

THE CORPORATION OF THE  
T O W N   O F   P E L H A M  
BY-LAW #334 (1975)

Being a by-law to authorize the Mayor and Clerk to  
execute an agreement with R. Shoalts Construction  
Limited for the construction of an arena.

WHEREAS Council deems it desirable to enter into an agreement  
with R. Shoalts Construction Limited for the construction of an arena in  
the Town of Pelham,

NOW THEREFORE COUNCIL OF THE CORPORATION OF THE TOWN OF PELHAM  
ENACTS AS FOLLOWS:

- (1) THAT the agreement attached hereto and made part of this by-law be  
and the same is hereby approved.
- (2) THAT the Mayor and Clerk be and each of them is hereby authorized and  
instructed on behalf of the Corporation to execute the said agreement and  
the Clerk is hereby authorized to affix the Corporate Seal thereto.

READ A FIRST, SECOND AND THIRD TIME  
AND FINALLY PASSED BY COUNCIL THIS  
26th. DAY OF August, 1975 A.D.

*Acting* MAYOR

*CLERK*

APR 17 1975

CONTRACT DOCUMENTS

CONSTRUCTION OF AN  
ARENA  
IN THE

TOWN OF PELHAM, ONTARIO

*Second Draft*

EO 75193

April 1975

PROCTOR & REDFERN LIMITED  
Consulting Engineers & Planners  
75 Eglinton Avenue East  
Toronto, Ontario M4P 1H3



# LIST OF CONTRACT DOCUMENTS

The following shall form the Contract Documents.

|                                                                                       | Paper Colour | Pages |
|---------------------------------------------------------------------------------------|--------------|-------|
| Addendum Numbered — to —                                                              |              |       |
| List of Contract Documents                                                            | PINK         | 1     |
| Preamble                                                                              | YELLOW       | 1     |
| Instruction To Proponents                                                             | BLUE         | 1     |
| Form of Tender                                                                        | YELLOW       | 2     |
| Agreement (CD-20)                                                                     | WHITE        | 4     |
| Agreement to Bond                                                                     | WHITE        | 1     |
| Agreement of Sub-Contractors (CD-3)                                                   | WHITE        | 1     |
| List of Sub-Contractors (CD-4)                                                        | WHITE        | 1     |
| Tenderer's Experience (CD-5)                                                          | WHITE        | 1     |
| Tenderer's Senior Staff (CD-5)                                                        | WHITE        | 1     |
| Tenderer's Plant (CD-6)                                                               | WHITE        | 1     |
| Supplementary Conditions                                                              | WHITE        | 1     |
| General Conditions                                                                    | BLUE         | 3     |
| Project Specifications                                                                |              |       |
| Section 1A General                                                                    |              | 4     |
| Section 1B Outline Specification                                                      |              |       |
| Section 3B Rirk Floor Slab                                                            | Missing      | 6     |
| Section 4A Masonry                                                                    |              |       |
| Section 8A Hollow Metal Doors with Frames                                             | Missing      | 2     |
| Section 13A Performance Specification Building Shell, Framing and Related Foundations |              | 3     |
| Section 15A Performance Specification Heating and Ventilating                         |              | 10    |
| Section 15B Performance Specification Plumbing                                        |              | 10    |
| Section 15C Performance Specification Refrigeration System                            |              | 5     |
| Section 16A Electrical                                                                |              | 9     |

EO 75193 LIST OF CONTRACT DOCUMENTS  
Page 1

Contract Drawings  
B-75193-61 Site Plan  
B-75193-62 Preferred Building Layout  
B-75193-63 Preferred Rink Board Construction

## PREAMBLE

The Town of Pelham wishes to receive proposals for a new ice hockey arena. The project is being undertaken by a somewhat conservative budget.

The Contract Documents have been prepared to advise proponents of the desired layout and features preferred by the Town. In writing the Documents, certain presumptions as to the building construction and type of heating equipment have been made. Alternatives will be considered, providing the equivalent performance is achieved.

Proposals will be reviewed not only on the basis of lowest cost, but also on the best value for dollars expended. The latter is best determined by the completeness of the sub-mission.



INSTRUCTION TO PROPONENTS

ITP.01 GENERAL

- A. Proposals will be received from experienced reputable companies.

ITP.02 DELIVERY AND OPENING OF PROPOSALS

- A. Sealed proposals, marked with the name of the project, will be received by: The Municipality of the TOWN OF PELHAM up to eleven thirty a.m. (11:30) E.S.D.T. on the 29 day of MAY 1975.
- B. Submittals of proposals and any clarifications to the contract documents are to be made through the Clerk of the Town of Pelham, Mr. L.C. Hunt @ 43 South Pelham St., P.O. Box 400, Fonthill, Ontario L0S 1E0 TELEPHONE (416) 892-2607.
- C. The proposals shall be valid for sixty (60) days from the date of closing and the proponent shall be notified within such sixty days as to the decision.
- D. All proposals will include the following:
1. The contract documents completed in the appropriate places including the FORM OF TENDER signed and sealed.
  2. The tender deposit.
  3. The Agreement to Bond.
  4. A design brief outlining the details on all equipment and materials to be used in this project. Clearly indicate alternate materials in lieu of the materials specified in the contract documents.
  5. Provide three copies of the following:
    - (A) A preliminary layout drawing.
    - (B) A preliminary elevation drawing.
    - (C) A perspective sketch of the proposal.
    - (D) A comprehensive room schedule.

ITP.03 EXAMINATION OF SITE

- A. The proponent shall visit the site of the work before submitting his proposal and shall by personal examination satisfy himself as to the local conditions that may be encountered during construction of the work. He shall make his own estimate of the facilities and difficulties that may be encountered and the nature of the subsurface materials and conditions.
- B. The proponent can not claim at any time after submission of his proposal that there was any misunderstandings of the terms and conditions of the contract relating to site conditions.

ITP.04 PROOF OF ABILITY

- A. The proponent must complete the form attached indicating his experience in similar work.

ITP.05 TENDER DEPOSIT

- A. Every proposal shall be accompanied by a Bid Bond in the amount equal to 10% of the tender sum.

ITP.06 AGREEMENT TO BOND

- A. Every proposal shall be accompanied by an Agreement to Bond in the form attached and shall be completed by a surety company lawfully doing business in the Province.

ITP.07 ACCEPTANCE OF PROPOSALS

- A. The lowest or any proposal need not necessarily be accepted by the Owner.

ITP.08 PROPONENTS BUILDING LIMITATIONS

- A. The proponent's responsibility for the overall building work shall extend five (5) feet outside the building surface.

ITP.09 PROVINCIAL SALES TAX

- A. All prices shall exclude Provincial Sales Tax.

ITP.10 FEDERAL SALES TAX

- A. All prices shall include Federal Sales Taxes on taxable items. No refunds will be obtainable for materials supplied under this contract.

ITP.11 TEST BORINGS

- A. Test borings have been taken on the site and results of these tests are available for viewing at the office of the Consultant, Proctor & Redfern Limited, 110 James Street, 3rd Floor, St. Catharines, Ontario.



FORM OF TENDER

FT.01 TENDER PRICE

1. OFFER BY - NAME -

ADDRESS -

DATE -

2. TO The Corporation of the Town of Pelham

- A. We, the undersigned, having examined the site of the work, having carefully investigated the conditions pertaining to the work and having secured all the information necessary to enable us to submit a bona fide tender, and having inspected all the Contract Documents, hereby agree to enter into a contract and to perform all the work in a good and workmanlike manner in accordance with the Contract Documents to the satisfaction of the Engineer for the total tender price of

Dollars (\$ )

FT.02 ALLOWANCES

We agree that the tender price includes an allowance of three thousand dollars (\$3,000.00) and seven thousand dollars (\$7,000.00) for painting and hardware respectively. The expenditure of these allowances shall be subject to the General Conditions of Contract.

FT.03 ADDITIONS AND DEDUCTIONS

- A. We agree that the valuation of additions and deductions from the Contract shall be made by one of the following methods:

1. a). The engineer may ask the Contractor for a quotation for the proposed work.
- b). If the quotation referred to in (a) above is not accepted by the Engineer, the actual cost of the work will be determined as the total of only the following:



FT.03 ADDITIONS AND DEDUCTIONS (Cont'd)

- 1). Actual cost of labour, including such items as Workmen's Compensation and Unemployment Insurance.
  - 2). Actual cost of materials to be incorporated into the work, including such items as freight and taxes.
  - 3). For work done by the Contractor, an amount equal to 15 percent of the totals from Subsections (1) and (2) above, which shall constitute overhead and profit of the contractor.
  - 4). For work done by sub-contractors, an amount equal to 20 percent of the totals from subsections (1) and (2) above, which shall constitute overhead and profit of the Contractor and Sub-contractors.
  - 5). Rental of equipment and plant having a new value greater than \$300. Rental rates shall be as set out in the current edition of M.T.C. Form 527.
2. Whenever extra work is being performed under Sub-section 1(b) above, we agree to submit daily reports in writing, indicating the total chargeable costs incurred for the day. Valuation of the extra work being so performed will be made only on the basis of the approved daily reports.

FT.04 ADDENDA

- A. We agree that we have received Addenda to inclusive, and the tender price includes the provisions set out in such addenda.

FT.05 COMPLETION

- A. We agree to commence work as specified, to proceed continuously to the completion and to complete all work by \_\_\_\_\_.

FT.06 SCHEDULE OF TENDER PRICES

| Item Description                     | Name of<br>Supplier or<br>Sub-Contractor | Contract Value |
|--------------------------------------|------------------------------------------|----------------|
| 1. Excavation                        |                                          | \$             |
| 2. Granular                          |                                          | \$             |
| 3. Concrete Foundations              |                                          | \$             |
| 4. Reinforcing Steel                 |                                          | \$             |
| 5. Structural Steel                  |                                          | \$             |
| 6. Masonry                           |                                          | \$             |
| 7. Metal Cladding                    |                                          | \$             |
| 8. Insulation                        |                                          | \$             |
| 9. Roofing                           |                                          | \$             |
| 10. Carpentry                        |                                          | \$             |
| 11. Glass and Glazing                |                                          | \$             |
| 12. Overhead Doors                   |                                          | \$             |
| 13. Hollow Metal Doors<br>and Frames |                                          | \$             |
| 14. Mechanical                       |                                          | \$             |
| 15. Electrical                       |                                          | \$             |
| 16. Refrigeration                    |                                          | \$             |
| 17. Concrete Ice Floor               |                                          | \$             |
| 18. Painting Allowance               |                                          | \$ 3,000.00    |
| 19. Hardware Allowance               |                                          | \$ 7,000.00    |
| 20. General Contractor's Work        |                                          | \$             |
| Total Contract Price                 |                                          | \$             |



OFFERED ON BEHALF  
OF THE CONTRACTOR

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Contractor's Seal

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Witness

\_\_\_\_\_  
Address

\_\_\_\_\_  
Date

Proctor & Redfern Limited  
Project EO 75193  
TOWN OF PELHAM, ONTARIO  
PELHAM ARENA

AGREEMENT

This Agreement made in triplicate this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, between \_\_\_\_\_ hereinafter called "The Contractor",

AND

hereinafter called "The Owner".

WITNESSETH, that the Contractor agrees with the Owner to perform all the work in accordance with the contract documents referred to in the tender of the Contractor dated the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_ (which shall be deemed to form part of this Contract) to the satisfaction of the Engineer for the total contract price of \$ \_\_\_\_\_ which contract documents are attached hereto and which are hereby expressly made part of this Contract.

The Owner hereby agrees with the Contractor, that in consideration of the work being performed by the Contractor as specified, the Owner shall pay the Contractor for said work in accordance with the prices set out in the Form of Tender attached hereto, and in accordance with the provisions set out in the attached contract documents.

Time shall be deemed the essence of this contract.

IN WITNESS WHEREOF the parties hereto have set their hands and seals the \_\_\_\_\_ day and year first written above.

EXECUTION BY OWNER -

Name \_\_\_\_\_

Officers \_\_\_\_\_

EXECUTION BY CONTRACTOR -

Company Name \_\_\_\_\_

Signatures \_\_\_\_\_

Witness \_\_\_\_\_

Date \_\_\_\_\_

Seal

Seal

EO 75193 AGREEMENT



AGREEMENT TO BOND

\*

Date ..... 19 ...

Project No. EO 75193  
Contract

Gentlemen:

Construction of Pelham Arena  
In The  
Town of Pelham, Ontario

In consideration of the Owner accepting the tender of and executing an Agreement with .....  
.....  
(hereinafter referred to as "the Tenderer") for the construction of the Pelham Arena in the Town of Pelham, Ontario subject to the express condition that the Owner receive the Performance Bond in accordance with the said Tenderer, we the undersigned hereby agree with the Owner to become bound to the Owner as surety for the Tenderer in a Performance Bond in the amount equal to 50% of the tender price, in the form of Performance Bond bound herein and in accordance with the said tender, and we agree to furnish the Owner with the said bond within 7 days after notification of the acceptance of the said tender and execution of the said Agreement by the Owner has been mailed to us.

Yours very truly,

Note: This Agreement must be executed on behalf of the surety company by its authorized officers under the company's corporate seal.

\* Enter name and address of surety company at top of the page.

LIST OF SUB-CONTRACTORS

| SUB-TRADE | NAME OF<br>SUB-CONTRACTOR | ADDRESS OF<br>SUB-CONTRACTOR |
|-----------|---------------------------|------------------------------|
|           |                           |                              |



TENDERER'S EXPERIENCE IN SIMILAR WORK

| YEAR<br>COMPLETED | DESCRIPTION<br>OF CONTRACT | FOR WHOM<br>WORK PERFORMED | VALUE |
|-------------------|----------------------------|----------------------------|-------|
|                   |                            |                            |       |

Proctor & Redfern Limited  
Consulting Engineers  
June 11, 1969  
AS:hs

TENDERER'S SENIOR STAFF

| NAME | APPOINTMENT | QUALIFICATIONS<br>AND EXPERIENCE |
|------|-------------|----------------------------------|
|      |             |                                  |

Proctor & Redfern Limited  
Consulting Engineers  
June 11, 1969  
AS:hs



TENDERER'S PLANT

The Tenderer shall list the plant, machinery and equipment he proposes to use on the work.

PLANT UNDER TENDERER'S CONTROL:

PLANT TO BE RENTED:

PLANT TO BE PURCHASED:

Proctor & Redfern Limited  
Consulting Engineers  
June 11, 1969  
AS:hs

PERFORMANCE BOND

No. .... \$ .....

KNOW ALL MEN BY THESE PRESENTS THAT .....  
.....as Principal,

hereinafter called the Principal, and .....  
a corporation created and existing under the laws of .....  
and duly authorized to transact the business of Suretyship in .....  
as Surety, hereinafter called the Surety, are held and firmly bound unto .....  
..... as Oblige

hereinafter called the Oblige, in the amount of ..... Dollars (\$ ..... )  
lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind  
themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a written contract with the Oblige, dated the .....  
day of ..... 19 ..... , for .....  
.....  
.....  
.....

In accordance with the Specifications and Drawings submitted therefor which contract, Specifications and Drawings, are  
by reference made part hereof and are hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal shall promptly and  
faithfully perform the Contract then this obligation shall be null and void; otherwise it shall remain in full force and  
effect.

Whenever the Principal shall be, and declared by the Oblige to be, in default under the Contract, the Oblige having  
performed the Oblige's obligations thereunder, the Surety may promptly remedy the default, or shall promptly

- (1) complete the Contract in accordance with its terms and conditions or
- (2) obtain a bid or bids for submission to the Oblige for completing the Contract in accordance with its terms and  
conditions, and upon determination by the Oblige and the Surety of the lowest responsible bidder, arrange for  
a contract between such bidder and the Oblige and make available as work progresses (even though there  
should be a default, or a succession of defaults, under the contract or contracts of completion, arranged under  
this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract price; but not  
exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set  
forth in the first paragraph hereof. The term "balance of the Contract price," as used in this paragraph, shall  
mean the total amount payable by the Oblige to the Principal under the Contract, less the amount properly  
paid by the Oblige to the Principal.

Any suit under this Bond must be instituted before the expiration of two (2) years from the date on which final  
payment under the Contract falls due.

The Surety shall not be liable for a greater sum than the specified penalty of this Bond.

No right of action shall accrue on this Bond, to or for the use of, any person or corporation other than the Oblige  
named herein, or the heirs, executors, administrators or successors of the Oblige.

IN WITNESS WHEREOF, the Principal and the Surety have Signed and Sealed this Bond this .....  
day of ..... 19 .....

SIGNED and SEALED  
In the presence of:

( .....  
( .....  
( .....  
( ..... Principal (Seal)  
( .....  
( .....  
( ..... Surety (Seal)



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**.as Principal**

100

df .....

and duly authorized to transact the business of Suretyship in .....

as Surety, hereinafter called the Surety, are held and firmly bound unto .....

**.as Obligee**

hereinafter called the Obligee, in the amount of .....

..... Dollars (\$ ..... )  
lawful money of Canada, for the payment of which sum, well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a written tender to the Obligee, dated the .....

day of ..... 19....., for .....

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the aforesaid Principal shall have the tender accepted within sixty (60) days from the closing date of tender and the said Principal will, within the time required, enter into a formal contract and give the specified security to secure the performance of the terms and conditions of the Contract, then his obligation shall be null and void; otherwise the Principal and the Surety will pay unto the Obligor the difference in money between the amount of the bid of the said Principal and the amount for which the Obligor legally contracts with another party to perform the work if the latter amount be in excess of the former.

The Principal and the Surety shall not be liable for a greater sum than the specified penalty of this Bond.

Any suit under this Bond must be instituted before the expiration of six months from the date of this Bond.

IN WITNESS WHEREOF, the Principal and the Surety have Signed and Sealed this Bond this

..... day of ..... 19.....

**SIGNED and SEALED**

in the presence of

Principal ..... (Seal)

..... (Seal)  
Surety



SUPPLEMENTARY CONDITIONS

SC.01 GUARANTEE PERIOD

- A. The Contractor shall guarantee that the material and work for a one year period, not to limit standard warranties as supplied by standard manufacturers and two years on the roof from the acceptance date remain in such condition as will meet with the Engineer's approval, and that he will make good in a permanent manner, satisfactory to the Engineer, any imperfections due to material or workmanship used in construction and any damage caused by such imperfections. The decision of the Engineer shall be final as to the nature and the cause of such imperfections and the necessity for remedying them.

Should the Contractor fail to comply with the directions of the Engineer, the Engineer may, after giving the Contractor forty-eight (48) hours written notice, perform the necessary work, and the cost may be deducted or collected by the Owner as provided in the Contract.

- B. Notwithstanding the provisions of sub-section (A) of this Clause, the Engineer may in cases of danger or public safety, make such immediate arrangements for repair as he sees fit and the Engineer inform the Contractor of such action. The cost of such emergency work shall be borne by the Contractor.

- C. If the Engineer notifies the Contractor, in writing, of imperfections prior to the termination of the guarantee period, the Contractor shall make good the imperfections as required in sub-section (A) above, notwithstanding that such work of making good may commence after or extend beyond the guarantee period.

SC.02 DEFINITIONS

- A. D.H.O., M.T.C. and Department of Highways shall mean the Ministry of Transportation and Communications.

- B. N.B.C. means the National Building Code of Canada.  
C. *PROVIDE also means supply and install*

SC.03 INSURANCE

- A. The Contractor shall insure and maintain insurance against liability for bodily injury and property damage that may arise with respect to the work being performed under the Contract, such insurance shall:

1. Be in the joint names of the Owner, the Contractor, the Sub-Contractors and the Engineer, and

2. Include coverage for:

- (A) Contractual liability, and  
(B) Gross liability, and  
(C) Contingent employer's liability, and



SC.03 INSURANCE (Cont'd)

2. (D) Completed operations liability, and  
(E) Non-owned automobile liability, and
3. Have an inclusive limit at least equal to \$500,000.00 unless otherwise specified, and
4. Remain in force until the issue by the Engineer of the final payment certificate, except that completed operations liability shall remain in force for the duration of the guarantee period.

SC.04 AUTOMOBILE INSURANCE

- A. The Contractor shall insure and maintain insurance against liability for bodily injury and property damage caused by automobiles owned by the Contractor and used on the work. Such insurance shall have an inclusive limit at least equal to \$500,000.00. An automobile shall be as defined in the Highway Traffic Act.

SC.05 INSURANCE CLAIMS

- A. Claims or alleged claims received by the Contractor shall be dealt with immediately by the Contractor. If a claim is settled to the satisfaction of the claimant, the Contractor shall submit to the Engineer a copy of the claimant's release.
- B. If a claim or alleged claim is rejected by the Contractor and/or his insurance company, the Contractor shall report this fact to the Engineer.
- C. Should 30 days elapse after the claim or alleged claim has been received by the Contractor, and the Contractor is not able to report settlement or rejection of the claim, he shall report to the Engineer the steps being taken with respect to the claim.

