

**A. SECTION 15010 GENERAL MECHANICAL PROVISIONS**

**1. CONFORMANCE**

- .1 Conform to terms and conditions of the General Contract Document.

**2. SCOPE**

- .1 Replace an existing exhaust fan.
- .2 Install door grilles in washroom doors.
- .3 Provide complete, fully tested and operational mechanical systems to meet the requirements described herein and in complete accordance with applicable codes and ordinances.
- .4 Contract documents of this division and drawings are diagrammatic and approximately to scale unless detailed otherwise. They establish scope, material and installation quality and are not detailed installation instructions.
- .5 Follow manufacturer's recommended installation details and procedures for equipment, supplemented by requirements of contract documents.
  - .1 Install equipment generally in locations and routes shown close to building structure with minimum interference with other services or free space. Remove and replace improperly installed equipment to the satisfaction of the Consultant at no extra cost.
  - .2 Connect to equipment specified in other sections and to equipment supplied and installed by other contractors or by the owner. Uncrate equipment, move in place and install complete; start-up and test.
- .6 Connect into existing systems with minimum disruption to the existing systems.
- .7 Work shall be coordinated with the owner seven days prior to work commencing.
- .8 Field verify all building and site dimensions prior to any fabrication and installation of equipment or materials. No additional charge shall be entertained for failure to verify these dimensions on site.

**3. MATERIALS**

- .1 Materials and equipment installed shall be new, full weight and of quality specified. Use same brand or manufacturer for each specified application.
- .2 Statically and dynamically balance rotating equipment for minimum vibration and low operating noise level.
- .3 Each major component of equipment shall bear manufacturer's name, address,

catalog and serial number in a conspicuous place.

- .4 Equipment shall be CSA listed and ULC approved.

#### **4. TESTING**

- .1 Perform necessary tests on equipment including those required by authorities having jurisdiction and certificate of approval obtained.

#### **5. CUTTING AND PATCHING**

- .1 Provide holes and sleeves, cutting and fitting required for mechanical work. Relocate improperly located holes and sleeves.
- .2 Repair building where damaged from equipment installation, improperly located holes, etc., by this section of the work. The specialist trade at the expense of this section of work shall carry out this repair. Use matching materials as specified in the respective sections.

#### **6. SHOP DRAWINGS**

- .1 Submit shop drawings for every piece of mechanical equipment.
- .2 Identify materials and equipment by manufacturer, trade name and model number. Include copies of applicable brochure or catalog material. Do not assume applicable catalogues are available in the consultant's office. Maintenance and operating manuals are not suitable submittal material.
- .3 Clearly mark submittal material using arrows, underlining or circling to show differences from specified, e.g. Ratings, capabilities and options being proposed. Cross out non-applicable material. Specifically note on the submittal specified features such as special tank linings, pumps, seals, material, or painting.
- .4 Include dimensional and technical data sufficient to check if equipment meets requirements. Include wiring, piping, and service connection data and motor sizes.
- .5 Installed materials and equipment shall meet specified requirements regardless of whether or not shop drawings are reviewed by the Consultant.
- .6 Shop drawings not requested will not be reviewed and processed by the Consultant.
- .7 Do not order equipment or material until the Consultant has reviewed and returned shop drawings.
- .8 Shop drawings shall be endorsed by the General Contractor and Mechanical Sub-Contractor indicating that the shop drawings have been reviewed and submitted without qualifications.

- .9 Submit one electronic (pdf) copy of shop drawings within fourteen (14) days after award of contract.

## **7. STANDARDS OF MATERIALS, EQUIPMENT AND INSTALLATION**

- .1 Equipment used shall not exceed space limitations in any dimension. Replace any equipment or apparatus that does not meet this specification at no cost. Assume full responsibility for the expense of redesign and adjustment to other parts of the building when proposing the use of approved equal or alternate equipment.
- .2 Provide equipment from the specified manufacturers. All mechanical equipment shall have the approved manufacturers name permanently affixed to it.
- .3 Equipment on alternate & approved manufacturers list must be equal in quality and performance to the model specified. Equipment, which is not equal, will be replaced with the specified equipment at no cost to the Owner.
- .4 The equipment manufacturer shall ensure that the strength and anchorage of the internal components of the equipment exceeds the force level used to restrain and anchor the unit itself to the supporting structure.
- .5 Provide following when required:

### **ITEMS**

### **APPROVED MANUFACTURER**

Fans

Greenheck, Delhi, Penn, Cook, Acme, Twin City

Grilles, Diffusers & Registers

E.H. Price, Nailor, Titus

## **8. PERFORMANCE VERIFICATION OF INSTALLED EQUIPMENT**

- .1 Installed mechanical equipment whose performance is questioned by the Consultant, may be subject to performance verification as specified herein.
- .2 When performance verification is requested, equipment shall be tested to determine compliance with specified performance requirements.
- .3 The Consultant shall approve testing procedures.
- .4 Should test results reveal that equipment does not meet specified performance requirements, equipment will be rejected and the following shall apply:
- .5 Remove rejected equipment. Replace with equipment that meets requirements of contract documents including specified performance requirements.
- .1 Replacement equipment will be subject to performance verification as

well, using same testing procedures on originally installed equipment.

- .2 Contractor shall pay all costs resulting from performance verification procedure.

## **9. PAINTING AND IDENTIFICATION**

- .1 Each piece of equipment shall be identified by stenciled lettering at least 25 mm high and shall be governed by the size of the equipment.

## **10. EQUIPMENT PROTECTION AND CLEAN-UP**

- .1 Protect equipment and material in storage on site and after installation until final acceptance. Leave factory covers in place. Take special precautions to prevent entry of foreign material into working parts of piping and duct systems.
- .2 All mechanical equipment stored on site shall be kept in a dry, heated and ventilated storage area.

## **11. LIABILITY**

- .1 Assume full responsibility for laying out the work and for any damage caused to the owner of other trades by improper location, or carrying out of the work.
- .2 Be responsible for prompt installation of his work in advance of concrete pouring or similar work. Provide and set sleeves where required. Should any cutting or repairing of either unfinished or finished work be required, this contractor shall direct the particular sub-contractor whose work is involved to do such cutting and repairing without expense to the owner. Before being undertaken, such work shall be laid out for the consultant's review.
- .3 Examine the site and the local conditions affecting work under this contract. Examine carefully the mechanical, electrical, structural and architectural drawings and confirm that the work under this contract can be satisfactorily carried out without changes to the building as shown on these plans. Before commencing the work, examine the work of the other trades and report at once any defect of interference affecting the work of this section, of the guarantee of same. No extras will be subsequently allowed to cover any such error, omission or oversight on the thorough inspection of the grounds, building, conditions, etc.
- .4 Arrange work in co-operation with other trades in the building in such a manner as not to interfere with other work being carried on in the building and places where other pipes and equipment be installed along with the pipes and ducts pertaining to this trade. Co-operate with the other trades to get all the pipes, ducts, conduit, etc., installed to the best advantage.
- .5 Where any pipes, ducts and equipment must be built into the work of other trades such as masonry, structural, or plastering, be responsible for supplying the equipment to be built in or measurements to allow the necessary openings to be left. All pipes and ducts which are to be concealed shall be installed neatly

and closely to the building structure so that the necessary furring can be kept as small as possible. Any pipes, ducts, or other work which are not, in the opinion of the consultant, installed as they should be, shall be taken out and replaced without cost to the owner.

- .6 Protect finished and unfinished work from damage due to the carrying out of his work, giving special attention to the protection of building vapour barriers, waterproof membranes, etc. Cover floors and other parts of the building with tarpaulins, etc., and repair all damage to the satisfaction of the owner and the consultant. During freezing weather, protect all his materials in such a manner that no harm can be done to installation already made and/or to materials and equipment on the job.
- .7 Be responsible for the condition of all materials and equipment supplied and shall provide all necessary protection for same.
- .8 Be responsible for the protection and maintenance of the work of this section until the building has been completed and accepted by the Owner. Be responsible for the sorting of his material inside and out of the way, and to clean up all refuse caused by his work to meet Consultant's review.
- .9 On completion of the work, all tools, surplus and waste materials shall be removed and the work left in a clean condition.

## **12. LIABILITY INSURANCE**

- .1 This contractor shall maintain such insurance as will fully protect both the owner and himself from any and all claims, all as noted within the general conditions and supplementary general conditions. When requested the contractor shall provide and show proof of, at his expense, comprehensive general liability insurance of not less than \$2,000,000.00 Including non-owned car coverage, contractual liability and containing a cross liability clause. Coverage shall include loss or damage the contractor may cause to any work, building, equipment, and structural, on the owner's property. The insurance may contain a deductible cause not to exceed \$500.00.
- .2 The Contractor shall carry full employee's liability insurance for the whole of the work in accordance with the workers' compensation act.

## **13. GUARANTEE WARRANTY**

- .1 This contractor shall furnish a warranty for all work executed under this division will be free from defects of material and workmanship for a period of one (1) year from the date of substantial performance, which shall include one (1) complete summer and one (1) complete winter of uninterrupted operation. Warranty shall include any part of equipment, units or structures furnished hereunder that show the works under normal operating conditions and/or for the purpose of which they were intended.
- .2 The Contractor shall, at his own expense, promptly investigate any mechanical

or control malfunction, and repair or replace all such defective work, and all other damages thereby which becomes defective during the time of the guaranty-warranty.

#### **14. HOISTS AND SCAFFOLDS**

- .1 Provide interior movable or roller scaffolds for the installation of the mechanical work. All other hoists, scaffolds, temporary elevators, ladders, runways, etc., shall be the responsibility of this contractor.

#### **15. SUBSTANTIAL PERFORMANCE INSPECTION**

- .1 Prior to the Contractor requesting an inspection for substantial performance all the following items must be provided to permit beneficial use by the Owner.
  - .1 Comply with requirements in General Contract conditions.
  - .2 A complete list of items that the Contractor has not finished, or are deficient, shall be provided. If in the opinion of the consultant, this list indicates the project is excessively incomplete, a substantial completion inspection will not be performed.
  - .3 The Contractor shall be fully responsible to accumulate all necessary data from his sub-trades and suppliers and present same in the specified format for the approval by the consultant.

#### **16. LAWS, NOTICES, PERMITS AND FEES**

- .1 Give all necessary notices, obtain all necessary permits and pay all fees in order that the work specified may be carried out, and furnish any certificates necessary as evidence that the work installed conforms with the law and regulations of all authorities having jurisdiction.
- .2 All work shall be in accordance with the regulations of the following authoritative bodies, the codes in effect at the time of tender, and any others having jurisdiction:
  - .1 Worker's Compensation Board
  - .2 Canadian Standards Association
  - .3 Underwriters' Laboratories of Canada

#### **17. DEMONSTRATION AND INSTRUCTION TO OWNER**

- .1 Demonstrate to and instruct the representative designated by the Owner on the complete systems operating and maintenance procedures.

#### **18. INSPECTION**

- .1 The Consultant or his representative may choose to inspect all work prior to it

being concealed. All work shall be approved by any other regulatory body having jurisdiction. All piping below ground must be approved prior to covering. All piping in wall spaces must be approved prior to boarding. All openings shall be sealed appropriately in particular in fire rated walls and floors. Sealing shall be approved prior to covering.

- .2 Provide a minimum of 48 hours notice to consultant for required inspection.

**B. SECTION 15500 HEATING, VENTILATION AND AIR**  
**CONDITIONING**

**1. SCOPE OF WORK**

**.1 Exhaust Fan:**

- .1 Remove existing roof mounted exhaust fan.
- .2 Install the following fan:
  - .1 Manufacturer: Greenheck
  - .2 Model: G-080-D
  - .3 Description: Room exhaust fan with aluminum housing, direct drive motor.
  - .4 Performance: 70L/s @ 125Pa
  - .5 Motor: 1/20hp, 115V/60Hz/1ph
- .3 Mount on exhausting roof curb and provide aluminum transition curb complete with stainless steel screws.

**.2 Door Grilles:**

- .1 Install door grilles on male and female washroom doors, typical of two.
- .2 Cut opening in door to suite new door grille.
- .3 Install backing in door as required at cut.
- .4 Install the following grille:
  - .1 Manufacturer: Price
  - .2 Model: STG1/BG/B15
  - .3 Size: 400mmx200mm
  - .4 Description: Heavy duty steel door grille with 33mm flat border, two sides, counter sunk screw holes and aluminum powder coat finish.

**2. DUCTING**

- .1 Provide flashing, curb and counter flashing for all ducting passing through roof and external envelope of the building.
- .2 All ductwork and equipment installed shall be free of scale, debris and dirt. During construction, cover all duct and equipment openings with polyethylene or equivalent to prevent the entry of dirt or dust. Any ductwork or equipment which is not sufficiently clean shall be cleaned using vacuum cleaners, brushes,

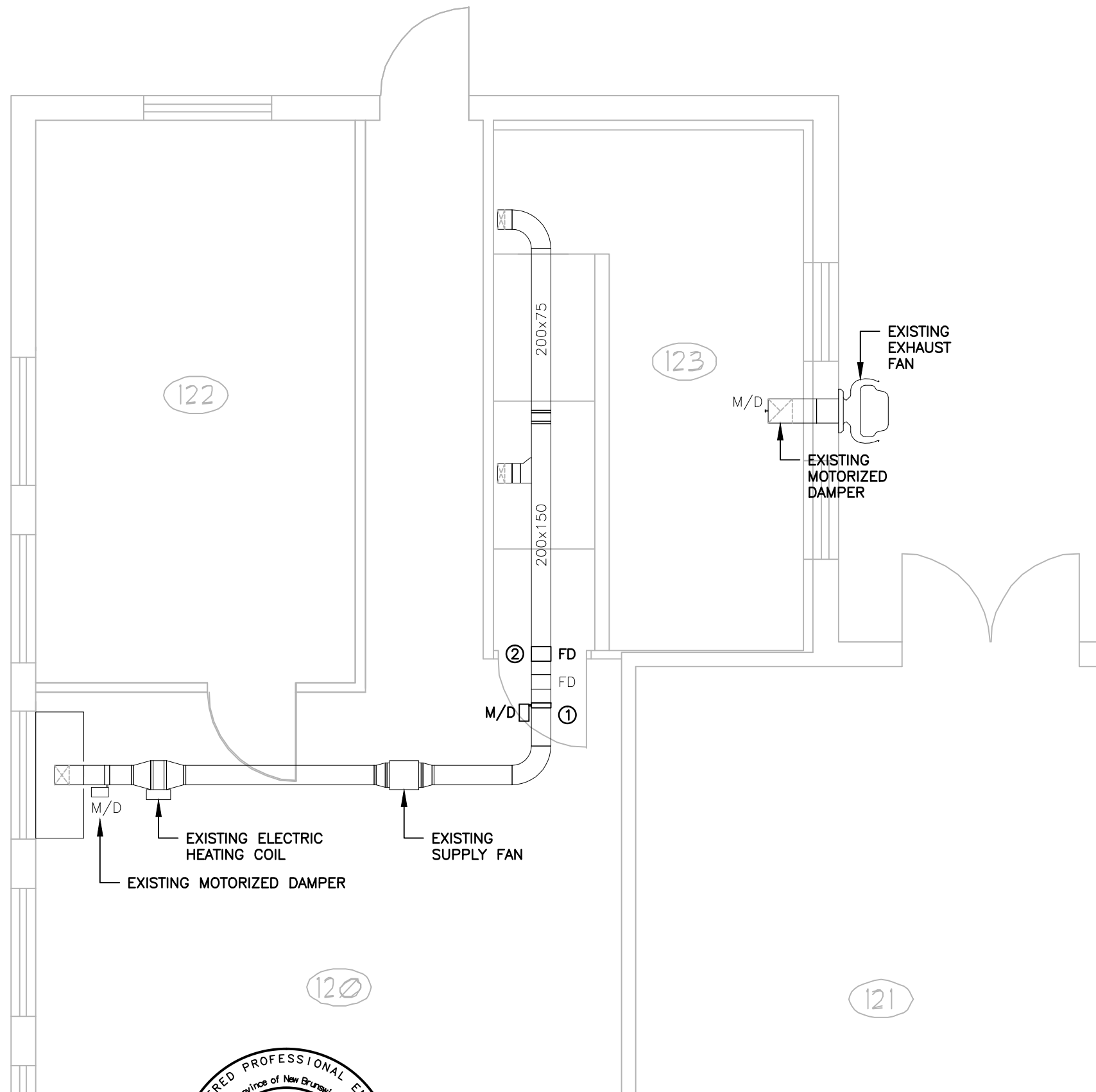
Mactaquac Biodiversity Facility

**Washroom Ventilation Upgrade in Administration Building**

March 31, 2016

and/or non-toxic solvents. Ensure duct dust covers are removed prior to system startup.

END OF RFQ






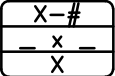
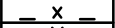
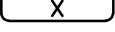





GENERAL NOTES:

1. TEST OPERATION OF SYSTEM INCLUDING: MOTORIZED DAMPER AT INLET, DUCT HEATER, SUPPLY FAN, NEW MOTORIZED DAMPER, EXHAUST MOTORIZED DAMPER, AND EXHAUST FAN. ENGINEER TO WITNESS TEST.
2. REBALANCE SUPPLY TO 10% LESS THAN EXHAUST.

