") thick minimum.
.3 Fitting covers, one piece, premoulded to match.
.4 Application on exposed insulated piping where noted below:
.1 Section 22 11 16 Domestic Water Piping for elbows and mechanical couplings only
.2 Section 22 13 17 Drainage Waste and Vent Piping for exposed RWL located within gym OWSJ.
.3 Section 23 21 13 Hydronic Systems for elbows and mechanical couplings only except humidification steam.
.5 Standard of Acceptance:
.1 Proto.
.2 The Sure-Fit System.
.3 Zeston 2000 PVC.

2.6 FINISHING CEMENT TO 450° C

.1 Thickness: 13mm (1/2").

.2 Applications:
- .1 Breechings.
- .2 Heat Exchangers.
- .3 Air Separators.
- .4 Domestic hot water tanks.

2.7 REMOVABLE PRE-FABRICATED INSULATION PADS

.1 Application:
- .1 Backflow preventers.
- .2 Circuit Balancing Valves over NPS 1
- .3 3 way control valves.
- .4 Flanged equipment connections
- .5 Valves and strainers over NPS 2.

.2 To permit periodic removal and replacement without damage to adjacent insulation.

3 Execution

3.1 APPLICATION

.1 Apply insulation after required tests have been completed and approved by Consultant.

.2 Verify that all piping, equipment, and ductwork are tested and approved prior to insulation installation.

.3 Verify that all surfaces are clean, dry and without foreign material before applying insulation materials.

.4 Surfaces shall be clean and dry when installed and during application of insulation and finishes.

.5 Apply insulation materials, accessories and finishes in accordance with manufacturer's recommendations and as specified herein.

.6 All surface finishes shall be extended in such a manner as to protect all raw edges, ends and surfaces of insulation.

.7 On piping with insulation and vapour barrier, maintain integrity of vapour barrier over full length of pipe without interruption at sleeves, fittings and supports.

.8 On ductwork with insulation and vapour barrier, maintain integrity of vapour barrier over full length of duct or surface, without penetration for hangers, standing duct seams and without interruption at sleeves. Do not break continuity of insulation vapour barrier with hangers or rods. Insulate strap hangers 100 mm (4”) beyond insulated duct.

.9 On equipment with insulation and vapour barrier, maintain integrity of vapour barrier over full length without interruption at sleeves, fittings and supports.

3.2 PIPE INSULATION INSTALLATION

.1 Performed: sectional up to NPS 12, sectional or curved segmented above NPS 12.

.2 Multi-layered: staggered butt joint construction.

.3 Vertical pipe over NPS 3: insulation supports welded or bolted to pipe directly above lowest pipe fitting. Thereafter, locate on 15' centers.

.4 Expansion joints in insulation: terminate single layer and each layer of multiple layers in straight cut at intervals recommended by manufacturer. Leave void of 25 mm (1”) between terminations. Pack void tightly with P-3 flexible mineral insulation.

.5 Seal and finish exposed ends and other terminations with insulating cement.

.6 Insulation on roof drain body to be held in place with 100% coverage of adhesive. If the Roof Drain Body above the roof deck foam in place the cavity around the body.

.7 Provide P-5 insulation at pipe shields. Refer to Section 23 05 29 Hangers and Supports.

.8 Expansion joints in piping: provide for adequate movement of expansion joint without damage to insulator or finishes.

.9 Insulation is not required for:
- .1 Chrome plated piping, valves and fittings.

.10 Insulation on heating pipes to up fed radiation to terminate below floor.

.11 Fastenings
- .1 Secure pipe insulation by tape at each end and center of each section, but not greater than 900 mm (36") on centers.

.12 On exterior piping, provide weather barrier membrane.

3.3 EQUIPMENT INSULATION INSTALLATION

.1 Insulation supports where welding or bolting is permitted:
- .1 Angle anchors: weld or bolt to equipment at lowest point of insulation. Thereafter, locate every 4500 mm (15') vertically.
- .2 Welded steel clips: at 200 mm (8") maximum on centers, but not less than 2 rows per side.

.2 Multi-layered: staggered butt joints and expansion joints in insulation, secured with wire or bands at 400 mm (16") on center intervals.

.3 Expansion joints in insulation: leave 25 mm (1”) space in each layer at 6000 mm (20') intervals. Pack space tightly with mineral fiber.

.4 Insulation at bolts, studs, nuts, instrumentation: bevel to permit removal without damage to insulation or finish.

.5 Fastenings: secure insulation with stainless steel wire at 900 mm (36") on center before application of finishing cement.

.6 Vapour barriers: adhere and seal with vapour seal adhesive.

.7 Finishes:
- .1 Cement: apply over insulation in two 6 mm (1/4") thick layers, reinforced by 25 mm (1”) mesh stainless steel wire netting.
- .2 Canvas: sewn and pasted on to all insulation and over cement finishes. Seams inconspicuously placed.
- .3 Metal Jacket:
  - .1 Apply over insulation in lieu of cement finish where specified.
  - .2 Apply over insulation in lieu of canvas finish where specified.

.8 Final surface: to be clean, smooth, ready for painting.

3.4 SPECIAL REQUIREMENTS

.1 Breechings: weld steel clips and/or angle anchors. Stretch 25 mm (1”) mesh stainless steel wire over insulation, anchor to wire or bands. Finish with finishing cement jacket with canvas or aluminum.

END OF SECTION

1 General

1.1 GENERAL

The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

2 Products

2.1 CARRIER PIPE

.1 Steel: to ASTM A53, Grade B, Schedule 40.

2.2 JOINTING MATERIAL FOR CARRIER PIPE

.1 Socket Weld fittings.

2.3 FITTINGS

.1 Steel
- .1 Socket weld: butt-welding to ANSI/ASME-B16.9.
- .2 Unions: malleable iron, brass to iron, ground seat, screwed, to ASTM A47M.
- .3 Nipples: Schedule 40, to ASTM A53.

2.4 VALVES

.1 As per Section 23 05 23 Valves.

2.5 OIL FILTER

.1 Replaceable cartridge type as recommended by oil burner manufacturer.

.2 Furnish spare filter cartridge.

3 Execution

3.1 PIPING

.1 Install oil piping system in accordance with CAN/CSA-B139 and CAN/CSA-B140.0

.2 Assemble piping using fittings manufactured to ANSI standards.

.3 Slope piping down in direction of storage tank unless otherwise indicated.

.4 Use eccentric reducers at pipe size change installed to provide positive drainage.

.5 Provide clearance for access and maintenance of equipment, valves and fittings.

.6 Ream pipes, clean scale and dirt, inside and out.

.7 Suction and return piping inside building:
- .1 Steel except at burner.
- .2 Install filter, fusible link valve, union, and gate valve on the suction and check valve and union on the return at each burner.
- .3 Where suction line enters building, install union, isolation valve, anti-siphon device and cap (for priming purposes).

3.2 OIL FILTERS

.1 At time of acceptance, replace filter cartridge with new.

3.3 FIELD QUALITY CONTROL

.1 Test system in accordance with CAN/CSA-B139 and CAN/CSA-B140.0 and authorities having jurisdiction.

.2 Isolate tanks from piping pressure tests.

.3 Maintain test pressure during backfilling.

3.4 FLUSHING AND CLEANING

.1 Flush after pressure test with number 1 or number 2 fuel oil for a minimum of 2 h. Clean strainers and filters.

.2 Dispose of fuel oil used for flushing out in accordance with requirements of authority having jurisdiction.

END OF SECTION

1 General

1.1 GENERAL

The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

2 Products

2.1 PIPE, FITTINGS, COUPLINGS AND JOINTS

.1 ASME/ANSI B16 series

.2 Welded pipe and fitting connections where noted on drawing

.3 Steel Pipe to ASTM A-53/A-135 Grade B.
- .1 Application: Hydronic
- .2 NPS 2 and Smaller Pipe Joints:
  - .1 Schedule 40: Screwed or Roll Grooved Couplings.
- .3 NPS 2½ up to NPS 8 Pipe Joints:
  - .1 Schedule 40: Welded, Flanged, Roll Grooved Couplings.
- .4 NPS 8 and Larger Pipe Joints:
  - .1 Schedule 30/40: Welded, Flanged, Roll Grooved Couplings.
- .5 Screwed fittings with Teflon tape.
- .6 Flanges: plain or raised face.
- .7 Pipe fittings
  - .1 Screwed, flanged or welded: to ASME/ANSI B16 series
  - .2 Cast iron pipe flanges: Class 125.
  - .3 Malleable iron screwed fittings: Class 150.
  - .4 Steel pipe flanges and flanged fittings, Steel butt-welding fittings
  - .5 Unions, malleable iron
  - .6 Bolts and nuts: to ASME/ANSI B18.2.1 and ASME/ANSI B18.2.2.
  - .7 Cold Press Mechanical Joint Fitting:
    - .1 EPDM sealing elements for press fittings.
    - .2 Factory installed sealing elements.
    - .3 Press ends with leakage path feature that assures leakage of liquids from inside the system past the sealing element of an unpressed connection. The function of this feature is to provide the installer quick and easy identification of connections which have not been pressed prior to putting the system into operation.
    - .4 Acceptable Material: Viega MegaPress fittings with the Smart Connect feature

.4 Copper Tube: Type L hard drawn to ASTM B88M.
- .1 Pipe fittings
  - .1 Solder/brazing: lead free to ASTM B32.
  - .2 Brazed with Sil-Fos BCuP5: to ANSI/AWS A5.8.

.3 Cast bronze threaded fittings.
.4 Wrought copper and copper alloy solder joint pressure fittings.
.5 Cast copper alloy solder joint pressure fittings.
.6 Press Fitting:
  .1 Copper and copper alloy press fittings conforming to material requirements of ASME B16.18 or ASME B16.22 and performance criteria of IAPMO PS 117.
  .2 EPDM sealing elements for press fittings.
  .3 Factory installed sealing elements.
  .4 Press ends with leakage path feature that assures leakage of liquids from inside the system past the sealing element of an unpressed connection. The function of this feature is to provide the installer quick and easy identification of connections which have not been pressed prior to putting the system into operation.
  .5 Acceptable Material: Viega Copper ProPress fittings.

2.2 ROLL GROOVED COUPLINGS AND FITTINGS

.1 Where rolled grooved couplings and fittings are used, they shall be of the same manufacturer.

.2 Grooved products to have current CRN Numbers.

.3 Ductile iron to ASTM A-536 or malleable iron to ASTM A-47 coupling housings painted with alkyd enamel.

.4 Rigid Grooved type Couplings: Housings cast with offsetting angle-pattern bolt pads to provide rigidity and system support and hanging in accordance with ANSI B31.1 and B31.9.

.5 Gaskets: Molded EPDM Compound to ASTM D-2000, -34° C to +120° C temperature range. Suitable all hydronic piping including hot water heating, glycol and chilled water supply and return piping.

.6 Ductile iron to ASTM A-536 or malleable iron to ASTM A-47 fittings painted with alkyd enamel.