SC.06 DAMAGE INSURANCE

- A. The Contractor will insure the works against "all risks". The coverage shall include all work in progress and materials delivered to the site.

SC.07 PERFORMANCE BOND

- A. The Contractor, together with a surety company approved by the Owner and authorized by law to carry on business in the province in which the work is to be performed, shall furnish a performance bond to the Owner in the form attached in the amount of 50 percent of the Contract Price. The bond shall unconditionally guarantee the performance of the Contractor, shall be at the expense of the Contractor, and shall remain in effect for one year after the acceptance date.

SC.08 FEDERAL - PROVINCIAL GRANTS

- A. The Town of Pelham may be applying for grants from the Federal and Provincial Governments for this project. The Contractor shall comply with all regulations required to obtain grants including the keeping of records.

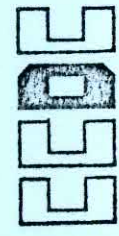
SC.09 ONTARIO MUNICIPAL BOARD APPROVAL

- A. The award of this Contract is subject to Ontario Municipal Board approval.



# Stipulated price contract

project



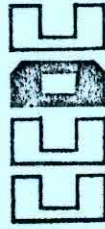
Canadian construction documents committee

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The Canadian Construction Documents Committee is a joint committee composed of representatives appointed by:

- The Association of Consulting Engineers of Canada
- The Canadian Construction Association
- The Engineering Institute of Canada
- The Royal Architectural Institute of Canada
- The Specification Writers Association of Canada

Committee policy and assignments are directed by the Presidents' Consultative Committee of the parent associations.

This document has been endorsed by each of the above organizations.

Comment and enquiries should be directed to:

The Secretary,  
Canadian Construction Documents Committee,  
151 O'Connor Street, Ottawa, Canada K2P 1T2.

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N.B.: A supplement will be required for work in the Province of Quebec.



**AGREEMENT BETWEEN OWNER AND CONTRACTOR**  
for use when a stipulated price forms the basis of payment and to  
be used only with the General Conditions of the Contract.

This Agreement made in duplicate the..... day of .....

in the year Nineteen hundred and.....

by and between .....

.....

hereinafter called the "Owner"

and .....

.....

hereinafter called the "Contractor"

witneseth: that the Owner and Contractor undertake and agree as follows:

**ARTICLE A-1 THE WORK**

The Contractor shall:

- (a) perform all the Work required by the Contract Documents for.....  
..... (insert here the title of the Work and the Project)  
.....  
which have been signed in duplicate by both the parties, and which were prepared by .....  
..... acting as and hereinafter called the "Engineer" and
- (b) do and fulfill everything indicated by this Agreement, and
- (c) commence the Work by the..... day of .....19....and substantially  
perform the Work of this Contract as certified by the Engineer by the .....day of.....

19.....



## ARTICLE A-3 CONTRACT PRICE

The Contract Price is ..... Dollars

(\$.....) in Canadian funds, which price shall be subject to adjustments as may be required in accordance with the General Conditions of the Contract.

**ARTICLE A-4 PAYMENT**

(a) Subject to applicable legislation and, where such legislation does not exist or apply, in accordance with such prescribed regulations or industry practice respecting holdback percentages and in accordance with the provisions of the General Conditions of the Contract, the Owner shall:

- (1) make monthly payments to the Contractor on account of the Contract Price. The amounts of such payments shall be as certified by the Engineer; and
  - (2) upon Substantial Performance of the Work as certified by the Engineer pay to the Contractor any unpaid balance of holdback monies then due; and
  - (3) upon Total Performance of the Work as certified by the Engineer pay to the Contractor any unpaid balance of the Contract Price then due.
- (b) If the Owner fails to make payments to the Contractor as they become due under the terms of this Contract or in any award by arbitration or court, interest at the rate of 1 per cent per month of such unpaid amounts including earned interest, shall also become due and payable until payment. Such interest shall be calculated and added to any unpaid amounts monthly.

## ARTICLE A-5 ADDRESSES FOR NOTICES

All communications in writing between the parties or between them and the Engineer shall be deemed to have been received by the addressee if delivered to the individual or to a member of the firm or to an officer of the Corporation for whom they are intended or if sent by post or by telegram addressed as follows:

**The Owner at . . . . .** *street and number and postal box number if applicable*

.....  
post office or district, province, postal code

The Contractor at ..... street and number and postal box number if applicable

.....  
post office or district, province, postal code

The Engineer at ..... street and number and postal box number if applicable

..... post office or district, province, postal code



ARTICLE A-6 SUCCESSION

The General Conditions of the Contract hereto annexed, and all other aforesaid Contract Documents, are all to be read into and form part of this Agreement and the whole shall constitute the Contract between the parties and subject to law and the provisions of the Contract Documents shall enure to the benefit of and be binding upon the parties hereto, their respective heirs, legal representatives, successors and assigns.

In witness whereof the parties hereto have executed this Agreement under their respective corporate seals and by the hands of their proper officers thereunto duly authorized.

SIGNED, SEALED AND DELIVERED

in the presence of:

| Owner                   | Contractor              |
|-------------------------|-------------------------|
| .....<br>name           | .....<br>name           |
| .....                   | .....                   |
| .....<br>signed         | .....<br>signed         |
| .....<br>name and title | .....<br>name and title |
| .....                   | .....                   |
| .....<br>signed         | .....<br>signed         |
| .....<br>name and title | .....<br>name and title |

N.B. Where any legal jurisdiction, local practice or client requirement calls for proof of authority to execute this document, proof of such authority in the form of a certified copy of a resolution naming the person or persons in question as authorized to sign the Agreement for and on behalf of the Corporation or Partnership, should be attached.



## THE GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT

### GC 1 DEFINITIONS

#### 1.1 Contract Documents

The Contract Documents consist of the executed Agreement and the General Conditions of the Contract, Supplementary General Conditions, Specifications, Drawings and such other documents as are listed in Article A-2 of the Agreement including all amendments thereto incorporated before their execution and subsequent amendments thereto made pursuant to the provisions of the Contract or agreed upon between the parties.

#### 1.2 Owner, Engineer, Contractor

The Owner, Engineer and Contractor are the persons, firms or corporations identified as such in the Agreement and referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Owner, Engineer and Contractor means the Owner, Engineer and Contractor or their authorized representatives as designated to each party in writing.

#### 1.3 Subcontractor

A Subcontractor is a person, firm or corporation having a direct contract with the Contractor to perform a part or parts of the Work included in the Contract, or to supply products worked to a special design according to the Contract Documents, but does not include one who merely supplies products not so worked. The term Subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender.

#### 1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part.

#### 1.5 The Work

The term the Work means the total construction required by the Contract Documents and includes all labour, products and services.

#### 1.6 Products

The term products means all material, machinery, equipment and fixtures forming the completed work as required by the Contract Documents but does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work and normally referred to as construction machinery and equipment.

#### 1.7 Other Contractor

The term Other Contractor means any person, firm or corporation employed by or having a separate contract directly or indirectly with the Owner for work other than that required by the Contract Documents.

#### 1.8 Place of Building

The place of building is the designated site or location of the Project.

#### 1.9 Law of the Contract

The law of the place of building shall govern the Contract.

#### 1.10 Time

(a) The Contract Time is the time stated in Article A-1(c) of the Agreement for Substantial Performance of the Work.

(b) The date of Substantial Performance of the Work is the date certified by the Engineer.

(c) The term day as used in the Contract Documents shall mean the calendar day.

(d) The term working day as used in the Contract Documents shall mean days other than Saturdays, Sundays and holidays which are observed by the construction industry in the area of the place of building.



### 1.11 Substantial Performance

Substantial Performance is as defined in the Mechanics' Lien legislation applicable to the place of building. If such legislation is not in force or does not contain such definition Substantial Performance shall have been reached when the Work is ready for use or is being used for the purpose intended and is so certified by the Engineer.

### 1.12 Total Performance

Total Performance shall mean when the entire Work has been performed to the requirements of the Contract Documents and is so certified by the Engineer.

## GC 2 DOCUMENTS

2.1 The Contract Documents shall be signed in duplicate by the Owner and the Contractor.

2.2 The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all.

2.3 The intention of the Contract Documents is to include all labour, products and services reasonably necessary to perform the Work in accordance with these documents. It is not intended, however, that the Contractor shall supply any products or work not covered by or properly inferable from any of the Contract Documents.

2.4 Words which have well known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings.

2.5 In the event of conflicts between Contract Documents the following shall apply:

(a) Documents of later date shall govern.

(b) Figured dimensions shown on the Drawings shall govern even though they may differ from scaled dimensions.

(c) Drawings of larger scale shall govern over those of smaller scale of the same date.

(d) Specifications shall govern over Drawings.

(e) The General Conditions of the Contract shall govern over Specifications.

(f) Supplementary General Conditions shall govern over the General Conditions of the Contract.

(g) The Agreement shall govern over all documents.

## GC 3 ADDITIONAL INSTRUCTIONS

3.1 During the progress of the Work the Engineer shall furnish to the Contractor such additional instructions as may be necessary to supplement the Contract Documents. All such instructions shall be consistent with the intent of the Contract Documents.

3.2 Additional instructions may include minor changes to the Work which affect neither the Contract Price nor the Contract Time.

3.3 Additional instructions may be in the form of drawings, samples, models or written instructions.

3.4 Additional instructions will be issued by the Engineer with reasonable promptness and in accordance with any schedule agreed upon.

## GC 4 DOCUMENTS PROVIDED

4.1 The Contractor will be provided without charge, with as many copies of the Contract Documents or parts thereof as are reasonably necessary for the performance of the Work.

## GC 5 DOCUMENTS ON THE SITE

5.1 The Contractor shall keep one copy of all current Contract Documents and shop drawings on the site, in good order and available to the Engineer and/or his representatives. This requirement shall not be deemed to include the executed Contract Documents.

## GC 6 OWNERSHIP OF DOCUMENTS AND MODELS

6.1 All Contract Documents and copies thereof, and all models furnished by the Engineer are and shall remain his property and are not to be used on other work.

6.2 Such documents are not to be copied or revised in any manner without the written authorization of the Engineer.

6.3 Models furnished by the Contractor or the Owner are the property of the Owner.



#### **GC 7 ENGINEER'S DECISIONS**

- 7.1** The Engineer, in the first instance, shall decide on questions arising under the Contract Documents and interpret the requirements therein. Such decisions shall be given in writing. The Engineer shall use his powers under the Contract to enforce its faithful performance by both parties hereto.
- 7.2** The Contractor shall notify the Engineer in writing immediately should he hold that a decision by the Engineer is in error and/or at variance with the Contract Documents.
- 7.3** If the question of error and/or variance is not resolved immediately, and the Engineer decides that the disputed work shall be carried out, the Contractor shall act according to the Engineer's written decision. Any question of change in Contract Price and/or extension of Contract Time due to such error and/or variance shall be decided as provided in GC 16 — Settlement of Disputes.
- 7.4** Should the Engineer's employment be terminated, the Owner shall appoint an Engineer whose status under the Contract shall be that of the former Engineer.
- 7.5** Nothing contained in the Contract Documents shall create any contractual relationship between the Engineer and the Contractor.

#### **GC 8 DELAYS**

- 8.1** If the Contractor is delayed in the performance of the Work by any act or neglect of the Owner, Engineer or any Other Contractor or any employee of any one of them, then the Contract Time shall be extended for such reasonable time as the Engineer may decide in consultation with the Contractor, and the Contractor shall be reimbursed for any costs incurred by him as the result of such delay.
- 8.2** If the Contractor is delayed in the performance of the Work by a Stop Work Order issued by any court or other public authority, and providing that such order was not issued as the result of any act or fault of the Contractor or of any one employed by him directly or indirectly, then the Contract Time shall be extended for such reasonable time as the Engineer and the Contractor may agree that the work was delayed, and the Contractor shall be reimbursed for any costs incurred by him as the result of such delay.
- 8.3** If the Contractor is delayed in the performance of the Work by labour disputes, strikes, lock-outs (including lock-outs decreed or recommended for its members by a recognized Contractors' Association, of which the Contractor is a member), fire, unusual delay by common carriers or unavoidable casualties or, without limit to any of the foregoing, by any cause of any kind whatsoever beyond the Contractor's control, then the Contract Time shall be extended for such reasonable time as may be mutually decided by the Engineer and Contractor, but in no case shall the extension of time be less than the time lost as the result of the event causing the delay, unless such shorter extension of time be agreed to by the Contractor.
- 8.4** In addition and without limit to the foregoing the Contract Time may be extended for any cause within the Contractor's control which the Engineer shall decide as justifying a delay for such reasonable time as the Engineer may decide.
- 8.5** No extension shall be made for delay unless written notice of claim is given to the Engineer within fourteen (14) days of its commencement, providing that in the case of a continuing cause of delay only one claim shall be necessary.
- 8.6** If no schedule is made under GC 3 — Additional Instructions, no claim for delay shall be allowed on account of failure to furnish instructions until two (2) weeks after a demand for such instructions and not then unless such claim is reasonable.
- 8.7** The Engineer shall not, except by written notice to the Contractor, or as provided in GC 15 — Emergencies, stop or delay any part of the work pending instructions or proposed changes in the work.

#### **GC 9 OWNER'S RIGHT TO DO WORK**

- 9.1** If the Contractor should neglect to prosecute the Work properly or fail to perform any provisions of the Contract, the Owner, subject to the approval of the Engineer, may notify the Contractor in writing that he is in default of his contractual obligations and instruct him to correct the default within five (5) working days of receiving the notice.
- 9.2** If the correction of the default cannot be completed within the five (5) working days specified, the Contractor shall be considered to be in compliance with the Owner's instruction if he:
- (a) commences the correction of the default within the specified time, and
  - (b) provides the Owner with an acceptable schedule for such correction, and
  - (c) completes the correction in accordance with such schedule.



9.3 If the Contractor fails to comply with the provisions 9.1 and 9.2 the Owner may, without prejudice to any other right or remedy he may have, correct such default and may deduct the cost thereof from the payment then or thereafter due the Contractor provided, however, that the Engineer shall approve both the action and the amount subsequently charged to the Contractor.

#### GC 10 OWNER'S RIGHT TO STOP WORK OR TERMINATE CONTRACT

10.1 If the Contractor should be adjudged bankrupt, or makes a general assignment for the benefit of creditors or if a receiver is appointed on account of his insolvency, the Owner may, without prejudice to any other right or remedy he may have, by giving the Contractor written notice, terminate the Contract.

10.2 Subject to the receipt of a certificate from the Engineer verifying that sufficient cause exists, the Owner may notify the Contractor in writing that he is in default of his contractual obligations, if the Contractor:

- (a) refuses or fails to supply sufficient properly skilled workmen or proper workmanship, products or construction machinery and equipment for the scheduled performance of the Work within five (5) working days of receiving written notice from the Engineer, except in those cases provided in GC 8 — Delays; or,
- (b) fails to make payments due to his Subcontractors, his suppliers or his workmen; or,
- (c) persistently disregards laws or ordinances, or the Engineer's instructions; or
- (d) otherwise violates the provisions of the Contract to a substantial degree.

Such written notice by the Owner shall instruct the Contractor to correct the default within five (5) working days from the receipt of the written notice.

10.3 If the correction of the default cannot be completed within the five (5) working days specified, the Contractor shall be considered to be in compliance with the Owner's instructions if he:

- (a) commences the correction of the default within the specified time, and
- (b) provides the Owner with an acceptable schedule for such correction, and
- (c) completes the correction in accordance with such schedule.

10.4 If the Contractor fails to correct the default within the time specified or subsequently agreed upon, the Owner may, without prejudice to any other right or remedy he may have, stop the Work or terminate the Contract.

10.5 If the Owner terminates the Contract under the conditions set out above, he is entitled to:

- (a) take possession of the premises and products and utilize the construction machinery and equipment, the whole subject to the rights of third parties, and to finish the Work by whatever method he may deem expedient but without undue delay or expense;
- (b) withhold any further payments to the Contractor until the Work is finished;
- (c) upon Total Performance of the Work, charge the Contractor the amount by which the full cost of finishing the Work as certified by the Engineer, including compensation to the Engineer for his additional services and a reasonable allowance as determined by the Engineer to cover the cost of any corrections required by GC 33 — Warranty, exceeds the unpaid balance of the Contract Price; or if such cost of finishing the Work is less than the unpaid balance of the Contract Price, pay the Contractor the difference.
- (d) on expiry of the warranty period, charge the Contractor the amount by which the cost of corrections under GC 33 — Warranty exceeds the allowance provided for such corrections, or if the cost of such corrections is less than the allowance, pay the Contractor the difference.

#### GC 11 CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE CONTRACT

11.1 If the Owner should be adjudged bankrupt, or makes a general assignment for the benefit of creditors or if a receiver is appointed on account of his insolvency, the Contractor may, without prejudice to any other right or remedy he may have, by giving the Owner written notice, terminate the Contract.

11.2 If the Work should be stopped or otherwise delayed for a period of thirty days or more under an order of any court, or other public authority, and providing that such order was not issued as the result of any act or fault of the Contractor or of any one directly or indirectly employed by him, the Contractor may, without prejudice to any other right or remedy he may have, by giving the Owner written notice, terminate the Contract.

11.3 The Contractor may notify the Owner in writing, with a copy to the Engineer, that the Owner is in default of his contractual obligations if:

- (a) the Engineer fails to issue a certificate in accordance with GC 23 — Certificates and Payments;
- (b) the Owner fails to pay to the Contractor when due any amount certified by the Engineer or awarded by arbitrators.



11.4

Such written notice shall advise the Owner that if such default is not corrected within five (5) work days from the receipt of the written notice the Contractor may, without prejudice to any other right or remedy he may have, stop the work and/or terminate the Contract.

If the Contractor terminates the Contract under the conditions set out above, he shall be entitled to be paid for all work performed and for any loss sustained upon products and construction machinery and equipment with reasonable profit and damages.

## GC 12 OTHER CONTRACTORS

- 12.1 The Owner reserves the right to let separate contracts in connection with the project of which the Work is part.
- 12.2 The Owner shall coordinate the work and insurance coverages of Other Contractors as it affects the Work of this Contract.
- 12.3 The Contractor shall coordinate his work with that of Other Contractors and connect as specified or shown in the Contract Documents. Any change in the costs incurred by the Contractor in the planning and performance of such work which was not shown or included in the Contract Documents as of the date of signing the Contract, shall be evaluated as provided under GC 21 - Valuation and Certification of Changes in the Work.
- 12.4 The Contractor shall report to the Engineer any apparent deficiencies in Other Contractors' work which would affect the Work of this Contract immediately they come to his attention and shall confirm such report in writing. Failure by the Contractor to so report shall invalidate any claims against the Owner by reason of the deficiencies of Other Contractors' work except as to those of which he was not reasonably aware.
- 12.5 The Owner shall take all reasonable precautions to avoid labour disputes or other disputes on the Project arising from the Work of Other Contractors.

## GC 13 ASSIGNMENT

- 13.1 Neither party to the Contract shall assign the Contract or any portion thereof without the written consent of the other, which consent shall not be unreasonably withheld.

## GC 14 SUBCONTRACTORS

- 14.1 The Contractor agrees to preserve and protect the rights of the Parties under the Contract with respect to any work to be performed under subcontract. He therefore agrees to:
  - (a) require his Subcontractors to perform their work in accordance with and subject to the terms and conditions of the Contract Documents, and
  - (b) be as fully responsible to the Owner for acts and omissions of his Subcontractors and of persons directly or indirectly employed by them as for acts and omissions of persons directly employed by him.
- The Contractor therefore agrees that he will incorporate all the terms and conditions of the Contract Documents into all Subcontract Agreements he enters into with his Subcontractors.
- 14.2 The Contractor agrees to employ those Subcontractors proposed by him in writing and accepted by the Owner prior to the signing of the Contract for such portions of the Work as may be designated in the bidding requirements.
- 14.3 The Owner may, for reasonable cause, object to the use of a proposed Subcontractor and require the Contractor to employ one of the other subcontractor bidders.
- 14.4 In the event that the Owner requires a change from any proposed Subcontractor the Contract Price shall be adjusted by the difference in cost occasioned by such required change.
- 14.5 The Contractor shall not be required to employ as a Subcontractor any person or firm to whom he may reasonably object.
- 14.6 The Engineer may, upon reasonable request and at his discretion, provide to a Subcontractor information as to the percentage of the Subcontractor's work which has been certified for payment.
- 14.7 Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and the Owner.