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SYMBOL LEGEND

	EXISTING SUPPLY AIR DUCT UP
	EXISTING SUPPLY AIR DUCT DOWN
 M/D	MOTORIZED DAMPER
 FD	FIRE DAMPER
E/A	EXHAUST AIR
NTS	NOT TO SCALE
OED	OPEN ENDED DUCT
	THERMOSTAT
	GRILLE TYPE
	NECK/GRILLE SIZE
	AIR VOLUME
	EQUIPMENT/FIXTURE TYPE
	KEYNOTE
	DRAWING REVISION

## KEYNOTES

- ① INSTALL NEW SPRING RETURN, NORMALLY CLOSED MOTORIZED DAMPER IMMEDIATELY BEFORE THE FIRE DAMPER. NEW MOTORIZED DAMPER TO BE CONTROLLED BY THE DELTA CONTROL SYSTEM TO OPEN UPON ACTIVATION OF SUPPLY FAN.
- ② REMOVE EXISTING FIRE DAMPER AND INSTALL NEW FIRE DAMPER IN WALL COMPLETE WITH ACCESS DOOR.



		Date APR 01/16	Scale 1:50	Designed MP	Drawn PA	Checked MP	Approved MP	CBCL No. 162810.00	Contract —
		<div><div>CBCL</div><div>CBCL LIMITED</div><div>Consulting Engineers</div></div>		CHEMICAL STORAGE ROOM					Drawing  <div>M1</div>
0	ISSUED FOR TENDER			FLOOR PLAN					
No.	Description								

A. SECTION 15010 GENERAL MECHANICAL PROVISIONS

1. CONFORMANCE:

- .1 CONFORM TO TERMS AND CONDITIONS OF THE GENERAL CONTRACT DOCUMENT.

2. SCOPE:

- .1 PROVIDE COMPLETE, FULLY TESTED AND OPERATIONAL MECHANICAL SYSTEMS TO MEET THE REQUIREMENTS DESCRIBED HEREIN AND IN COMPLETE ACCORDANCE WITH APPLICABLE CODES AND ORDINANCES.
- .2 CONTRACT DOCUMENTS OF THIS DIVISION AND DRAWINGS ARE DIAGRAMMATIC AND APPROXIMATELY TO SCALE UNLESS DETAILED OTHERWISE. THEY ESTABLISH SCOPE, MATERIAL AND INSTALLATION QUALITY AND ARE NOT DETAILED INSTALLATION INSTRUCTIONS.
- .3 FOLLOW MANUFACTURER'S RECOMMENDED INSTALLATION DETAILS AND PROCEDURES FOR EQUIPMENT, SUPPLEMENTED BY REQUIREMENTS OF CONTRACT DOCUMENTS.
- .1 INSTALL EQUIPMENT GENERALLY IN LOCATIONS AND ROUTES SHOWN CLOSE TO BUILDING STRUCTURE WITH MINIMUM INTERFERENCE WITH OTHER SERVICES OR FREE SPACE. REMOVE AND REPLACE IMPROPERLY INSTALLED EQUIPMENT TO THE SATISFACTION OF THE CONSULTANT AT NO EXTRA COST.
- .4 WORK SHALL BE COORDINATED WITH THE OWNER SEVEN DAYS PRIOR TO WORK COMMENCING.
- .5 FIELD VERIFY ALL BUILDING AND SITE DIMENSIONS PRIOR TO ANY FABRICATION AND INSTALLATION OF EQUIPMENT OR MATERIALS. NO ADDITIONAL CHARGE SHALL BE ENTERTAINED FOR FAILURE TO VERIFY THESE DIMENSIONS ON SITE.
- .6 THE WORK SHALL INCLUDE BUT NOT LIMIT TO THE FOLLOWING:
- .1 COMPLETE HEATING/VENTILATING/AIR CONDITIONING INSTALLATION.
- .2 COMMISSIONING AND BALANCING

3. MATERIALS

- .1 MATERIALS AND EQUIPMENT INSTALLED SHALL BE NEW, FULL WEIGHT AND OF QUALITY SPECIFIED. USE SAME BRAND OR MANUFACTURER FOR EACH SPECIFIED APPLICATION.

4. SHOP DRAWINGS

- .1 SUBMIT SHOP DRAWINGS FOR EVERY PIECE OF MECHANICAL EQUIPMENT.
- .2 IDENTIFY MATERIALS AND EQUIPMENT BY MANUFACTURER, TRADE NAME AND MODEL NUMBER. INCLUDE COPIES OF APPLICABLE BROCHURE OR CATALOG MATERIAL. DO NOT ASSUME APPLICABLE CATALOGUES ARE AVAILABLE IN THE CONSULTANT'S OFFICE. MAINTENANCE AND OPERATING MANUALS ARE NOT SUITABLE SUBMITTAL MATERIAL.
- .3 CLEARLY MARK SUBMITTAL MATERIAL USING ARROWS, UNDERLINING OR CIRCLING TO SHOW DIFFERENCES FROM SPECIFIED, E.G. RATINGS, CAPABILITIES AND OPTIONS BEING PROPOSED. CROSS OUT NON-APPLICABLE MATERIAL. SPECIFICALLY NOTE ON THE SUBMITTAL SPECIFIED FEATURES SUCH AS SPECIAL TANK LININGS, PUMPS, SEALS, MATERIAL, OR PAINTING.
- .4 INCLUDE DIMENSIONAL AND TECHNICAL DATA SUFFICIENT TO CHECK IF EQUIPMENT MEETS REQUIREMENTS. INCLUDE WIRING, PIPING, AND SERVICE CONNECTION DATA AND MOTOR SIZES.
- .5 INSTALLED MATERIALS AND EQUIPMENT SHALL MEET SPECIFIED REQUIREMENTS REGARDLESS OF WHETHER OR NOT SHOP DRAWINGS ARE REVIEWED BY THE CONSULTANT.
- .6 SHOP DRAWINGS NOT REQUESTED WILL NOT BE REVIEWED AND PROCESSED BY THE CONSULTANT.

- .7 DO NOT ORDER EQUIPMENT OR MATERIAL UNTIL THE CONSULTANT HAS REVIEWED AND RETURNED SHOP DRAWINGS.
- .8 SHOP DRAWINGS SHALL BE ENDORSED BY THE GENERAL CONTRACTOR AND MECHANICAL SUB-CONTRACTOR INDICATING THAT THE SHOP DRAWINGS HAVE BEEN REVIEWED AND SUBMITTED WITHOUT QUALIFICATIONS.
- .9 SUBMIT DIGITAL COPIES OF SHOP DRAWINGS WITHIN FOURTEEN (14) DAYS AFTER AWARD OF CONTRACT.

5. STANDARDS OF MATERIALS, EQUIPMENT AND INSTALLATION

- .1 EQUIPMENT USED SHALL NOT EXCEED SPACE LIMITATIONS IN ANY DIMENSION. REPLACE ANY EQUIPMENT OR APPARATUS THAT DOES NOT MEET THIS SPECIFICATION AT NO COST. ASSUME FULL RESPONSIBILITY FOR THE EXPENSE OF REDESIGN AND ADJUSTMENT TO OTHER PARTS OF THE BUILDING WHEN PROPOSING THE USE OF APPROVED EQUAL OR ALTERNATE EQUIPMENT.
- .2 PROVIDE EQUIPMENT FROM THE SPECIFIED MANUFACTURERS. ALL MECHANICAL EQUIPMENT SHALL HAVE THE APPROVED MANUFACTURERS NAME PERMANENTLY AFFIXED TO IT.
- .3 EQUIPMENT ON ALTERNATE & APPROVED MANUFACTURERS LIST MUST BE EQUAL IN QUALITY AND PERFORMANCE TO THE MODEL SPECIFIED. EQUIPMENT, WHICH IS NOT EQUAL, WILL BE REPLACED WITH THE SPECIFIED EQUIPMENT AT NO COST TO THE OWNER.
- .4 THE EQUIPMENT MANUFACTURER SHALL ENSURE THAT THE STRENGTH AND ANCHORAGE OF THE INTERNAL COMPONENTS OF THE EQUIPMENT EXCEEDS THE FORCE LEVEL USED TO RESTRAIN AND ANCHOR THE UNIT ITSELF TO THE SUPPORTING STRUCTURE.
- .5 PROVIDE FOLLOWING WHEN REQUIRED:
- |                      |                         |
|----------------------|-------------------------|
| ITEMS                | APPROVED MANUFACTURER   |
| DAMPER - LOW LEAKAGE | AMERICAN WARMING, TAMCO |

6. PERFORMANCE VERIFICATION OF INSTALLED EQUIPMENT

- .1 INSTALLED MECHANICAL EQUIPMENT WHOSE PERFORMANCE IS QUESTIONED BY THE CONSULTANT, MAY BE SUBJECT TO PERFORMANCE VERIFICATION AS SPECIFIED HEREIN.
- .2 WHEN PERFORMANCE VERIFICATION IS REQUESTED, EQUIPMENT SHALL BE TESTED TO DETERMINE COMPLIANCE WITH SPECIFIED PERFORMANCE REQUIREMENTS.
- .3 THE CONSULTANT SHALL APPROVE TESTING PROCEDURES.
- .4 SHOULD TEST RESULTS REVEAL THAT EQUIPMENT DOES NOT MEET SPECIFIED PERFORMANCE REQUIREMENTS, EQUIPMENT WILL BE REJECTED AND THE FOLLOWING SHALL APPLY:
- .5 REMOVE REJECTED EQUIPMENT. REPLACE WITH EQUIPMENT THAT MEETS REQUIREMENTS OF CONTRACT DOCUMENTS INCLUDING SPECIFIED PERFORMANCE REQUIREMENTS.
- .1 REPLACEMENT EQUIPMENT WILL BE SUBJECT TO PERFORMANCE VERIFICATION AS WELL, USING SAME TESTING PROCEDURES ON ORIGINALLY INSTALLED EQUIPMENT.
- .2 CONTRACTOR SHALL PAY ALL COSTS RESULTING FROM PERFORMANCE VERIFICATION PROCEDURE.

7. RECORD DRAWINGS

- .1 THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND KEEP ONE SET OF WHITE PRINTS, INCLUDING REVISION DRAWINGS, IN JOB SITE OFFICE.
- .2 THE RECORD DRAWINGS SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING CHANGES AND SHALL BE RECORDED DAILY:
- .1 SIZE, LOCATION, ARRANGEMENT, ROUTE AND EXTENT OF DUCTWORK, CONDUIT, EQUIPMENT, ETC., ABOVE AND BELOW GRADE INSIDE THE BUILDING.
- .2 ALL CHANGES WHICH AFFECT THE OPERATION OF THE MECHANICAL SYSTEM.
- .3 THE AS-BUILT DAILY MARKED-UP PRINTS SHALL CONFORM TO THE STANDARDS OF THE CONTRACT DRAWINGS AND SHALL INCLUDE ALL DETAILS FROM REVISION DRAWINGS, SUPPLEMENTARY DRAWINGS, CHANGE ORDERS, ADDENDA AND SITE REVISIONS, ETC..

8. CONNECTION AND INTERRUPTION TO EXISTING SYSTEMS

- .1 COORDINATE WITH OWNER ALL SHUT DOWNS AND CONNECTIONS TO EXISTING EQUIPMENT.

9. LIABILITY

- .1 ASSUME FULL RESPONSIBILITY FOR LAYING OUT THE WORK AND FOR ANY DAMAGE CAUSED TO THE OWNER OF OTHER TRADES BY IMPROPER LOCATION, OR CARRYING OUT OF THE WORK.
- .2 BE RESPONSIBLE FOR PROMPT INSTALLATION OF HIS WORK IN ADVANCE OF CONCRETE POURING OR SIMILAR WORK. PROVIDE AND SET SLEEVES WHERE REQUIRED. SHOULD ANY CUTTING OR REPAIRING OF EITHER UNFINISHED OR FINISHED WORK BE REQUIRED, THIS CONTRACTOR SHALL DIRECT THE PARTICULAR SUB-CONTRACTOR WHOSE WORK IS INVOLVED TO DO SUCH CUTTING AND REPAIRING WITHOUT EXPENSE TO THE OWNER. BEFORE BEING UNDERTAKEN, SUCH WORK SHALL BE LAID OUT FOR THE CONSULTANT'S REVIEW.
- .3 EXAMINE THE SITE AND THE LOCAL CONDITIONS AFFECTING WORK UNDER THIS CONTRACT. EXAMINE CAREFULLY THE MECHANICAL, ELECTRICAL, STRUCTURAL AND ARCHITECTURAL DRAWINGS AND CONFIRM THAT THE WORK UNDER THIS CONTRACT CAN BE SATISFACTORILY CARRIED OUT WITHOUT CHANGES TO THE BUILDING AS SHOWN ON THESE PLANS. BEFORE COMMENCING THE WORK, EXAMINE THE WORK OF THE OTHER TRADES AND REPORT AT ONCE ANY DEFECT OF INTERFERENCE AFFECTING THE WORK OF THIS SECTION, OF THE GUARANTEE OF SAME. NO EXTRAS WILL BE SUBSEQUENTLY ALLOWED TO COVER ANY SUCH ERROR, OMISSION OR OVERSIGHT ON THE THOROUGH INSPECTION OF THE GROUNDS, BUILDING, CONDITIONS, ETC.
- .4 ARRANGE WORK IN CO-OPERATION WITH OTHER TRADES IN THE BUILDING IN SUCH A MANNER AS NOT TO INTERFERE WITH OTHER WORK BEING CARRIED ON IN THE BUILDING AND PLACES WHERE OTHER PIPES AND EQUIPMENT BE INSTALLED ALONG WITH THE PIPES AND DUCTS PERTAINING TO THIS TRADE. CO-OPERATE WITH THE OTHER TRADES TO GET ALL THE PIPES, DUCTS, CONDUIT, ETC., INSTALLED TO THE BEST ADVANTAGE.
- .5 WHERE ANY PIPES, DUCTS AND EQUIPMENT MUST BE BUILT INTO THE WORK OF OTHER TRADES SUCH AS MASONRY, STRUCTURAL, OR PLASTERING, BE RESPONSIBLE FOR SUPPLYING THE EQUIPMENT TO BE BUILT IN OR MEASUREMENTS TO ALLOW THE NECESSARY OPENINGS TO BE LEFT. ALL PIPES AND DUCTS WHICH ARE TO BE CONCEALED SHALL BE INSTALLED NEATLY AND CLOSELY TO THE BUILDING STRUCTURE SO THAT THE NECESSARY FURRING CAN BE KEPT AS SMALL AS POSSIBLE. ANY PIPES, DUCTS, OR OTHER WORK WHICH ARE NOT, IN THE OPINION OF THE CONSULTANT, INSTALLED AS THEY SHOULD BE, SHALL BE TAKEN OUT AND REPLACED WITHOUT COST TO THE OWNER.
- .6 PROTECT FINISHED AND UNFINISHED WORK FROM DAMAGE DUE TO THE CARRYING OUT OF HIS WORK, GIVING SPECIAL ATTENTION TO THE PROTECTION OF BUILDING VAPOUR BARRIERS, WATERPROOF MEMBRANES, ETC. COVER FLOORS AND OTHER PARTS OF THE BUILDING WITH TARPULINS, ETC., AND REPAIR ALL DAMAGE TO THE SATISFACTION OF THE OWNER AND THE CONSULTANT. DURING FREEZING WEATHER, PROTECT ALL HIS MATERIALS IN SUCH A MANNER THAT NO HARM CAN BE DONE TO INSTALLATION ALREADY MADE AND/OR TO MATERIALS AND EQUIPMENT ON THE JOB.
- .7 BE RESPONSIBLE FOR THE CONDITION OF ALL MATERIALS AND EQUIPMENT SUPPLIED AND SHALL PROVIDE ALL NECESSARY PROTECTION FOR SAME.
- .8 BE RESPONSIBLE FOR THE PROTECTION AND MAINTENANCE OF THE WORK OF THIS SECTION UNTIL THE BUILDING HAS BEEN COMPLETED AND ACCEPTED BY THE OWNER. BE RESPONSIBLE FOR THE SORTING OF HIS MATERIAL INSIDE AND OUT OF THE WAY, AND TO CLEAN UP ALL REFUSE CAUSED BY HIS WORK TO MEET CONSULTANT'S REVIEW.
- .9 ON COMPLETION OF THE WORK, ALL TOOLS, SURPLUS AND WASTE MATERIALS SHALL BE REMOVED AND THE WORK LEFT IN A CLEAN CONDITION.