.7 Coupling Bolts/Nuts: Heat treated carbon steel, track head to ASTM A-183 minimum tensile 110,000 psi.

.8 Standard of Acceptance:
  .1 Victaulic Co. of Canada Style 07 Zeroflex couplings with Grade “EHP” EPDM gaskets and grooved-end fittings.
  .2 Victaulic Co. of Canada Style 107 Quick-Vic Installation ready rigid coupling, with grade “EHP” EPDM gaskets for direct stab installation without field disassembly.

.9 Acceptable Manufacturers: Anvil Gruvlok

2.3 VALVES

.1 In accordance with Section 20 05 01 Common Work Results for Mechanical – General.

2.4 RELIEF VALVE PIPING AND DRAINS

.1 All sizes: Steel Pipe as noted above.

2.5 HANGERS SUPPORTS

.1 As per Section 23 05 29 Hangers and Supports.

2.6 INSULATION

.1 As per Section 23 07 00 Mechanical Thermal Insulation

3 Execution

3.1 INSTALLATION

.1 Cut piping square, ream, ensure free of cuttings and foreign material.

.2 Install pipes close to building structure to minimize furring, conserve headroom and space. Run piping parallel to walls. Group piping wherever possible.

.3 Slope piping in direction of flow wherever possible. Slope for positive drainage and venting.

.4 Use eccentric reducers for pipe size changes at wall fin connections to provide positive drainage or positive venting

.5 Where pipe sizes differ from connection sizes of equipment, install reducing fittings close to the equipment. Reducing bushings are not acceptable.

.6 Provide clearance for installation of insulation and access for maintenance of equipment, valves and fittings. Install piping, unions and flanges so that any fixed piping does not interfere with removal of coils, tubes or tube bundles.

.7 Assemble piping using fittings manufactured to ANSI standards.

.8 Saddle type branch fittings may be used on mains if branch line is half size or smaller than main. Hole saw or drill and ream main to maintain full inside diameter of branch line prior to welding saddle or installing mechanical T.

.9 Minimum size NPS 3/4.

.10 Forced water supply and return piping to be taken off main at 45° angle vertically from each main or branch. All runout made from main using four joint swing connection to permit expansion and avoid strain on equipment.

.11 Ensure that proper clearance around equipment permits performance of service maintenance, that height clearance for piping is adequate. Check final location with Consultant if different from that shown prior to installation. Allow removal space for removal of all coils. Install piping, unions and flanges so that any fixed piping does not interfere with removal of coils, tubes or tube bundles.

3.2 RELIEF VALVE PIPING AND DRAINS

.1 Turn down at floor drain.

.2 Cut end of discharge pipe at 45°.

3.3 WELDED PIPE

.1 Welded connections where noted on drawing

3.4 ROLL GROOVED COUPLINGS AND FITTINGS

.1 Roll grooved product manufacturer to supply on site product installation training.

3.5 PRESS CONNECTION INSTALLATION

.1 In accordance with the manufacturer's installation instructions.

.2 The pipe cut and the outside of the pipe end prepared to fitting manufacturer's requirements.

.3 Fully inserted tubing into the fitting and the tubing marked at the shoulder of the fitting.

.4 Check the fitting alignment against the mark on the tubing to assure the tubing is fully engaged (inserted) in the fitting.

.5 Pressed the joints using the tool(s) approved by the manufacturer.

3.6 FLUSHING AND CLEANING

.1 Refer to Section 23 25 00 HVAC Water Treatment Systems.

3.7 TESTING

.1 Test system in accordance with Section 20 05 01 Mechanical General Requirements

.2 Repair any leaking joints, fittings or valves and retest.

.3 For glycol systems, retest after filling with specified quality of glycol.

3.8 CONTROLS

.1 Install sensor wells and control valves supplied by Controls.

END OF SECTION

1 General

1.1 GENERAL

The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

2 Products

2.1 EXPANSION TANK

.1 Constructed in accordance with ASME requirements.

.2 Capacity as indicated.

.3 Suitable for 115° C operating temperature.

.4 Working pressure: 860 kPa (125 psig).

.5 Air precharged to 85 kPa (12 psig) (initial fill pressure of system) or as noted on drawings.

.6 Base mount for vertical installation.

.7 Bladder type
- .1 Pressurized bladder type expansion tank.
- .2 Replaceable Butyl Bladder.
- .3 Standard of Acceptance:
  - .1 Bell & Gossett Series B
- .4 Acceptable Manufacturer:
  - .1 Expanflex AL Series
  - .2 Taco Canada Ltd. CA Series
  - .3 S.A. Armstrong L Series.
  - .4 Amtrol L Series

2.2 AUTOMATIC AIR VENT

.1 Standard float vent with brass body and NPS 1/8 connection and rated at 690 kPa (100 psig) working pressure.
- .1 Provide separate gauge cock. Refer to section 23 05 23 Valves

.2 Industrial high capacity float vent with cast iron body and NPS 3/4 connection and rated at 690 kPa (100 psig) working pressure. Provide ball valve on inlet.

.3 Float: solid material suitable for 115° C working temperature.

.4 Standard of Acceptance
- .1 Standard Vent: Amtrol 701.
- .2 High Capacity Vent: Amtrol 720.

.5 Acceptable Manufacturer:
- .1 Bell & Gossett
- .2 Taco Canada Ltd.

2.3 AIR SEPARATOR IN-LINE

.1 In-line air separator.

.2 Strainer with valved bottom blow down connection.

.3 Working pressure: 860 kPa (125 psig).

.4 Size as indicated.

.5 Acceptable Material:
- .1 Bell & Gossett Rolairtrol
- .2 S.A. Armstrong Vortex Air Separator
- .3 Taco Canada Ltd. Air Separator

3 Execution

3.1 GENERAL

.1 Install according to piping layout. Pipe drains and blow off connections to nearest drain.

.2 Maintain proper clearance around equipment to permit performance of service maintenance. Check final location with Consultant if different from that indicated prior to installation.

.3 Should deviations beyond allowable clearances arise, request and follow Consultant's directive.

.4 Check that all openings for appurtenances and equipment operating weight conform to shop drawings.

.5 If accessories, ancillaries, are received knocked down, check assembly with Consultant.

3.2 AIR VENTS

.1 Install at high points of systems and where indicated.

.2 Provide high capacity air vents at air separators. Pipe to floor drain.

3.3 AIR SEPARATORS

.1 Pipe blowdown to floor drain

3.4 EXPANSION TANKS

.1 Install lockshield type valve at inlet to tank.

END OF SECTION

1 General

1.1 GENERAL

The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

2 Products

2.1 GENERAL

.1 Non overloading design.

.2 Capacity: As per schedule on drawing.

.3 Motors: In accordance with Section 20 05 01 Common Work Results for Mechanical - General

2.2 ECM TYPE

.1 Canned-rotor type: The pump and motor form an integral unit without shaft seal and with only two gaskets for sealing.

.2 Bearings lubricated by the pumped liquid.

.3 Pump features
- .1 Controller integrated in the terminal box
- .2 Control panel on the terminal box
- .3 Terminal box prepared for optional modules
- .4 Differential-pressure and temperature detection
- .5 Cast-iron or stainless-steel pump housing
- .6 Motor and electronic controller
  - .1 Single-phase motor
  - .2 4- or 8-pole, synchronous, permanent-magnet motor (PM motor).
  - .3 Pump speed controlled by an integrated frequency converter. P

.4 Capable of operating continuously at temperatures from -10° C to 110° C for closed systems

.5 Maximum working pressure shall be 1000 kPa.

.6 Volute constructed of close-grained cast iron for closed systems

.7 Acceptable Material:
- .1 Grundfos Magna as per drawings.

3 Execution

3.1 INSTALLATION

.1 Base mounted type: supply templates for anchor bolt placement. Furnish anchor bolts with sleeves. Place level, shim unit and grout to top of channel frame. Align coupling in accordance with manufacturer's recommended tolerance. Check oil level and lubricate.

.2 In line circulators: Install with flow vertically up or down and as indicated by flow arrows. Support at flanges or near unions on outlets of unit. Install with bearing lubrication points accessible. Check rotation.

.3 Ensure that pump body does not support piping or equipment. Provide stanchions or hangers for this purpose. Refer to manufacturer's installation instructions for details.

.4 Install volute venting pet cock in accessible location.

.5 Change the flush line filters after the system has been flushed and on a regular basis until the pumps are turned over to the owner.

END OF SECTION

1 General

1.1 GENERAL

.1 The General Conditions of the contract as well as provisions of Division 1 and Section 21 05 01 Common Work Results for Mechanical – General, Section 21 05 02 Common Work Results for Mechanical – Submittals and Section 21 05 03 Common Work Results for Mechanical - Contract Closeout, are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 21 05 01 Common Work Results for Mechanical - General.

2 Products

2.1 PIPE: STEEL TO ASTM A53 GRADE B, AS FOLLOWS:

.1 Steam:
- .1 To NPS 2: Schedule 80.
- .2 NPS 2 1/2 and over: Schedule 40.

.2 Condensate: Schedule 80

2.2 PIPE JOINTS

.1 NPS 2 and under:
- .1 Screwed fittings with Teflon tape.

.2 NPS 2-1/2 and over:
- .1 Welding fittings and flanges.
- .2 Flanges: plain or raised face.
- .3 Flange gaskets: to ASME/ANSI B16.21, ASME/ANSI B16.20.
- .4 Bolts and nuts: to ASME/ANSI B18.2.1 and ASME/ANSI B18.2.2.

2.3 FITTINGS

.1 Pipe fittings, screwed, flanged or welded.

.2 Cast iron pipe flanges: Class 125 to ASME/ANSI B16.1.
- .1 Malleable iron screwed fittings: Class 150 to ASME/ANSI B16.3.
- .2 Steel pipe flanges and flanged fittings: to ASTM/ANSI B16.5.
- .3 Steel butt-welding fittings: to ASTM/ANSI B16.9.
- .4 Unions, malleable iron: to ASTM/ANSI B16.3.

2.4 VALVES

.1 In accordance with Section 23 05 23 Valves.

3 Execution

3.1 INSTALLATION

.1 Cut piping square, ream, ensure free of cuttings and foreign material.

.2 Slope piping down in direction of flow, 1:240 (1" in 20') unless otherwise noted.

.3 Drip Pockets: Line size up to NPS 4 and NPS 4 for larger pipes.

.4 Where pipe sizes differ from connection sizes of equipment, install reducing fittings close to the equipment. Reducing bushings are not acceptable.

.5 Provide clearance for installation of insulation and access for maintenance of equipment, valves and fittings. Install piping, unions and flanges so that any fixed piping does not interfere with removal of coils, tubes or tubule bundles.

.6 Assemble piping using fittings manufactured to ANSI standards.

.7 Saddle type branch fittings may be used on mains if branch line is half size or smaller than main. Hole saw or drill and ream main to maintain full inside diameter of branch line prior to welding saddle.