## GC 15 EMERGENCIES

- 15.1 The Engineer has authority in an emergency to stop the progress of the Work whenever in his opinion such stoppage may be necessary to ensure the safety of life, or the Work, or neighbouring property. This includes authority to make changes in the Work, and to order, assess and award the cost of such work, extra to the Contract or otherwise, as may in his opinion be necessary. The Engineer shall within two (2) working days confirm in writing any such instructions. In such a case if work has been performed under direct order of the Engineer, the Contractor shall keep his right to claim the value of such work, notwithstanding Article 1690 of the Quebec Civil Code.



## **GC 16 SETTLEMENT OF DISPUTES**

**16.1** In the case of any dispute arising between the Owner and the Contractor as to their respective rights and obligations under the Contract, either party hereto shall be entitled to give to the other notice of such dispute. In the event that the parties have agreed to submit such disputes to arbitration pursuant to a Supplementary General Condition to the Contract, or by subsequent agreement, either party may thereupon request arbitration pursuant to such provisions. In the event that no provision or agreement is made for arbitration, then either party may seek recourse in such judicial tribunal as the circumstances may require.

**16.2** Arbitration proceedings or legal proceedings shall not take place until after the performance or alleged performance of the disputed work except:

- (a) when the dispute concerns a certificate for payment,
- (b) where either party can show that the matter in dispute requires immediate consideration while evidence is available,
- (c) in the case of legal proceedings, where the action may become prescribed by reason of delay.

## **GC 17 INDEMNIFICATION**

**17.1** Except as provided in 17.2 and 17.3, the Contractor shall indemnify and hold harmless the Owner and the Engineer, their agents and employees from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of or attributable to the Contractor's performance of the Contract, providing that any such claims, damage loss or expense is:

(a) attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property; and

(b) is caused by a negligent act or omission of the Contractor or anyone for whose acts he may be liable.

**17.2** The obligations of the Contractor under this General Condition shall not extend to the liability of the Owner and the Engineer, their agents and employees where the primary cause of the injury or damage arises out of:

- (a) the use of maps, drawings, reports, surveys, change orders, designs or specifications provided by the Owner, the Engineer, their agents and employees, or
- (b) the giving of or the failure to give decisions or instructions by the Owner, the Engineer, their agents and employees.

**17.3** The Owner shall indemnify and hold harmless the Contractor from and against all claims, demands, losses, costs, damages, actions, suits or proceedings arising out of the Contractor's performance of the Contract which are attributable to lack of or a defect in title or an alleged lack of or defect in title to the site of the Work.

## **GC 18 CONTINGENCY ALLOWANCE**

**18.1** The Contract Price includes the contingency allowance, if any, stated in the Contract Documents.

**18.2** The contingency allowance is specified to provide for changes in the Work authorized under GC 20 — Changes in the Work, and evaluated under GC 21 — Valuation and Certification of Changes in the Work.

## **GC 19 CASH ALLOWANCES**

**19.1** The Contract Price includes all cash allowances stated in the Contract Documents.

**19.2** Cash allowances, unless otherwise specified, cover the net cost to the Contractor of all services, products, construction machinery and equipment, freight, unloading, handling, storage, installation and other authorized expenses incurred in performing the work stipulated under the cash allowance.

**19.3** The Contract Price, and not the cash allowance, includes the Contractor's overhead and profit in connection with such cash allowances.

**19.4** Where costs under a cash allowance exceed the amount of the allowance, the Contractor will be compensated for any excess incurred and substantiated plus an allowance for overhead and profit as set out in the Contract Documents.

**19.5** The Contract Price shall be adjusted by written order to provide for any excess or deficit to each cash allowance.

**19.6** Progress payments on account of authorized purchases under cash allowances shall be certified on the Engineer's monthly certificates for payment.

**19.7** A schedule shall be prepared jointly by the Engineer and Contractor to show when items called for under cash allowances must be authorized by the Engineer for ordering purposes so that the progress of the Work will not be delayed.



**GC 20 CHANGES IN THE WORK**

**20.1** The Owner through the Engineer, without invalidating the Contract, may make changes by altering, adding to, or deducting from the Work, with the Contract Price and the Contract Time being adjusted accordingly.

**20.2** Except as provided in GC 15 — Emergencies, no change shall be made without a written order from the Engineer and no claim for an addition or deduction to the Contract Price or change in the Contract Time shall be valid unless so ordered and at the same time valued or agreed to be valued as provided in GC 21 — Valuation and Certification of Changes in the Work.

**GC 21 VALUATION AND CERTIFICATION OF CHANGES IN THE WORK**

**21.1** The value of any change shall be determined in one or more of the following methods:

- (a) by estimate and acceptance in a lump sum.
- (b) by unit prices set out in the Contract or subsequently agreed upon
- (c) by cost and a fixed or percentage fee.

**21.2** When a change in the Work is proposed or required the Contractor shall present to the Engineer for approval his claim for any change in the Contract Price and/or change in Contract Time. The Engineer shall satisfy himself as to the correctness of such claim and, when approved by him, shall issue a written order to the Contractor to proceed with the change. The value of work performed in the change shall be included for payment with the regular certificates for payment.

**21.3** In the case of changes in the Work to be paid for under methods (b) and (c) of 21.1, the form of presentation of costs and methods of measurement shall be agreed to by the Engineer and Contractor before proceeding with the change. The Contractor shall keep accurate records, as agreed upon, of quantities or costs and present an account of the cost of the change in the Work, together with vouchers where applicable.

**21.4** If the method of valuation, measurement and the change in Contract Price and/or change in Contract Time cannot be promptly agreed upon, and the change is required to be proceeded with then the Engineer shall determine the method of valuation, measurement and the change in Contract Price and/or Contract Time subject to final determination in the manner set out in GC 16 — Settlement of Disputes. In this case the Engineer shall issue a written authorization for the change setting out the method of valuation and if by lump sum his valuation of the change in Contract Price and/or Contract Time.

**21.5** In the case of a dispute in the valuation of a change authorized in the Work and pending final determination of such value, the Engineer shall certify the value of work performed and include the amount with the regular certificates for payment.

**21.6** It is intended in all matters referred to above that both the Engineer and Contractor shall act promptly.

**GC 22 APPLICATION FOR PAYMENT**

**22.1** Applications for payment on account as provided for in Article A-4 may be made monthly as the Work progresses.

**22.2** Applications for payment shall be dated the last day of the agreed monthly payment period and the amount claimed shall be for the value, proportionate to the amount of the Contract, of work performed and products delivered to the site at that date.

**22.3** The Contractor shall submit to the Engineer before the first application for payment, a schedule of values of the various parts of the Work, aggregating the total amount of the Contract Price and divided so as to facilitate evaluation of applications for payment.

**22.4** This schedule shall be made out in such form, and supported by such evidence as to its correctness, as the Engineer may reasonably direct, and when approved by the Engineer shall be used as the basis for application for payment, unless it be found to be in error.

**22.5** When making application for payment, the Contractor shall submit a statement based upon this schedule. Claims for products delivered to the site but not yet incorporated into the Work shall be supported by such evidence as the Engineer may reasonably require to establish the value and delivery of the products.

**22.6** Applications for release of holdback monies following the Substantial Performance of the Work and the application for final payment shall be made at the time and in the manner set forth in GC 23 — Certificates and Payments.

**GC 23 CERTIFICATES AND PAYMENTS**

**23.1** The Engineer shall, within ten (10) days of receipt of an application for payment from the Contractor submitted in accordance with GC 22 — Application for Payment, issue a certificate for payment in the amount applied for or such other amount as he shall determine to be properly due. If the Engineer amends the application, he shall promptly notify the Contractor in writing giving his reasons for the amendment.



23.2 The Owner shall within five (5) days of the issuance of a certificate for payment by the Engineer, make payment to the Contractor on account in accordance with the provisions of Article A-4 of the Agreement.

23.3 Notwithstanding any other provisions of this Contract:

(a) If on account of climatic or other conditions reasonably beyond the control of the Contractor there are items of work that cannot be performed, the payment in full for work which has been performed as certified by the Engineer shall not be withheld or delayed by the Owner on account thereof, but the Owner may withhold from the Contract Price until the remaining work is finished only such monies as the Engineer shall determine are sufficient and reasonable to cover the cost of performing such remaining work and to adequately protect the Owner from claims;

(b) Where legislation permits and where, upon application by the Contractor, the Engineer has certified that a Subcontract has been totally performed to his satisfaction prior to the Substantial Performance of this Contract, the Owner shall pay the Contractor the holdback retained for such Subcontractor on the day following the expiration of the Statutory Limitation Period stipulated in the Mechanics' Lien Act applicable to the place of building.

23.4 Notwithstanding the provisions of 23.3 (b) and notwithstanding the wording of such certificates the Contractor shall ensure that such work is protected pending the Total Performance of the Contract and be responsible for the correction of any defects in it regardless of whether or not they were apparent when such certificates were issued.

23.5 The Engineer shall, within ten (10) days of receipt of an application from the Contractor for a certificate of Substantial Performance, make an inspection and assessment of the Work to verify the validity of the application. The Engineer shall within seven (7) days of his inspection notify the Contractor of his approval or disapproval of the application. When the Engineer finds the Work to be substantially performed he shall issue such a certificate. The date of this certificate shall be the date of Substantial Performance of the Contract. Immediately following the issuance of the Certificate of Substantial Performance, the Engineer, in consultation with the Contractor shall establish a reasonable date for the Total Performance of the Contract.

23.6 Following the issuance of the Certificate of Substantial Performance and upon receipt from the Contractor of all documentation called for in the Contract Documents the Engineer shall issue a certificate for payment of holdback monies. The release of holdback monies authorized by this certificate shall become due and payable on the day following the expiration of the Statutory Limitation Period stipulated in the Mechanics' Lien Act applicable to the place of building, or where such legislation does not exist or apply in accordance with such other legislation, regulations governing privileges, industry practice or such other provisions which may be agreed to between the parties, providing that no lien or privilege claims against the Work exist and the Contractor has submitted to the Owner a sworn statement that all accounts for labour, subcontracts, products, construction machinery and equipment and any other indebtedness which may have been incurred by the Contractor in the Substantial Performance of the Work and for which the Owner might in any way be held responsible have been paid in full except holdback monies properly retained.

23.7 The Engineer shall within ten (10) days of receipt of an application from the Contractor for payment upon Total Performance of the Contract, make an inspection and assessment of the work to verify the validity of the application. The Engineer shall within seven (7) days of his inspection notify the Contractor of his approval or disapproval of the application. When the Engineer finds the Work to be totally performed to his satisfaction, he shall issue a Certificate of Total Performance and certify for payment the remaining monies due to the Contractor under the Contract less any holdback monies which are required to be retained. The date of this certificate shall be the date of Total Performance of the Contract. The Owner shall, within five (5) days of issuance of such certificate, make payment to the Contractor in accordance with the provisions of Article A-4 of the Agreement.

23.8 The release of any remaining holdback monies shall become due and payable on the day following the expiration of the Statutory Limitation Period stipulated in the Mechanics' Lien Act applicable to the place of building, or where such legislation does not exist or apply in accordance with such other legislation, regulations governing privileges, industry practice or such other provisions which may be agreed to between the parties, provided that no claims against the Work exist and the Contractor has submitted to the Owner a sworn statement that all accounts for labour, subcontracts, products, construction machinery and equipment and any other indebtedness which may have been incurred by the Contractor in the Total Performance of the Work and for which the Owner might in any way be held responsible have been paid in full except holdback monies properly retained.

23.9 No certificate for payment, or any payment made thereunder, nor any partial or entire use of occupancy of the Work by the Owner shall constitute an acceptance of any work or products not in accordance with the Contract Documents.



23.10 The issuance of the Certificate of Total Performance shall constitute a waiver of all claims by the Owner against the Contractor except those previously made in writing and still unsettled, if any, and those arising from the provisions of GC 33 — Warranty.

The acceptance of the Certificate of Total Performance or of the payment due thereunder shall constitute a waiver of all claims by the Contractor against the Owner except those made in writing prior to his application for payment upon Total Performance of the Contract and still unsettled, if any.

#### GC 24 TAXES AND DUTIES

24.1 Unless otherwise stated in Supplementary General Conditions the Contractor shall pay all government sales taxes, customs duties and excise taxes with respect to the Contract.

24.2 Any increase or decrease in costs to the Contractor due to changes in such taxes and duties after the date of the Agreement, shall increase or decrease the Contract Price accordingly.

24.3 Where an exemption of government sales taxes, customs duties or excise taxes is applicable to the Contract by way of the Contractor filing claims for, or cooperating fully with the Owner and the proper authorities in seeking to obtain such refunds, the procedure shall be established in a Supplementary General Condition.

#### GC 25 LAWS, NOTICES, PERMITS AND FEES

25.1 The laws of the place of building shall govern the Work.

25.2 The Contractor shall obtain all permits, licences and certificates and pay all fees required for the performance of the Work which are in force at the date of tender submission (but this shall not include the obtaining of permanent easements or rights of servitude).

25.3 The Contractor shall give all required notices and comply with all laws, ordinances, rules, regulations, codes and order of all authorities having jurisdiction relating to the Work, to the preservation of the public health and construction safety which are or become in force during the performance of the Work.

25.4 The Contractor shall not be responsible for verifying that the Contract Documents are in compliance with the applicable laws, ordinances, rules, regulations and codes relating to the Work. If the Contract Documents are at variance therewith, or changes which require modification to the Contract Documents are made to any of the laws, ordinances, rules, regulations and codes by the authorities having jurisdiction subsequent to the date of tender submission, any resulting change in the cost shall constitute a corresponding change in the Contract Price. The Contractor shall notify the Engineer in writing requesting direction immediately any such variance or change is observed by him.

25.5 If the Contractor fails to notify the Engineer in writing and obtain his direction as required in GC 25.4 and performs any work knowing it to be contrary to any laws, ordinances, rules, regulations, codes and orders of any authority having jurisdiction, he shall be responsible for and shall correct any violations thereof and shall bear all costs, expense and damages attributable to his failure to comply with the provisions of such laws, ordinances, rules, regulations, codes and orders.

#### GC 26 PATENT FEES

26.1 The Contractor shall pay all royalties and patent licence fees required for the performance of the Contract. He shall hold the Owner harmless from and against all claims, demands, losses, costs, damages, actions, suits or proceedings arising out of the Contractor's performance of the Contract which are attributable to an infringement or an alleged infringement of any patent of invention by the Contractor or anyone for whose acts he may be liable.

26.2 The Owner shall hold the Contractor harmless against all claims, demands, losses, costs, damages, actions, suits or proceedings arising out of the Contractor's performance of the Contract which are attributable to an infringement or an alleged infringement of any patent or invention in executing anything for the purpose of the Contract, the model, plan or design of which was supplied to the Contractor by the Owner.

#### GC 27 WORKMEN'S COMPENSATION

27.1 Prior to commencing the Work and prior to receiving payment on Substantial and Total Performance of the Work, the Contractor shall provide evidence of compliance with all requirements of the province or territory of the place of building with respect to workmen's compensation including payments due thereunder.

27.2 At any time during the term of Contract, when requested by the Engineer, the Contractor shall provide such evidence of compliance by himself and any or all of his Subcontractors.



**GC 28 LIABILITY INSURANCE**

**28.1 Comprehensive General Liability Insurance**

- (a) Without restricting the generality of GC 17 — Indemnification, the Contractor shall provide and maintain, either by way of a separate policy or by an endorsement to his existing policy, Comprehensive General Liability Insurance acceptable to the Owner and subject to limits of not less than one million dollars inclusive per occurrence for bodily injury, death, and damage to property including loss of use thereof.
- (b) The insurance shall be in the joint names of the Contractor, the Owner and the Engineer, and shall also cover as Unnamed Insureds all Subcontractors and anyone employed directly or indirectly by the Contractor or his Subcontractors to perform a part or parts of the Work but excluding suppliers whose only function is to supply and/or transport products to the project site.
- (c) The insurance shall also include as Unnamed Insureds the architectural and engineering consultants of the Owner and the Engineer.
- (d) The insurance shall preclude subrogation claims by the Insurer against anyone insured thereunder.
- (e) The Comprehensive General Liability insurance shall include coverage for:

- 1) premises and operations liability
- 2) products or completed operations liability
- 3) blanket contractual liability
- 4) cross liability
- 5) elevator and hoist liability
- 6) contingent employer's liability
- 7) personal injury liability arising out of false arrest, detention or imprisonment or malicious prosecution; libel, slander or defamation of character; invasion of privacy, wrongful eviction or wrongful entry.
- 8) shoring, blasting, excavating, underpinning, demolition, pile driving and caisson work, work below ground surface, tunnelling and grading, as applicable.
- 9) liability with respect to non-owned licenced vehicles.

**28.2 Automobile Liability Insurance**

The Contractor shall provide and maintain liability insurance in respect of owned licenced vehicles subject to limits of not less than one million dollars inclusive.

**28.3 Aircraft and/or Watercraft Liability Insurance**

The Contractor shall provide and maintain liability insurance with respect to owned or non-owned aircraft and watercraft, as may be applicable, subject to limits of not less than one million dollars inclusive. Such insurance shall be in the joint names of the Contractor, the Owner, the Engineer and those parties defined in 28.1 (b) (c) where they have an interest in the use and operation of such aircraft or watercraft. The insurance shall preclude subrogation claims by the Insurer against anyone insured thereunder.

**28.4** All liability insurance shall be maintained continuously until twelve (12) months after the date the Engineer issues a certificate of Total Performance.

**28.5** The Contractor shall provide the Owner with evidence of all liability insurance prior to the commencement of the Work and shall promptly provide the Owner with a certified true copy of each insurance policy.

**28.6** All liability insurance policies shall contain an endorsement to provide all Named Insureds with prior notice of changes and cancellations. Such endorsement shall be in the following form:

"It is understood and agreed that the coverage provided by this policy will not be changed or amended in any way nor cancelled until 30 days after written notice of such change or cancellation shall have been given to all Named Insureds."

**GC 29 PROPERTY INSURANCE**

**29.1** The Contractor\* shall provide and maintain property insurance, acceptable to the Owner, insuring the full value of the Work in the amount of the Contract Price and the full value as stated of products that are specified to be provided by the Owner for incorporation into the Work\*. The insurance shall be in the joint names of the Contractor and the Owner and shall include the interests of the Contractor, the Owner, the Subcontractors and all others having an insurable interest in the Work. The policies shall include all Subcontractors as Unnamed Insureds or, if they specifically request, as Named Insureds. The policies shall preclude subrogation claims by the Insurer against anyone insured thereunder.



29.2 Such coverage shall be provided for by EITHER an All Risks Builders' Risk Policy OR by a combination of a standard Builders' Risk Fire Policy including Extended Coverage and Malicious Damage Endorsements and a Builders' Risk Differences in Conditions Policy providing equivalent coverage.

29.3 The policies shall insure against all risks of direct loss or damage subject to the exclusion specified in the Supplementary General Conditions (SGC)\*\*\*. Such coverage shall apply to:

- (a) all products, labour and supplies of any nature whatsoever, the property of the Insureds or of others for which the Insureds may have assumed responsibility, to be used in or pertaining to the site preparations, demolition of existing structures, erection and/or fabrication and/or reconstruction and/or repair of the insured project, while on the site or in transit, subject to the exclusion of the property specified\*\*\*.
- (b) the installation, testing and any subsequent use of machinery and equipment including boilers, pressure vessels or vessels under vacuum.
- (c) damage to the Work caused by an accident to and/or the explosion of any boiler(s) or pressure vessel(s) forming part of the Work.

Such coverage shall exclude construction machinery, equipment, temporary structural and other temporary facilities, tools and supplies used in the construction of the Work and which are not expendable under the Contract.

29.4 The Contractor shall provide the Owner with evidence of all insurance prior to commencement of the Work and shall promptly provide the Owner with a certified true copy of each insurance policy.

Policies provided shall contain an endorsement to provide all Named Insureds with prior notice of changes and cancellations. Such endorsement shall be in the following form:

"It is understood and agreed that the coverage provided by this policy will not be changed or amended in any way nor cancelled until 30 days after written notice of such change or cancellation shall have been given to all Named Insureds."

29.5 All such insurance shall be maintained continuously until ten (10) days after the date the Engineer issues a certificate of Total Performance. All such insurance shall provide for the Owner to take occupancy of the Work or any part thereof during the term of this insurance. Any increase in the cost of this insurance arising out of such occupancy shall be at the Owner's expense.

29.6 The policies shall provide that, in the event of a loss, payment for damage to the Work shall be made to the Owner and the Contractor as their respective interests may appear. The Contractor shall act on behalf of the Owner and himself for the purpose of adjusting the amount of such loss with the Insurers. On the determination of the extent of the loss, the Contractor shall immediately proceed to restore the Work and shall be entitled to receive from the Owner (in addition to any sum due under the Contract) the amount at which the Owner's interest in the restoration work has been appraised, such amount to be paid as the work of the restoration proceeds and in accordance with the Engineer's certificates for payment. Damage shall not affect the rights and obligations of either party under the Contract except that the Contractor shall be entitled to such reasonable extension of time for Substantial and Total Performance of the Work as the Engineer may decide.