0	ISSUED FOR TENDER
No.	Description

Date	Scale	Designed	Drawn	Checked	Approved	CBCL No.	Contract
APR 01/16	NTS	MP	PA	MP	MP	162810.00	—
<div><div>CBC L</div><div>CBCL LIMITED</div><div>Consulting Engineers</div></div>		CHEMICAL STORAGE ROOM				Drawing  M2	
		SPECIFICATIONS (1 OF 2)					

UNIVERSITY OF NEW BRUNSWICK - 1000 UNIVERSITY AVENUE - FREDERICTON, NEW BRUNSWICK E3B 6C1 - CANADA TEL: (506) 335-2222 FAX: (506) 335-2223

10. LIABILITY INSURANCE

- .1

THIS CONTRACTOR SHALL MAINTAIN SUCH INSURANCE AS WILL FULLY PROTECT BOTH THE OWNER AND HIMSELF FROM ANY AND ALL CLAIMS, ALL AS NOTED WITHIN THE GENERAL CONDITIONS AND SUPPLEMENTARY GENERAL CONDITIONS. WHEN REQUESTED THE CONTRACTOR SHALL PROVIDE AND SHOW PROOF OF, AT HIS EXPENSE, COMPREHENSIVE GENERAL LIABILITY INSURANCE OF NOT LESS THAN \$2,000,000.00 INCLUDING NON-OWNED CAR COVERAGE, CONTRACTUAL LIABILITY AND CONTAINING A CROSS LIABILITY CLAUSE. COVERAGE SHALL INCLUDE LOSS OR DAMAGE THE CONTRACTOR MAY CAUSE TO ANY WORK, BUILDING, EQUIPMENT, AND STRUCTURAL, ON THE OWNER'S PROPERTY. THE INSURANCE MAY CONTAIN A DEDUCTIBLE CAUSE NOT TO EXCEED \$500.00.
- .2

THE CONTRACTOR SHALL CARRY FULL EMPLOYEE'S LIABILITY INSURANCE FOR THE WHOLE OF THE WORK IN ACCORDANCE WITH THE WORKERS' COMPENSATION ACT.

11. GUARANTEE WARRANTY

- .1

THIS CONTRACTOR SHALL FURNISH A WARRANTY FOR ALL WORK EXECUTED UNDER THIS DIVISION WILL BE FREE FROM DEFECTS OF MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL PERFORMANCE, WHICH SHALL INCLUDE ONE (1) COMPLETE SUMMER AND ONE (1) COMPLETE WINTER OF UNINTERRUPTED OPERATION. WARRANTY SHALL INCLUDE ANY PART OF EQUIPMENT, UNITS OR STRUCTURES FURNISHED HEREUNDER THAT SHOW THE WORKS UNDER NORMAL OPERATING CONDITIONS AND/OR FOR THE PURPOSE OF WHICH THEY WERE INTENDED.
- .2

THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, PROMPTLY INVESTIGATE ANY MECHANICAL OR CONTROL MALFUNCTION, AND REPAIR OR REPLACE ALL SUCH DEFECTIVE WORK, AND ALL OTHER DAMAGES THEREBY WHICH BECOMES DEFECTIVE DURING THE TIME OF THE GUARANTY-WARRANTY.

12. SUBSTANTIAL PERFORMANCE INSPECTION

- .1

PRIOR TO THE CONTRACTOR REQUESTING AN INSPECTION FOR SUBSTANTIAL PERFORMANCE ALL THE FOLLOWING ITEMS MUST BE PROVIDED TO PERMIT BENEFICIAL USE BY THE OWNER.

.1

COMPLY WITH REQUIREMENTS IN GENERAL CONTRACT CONDITIONS.

.2

MAINTENANCE AND OPERATING MANUALS TO BE SUBMITTED AND APPROVED.

.3

RECORD DRAWINGS.

.4

AIR BALANCING REPORTS

.5

A COMPLETE LIST OF ITEMS THAT THE CONTRACTOR HAS NOT FINISHED, OR ARE DEFICIENT, SHALL BE PROVIDED. IF IN THE OPINION OF THE CONSULTANT, THIS LIST INDICATES THE PROJECT IS EXCESSIVELY INCOMPLETE, A SUBSTANTIAL COMPLETION INSPECTION WILL NOT BE PERFORMED.
- .2

THE CONTRACTOR SHALL BE FULLY RESPONSIBLE TO ACCUMULATE ALL NECESSARY DATA FROM HIS SUB-TRADES AND SUPPLIERS AND PRESENT SAME IN THE SPECIFIED FORMAT FOR THE APPROVAL BY THE CONSULTANT.

13. LAWS, NOTICES, PERMITS AND FEES

- .1

GIVE ALL NECESSARY NOTICES, OBTAIN ALL NECESSARY PERMITS AND PAY ALL FEES IN ORDER THAT THE WORK SPECIFIED MAY BE CARRIED OUT, AND FURNISH ANY CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH THE LAW AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION.

- .2

ALL WORK SHALL BE IN ACCORDANCE WITH THE REGULATIONS OF THE FOLLOWING AUTHORITATIVE BODIES, THE CODES IN EFFECT AT THE TIME OF TENDER, AND ANY OTHERS HAVING JURISDICTION:

.1

CANADIAN ELECTRICAL CODE

.2

NEW BRUNSWICK BUILDING CODE AND LOCAL BUILDING BY-LAWS

.3

WORKER'S COMPENSATION BOARD

.4

CANADIAN STANDARDS ASSOCIATION

14. DEMONSTRATION AND INSTRUCTION TO OWNER

- .1

DEMONSTRATE TO AND INSTRUCT THE REPRESENTATIVE DESIGNATED BY THE OWNER ON THE COMPLETE SYSTEMS OPERATING AND MAINTENANCE PROCEDURES.

15. INSPECTION

- .1

THE CONSULTANT OR HIS REPRESENTATIVE MAY CHOOSE TO INSPECT ALL WORK PRIOR TO IT BEING CONCEALED. ALL WORK SHALL BE APPROVED BY ANY OTHER REGULATORY BODY HAVING JURISDICTION. ALL PIPING BELOW GROUND MUST BE APPROVED PRIOR TO COVERING. ALL PIPING IN WALL SPACES MUST BE APPROVED PRIOR TO BOARDING. ALL OPENINGS SHALL BE SEALED APPROPRIATELY IN PARTICULAR IN FIRE RATED WALLS AND FLOORS. SEALING SHALL BE APPROVED PRIOR TO COVERING.
- .2

PROVIDE A MINIMUM OF 48 HOURS NOTICE TO CONSULTANT FOR REQUIRED INSPECTION.

B. SECTION 15500 HEATING, VENTILATION AND AIR CONDITIONING

1. DUCTING

- .1

DUCTWORK SHALL BE GALVANIZED STEEL, LOCK FORMED 2" W.G. SMACNA STANDARD FOR LOW VELOCITY AND MEDIUM VELOCITY DUCTWORK QUALITY. FABRICATED IN ACCORDANCE WITH SMACNA DUCT MANUALS AND ASHRAE HANDBOOKS. DUCTWORK SHALL MEET THE REQUIREMENTS OF NFPA 90A, 91 AND 96 AND CONFORM TO APPLICABLE CODES.
- .2

PRIOR TO FABRICATION OF DUCTWORK, CHECK ALL CEILING SPACES AND HEIGHTS AND CONFLICTS WITH OTHER TRADES. INCLUDE AND PROVIDE NECESSARY OFFSET TO MAINTAIN CEILING HEIGHT, HEADROOM ETC.
- .3

ALL DUCTWORK PENETRATING FIRE RATED FLOOR SLABS ABOVE AND BELOW OR FIRE SEPARATIONS SHALL BE COMPLETE WITH FIRE DAMPERS AND ACCESS DOORS.

2. AIR BALANCING:

- .1

AIR BALANCING TO BE PERFORMED ON ALL AIR SYSTEMS AS INDICATED. BALANCE TO WITHIN 10% OF QUANTITIES SHOWN ON DRAWINGS. PROVIDE BALANCING REPORT.

3. FIRE DAMPERS

- .1

PROVIDE U.L.C. APPROVED FIRE DAMPERS MADE OF GALVANIZED STEEL OR PRIME COATED BLACK STEEL WEIGHTED TO CLOSE AND LOCK IN CLOSED POSITION WHEN RELEASED BY FUSIBLE LINK.
- .2

FIRE DAMPERS IN LOW PRESSURE DUCTWORK MAY BE MULTI BLADE OR CURTAIN TYPE.
- .3

FABRICATE COMBINATION FIRE AND BALANCING DAMPERS WITH LINKAGE READILY ADJUSTABLE IN OPEN POSITION.
- .4

CURTAIN FIRE DAMPERS SHALL HAVE BLADES RETAINED IN A RECESS SO THAT FREE AREA OF CONNECTING DUCTWORK IS NOT REDUCED.
- .5

FUSIBLE LINKS SHALL BE SET FOR 72°C.



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<div><div>CBCL</div><div>CBCL LIMITED</div><div>Consulting Engineers</div></div>		CHEMICAL STORAGE ROOM					Drawing  <b>M3</b>
		SPECIFICATIONS (2 OF 2)					



A. SECTION 15010 GENERAL MECHANICAL PROVISIONS

1. CONFORMANCE:

- .1 CONFORM TO TERMS AND CONDITIONS OF THE GENERAL CONTRACT DOCUMENT.

2. SCOPE:

- .1 PROVIDE COMPLETE, FULLY TESTED AND OPERATIONAL MECHANICAL SYSTEMS TO MEET THE REQUIREMENTS DESCRIBED HEREIN AND IN COMPLETE ACCORDANCE WITH APPLICABLE CODES AND ORDINANCES.
- .2 CONTRACT DOCUMENTS OF THIS DIVISION AND DRAWINGS ARE DIAGRAMMATIC AND APPROXIMATELY TO SCALE UNLESS DETAILED OTHERWISE. THEY ESTABLISH SCOPE, MATERIAL AND INSTALLATION QUALITY AND ARE NOT DETAILED INSTALLATION INSTRUCTIONS.
- .3 FOLLOW MANUFACTURER'S RECOMMENDED INSTALLATION DETAILS AND PROCEDURES FOR EQUIPMENT, SUPPLEMENTED BY REQUIREMENTS OF CONTRACT DOCUMENTS.
- .1 INSTALL EQUIPMENT GENERALLY IN LOCATIONS AND ROUTES SHOWN CLOSE TO BUILDING STRUCTURE WITH MINIMUM INTERFERENCE WITH OTHER SERVICES OR FREE SPACE. REMOVE AND REPLACE IMPROPERLY INSTALLED EQUIPMENT TO THE SATISFACTION OF THE CONSULTANT AT NO EXTRA COST.
- .2 THE DRAWINGS INDICATE THE GENERAL LOCATION AND ROUTE TO BE FOLLOWED BY DUCTWORK. WHERE DETAILS ARE NOT SHOWN ON THE DRAWINGS OR ONLY SHOWN DIAGRAMMATICALLY, THE PIPES AND DUCTWORK SHALL BE INSTALLED IN SUCH A WAY AS TO CONSERVE HEADROOM AND INTERFERE AS LITTLE AS POSSIBLE WITH THE FREE USE OF SPACE THROUGH WHICH THEY PASS. ALL DUCT AND PIPES AT CEILING SHALL BE KEPT AS TIGHT AS POSSIBLE TO BEAMS OR OTHER LIMITING MEMBERS AT HIGH END.
- .3 CONNECT TO EQUIPMENT SPECIFIED IN OTHER SECTIONS AND TO EQUIPMENT SUPPLIED AND INSTALLED BY OTHER CONTRACTORS OR BY THE OWNER. UNCRATE EQUIPMENT, MOVE IN PLACE AND INSTALL COMPLETE; START-UP AND TEST.
- .4 CONNECT INTO EXISTING SYSTEMS WITH MINIMUM DISRUPTION TO THE EXISTING SYSTEMS.
- .5 WORK SHALL BE COORDINATED WITH THE OWNER SEVEN DAYS PRIOR TO WORK COMMENCING.
- .6 FIELD VERIFY ALL BUILDING AND SITE DIMENSIONS PRIOR TO ANY FABRICATION AND INSTALLATION OF EQUIPMENT OR MATERIALS. NO ADDITIONAL CHARGE SHALL BE ENTERTAINED FOR FAILURE TO VERIFY THESE DIMENSIONS ON SITE.
- .7 THE WORK SHALL INCLUDE BUT NOT LIMIT TO THE FOLLOWING:
- .1 COMPLETE HEATING/VENTILATING/AIR CONDITIONING INSTALLATION.
- .2 COMPLETE AUTOMATIC CONTROL AND RELATED WIRING INSTALLATION.
- .3 COMMISSIONING.

3. MATERIALS

- .1 MATERIALS AND EQUIPMENT INSTALLED SHALL BE NEW, FULL WEIGHT AND OF QUALITY SPECIFIED. USE SAME BRAND OR MANUFACTURER FOR EACH SPECIFIED APPLICATION.
- .2 STATICALLY AND DYNAMICALLY BALANCE ROTATING EQUIPMENT FOR MINIMUM VIBRATION AND LOW OPERATING NOISE LEVEL.
- .3 EACH MAJOR COMPONENT OF EQUIPMENT SHALL BEAR MANUFACTURER'S NAME, ADDRESS, CATALOG AND SERIAL NUMBER IN A CONSPICUOUS PLACE.
- .4 FITTINGS SHALL BE OF APPROVED MATERIALS AND MEET CODES HAVING JURISDICTION.
- .6 EQUIPMENT SHALL BE CSA LISTED AND ULC APPROVED.
- .7 PROVIDE AND INSTALL DUCT SUPPORTS AND HANGERS TO SMACNA STANDARDS.

4. TESTING

- .1 PERFORM NECESSARY TESTS ON EQUIPMENT INCLUDING THOSE REQUIRED BY AUTHORITIES HAVING JURISDICTION AND CERTIFICATE OF APPROVAL OBTAINED.
- .2 PERFORM APPROVED TESTS ON ALL DUCTWORK SYSTEMS, OBTAIN AND SUBMIT CERTIFICATES OF APPROVAL AND ACCEPTANCE.

5. CUTTING AND PATCHING

- .1 PROVIDE HOLES AND SLEEVES, CUTTING AND FITTING REQUIRED FOR MECHANICAL WORK. RELOCATE IMPROPERLY LOCATED HOLES AND SLEEVES.
- .2 DRILL FOR EXPANSION BOLTS, HANGER RODS, BRACKETS, AND SUPPORTS.
- .3 REPAIR BUILDING WHERE DAMAGED FROM EQUIPMENT INSTALLATION, IMPROPERLY LOCATED HOLES, ETC., BY THIS SECTION OF THE WORK. THE SPECIALIST TRADE AT THE EXPENSE OF THIS SECTION OF WORK SHALL CARRY OUT THIS REPAIR. USE MATCHING MATERIALS AS SPECIFIED IN THE RESPECTIVE SECTIONS.

6. SHOP DRAWINGS

- .1 SUBMIT SHOP DRAWINGS FOR EVERY PIECE OF MECHANICAL EQUIPMENT.
- .2 IDENTIFY MATERIALS AND EQUIPMENT BY MANUFACTURER, TRADE NAME AND MODEL NUMBER. INCLUDE COPIES OF APPLICABLE BROCHURE OR CATALOG MATERIAL. DO NOT ASSUME APPLICABLE CATALOGUES ARE AVAILABLE IN THE CONSULTANT'S OFFICE. MAINTENANCE AND OPERATING MANUALS ARE NOT SUITABLE SUBMITTAL MATERIAL.
- .3 CLEARLY MARK SUBMITTAL MATERIAL USING ARROWS, UNDERLINING OR CIRCLING TO SHOW DIFFERENCES FROM SPECIFIED, E.G. RATINGS, CAPABILITIES AND OPTIONS BEING PROPOSED. CROSS OUT NON-APPLICABLE MATERIAL. SPECIFICALLY NOTE ON THE SUBMITTAL SPECIFIED FEATURES SUCH AS SPECIAL TANK LININGS, PUMPS, SEALS, MATERIAL, OR PAINTING.
- .4 INCLUDE DIMENSIONAL AND TECHNICAL DATA SUFFICIENT TO CHECK IF EQUIPMENT MEETS REQUIREMENTS. INCLUDE WIRING, PIPING, AND SERVICE CONNECTION DATA AND MOTOR SIZES.
- .5 INSTALLED MATERIALS AND EQUIPMENT SHALL MEET SPECIFIED REQUIREMENTS REGARDLESS OF WHETHER OR NOT SHOP DRAWINGS ARE REVIEWED BY THE CONSULTANT.
- .6 SHOP DRAWINGS NOT REQUESTED WILL NOT BE REVIEWED AND PROCESSED BY THE CONSULTANT.
- .7 DO NOT ORDER EQUIPMENT OR MATERIAL UNTIL THE CONSULTANT HAS REVIEWED AND RETURNED SHOP DRAWINGS.
- .8 SHOP DRAWINGS SHALL BE ENDORSED BY THE GENERAL CONTRACTOR AND MECHANICAL SUB-CONTRACTOR INDICATING THAT THE SHOP DRAWINGS HAVE BEEN REVIEWED AND SUBMITTED WITHOUT QUALIFICATIONS.
- .9 SUBMIT DIGITAL COPIES OF SHOP DRAWINGS WITHIN FOURTEEN (14) DAYS AFTER AWARD OF CONTRACT.
- .10 SUBMIT WEIGHTS OF ALL MAJOR EQUIPMENT FOR REVIEW SUCH THAT THE APPROPRIATE CONSULTANT CAN REVIEW THE LOADS.