.8 Minimum size NPS 3/4 unless otherwise noted.

.9 Provide drip trap assembly at low points and points where condensate may back-up in front of control valves.

.10 On long runs, provide drip legs at every 30 meters (100 feet) and as required to raise the steam lines as dictated by the ceiling heights. The floor plans do not show all the required drip legs.

.11 All supply risers, ends of mains and where rises in mains occur, the supply shall be dropped to return mains. Each drip shall be trapped as detailed on drawings.

.12 All branches on steam supply or condensate return lines shall be taken off the top of the steam supply or return mains.

.13 Use eccentric reducers at pipe size changes.

.14 Ensure that proper clearance around equipment permits performance of service maintenance, that height clearance for piping is adequate. Check final location with Consultant if different from that shown prior to installation. Allow removal space for removal of all coils. Install piping, unions and flanges so that any fixed piping does not interfere with removal of coils, tubes or tube bundles.

3.2 TESTING

.1 Test system in accordance with Section 21 05 01 Common Work Results for Mechanical – General.

END OF SECTION

1 General

1.1 GENERAL

.1 The General Conditions of the contract as well as provisions of Division 1 and Section 21 05 01 Common Work Results for Mechanical – General, Section 21 05 02 Common Work Results for Mechanical – Submittals and Section 21 05 03 Common Work Results for Mechanical - Contract Closeout, are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 21 05 01 Common Work Results for Mechanical - General.

2 Products

2.1 FLOAT & THERMOSTATIC STEAM TRAPS 0- 100 KPA (0-15 PSIG).

.1 Application for modulating steam service on converters.

.2 Materials: body - cast iron or semi-steel; valve - chrome or stainless steel with stainless steel seat; float and mechanisms - stainless steel; thermostatic air vent - phosphor bronze or stainless steel.

.3 Integral Vacuum Breaker.

.4 Standard of Acceptance.
- .1 Armstrong 15-B-VB.relavent
- .2

.5 Acceptable Manufacturer:
- .1 Hoffman.
- .2 Spirax Sarco.

2.2 INVERTED BUCKET STEAM TRAP 0- 1000 KPA (0-15 PSIG).

.1 Application for non-modulating steam services on end of line drips and humidifiers.

.2 Materials: body - cast iron or semi-steel; valve - chrome steel or stainless steel; bucket - stainless steel, with bimetal air vent.

.3 Standard of Acceptance:
- .1 Armstrong "800" series.

.4 Acceptable Material:
- .1 Hoffman.
- .2 Spirax Sarco "B" Series.

2.3 PIPE LINE STRAINER UP TO NPS 2

.1 Application: ahead of each steam trap, control valve and as indicated.

.2 Working pressure: 860 kPa (125 psi.)

.3 Body: cast iron.

.4 Connections: screwed.

.5 Screen: stainless steel with perforated size of 0.8 mm.

.6 Standard of Acceptance:
.1 Armstrong A1SC.

.7 Acceptable Material:
.1 Spirax Sarco IT.

2.4 CONDENSATE PUMP

.1 Single Pump – Duplex Capable packaged unit.

.2 Cast Iron receiver.

.3 Externally adjustable 2pole float switch

.4 Pump:
.1 Bronze fitted, stainless steel shaft.
.2 Bronze impeller and wear rings.
.3 High temperature mechanical seal.

.5 Standard of Acceptance:
.1 Bell & Gossett – Watchman
.6 Acceptable Material:
.1 FloFab

3 Execution

3.1 GENERAL

.1 Maintain proper clearance around equipment to permit maintenance.

.2 Size all traps used for dripping ends of mains, heating exchangers, etc., for two times the maximum condensing rate of the apparatus coil, etc., with 3.5 kPa (0.5 psi) differential on the trap.

.3 Size main drips for a capacity of at least 300 kg (700 lb.) of condensate per hour.

.4 Bucket type on end of main drips and steam tracer lines.

.5 Float and thermostatic type on heat exchangers, humidifiers and other modulating equipment.

3.2 STRAINERS

.1 Install in horizontal or down-flow lines.

.2 Ensure clearance for removal of basket.

END OF SECTION

1 General

1.1 GENERAL

The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

2 Products

2.1 MANUFACTURER

.1 Equipment, chemicals and service by one manufacturer.

.2 Acceptable Manufacturers:
- .1 Dearborn
- .2 Drew Chemicals
- .3 T. Donovan & Son Ltd.
- .4 State Industrial
- .5 Chem-Aqua

2.2 POT FEEDER

.1 Malleable cast iron or bronze: to ASME S-15. Pressure rating: 1035 kPa (150 psig). Temperature rating 107° C.

.2 Welded steel: Pressure rating: 1035 kPa (150 psig). Temperature rating 107° C.

2.3 CHEMICAL FEED PIPING

.1 Schedule 80, black steel.

2.4 CLOSED HYDRONIC SYSTEMS

.1 Pot feeder as specified elsewhere in this section.

.2 Fittings: Schedule 80 forged steel.

2.5 SUPPLY OF CHEMICALS

.1 Provide supply of chemical for warranty period. Chemicals to be compatible with each type of system specified.

2.6 TEST EQUIPMENT

.1 Provide for each type of system specified herein, one set of basic test equipment complete with carrying case and reagents for chemicals supplied. Include required specialized or supplementary equipment.

3 Execution

3.1 INSTALLATION

.1 Install HVAC water treatment systems in accordance with ASME Boiler Code Section VII, and requirements and standards of authorities having jurisdiction.

.2 Ensure adequate clearances to permit performance of servicing and maintenance of equipment.

3.2 POT FEEDERS

.1 Provide for each hydronic system.

3.3 CHEMICAL FEED PIPING

.1 Install crosses at all changes in direction. Install plugs in all unused connections.

3.4 FLUSHING OF MECHANICAL SYSTEM

.1 Flush after pressure test for a minimum of 4 hours.

.2 During initial flushing, equipment, such as, radiant panels, unit/cabinet heaters, infloor heat, DHW tanks, plate heat exchangers, reheat coils, coils in air handling units and coils other than wall radiation to be disconnected from the heating mains and the supply pipes and return pipes looped at the equipment. Final flushing to be through entire system. Provide temporary hose connectors to facilitate flushing.

.3 Flushing of infloor distribution system

- .1 If the infloor distribution system is used to supply heat during the construction period by the general contractor, isolate manifolds and flush construction heating system.
- .2 After use to supply heat during the construction period, isolate manifolds and reflush entire infloor distribution system before opening to permanent heating system.
- .3 Provide written confirmation of flushing.

.4 Do not use system pumps. Provide a temporary flushing pump with a minimum capacity of 3 l/s (50 USgpm). Remove temporary flushing pump from site at end of project.

3.5 CLEANING OF MECHANICAL SYSTEM

.1 Provide copy of recommended cleaning procedures and chemicals for review by Consultant.

.2 Thoroughly flush all mechanical systems and equipment with cleaning chemicals designed to remove deposition from construction such as pipe dope, oils, loose mill scale and other extraneous materials. Chemicals to inhibit corrosion of various systems materials and be safe to handle and use.

.3 During circulation of cleaning solution, periodically examine and clean filters and screens and monitor changes in pressure drop across equipment.

.4 Drain and flush systems until alkalinity of rinse water is equal to make-up water. Refill with clean water treated to prevent scale and corrosion during system operation.

.5 Disposal of cleaning solutions to be approved by authority having jurisdiction.

.6 Refill glycol systems with glycol of concentration as specified.

.7 Following final filling of system, provide written recommendation for ongoing water treatment.

3.6 WATER TREATMENT SERVICES

.1 Provide water treatment monitoring and consulting services for project warranty period. Service to include:

- .1 Initial water analysis and treatment recommendations.
- .2 System start-up assistance.
- .3 Operating staff training.
- .4 Visit plant every 2 months during period of operation and as required until system stabilizes and advice on treatment system performance.
- .5 Provide necessary recording charts and log sheets for operation during warranty period.
- .6 Provide necessary laboratory and technical assistance.
- .7 Instructions and advice to operating staff to be clear, concise and in writing.

END OF SECTION

1 General

1.1 GENERAL

.1 The General Conditions of the contract as well as provisions of Division 1 and Section 21 05 01 Common Work Results for Mechanical – General, Section 21 05 02 Common Work Results for Mechanical – Submittals and Section 21 05 03 Common Work Results for Mechanical - Contract Closeout, are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 21 05 01 Common Work Results for Mechanical - General.

2 Products

2.1 GENERAL

.1 ULC and / or CSA approved Boiler Burner package including any field installed devices.

.2 Complete with burner, necessary accessories and controls.

.3 Designed and constructed to ANSI/ASME Boiler and Pressure vessel Code.

.4 CRN (Canadian Registration Number) to CSA B51 for the Province of Nova Scotia.

.5 Rated for Oil.

.6 Electrical components: CSA or CGA approved.

.7 Controls: Enclosed in NEMA 1 steel cabinet.

.8 Provide auxiliaries for each boiler and to meet ANSI/ASME requirements.

.9 Start-up, instruction, on-site performance tests: 1 day per boiler.

.10 Trial usage:
- .1 Consultant may use boilers for test purposes prior to acceptance and commencement of warranty period.
- .2 Supply labour, materials and instruments required for tests.

.11 Refurbish to as-new condition before final inspection and acceptance.

2.2 OIL BURNER: 2-STAGE FIRING

.1 Pressure-mechanical atomizing, forced draft, with built-in blower to supply combustion air, complete with silencer and damper, two stage oil pump driven by blower motor, dual oil solenoid valve, complete with integral relief valve and filter, pressure gauge, high voltage ignition transformer, flame observation port.

.2 Direct spark ignition

.3 Provide easy access to nozzle/electrode assembly.

.4 Turndown ratio at least 2:1.

.5 Control panel mounted on burner chassis.

.6 Electronic combustion control relay with scanner to control combustion and to supervise flame. Control to shut off fuel within 5 s upon flame failure or upon signal of a safety interlock and to ensure, when restarted, in sequence, ignition and supervision of burner operation.

.7 Three 3 immersion controllers:
- .1 Operating controller: to start and stop burner, operating between adjustable set points.
- .2 High/low controller: to shift burner operation to high or low fire.
- .3 High limit manual reset controller: set at 15PSI.

.8 Low-fire hold switch.

.9 Acceptable Material:
- .1 Carlin Two Stage Oil Burner as per schedule on drawings

2.3 CAST IRON BOILER

.1 Sectional forced draft firing, waterwall design, complete with field assembled sections, front plate and removable panels.

.2 Design of sections to provide balanced water circulation and flue gas travel. Make sections gas-tight and water-tight through use of high temperature rope, nipples, pull-up bolts.

.3 Flue passages: readily accessible without use of special tools.

.4 Thermal insulation: 25 mm (1") thick mineral fiber.

.5 Jackets: heavy gauge metal, finished with heat resisting paint.