29.7 The Contractor and/or his Subcontractors as may be applicable shall be responsible for any deductible amounts under the policies and for providing such additional insurance as may be required to protect the Insureds against loss on items excluded from the policies.

\* *If the Owner decides to insure, interchange the words "Owner" and "Contractor" where appropriate and state any deductible amounts in the SGC's.*

\*\* *State value of products supplied by Owner for incorporation in the Work in the SGC's.*

\*\*\* *Define specific exclusions in the SGC's.*

#### GC 30 PROTECTION OF WORK AND PROPERTY

30.1 The Contractor shall protect the property adjacent to the Project site from damage as the result of his operations under the Contract.

30.2 The Contractor shall protect the Work and the Owner's property from damage and shall be responsible for any damage which may arise as the result of his operations under the Contract except damage which occurs as the result of:

- (a) errors in the Contract Documents, and/or
- (b) acts or omissions by the Owner, his agents, employees or Other Contractors.



30.3 Should any damage occur to the Work and/or Owner's property for which the Contractor is responsible he shall make good such damage at his own expense or pay all costs incurred by others in making good such damage.

30.4 Should any damage occur to the Work and/or Owner's property for which the Contractor is not responsible as provided in GC 30.2 he shall make good such damage to the Work and, if the Owner so directs to the Owner's property, and the Contract Price and Contract Time shall be adjusted in accordance with GC 20 — Changes in the Work.

#### **GC 31 DAMAGES AND MUTUAL RESPONSIBILITY**

31.1 If either party to this Contract should suffer damage in any manner because of any wrongful act or neglect of the other party or anyone employed by him, then he shall be reimbursed by the other party for such damage. The party reimbursing the other party shall be subrogated to the rights of the other party in respect of such wrongful act or neglect if it be that of a third party.

31.2 Claims under this GC shall be made in writing to the party liable within reasonable time after the first observance of such damage and not later than the time limits stipulated in GC 23.10 — Certificates and Payments, and may be adjusted by agreement or in the manner set out in GC 16 — Settlement of Disputes.

31.3 If the Contractor has caused damage to any Other Contractor on the Work, the Contractor agrees upon due notice to settle with such Other Contractor by agreement or arbitration, if he will so settle. If such Other Contractor sues the Owner on account of any damage alleged to have been so sustained, the Owner shall notify the Contractor and may require the Contractor to defend the action at the Contractor's expense. If any final order or judgment against the Owner arises therefrom the Contractor shall pay or satisfy it and pay all costs incurred by the Owner.

31.4 If the Contractor becomes liable to pay or satisfy any final order, judgment or award against the Owner then the Contractor, upon undertaking to indemnify the Owner against any and all liability for costs, shall have the right to appeal in the name of the Owner such final order or judgment to any and all courts of competent jurisdiction.

#### **GC 32 BONDS**

32.1 The Owner shall have the right during the period stated in the tender documents for acceptance of the tender to require the Contractor to provide and maintain in good standing until the fulfilment of the Contract, bonds covering the faithful performance of the Contract including the requirements of the Warranty provided for in GC 33 — Warranty, and the payment of all obligations arising under the Contract.

32.2 All such bonds shall be issued by a duly incorporated surety company approved by the Owner and authorized to transact a business or suretyship in the Province or Territory of the place of building. The form of such bonds shall be the latest edition of the CCA approved forms.

32.3 If bonds are called for in the tender documents the costs attributable to providing such bonds shall be included in the tender price.

32.4 Should the Owner require the provision of a bond or bonds by the Contractor after the receipt of tenders for the Work, the Contract Price shall be increased by all costs attributable to providing such bonds.

32.5 The Contractor shall promptly provide the Owner, through the Engineer, with any bonds that are required.

#### **GC 33 WARRANTY**

33.1 The Contractor shall correct at his own expense any defects in the Work due to faulty products and/or workmanship appearing within a period of one year from the date of Substantial Performance of the Work.

33.2 The Contractor shall correct and/or pay for any damage to other work resulting from any corrections required under the conditions of 33.1.

33.3 Neither the Engineer's final certificate nor payment thereunder shall relieve the Contractor from his responsibility hereunder.

33.4 The Owner and/or the Engineer shall give the Contractor written notice of observed defects promptly.

33.5 The Contractor shall be liable for the proper performance of the Work only to extent that careful workmanship and proper implementation of the Contract Documents will permit and any warranty given respecting the Work and performance shall only be valid so far as the design will permit such performance.

33.6 Nothing in this GC shall be deemed to restrict any liability of the Contractor arising out of any law in force in the Province or Territory.



**GC 34 CONTRACTOR'S RESPONSIBILITIES AND CONTROL OF THE WORK**

**34.1** The Contractor shall have complete control of the Work except as provided in GC 15 — Emergencies. He shall effectively direct and supervise the Work using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, sequences, and procedures and for coordinating all parts of the Work under the Contract.

**34.2** The Contractor shall have the sole responsibility for the design, erection, operation, maintenance and removal of temporary structural and other temporary facilities and the design and execution of construction methods required in their use. The Contractor shall engage and pay for registered professional engineering personnel skilled in the appropriate discipline to perform these functions where required by law or by the Contract Documents and in all cases where such temporary facilities and their method of construction are of such a nature that professional engineering skill is required to produce safe and satisfactory results.

**34.3** Notwithstanding the provisions of paragraphs 34.1 and 34.2 above, or any provisions to the contrary elsewhere in the Contract Documents where such Contract Documents include designs for temporary structural and other temporary facilities or specify a method of construction in whole or in part, such facilities and methods shall be deemed to comprise part of the overall design of the Work and the Contractor shall not be held responsible for that part of the design or the specified method of construction. The Contractor shall, however, be responsible for the execution of such design or specified method of construction in the same manner that he is responsible for the execution of the Work.

**34.4** The Contractor shall carefully examine the Contract Documents and shall promptly report to the Engineer any error, inconsistency or omission he may discover. The Contractor shall not be held liable for any damage resulting from any such errors, inconsistencies or omissions in the Contract Documents.

**GC 35 SUPERINTENDENCE**

**35.1** The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Work site at all times while work is being performed.

**35.2** The superintendent shall be satisfactory to the Engineer and shall not be changed except for good reason and only then after consultation with and agreement by the Engineer.

**35.3** The superintendent shall represent the Contractor at the Work site and directions given to him by the Engineer shall be held to have been given to the Contractor. Important directions shall be confirmed to the Contractor in writing, other directions will be so confirmed if requested.

**GC 36 LABOUR AND PRODUCTS**

**36.1** Unless otherwise stipulated elsewhere in the Contract Documents, the Contractor shall provide and pay for all labour, products, tools, construction equipment and machinery, water, heat, light, power, transportation and other facilities and services necessary for the proper performance of the Work.

**36.2** All products provided shall be new unless otherwise specified in the Contract Documents. Any products which are not specified shall be of a quality best suited to the purpose required and their use subject to the approval of the Engineer.

**36.3** The Contractor shall at all times maintain good order and discipline among his employees engaged on the Work and shall not employ on the Work any unfit person nor anyone not skilled in the task assigned to him.

**GC 37 SUBSURFACE CONDITIONS**

**37.1** The Contractor shall promptly notify the Engineer in writing if in his opinion the subsurface conditions at the Project site differ materially from those indicated in the Contract Documents or as may have been represented to him by the Owner or Engineer before the time of tender submission.

**37.2** After prompt investigation, should the Engineer determine that conditions do differ materially, he shall issue appropriate instructions for changes in the Work as provided for in GC 20 — Changes in the Work.

**GC 38 USE OF PREMISES**

**38.1** The Contractor shall confine his apparatus, the storage of products, and the operations of his workmen to limits indicated by laws, ordinances, permits or by directions of the Engineer and shall not unreasonably encumber the premises with his products.

**38.2** The Contractor shall not load or permit to be loaded any part of the Work with a weight that will endanger its safety.

**38.3** The Contractor shall enforce the Engineer's instructions regarding signs, advertisements, fires and smoking.



#### **GC 39 CLEANUP AND FINAL CLEANING OF WORK**

- 39.1 The Contractor shall maintain the Work in a tidy condition and free from the accumulation of waste products and debris, other than that caused by the Owner, Other Contractors or their employees.
- 39.2 When the Work is Substantially Performed, the Contractor shall remove all of his surplus products, tools, construction machinery and equipment not required for the performance of the remaining work. He shall also remove any waste products and debris and leave the Work clean and suitable for occupancy by the Owner unless otherwise specified.
- 39.3 When the Work is Totally Performed, the Contractor shall remove all of his surplus products, tools, construction machinery and equipment. He shall also remove any waste products and debris, other than that caused by the Owner, Other Contractors or their employees.

#### **GC 40 CUTTING AND REMEDIAL WORK**

- 40.1 The Contractor shall do all cutting and remedial work that may be required to make the several parts of the Work come together properly.
- 40.2 The Contractor shall coordinate the schedule for the Work to ensure that this requirement is kept to a minimum.
- 40.3 Should the Owner or anyone employed by him be responsible for ill-timed work necessitating cutting and/or remedial work to be performed, the cost of such cutting and/or remedial work shall be valued as provided in GC 21 — Valuation and Certification of Changes in the Work and added to the Contract Price.
- 40.4 Cutting and remedial work shall be performed by specialists familiar with the materials affected and shall be performed in a manner to neither damage nor endanger any Work.

#### **GC 41 INSPECTION OF WORK**

- 41.1 The Owner and the Engineer and their authorized representatives shall have access to the Work for inspection wherever it is in preparation or progress. The Contractor shall cooperate to provide reasonable facilities for such access.
- 41.2 If special tests, inspections or approvals are required by the Contract Documents, the Engineer's instructions or the laws or ordinances of the place of building the Contractor shall give the Engineer timely notice requesting inspection. Inspection by the Engineer shall be made promptly. The Contractor shall arrange inspections by other authorities and shall notify the Engineer of the date and time.
- 41.3 If the Contractor covers or permits to be covered any of the Work that is subject to inspection or before any special tests and approvals are completed without the approval of the Engineer, the Contractor shall uncover the Work, have the inspections satisfactorily completed and make good the Work at his own expense.
- 41.4 Examination of any questioned Work may be ordered by the Engineer. If such Work be found in accordance with the Contract, the Owner shall pay the cost of examination and replacement. If such Work be found not in accordance with the Contract, through the fault of the Contractor, the Contractor shall pay such cost.
- 41.5 The Contractor shall furnish promptly to the Engineer two (2) copies of all certificates and inspection reports relating to the Work.

#### **GC 42 REJECTED WORK**

- 42.1 Defective work whether the result of poor workmanship, use of defective products or damage through carelessness or other act or omission of the Contractor, and whether incorporated in the Work or not, which has been rejected by the Engineer as failing to conform to the Contract Documents shall be removed promptly from the premises by the Contractor and replaced and/or re-executed promptly in accordance with the Contract Documents at the Contractor's expense.
- 42.2 Other Contractor's work destroyed or damaged by such removals or replacements shall be made good promptly at the Contractor's expense.
- 42.3 If in the opinion of the Engineer it is not expedient to correct defective work or work not done in accordance with the Contract Documents, the Owner may deduct from the Contract Price the difference in value between the Work as done and that called for by the Contract, the amount of which shall be determined in the first instance by the Engineer.

#### **GC 43 SHOP DRAWINGS**

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



43.2 The Contractor shall arrange for the Preparation of clearly identified shop drawings as called for by the Contract Documents or as the Engineer may reasonably request.

43.3 Prior to submission to the Engineer the Contractor shall review all shop drawings. By this review the Contractor represents that he has determined and verified all field measurements, field construction criteria, materials, catalogue numbers and similar data or will do so and that he has checked and coordinated each shop drawing with the requirements of the Work and of the Contract Documents. The Contractor's review of each shop drawing shall be indicated by stamp, date and signature of a responsible person.

43.4 The Contractor shall submit shop drawings to the Engineer for his review with reasonable promptness and in orderly sequence so as to cause no delay in the Work or in the Work of Other Contractors. If either the Contractor or the Engineer so requests they shall jointly prepare a schedule fixing the dates for submission and return of shop drawings. Shop drawings shall be submitted in the form of a reproducible transparency or prints as the Engineer may direct. At the time of submission the Contractor shall notify the Engineer in writing of any deviations in the shop drawings from the requirements of the Contract Documents.

43.5 The Engineer will review and return shop drawings in accordance with any schedule agreed upon, or otherwise with reasonable promptness so as to cause no delay. The Engineer's review shall be for conformity to the design concept and for general arrangement only and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the Contract Documents unless a deviation on the shop drawings has been approved in writing by the Engineer.

43.6 The Contractor shall make any changes in shop drawings which the Engineer may require consistent with the Contract Documents and resubmit unless otherwise directed by the Engineer. When resubmitting, the Contractor shall notify the Engineer in writing of any revisions other than those requested by the Engineer.

#### GC 44 SAMPLES

44.1 The Contractor shall submit for the Engineer's approval such standard manufacturers' samples as the Engineer may reasonably require. Samples shall be labelled as to origin and intended use in the Work and shall conform to the requirements of the Contract Documents.

44.2 The Contractor shall provide samples of special products, assemblies, or components when so specified. The cost of such samples not specified shall be authorized as an addition to the Contract Price as provided in GC 20 — Changes in Work.

#### GC 45 TESTS AND MIX DESIGNS

45.1 The Contractor shall furnish to the Engineer test results and mix designs as may be requested.

45.2 The cost of tests and mix designs beyond those called for in the Contract Documents or beyond those required by laws, ordinances, rules and regulations relating to the Work and the preservation of public health, shall be authorized as an addition to the Contract Price as provided in GC 20 — Changes in the Work.



SECTION 1A - GENERAL

PART 1 - GENERAL

Part 1.01 Description of Work

- \* OK
- A. The proposed arena project is being undertaken by the Town of Pelham on a somewhat conservative budget. Proposals are sought for a battery limits of 5 feet outside the building on a design-build basis that is complete in every respect unless otherwise specified.
- B. The Contract Documents have been prepared to advise proponents of the desired layout and features of the arena. Some flexibility is permissible in order to encourage innovation in design.
- C. Proposals will be reviewed not only on the basis of lowest cost, but will be judged on the best value received for dollars expended. The latter is best determined by the completeness of the submission.
- D. Provide all labour, materials and equipment required and/or necessary to complete the construction of Pelham Arena in the Town of Pelham and as described in the Specifications and Drawings.
1. The complex consists of an 85' x 185' indoor artificial skating rink with spectator standing room, player and penalty boxes, change rooms, public rooms, concession area, storage rooms, service and equipment rooms and community hall.
  2. The rink will be used for hockey and pleasure skating on a seasonal basis during the months of October 1st to May 15th and lacross for the remainder of the year.
  3. Various parts of the work are specified on a performance basis including but not limited to the following:
    - (A) Building shell, framing and related foundations.
    - (B) Heating, ventilating and electrical work.
    - (C) Refrigerated equipment.
    - (D) Plumbing Work.
  4. The particular designs indicated on the drawings regarding the performance items only indicate the extent and general appearance of the complex, to establish basic layouts and set minimum physical dimensions.
  5. Construct the balance of the work as specified.
  6. The Contractor's responsibility for the overall building work shall extend five (5) feet outside the building surface.



PART 1 - GENERAL (Cont'd)

Part 1.02 Cost Breakdown

- A. The proponents must submit a breakdown of the cost of the work. The form of the breakdown shall give values against the individual trades in the work. All subcontractors and suppliers shall be approved by the Engineer.

Part 1.03 Local Labour

- A. Where possible preference shall be given to the hiring of local labour.

Part 1.04 Limits of Site

- A. The limits of the site are shown on the contract drawings. Confine all operations within these limits, unless written approval is obtained from the Engineer and from the property owners concerned.

Part 1.05 Setting out of the work

- A. All setting out shall be performed by the Contractor, working from bench marks and points of reference supplied by the Engineer.
- B. Setting out shall include the preparation of grade sheets, installation of stakes, offsets, site rails and similar operations.
- C. The Contractor will be held responsible for the correctness of the position, levels, dimensions and alignment of all parts of the works, and for the provision of all necessary instruments and labour in connection therewith. Checking of the setting out of any line or level by the Engineer shall not relieve the Contractor of his responsibility for the correctness thereof.
- D. All stakes, lot pins, marks and reference points shall be carefully protected and preserved and, if destroyed or removed by the Contractor, shall be replaced at his expense.

Part 1.06 Construction Schedule

- A. The Contractor shall within two weeks after being awarded the contract, submit his proposed construction schedule to the Engineer for approval. The schedule shall show proposed progress in weekly stages for the main sections and subsections of the work.

Part 1.07 Site Office

- A. Provide a site office to be used jointly by the Contractor and the Engineer. It shall incorporate the following:
1. Lockable door and screen door.
  2. Desk and chairs.
  3. Private telephone lines.
- B. Service, maintain and carry insurance on the site office and contents.



PART 2 - PRODUCTS

Part 2.01 Canadian Materials

- A. Unless otherwise specifically approved, the Contractor shall use materials and equipment of Canadian manufacture in constructing the works.

Part 2.02 Tests

- A. Where required by the Engineer, supply certified copies of all tests upon all materials to be used in the construction of the works, indicating that the materials comply with the specifications.
- B. Tests will be carried out by an independent company specializing in this line of work.
- C. Tests will be paid for by the Owner when the results indicate the work has complied with the specifications.
- D. When the tests indicate the work does not comply with the specifications, the cost of retesting will be borne by the Contractor.

PART 3 - EXECUTION

Part 3.01 Use of Hydrants

- A. Fire hydrants shall be kept accessible and free of obstructions.
- B. Fire hydrants may be used as a source of water only with the approval of the Water Authority, and subject to its rules and conditions.

Part 3.02 Inclement Weather

- A. Adequate protection shall be made and precautions taken at times of inclement weather.
- B. Inclement weather or extra work caused by such weather will not be accepted as reason for additional payment.

Part 3.03 Mud and Dust

- A. Streets and other construction areas shall be kept reasonably clean. If it is necessary to haul wet material, suitable watertight trucks shall be used.
- B. Dust shall be laid by the use of water or calcium, or both.

Part 3.04 Other Construction

- A. Other construction may be proceeding at the same time near the work of this Contract. Co-operation and free access shall be extended to all other companies and employees who may be working in the area.



PART 3 - PRODUCTS (Cont'd)

Part 3.05 Adjacent Structures and Utilities

- A. Temporary and permanent support and temporary relocation and replacement of underground or overhead utilities ~~shall be performed~~ as part of the Contract and as detailed in the General Conditions.

Part 3.06 Temporary Services

- A. Temporary water service is available at the road allowance.
- B. Temporary electrical service is available at the road allowance.
- C. All electrical power costs prior to the issuance of the acceptance certificate will be borne by the Contractor.



SECTION 1B - OUTLINE SPECIFICATION

PART 1 - GENERAL

Part 1.01 Intent of Section

- A. This Section covers the physical description of each area including but not necessarily limited to the function, facilities and approximate areas of each.

Part 1.02 Related Work

- A. Refer to applicable sections of this specification for the necessary performance standards.

Part 1.03 Finishes

- A. Submit to the Engineer for approval a finish schedule indicating the areas to be painted.

- B. Colour selection for each area indicated on schedule is subject to the approval of the Engineer.

Part 1.04 Codes and Standards

- A. Unless otherwise specifically stated, all design and construction must meet the requirements of the National Building Code of Canada and all other authorities having jurisdiction.

- B. Materials must conform to the applicable standards used in the industry to maintain a high grade quality.

Part 1.05 Approvals

- A. All drawings ~~must~~ be approved by the Department of Labour and all other authorities having jurisdiction.

- B. The cost of obtaining all permits and approvals with the exception of those issued directly by the Town of Pelham will be borne by the Contractor.

PART 2 - DESIGN CRITERIA: SPECIFIC AREAS

Part 2.01 General - All Rooms Except the Ice Rink Area

A. Floor Drains

1. As shown on Drawing B-75193-G2.



PART 2 - DESIGN CRITERIA: SPECIFIC AREAS (Cont'd)

Part 2.02 Dressing Rooms

A. Provide four (4) dressing rooms each complete with the following:

1. Water closet
  2. Lavatory *Lavatory* ✓
  3. Shower stall
  4. Perimeter wood benches with steel frames
  5. Individual locking system for each dressing room
  6. Stick rack near the door.
- B. Each dressing room must be a minimum of 250 sq.ft.
- C. Supply and installation of coat hooks will be carried out by the Owner.
- D. Do not use windows in the dressing rooms.