7. STANDARDS OF MATERIALS, EQUIPMENT AND INSTALLATION

- .1 EQUIPMENT USED SHALL NOT EXCEED SPACE LIMITATIONS IN ANY DIMENSION. REPLACE ANY EQUIPMENT OR APPARATUS THAT DOES NOT MEET THIS SPECIFICATION AT NO COST. ASSUME FULL RESPONSIBILITY FOR THE EXPENSE OF REDESIGN AND ADJUSTMENT TO OTHER PARTS OF THE BUILDING WHEN PROPOSING THE USE OF APPROVED EQUAL OR ALTERNATE EQUIPMENT.
- .2 PROVIDE EQUIPMENT FROM THE SPECIFIED MANUFACTURERS. ALL MECHANICAL EQUIPMENT SHALL HAVE THE APPROVED MANUFACTURERS NAME PERMANENTLY AFFIXED TO IT.
- .3 EQUIPMENT ON ALTERNATE & APPROVED MANUFACTURERS LIST MUST BE EQUAL IN QUALITY AND PERFORMANCE TO THE MODEL SPECIFIED. EQUIPMENT, WHICH IS NOT EQUAL, WILL BE REPLACED WITH THE SPECIFIED EQUIPMENT AT NO COST TO THE OWNER.
- .4 THE EQUIPMENT MANUFACTURER SHALL ENSURE THAT THE STRENGTH AND ANCHORAGE OF THE INTERNAL COMPONENTS OF THE EQUIPMENT EXCEEDS THE FORCE LEVEL USED TO RESTRAIN AND ANCHOR THE UNIT ITSELF TO THE SUPPORTING STRUCTURE.

.5 PROVIDE FOLLOWING WHEN REQUIRED:

- ITEMS  
DAMPER - LOW LEAKAGE  
FANS  
  
LOUVRES  
  
APPROVED MANUFACTURER  
AMERICAN WARMING, TAMCO  
GREENHECK, DELHI, PENN, BROAN,  
COOK, NUTONE, LAU, ACME, TWIN  
CITY, SOLER & PALAU  
AIROLITE, WESTVENT, RUSKIN,  
VENTEX/ALUMIAVENT, CANARM

8. PERFORMANCE VERIFICATION OF INSTALLED EQUIPMENT

- .1 INSTALLED MECHANICAL EQUIPMENT WHOSE PERFORMANCE IS QUESTIONED BY THE CONSULTANT, MAY BE SUBJECT TO PERFORMANCE VERIFICATION AS SPECIFIED HEREIN.
- .2 WHEN PERFORMANCE VERIFICATION IS REQUESTED, EQUIPMENT SHALL BE TESTED TO DETERMINE COMPLIANCE WITH SPECIFIED PERFORMANCE REQUIREMENTS.
- .3 THE CONSULTANT SHALL APPROVE TESTING PROCEDURES.
- .4 SHOULD TEST RESULTS REVEAL THAT EQUIPMENT DOES NOT MEET SPECIFIED PERFORMANCE REQUIREMENTS, EQUIPMENT WILL BE REJECTED AND THE FOLLOWING SHALL APPLY:
- .5 REMOVE REJECTED EQUIPMENT. REPLACE WITH EQUIPMENT THAT MEETS REQUIREMENTS OF CONTRACT DOCUMENTS INCLUDING SPECIFIED PERFORMANCE REQUIREMENTS.
- .1 REPLACEMENT EQUIPMENT WILL BE SUBJECT TO PERFORMANCE VERIFICATION AS WELL, USING SAME TESTING PROCEDURES ON ORIGINALLY INSTALLED EQUIPMENT.
- .2 CONTRACTOR SHALL PAY ALL COSTS RESULTING FROM PERFORMANCE VERIFICATION PROCEDURE.

9. OPERATING AND MAINTENANCE DATA

- .1 INSTRUCT THE BUILDING OPERATORS IN THE OPERATION AND PREVENTATIVE MAINTENANCE OF EACH PIECE OF EQUIPMENT AND SYSTEM SUPPLIED AND INSTALLED. COMPLETE AND TURN OVER DOCUMENTATION PRIOR TO SUBSTANTIAL PERFORMANCE.
- .2 SUBMIT 3 SETS O & M MANUAL IN 3-RING BINDERS, TO INCLUDE THE FOLLOWING:
- .1 DESCRIPTION OF OPERATION.
- .2 SHOP DRAWING OF ALL EQUIPMENT.
- .3 EXTENDED WARRANTIES.
- .4 MAINTENANCE AND OPERATION INSTRUCTIONS.
- .5 LIST OF MANUFACTURERS SOURCE AND TRADE NAMES.
- .6 BALANCE REPORT.
- .7 NAME OF ENGINEER AND MECHANICAL CONTRACTOR AND PHONE NUMBER.
- .8 COPY OF RECORD DRAWING.
- .9 LIST OF INSPECTION CERTIFICATES.

10. RECORD DRAWINGS

- .1 THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND KEEP ONE SET OF WHITE PRINTS, INCLUDING REVISION DRAWINGS, IN JOB SITE OFFICE.
- .2 THE RECORD DRAWINGS SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING CHANGES AND SHALL BE RECORDED DAILY:
- .1 SIZE, LOCATION, ARRANGEMENT, ROUTE AND EXTENT OF DUCTWORK, CONDUIT, EQUIPMENT, ETC.
- .2 ALL CHANGES WHICH AFFECT THE OPERATION OF THE MECHANICAL SYSTEM.
- .3 THE AS-BUILT DAILY MARKED-UP PRINTS SHALL CONFORM TO THE STANDARDS OF THE CONTRACT DRAWINGS AND SHALL INCLUDE ALL DETAILS FROM REVISION DRAWINGS, SUPPLEMENTARY DRAWINGS, CHANGE ORDERS, ADDENDA AND SITE REVISIONS, ETC.

11. PAINTING AND IDENTIFICATION

- .1 CLEAN ALL EXPOSED BARE METAL SURFACES SUPPLIED BY THE MECHANICAL AND PLUMBING TRADE BY REMOVING ALL DIRT, DUST, GREASE AND MILLSCALE.



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<div><div>CBCL</div><div>CBCL LIMITED</div><div>Consulting Engineers</div></div>		ELECTRICAL ROOM COOLING				Drawing  M2	
		SPECIFICATIONS (1 OF 3)					

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- .2 REPAINT ALL MARRED FACTORY FINISHED EQUIPMENT, WHICH IS NOT SCHEDULED TO BE REPAINTED, TO MATCH THE ORIGINAL FACTORY FINISH.
- .3 EACH PIECE OF EQUIPMENT SHALL BE IDENTIFIED BY LAMACOID LABELS PERMANENTLY ADHERED TO THE EQUIPMENT AND SHALL BE GOVERNED BY THE SIZE OF THE EQUIPMENT.
- .4 EACH TRADE SHALL PREPARE A LIST DETAILING THE VALVES, LOCATION; NORMAL POSITION, AND PURPOSE SERVED. TRADES SHALL CO-OPERATE IN PREPARING A WHITE PRINT CHART SHOWING LOCATION OF ALL VALVES.

12. EQUIPMENT PROTECTION AND CLEAN-UP

- .1 PROTECT EQUIPMENT AND MATERIAL IN STORAGE ON SITE AND AFTER INSTALLATION UNTIL FINAL ACCEPTANCE. LEAVE FACTORY COVERS IN PLACE. TAKE SPECIAL PRECAUTIONS TO PREVENT ENTRY OF FOREIGN MATERIAL INTO WORKING PARTS OF PIPING AND DUCT SYSTEMS.
- .2 ALL MECHANICAL EQUIPMENT STORED ON SITE SHALL BE KEPT IN A DRY, HEATED AND VENTILATED STORAGE AREA.
- .3 THOROUGHLY CLEAN PIPING, DUCTS AND EQUIPMENT OF DIRT, CUTTINGS, AND OTHER FOREIGN MATERIAL.
- .4 PROTECT BEARINGS AND SHAFTS DURING INSTALLATION. GREASE SHAFTS AND SHEAVES TO PREVENT CORROSION. SUPPLY AND INSTALL NECESSARY EXTENDED NIPPLES FOR LUBRICATION PURPOSES.
- .5 ENSURE THAT EXISTING EQUIPMENT IS CAREFULLY DISMANTLED AND NOT DAMAGED OR LOST. DO NOT REUSE EXISTING MATERIALS AND EQUIPMENT UNLESS SPECIFICALLY INDICATED.

13. LIABILITY

- .1 ASSUME FULL RESPONSIBILITY FOR LAYING OUT THE WORK AND FOR ANY DAMAGE CAUSED TO THE OWNER OF OTHER TRADES BY IMPROPER LOCATION, OR CARRYING OUT OF THE WORK.
- .2 BE RESPONSIBLE FOR PROMPT INSTALLATION OF HIS WORK IN ADVANCE OF CONCRETE POURING OR SIMILAR WORK. PROVIDE AND SET SLEEVES WHERE REQUIRED. SHOULD ANY CUTTING OR REPAIRING OF EITHER UNFINISHED OR FINISHED WORK BE REQUIRED, THIS CONTRACTOR SHALL DIRECT THE PARTICULAR SUB-CONTRACTOR WHOSE WORK IS INVOLVED TO DO SUCH CUTTING AND REPAIRING WITHOUT EXPENSE TO THE OWNER. BEFORE BEING UNDERTAKEN, SUCH WORK SHALL BE LAID OUT FOR THE CONSULTANT'S REVIEW.
- .3 EXAMINE THE SITE AND THE LOCAL CONDITIONS AFFECTING WORK UNDER THIS CONTRACT. EXAMINE CAREFULLY THE MECHANICAL, ELECTRICAL, STRUCTURAL AND ARCHITECTURAL DRAWINGS AND CONFIRM THAT THE WORK UNDER THIS CONTRACT CAN BE SATISFACTORILY CARRIED OUT WITHOUT CHANGES TO THE BUILDING AS SHOWN ON THESE PLANS. BEFORE COMMENCING THE WORK, EXAMINE THE WORK OF THE OTHER TRADES AND REPORT AT ONCE ANY DEFECT OF INTERFERENCE AFFECTING THE WORK OF THIS SECTION, OF THE GUARANTEE OF SAME. NO EXTRAS WILL BE SUBSEQUENTLY ALLOWED TO COVER ANY SUCH ERROR, OMISSION OR OVERSIGHT ON THE THOROUGH INSPECTION OF THE GROUNDS, BUILDING, CONDITIONS, ETC.
- .4 ARRANGE WORK IN CO-OPERATION WITH OTHER TRADES IN THE BUILDING IN SUCH A MANNER AS NOT TO INTERFERE WITH OTHER WORK BEING CARRIED ON IN THE BUILDING AND PLACES WHERE OTHER PIPES AND EQUIPMENT BE INSTALLED ALONG WITH THE PIPES AND DUCTS PERTAINING TO THIS TRADE. CO-OPERATE WITH THE OTHER TRADES TO GET ALL THE PIPES, DUCTS, CONDUIT, ETC., INSTALLED TO THE BEST ADVANTAGE.
- .5 WHERE ANY PIPES, DUCTS AND EQUIPMENT MUST BE BUILT INTO THE WORK OF OTHER TRADES SUCH AS MASONRY, STRUCTURAL, OR PLASTERING, BE RESPONSIBLE FOR SUPPLYING THE EQUIPMENT TO BE BUILT IN OR MEASUREMENTS TO ALLOW THE NECESSARY OPENINGS TO BE LEFT. ALL PIPES AND DUCTS WHICH ARE TO BE CONCEALED SHALL BE INSTALLED NEATLY AND CLOSELY TO THE BUILDING STRUCTURE SO THAT THE NECESSARY FURRING CAN BE KEPT AS SMALL AS POSSIBLE. ANY PIPES,

- DUCTS, OR OTHER WORK WHICH ARE NOT, IN THE OPINION OF THE CONSULTANT, INSTALLED AS THEY SHOULD BE, SHALL BE TAKEN OUT AND REPLACED WITHOUT COST TO THE OWNER.
- .6 PROTECT FINISHED AND UNFINISHED WORK FROM DAMAGE DUE TO THE CARRYING OUT OF HIS WORK, GIVING SPECIAL ATTENTION TO THE PROTECTION OF BUILDING VAPOUR BARRIERS, WATERPROOF MEMBRANES, ETC. COVER FLOORS AND OTHER PARTS OF THE BUILDING WITH TARPULINS, ETC., AND REPAIR ALL DAMAGE TO THE SATISFACTION OF THE OWNER AND THE CONSULTANT. DURING FREEZING WEATHER, PROTECT ALL HIS MATERIALS IN SUCH A MANNER THAT NO HARM CAN BE DONE TO INSTALLATION ALREADY MADE AND/OR TO MATERIALS AND EQUIPMENT ON THE JOB.
- .7 BE RESPONSIBLE FOR THE CONDITION OF ALL MATERIALS AND EQUIPMENT SUPPLIED AND SHALL PROVIDE ALL NECESSARY PROTECTION FOR SAME.
- .8 BE RESPONSIBLE FOR THE PROTECTION AND MAINTENANCE OF THE WORK OF THIS SECTION UNTIL THE BUILDING HAS BEEN COMPLETED AND ACCEPTED BY THE OWNER. BE RESPONSIBLE FOR THE SORTING OF HIS MATERIAL INSIDE AND OUT OF THE WAY, AND TO CLEAN UP ALL REFUSE CAUSED BY HIS WORK TO MEET CONSULTANT'S REVIEW.
- .9 ON COMPLETION OF THE WORK, ALL TOOLS, SURPLUS AND WASTE MATERIALS SHALL BE REMOVED AND THE WORK LEFT IN A CLEAN CONDITION.

14. LIABILITY INSURANCE

- .1 THIS CONTRACTOR SHALL MAINTAIN SUCH INSURANCE AS WILL FULLY PROTECT BOTH THE OWNER AND HIMSELF FROM ANY AND ALL CLAIMS, ALL AS NOTED WITHIN THE GENERAL CONDITIONS AND SUPPLEMENTARY GENERAL CONDITIONS. WHEN REQUESTED THE CONTRACTOR SHALL PROVIDE AND SHOW PROOF OF, AT HIS EXPENSE, COMPREHENSIVE GENERAL LIABILITY INSURANCE OF NOT LESS THAN \$2,000,000.00 INCLUDING NON-OWNED CAR COVERAGE, CONTRACTUAL LIABILITY AND CONTAINING A CROSS LIABILITY CLAUSE. COVERAGE SHALL INCLUDE LOSS OR DAMAGE THE CONTRACTOR MAY CAUSE TO ANY WORK, BUILDING, EQUIPMENT, AND STRUCTURAL, ON THE OWNER'S PROPERTY. THE INSURANCE MAY CONTAIN A DEDUCTIBLE CAUSE NOT TO EXCEED \$500.00.
- .2 THE CONTRACTOR SHALL CARRY FULL EMPLOYEE'S LIABILITY INSURANCE FOR THE WHOLE OF THE WORK IN ACCORDANCE WITH THE WORKERS' COMPENSATION ACT.

15. GUARANTEE WARRANTY

- .1 THIS CONTRACTOR SHALL FURNISH A WARRANTY FOR ALL WORK EXECUTED UNDER THIS DIVISION WILL BE FREE FROM DEFECTS OF MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL PERFORMANCE, WHICH SHALL INCLUDE ONE (1) COMPLETE SUMMER AND ONE (1) COMPLETE WINTER OF UNINTERRUPTED OPERATION. WARRANTY SHALL INCLUDE ANY PART OF EQUIPMENT, UNITS OR STRUCTURES FURNISHED HEREUNDER THAT SHOW THE WORKS UNDER NORMAL OPERATING CONDITIONS AND/OR FOR THE PURPOSE OF WHICH THEY WERE INTENDED.
- .2 THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, PROMPTLY INVESTIGATE ANY MECHANICAL OR CONTROL MALFUNCTION, AND REPAIR OR REPLACE ALL SUCH DEFECTIVE WORK, AND ALL OTHER DAMAGES THEREBY WHICH BECOMES DEFECTIVE DURING THE TIME OF THE GUARANTY-WARRANTY.

16. SUBSTANTIAL PERFORMANCE INSPECTION

- .1 PRIOR TO THE CONTRACTOR REQUESTING AN INSPECTION FOR SUBSTANTIAL PERFORMANCE ALL THE FOLLOWING ITEMS MUST BE PROVIDED TO PERMIT BENEFICIAL USE BY THE OWNER.
  - .1 COMPLY WITH REQUIREMENTS IN GENERAL CONTRACT CONDITIONS.
  - .2 MAINTENANCE AND OPERATING MANUALS TO BE SUBMITTED AND APPROVED.
  - .3 RECORD DRAWINGS.

- .4 A COMPLETE LIST OF ITEMS THAT THE CONTRACTOR HAS NOT FINISHED, OR ARE DEFICIENT, SHALL BE PROVIDED. IF IN THE OPINION OF THE CONSULTANT, THIS LIST INDICATES THE PROJECT IS EXCESSIVELY INCOMPLETE, A SUBSTANTIAL COMPLETION INSPECTION WILL NOT BE PERFORMED.
- .5 STARTUP REPORTS.
- .2 THE CONTRACTOR SHALL BE FULLY RESPONSIBLE TO ACCUMULATE ALL NECESSARY DATA FROM HIS SUB-TRADES AND SUPPLIERS AND PRESENT SAME IN THE SPECIFIED FORMAT FOR THE APPROVAL BY THE CONSULTANT.