.6 Steam Boiler:
- .1 Safety relief valve: ANSI/ASME rated, set at 100 kPa (15 psig) to release entire boiler capacity.
- .2 Pressure gauge: 125 mm (5 1/2") diameter complete with siphon and shut-off cock.
- .3 Water column assembly with tri-cocks, gauge glass, protective rods, blowdown valves.
- .4 Float Type Low water cut-off.
- .5 Low & high fire pressure switches.
- .6 Boiler feed pump control
- .7 Test-N-Check Valves

.7 Steam Boiler Performance:
- .1 In accordance with American Boiler Manufacturers Association (ABMA), testing procedures.
- .2 Steam: 100 kPa (15 psig)
- .3 Firing Fuel Oil #2.
- .4 Burner mounted Control Panel bearing ULC label
  - .1 Indicating Lights for:
    - .1 Power On
    - .2 Low water
    - .3 Flame Failure
    - .4 High Water
  - .2 Alarm bell and Building Automation System Contacts to indicate an alarm for any of the following conditions:
    - .1 Low water
    - .2 Flame Failure
    - .3 High Water
  - .3 Alarm silencing switch.
- .5 Oil Burner
  - .1 Low-high-low Firing
  - .2 Electrical:
    - .1 Power: 120V/1ph
    - .2 Controls: Internal Transformer.
- .6 Field assembled boiler/burner package to bear ULC label.

.8 Standard of Acceptance:
- .1 Burnham w/ Carlin Burner as per schedule on drawings.

.9 Acceptable Manufacturer:
- .1 Weil McLain

3 Execution

3.1 INSTALLATION

.1 Install in accordance with ANSI/ASME Boiler and Pressure Vessels Code Section IV, regulations of Province having jurisdiction

.2 Make all required electrical connections recommended by boiler manufacturer.

.3 Maintain clearances as indicated or if not indicated, as recommended by manufacturer for operation, servicing and maintenance without disruption of operation of any other equipment/system.

.4 Mount unit level.

.5 Natural Gas installations - in accordance with CAN/CGA-B149.2.

3.2 MOUNTINGS AND ACCESSORIES

.1 Safety relief valves:
- .1 Run separate discharge from each valve.
- .2 Terminate discharge pipe as indicated.

.2 Blowdown valves:
.1 Run discharge to terminate as indicated.

3.3 COMMISSIONING

.1 Manufacturer to:
.1 Certify installation.
.2 Start up and commission installation.
.3 Carry out on-site performance verification tests.
.4 Demonstrate operation and maintenance.

.2 Provide Consultant at least 24 h notice prior to inspections, tests, and demonstrations. Submit written report of inspections and test results.

END OF SECTION

1 General

1.1 GENERAL

The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

1.3 RELATED SECTIONS

.1 Section 25 30 02 BAS: Field Control Devices.

.2 Section 25 30 03 BAS Field Installation

1.4 BAS IDENTIFICATION

.1 Conform to requirements of Section 23 05 53 Mechanical Identification and Section 26 05 03 Electrical Identification supplemented and modified by requirements specified in this section.

1.5 WORK INCLUDED

.1 Except as otherwise indicated the system supplier shall secure and pay for all permits, inspections and certifications required for his work and arrange for necessary approvals by the governing authorities.

.2 Work covered by sections referred to above consists of fully operational BAS, including, but not limited to, following:

- .1 Expansion of existing BACnet® based Building Automation System.
- .2 Design and provide all new networking equipment, building controllers, field control devices, cabling and any other accessories or devices required to make new controls function as designed.
- .3 Modify existing BAS programming and graphics to suit new sensors and controlled devices. New graphics to the standard of the existing BAS Graphic User Interface.
- .4 Provide all necessary power required for BAS from local 120V/208V branch circuit panelboards including low voltage transformers.
- .5 Related work performed by other Sections.
  - .1 This section to mount control damper actuators on the control dampers supplied by Section 24 33 15 Dampers Operating
  - .2 This section to wire control damper actuators supplied by this section.

1.6 COORDINATION

.1 Coordinate location of exposed control sensors with plans and room details before installation.

.2 Coordinate controlled/monitored equipment from other divisions to achieve compatibility with BAS.

.3 Coordinate with the Owner's IT department for Ethernet communication cabling and TCP/IP address.

1.7 WARRANTY

.1 Control system failures during warranty period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to Owner. Respond during normal business hours within 24 hours of Owner's warranty service request 24 hours Monday through Friday and 48 hours on Saturday and Sunday.

.2 Provide updates to operator workstation or web server software, project-specific software, graphic software, database software, and firmware that resolve Contractor-identified software deficiencies at no charge during warranty period. Coordinate updates or upgrades with Owner's representative.

.3 Provide for 16 hours of customized programming after verification by the original programmer

1.8 OWNERSHIP OF PROPRIETARY MATERIAL

.1 Project-specific software and documentation shall become Owner's property. This includes, but is not limited to:
- .1 Graphics
- .2 Record drawings
- .3 Database
- .4 Application programming code
- .5 Documentation

1.9 PERMITS, FEES AND INSPECTIONS

.1 Line and low voltage Control Wiring permit.
- .1 Wiring shall be installed by an Electrician
- .2 Submit to Electrical Inspection Department and Supply Authority necessary quantity of Control Drawings and Control Specifications for examination and approval prior to commencement of work
- .3 Pay associated fees.
- .4 Furnish Certificates of Acceptance from Inspection Department and authorities having jurisdiction on completion of work.

1.10 SUBMITTALS

.1 In accordance with Section 20 05 02 Mechanical Submittals.
- .1 Submit control diagrams
  - .1 Sequences of operation for each system,
  - .2 All input/output object listings and an alarm point summary listing.
  - .3 Complete bill of materials
  - .4 Provide BACnet® Conformance
  - .5 Provide complete description and documentation of any proprietary (non-BACnet®) services and/or objects used in the system.
  - .6 Specification sheets for each item to include manufacturer's descriptive literature, specification, drawings, diagrams, performance and characteristic curves, catalogue cuts, manufacturer's name, trade name, catalogue or model number, nameplate data, size, layout, dimensions, capacity, other data to establish compliance.

.7 Sketch of site-specific system architecture.
.8 Specification sheets for each item including memory provided, programming language, speed, type of data transmission.
.9 Controller locations.
.10 Sensing element type and location.

.2 Record Drawings
.1 Conform to requirements of Division 1 and Section 20 05 01 Common Work Results for Mechanical - General, supplemented and modified by requirements specified in this section.
.2 Final Control Diagrams
.3 Changes to contract documents as well as addenda and contract extras.
.4 Changes to interface wiring.
.5 Major routing of conduit and control air lines.
.6 Signal levels, setpoints, reset curves, schedules.

2 Products

2.1 GENERAL

.1 Control system installed to be "fail-safe".

.2 Provide all required adapters between "metric" and "Imperial" components.

2.2 WIRING METHODS

.1 Use electrical metallic tubing (EMT) for the following:
.1 All control system wiring.

.2 EMT shall be installed as a complete system and shall be securely fastened in place within 1 meter (39 inches) of each outlet box, junction box, cabinet, couplings, fittings and changes in direction and the spacing between supports as follows:
.1 Not greater than 1500 mm (five feet) for 16 mm (1/2 inch) and 21 mm (3/4 inch) EMT
.2 Not greater than 1800 mm (six feet) for 27 mm (1 inch) and 35 mm (1-1/4 inch) EMT
.3 Not greater than 3050 mm (ten feet) for 41 mm (1-1/2 inch) EMT or larger.

.3 Liquid tight metal flexible conduit is not to be used as a general purpose raceway. Use liquid tight flexible metal conduit (maximum length permitted to be 1.5 M) and liquid tight conduit fittings for:
.1 Final connection to all mechanical equipment (fans, pumps, terminal units, etc.) and all vibrating equipment.
.2 Final connection for primary, secondary and system ground conductors on all dry core transformers.

.4 All conduit runs shall be a maximum of 30 meters (100 feet) in length with a maximum of four (4) 90 degree bends between pull points. A pull box shall be placed in conduit runs where the sum of the bends exceeds 360 degrees, where the overall run exceeds 30 meters (100 feet) or there is a reverse bend in the run.

.5 Pull boxes shall be placed in straight sections of conduit run and shall not be used in lieu of a bend. Conduit fittings shall not be used in place of pull boxes or bends. The use of C, LB, LL, LR and T type fittings are prohibited on this project unless written permission is provided by the Engineer.

2.3 CONTROL SYSTEM WIRE AND CABLE

.1 Cable jacket:
- .1 FT6 jacket rated and bear the following labels: CSA 300 volts and FT6.
- .2 FT4 jacket rated and bear the following labels: CSA 600 volts and FT4.
- .3 Labeled with the following information, as a minimum:
  - .1 Cable type.
  - .2 FT rating.
  - .3 Temperature rating.
  - .4 CSA number.
  - .5 Rated voltage.
  - .6 Gauge and number of conductors.
- .4 Application:
  - .1 Control wiring to 600 volt starters to be FT4 in conduit.
  - .2 All control wiring in conduit may be FT4.
  - .3 All other control wiring to be FT6.
  - .4 Colored as follows:

System Description	Jacket Colour
BAS	Yellow

2.4 PRODUCT

.1 Use new products the manufacturer is currently manufacturing and selling for use in new installations. Do not use this installation as a product test site unless explicitly approved in writing by Owner. Spare parts shall be available for at least seven years after completion of this contract.

.2 Each major component of equipment shall have the manufacturer's name and address and the model and serial number on a nameplate.

.3 Maintainability: Maintenance of any satellite panel or any peripheral device shall not affect the remainder of the system.

2.5 BUILDING CONTROLLERS

.1 Listed as a certified B-BC in the BACnet® Testing Laboratories (BTL) Product Listing.

.2 Fully programmable BACnet® Building Controllers that communicate on BACnet® Local Area Network (LAN) and BACnet® MS/TP Network (MS/TP)

.3 Controllers equal to or better than most recent expanded building controllers. Compatible with existing BACnet® BAS

.4 Provide UPS for each Building Controller

.5 Provide quantity as required to create a functional system.

2.6 LOCKABLE CONTROL ENCLOSURES

.1 Enclosures to bear the appropriate CSA designation i.e. CSA Enclosure 1 - General Purpose, CSA Enclosure 3 - Weatherproof.

.2 To have hinged doors equipped with standard keyed-alike cabinet locks, keyed to same key.

.3 Either free-standing or wall mounted enameled steel cabinets with hinged and key-locked front door.

.4 Modular multiple panels as required to handle requirements with additional space to accommodate future capacity without adding additional cabinets.

.5 Cabinets: 12 gauge furniture steel (12 gauge) with baked enamel finish on exterior and rust inhibitive paint on interior, for surface mounting, with hinged door, latch lock, 2 keys, complete with perforated metal mounting backboard.

.6 Factory installed bonding and neutral termination strips.

.7 Provide for conduit entrance from top, bottom or sides of panel.