Part 2.03 Public Washrooms

A. Provide each washroom with the following:

1. Women
  - (A) 3 water closets
  - (B) 2 lavatories
2. Men
  - (A) 2 water closets
  - (B) 2 urinals
  - (C) 2 lavatories

B. Make provisions for electric hand dryers in both washrooms.

Part 2.04 Canteen

A. The canteen will be provided with the following: ✓

1. Arborite counters
2. A 3- compartment sink
3. All necessary electrical services



PART 2 - DESIGN CRITERIA: SPECIFIC AREAS (Cont'd)

Part 2.04 Canteen (Cont'd)

- A. 4. Rolling counter shutters
- 5. Suitable exhaust fan.

Part 2.05 Lobby

- A. Lobby area: Minimum of 800 sq.ft.
- B. Lobby ~~will be~~ a common area serving the public washrooms, canteen, concession storage, ticket booth, main entrance, entrance to arena, entrance to dressing rooms and entrance to community hall.
- C. Ceiling of lobby to remain unfinished.
- D. The separation of public from athletes is a prerequisite, however, common entry to arena is permissible.
- E. Glazing between lobby and ice rink shall be plexiglass. Conform to manufacturers recommendations as to minimum thickness of plexiglass. *leave in*

Part 2.06 Manager's office and Communications Room

- A. Provide a combination manager's office and communications room ~~in the proximity of the ticket booth~~ situated so the ice surface and lobby can be viewed easily.
- B. Provide a plexiglass vision panel facing the ice rink area.
- C. This area must be accessible to the lobby and ice rink area.
- D. Minimum combined area 110 sq.ft.

Part 2.07 Ticket Booth

- A. Locate in the immediate proximity of the arenas main entrance and the entrance to the ice rink.
- B. Provide an arborite counter at the ticket window.
- C. Ticket booth glazing: 1/4" plate glass with all necessary cut-outs.

Part 2.08 Skate Room

- A. Provide a skate sharpening room of sufficient size for the required equipment and skate storage.
- B. Door for skate sharpening room: Dutch door with arborite counter top.



PART 2 - DESIGN CRITERIA: SPECIFIC AREAS (Cont'd)

Part 2.09 Concession Storage

- A. Provide wood shelving around the perimeter storage area.

Part 2.10 Janitor's Closet

- A. Janitor's closet ~~must have~~ a slop sink and wood shelving.

Part 2.11 First Aid Room

- A. The first aid room will have a minimum area of 80 sq.ft.
- B. Provide a lavatory.
- C. Water closet.

Part 2.12 Referees Room

- A. Provide one referees room having a minimum area of 80 sq.ft. complete with a water closet, lavatory, and shower stall.
- B. Provide one wooden bench.

Part 2.13 Furnace and Utility Room

- A. Adequate space for the furnace and utility equipment including electrical panel and water meter, bell telephone panel must be provided. Selection of furnace type is a performance specification item.
- B. Mount utility boxes in accordance with the applicable Codes and to the Engineer's approval.

Part 2.14 Refrigeration Room

- A. Provide a room of sufficient size to house the refrigeration equipment for the ice arena.
- B. Minimum area: 360 sq.ft.
- C. Outside Access:
  - 1. Double 3'x 7' door without centre mullion. Refer to hollow metal door section for standards.

Part 2.15 Equipment Room

- A. Provide an equipment room of sufficient size to house to ice re-surfacer, include a hot water hose and an ice melting pit in this area.
- B. Minimum area: 940 sq.ft. Minimum width 20 ft.

*add paving we shop equip furnace and  
furnace to be selected at a later date by  
engineer.*



PART 2 - DESIGN CRITERIA: SPECIFIC AREAS (Cont'd)

Part 2.15 Equipment Room (Cont'd)

- C. Access to the ice surface: 10'-0" x 10'-0" manually operated steel overhead door.

D. Outside Access:

1. Two 10'-0" x 10'-0" manually operated steel overhead door including all necessary framing, weatherstripping and hardware.
2. One hollow metal door.
3. Apply a shop coat primer to all exterior frames and doors.
4. Finish to be selected at a later date by the Engineer.

Part 2.16 Ice Rink Area

- A. The ice surface will be 85' wide x 185' long.

B. Outside Access

1. One 10'0" x 10'-0" steel single leaf vertical lift door manually operated complete with all necessary framing, hardware and weatherstripping.
2. Provide 3 double hollow metal emergency exit doors from rink area. Conform to the NBC for maximum spacing and Department of Labour for widths.
3. Apply a shop coat primer to all doors and frames.
4. Finish will be selected at a later date by the Engineer.
5. Preferred rink board construction is shown on Drawing B-75193-G3.
6. Knock-out board construction to be provided opposite exterior overhead door.

- C. Locate two penalty boxes at the opposite side of the rink from the players bench.

1. Enclose sides of penalty boxes to rink board level.
2. Separate penalty boxes by a time keepers box.
3. Put high backs on penalty and timer boxes.
4. Finish woodwork must conform to the Canadian Lumberman's Association Standards.
5. Construct wood benches with Fir conforming to the above standards and metal framing.



PART 2 - DESIGN CRITERIA: SPECIFIC AREAS (Cont'd)

Part 2.16 Ice Rink Area (Cont'd)

C. 6. The timekeepers box will contain the following:

- (A) Wooden desk and bench.
- (B) Electrical outlet for portable heater.
- (C) Ducts for score clock.
- (D) Wiring for future public address system and tape deck.
- (E) Enclose the timekeepers box with plexiglass on three sides and construct a high back with wood.

(F) Size gas piping to accommodate future heaters in seating area.

D. Provide space for future spectator seating. Do not include bleachers or seating for future spectators in this contract.

E. Construct players boxes with the following criteria:

1. Wood benches conforming to standards specified under D.5. with metal framing.
  2. Provide adequate lengths of bench to seat 18 players with two exits per box leading to the ice surface.
  3. Leave sufficient walking space behind the players benches.
- F. Construct the first 10'-0" of the exterior walls with concrete blocks. Conform with the masonry section of this specification.

Part 2.17 Community Hall

A. Provide as a second storey a community hall with a minimum area of 3600 sq.ft.

B. Exclude finishes to the community area from this contract.

C. Provide a viewing area to the ice surface. Windows shall be plexiglass.

D. Provide roughed in plumbing to future washrooms, kitchen and bar.

E. Size electrical service to accommodate future kitchen facilities and air conditioning.

F. Finish the second floor slab sufficient to accept vinyl asbestos tile without having to refinish before application. Do not include vinyl asbestos floor tile in this contract.

G. Construct the face of the community hall (rink side) with concrete block or metal. Plywood construction will not be acceptable.

*Seating bleachers to be provided so that seating can be installed. Either in the community hall*

PART 2 - DESIGN CRITERIA: SPECIFIC AREAS (Cont'd)

Part 2.18 Stair and Handrails

- A. Supply and install steel stairs and handrails.
- B. Apply one shop coat of primer and touch up damaged areas on site.
- C. Fabricate stairs in accordance with the latest applicable standards.
- D. Provide non-slip nosing on all stairs.

Part 2.19 Hardware

- A. Excluding the public washroom, provide each door with a separate key as well as in a master lock system. Provide all doors with the necessary hardware including weatherstripping, closers and kickplates.
- B. Provide the main entrance and all emergency exits with panic hardware, dead locks, weatherstripping, push-pull, closers, kickplates.
- C. Submit a comprehensive itemized schedule of hardware for each door to the Engineer for approval.



SECTION 4A - MASONRY

PART 1 - GENERAL

Part 1.01 Intent

A. This Section covers the masonry work including, but not confined to the following:

1. Concrete block
2. Mortar
3. Mortar Waterproofing
4. Wall Flashing or Dampproof Course
5. Masonry Reinforcing
6. Control Joints
7. Cutting out and Building in
8. Cleaning
9. Insulation

B. Related work specified elsewhere is as follows:

1. Hollow metal doors with frames - Section 8B.

Part 1.02 Standards

A. Ensure all work conforms to the National Building Code of Canada.

B. Recognized authorities are the applicable publications of:

1. Canadian Standards Association (CSA)
2. Local Building By-Laws
3. American Society for Testing Materials\* (ASTM)

Part 1.03 Testing - Conform to Latest Edition of all Reference Standards:

A. Masonry Units - CSA 165

1. Test masonry units in accordance with ~~ASTM C140-63T~~.

B. Mortar

1. Test mortar in accordance with CSA A179.

PART 1 - GENERAL (Cont'd)

Part 1.03 Testing-Conform to Latest Edition of all Reference Standards (Cont'd)

Owner will

- C. Employ an approved testing agency to carry out all testing. Owner will pay cost of testing.
- D. Carry cost of all testing required because of changes in materials requested by the Contractor and extra testing of materials occasioned by their failure to meet the specification requirements.
- E. Furnish such casual labour as is necessary to obtain and handle samples at the project site or at other sources of material.
- F. Advise the testing agency sufficiently in advance of operations to allow for the assignment of personnel.
- G. Provide and maintain for sole use of the testing agency facilities for the proper storage of samples and specimens.

Part 1.04 Samples

A. Before commencing work, submit samples of:

- 1. Block
- 2. Tiles
- 3. Joint Reinforcing
- 4. Erect sample panel of block on site 4'-0" x 6'-0" for approval of the Engineer. Erect further panels as necessary.

Part 1.05 Handling and Storage

Deliver packaged material to site in original containers with unbroken seals and labels.

- A. Deliver packaged material to site in original containers with unbroken seals and labels.
- B. Store cement and lime, clear of ground under complete cover.
- C. Store sand clear of ground on a platform.
- D. Store masonry units on non-staining raised skids, covered with polyethylene.
- E. Store accessories (ties, reinforcing) under cover.
- F. Remove foreign matter that will destroy bond in masonry.

Part 1.06 Co-ordination

- A. Co-ordinate with all trades items such as openings, bases and anchorage required for mechanical and electrical equipment to be used. Verify sizes with the trade supplying and installing the equipment or obtain data on relevant sizes to suit any change in equipment.



PART 1 - GENERAL (Cont'd)

Part 1.06 Co-ordination (Cont'd)

- B. Co-ordinate with the manufacturer of the Building Shell as specified in Section 13A to ensure the necessary lateral support for the blockwork is achieved.

PART 2 - PRODUCTS

Part 2.01 Materials - Conform to latest Edition of all Reference Standards

A. Block

1. Facet 1 - (H) and (S)
2. Facet 2 - Min. 2750
3. Facet 3 - A (Concrete Block)
4. Facet 4 - M (High Pressure Autoclave)

- B. Autoclave units by high pressure steam curing, at 140 to 150 psi at 235 to 365 degrees for 5 hours.

- C. Portland cement - CSA A5

- D. Sand - clean, sharp, natural - CSA A82.53

- E. Water - potable

- F. Mortar waterproofing - Medusa 'stearate'

- G. Wallflashing or dampproof course - 2 oz. copper 'Fibreen'

- H. White non-staining cement - as 'Medusa' stoneset or equal.

- I. Lime -hydrated CSA A82.43

- J. Pointing mix aggregate - white silica sand

- K. Masonry Reinforcing - 'Durawall' as supplied by General Concrete Ltd.

- L. Non-shrink Mortar - 'Embeco' by Master Builders or equal.

- M. Insulation - Loose fill vermiculite.  
Part 2.02 Mortar

- A. Use type 'S' mortar as specified in NBC Supplement No. 4 for all masonry work.

- B. Mix mortar dry, then wetted using a maximum of six gallons of water per bag of cement.

## PART 2 - PRODUCTS (Cont'd)

### Part 2.02 Mortar (Cont'd)

- C. Obtain Engineers approval for use of premixed masonry mortars.

## PART 3 - EXECUTION

### Part 3.01 Workmanship

- A. Execute work - by qualified workmen.
- B. Fit and finish work neatly throughout.
- C. Secure masonry rigidly in place, square, plumb and true.
- D. Provide all necessary lateral bracing for blockwork between columns and girts.
- E. Mix mortar in watertight boxes or mechanical mixer. Clean mixer after each batch.
- F. Mix only enough mortar for one hour's use. Do not use mortar that has stood for more than one hour. Do not remix or retemper mortar.
- G. Use only masonry units free from damage such as broken corners, surface blemishes and cracks.
- H. Use only masonry units that are uniform in size.
- I. Use headers, corners, stretcher and square end units as required.
- J. Where fresh masonry joins masonry that is partially or completely set, clean exposed faces of set masonry with a stiff brush and lightly wet to obtain the best possible bond with new work. Remove and reset loose units and mortar.
- K. Tool exposed joints to concave unless instructed otherwise by the Engineer.
- L. Strike unexposed joints flush.
- M. Insulation
  - 1. Apply loose fill vermiculite insulation to all exterior blockwork.
  - 2. Fill concrete block cores with vermiculite as the blockwork progresses. Pour insulation into blocks every third course laid to obtain even distribution throughout walls.

### Part 3.02 Cold Weather Requirements

- A. Obtain approval of the Engineer before laying masonry in freezing weather.
  - 1. The Engineer will only give approval after receiving a written submission by the Contractor indicating suitable precautions and methods of protection to be used.
- B. Provide temporary enclosures and coverings deemed suitable by the Engineer for protection and laying of masonry.
  - 1. Retain enclosures in place for not less than 72 hours after masonry is laid.



PART 3 - EXECUTION (Cont'd)

Part 3.02 Cold Weather Requirements (Cont'd)

- B. 2. Maintain enclosure at 40 degrees by approved smokeless and vented equipment.
- C. Do not use calcium chloride or other additives to lower the freezing point of mortar.
- D. Employ only methods approved by the Engineer for heating sand, water and masonry units.
- E. Protect masonry at all times from snow and ice.

Part 3.03 Laying Concrete Block

- A. Erect block walls in common running bond with 3/8" horizontal and vertical joints. Align shells and webs one over the other in a full bed of mortar.
- B. Build horizontal joint reinforcing into every second course.

Part 3.04 Dampproof Course and Wall Flashing.

- A. Install dampproof course at base of walls, full thickness of wall.
- B. Install wall flashing over lintels to doors, windows and other openings in external walls, full thickness of wall. Extend flashing 6" beyond end of lintels.

- C. Lap joints at least 8 inches.

Part 3.05 Control Joints

- A. Provide control joints in accordance with the applicable standards.

Part 3.06 Other Work

- A. Rake out joints 1 inch deep for setting of roof flashings.
- B. Build in loose lintels, doors, windows and louvre frames, pipe sleeves, fittings and other similar items.
- C. Apply two coats of bituminous paint to lintels prior to setting.
- D. Apply back paint of two coats of bituminous paint to aluminum work prior to building in.

Part 3.07 Building In

- A. Build in all louvres, masonry vents, pipes and services as necessary.

PART 3 - EXECUTION (Con't)

Part 3.08 Cleaning

A. Clean masonry upon completion.

1. Remove loose mortar
2. Remove streaks and stains by rubbing with soap and water
3. Do not use acid of any kind.

Part 3.09 Clean-Up

- A. On a daily basis as the work proceeds and upon completion, remove from the site all rubbish and surplus material resulting from the work of this Section.



PERFORMANCE SPECIFICATION  
SECTION 13A - BUILDING SHELL, FRAMING AND RELATED FOUNDATIONS

PART 1 - GENERAL

Part 1.01 Intent of Section

- A. Provide all labour and material to design and construct the building shell including structural framing, cladding, roofing and all related foundations in accordance with the performance standards described in this Section.
- B. The specific design indicated on inferred on the drawings serves only as a general indication of the appearance of the complex to establish layouts and determine physical dimensions.
- C. Provided the general intent of the performance items are not deviated in regards to overall physical dimensions, a maximum flexibility of materials and framing schemes may be incorporated.
- D. This performance specification section describes the building shell on the basis of a steel cladding, column and girt system. Alternative systems such as laminated timber, open web steel joists, precast concrete and precast concrete T sections will be considered providing the design criteria specified in this section are met.

- E. The following list of performance items include but are not limited to:

1. Framing
2. Exterior walls
3. Roofing
4. Second floor framing
5. All foundations for performance items
6. Second floor deck including topping.

Part 1.02 Related Non-Performance Items

- A. Exterior and interior masonry walls.
- B. Doors.
- C. Concrete floors.
- D. Stairs and handrails.
- E. Puckboards

Part 1.03 Qualifications

- A. Design and construct items specified in this Section by a company having reputable experience in this type of work.

- B. Provide a comprehensive list of completed jobs similar in construction.

PART 1 - GENERAL (Cont'd)

Part 1.04 Submittals and Samples

- A. Submit the following to the Engineer for approval prior to commencing fabrication or construction:

1. Detailed drawings of:

- (a) Framing for structure.
- (b) Cladding and roofing.
- (c) Foundations.
- (d) Second floor framing and deck.

2. Submit descriptive literature, samples of cladding and roofing with details outlining physical and thermal characteristics.

3. Colour charts.

4. Structural design briefs.

Part 1.05 Certification

- A. Stamp all drawings and design briefs by a Registered Professional Engineer in the Province of Ontario and certified to be in accordance with the requirements of the National Building Code of Canada and requirements specified herein.

Part 1.06 Guarantee

- A. In addition to the normal guarantee of one year for workmanship and materials, the proprietary items in this Section shall be guaranteed for a minimum of 5 years against colour fading, finishes delamination, peeling, deformation, warping, and weatherproofness.

PART 2 - PRODUCTS

Part 2.01 Conformance with Specifications or Standards

- A. Where standard materials and construction such as concrete are a part of the work covered within this Section, they shall conform to the appropriate technical Section of the specifications such as Section 3A for concrete.

- B. Where there is no technical specification Section for the materials used, then they shall conform to the standards used in the industry.

Part 2.02 Codes

- A. Unless otherwise specifically stated, all design and construction shall meet the requirements of the National Building Code of Canada.



PART 2 - PRODUCTS (Cont'd)

Part 2.03 Design Criteria - Structural

A. Loads

1. Snow loads shall be 45 lbs./sq.ft. on the main roof areas.
2. Design wind loads in accordance with the National Building Code and not less than 20 lbs/sq.ft. Deflection not to exceed 1/180th of the span.
3. Floor vertical live loads shall be 100 lbs./sq.ft. with the exception of the areas subject to passage of vehicles which shall carry wheel loads corresponding to H20-S16 of the AASHO loading tables. Horizontal seat live loads shall be in accordance with NBC Supplement No.4, Section No.4.1.8.2.
4. Loads due to backfill against retaining walls and footings shall be taken as a minimum of 40 lbs./cu.ft. equivalent fluid pressure with an additional 2'-0" of surcharge when subject to vehicular loading.

B. Fire Ratings

1. Fire ratings shall be in accordance with the National Building Code and shall correspond to Group A, Division 3.

C. Soil

1. Bearing. The maximum allowable bearing pressure to be assumed for the undisturbed soil in the area and at or below the elevations shown on the drawings shall be 4000 lbs./sq.ft.
2. Footing Elevations. All footings shall be placed at or below the elevations shown on the drawings and have a minimum of 5'-0" of frost cover.

Part 2.04 Design Criteria - Thermal

- A. Sufficient insulation shall be incorporated in the building such that the overall Heat Transfer Coefficient (U) shall be not greater than the following:

1. Heat loss through the roof (and vapour barrier) -  $U = 0.12 \text{ BTU/hr. (sq.ft.) (}^{\circ}\text{F.)}$ .
2. Heat loss through exterior walls (and vapour barrier) -  $U = 0.15 \text{ BTU/hr. (sq.ft.) (}^{\circ}\text{F.)}$ .
3. The subgirt and thermal dip assembly shall provide  $R = 7.46$ .

2.05 ACOUSTICS ✓

PART 2 - PRODUCTS (Cont'd)

Part 2.05 Structure

- A. The layout and physical dimensions of the building shall be as indicated on the drawings. Maintain a minimum of 20 feet clearance between the ice surface and the underside of the building with the first 10 feet of the perimeter walls being constructed of concrete block. Submit detailed amendments to the Engineer for approval.