17. LAWS, NOTICES, PERMITS AND FEES

- .1 GIVE ALL NECESSARY NOTICES, OBTAIN ALL NECESSARY PERMITS AND PAY ALL FEES IN ORDER THAT THE WORK SPECIFIED MAY BE CARRIED OUT, AND FURNISH ANY CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH THE LAW AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION.
- .2 ALL WORK SHALL BE IN ACCORDANCE WITH THE REGULATIONS OF THE FOLLOWING AUTHORITATIVE BODIES, THE CODES IN EFFECT AT THE TIME OF TENDER, AND ANY OTHERS HAVING JURISDICTION:
  - .1 FIRE MARSHALL
  - .2 CANADIAN ELECTRICAL CODE
  - .3 NEW BRUNSWICK BUILDING CODE AND LOCAL BUILDING BY-LAWS
  - .4 WORKER'S COMPENSATION BOARD
  - .5 CANADIAN STANDARDS ASSOCIATION
  - .6 CANADIAN GAS CODE B-149.1
  - .7 NATIONAL PLUMBING CODE
  - .8 UNDERWRITERS' LABORATORIES OF CANADA
  - .9 NATIONAL FIRE PROTECTION ASSOCIATION

18. DEMONSTRATION AND INSTRUCTION TO OWNER

- .1 DEMONSTRATE TO AND INSTRUCT THE REPRESENTATIVE DESIGNATED BY THE OWNER ON THE COMPLETE SYSTEMS OPERATING AND MAINTENANCE PROCEDURES.

19. INSPECTION

- .1 THE CONSULTANT OR HIS REPRESENTATIVE MAY CHOOSE TO INSPECT ALL WORK PRIOR TO IT BEING CONCEALED. ALL WORK SHALL BE APPROVED BY ANY OTHER REGULATORY BODY HAVING JURISDICTION. ALL PIPING BELOW GROUND MUST BE APPROVED PRIOR TO COVERING. ALL PIPING IN WALL SPACES MUST BE APPROVED PRIOR TO BOARDING. ALL OPENINGS SHALL BE SEALED APPROPRIATELY IN PARTICULAR IN FIRE RATED WALLS AND FLOORS. SEALING SHALL BE APPROVED PRIOR TO COVERING.
- .2 PROVIDE A MINIMUM OF 48 HOURS NOTICE TO CONSULTANT FOR REQUIRED INSPECTION.



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Date	Scale	Designed	Drawn	Checked	Approved	CBCL No.	Contract
APR 01/16	NTS	MP	PA	MP	MP	162810.00	—
<div><div>CBC</div><div>L</div><div>CBCL LIMITED</div><div>Consulting Engineers</div></div>		ELECTRICAL ROOM COOLING				Drawing  M3	
		SPECIFICATIONS (2 OF 3)					

B. SECTION 15500 HEATING, VENTILATION AND AIR CONDITIONING

1. DUCTING

- .1 DUCTWORK SHALL BE GALVANIZED STEEL, LOCK FORMED 2" W.G. SMACNA STANDARD FOR LOW VELOCITY AND MEDIUM VELOCITY DUCTWORK QUALITY. FABRICATED IN ACCORDANCE WITH SMACNA DUCT MANUALS AND ASHRAE HANDBOOKS. DUCTWORK SHALL MEET THE REQUIREMENTS OF NFPA 90A, 91 AND 96 AND CONFORM TO APPLICABLE CODES.
- .2 PRIOR TO FABRICATION OF DUCTWORK, CHECK ALL CEILING SPACES AND HEIGHTS AND CONFLICTS WITH OTHER TRADES. INCLUDE AND PROVIDE NECESSARY OFFSET TO MAINTAIN CEILING HEIGHT, HEADROOM ETC.
- .3 ALL FANS AND AIR CONDITIONING UNITS SHALL BE MOUNTED WITH VIBRATION ISOLATION.
- .4 ALL FANS AND AIR MOVING HVAC UNITS SHALL HAVE FLEXIBLE CONNECTIONS.
- .5 PROVIDE GALVANIZED STEEL SCREEN, 12 MM SQUARE MESH FOR EXTERIOR INTAKE & EXHAUST OUTLETS UNLESS OTHERWISE NOTED.
- .6 PROVIDE FLASHING, CURB AND COUNTER FLASHING FOR ALL DUCTING PASSING THROUGH ROOF AND EXTERNAL ENVELOPE OF THE BUILDING.
- .7 ALL DUCTWORK AND EQUIPMENT INSTALLED SHALL BE FREE OF SCALE, DEBRIS AND DIRT. DURING CONSTRUCTION, COVER ALL DUCT AND EQUIPMENT OPENINGS WITH POLYETHYLENE OR EQUIVALENT TO PREVENT THE ENTRY OF DIRT OR DUST. ANY DUCTWORK OR EQUIPMENT WHICH IS NOT SUFFICIENTLY CLEAN SHALL BE CLEANED USING VACUUM CLEANERS, BRUSHES, AND/OR NON-TOXIC SOLVENTS. ENSURE DUCT DUST COVERS ARE REMOVED PRIOR TO SYSTEM STARTUP.



0	ISSUED FOR TENDER
No.	Description

Date APR 01/16	Scale NTS	Designed MP	Drawn PA	Checked MP	Approved MP	CBCL No. 162810.00	Contract -
<div><div>CBCL</div><div>CBCL LIMITED</div><div>Consulting Engineers</div></div>		ELECTRICAL ROOM COOLING					Drawing  M4
		SPECIFICATIONS (3 OF 3)					

You are being invited to submit a quote for the following work located at the Mactaquac Biodiversity Facility.

**A. SECTION 15010 GENERAL MECHANICAL PROVISIONS**

**1. CONFORMANCE**

- .1 Conform to terms and conditions of the General Contract Document.

**2. SCOPE**

- .1 Door Grilles: Install door grille on Formaldehyde Room.
- .2 Provide complete, fully tested and operational mechanical systems to meet the requirements described herein and in complete accordance with applicable codes and ordinances.
- .3 Contract documents of this division. They establish scope, material and installation quality and are not detailed installation instructions.
- .4 Follow manufacturer's recommended installation details and procedures for equipment, supplemented by requirements of contract documents.
- .5 Work shall be coordinated with the owner seven days prior to work commencing.
- .6 Field verify all building and site dimensions prior to any fabrication and installation of equipment or materials. No additional charge shall be entertained for failure to verify these dimensions on site.

**3. MATERIALS**

- .1 Materials and equipment installed shall be new, full weight and of quality specified. Use same brand or manufacturer for each specified application.
- .2 Each major component of equipment shall bear manufacturer's name, address, catalog and serial number in a conspicuous place.
- .3 Fittings shall be of approved materials and meet codes having jurisdiction.
- .4 Pipe and fittings shall be CSA listed and ULC approved.

**4. CUTTING AND PATCHING**

- .1 Repair building where damaged from equipment installation, improperly located holes, etc., by this section of the work. The specialist trade at the expense of this section of work shall carry out this repair. Use matching materials as specified in the respective sections.

**5. SHOP DRAWINGS**

- .1 Submit shop drawings for every piece of mechanical equipment.
- .2 Identify materials and equipment by manufacturer, trade name and model number. Include copies of applicable brochure or catalog material. Do not assume applicable catalogues are available in the consultant's office. Maintenance and operating manuals are not suitable submittal material.
- .3 Clearly mark submittal material using arrows, underlining or circling to show differences from specified, e.g. Ratings, capabilities and options being proposed. Cross out non-applicable material. Specifically note on the submittal specified features such as special tank linings, pumps, seals, material, or painting.
- .4 Include dimensional and technical data sufficient to check if equipment meets requirements. Include wiring, piping, and service connection data and motor sizes.
- .5 Installed materials and equipment shall meet specified requirements regardless of whether or not shop drawings are reviewed by the Consultant.
- .6 Shop drawings not requested will not be reviewed and processed by the Consultant.
- .7 Do not order equipment or material until the Consultant has reviewed and returned shop drawings.
- .8 Submit one electronic copy of shop drawings within fourteen (14) days after award of contract.

## **6. STANDARDS OF MATERIALS, EQUIPMENT AND INSTALLATION**

- .1 Equipment used shall not exceed space limitations in any dimension. Replace any equipment or apparatus that does not meet this specification at no cost. Assume full responsibility for the expense of redesign and adjustment to other parts of the building when proposing the use of approved equal or alternate equipment.
- .2 Provide equipment from the specified manufacturers. All mechanical equipment shall have the approved manufacturers name permanently affixed to it.
- .3 Equipment on alternate & approved manufacturers list must be equal in quality and performance to the model specified. Equipment, which is not equal, will be replaced with the specified equipment at no cost to the Owner.
- .4 The equipment manufacturer shall ensure that the strength and anchorage of the internal components of the equipment exceeds the force level used to restrain and anchor the unit itself to the supporting structure.
- .5 Provide following when required:

**ITEMS**

**APPROVED MANUFACTURER**

Grilles, Diffusers &  
Registers

E.H. Price, Nailor, Titus

## **7. PERFORMANCE VERIFICATION OF INSTALLED EQUIPMENT**

- .1 Installed mechanical equipment whose performance is questioned by the Consultant, may be subject to performance verification as specified herein.
- .2 When performance verification is requested, equipment shall be tested to determine compliance with specified performance requirements.
- .3 The Consultant shall approve testing procedures.
- .4 Should test results reveal that equipment does not meet specified performance requirements, equipment will be rejected and the following shall apply:
- .5 Remove rejected equipment. Replace with equipment that meets requirements of contract documents including specified performance requirements.
  - .1 Replacement equipment will be subject to performance verification as well, using same testing procedures on originally installed equipment.
  - .2 Contractor shall pay all costs resulting from performance verification procedure.

## **8. CONNECTION AND INTERRUPTION TO EXISTING SYSTEMS**

- .1 Coordinate with owner all shut downs and connections to existing equipment.

## **9. ACCESS OF EQUIPMENT**

- .1 Make all arrangements to ensure that access into the building is available for all mechanical equipment.

## **10. LIABILITY**

- .1 Assume full responsibility for laying out the work and for any damage caused to the owner of other trades by improper location, or carrying out of the work.
- .2 Be responsible for prompt installation of his work in advance of concrete pouring or similar work. Provide and set sleeves where required. Should any cutting or repairing of either unfinished or finished work be required, this contractor shall direct the particular subcontractor whose work is involved to do such cutting and repairing without expense to the owner. Before being undertaken, such work shall be laid out for the consultant's review.
- .3 Examine the site and the local conditions affecting work under this contract. Examine carefully the mechanical, electrical, structural and architectural drawings and confirm that the work under this contract can be satisfactorily carried out without changes to the building

as shown on these plans. Before commencing the work, examine the work of the other trades and report at once any defect of interference affecting the work of this section, of the guarantee of same. No extras will be subsequently allowed to cover any such error, omission or oversight on the thorough inspection of the grounds, building, conditions, etc.

.4 Arrange work in co-operation with other trades in the building in such a manner as not to interfere with other work being carried on in the building and places where other pipes and equipment be installed along with the pipes and ducts pertaining to this trade. Co-operate with the other trades to get all the pipes, ducts, conduit, etc., installed to the best advantage.

.5 Where any pipes, ducts and equipment must be built into the work of other trades such as masonry, structural, or plastering, be responsible for supplying the equipment to be built in or measurements to allow the necessary openings to be left. All pipes and ducts which are to be concealed shall be installed neatly and closely to the building structure so that the necessary furring can be kept as small as possible. Any pipes, ducts, or other work which are not, in the opinion of the consultant, installed as they should be, shall be taken out and replaced without cost to the owner.

.6 Protect finished and unfinished work from damage due to the carrying out of his work, giving special attention to the protection of building vapour barriers, waterproof membranes, etc. Cover floors and other parts of the building with tarpaulins, etc., and repair all damage to the satisfaction of the owner and the consultant. During freezing weather, protect all his materials in such a manner that no harm can be done to installation already made and/or to materials and equipment on the job.

.7 Be responsible for the condition of all materials and equipment supplied and shall provide all necessary protection for same.

.8 Be responsible for the protection and maintenance of the work of this section until the building has been completed and accepted by the Owner. Be responsible for the sorting of his material inside and out of the way, and to clean up all refuse caused by his work to meet Consultant's review.

.9 On completion of the work, all tools, surplus and waste materials shall be removed and the work left in a clean condition.

## **11. LIABILITY INSURANCE**

.1 This contractor shall maintain such insurance as will fully protect both the owner and himself from any and all claims, all as noted within the general conditions and supplementary general conditions. When requested the contractor shall provide and show proof of, at his expense, comprehensive general liability insurance of not less than \$2,000,000.00 Including non-owned car coverage, contractual liability and containing a cross liability clause. Coverage shall include loss or damage the contractor may cause to any work, building, equipment, and structural, on the owner's property. The insurance may contain a deductible cause not to exceed \$500.00.

.2 The Contractor shall carry full employee's liability insurance for the whole of the work in accordance with the workers' compensation act.

## **12. GUARANTEE WARRANTY**

.1 This contractor shall furnish a warranty for all work executed under this division will be free from defects of material and workmanship for a period of one (1) year from the date of substantial performance, which shall include one (1) complete summer and one (1) complete winter of uninterrupted operation. Warranty shall include any part of equipment, units or structures furnished hereunder that show the works under normal operating conditions and/or for the purpose of which they were intended.

.2 The Contractor shall, at his own expense, promptly investigate any mechanical or control malfunction, and repair or replace all such defective work, and all other damages thereby which becomes defective during the time of the guaranty-warranty.

## **13. SUBSTANTIAL PERFORMANCE INSPECTION**

.1 Prior to the Contractor requesting an inspection for substantial performance all the following items must be provided to permit beneficial use by the Owner.

- .1 Comply with requirements in General Contract conditions.
- .2 A complete list of items that the Contractor has not finished, or are deficient, shall be provided. If in the opinion of the consultant, this list indicates the project is excessively incomplete, a substantial completion inspection will not be performed.
- .3 The Contractor shall be fully responsible to accumulate all necessary data from his sub-trades and suppliers and present same in the specified format for the approval by the consultant.

## **14. LAWS, NOTICES, PERMITS AND FEES**

.1 Give all necessary notices, obtain all necessary permits and pay all fees in order that the work specified may be carried out, and furnish any certificates necessary as evidence that the work installed conforms with the law and regulations of all authorities having jurisdiction.

.2 All work shall be in accordance with the regulations of the following authoritative bodies, the codes in effect at the time of tender, and any others having jurisdiction:

- .1 Fire Marshall
- .2 Canadian Electrical Code
- .3 Worker's Compensation Board
- .4 Canadian Standards Association
- .5 National Plumbing Code

## **15. INSPECTION**

.1 The Consultant or his representative may choose to inspect all work prior to it being concealed. All work shall be approved by any other regulatory body having jurisdiction. All piping below ground must be approved prior to covering. All piping in wall spaces must be

approved prior to boarding. All openings shall be sealed appropriately in particular in fire rated walls and floors. Sealing shall be approved prior to covering.

.2 Provide a minimum of 48 hours notice to consultant for required inspection.

**B. SECTION 15500 HEATING, VENTILATION AND AIR CONDITIONING**

**1. DOOR GRILLE**

- .1 Install door grille on Formaldehyde Room.
- .2 Cut opening in door to suite new door grille.
- .3 Install backing in door as required at cut.
- .4 Install the following grille:
  - .1 Manufacturer: Price
  - .2 Model: ATGH/BF/B15
  - .3 Size: 500mmx400mm
  - .4 Description: Heavy duty aluminum door grille with 33mm flat border, two sides, counter sunk screw holes and aluminum powder coat finish.

**2. DUCTING**

- .1 Ductwork shall be galvanized steel, lock formed 2" W.G. SMACNA Standard for low velocity and medium velocity ductwork quality. Fabricated in accordance with SMACNA duct manuals and ASHRAE handbooks. Ductwork shall meet the requirements of NFPA 90A, 91 and 96 and conform to applicable codes.
- .2 All ductwork and equipment installed shall be free of scale, debris and dirt. During construction, cover all duct and equipment openings with polyethylene or equivalent to prevent the entry of dirt or dust. Any ductwork or equipment which is not sufficiently clean shall be cleaned using vacuum cleaners, brushes, and/or non-toxic solvents. Ensure duct dust covers are removed prior to system startup.

END OF RFQ

**A. SECTION 15010 GENERAL MECHANICAL PROVISIONS**

**1. CONFORMANCE**

- .1 Conform to terms and conditions of the General Contract Document.