.8 Cabinets to provide protection from water dripping from above, while allowing sufficient airflow to prevent internal overheating.

2.7 ACCEPTABLE MATERIAL AND INSTALLER

.1 Native BACnet® Building Automation System (BAS) throughout project. Building Controllers (B-BC) to be currently listed by BACnet® Testing Laboratories (BTL)

.2 Acceptable Installer and Material:
- .1 Advanced Energy Management with Alerton, Inc. BTL Listed BACnet® Building Controllers (B-BC)
- .2 Controls & Equipment Limited with Delta Controls BTL Listed BACnet® Building Controllers (B-BC)

3 Execution

3.1 ELECTRICAL ENCLOSURES

.1 House all electrical equipment associated with the control system in separate dedicated enclosures provided by this section.

.2 House all controllers associated with the control system in lockable enclosures provided by this section.

.3 Top of lockable enclosure to be 1980 mm AFF.

3.2 BAS OBJECT TYPE SUMMARY

.1 Displays: System displays shall show all analog and binary object types within the system. They shall be logically laid out for easy use by the owner. Provide outside air temperature indication on all system displays associated

.2 Run Time Totalization: At a minimum, run time totalization shall be incorporated for each monitored piece of equipment (i.e. Fans, Pumps, Boilers but not including valves, dampers etc.). Warning limits for each point shall be entered for alarm and or maintenance purposes.

.3 Trend log: All binary and analog object types (including zones) shall have the capability to be automatically trended.

.4 Alarm: All analog inputs (High/Low Limits) and selected binary input alarm points shall be routed (locally or remotely) with alarm message per owner's requirements.

.5 Database Save: Provide back-up database for all stand-alone application controllers on disk.

3.3 BAS POINT DESCRIPTORS & NOMENCLATURE

.1 Conform to existing naming conventions for buildings, zones, controllers and devices in use at building.

.2 Typical control device identification tag:

Point: XYZ _AH1_SAT Address: 1000300.AI2 Description: Supply Air Temperature Part No. XXX – XXXX	Point: XYZ _HX1_VLV Address: 1000100.AO9 Description: Heating Water Exchanger: Steam Valve Part No. XXX – XXXX
Point: XYZ _AH2_FSS Address: 1000500.BO1 Description: Fan Start/Stop Relay Part No. XXX – XXXX	Point: XYZ _ DHWR_PST Address: 1000200.BI4 Description: Domestic Hot Water Return: Pump Current Sensor Part No XXX - XXXX

END OF SECTION

1 General

1.1 GENERAL

The General Conditions of the contract as well as provisions of Division 1 and Section 20 05 01 Mechanical General Requirements, Section 20 05 02 Mechanical Submittals and Section 20 05 03 Mechanical Contract Closeout are part of and to be read in conjunction with this Section.

1.2 REFERENCE STANDARDS

.1 In accordance with Section 20 05 01 Mechanical General Requirements.

2 Products

2.1 GENERAL

.1 External trim materials to be corrosion resistant. Internal parts to be assembled in vibration-proof, assembly.

.2 Terminations: use standard conduit box with slot screwdriver compression connector block unless otherwise specified.

.3 Transmitters to be unaffected by external transmitters (e.g. walkie talkies).

.4 Account for hysteresis, relaxation time, maximum and minimum limits in applications of sensors and controls.

.5 Devices to be installed in user occupied space must not exceed Noise Criteria (NC) of 35. Noise generated by any device must not be detectable above space ambient conditions.

2.2 ETHERNET SWITCHES

.1 Conform to IEEE Standard 802.3 and UL508 Listed, Industrial Control Equipment.

.2 RoHS Compliant

.3 Data rate: 10/100Mbps using RJ-45 Connectors.

2.3 TEMPERATURE SENSORS

.1 General: except for Terminal unit box control to be resistance or thermocouple type to following requirements:

- .1 Thermocouples: to be limited to temperature range of 200° C and over. RTD's: 100 ohm at 0° C (plus or minus 0.2 ohms) platinum element with strain minimizing construction, 3 integral anchored leadwires. Coefficient of resistivity: 0.00385 ohms/ohm ° C.
- .2 Sensing element: hermetically sealed.
- .3 Stem and tip construction: copper or type 304 stainless steel. Time constant response: less than 3 seconds to temperature change of 10° C.

.2 Thermistor:
- .1 Monitoring Range.
  - .1 -40° C to 55° C where exposed to outside air.
  - .2 -5° C to 55° C elsewhere.
- .2 Factory Calibration Point 25° C with accuracy of Calibration Point +/- 0.3° C.
- .3 Stainless steel probe.

.3 Resistance Temperature Detectors (RTD's):
- .1 Monitoring Range.
  - .1 -1° C to 49° C for ducts.
  - .2 21° C to 104° C for hot water and glycol systems.
- .2 Factory Calibration Point 21° C.
- .3 Accuracy Calibration Point.
  - .1 For -7° C to 49° C type +/- 0.7° C.
  - .2 For 21° C to 104° C type +/- 1.1° C.
  - .3 Platinum or Nickel Wire Sensor.

.4 Immersion wells: NPS 3/4, stainless steel spring loaded construction, with heat transfer compound compatible with sensor. Insertion length 100 mm or as indicated.

2.4 TEMPERATURE TRANSMITTERS

.1 Input circuit: to accept 3-lead, 100 ohm at 0° C, platinum resistance detectors type sensors.

.2 Power supply: 575 ohms at 24 V DC into load of 575 ohms. Power supply effect less than 0.01° C per volt change.

.3 Output signal: 4 - 20 mA into 500 ohm maximum load.

.4 Input and output short circuit and open circuit protection.

.5 Output variation: less than 0.2 % of full scale for supply voltage variation of plus or minus 10 %.

.6 Combined non-linearity, repeatability, hysteresis effects: not to exceed plus or minus 0.5 % of full scale output.

.7 Maximum current to 100 ohm RTD sensor: not to exceed 25 mA.

.8 Integral zero and span adjustments.

.9 Temperature effects: not to exceed plus or minus 1.0 % of full scale/ 50° C.

.10 Long term output drift: not to exceed 0.25 % of full scale/ 6 months.

.11 Transmitter ranges: Select narrowest range to suit application from following:
- .1 - 50° C to +50° C, plus or minus 0.5° C.
- .2 0 to 100° C, plus or minus 0.5° C.
- .3 0 to 5° C, plus or minus 0.25° C.
- .4 0 to 25° C, plus or minus 0.1° C.
- .5 10 to 35° C, plus or minus 0.25° C.

2.5 ELECTRICAL RELAYS

.1 Double voltage, DPDT, plug-in type with termination base

.2 Coils: rated for 120 VAC or 12 V DC. Other voltage: provide transformer

.3 Contacts: rated at 6 amps at 120 VAC

.4 Relay to have visual status indication

.5 Acceptable material: Eaton Model # XRR2D12 and plug-in base.

2.6 CONTROL VALVES

.1 NPS 2 and under.
- .1 Class 250.
- .2 Bronze body and trim.
- .3 Screwed ends.

.2 NPS 2 1/2 and over.
- .1 Class 125.
- .2 Cast iron body.
- .3 Bronze trim.
- .4 Flanged or roll grooved ends.

2.7 ELECTRONIC/ELECTRIC VALVE ACTUATORS

.1 Construction: steel, cast iron, aluminum.
- .1 Control voltage: 0-20V DC or 24V AC.
- .2 Positioning time: to suit application. 90 sec maximum
- .3 Spring return to normal position as indicated

.2 Size operators to ensure tight shut off when subjected to maximum system differential pressure

.3 Minimum close off rating shall be 200 kPa (30 psi).

3 Execution

3.1 GENERAL

.1 Temperature transmitters, humidity transmitters, controllers, relays: install in NEMA I enclosure or as required for specific applications. Provide for electrolytic isolation in all cases when dissimilar metals make contact.

.2 Support field-mounted transmitters, sensors on pipe stands or channel brackets.

.3 Duct and AH unit mounted devices: Seal duct and AH unit to prevent air leakage.

.4 Wall mounted devices: Install on plywood panel properly attached to wall.

.5 Duct mounted devices: On insulated ducts, mount devices and associated wiring on standoffs.

3.2 FAN AND PUMP STATUS

.1 Fan status: determined via AI points connected to current-operated sensors.

.2 Pump status: determined via AI points connected to current operated sensors.

.3 Auxiliary contacts on motor starters will not be acceptable for this function.

3.3 TEMPERATURE SENSORS

.1 Mount room temperature sensors on electrical box as per detail on the drawings.

.2 Stabilized to such a level as to permit on-the-job installations that will require minimum field adjustments or calibration.

.3 Assemblies readily accessible and adaptable to each type of application in such a manner as to allow for quick, easy replacement and servicing without special tools or skills.

.4 Locate duct sensors locations to sense the correct temperature of the air only, and not be located in dead air spaces. The location shall be within the vibration and velocity limits of the sensor. Where an extended surface element is required to properly sense the average temperature it shall be securely mounted within the duct to measure the best average temperatures. Elements shall be thermally isolated from brackets and supports to respond to air temperature only. Sensor element to be supported separately and not connected to coils or filter racks.

.5 Install wells in the piping at elbows where piping is smaller than the length of the well to affect proper flow across the entire area of the well. Well shall not restrict flow area to less than 70 percent of line-size-pipe normal flow area.

3.4 FIELD MOUNTED TRANSMITTERS AND SENSORS

.1 Support properly on pipe stands or channel brackets.

.2 Install wall mounted devices on plywood panel attached properly to wall.