B. Exterior Shell Construction

1. Metal siding shall be pre-painted 5000 Series Baycoat standard colour on steel sheet galvanized at the rate of 1.25 ozs. per square foot of surface area, colour to be approved. Corrugated exterior panels shall be similar to Profile No. 3Q Panel as manufactured by Robertson Irwin Ltd. or approved equal. Gauge thickness: min. 22 gauge.
  2. Interior sheet liner to walls of the rink area shall be galvanized steel sheet, galvanized at the rate of 1.25 ozs. per square foot of surface area.
  3. The insulation shall be of a type and thickness to meet the thermal criteria noted earlier in this Section of the specifications.
  4. The exterior corrugated steel facing together with the insulation and interior steel sheet shall make up an insulated wall panel unit that shall span completely from girt to girt without intermediate girts.
  5. The interior sheets shall be caulked at all side and end laps to provide a vapour barrier and a 4 mil polyethylene sheet shall be installed between the interior metal liner and the insulation.
  6. Notched neoprene closures and caulking shall be provided to ensure a vapour seal at the top and bottom of all panel runs and openings.
  7. Provide metal ties from girts and exterior shell framing to laterally brace the concrete blockwork between girts. Conform to the National Building Code for lateral support standards.
- C. All fasteners shall be cadmium plated and shall have colour matched heads to match the exterior pre-coated material.
- D. Roof Construction
1. Roofing shall include all necessary flashings, drains, gutters, rainwater leaders, insulation, vapour barriers and caulking.
  2. All flat roofing shall have a continuous vapour barrier in strict accordance with the manufacturer's specifications.



PART 2 - PRODUCTS (Cont'd)

Part 2.05 Structure (Cont'd)

D. Roof Construction (Cont'd)

3. The sloping roof system shall be made up of components similar to the wall system without the internal metal liner. The insulation shall be a batt or roll type with built on vinyl vapour barrier. The corrugated deck shall be fluted and be of suitable gauge to meet the structural requirements outlined earlier in this Section of the Specifications and be caulked at all laps.
4. Caulk at end and side laps with vapour barrier, insulation and built up roofing as required by the Canadian Roofing Contractor's Association and the Canadian Government Specification Board, Specification 19 GP 5.
5. The insulation shall be as required by the thermal design criteria noted previously; the structural qualities of the deck similarly as noted in structural design criteria.
6. Notched neoprene closures and caulking shall be arranged as necessary to ensure a seal at the perimeters of openings and at the edges of the building.
- E. All holes through the roof system required by the Contract shall be trimmed as necessary, all trimming steel being provided to suit the structural design criteria.
- F. The drainage from the flat lower roofs shall be by roof drains in accordance with the appropriate codes.
- G. The drainage from the sloping roof shall be via steel gutters, colour matched to the siding, and by steel downpipes also colour matched to the siding.
- H. Flashing material for the pitched roofing shall be galvanized steel as for the roof deck and where visible shall be of coloured material to match the roofing colour.

PART 3 - EXECUTION

Part 3.01 Fabrication

- A. Fabrication of any component material shall not be started until approval of submitted drawings is given by the Engineer.
- B. Fabrication records and inspection reports certifying conformance to specifications shall be submitted to the Engineer prior to erection.

PART 3 - EXECUTION (Cont'd)

Part 3.02 Erection and Installation

- A. All erection and installation shall be carried out true to line and grade and shall be plumb to within recognized established tolerances.

Part 3.03 Openings in Walls and Roofs

- A. Opening in walls and roofs for equipment shall be cut and flashed in the field after verification of measurements.

Part 3.04 As Built Drawings

- A. On completion of erection and installation, one complete set of 'As Built' reproducible drawings shall be turned over to the Engineer for record purposes.



SECTION 15A - HEATING AND VENTILATING  
PERFORMANCE SPECIFICATION

PART 1 - GENERAL

Part 1.01 Intent of Section

- A. This section is written on the assumption that a hot water heating system will be utilized. Other methods of heating will be considered providing the equivalent performance is achieved.
- B. This Section is a performance specification for the supply and installation of all space heating and ventilating systems for the project. It is the Contractor's responsibility to select equipment and to arrange the installation of it to co-ordinate with the building system selected. All work shall be in accordance with the best commercial practice. The result shall be a completely operational and readily serviced, efficient system to provide comfort conditions in the various areas.

C. This Section covers the supply and installation of the following:

1. Complete gas-fired heating system for all areas except the rink room and two remote storage rooms.
2. Ventilation for the rink area by roof mounted exhaust fans and wall mounted intake louvres.
3. Ventilation of players' room, washrooms, canteen, referee's dressing room, first aid room, ice resurfacer room, and refrigeration room, all by individual fans.
4. Temporary heating for the proposed future community hall.
5. Electric heating for the two remote storage rooms.

D. The following is covered in other sections:

1. Wiring to the line side of disconnects in Division 16.
2. Wiring to the line terminals of electric heaters in Division 16.
3. Gas piping and gas service in Section 15B.

Part 1.02 Installation and Shop Drawings

A. Submit installation drawings for:

1. Heating system showing pipe or duct routing and schematics of the system.

PART 1 - GENERAL (Cont'd)

Part 1.02 Installation and Shop Drawings (Cont'd)

- A. 2. Ventilating systems showing equipment locations, ductwork and wall openings.

B. Submit shop drawings for:

1. Heating equipment including combustion equipment.
2. Ventilating equipment.
3. Control systems.
4. Heat distribution equipment.

- C. Submit sufficient copies to permit three (3) copies to be retained by the Engineer.

- D. Shop drawings will be stamped 'Approved', or 'Approved as Noted', or 'Revise and Resubmit', then returned.

- E. The review or approval of installation or shop drawings by the Engineer does not in any way relieve the Contractor of any responsibility for making the work accurate and in conformity with Contract Documents.

Part 1.03 Permits, Notices, Laws and Rules

- A. Make all work comply with requirements of the latest edition of the Ontario Hydro Safety Code, Ontario Ministry of Energy and Resources Management, Ontario Ministry of Labour, Ontario Fire Marshall, Local Building Department, Public Utilities Commission, Local Gas Utility and any other Authority having jurisdiction.

- B. Submit drawings and specifications to all authorities and obtain general approval before commencing work.

- C. Obtain and pay for permit, fees, approvals and inspections required by all governing authorities. Correct work as required to fulfill approval requirements of governing authorities. Commencement of work shall imply that responsibility for difficulties arising from failure to obtain approval has been accepted.

Part 1.04 Painting

- A. Equipment of aluminum, plated metal, or stainless steel need not be painted. Supply all other equipment with at least one shop coat of metal primer.



PART 1 - GENERAL (Cont'd)

Part 1.05 Design Criteria

- Common to all Occupied Spaces*
- A. Provide a heating system capable of maintaining 72°F in all occupied spaces except the main rink room when the outside temperature is 5°F.
- B. Provide a gas-fired forced flow hydronic type system, sized in accordance with the best commercial practice, taking into account building heat loss, ventilation and infiltration loads and pick up and piping losses. Provide primary and secondary piping with a system circulator and individual boiler circulator(s).
- C. Control the system using an indoor-outdoor controller to sequence the furnace (s) and high-low firing sequences as required. Provide local thermostats in areas specified below.
- D. Provide heavy gauge wall mounted radiation, not baseboard, for:
1. All washrooms and dressing rooms including referee's dressing room.
  2. Ticket booth, Manager's Office, skate room, first aid, concession, *3 why not by storage and janitor's rooms. cheap baseboard here?*
  3. Stairwells, keeping in mind infiltration and the requirement for traffic.
- E. Provide unit heaters with individual thermostats:
1. Ice resurfacers room
  2. Refrigeration room
  3. Future community hall (these will be removed and replaced by wall mounted radiation in the future).
- F. Provide ceiling-hung, horizontal, forceflow cabinet type heater(s) with thermostat(s) for the lobby, particularly to offset infiltration at the entrance.
- G. Provide ventilation for washrooms and changing rooms based on Local Codes with a minimum of 2 cfm/sq.ft. of floor area.
- H. Provide rink room ventilation of 10,000 cfm minimum using exhaust fan(s) with intake louver with inter-locked motorized damper. Provide a second rink exhaust system with inter-locked motorized inlet, rated at 2,000 cfm to accommodate requirements for future unvented gas-fired radiant spectator heaters. Select fans to produce 12,000 cfm of total rink area ventilation when operating together.
- I. Although a hydronic system is preferred, a ducted hot-air system meeting the functional design criteria will be considered as an acceptable alternative.

## PART 1 - GENERAL (Cont'd)

### Part 1.05 Design Criteria (Cont'd)

- J. Select equipment taking into account the possibility of vandalism. Protect controls from interference from the public using protective covers or by locating operating controls in areas not open to the public.
- K. Use Designers and Tradesmen with proven experience in this type of work. Select and install all equipment in strict accordance with the manufacturer's printed instructions and best commercial practice using such authority as ASHRAE.

## PART 2 - PRODUCTS

### Part 2.01 Electrical

- A. Supply equipment with motors of less than 3/4 HP suitable for operation on 120V single phase, 60 hertz. Equip all single phase motors with manual starters, key operated operated where in public areas.
- B. Supply equipment with 3/4 HP or greater motors suitable for operation on 575V, 3 phase, 60 hertz. Supply a circuit breaker type combination magnetic starter for each motor, complete with 120V, single phase control circuit transformer, pilot light and operating push buttons.
- C. Equip all starters with heaters in all phases; select heaters from nameplate full load current ratings of the motors controlled.
- D. Wiring to the line side of the disconnecting equipment is specified under Division 16. Carry out wiring from the load side of starters or disconnecting devices in accordance with the requirements of Division 16.

### Part 2.02 Controls

- A. Supply pressure switches, control systems, thermostats, starters, etc. as required to make all mechanical systems fully operative. Provide wiring diagrams as required and as supplied by experienced control manufacturers such as Honeywell Controls, Johnson Controls, or Barber-Colman.

### Part 2.03 Pipe and Fittings

- A. For hydronic heating systems, use Schedule 45 ASTM A-53 Grade 'A' Carbon steel pipe with malleable screwed fittings or Type 'L' copper tubing with brass solder fittings.

### Part 2.04 Valves

- A. Supply valves as manufactured by one manufacturer with the manufacturer's name and and pressure rating clearly marked on the outside of the body. Jenkins Catalogue Numbers are specified but equal valves by Crane are acceptable.



PART 2 - PRODUCTS (Cont'd)

Part 2.04 Valves (Cont'd)

B. Provide valves as follows:

1. Gate valves up to 2" - bronze, double disc, taper seat, rising spindle, 200 OWG, screwed ends, Fig. 470; solder ends, Fig. 300-P.
2. Gate valves 2-1/2" and over - iron body, bronze mounted, outside screw and yoke, double disc, taper seat, rising spindle, 200 OWG, Fig. 404.
3. Globe valves up to 2" - bronze disc type 225 OWG fitted with correct disc for the service, screwed ends, Fig. 106-A; solder ends, Fig. 106-AP.
4. Globe valves 2-1/2" and over - iron body, bronze mounted, outside screw and yoke, 200 OWG, bronze seat ring and removable composition disc suitable for the service, Fig. 142.
5. Hose Bibbs - finished brass 3/4" Mueller C-12210.

Part 2.05 Hot Water Boiler

- A. Supply a hot water boiler system of the heavy duty copper tube type designed for high-low firing on natural gas, with CGA approval, designed for an operating pressure of 30 psi and with 10 year manufacturer's guarantee on the heat exchanger. Provide at least the following items:

1. Gas train with pressure regulator
  2. Temperature and pressure gauges
  3. ASME rated relief valve set at 30 psi
  4. Controls including limit and operating thermostats and 100% shut-off in case of pilot flame failure
  5. Draft hood
  6. Main gas cock
  7. Boiler circulator.
  8. Non-linting type burner distributed to give full heat coverage to all exchanger surfaces.
  9. Steel outer jacket factory finished in baked enamel.
- B. Provide boilers equal to those manufactured by A.O. Smith Corporation, Ruud Limited or Ray-Pak.

Part 2.06 Expansion Tank

- A. Provide an expansion tank for the hot water heating system sized in accordance with ASHRAE recommendations complete with gauge glass, sufficient valving to permit easy draining in case of water logging and rated at 100 psi.

PART 2 - PRODUCTS (Cont'd)

Part 2.07 Circulators

- A. Provide standard in-line type circulators designed for quiet leak-free operation and complete with standard open dripproof motors, all equal to S.A. Armstrong or Taco manufacture.

Part 2.08 Specialties

- A. Provide each heating unit with valves on the inlet and the outlet to permit isolation and to balance flow.
- B. Provide automatic air vents at system high points, equal to Taco No. 427 or S.A. Armstrong #7. Supply coin operated air vents on upfed heating units.
- C. Provide automatic water makeup complete with regulating valve, stop valve, safety valve and gauge for the hot water system.
- D. Provide a Clayton R.P.P. backflow preventer in the line feeding the boiler.
- E. Provide a Dearborn Type 'H' chemical feeder on the boiler system. Provide flush out chemicals as required. Final fill chemicals will be provided by the Owner as per the recommendation of the Contractor.
- F. Provide thermometer wells entering and leaving all boiler equipment and major heat exchange equipment. Provide two (2) thermometers of suitable range to fit these wells, equal to Terrice.

Part 2.09 Heating Units

- A. Supply heating units equal to those manufactured by Trane or Slant-Fin.
- B. Use fin-tube or baseboard type wall mounted radiation with casings of 18 gauge steel or heavier.
- C. Provide unit heaters with quiet resilient mounted propeller fans and adjustable louvres, in 18 gauge or heavier cases.
- D. Provide cabinet heaters in 18 gauge or heavier casings with centrifugal fans with built-in overload protection on the fan motors.

Part 2.10 Fans

- A. Provide fans with automatic backdraft dampers, motors rated for continuous duty and local disconnecting devices to meet Hydro Code. Operate washroom fans and lighting switches with key operated manual starters.
- B. Provide a wall mounted propeller fan complete with backdraft damper and protective guard for refrigeration equipment room, sized as required by the Refrigeration Code and as recommended by the supplier of the refrigeration system.



## PART 2 - PRODUCTS (Cont'd)

### Part 2.10 Fans (Cont'd)

- C. Provide wall mounted propeller exhaust fans with backdraft dampers and guards for the ice resurfacer room.
- D. Ventilate the canteen area with a wall or ceiling mounted exhaust fan rated at least 400 cfm, discharging through ductwork and weather cap.
- E. Fans shall be equal to Breidert or Canadian Blower and Forge.

### Part 2.11 Louvres

- A. Provide 4" deep all aluminum weather-tight louvres for air makeup, equal to Construction Specialties Model 4100. Select intake louvres on an air velocity through the free area not to exceed 600 fpm.
- B. Provide intake louver(s) in the furnace and utility room, to provide makeup air for combustion and ventilation in accordance with the Gas Installation Code.

### Part 2.12 Gas Vents

- A. Provide double wall type 'B' gas vents equal to Selkirk-Metalbestos Ltd. for all gas burning appliances. Select the venting system in accordance with recommendations of the vent manufacturer to ensure adequate venting of flue gases without spillage.

### Part 2.13 Insulation

- A. Provide standard pipe insulation, 1" thick, equal to Fiberglas with canvas jacket.

## PART 3 - EXECUTION

### Part 3.01 Layout

- A. Provide proper heating and ventilation to all areas specified keeping in mind valdalism, personal safety and ease of service.
- B. Install equipment and piping parallel to building lines and so as to conserve head room, providing service access around all equipment. Provide valves for proper system balancing; provide unions to facilitate removal of equipment.
- C. Provide for the proper venting and draining of the systems, using air vents at high points and hose end drain valves at low points.
- D. Provide for system expansion using either expansion joints or swing joints and expansion loops.

PART 3 - EXECUTION (Cont'd)

Part 3.01 Layout (Cont'd)

- E. Install gas-fired equipment in accordance with CSA Code for Installation of Gas Burning Equipment and the Ontario Gas Utilization Code.

Part 3.02 Hangers

- A. Provide pipe hangers and supports for all piping. Install hanging hanger rods vertically without bends or offsets and with workmanship such that finished piping is true with respect to both line and grading.
- B. Use wrought steel clevis hangers with hanger rods and locking nuts. Space hangers on horizontal lines not more than 5' apart for lines to 1 inch, and 8' for lines over 1 inch. Chain or strap hangers are not acceptable.
- C. Use properly sized galvanized insulation protection shield where insulated pipe passes through hangers.
- D. Powder actuated fastening systems are not acceptable.

Part 3.03 Joints

- A. Use threaded joints for pipe 2" and smaller; use welded joints for pipe 2-1/2" and larger. Use licensed welders for all welded connections. *Add sentence for cop joints*
- B. Use approved pipe jointing compound on threaded joints. No fibrous filler material shall be used.
- C. For flanged joints use gasket materials with suitable temperature and pressure ratings for the fluid carried. Align flanges to prevent flanges rocking on the gaskets.
- D. Solder joints in copper piping with 50-50 solder.

Part 3.04 Insulation

- A. To give personal protection, insulate all lines carrying heated water where within 8 feet of the floor. Insulate heating lines passing through unheated areas.
- B. Install insulation after leak-testing and only on dry, properly prepared surfaces, using experienced installers following the insulation manufacturer's printed instructions.

Part 3.05 Electrical

- A. Supply all pumps and equipment with starters as required.
- B. Install starters on the nearest available wall and wire to the load.
- C. Wire controls as required to make the system operate correctly.
- D. Wire in strict accordance with the standards of Division 16.



PART 3 - EXECUTION (Cont'd)

Part 3.06 Co-ordination

- A. Prepare and submit drawings of the intended installation in time to permit checking in compliance with the specification and to permit proper co-ordination of the heating and ventilating work into the building structure.
- B. Lay out work and co-ordinate it with concrete placing, masonry, structural work, finishing and similar work so that such items as sleeves, inserts and openings are provided at the proper time. Rectify to new standards, any damage caused by improper location in the execution of work.
- C. Consult with the Engineer to obtain detailed drawings or instructions for exact locations of equipment before installing equipment and pipes which may interfere with the interior treatment use of the building.
- D. On completion of work, submit to the Engineer one set of drawings nearly marked in red to show the 'as constructed' conditions.

Part 3.07 System Start-Up

- A. Completely fill the system and vent all air. Notify the Engineer then pressure test the complete system at 50 psi, blanking off any equipment with a lower pressure rating. Examine all joints for leaking. Relieve pressure, remove blank off plates and retest the complete system at 30 psig, examining all equipment not previously inspected. Repair all leaks and repeat testing until the complete system passes the test.
- B. After testing, thoroughly flush the system and boil it out using approved compound, as recommended by a qualified Water Treatment Specialist. Follow instructions of the Specialist and of the equipment manufacturers ensuring that the chemicals used are compatible with the installed equipment. After boiling out, flush the system with clear water. Clean all strainers. Fill the system completely, venting air as required. Install water treatment chemicals as provided by the Owner to the recommendations of the Contractor.
- C. Adjust all thermostats, controls, regulating and balancing valves, etc. to produce correct flow in all distribution devices. Make final adjustments of the heating system during the appropriate peak season and before 'completion of the contract', to ensure that proper temperatures are being maintained in all heated spaces.
- D. Balance all exhaust systems, giving a report on all air flows.
- E. Demonstrate all systems to the Owner and Engineer, showing that they operate correctly and produce design conditions.

Part 3.08 Operating and Maintenance Instructions

- A. Supply complete operating and maintenance instructions to the Owner's personnel.

PART 3 - EXECUTION (Cont'd)

Part 3.08 Operating and Maintenance Instructions

- B. Prepare a complete operating and maintenance manual complete with manufacturer's service literature on all equipment and neatly typed operating and maintenance service instructions. Provide two copies of this information for use during the instruction sessions.

Part 3.09 Clean-Up

- A. As the work proceeds and upon completion, clean up and remove all rubbish and surplus material from the site.

- B. Ensure that floors, walls, etc. are not marred by construction operations.

Part 3.10 Hot Air System

- A. If a hot air system is supplied, construct ductwork in accordance with the printed recommendations of SMACNA.



SECTION 15B - PLUMBING  
PERFORMANCE SPECIFICATION

PART 1 - GENERAL

Part 1.01 Intent of Section

- A. This Section is a performance specification for the supply and installation of all plumbing systems. The specifications indicate the areas to be served but it is the Contractor's responsibility to arrange the installation to co-ordinate with the building systems selected and to provide completely operational systems. Work shall be in accordance with best commercial practice, to result in a completely operational and readily serviced, efficient system.
- B. This Section covers the supply and installation of the following systems and equipment:
1. Domestic cold water to a point 5' outside the building wall, including arrangement for service.
  2. Domestic hot water with heaters.
  3. Rink flooding hot water.
  4. Natural Gas piping to a point 5' outside the building wall, including arrangement for service.
  5. Sanitary drainage to a point 5' outside the building wall.
  6. Rink surface drainage.
  7. Roof Drainage (to be determined)?

C. The following is covered in other Sections:

1. Wiring to the line side of the equipment disconnecting devices.
2. Sub-drainage piping .
3. Roof Drainage from the main roof area (to be determined)?

Part 1.02 Co-ordination

- A. Prepare and submit drawings showing pipe routing, equipment locations, and piping schematics far enough ahead of time to permit checking for compliance

PART 1 - GENERAL (Cont'd)

Part 1.02 Co-ordination (Cont'd)

with the specifications and to permit proper co-ordination of the plumbing work into the building structure.