**2. SCOPE**

- .1 Replace existing faucet on janitor's sink as indicated herein.
- .2 Provide complete, fully tested and operational mechanical systems to meet the requirements described herein and in complete accordance with applicable codes and ordinances.
- .3 Contract documents of this division are diagrammatic and approximately to scale unless detailed otherwise. They establish scope, material and installation quality and are not detailed installation instructions.
- .4 Follow manufacturer's recommended installation details and procedures for equipment, supplemented by requirements of contract documents.
  - .1 Install equipment generally in locations and routes shown close to building structure with minimum interference with other services or free space. Remove and replace improperly installed equipment to the satisfaction of the Consultant at no extra cost.
- .5 Connect into existing systems with minimum disruption to the existing systems.
- .6 Work shall be coordinated with the owner seven days prior to work commencing.
- .7 Field verify all building and site dimensions prior to any fabrication and installation of equipment or materials. No additional charge shall be entertained for failure to verify these dimensions on site.

**3. MATERIALS**

- .1 Materials and equipment installed shall be new, full weight and of quality specified. Use same brand or manufacturer for each specified application.
- .2 Each major component of equipment shall bear manufacturer's name, address, catalog and serial number in a conspicuous place.
- .3 Equipment, pipe and fittings shall be CSA listed and ULC approved.

**4. TESTING**

- .1 Perform necessary tests on equipment including those required by authorities having jurisdiction and certificate of approval obtained.

## **5. SHOP DRAWINGS**

- .1 Submit shop drawings for every piece of mechanical equipment.
- .2 Identify materials and equipment by manufacturer, trade name and model number. Include copies of applicable brochure or catalog material. Do not assume applicable catalogues are available in the consultant's office. Maintenance and operating manuals are not suitable submittal material.
- .3 Clearly mark submittal material using arrows, underlining or circling to show differences from specified, e.g. Ratings, capabilities and options being proposed. Cross out non-applicable material.
- .4 Include dimensional and technical data sufficient to check if equipment meets requirements.
- .5 Installed materials and equipment shall meet specified requirements regardless of whether or not shop drawings are reviewed by the Consultant.
- .6 Shop drawings not requested will not be reviewed and processed by the Consultant.
- .7 Do not order equipment or material until the Consultant has reviewed and returned shop drawings.
- .8 Shop drawings shall be endorsed by the General Contractor and Mechanical Sub-Contractor indicating that the shop drawings have been reviewed and submitted without qualifications.
- .9 Submit one electronic (pdf) copy of shop drawings within fourteen (14) days after award of contract.

## **6. STANDARDS OF MATERIALS, EQUIPMENT AND INSTALLATION**

- .1 Equipment used shall not exceed space limitations in any dimension. Replace any equipment or apparatus that does not meet this specification at no cost. Assume full responsibility for the expense of redesign and adjustment to other parts of the building when proposing the use of approved equal or alternate equipment.
- .2 Provide equipment from the specified manufacturers. All mechanical equipment shall have the approved manufacturers name permanently affixed to it.
- .3 Equipment on alternate & approved manufacturers list must be equal in quality and performance to the model specified. Equipment, which is not equal, will be replaced with the specified equipment at no cost to the Owner.
- .4 Provide following when required:

<u>ITEMS</u>	<u>APPROVED MANUFACTURER</u>
Plumbing Trim	Cambridge, Delta, Moen, Chicago
<b>7. CONNECTION AND INTERRUPTION TO EXISTING SYSTEMS</b>	
.1	Coordinate with owner all shut downs and connections to existing equipment.
<b>8. LIABILITY</b>	
.1	Assume full responsibility for laying out the work and for any damage caused to the owner of other trades by improper location, or carrying out of the work.
.2	Be responsible for prompt installation of his work in advance of concrete pouring or similar work. Provide and set sleeves where required. Should any cutting or repairing of either unfinished or finished work be required, this contractor shall direct the particular sub-contractor whose work is involved to do such cutting and repairing without expense to the owner. Before being undertaken, such work shall be laid out for the consultant's review.
.3	Examine the site and the local conditions affecting work under this contract. Examine carefully the mechanical, electrical, structural and architectural drawings and confirm that the work under this contract can be satisfactorily carried out without changes to the building as shown on these plans. Before commencing the work, examine the work of the other trades and report at once any defect of interference affecting the work of this section, of the guarantee of same. No extras will be subsequently allowed to cover any such error, omission or oversight on the thorough inspection of the grounds, building, conditions, etc.
.4	Arrange work in co-operation with other trades in the building in such a manner as not to interfere with other work being carried on in the building and places where other pipes and equipment be installed along with the pipes and ducts pertaining to this trade. Co-operate with the other trades to get all the pipes, ducts, conduit, etc., installed to the best advantage.
.5	Where any pipes, ducts and equipment must be built into the work of other trades such as masonry, structural, or plastering, be responsible for supplying the equipment to be built in or measurements to allow the necessary openings to be left. All pipes and ducts which are to be concealed shall be installed neatly and closely to the building structure so that the necessary furring can be kept as small as possible. Any pipes, ducts, or other work which are not, in the opinion of the consultant, installed as they should be, shall be taken out and replaced without cost to the owner.
.6	Protect finished and unfinished work from damage due to the carrying out of his work, giving special attention to the protection of building vapour barriers, waterproof membranes, etc. Cover floors and other parts of the building with tarpaulins, etc., and repair all damage to the satisfaction of the owner and the

consultant. During freezing weather, protect all his materials in such a manner that no harm can be done to installation already made and/or to materials and equipment on the job.

- .7 Be responsible for the condition of all materials and equipment supplied and shall provide all necessary protection for same.
- .8 Be responsible for the protection and maintenance of the work of this section until the building has been completed and accepted by the Owner. Be responsible for the sorting of his material inside and out of the way, and to clean up all refuse caused by his work to meet Consultant's review.
- .9 On completion of the work, all tools, surplus and waste materials shall be removed and the work left in a clean condition.

#### **9. LIABILITY INSURANCE**

- .1 This contractor shall maintain such insurance as will fully protect both the owner and himself from any and all claims, all as noted within the general conditions and supplementary general conditions. When requested the contractor shall provide and show proof of, at his expense, comprehensive general liability insurance of not less than \$2,000,000.00 Including non-owned car coverage, contractual liability and containing a cross liability clause. Coverage shall include loss or damage the contractor may cause to any work, building, equipment, and structural, on the owner's property. The insurance may contain a deductible cause not to exceed \$500.00.
- .2 The Contractor shall carry full employee's liability insurance for the whole of the work in accordance with the workers' compensation act.

#### **10. GUARANTEE WARRANTY**

- .1 This contractor shall furnish a warranty for all work executed under this division will be free from defects of material and workmanship for a period of one (1) year from the date of substantial performance, which shall include one (1) complete summer and one (1) complete winter of uninterrupted operation. Warranty shall include any part of equipment, units or structures furnished hereunder that show the works under normal operating conditions and/or for the purpose of which they were intended.
- .2 The Contractor shall, at his own expense, promptly investigate any mechanical or control malfunction, and repair or replace all such defective work, and all other damages thereby which becomes defective during the time of the guaranty-warranty.

#### **11. SUBSTANTIAL PERFORMANCE INSPECTION**

- .1 Prior to the Contractor requesting an inspection for substantial performance all the following items must be provided to permit beneficial use by the Owner.

- .1 Comply with requirements in General Contract conditions.
- .2 A complete list of items that the Contractor has not finished, or are deficient, shall be provided. If in the opinion of the consultant, this list indicates the project is excessively incomplete, a substantial completion inspection will not be performed.
- .3 The Contractor shall be fully responsible to accumulate all necessary data from his sub-trades and suppliers and present same in the specified format for the approval by the consultant.

## **12. LAWS, NOTICES, PERMITS AND FEES**

- .1 Give all necessary notices, obtain all necessary permits and pay all fees in order that the work specified may be carried out, and furnish any certificates necessary as evidence that the work installed conforms with the law and regulations of all authorities having jurisdiction.
- .2 All work shall be in accordance with the regulations of the following authoritative bodies, the codes in effect at the time of tender, and any others having jurisdiction:
  - .1 Worker's Compensation Board
  - .2 Canadian Standards Association
  - .3 National Plumbing Code

## **13. DEMONSTRATION AND INSTRUCTION TO OWNER**

- .1 Demonstrate to and instruct the representative designated by the Owner on the complete systems operating and maintenance procedures.

## **14. INSPECTION**

- .1 The Consultant or his representative may choose to inspect all work prior to it being concealed. All work shall be approved by any other regulatory body having jurisdiction. All piping below ground must be approved prior to covering. All piping in wall spaces must be approved prior to boarding. All openings shall be sealed appropriately in particular in fire rated walls and floors. Sealing shall be approved prior to covering.
- .2 Provide a minimum of 48 hours notice to consultant for required inspection.

## **B. SECTION 15400 PLUMBING**

- .1 Scope of Work:
  - .1 Remove existing faucet.
  - .2 Install the following faucet:
    - .1 Chicago Faucets

Mactaquac Biodiversity Facility  
**Janitors Room Faucet Replacement**  
March 31, 2016

	.2	895-L8BVVE2-2CP
	.3	Description: deck mounted, 100mm fixed centre sink faucet with 200mm L-type swing spout with vacuum breaker, 60mm (2-3/8") lever handles, compression cartridge.
.2		To comply with National Plumbing Code and local municipality requirements.
.3		Inform the engineer immediately if any changes are required.
.4		Provide stop valve to all equipment and plumbing fixture connection. Provide stop valve to base of water risers.


END OF RFQ

REGISTERED PROFESSIONAL ENGINEER  
Province of New Brunswick

M6525  
Matthew Peachman

*Matthew Peachman*  
Signature  
April 1st 2016  
Date

Province du Nouveau-Brunswick  
INGÉNIEUR IMMATRICULÉ

		Date APR 01/16	Scale 1:500	Designed MP	Drawn PA	Checked MP	Approved MP	CBCL No. 162810.00	Contract —
		 <b>CBCL LIMITED</b> <u>Consulting Engineers</u>			FISH POND VENTILATION UPGRADE				Drawing  <b>M1</b>
					MECHANICAL SITE PLAN				
0	ISSUED FOR TENDER								
No.	Description								



A. SECTION 15010 GENERAL MECHANICAL PROVISIONS

1. CONFORMANCE:

- .1 CONFORM TO TERMS AND CONDITIONS OF THE GENERAL CONTRACT DOCUMENT.

2. SCOPE:

- .1 PROVIDE COMPLETE, FULLY TESTED AND OPERATIONAL MECHANICAL SYSTEMS TO MEET THE REQUIREMENTS DESCRIBED HEREIN AND IN COMPLETE ACCORDANCE WITH APPLICABLE CODES AND ORDINANCES.
- .2 CONTRACT DOCUMENTS OF THIS DIVISION AND DRAWINGS ARE DIAGRAMMATIC AND APPROXIMATELY TO SCALE UNLESS DETAILED OTHERWISE. THEY ESTABLISH SCOPE, MATERIAL AND INSTALLATION QUALITY AND ARE NOT DETAILED INSTALLATION INSTRUCTIONS.
- .3 FOLLOW MANUFACTURER'S RECOMMENDED INSTALLATION DETAILS AND PROCEDURES FOR EQUIPMENT, SUPPLEMENTED BY REQUIREMENTS OF CONTRACT DOCUMENTS.
- .1 INSTALL EQUIPMENT GENERALLY IN LOCATIONS AND ROUTES SHOWN CLOSE TO BUILDING STRUCTURE WITH MINIMUM INTERFERENCE WITH OTHER SERVICES OR FREE SPACE. REMOVE AND REPLACE IMPROPERLY INSTALLED EQUIPMENT TO THE SATISFACTION OF THE CONSULTANT AT NO EXTRA COST.
- .2 THE DRAWINGS INDICATE THE GENERAL LOCATION AND ROUTE TO BE FOLLOWED BY DUCTWORK. WHERE DETAILS ARE NOT SHOWN ON THE DRAWINGS OR ONLY SHOWN DIAGRAMMATICALLY, THE PIPES AND DUCTWORK SHALL BE INSTALLED IN SUCH A WAY AS TO CONSERVE HEADROOM AND INTERFERE AS LITTLE AS POSSIBLE WITH THE FREE USE OF SPACE THROUGH WHICH THEY PASS. ALL DUCT AND PIPES AT CEILING SHALL BE KEPT AS TIGHT AS POSSIBLE TO BEAMS OR OTHER LIMITING MEMBERS AT HIGH END.
- .3 CONNECT TO EQUIPMENT SPECIFIED IN OTHER SECTIONS AND TO EQUIPMENT SUPPLIED AND INSTALLED BY OTHER CONTRACTORS OR BY THE OWNER. UNCRATE EQUIPMENT, MOVE IN PLACE AND INSTALL COMPLETE; START-UP AND TEST.
- .4 CONNECT INTO EXISTING SYSTEMS WITH MINIMUM DISRUPTION TO THE EXISTING SYSTEMS.
- .5 WORK SHALL BE COORDINATED WITH THE OWNER SEVEN DAYS PRIOR TO WORK COMMENCING.
- .6 FIELD VERIFY ALL BUILDING AND SITE DIMENSIONS PRIOR TO ANY FABRICATION AND INSTALLATION OF EQUIPMENT OR MATERIALS. NO ADDITIONAL CHARGE SHALL BE ENTERTAINED FOR FAILURE TO VERIFY THESE DIMENSIONS ON SITE.
- .7 THE WORK SHALL INCLUDE BUT NOT LIMIT TO THE FOLLOWING:
- .1 COMPLETE HEATING/VENTILATING/AIR CONDITIONING INSTALLATION.
- .2 COMPLETE AUTOMATIC CONTROL AND RELATED WIRING INSTALLATION.
- .3 COMMISSIONING.

3. MATERIALS

- .1 MATERIALS AND EQUIPMENT INSTALLED SHALL BE NEW, FULL WEIGHT AND OF QUALITY SPECIFIED. USE SAME BRAND OR MANUFACTURER FOR EACH SPECIFIED APPLICATION.
- .2 STATICALLY AND DYNAMICALLY BALANCE ROTATING EQUIPMENT FOR MINIMUM VIBRATION AND LOW OPERATING NOISE LEVEL.
- .3 EACH MAJOR COMPONENT OF EQUIPMENT SHALL BEAR MANUFACTURER'S NAME, ADDRESS, CATALOG AND SERIAL NUMBER IN A CONSPICUOUS PLACE.
- .4 FITTINGS SHALL BE OF APPROVED MATERIALS AND MEET CODES HAVING JURISDICTION.
- .6 EQUIPMENT SHALL BE CSA LISTED AND ULC APPROVED.
- .7 PROVIDE AND INSTALL DUCT SUPPORTS AND HANGERS TO SMACNA STANDARDS.

4. TESTING

- .1 PERFORM NECESSARY TESTS ON EQUIPMENT INCLUDING THOSE REQUIRED BY AUTHORITIES HAVING JURISDICTION AND CERTIFICATE OF APPROVAL OBTAINED.
- .2 PERFORM APPROVED TESTS ON ALL DUCTWORK SYSTEMS, OBTAIN AND SUBMIT CERTIFICATES OF APPROVAL AND ACCEPTANCE.

5. CUTTING AND PATCHING

- .1 PROVIDE HOLES AND SLEEVES, CUTTING AND FITTING REQUIRED FOR MECHANICAL WORK. RELOCATE IMPROPERLY LOCATED HOLES AND SLEEVES.
- .2 DRILL FOR EXPANSION BOLTS, HANGER RODS, BRACKETS, AND SUPPORTS.
- .3 REPAIR BUILDING WHERE DAMAGED FROM EQUIPMENT INSTALLATION, IMPROPERLY LOCATED HOLES, ETC., BY THIS SECTION OF THE WORK. THE SPECIALIST TRADE AT THE EXPENSE OF THIS SECTION OF WORK SHALL CARRY OUT THIS REPAIR. USE MATCHING MATERIALS AS SPECIFIED IN THE RESPECTIVE SECTIONS.

6. SHOP DRAWINGS

- .1 SUBMIT SHOP DRAWINGS FOR EVERY PIECE OF MECHANICAL EQUIPMENT.
- .2 IDENTIFY MATERIALS AND EQUIPMENT BY MANUFACTURER, TRADE NAME AND MODEL NUMBER. INCLUDE COPIES OF APPLICABLE BROCHURE OR CATALOG MATERIAL. DO NOT ASSUME APPLICABLE CATALOGUES ARE AVAILABLE IN THE CONSULTANT'S OFFICE. MAINTENANCE AND OPERATING MANUALS ARE NOT SUITABLE SUBMITTAL MATERIAL.
- .3 CLEARLY MARK SUBMITTAL MATERIAL USING ARROWS, UNDERLINING OR CIRCLING TO SHOW DIFFERENCES FROM SPECIFIED, E.G. RATINGS, CAPABILITIES AND OPTIONS BEING PROPOSED. CROSS OUT NON-APPLICABLE MATERIAL. SPECIFICALLY NOTE ON THE SUBMITTAL SPECIFIED FEATURES SUCH AS SPECIAL TANK LININGS, PUMPS, SEALS, MATERIAL, OR PAINTING.
- .4 INCLUDE DIMENSIONAL AND TECHNICAL DATA SUFFICIENT TO CHECK IF EQUIPMENT MEETS REQUIREMENTS. INCLUDE WIRING, PIPING, AND SERVICE CONNECTION DATA AND MOTOR SIZES.
- .5 INSTALLED MATERIALS AND EQUIPMENT SHALL MEET SPECIFIED REQUIREMENTS REGARDLESS OF WHETHER OR NOT SHOP DRAWINGS ARE REVIEWED BY THE CONSULTANT.
- .6 SHOP DRAWINGS NOT REQUESTED WILL NOT BE REVIEWED AND PROCESSED BY THE CONSULTANT.
- .7 DO NOT ORDER EQUIPMENT OR MATERIAL UNTIL THE CONSULTANT HAS REVIEWED AND RETURNED SHOP DRAWINGS.
- .8 SHOP DRAWINGS SHALL BE ENDORSED BY THE GENERAL CONTRACTOR AND MECHANICAL SUB-CONTRACTOR INDICATING THAT THE SHOP DRAWINGS HAVE BEEN REVIEWED AND SUBMITTED WITHOUT QUALIFICATIONS.
- .9 SUBMIT DIGITAL COPIES OF SHOP DRAWINGS WITHIN FOURTEEN (14) DAYS AFTER AWARD OF CONTRACT.
- .10 SUBMIT WEIGHTS OF ALL MAJOR EQUIPMENT FOR REVIEW SUCH THAT THE APPROPRIATE CONSULTANT CAN REVIEW THE LOADS.