END OF SECTION

SHANNON PARK ELEMENTARY SCHOOL
HEATING RENOVATIONS

75 IROQUOIS DR, DARTMOUTH, NS

PREPARED FOR:
HALIFAX REGIONAL CENTRE FOR EDUCATION

PREPARED BY:

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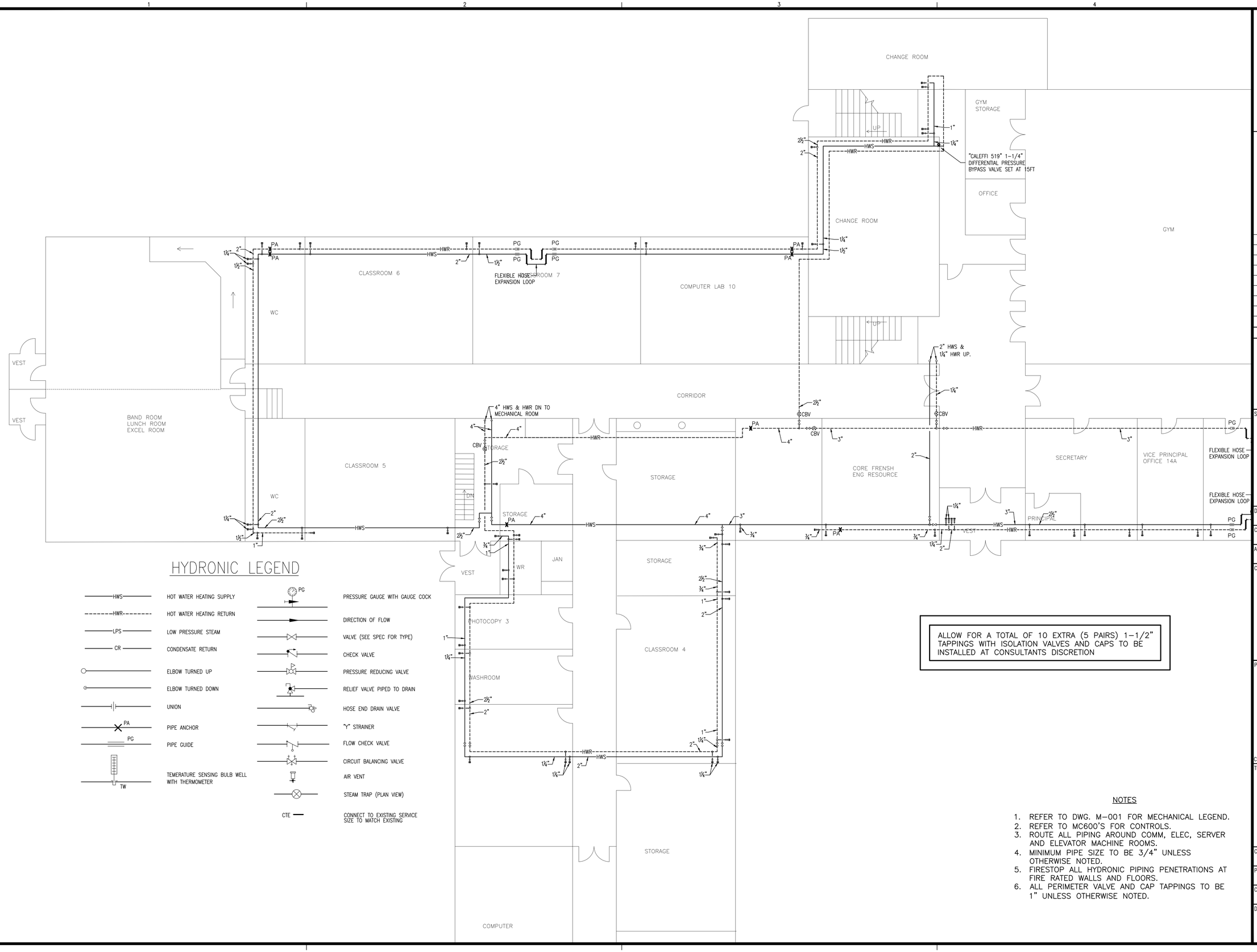
DRAWING LIST

JUNE 2018

DUMAC# 18-044



HYDRONIC LEGEND

HWS	HOT WATER HEATING SUPPLY	PG	PRESSURE GAUGE WITH GAUGE COCK
HWR	HOT WATER HEATING RETURN		DIRECTION OF FLOW
LPS	LOW PRESSURE STEAM		VALVE (SEE SPEC FOR TYPE)
CR	CONDENSATE RETURN		CHECK VALVE
	ELBOW TURNED UP		PRESSURE REDUCING VALVE
	ELBOW TURNED DOWN		RELIEF VALVE PIPED TO DRAIN
	UNION		HOSE END DRAIN VALVE
PA	PIPE ANCHOR		"Y" STRAINER
PG	PIPE GUIDE		FLOW CHECK VALVE
TW	TEMERATURE SENSING BULB WELL WITH THERMOMETER		CIRCUIT BALANCING VALVE
			AIR VENT
			STEAM TRAP (PLAN VIEW)
CTE	CONNECT TO EXISTING SERVICE SIZE TO MATCH EXISTING		

ALLOW FOR A TOTAL OF 10 EXTRA (5 PAIRS) 1-1/2" TAPPINGS WITH ISOLATION VALVES AND CAPS TO BE INSTALLED AT CONSULTANTS DISCRETION

NOTES

1. REFER TO DWG. M-001 FOR MECHANICAL LEGEND.
2. REFER TO MC600'S FOR CONTROLS.
3. ROUTE ALL PIPING AROUND COMM, ELEC, SERVER AND ELEVATOR MACHINE ROOMS.
4. MINIMUM PIPE SIZE TO BE 3/4" UNLESS OTHERWISE NOTED.
5. FIRESTOP ALL HYDRONIC PIPING PENETRATIONS AT FIRE RATED WALLS AND FLOORS.
6. ALL PERIMETER VALVE AND CAP TAPPINGS TO BE 1" UNLESS OTHERWISE NOTED.

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ISSUED FOR TENDER	1	JUNE 15, 2018
DESCRIPTION	NO.	DATE

REVISIONS

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REGISTERED PROFESSIONAL ENGINEER
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9858
PROVINCE OF NOVA SCOTIA

DRAWN: STAFF	SCALE: NTS
CHECKED: CJL	DATE: July 8, 2018
APPROVED: CJL	

CLIENT

HALIFAX REGIONAL CENTRE FOR EDUCATION

PROJECT

SHANNON PARK ELEMENTARY SCHOOL HEATING RENOVATIONS

DARTMOUTH — CITY
NS — PROVINCE

TITLE

PARTIAL MAIN FLOOR PLAN HEATING

COMMISSION NO.

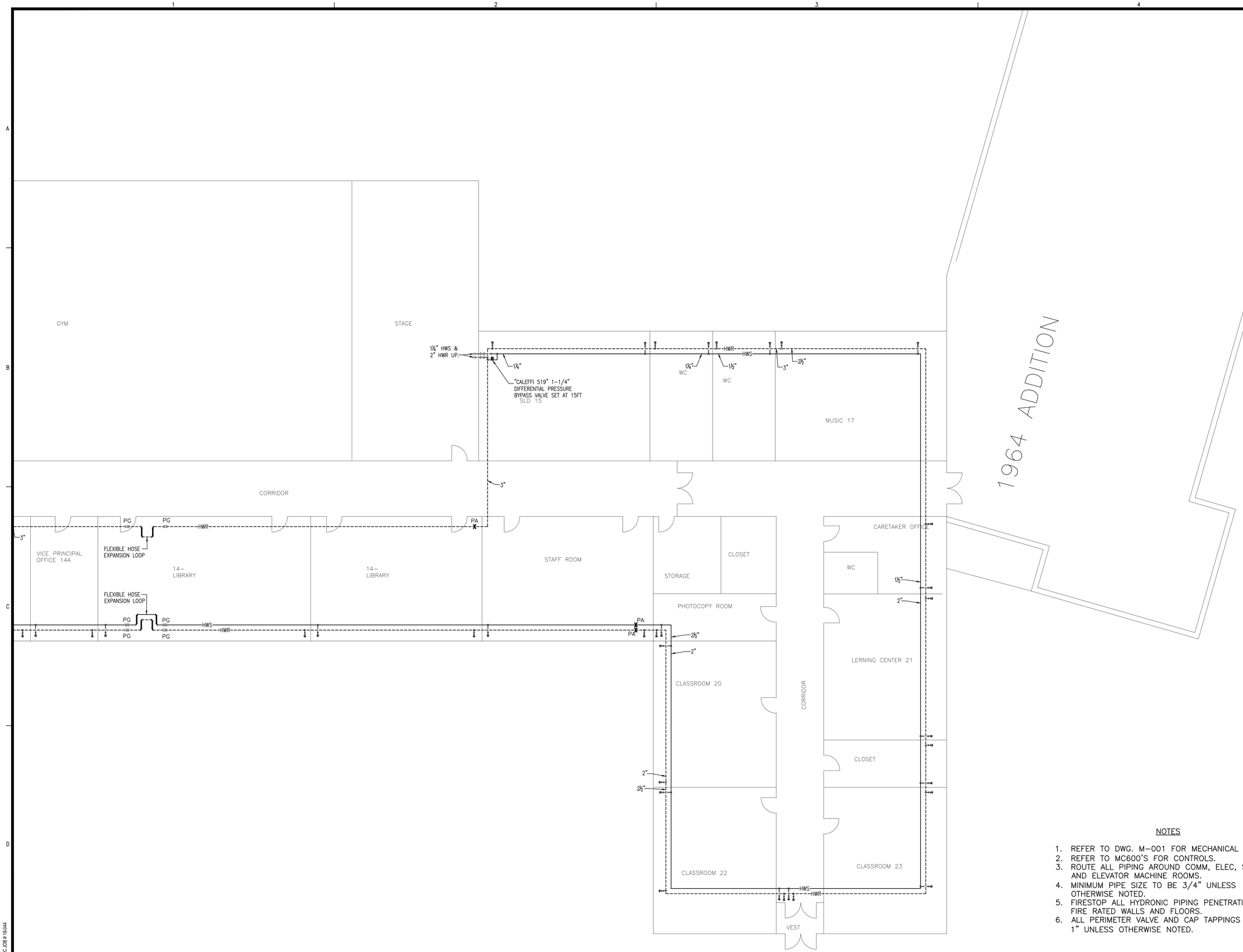
PROJECT NO. –

CONTRACT NO.

DWG.NO.

MH101

DUMAC JOB # 18-044



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REGISTERED PROFESSIONAL ENGINEER
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CLIENT