- B. Lay out work and properly co-ordinate it with concrete placing, masonry, structural work, finishing and similar work so that such items as sleeves, inserts, and roughing-in are provided at the proper time. Rectify any damage caused by improper location in the execution of work.
- C. The drawings show the general arrangement of the building. Connect to all fixtures with piping installed in such a way so as to conserve head room and to interfere as little as possible with the free use of space.
- D. Before installing equipment or pipes which may interfere with the interior treatment and use of the building, consult with the Engineer to obtain detailed drawings or instructions for exact locations.
- E. On completion of the work, submit one set of drawings neatly marked in red to show location of hidden services, inverts of buried pipes, and all other 'as constructed' conditions. Submit these drawings to the Engineer.

Part 1.03 Shop Drawings

A. Submit shop drawings for:

- 1. Plumbing fixtures
- 2. Water heating system
- 3. Gas distribution system showing design loads

B. Submit sufficient copies to permit three (3) copies to be retained by the Engineer.

C. Shop drawings will be stamped 'Approved' or 'Approved as Noted' or, 'Revise and Resubmit', then returned.

D. The review or approval of erection or shop drawings by the Engineer does not in any way relieve the Contractor of any responsibility for making the work accurate and in conformity with Contract Documents.

Part 1.04 Permits, Notices, Laws and Rules

A. Make all work comply with the requirements of the latest edition of the Ontario Hydro Safety Code, Ontario Ministry of Energy and Resources Management, Ontario Fire Marshall, Ontario Ministry of Labour, Ontario Ministry of the Environment, Local Building Department, Public Utilities Commission, Local Gas Utility and other Authorities having jurisdiction.



PART I - GENERAL (Cont'd)

Part I:04 Permits, Notices, Laws and Rules

- B: Submit drawings and specifications to all authorities and obtain general approval before commencing work.
- C: Obtain and pay for permits, fees, approvals and inspections required by all governing authorities. Correct work is required to fulfill approval requirements of governing authorities, commencement of work shall imply that responsibility for difficulties arising from failure to obtain approval has been accepted.

Part I:05 Trenching, Backfilling, Concrete Work

- A: Provide trenching, backfilling or concrete work required to complete the pumping and drainage in accordance with Section 2A of the specification.

Part I:06 Water Service

- A: Arrange with the local Supply Authority for a suitable water service and install all required equipment, including meter or provision for meter in accordance with the authority's instructions.

Part I:07 Natural Gas Service

- A: Arrange for an adequate natural gas service with the Local Gas Utility and pay all charges connected therewith. Complete arrangements at least eight weeks before the required 'in-service' date. Size the gas service to accommodate both building space heating systems and domestic water heating.

Part I:08 Painting

- A: Equipment of aluminum, plate metal or stainless steel, need not be painted. Supply all other equipment with at least one shop coat of metal primer.

Part I:09 Design Criteria

- A: Provide hot and cold water supply adequate cold water to all fixtures including W.C.'s, laboratories, drinking fountains, showers, janitor's sinks, water heating systems, and mechanical equipment, including refrigeration equipment.
- B: Provide hot water to all washing facilities including showers and lavatories.
- C: Provide water heating systems with capacities as specified below.
- D: Provide hot and cold water connections for a possible 6 W.C.'s, 3 urinals, and 6 lavatories at each end of the future second floor community hall. Design the service to accommodate the present load plus one such set of sanitary fixtures plus one 3-compartment kitchen sink, also potentially located in the community hall area.

PART 1 - GENERAL (Cont'd)

Part 1.09 Design Criteria (Cont'd)

- E. Provide an adequate sanitary drainage system to handle all specified present and future fixtures including floor drains in all dressing rooms, storage and ice resurfacer room including snow pit, refrigeration room, lobby, and canteen. Provide floor drains in the refrigeration header pipe trench to receive drainage from the rink floor. Provide above floor stack connections for the possible future connection of washroom groupings as specified above for each end of the future community hall.
- F. Size the building sewer based on installation of all present fixtures plus one group of community hall washroom fixtures plus one kitchen group for the community hall.
- G. Size all lines in accordance with the Ontario Plumbing Code and ASHRAE Recommendations for water systems.

PART 2 - PRODUCTS

Part 2.01 Electrical

- A. Comply with the Electrical provisions on Section 15A, providing all required pressure switches, control systems, thermostats, starters, etc.

Part 2.02 Pipe and Fittings

- A. For potable piping up to 2 inches in size inside buildings, use type 'L' hard drawn copper tubing with solder joint cast bronze or wrought copper fittings.
- B. For potable water piping over 2" in buildings, use Schedule 40 galvanized steel with galvanized cast screwed fittings and unions or flanges to facilitate service work.
- C. For buried potable water pipe up to 3", use type 'K' soft drawn copper tubing with solder joint cast bronze or wrought copper fittings.
- D. For drainage piping up to and including 2", use type DWV copper with drainage drainage type solder fittings.
- E. For drainage piping 2-1/2" to 6", use cast iron Class 4000 mechanical joint type fittings and jointing materials as supplied by the pipe manufacturer.
- F. For drainage piping over 6", use cast iron Class 4000, Bell and Spigot pattern with matching fittings, or asbestos-cement pipe with matching fittings.
- G. For vent piping, use type DWV hard drawn copper with solder joint cast fittings.



PART 2 - PRODUCTS (Cont'd)

Part 2.02 Pipe and Fittings (Cont'd)

- H. For gas piping, use Schedule 40 ASTM, A53 Grade 'A' carbon steel with malleable iron screwed fittings to 1-1/2" in size; for 2" and over, use butt weld 150 psi Class fittings.
- I. Factory cover buried gas lines with polyethylene coating with joints sealed with polyethylene tape.
- Part 2.03 Drainage Control Equipment.
- A. Wade Catalogue numbers are specified for this equipment, but Josam, Rototech-Smith, or Zurn equivalents are equally acceptable.
- B. Provide the following drainage control equipment:
1. Floor Drains - W1200 with nickel bronze strainers; for showers provide sediment bucket.
  2. Floor Cleanout - W8200 with nickel bronze cover.
  3. Stack Cleanout - W8460

Part 2.05 Plumbing Fixtures

- A. Provide plumbing fixtures by American Standard or Crane, as follows:
1. Water Closet  
AF-2155 American Standard elongated Cadet-2, reverse trap with bolted on tank cover, wheel handle angle stop and flexible riser, open front seat without cover.
  2. Basin  
AD-0100 American Standard Rapide 18 x 18 with centreset faucet.
  3. Urinal  
AF-658 American Standard Maybrook with integral strainer, trap and Galt 64505 metering valve.
  4. Shower Fitting  
Emco two-faucet type with 3 IGPM volume regulator.

PART 2 - PRODUCTS (Cont'd)

Part 2.05 Plumbing Fixtures (Cont'd)

A. 5. Janitor Sink

AB-7692 - 0310 American Standard Lakewell with wall hanger, S-trap and sink faucet with bucket hook on spout.

6. Drinking Fountain

AF-8333 American Standard Tioga semi-recessed with integral strainer and bubbler with guard, valve with volume regulator.

Part 2.06 Water Heaters

A. Provide a domestic water heating system using gas-fired storage type heaters to provide hot water at 120°F to showers, washbasins, janitor sinks and canteen area. The system should have capacity to store at least 80 I.G. and should have a recovery rate of at least 3 igpm from 40°F inlet temperature.

B. Provide a tank water heating system able to produce 125 imp gallons of water per hour at 180°F when supplied with water at 40°F. Provide at least 85 imp gallons storage in order that 100 imp gallons of water will be available in one 10-minute draw and in 15 minutes, the remaining water is available in a ten-minute draw.

C. Heater construction - suitable for continuous operation at 180°F and designed to burn natural gas - CGA approved - 150 psi working pressure - insulated - factory painted jacket enclosure.

D. Minimum controls:

1. Electric gas valve
2. Gas pressure regulator
3. Pilot with automatic gas shut-off on pilot failure
4. Pilot filter
5. Electric high limit thermostat to close gas valve on temperature rise.
6. Approved draft diverter
7. Temperature pressure relief valve.

E. Supply an all bronze-circulator on the domestic hot water system to provide loop recirculation to continuously carry hot water within 20' of all load areas including the canteen, all washrooms, and future community hall fixtures.

F. Design the water heating systems in strict accordance with the printed recommendations of the Equipment Manufacturer. Use equipment equal to A.O. Smith Corporation, Ruud Limited, or Ray-Pak.



PART 2 - PRODUCTS (Cont'd)

Part 2.06 Water Heaters (Cont'd)

G. Ensure that equipment selected will fit the indicated space.

H. Provide complete water heating systems including:

1. Natural gas connection to the service.
  2. Gas vents as specified under Section 15A, Heating and Ventilating with free standing unguyed vents sized in accordance with manufacturer's instructions.
  3. Electric connection at a power feed terminated adjoining the heaters.
  4. All required equipment including the hot water return circulator.
  5. Connection to cold water, hot water and hot water return lines.
- I. Ensure that adequate space is provided for servicing.

Part 2.07 Thermometers

- A. Provide thermometer wells in outgoing water connections from water heaters, in hot water supply lines and in hot water return lines. Match these wells with those provided in Section 15A.

PART 3 - EXECUTION

Part 3.01 Layout

- A. Connect hot water, cold water and sanitary drains to all fixtures shown and specified.
- B. Shower enclosures shall be equipped with one shower head and faucet assembly each.
- C. Layout the system for easy service and to be as vandalproof as possible.
- D. Provide shut-off valves for groups of fixtures to permit servicing without removal of the whole system from service. Run all hot and cold lines overhead within the building, insulating throughout to minimize heat loss or condensation.
- E. Provide a 2" service to the ice resurfacer room. Provide a 1-1/2" hose end globe valve and a 3/4" hose bibb for rink flooding and filling the ice resurfacer. Provide a system of valves to permit operating these hose valves on hot water, cold water, or mixed water.
- F. Provide a water service to the refrigeration room, as required by the Refrigeration System Supplier. Terminate the supply in a gate valve within the room.

PART 3 - EXECUTION (Cont'd)

Part 3.01 Layout (Cont'd)

- G. Provide gas through an appropriate meter to a gas manifold in the furnace room. Pipe to all existing loads including space heating and water heaters.
- H. Provide two 2" plugged connections on manifold for future connection of loads such as a gas-fired radiant spectator heating system. (In the future, gas mains will be run exposed through the end of the arena to the spectator area.)
- I. Size and test all gas piping in accordance with the Gas Utilization Code. Demonstrate the proper performance of the system to the Engineer and to the Local Gas Inspector.

Part 3.02 Testing

- A. Provide all labour, materials and equipment required for testing and pay all fees for inspection and tests. Notify the Engineer and Head Plumbing Inspector of tests and conduct these to their satisfaction and in the presence of their representatives.
- B. Pressure test piping at 150 psig. During the test, all joints shall remain drop free for a period of two hours. Repair leaks and retest the section in question until acceptable. Caulking of leaks is not acceptable.
- C. During testing, blank off equipment not capable of withstanding the test pressure. Retest at the limit of this equipment after removing blanks.
- D. Test drains as required by the Local Plumbing Inspector and the Plumbing Code.
- E. Complete all tests before covering.

Part 3.03 Pipe Installation

- A. Grade nominally horizontal drainage lines at a uniform slope of 1/4 inch in 1 foot.
- B. Slope water piping so that the system may be drained. Provide a hose bibb in an accessible location where a branch cannot be drained through fixtures.
- C. Provide stop valves and unions at connections to fixtures and equipment, in accessible locations to facilitate equipment removal.
- D. Arrange all exposed pipe in the space provided, running it close to walls, columns, or other piping to present a neat orderly appearance and to conserve head room. Conceal pipe wherever possible, running it within walls, ceiling spaces or in secondary areas such as storage rooms.
- E. Provide swing joints and offsets as required to accommodate expansion in hot water piping.



PART 3 - EXECUTION (Cont'd)

Part 3.03 Pipe Installation (Cont'd)

- F. Provide traps for all floor drains, deep seal, running pattern with cleanout as required.
- G. Encase drainage piping passing under footings in 2000 psi concrete.
- H. Pipe all overflows, relief valves and pumpbases to the nearest floor drain using 3/4" copper pipe.
- I. Provide drip legs for gas connections to all appliances.

Part 3.04 Joints

- A. Make joints in mechanical joint pipe in accordance with the manufacturer's instructions using his approved tools and materials.
- B. Properly lead solder joints in copper piping.
- C. Make joints between cast iron hub and non-ferrous pipe with solid cast brass caulking ferrules with true wiped joints.
- D. Make up joints in screwed pipe with approved joint compound. The use of lampwick will not be permitted.
- E. Use licensed welders for all welded connections.
- F. Provide unions where necessary to facilitate installation or maintenance of equipment.

Part 3.05 Hangers

- A. Support all pipe using hanger rods vertically mounted without bends or offsets and with workmanship such that the finished piping is true with respect to both line and grade.
- B. Use wrought steel clevis type (copper plated for copper tubing) with hanger rods and locking nuts for all pipes. Space hangers not more than 5' apart for lines to 1" and 8 feet for lines over 1 inch. Support horizontal runs of soil pipe at every hub and at every fitting and as close to the joint as possible.
- C. Powder actuated fastening systems, chain or strap hangers are not acceptable.
- D. Use properly sized galvanized insulation protection shields for insulated pipe passing through hangers.

Part 3.06 Venting

- A. Protect the complete drainage system by a vent system as required by the Plumbing Code and any applicable rules and regulations.
- B. Conceal vents in walls and pipe spaces where possible.

PART 3 - EXECUTION (Cont'd)

Part 3.07 Insulation Installation

- A. Insulate all lines carrying hot water with standard pipe insulation.
- B. Insulate all lines carrying cold water with standard pipe insulation and with vapour barrier jacket.
- C. Insulate fittings when insulating cement to a thickness equal to the adjoining insulation.
- D. Recover all insulation in 6 oz. canvas in exposed areas.
- E. Install insulation only on dry properly prepared surfaces using experienced installers working in strict accordance with the manufacturer's instructions.

Part 3.08 Clean-Up

- A. Clean up and remove all rubbish and surplus material from the site both as work progresses and at completion.

Part 3.09 Electrical

- A. Supply starters for all equipment; install starters on the nearest available wall and wire them to the equipment.
- B. Wire all controls as required to make the system operate correctly.
- C. Carry out wiring in accordance with the standards of Division 16.

Part 3.10 Operating and Maintenance Instructions

- A. Supply complete operating and maintenance instructions to the Owners personnel.
- B. Prepare a complete operating and maintenance manual complete with manufacturer's service literature on all equipment with neatly typed operating and maintenance service instructions. Provide two copies of this information for use during instruction sessions.



PERFORMANCE SPECIFICATION  
SECTION 15C - REFRIGERATION SYSTEM

PART 1 - GENERAL

Part 1.01 Intent of Section

- A. This Section is a Performance Specification covering the supply and installation of a refrigeration system to produce hockey ice in the arena for seven months a year, using brine and either ammonia or halocarbon refrigerant.
- B. Space has been provided for the basic equipment required. Exact arrangement of the space and connections are the responsibility of the Contractor.

Part 1.02 Qualifications

- A. Employ a Specialist Company with proven experience in this type of work to design, supply and install this system. The company shall employ Professional Engineers to design the project and drawings shall be stamped by a Professional Engineer registered in the Province of Ontario.
- B. Submit information on the company employed showing qualification and willingness to undertake the long term service of the equipment using suitably equipped service technicians.

Part 1.03 Submittals

- A. Submit the following to the Engineer for approval prior to commencement of fabrication or construction.

1. Descriptive literature on the equipment proposed including sizes and operating weights.
2. Detail drawings of the layout of equipment to show the arrangement of the within the equipment.
3. Detail drawings of concrete bases required for equipment.
4. Drawing locating required openings and ventilation requirements.
5. Detail control and piping drawings.

Part 1.04 Guarantee

- A. Guarantee the complete installation for one year for workmanship and materials. In case of loss of refrigerant or brine charge during this time, correct the reason for loss and replace the charge at no cost to the Owner.

## PART 2 - PRODUCTS

### Part 2.01 Conformance with Specifications or Standards

- A. Where standard materials and construction such as pipe, concrete or electrical are a part of the work covered within this Section, conform to the appropriate technical Section of the specifications.
- B. Where no technical specification section covers the materials or techniques used conform to the highest standards used in the industry.

### Part 2.02 Codes

- A. Comply with the requirements of the Ontario Ministry of Labour, Ontario Hydro Safety Code, Ontario Fire Marshall and all other authorities having jurisdiction.
- B. Submit to the Engineer copies of approval certificates of authorities having Jurisdiction, including the approval of Ontario Hydro.
- C. Install in strict accordance with the C.S.A. Mechanical Refrigeration Code, latest edition.

### Part 2.03 Design Criteria

- A. Operation of the complete system shall not require the services of a Stationary Engineer or Operator.

- B. Use multiple compressors (at least two). brine chiller, pumps, condenser using outside air as the heat sink, tanks, receivers, piping, controls, fire lines and valves, and all other appurtenances required to make a complete and readily serviced system. Provide adequate safety devices to prevent system damage due to oil failure, loss of charge, or other abnormal operation.

- C. Performance:

1. Using 1" polyethylene pipe on 4" centres over the complete ice surface, supply a refrigeration - brine system with sufficient capacity to produce a maximum ice temperature of 26°F as measured by a thermometer bulb embedded 1" into the ice when ice thickness does not exceed 1-1/2", with outdoor ambient varying from -10°F DB to 70°F DB, 65°F WB. Minimum capacity - 56 tons.

Select brine flow rate to ensure even cooling over the total rink surface. Temperature difference between brine leaving the chiller and returning to the chiller shall not exceed 2°F.

- D. Arrangement:

Mount the condenser on the roof of the equipment room with an indoor sump tank to prevent winter freeze up. Provide head pressure control to ensure proper cold weather operation. Arrange equipment within the refrigeration room to provide adequate service space and to facilitate servicing. Provide sufficient instrumentation to fully monitor system performance, including pressure gauges across the pump, thermometers in wells on the brine connections to the cooler, and pressure gauges and thermometers as required on the compressors to verify proper lubrication and operation. Provide proper venting of all brine piping.



#### Part 2.04 Electrical

- A. Assemble all starters and controls into a single control panel provided with over-current protection circuit breakers as required.
- B. Power will be supplied from a thermal magnetic circuit breaker in the 575 volt 3 phase 60 Hertz main distribution panel. Supply a suitably rated disconnect device as part of the refrigeration control panel.
- C. Use reduced voltage starters for motors 50 HP and over; full voltage starters are acceptable to 40 HP. Provide overload protection in all three phases of all starters with heaters sized to the nameplate full load current of the individual motors. Provide time delay so two compressors cannot start simultaneously.
- D. All controls shall operate on 120 volt single phase supplied by a suitable 575/115 volt single phase control transformer built into the panel. Provide overcurrent protection on all control feeds. Provide pilot lights to indicate system operation.

#### Part 2.05 Bases

- A. Provide concrete housekeeping pads, 4" high, under all floor mounted equipment including pumps, compressors, and tanks.
- B. Support the brine chiller on piers.
- C. Provide a structurally sound steel base for the roof mounted condenser.

#### Part 2.06 Brine Piping

- A. Use virgin polyethylene 1" pipe complete with purpose-made chairs for floor piping.
- B. Use PVC U-bends with double stainless steel clamps.
- C. Use 6" schedule 40 ASTM Specification A-53 grade A standard black electric weld pipe for brine headers.
- D. Use 3/4" extra heavy A-53 nipples between the headers and rink floor piping. Provide air vents on the return header.
- E. Use stainless steel clamps with stainless steel screws for all plastic rink piping.

#### Part 2.07 Water Piping

- A. Use galvanized schedule 40 pipe with galvanized screwed fittings for all fresh water piping.

#### Part 2.08 Miscellaneous Equipment

- A. For ammonia systems, provide one ammonia helmet of approved manufacture with two extra canisters and one hand pump for compressor crankcase charging.

B. Provide

#### PART 3 - EXECUTION

##### Part 3.01 Equipment Installation

- A. Install all equipment true and level with easy access to operating controls and service points. Wire in accordance with division 16.

### Part 3.02 Brine Piping Installation

- A. Install rink floor piping on 4" centres on chairs 3'-0" on centres, true to line and grade, and under tension to a temporary tensioning block secured to the end of the rink.
- B. Test piping at 60 psig. Maintain pressure for 48 hours without leakage.
- C. Supervise the concrete pouring using qualified personnel to ensure piping is maintained level and properly installed. During pouring, continuously circulate brine or water, depending on job conditions, ambient temperature, etc.
- D. If leaks occur during the test, during pouring of the floor, or at any time during construction, replace the whole length of the pipe if possible. Otherwise, remove the damaged portion of pipe and replace it in an approved manner. Test the repair and prove it before the repair is covered up.