7. STANDARDS OF MATERIALS, EQUIPMENT AND INSTALLATION

- .1 EQUIPMENT USED SHALL NOT EXCEED SPACE LIMITATIONS IN ANY DIMENSION. REPLACE ANY EQUIPMENT OR APPARATUS THAT DOES NOT MEET THIS SPECIFICATION AT NO COST. ASSUME FULL RESPONSIBILITY FOR THE EXPENSE OF REDESIGN AND ADJUSTMENT TO OTHER PARTS OF THE BUILDING WHEN PROPOSING THE USE OF APPROVED EQUAL OR ALTERNATE EQUIPMENT.
- .2 PROVIDE EQUIPMENT FROM THE SPECIFIED MANUFACTURERS. ALL MECHANICAL EQUIPMENT SHALL HAVE THE APPROVED MANUFACTURERS NAME PERMANENTLY AFFIXED TO IT.
- .3 EQUIPMENT ON ALTERNATE & APPROVED MANUFACTURERS LIST MUST BE EQUAL IN QUALITY AND PERFORMANCE TO THE MODEL SPECIFIED. EQUIPMENT, WHICH IS NOT EQUAL, WILL BE REPLACED WITH THE SPECIFIED EQUIPMENT AT NO COST TO THE OWNER.
- .4 THE EQUIPMENT MANUFACTURER SHALL ENSURE THAT THE STRENGTH AND ANCHORAGE OF THE INTERNAL COMPONENTS OF THE EQUIPMENT EXCEEDS THE FORCE LEVEL USED TO RESTRAIN AND ANCHOR THE UNIT ITSELF TO THE SUPPORTING STRUCTURE.

.5 PROVIDE FOLLOWING WHEN REQUIRED:

ITEMS	APPROVED MANUFACTURER
DAMPER - LOW LEAKAGE	AMERICAN WARMING, TAMCO
FANS	GREENHECK, DELHI, PENN, BROAN, COOK, NUTONE, LAU, ACME, TWIN CITY, SOLER & PALAU
LOUVRES	AIROLITE, WESTVENT, RUSKIN, VENTEX/ALUMIAVENT, CANARM
GRILLES, DIFFUSERS & REGISTERS	E.H. PRICE, NAILOR, TITUS, KRUEGER, TUTTLE & BAILEY

8. PERFORMANCE VERIFICATION OF INSTALLED EQUIPMENT

- .1 INSTALLED MECHANICAL EQUIPMENT WHOSE PERFORMANCE IS QUESTIONED BY THE CONSULTANT, MAY BE SUBJECT TO PERFORMANCE VERIFICATION AS SPECIFIED HEREIN.
- .2 WHEN PERFORMANCE VERIFICATION IS REQUESTED, EQUIPMENT SHALL BE TESTED TO DETERMINE COMPLIANCE WITH SPECIFIED PERFORMANCE REQUIREMENTS.
- .3 THE CONSULTANT SHALL APPROVE TESTING PROCEDURES.
- .4 SHOULD TEST RESULTS REVEAL THAT EQUIPMENT DOES NOT MEET SPECIFIED PERFORMANCE REQUIREMENTS, EQUIPMENT WILL BE REJECTED AND THE FOLLOWING SHALL APPLY:
- .5 REMOVE REJECTED EQUIPMENT. REPLACE WITH EQUIPMENT THAT MEETS REQUIREMENTS OF CONTRACT DOCUMENTS INCLUDING SPECIFIED PERFORMANCE REQUIREMENTS.
- .1 REPLACEMENT EQUIPMENT WILL BE SUBJECT TO PERFORMANCE VERIFICATION AS WELL, USING SAME TESTING PROCEDURES ON ORIGINALLY INSTALLED EQUIPMENT.
- .2 CONTRACTOR SHALL PAY ALL COSTS RESULTING FROM PERFORMANCE VERIFICATION PROCEDURE.

9. OPERATING AND MAINTENANCE DATA

- .1 INSTRUCT THE BUILDING OPERATORS IN THE OPERATION AND PREVENTATIVE MAINTENANCE OF EACH PIECE OF EQUIPMENT AND SYSTEM SUPPLIED AND INSTALLED. COMPLETE AND TURN OVER DOCUMENTATION PRIOR TO SUBSTANTIAL PERFORMANCE.
- .2 SUBMIT 3 SETS O & M MANUAL IN 3-RING BINDERS, TO INCLUDE THE FOLLOWING:
- .1 DESCRIPTION OF OPERATION.
- .2 SHOP DRAWING OF ALL EQUIPMENT.
- .3 EXTENDED WARRANTIES.
- .4 MAINTENANCE AND OPERATION INSTRUCTIONS.
- .5 LIST OF MANUFACTURERS SOURCE AND TRADE NAMES.
- .6 NAME OF ENGINEER AND MECHANICAL CONTRACTOR AND PHONE NUMBER.
- .7 COPY OF RECORD DRAWING.
- .8 LIST OF INSPECTION CERTIFICATES.

10. RECORD DRAWINGS

- .1 THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND KEEP ONE SET OF WHITE PRINTS, INCLUDING REVISION DRAWINGS, IN JOB SITE OFFICE.
- .2 THE RECORD DRAWINGS SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING CHANGES AND SHALL BE RECORDED DAILY:
- .1 SIZE, LOCATION, ARRANGEMENT, ROUTE AND EXTENT OF DUCTWORK, CONDUIT, EQUIPMENT, ETC., ABOVE AND BELOW GRADE INSIDE THE BUILDING.
- .2 ALL CHANGES WHICH AFFECT THE OPERATION OF THE MECHANICAL SYSTEM.
- .3 THE AS-BUILT DAILY MARKED-UP PRINTS SHALL CONFORM TO THE STANDARDS OF THE CONTRACT DRAWINGS AND SHALL INCLUDE ALL DETAILS FROM REVISION DRAWINGS, SUPPLEMENTARY DRAWINGS, CHANGE ORDERS, ADDENDA AND SITE REVISIONS, ETC.



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APR 01/16	NTS	MP	PA	MP	MP	162810.00	—
<div><div>CBC</div><div>L</div><div>CBCL LIMITED</div><div>Consulting Engineers</div></div>		FISH POND VENTILATION UPGRADE				Drawing  M3	
		SPECIFICATIONS (1 OF 4)					

UNAWING NAME: N. V. RAOUL C. ZUO 19201000 MARCAQUA DUBUQUE 111 1 AUG 11 1920 00 1311 FUND VLIN1 MI-MO.DWG LATLONG NAME: M4 FLV MAIL-MUIC1-30-10-10-37-29 FM VAW OFFICIAL: FINLAND

- .4. ARRANGE WORK IN CO-OPERATION WITH OTHER TRADES IN THE BUILDING IN SUCH A MANNER AS NOT TO INTERFERE WITH OTHER WORK BEING CARRIED ON IN THE BUILDING AND PLACES WHERE OTHER PIPES AND EQUIPMENT BE INSTALLED ALONG WITH THE PIPES AND DUCTS PERTAINING TO THIS TRADE. CO-OPERATE WITH THE OTHER TRADES TO GET ALL THE PIPES, DUCTS, CONDUIT, ETC., INSTALLED TO THE BEST ADVANTAGE.
- .5. WHERE ANY PIPES, DUCTS AND EQUIPMENT MUST BE BUILT INTO THE WORK OF OTHER TRADES SUCH AS MASONRY, STRUCTURAL, OR PLASTERING, BE RESPONSIBLE FOR SUPPLYING THE EQUIPMENT TO BE BUILT IN OR MEASUREMENTS TO ALLOW THE NECESSARY OPENINGS TO BE LEFT. ALL PIPES AND DUCTS WHICH ARE TO BE CONCEALED SHALL BE INSTALLED NEATLY AND CLOSELY TO THE BUILDING STRUCTURE SO THAT THE NECESSARY FURRING CAN BE KEPT AS SMALL AS POSSIBLE. ANY PIPES, DUCTS, OR OTHER WORK WHICH ARE NOT, IN THE OPINION OF THE CONSULTANT, INSTALLED AS THEY SHOULD BE, SHALL BE TAKEN OUT AND REPLACED WITHOUT COST TO THE OWNER.
- .6. PROTECT FINISHED AND UNFINISHED WORK FROM DAMAGE DUE TO THE CARRYING OUT OF HIS WORK, GIVING SPECIAL ATTENTION TO THE PROTECTION OF BUILDING VAPOUR BARRIERS, WATERPROOF MEMBRANES, ETC. COVER FLOORS AND OTHER PARTS OF THE BUILDING WITH TARPULINS, ETC., AND REPAIR ALL DAMAGE TO THE SATISFACTION OF THE OWNER AND THE CONSULTANT. DURING FREEZING WEATHER, PROTECT ALL HIS MATERIALS IN SUCH A MANNER THAT NO HARM CAN BE DONE TO INSTALLATION ALREADY MADE AND/OR TO MATERIALS AND EQUIPMENT ON THE JOB.
- .7. BE RESPONSIBLE FOR THE CONDITION OF ALL MATERIALS AND EQUIPMENT SUPPLIED AND SHALL PROVIDE ALL NECESSARY PROTECTION FOR SAME.
- .8. BE RESPONSIBLE FOR THE PROTECTION AND MAINTENANCE OF THE WORK OF THIS SECTION UNTIL THE BUILDING HAS BEEN COMPLETED AND ACCEPTED BY THE OWNER. BE RESPONSIBLE FOR THE SORTING OF HIS MATERIAL INSIDE AND OUT OF THE WAY, AND TO CLEAN UP ALL REFUSE CAUSED BY HIS WORK TO MEET CONSULTANT'S REVIEW.
- .9. ON COMPLETION OF THE WORK, ALL TOOLS, SURPLUS AND WASTE MATERIALS SHALL BE REMOVED AND THE WORK LEFT IN A CLEAN CONDITION.

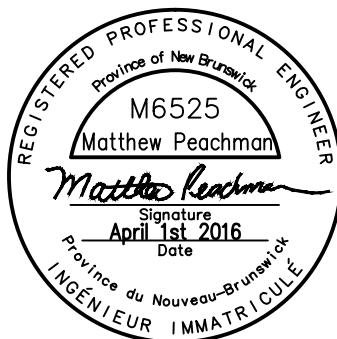
## LIABILITY INSURANCE

- .1 THIS CONTRACTOR SHALL MAINTAIN SUCH INSURANCE AS WILL FULLY PROTECT BOTH THE OWNER AND HIMSELF FROM ANY AND ALL CLAIMS, ALL AS NOTED WITHIN THE GENERAL CONDITIONS AND SUPPLEMENTARY GENERAL CONDITIONS. WHEN REQUESTED THE CONTRACTOR SHALL PROVIDE AND SHOW PROOF OF, AT HIS EXPENSE, COMPREHENSIVE GENERAL LIABILITY INSURANCE OF NOT LESS THAN \$2,000,000.00 INCLUDING NON-OWNED CAR COVERAGE, CONTRACTUAL LIABILITY AND CONTAINING A CROSS LIABILITY CLAUSE. COVERAGE SHALL INCLUDE LOSS OR DAMAGE THE CONTRACTOR MAY CAUSE TO ANY WORK, BUILDING, EQUIPMENT, AND STRUCTURAL, ON THE OWNER'S PROPERTY. THE INSURANCE MAY CONTAIN A DEDUCTIBLE CAUSE NOT TO EXCEED \$500.00.
- .2 THE CONTRACTOR SHALL CARRY FULL EMPLOYEE'S LIABILITY INSURANCE FOR THE WHOLE OF THE WORK IN ACCORDANCE WITH THE WORKERS' COMPENSATION ACT.

## 18. GUARANTEE WARRANTY

- .1 THIS CONTRACTOR SHALL FURNISH A WARRANTY FOR ALL WORK EXECUTED UNDER THIS DIVISION WILL BE FREE FROM DEFECTS OF MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL PERFORMANCE, WHICH SHALL INCLUDE ONE (1) COMPLETE SUMMER AND ONE (1) COMPLETE WINTER OF UNINTERRUPTED OPERATION. WARRANTY SHALL INCLUDE ANY PART OF EQUIPMENT, UNITS OR STRUCTURES FURNISHED HEREUNDER THAT SHOW THE WORKS UNDER NORMAL OPERATING CONDITIONS AND/OR FOR THE PURPOSE OF WHICH THEY WERE INTENDED.

- .1 THE CONSULTANT OR HIS REPRESENTATIVE MAY CHOOSE TO INSPECT ALL WORK PRIOR TO IT BEING CONCEALED. ALL WORK SHALL BE APPROVED BY ANY OTHER REGULATORY BODY HAVING JURISDICTION. ALL PIPING BELOW GROUND MUST BE APPROVED PRIOR TO COVERING. ALL PIPING IN WALL SPACES MUST BE APPROVED PRIOR TO BOARDING. ALL OPENINGS SHALL BE SEALED APPROPRIATELY IN PARTICULAR IN FIRE RATED WALLS AND FLOORS. SEALING SHALL BE APPROVED PRIOR TO COVERING.
- .2 PROVIDE A MINIMUM OF 48 HOURS NOTICE TO CONSULTANT FOR REQUIRED INSPECTION.

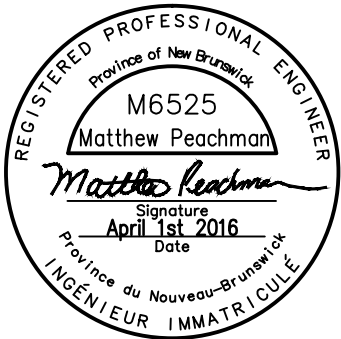


		Date APR 01/16	Scale NTS	Designed MP	Drawn PA	Checked MP	Approved MP	CBCL No. 162810.00	Contract —
		<div><div>CBCL</div><div>CBCL LIMITED</div><div>Consulting Engineers</div></div>		FISH POND VENTILATION UPGRADE					Drawing  <b>M4</b>
				SPECIFICATIONS (2 OF 4)					
0	ISSUED FOR TENDER								
No.	Description								

B. SECTION 15500 HEATING, VENTILATION AND AIR CONDITIONING

1. DUCTING

- .1 DUCTWORK SHALL BE GALVANIZED STEEL, LOCK FORMED 2" W.G. SMACNA STANDARD FOR LOW VELOCITY AND MEDIUM VELOCITY DUCTWORK QUALITY. FABRICATED IN ACCORDANCE WITH SMACNA DUCT MANUALS AND ASHRAE HANDBOOKS. DUCTWORK SHALL MEET THE REQUIREMENTS OF NFPA 90A, 91 AND 96 AND CONFORM TO APPLICABLE CODES.
- .2 PRIOR TO FABRICATION OF DUCTWORK, CHECK ALL CEILING SPACES AND HEIGHTS AND CONFLICTS WITH OTHER TRADES. INCLUDE AND PROVIDE NECESSARY OFFSET TO MAINTAIN CEILING HEIGHT, HEADROOM ETC.
- .3 ALL DUCTWORK PENETRATING FIRE RATED FLOOR SLABS ABOVE AND BELOW OR FIRE SEPARATIONS SHALL BE COMPLETE WITH FIRE DAMPERS AND ACCESS DOORS.
- .4 PROVIDE BALANCING DAMPERS WHERE INDICATED ON DRAWINGS AND AT ALL DUCT BRANCHES. SUCH DAMPER LOCATION MAY NOT BE SHOWN ON DRAWINGS.
- .5 SIZE ROUND DUCTS, INSTALLED IN PLACE OF RECTANGULAR DUCTS, FROM ASHRAE TABLE OF EQUIVALENT RECTANGULAR AND ROUND DUCTS. NO VARIATION OF DUCT CONFIGURATION OR SIZES PERMITTED EXCEPT BY PERMISSION FROM CONSULTANT.
- .6 ALL FANS AND AIR CONDITIONING UNITS SHALL BE MOUNTED WITH VIBRATION ISOLATION.
- .7 PROVIDE BACK DRAFT DAMPER TO ALL EXHAUST OUTLETS TO EXTERIOR.
- .8 PROVIDE STAINLESS STEEL SCREEN, 12 MM SQUARE MESH FOR EXTERIOR INTAKE & EXHAUST OUTLETS UNLESS OTHERWISE NOTED.
- .9 PROVIDE FLASHING, CURB AND COUNTER FLASHING FOR ALL DUCTING PASSING THROUGH ROOF AND EXTERNAL ENVELOPE OF THE BUILDING.
- .10 ALL DUCTWORK AND EQUIPMENT INSTALLED SHALL BE FREE OF SCALE, DEBRIS AND DIRT. DURING CONSTRUCTION, COVER ALL DUCT AND EQUIPMENT OPENINGS WITH POLYETHYLENE OR EQUIVALENT TO PREVENT THE ENTRY OF DIRT OR DUST. ANY DUCTWORK OR EQUIPMENT WHICH IS NOT SUFFICIENTLY CLEAN SHALL BE CLEANED USING VACUUM CLEANERS, BRUSHES, AND/OR NON-TOXIC SOLVENTS. ENSURE DUCT DUST COVERS ARE REMOVED PRIOR TO SYSTEM STARTUP.