HALIFAX REGIONAL CENTRE FOR EDUCATION

PROJECT

SHANNON PARK ELEMENTARY SCHOOL HEATING RENOVATIONS

DARTMOUTH — CITY
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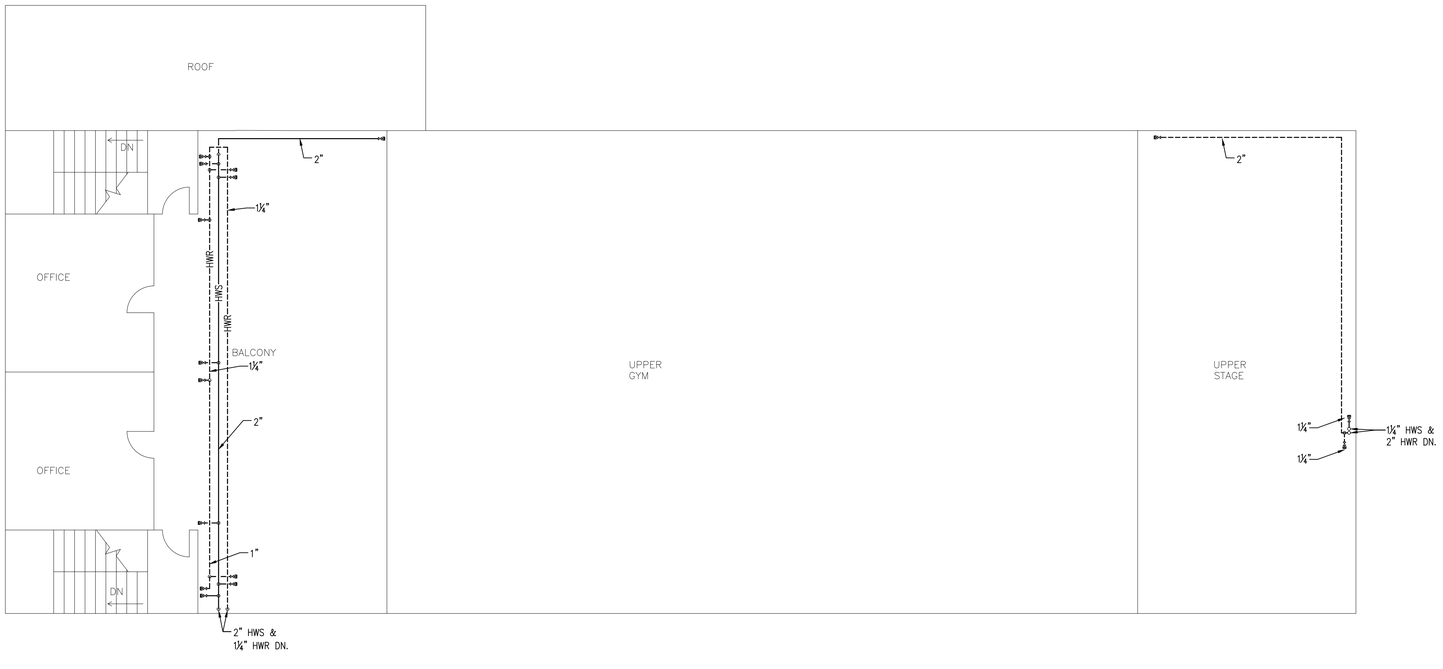
MH102

DUMAC JOB # 18-044



NOTES

1. REFER TO DWG. M-001 FOR MECHANICAL LEGEND.
2. REFER TO MC600'S FOR CONTROLS.
3. ROUTE ALL PIPING AROUND COMM, ELEC, SERVER AND ELEVATOR MACHINE ROOMS.
4. MINIMUM PIPE SIZE TO BE 3/4" UNLESS OTHERWISE NOTED.
5. FIRESTOP ALL HYDRONIC PIPING PENETRATIONS AT FIRE RATED WALLS AND FLOORS.
6. ALL PERIMETER VALVE AND CAP TAPPINGS TO BE 1" UNLESS OTHERWISE NOTED.

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DESCRIPTION	NO.	DATE
ISSUED FOR TENDER	1	JUNE 15, 2018

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PROVINCE OF NOVA SCOTIA
9858

DRAWN: STAFF	SCALE: NTS
CHECKED: CJL	DATE: July 8, 2018
APPROVED: CJL	

CLIENT

HALIFAX REGIONAL CENTRE FOR EDUCATION

PROJECT

SHANNON PARK ELEMENTARY SCHOOL HEATING RENOVATIONS

DARTMOUTH (CITY) NS (PROVINCE)

TITLE

PARTIAL LEVEL 2 FLOOR PLAN HEATING

COMMISSION NO.

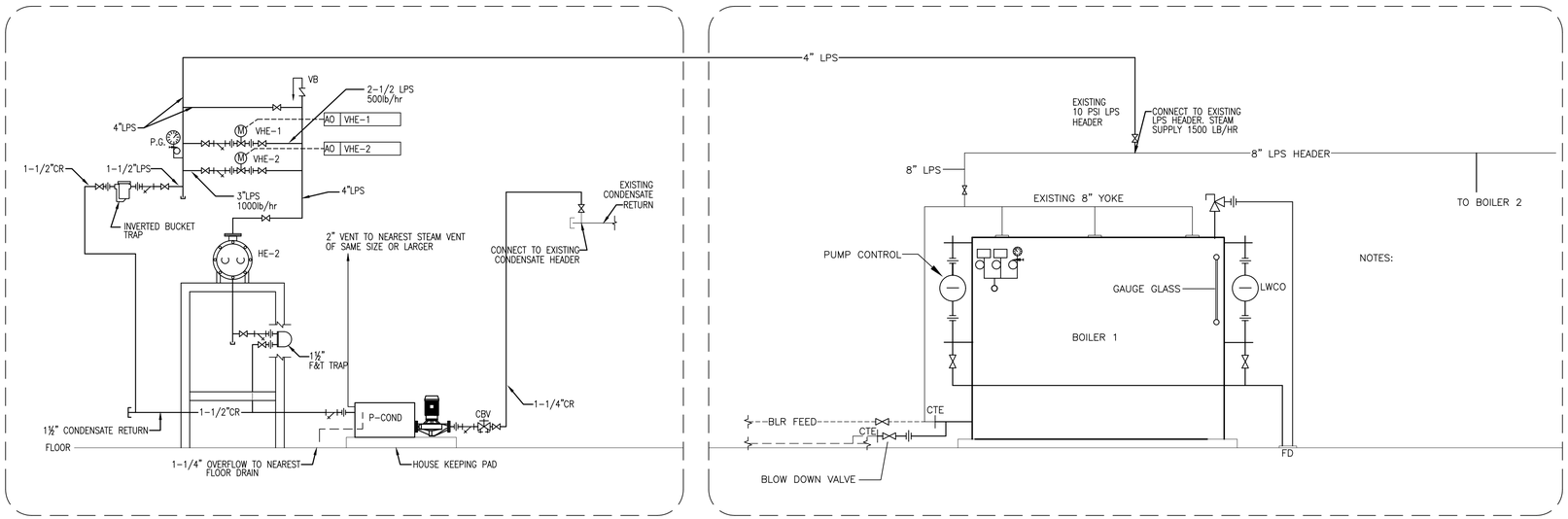
PROJECT NO. –

CONTRACT NO.

DWG.NO.

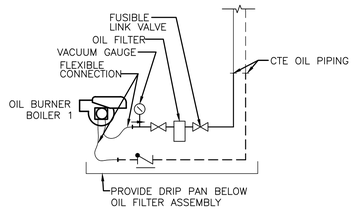
MH103

DUMAC JOB # 18-044



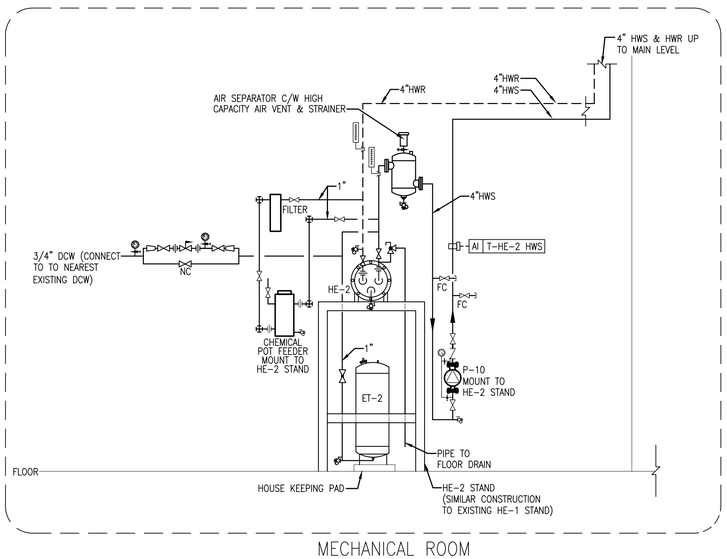
3 MH401 STEAM PIPING SCHEMATIC

NTS



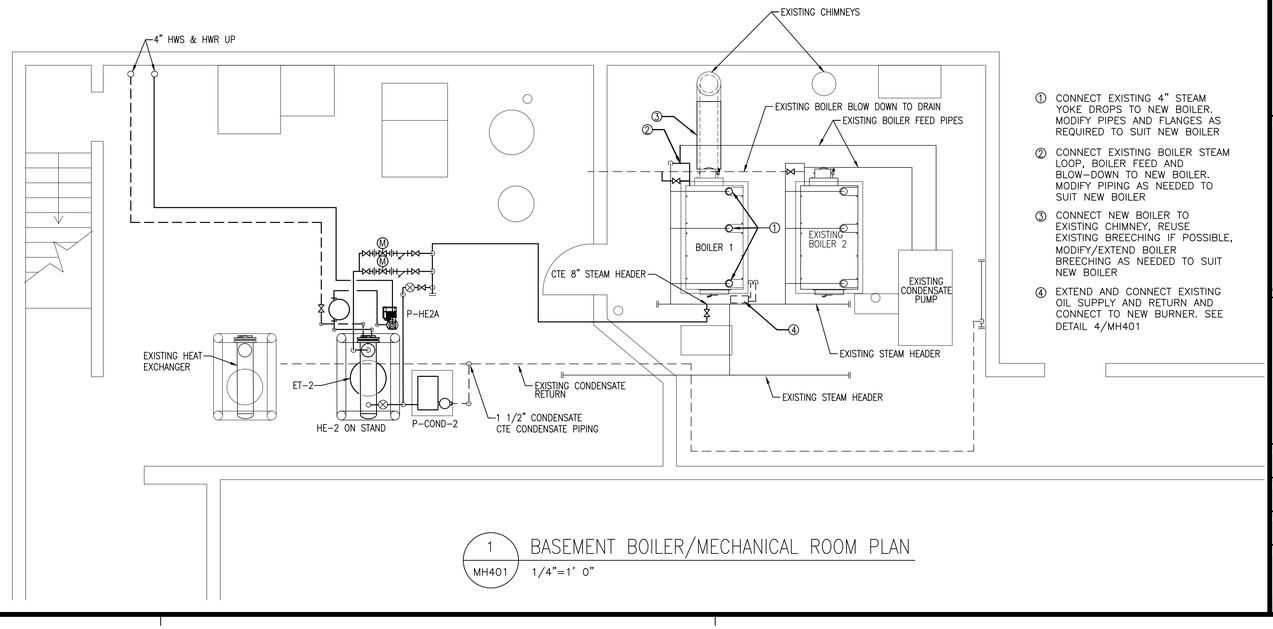
4 MH401 OIL PIPING SCHEMATIC

NTS



2 MH401 HYDRONIC PIPING SCHEMATIC

NTS



① CONNECT EXISTING 4" STEAM YOKE DROPS TO NEW BOILER. MODIFY PIPES AND FLANGES AS REQUIRED TO SUIT NEW BOILER

② CONNECT EXISTING BOILER STEAM LOOP, BOILER FEED AND BLOW-DOWN TO NEW BOILER. MODIFY PIPING AS NEEDED TO SUIT NEW BOILER

③ CONNECT NEW BOILER TO EXISTING CHIMNEY, REUSE EXISTING BREECHING IF POSSIBLE, MODIFY/EXTEND BOILER BREECHING AS NEEDED TO SUIT NEW BOILER

④ EXTEND AND CONNECT EXISTING OIL SUPPLY AND RETURN AND CONNECT TO NEW BURNER. SEE DETAIL 4/MH401

1 MH401 BASEMENT BOILER/MECHANICAL ROOM PLAN

1/4"=1' 0"

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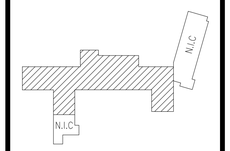

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HALIFAX REGIONAL CENTRE FOR EDUCATION

PROJECT

SHANNON PARK ELEMENTARY SCHOOL HEATING RENOVATIONS

DARTMOUTH — CITY — NS — PROVINCE

TITLE

HYDRONIC / STEAM PLANS AND SCHEMATICS

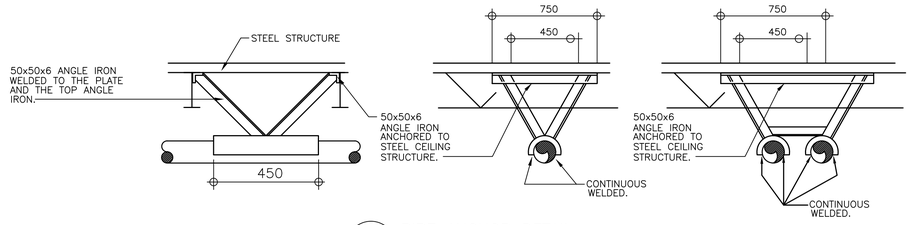
COMMISSION NO.