### Part 3.03 Headers and Mains Installation

- A. Weld all joints on headers and mains.
- B. Support headers on purpose made steel brackets on 8'-0" centres in the pipe trench.
- C. Wire brush clean and paint with one coat of heavy black asphaltum paint headers in the trench, take offs to rink piping, and mounting brackets.

### Part 3.04 Refrigerant Piping

- A. Hang all piping parallel to the lines of the building leaving clearances to give best use of the space available.
- B. Install pipe in accordance with best commercial practice and recommendations of ASHRAE.

### Part 3.05 Water and Drain Piping

- A. Connect to the water supply valve provided within the refrigeration room. Connect all drains to a funnel floor drain, as shown in Section 15B.

### Part 3.06 Hangers

- A. Use wroughtsteel clevis hangers with hanger rods and locking nuts to hold all pipe securely and to ensure that lines and the building are not subject to vibration.
- B. Provide substantial hangers for all equipment that is not floor mounted.
- C. Provide isolation if required to prevent vibration transmission to the building structure.

### Part 3.07 Insulation

- A. Insulate all lines and equipment which can condense water on the surface, in accordance with good commercial practice. Headers in the trench do not need to be insulated.

- B. Recover all insulation with 6 oz. canvas smoothly applied and coated with fire resistive adhesive, all in accordance with the manufacturers instructions.

### Part 3.08 Charge

- A. Charge the refrigerant system completely to ensure full capacity.



PART 3 - EXECUTION (Cont'd)

Part 3.08 Charge (cont'd)

- B. Fully charge the brine system with calcium chloride brine of specific gravity of 1.2. Ensure that the calcium chloride is fully dissolved before introducing it into the system. Treat the brine with anti-corrosive inhibitor to provide a normal pH.

Part 3.09 Openings

- A. Provide information on required roof and wall openings so this work can be incorporated into the building construction. Seal and counter flash pipes passing through these openings to render the room weather tight.

Part 3.10 Instructions

- A. Notify the Owner and Engineer when the equipment is ready for start-up in order that the Owner's representative may be present.
- B. When the equipment is operating properly, instruct the Owner's representative in the proper maintenance and operating procedures for the complete installation.
- C. Submit two copies of a complete system operating and maintenance manual to the Engineer. The maintenance manual shall contain parts lists, system operating instructions, recommended maintenance procedures, "As Built" drawings and manufacturer's maintenance literature, and shall be available for use at the time of the instruction sessions.
- D. Submit one complete set of "As Built" reproducible drawings to the Engineer for record purposes.
- E. Ensure that all equipment carries engraved labels corresponding to the names used in the operating instructions.

Part 3.11 Clean Up

- A. As the work proceeds and upon completion clean up and remove all rubbish and surplus material from the site. Leave all equipment in clean operating condition.

~~DRAFT~~ CONT

SECTION 16A ELECTRICAL  
PERFORMANCE SPECIFICATION

FOR PELHAM ARENA

Part 1 General

Part 1.01 Intent of Section

A. This section is a performance specification for the supply and installation of all electrical systems for the project. It is the Contractor's responsibility to select equipment to meet the design criteria and specifications and to arrange the installation of it to co-ordinate with the building system selected. Be sure that work is in accordance with the best commercial practice. The result must be a completely operational, readily serviced and safe system.

B. This section covers the supply and installation of the following systems and equipment:

1. 600 volt electrical service complete with service switch and <sup>conduit</sup> empty service conduit to the location shown. <sup>Detail page</sup>
2. 600 volt electrical distribution to mechanical equipment and to lighting transformer.
3. Lighting transformer and 120/208 volt distribution.
4. Lighting systems including exterior lighting.
5. Emergency lighting system.
6. <sup>Public address</sup> ~~Public address~~ and music systems <sup>in managed office</sup> ~~in concession area~~.
7. Facilities for kitchen equipment.
8. <sup>Receptacles for</sup> ~~Machine power tools in workshop.~~

*empty conduits and spare power capacity*  
*see spec*



Part 1 GENERAL (Cont'd)

Part 1.01 Intent of Section (Cont'd)

C. The following is included in other sections:

1. Wiring from load side of disconnects for mechanical equipment in Division 15.
2. Supply and installation of starters and controls for mechanical equipment, in Division 15.

Part 1.02 Code Rules

- A. Be sure that all work and materials are in accordance with the rules and regulations of the Hydro Electric Power Commission of Ontario. Obtain and deliver to the Engineer the final certificate of approval from the Inspection Department of The Hydro Electric Power Commission covering this work pay for all fees in connection therewith.
- B. Ensure that all equipment are approved by the manufacturer for the intended use and also that they carry CSA or Ontario Hydro Special approval.

Part 1.03 Co-ordination

- A. Prepare and submit drawings of the intended installation far enough ahead of time to permit checking for compliance with the specifications and to permit proper co-ordination of the electrical work into the building structure.
- B. Layout and properly co-ordinate work with concrete placing, masonry, structural work, finishing and similar work so that such items as sleeves, inserts and openings are provided at the proper time. ~~It is the Contractor's responsibility to~~ Rectify any damage caused by improper location in the execution of the work.

EO

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Part 1 GENERAL (Cont'd)

Part 1.03 Coordination (Cont'd)

- C. Consult the Engineer before installing equipment and pipes which may interfere with the interior treatment and use of buildings, to obtain detail drawings or instructions for the exact location.

D. E. On completion of the work, mark one set of drawings neatly in red to show the "as constructed" conditions. Hand these drawings over to the Engineer.

Part 1.04 Shop Drawings

- A. Shop drawings shall be submitted for:

Electrical Distribution panels

Lighting fixtures and receptacles.

Emergency lighting system

Lighting transformer

Public address and music system

Kitchen facilities

- B. Submit sufficient copies to permit three copies to be retained by the Engineer.

- C. Shop drawings will be stamped 'Approved' or 'Approved as Noted', or 'Revise and Resubmit', then returned.

- D. The review or approval of ~~execution~~ or shop drawings by the Engineer does not in any way relieve the contractor of any responsibility for making the work accurate and in conformity with contract documents.



Part 1 GENERAL (Cont'd)

Part 1.05 Service

- A. Make all arrangements and pay all charges for the local power supply authority to provide a 600 volt, 3 phase, 60 Hz service.
- A suitable underground service ~~duct~~ shall be provided as necessary.

Part 1.06 Painting

- A. Make sure that all equipment are factory finished in good quality enamel. If surfaces are scratched or damaged before final acceptance, ~~the~~ the equipment with a good quality enamel. Touching up of damage can only be accepted if it produces a neat result equal in every way to the undamaged finish.

Part 1.07 Excavation, Backfill Cutting and Patching

- A. Do all excavation, backfill, cutting and patching work as required for the execution of the electrical installation.

Part 1.08 Design Criteria

- A. Select the service for the total connected load plus 20 per cent. Supply all service equipment required by the supply authority including metering cabinet.
- B. Use moulded case thermal magnetic trip circuit breakers for overcurrent protection throughout the project. Size breakers in accordance with the Code, including derating factors for discharge type lamps.

- C. Locate service equipment and the main distribution panel in the appropriate room. See service equipment for future requirement of the second floor and lighting panels have space for 20% more circuits than are actually used. Also an extra 150 Amp panel for breaker and empty conductors Selected equipment to be reasonably compact in order that space be left for other use.

Specify in what SEC 16A ELECTRICAL

Part 1 GENERAL (Cont'd)

Part 1.08 Criteria (Cont'd)

- D. Size wire to limit branch circuit voltage drop to a maximum of ~~1 1/2~~ percent. Select wires in a manner that the voltage drop between service entry and the furthest point in the installation does not exceed 5 percent.



Part 1 GENERAL (Cont'd)

Part 1.08 Criteria (Cont'd)

E. Lighting shall be provided to all areas of the building to the following minimum maintained levels:

|                                |       |
|--------------------------------|-------|
| Rink surface                   | 30 fc |
| Rink Surround                  | 25 fc |
| players rooms and<br>washrooms | 30 fc |
| lobby                          | 30 fc |
| Office                         | 50 fc |

Meeting Room Lighting Equipment shall be manufactured for the intended use.

F. Illuminate the rink surface with long life (16,000 hour) lamps

with good colour rendition equal to deluxe white mercury vapour.

Make sure fixtures have constant wattage or regulated type low temperature ballasts. Supply supplementary incandescent lighting for use during mercury lamp striking time and when the rink is not in use.

use. Arrange the switching of the incandescent lamps so that only the minimum amount of light can be turned on by each switch.

Install these lights so as to provide enough light for janitorial service without the need for the rink lighting.

G. <sup>Player's Rooms</sup> Illuminate office, music room, meeting room, canteen, workshop and equipment rooms with fluorescent fixtures <sup>having</sup> 12,000 hours cool white lamps.

H. Provide wire mesh guards for lighting fixtures in lobby, dressing

Part 1 GENERAL (Cont'd)

Part 1.08 Criteria (Cont'd)

J. Provide sufficient mercury vapour type exterior lighting fixtures on the building walls, overlooking the parking lot, and near the truck doors. Provide flush mount fixtures to give light at the front entrance of the building. Operate all exterior fixtures by timers with astronomic type dials.

K. Install a suitably protected 600 volt, 3 phase feeder for 150 HP

into the refrigeration room for connection to the line terminals

of the refrigeration control panel. Provide feeders (one for 120

volt, one for 600 volts) terminating in unfused disconnects in the

heating <sup>utility</sup> equipment room for supply to the domestic water and space

heating systems. Make provision in the wiring for connection of

local fan systems. Provide separate breakers for the two ~~rink exhaust~~ fans. ~~The 400/208v range outlets shall be provided~~

~~one in the canteen area, one in the community hall.~~  
L. Illuminate all areas accessible to the public for at least one-

half hour by an emergency lighting to facilitate safe evacuation

of the building in case of power failure. Provide Exit lights

on all doors suitable for emergency exit.

M. Provide one convenience receptacle for every 15 feet of wall in the <sup>manager</sup> workshop, office, refrigeration room <sup>make allowance for future community hall</sup> and meeting room. Provide

the ~~music room~~ and ice resurfacers room and the utility room with

two separately protected receptacles. Provide convenience

receptacles as required for the emergency lighting system.

Provide at least 4 separately protected outlets in the canteen

for future equipment, ~~otherwise, provide a minimum of one~~ ~~convenience outlet.~~ ~~with~~

~~and in the~~  
~~community hall~~  
~~kitchen area~~

EO

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Part 1 GENERAL (Cont'd)

Part 1.08 Design Criteria (Cont'd)

- N. Provide empty conduit from the timekeeper's location to the north end of the rink for future installation of a timer. Provide a separate conduit to each end of the rink for the future installation of a timekeepers lights, and goal judges lights. Provide convenience outlets for a heater, ~~connected~~ <sup>at the timekeeper's location</sup> Connect these outlets to two separate circuits, <sup>Provide goal judges lights.</sup> at the timekeeper's position. Provide a facility for the Public address system at the timers bench.
- O. Install all equipment in areas accessible to the public taking the vandal problem into account. Do not install controls for public area lighting or switches for players rooms and washrooms in public areas, <sup>make</sup> ~~that~~ these devices ~~are~~ accessible only to authorised persons.
- P. Provide sufficient outlets in zambonie and storage rooms to operate power and machine tools.
- Q. Make provisions that the music-room can be wired to P.A. system also for tape recorder and music system.
- R. Allow for future kitchen facilities to be available in community hall.

S. Provide electrical outlets in the <sup>concession</sup> ~~canteen~~ area for 120/208 volt <sup>range</sup> ~~stove~~, fryer, grille, refrigerator, freezer, exhaust fan, 4-15 amp circuits for auxiliary equipment.

*Word ing needs to be cleared up. A 11' empty conduit is required between for managers office and timers for future system wiring.*

*Allow for future addition of one 120/208 V range in the kitchen area in the second floor.*

Part 2 PRODUCTS

Part 2.01 Power Distribution Panel

- A. Distribute power from a circuit breaker panel board. Allow enough spaces for the future installation of various sizes of breakers, as required. Include in the panel board the main service switch and supply authority metering.

Part 2 PRODUCTS (Cont'd)

Part 2.01 Power, Distribution Panel (Cont'd)

B. Circuit Breakers

1. Molded case type.
2. Fitted with thermal magnetic trip selected for particular service.
3. Single, double, or triple pole bolted on type as appropriate.
4. Interrupting rating of 14,000 A (asym) or as appropriate.

Part 2.02 Lighting Transformers

A. Lighting Transformer

1. Ventilated dry type.
2. Air cooled.
3. 3 phase, 60 Hz, 600 volt primary.
4. 3 phase, 4 wire, 120/208 volt secondary.
5. Four full capacity taps on the primary, two 2½ percent above

normal, two 2½ percent below normal. *Sized for 20% future load.*

Part 2.03 Lighting Panels

A. Lighting Distribution Panel

1. 208/120 volt 3 phase, 4 wire *60 volt*
2. Fitted with single and double pole branch breakers and main lugs.
3. Fitted with spare breakers and adequate spaces for future use.
4. Complete with hinged door with catch and lock.
5. Fitted with a directory under plastic on the inside of door.
6. Fitted with lock dogs on all circuits not regularly switched.



PART 2 - PRODUCTS (Cont'd.)

Part 2.04 Wire and Conduit

A. Wire - copper conductor type TWH based on ambient temperature.

B. Rigid conduit - for direct burial in concrete or within 8 feet of the floor. EMT for use above the 8-foot level.

C. PVC conduit - for service duct.

PVC JACKETED  
D. Jacket flexible conduit - to motors.

Part 2.05 Wiring Devices

A. Wiring devices as necessary.

Part 2.06 Lighting Fixtures

A. Rink lighting fixtures - to be fitted with wire mesh guards.

B. Fluorescent lighting - to be the surface or suspended mounting type with reflector. The fixtures to have wire guards in areas accessible to the public. Fixtures to have high power factor rapid start ballasts with automatic reset thermal

PART 2 - PRODUCTS (Cont'd.)

- D. Exterior recessed mounting fixtures to be the weatherproof ~~square~~ incandescent type with regressed Fresnel Lens and 300 W lamp.

Part 2.07 Emergency Lighting

- A. Emergency lighting - to operate on low maintenance, low antimony ~~or nickel-cadmium~~ type batteries, on wall mounting racks, complete with wire guards. Sufficient heads to be supplied to provide light along the rink surround, in the lobby and in all players' rooms and areas open to the public.

- B. The system installed must automatically operate all connected heads for at least 1/2 hour after normal electric power fails. The battery must then recharge fully when power is restored. The system must be complete with pilot lights and push-to-test switches.

- C. Emergency lighting system must have the manufacturer's approval on the equipment selection.

- D. ~~The lighting system - to be equal to Chloride Systems (Canada) Ltd., Type SWL.~~



## PART 3 - EXECUTION

### Part 3.01 Layout

- A. Install a complete electrical system with distribution to every room and space and with all equipment to obtain the functions as specified under Design Criteria and as required in commercial buildings of this type. Submit a list of materials stating manufacture catalogue number for approval.

- ~~B.~~ C. Install all parts of the systems so as to maintain neat appearance, safety, efficient use of spaces, ready service-ability and to minimize problems of vandalism.

- ~~C.~~ <sup>Mark</sup> ~~Work~~ all equipment to indicate its purpose. Identify the circuits on all distribution panels properly by neatly typewritten plastic protected lists in the panels. Use labels to indicate the equipment actually controlled by each breaker.

- ~~D.~~ E. Co-ordinate the layout of equipment carefully with the building shell system selected.

*Part 3.02 Lighting System.  
A. Connect 250W Fluorescent Vapour Ball Fixtures to the 347/600V Panel.  
B. Connect all other lighting and receptacles to the 120/200V Panel.*

### Part 3.02 Conduit and Wire

- A. Equip all conduits with proper fittings. Install all wiring placed in concrete or wiring within 8 feet of the floor in rigid conduit. Wiring above this level may be installed in EMT.

PART 3 - EXECUTION (Cont'd.)

- B. Wherever possible run conduit concealed or in secondary spaces. Where exposed, run conduit parallel to the lines of the building, install conduit to maintain the neat appearance of the spaces. Where runs are grouped space bends evenly that they appear concentric.
- C. Use field made bends in conduits 1-1/2" and smaller. Conduits 2" and larger <sup>must have</sup> ~~shall~~ use factory made bends. Where required make bends cold and in such a way as will not flatten the conduit any more than 1/10th of its diameter. Do not include more than the equivalent of 4 quarter bends in conduit runs. Use pulling elbows and pull boxes where necessary.
- D. Take extreme care in reaming the ends of all conduit to ensure a smooth interior finish that will not damage the insulation of the wire.
- E. Where conduit is run in concrete, screwed up joints tightly and paint with asphaltum paint. Before concrete is poured, tightly pack all outlet boxes with paper and <sup>have</sup> open ends capped to prevent concrete oozing in.



PART 3 - EXECUTION

- F. Before installation verify conduit locations against equipment manufacturer's shop drawing and all other detail drawings to ensure a neat installation. Make connections to motors in short lengths of flexible conduit. Co-ordinate the complete wiring installation carefully with the requirements of the installation of all other systems and equipment.
- G. Cut any openings required in the structure neatly, trim and seal in accordance with the instructions of the building supplier.
- H. When the job is ready for pulling of wires, dry all conduit carefully before wires are drawn. ~~If used~~, <sup>use</sup> Drawing lubricant, ~~if used~~ must be as approved by <sup>both</sup> the wire manufacturer and conduit manufacturer.
- I. Use wire and conduit sizes as specified by the Hydro code, <sup>use</sup> but do except no <sup>use</sup> wire smaller than #12 AWG on branch circuits. Do not use conduit smaller than 3/4". Select wire sizes for the emergency lighting system in accordance with the manufacturer's recommendations.

PART 3 - EXECUTION (Cont'd.)

centred

J. Lay the underground service conduit <sup>centred</sup> in a 12" sand envelope and locate not less than 36" below finished grade. Identify the location of the conduit run with a bright coloured plastic strip buried 12" below finished grade. Mark the strip suitably to identify the service below.

K. Run wiring to floor mounted equipment in the floor slab to suitable turn-ups at the equipment.

Part 3.03 Hangers and Supports

A. Install hangers, supports, inserts and sleeves as necessary for all equipment. Fasten conduit using malleable iron one hole conduit straps or two hole stamped steel conduit straps, fastened with appropriate anchors. Wood plugs or explosive actuated fasteners are not acceptable. Location of fastenings to the building shell must be as recommended by the building manufacturer.

B. Support outlet boxes, junction boxes, hubs, independent of the conduits running to them.



PART 3 - EXECUTION (Cont'd.)

C. Where several surface mounted devices are mounted together, install a 3/4" plywood panel of appropriate size to provide support. The panel must be painted appropriately.

D. Support all equipment securely from the building structure.

Part 3.04 Grounding

A. Ground the electrical system in accordance with the Hydro code to ground rods placed at least 10 feet apart and at least 10 feet from the building.

B. Extend the grounding system to all equipment and installations in the building, in keeping with the requirement of public safety.

Part 3.05 Tests

A. At the completion of the job, make a megger test of resistance phase to phase and phase to ground. Submit readings in accordance with Hydro-Electric Power Commission requirements in writing to the Engineer.

B. Demonstrate all equipment that it operates correctly and safely. Provide all labour and equipment necessary to perform all tests requested by the Engineer or governing authorities.

PART 3 - EXECUTION (Cont'd.)

Part 3.06 Clean Up

- A. As the work proceeds and upon completion, clean up all rubbish and surplus material and remove from the site.
- B. Leave all glassware and equipment clean and dry. Remove loose dirt, chips, scraps, etc., <sup>or any other unused material</sup> ~~carefully~~ from the interior of equipment.

Part 3.07 Operating Instructions

- A. Prepare a manual containing manufacturers' maintenance instructions and instructions for the operation of all of the installed electrical equipment and systems.
- B. Instruct the Owner's representatives in the correct operation of all systems provided. At the instruction session, give the maintenance manual to the Owner and explain as required. At the same time, submit a set of record drawings showing the details of work "as constructed" to the Engineer for inclusion with other drawings to be passed to the Owner.

Part 3.08 Unit Prices

- A. In addition to the basic Tender Price submit an itemized list of unit prices for each item of work.



PART 3 - EXECUTION (Cont'd.)

B. The list must contain the columns:

1. Items of work
2. Basic tender price
3. Extra for addition
4. Credit for deletion