PROJECT NO. –

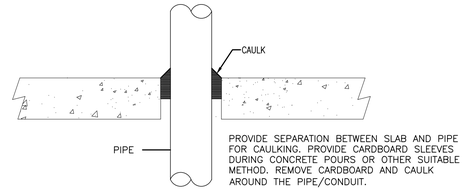
CONTRACT NO.

DWG.NO. MH401

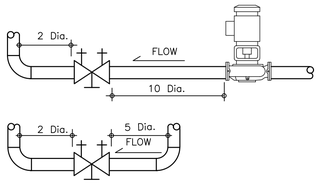
DUMAC JOB # 18-044



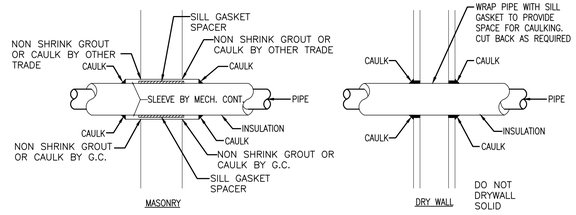
2 MH501 PIPE ANCHOR DETAIL
NTS



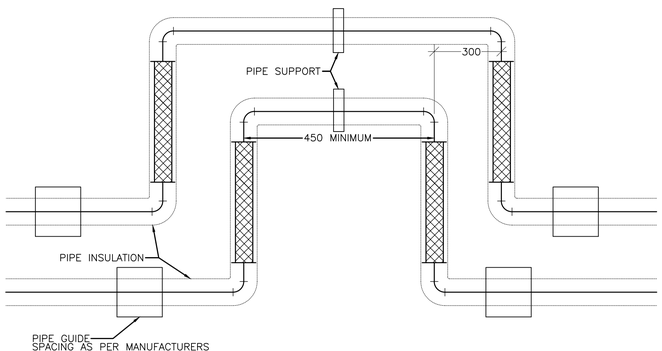
5 MH501 TYPICAL PIPE/CONDUIT PENATRATION THROUGH SLAB ON GRADE
NTS



3 MH501 CIRCUIT BALANCING VALVE INSTALLATION
NTS

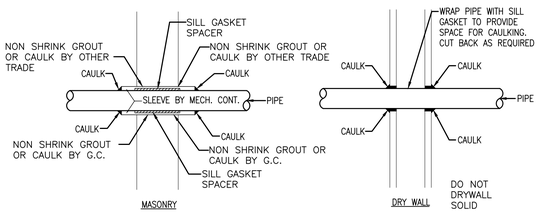


6 MH501 INSULATED PIPE THRU UNRATED PARTITION
NTS



1 MH501 FLEXIBLE HOSE EXPANSION LOOP
N.T.S.

4 MH501 TYPICAL PIPE IDENTIFICATION
NTS



7 MH501 UNINSULATED PIPE THRU UNRATED PARTITION
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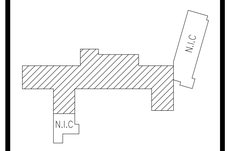

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HALIFAX REGIONAL CENTRE FOR EDUCATION

PROJECT

SHANNON PARK ELEMENTARY SCHOOL HEATING RENOVATIONS

DARTMOUTH — CITY
NS — PROVINCE

TITLE

HEATING DETAILS

COMMISSION NO.

PROJECT NO. –

CONTRACT NO.

DWG.NO.

MH501

DUMAC JOB # 18-044

PUMP SCHEDULE

SYMBOL	SERVICE	LOCATION	STANDARD OF ACCEPTANCE		FLUID	FLOW at P.D. GPM at FT.HD	MOTOR			REMARKS
			MANUFACTURER	MODEL			WATTS	HP	VOLTAGE	
P-10	PERIMETER HEAT	MECHANICAL ROOM	GRUNDFOS	MAGNA 3 100-120	WATER	150 @ 34	1380		230/1	ECM MOTOR. VARIABLE FREQUENCY DRIVE SUPPLIED WITH PUMP ELECTRICAL CONNECTION BY OTHERS.
P-COND	CONDENSATE	MECHANICAL ROOM	BELL & GOSSETT	WATCHMAN 12-20B	WATER	20 @ 15		1/3	120/1	ELECTRICAL CONNECTION BY OTHERS.

STEAM HEAT EXCHANGER SCHEDULE

SYMBOL	SERVICE	LOCATION	STANDARD OF ACCEPTANCE		WARM SIDE		COLD SIDE				CAPACITY BTU/HR	ACCESSORIES AND/OR REMARKS
			MANUFACTURER	MODEL	FLUID	LB/HR @ PSI	FLUID	FLOW GPM @ FT	EWT°F	LWT°F		
HE-2	PERIMETER HEAT	MECHANICAL ROOM	BELL & GOSSETT	SU-104-2	STEAM	1540 @ 2	WATER	150 @ 1	160	180	1,500,000	SUPPORT FRAME BY MECHANICAL CONTRACTOR

EXPANSION TANK SCHEDULE

SYMBOL	SERVICE	LOCATION	STANDARD OF ACCEPTANCE		TANK & ACCEPTANCE VOLUME (GALLONS)	ACCESSORIES AND/OR REMARKS
			MANUFACTURER	MODEL		
ET-2	HEATING	MECHANICAL ROOM	EXPANFLEX	AL-600	158	

HOT WATER BOILER SCHEDULE

SYMBOL	SERVICE	LOCATION	STANDARD OF ACCEPTANCE				BURNER					ACCESSORIES AND/OR REMARKS
			MANUFACTURER	MODEL	INPUT (GPH)	OUTPUT (MBH)	MANUFACTURER	MODEL	FUEL	MOTOR (HP)	VOLTAGE	
BOILER 1	STEAM HEATING	BOILER RM.	BURNHAM	V1111H	18.3	2175	CARLIN	1050FD	NO. 2 OIL	1.0	120/1	REFER TO MC600'S FOR CONTROLS RECONNECT EXISTING ELECTRICAL TO BURNER

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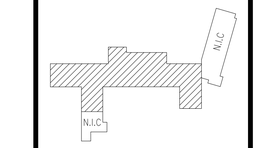

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PROJECT

SHANNON PARK ELEMENTARY SCHOOL HEATING RENOVATIONS

DARTMOUTH (CITY) NS (PROVINCE)

TITLE

HEATING SCHEDULES

COMMISSION NO.

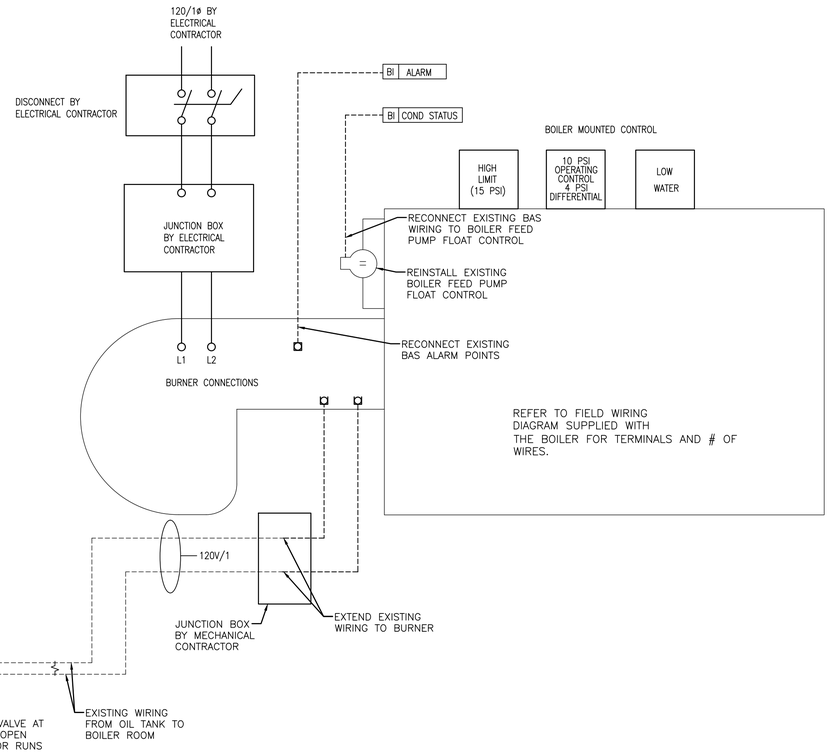
PROJECT NO. –

CONTRACT NO.

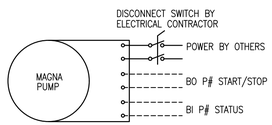
DWG.NO.

MH601

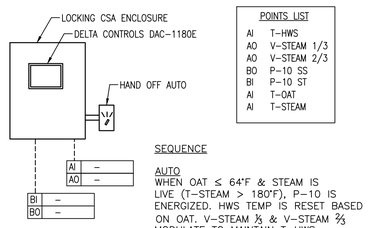
DUMAC JOB # 18-044



3 / MC601 — BOILER 1 WIRING SCHEMATIC
NTS



2 / MC601 — MAGNA (ECM) PUMP WIRING SCHEMATIC
P-10



1 / MC601 — HYDRONIC CONTROL DETAIL

WIRING BY OTHERS

WIRING BY CONTROLS CONTRACTOR

DUMAC JOB # 18-044

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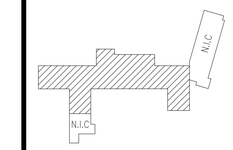

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PROJECT

SHANNON PARK ELEMENTARY SCHOOL HEATING RENOVATIONS

DARTMOUTH (CITY) NS (PROVINCE)

TITLE

CONTROLS DETAILS

COMMISSION NO.

PROJECT NO. –

CONTRACT NO.

DWG.NO.

MC601