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		SPECIFICATIONS (3 OF 4)					

C. HAZARDOUS MATERIALS

1. GENERAL:

- .1 LEAD-CONTAINING PAINT FINISHES REQUIRING REMOVAL AND DISPOSAL AT AN APPROVED ENGINEERED LANDFILL WITH OPERATOR APPROVAL INCLUDE:
  - .1 THE FISH POND STEEL STRUCTURE.
- .2 IN ORDER TO INSTALL NEW FAN FRAMING MEMBERS AS DESCRIBED ON THE DRAWINGS, NEW HOLES WILL HAVE TO BE DRILLED INTO THE EXISTING FISH POND STEEL STRUCTURE. AS SUCH, LEAD BASED PAINT WILL HAVE TO BE REMOVED AROUND THE AREA TO BE DRILLED.
- .3 A LEACHATE EXTRACTION TEST WAS NOT CONDUCTED ON THE LEAD PAINT FINISH. IT HAS BEEN ASSUMED THAT THE LEAD PAINT IS CONSIDERED LEACHATE TOXIC.
- .4 WORK TO BE CONDUCTED IN ACCORDANCE WITH 'GOVERNMENT OF ONTARIO – GUIDELINE LEAD ON CONSTRUCTION PROJECTS, SEPTEMBER 2004', TYPE 2A OPERATIONS.
- .5 IT IS THE CONTRACTOR’S RESPONSIBILITY TO INCLUDE THE COST OF REMOVING AND DISPOSING OF ALL HAZARDOUS MATERIALS IN THEIR BID PRICE.

2. REFERENCES:

- .1 DEPARTMENT OF JUSTICE CANADA
  - .1 CANADIAN ENVIRONMENTAL PROTECTION ACT, 1999 (CEPA).
- .2 HEALTH CANADA
  - .1 WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS), MATERIAL SAFETY DATA SHEETS (MSDS).
- .3 HUMAN RESOURCES AND SOCIAL DEVELOPMENT CANADA (HRSDC)
  - .1 CANADA LABOUR CODE PART II, – SOR 86-304 – OCCUPATIONAL HEALTH AND SAFETY REGULATIONS.
- .4 TRANSPORT CANADA (TC)
  - .1 TRANSPORTATION OF DANGEROUS GOODS ACT, 1992 (TDGA).
- .5 U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
  - .1 EPA 747-R-95-007-1995, SAMPLING HOUSE DUST FOR LEAD.
- .6 U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES/CENTERS FOR DISEASE CONTROL AND PREVENTION/NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)
  - .1 NIOSH 94-113 – NIOSH MANUAL OF ANALYTICAL METHODS (NMAM), 4TH EDITION (1994).
- .7 U.S. DEPARTMENT OF LABOUR – OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) – TOXIC AND HAZARDOUS SUBSTANCES
  - .1 LEAD IN CONSTRUCTION REGULATION – 29 CFR 1926.62-1993.
- .8 UNDERWRITERS’ LABORATORIES OF CANADA (ULC)
- .9 GOVERNMENT OF NOVA SCOTIA
  - .1 CODE OF PRACTICE: WORKING WITH INORGANIC LEAD, JUNE 17, 2010.
  - .2 WORKING WITH INORGANIC LEAD – AN INFORMATION PACKAGE, AUGUST 2001.
- .10 GOVERNMENT OF ONTARIO – GUIDELINE LEAD ON CONSTRUCTION PROJECTS, SEPTEMBER 2004.

3. HEALTH AND SAFETY:

- .1 EATING, DRINKING, CHEWING, AND SMOKING ARE NOT PERMITTED WHEN HOLDING OR DISPOSING OF HAZARDOUS WASTE.
- .2 VISITOR PROTECTION:
  - .1 PROVIDE PROTECTIVE CLOTHING AND APPROVED RESPIRATORS TO AUTHORIZED VISITORS TO WORK AREAS.
  - .2 INSTRUCT AUTHORIZED VISITORS IN THE USE OF PROTECTIVE CLOTHING AND RESPIRATORS.
  - .3 INSTRUCT AUTHORIZED VISITORS IN PROPER PROCEDURES TO BE FOLLOWED IN ENTERING INTO AND EXITING FROM WORK AREAS.
- .3 CONFIRM PERSONNEL HAVE BEEN TRAINED IN ACCORDANCE WITH WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) REQUIREMENTS.
- .4 REPORT ACCIDENTS IMMEDIATELY TO DFO REPRESENTATIVE. SUBMIT A WRITTEN REPORT TO DFO REPRESENTATIVE WITHIN 24 HOURS OF INCIDENT.

4. PREPARATION:

- .1 PRODUCTS:
  - .1 POLYETHYLENE: 0.15 MM UNLESS OTHERWISE SPECIFIED; IN SHEET SIZE TO MINIMIZE JOINTS.
  - .2 FR POLYETHYLENE: 0.15 MM WOVEN FIBRE REINFORCED FABRIC BONDED BOTH SIDES WITH POLYETHYLENE.
  - .3 TAPE: FIBREGLASS – REINFORCED DUCT TAPE SUITABLE FOR SEALING POLYETHYLENE UNDER DRY CONDITIONS AND WET CONDITIONS USING AMENDED WATER.
  - .4 LEAD WASTE CONTAINERS: METAL TYPE ACCEPTABLE TO DUMP OPERATOR WITH TIGHTLY FITTING COVERS AND 0.15 MM SEALABLE POLYETHYLENE LINERS. LABEL CONTAINERS WITH PRE-PRINTED BILINGUAL CAUTIONARY WARNING LEAD CLEARLY VISIBLE WHEN READY FOR REMOVAL TO DISPOSAL SITE.
- .2 LEAD ABATEMENT WORK AREA:
  - .1 SEAL OFF OPENINGS, CORRIDORS, DOORWAYS, WINDOWS, SKYLIGHTS, DUCTS, GRILLES, AND DIFFUSERS, WITH POLYETHYLENE SHEETING SEALED WITH TAPE.
  - .2 COVER AREAS BELOW WORK AREA WHERE LOOSE AND FLAKING IS TO BE REMOVED WITH FR POLYETHYLENE DROP SHEETS TO COLLECT FLAKING PAINT. PROVIDE ADEQUATE COVERAGE SO AS TO PREVENT ANY FLAKING PAINT FROM ENTERING SURROUNDING AREAS INCLUDING FISH PONDS.
  - .3 AT POINT OF ACCESS TO WORK AREAS INSTALL WARNING SIGNS IN BOTH OFFICIAL LANGUAGES IN UPPER CASE "HELVETICA MEDIUM" LETTERS READING AS FOLLOWS WHERE NUMBER IN PARENTHESES INDICATES FONT SIZE TO BE USED:
    - .1 CAUTION LEAD HAZARD AREA (25 MM).
    - .2 NO UNAUTHORIZED ENTRY (19 MM).
    - .3 WEAR ASSIGNED PROTECTIVE EQUIPMENT AND RESPIRATOR (19 MM).
    - .4 BREATHING LEAD CONTAMINATED DUST CAUSES SERIOUS BODILY HARM (7 MM).
    - .5 MAINTAIN EMERGENCY AND FIRE EXITS FROM LEAD ABATEMENT WORK AREAS, OR ESTABLISH ALTERNATIVE EXITS SATISFACTORY TO AUTHORITY HAVING JURISDICTION.
    - .6 WHERE WATER APPLICATION IS REQUIRED FOR WETTING LEAD CONTAINING MATERIALS, PROVIDE TEMPORARY WATER SUPPLY BY USE OF APPROPRIATELY SIZED HOSES FOR APPLICATION OF WATER AS REQUIRED.
    - .7 PROVIDE ELECTRICAL POWER AND SHUT OFF FOR OPERATION OF POWERED TOOLS AND EQUIPMENT. PROVIDE 24 VOLT SAFETY LIGHTING AND GROUND FAULT INTERRUPTER CIRCUITS ON POWER SOURCE FOR ELECTRICAL TOOLS, IN ACCORDANCE WITH APPLICABLE CSA STANDARD. ENSURE SAFE INSTALLATION OF ELECTRICAL LINES AND EQUIPMENT.

5. REMOVALS:

- .1 PERFORM REMOVAL OF LEAD BASED PAINT BY SCRAPING OR SANDING USING NON-POWERED HAND TOOLS.
- .2 MINIMIZE FOOTPRINT OF WORK AREA SO AS TO NOT DISTURB SURROUNDING LOOSE FLAKING LEAD BASED PAINT AREAS DURING REMOVALS.
- .3 REMOVE LEAD BASED PAINT IN SMALL SECTIONS AND PACK AS IT IS BEING REMOVED IN SEALABLE 0.15 MM PLASTIC BAGS AND PLACE IN LABELLED CONTAINERS FOR TRANSPORT.
- .4 SEAL FILLED CONTAINERS. CLEAN EXTERNAL SURFACES THOROUGHLY BY WET SPONGING. REMOVE FROM IMMEDIATE WORKING AREA TO STAGING AREA. CLEAN EXTERNAL SURFACES THOROUGHLY AGAIN BY WET SPONGING BEFORE MOVING CONTAINERS TO HOLDING ROOM PENDING REMOVAL TO UNLOADING ROOM AND OUTSIDE. REMOVE CONTAINERS FROM HOLDING ROOM BY WORKERS WHO HAVE ENTERED FROM UNCONTAMINATED AREAS DRESSED IN CLEAN COVERALLS.
- .5 AFTER COMPLETION OF STRIPPING WORK, WIRE BRUSH AND WET SPONGE SURFACE FROM WHICH LEAD BASED PAINT HAS BEEN REMOVED TO REMOVE VISIBLE MATERIAL. DURING THIS WORK KEEP SURFACES WET.

6. CLEANUP:

- .1 REMOVE POLYETHYLENE SHEET BY ROLLING IT AWAY FROM WALLS TO CENTRE OF WORK AREA. VACUUM VISIBLE LEAD CONTAINING PARTICLES OBSERVED DURING CLEANUP, IMMEDIATELY, USING HEPA VACUUM EQUIPMENT.
- .2 PLACE POLYETHYLENE SEALS, TAPE, CLEANING MATERIAL, CLOTHING, AND OTHER CONTAMINATED WASTE IN PLASTIC BAGS AND SEALED LABELLED WASTE CONTAINERS FOR TRANSPORT.
- .3 CLEAN-UP WORK AREAS, EQUIPMENT AND OTHER CONTAMINATED AREAS.
- .4 CLEAN-UP SEALED WASTE CONTAINERS AND EQUIPMENT USED IN WORK AND REMOVE FROM WORK AREAS, CONTAINER AND EQUIPMENT DECONTAMINATION ENCLOSURE SYSTEM, AT APPROPRIATE TIME IN CLEANING SEQUENCE.
- .5 CONDUCT FINAL CHECK TO ENSURE NO DUST OR DEBRIS REMAINS ON SURFACES AS RESULT OF DISMANTLING OPERATIONS.
- .6 REPAIR OR REPLACE OBJECTS DAMAGED IN COURSE OF WORK TO THEIR ORIGINAL STATE OR BETTER, AS DIRECTED BY DFO REPRESENTATIVE.

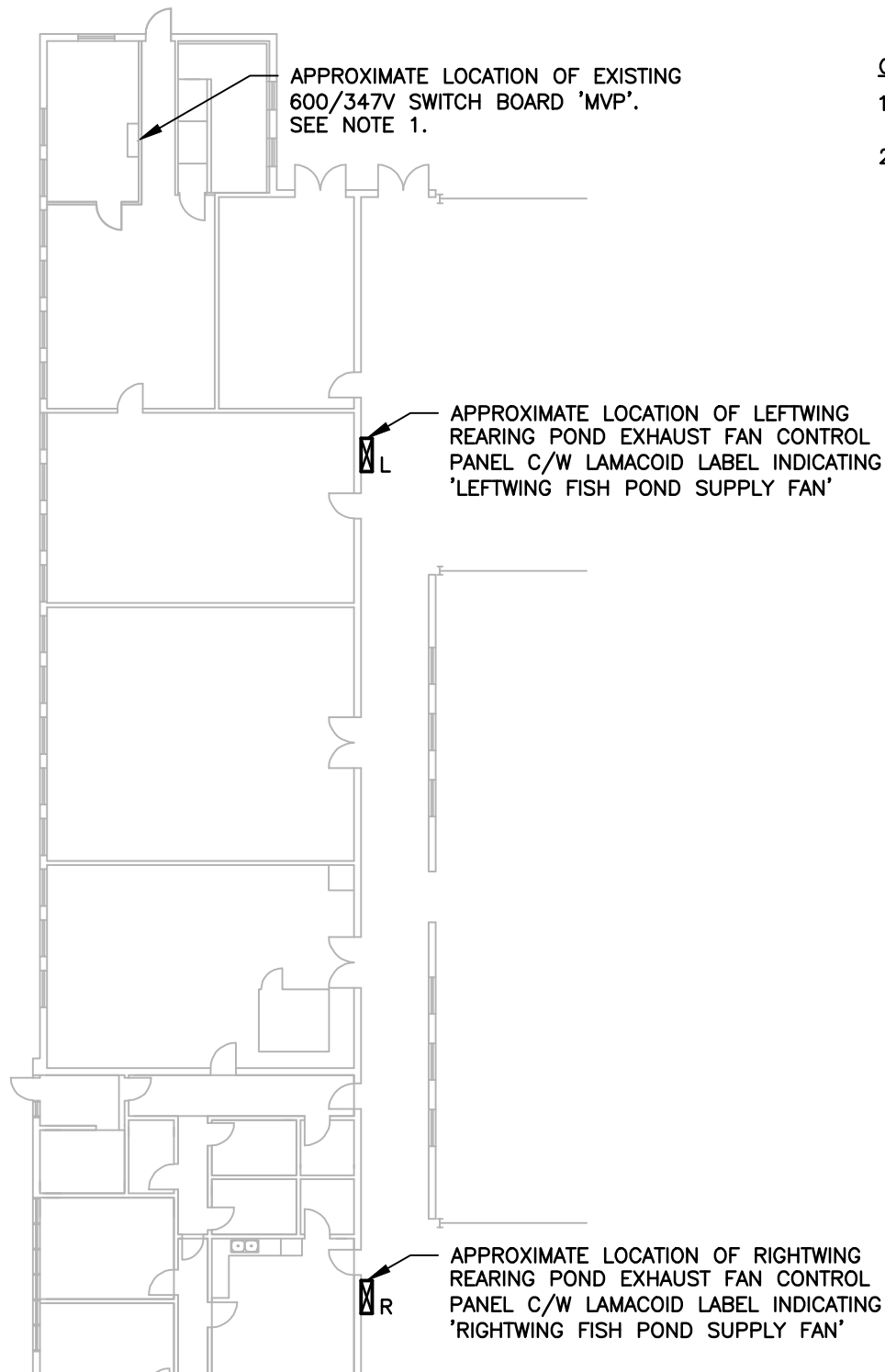
7. DISPOSAL:

- .1 DISPOSE OF HAZARDOUS WASTE MATERIALS IN ACCORDANCE WITH APPLICABLE FEDERAL AND PROVINCIAL ACTS, REGULATIONS, AND GUIDELINES.
- .3 SEND HAZARDOUS WASTES ONLY TO AUTHORIZED HAZARDOUS WASTE DISPOSAL OR TREATMENT FACILITIES.
- .4 BURNING, DILUTING, OR MIXING HAZARDOUS WASTES FOR PURPOSE OF DISPOSAL IS PROHIBITED.
- .5 DISPOSAL OF HAZARDOUS MATERIALS IN WATERWAYS, STORM OR SANITARY SEWERS, OR IN MUNICIPAL SOLID WASTE LANDFILLS IS PROHIBITED.
- .6 DISPOSE OF HAZARDOUS WASTES IN TIMELY FASHION IN ACCORDANCE WITH APPLICABLE PROVINCIAL REGULATIONS.
- .7 MINIMIZE GENERATION OF HAZARDOUS WASTE TO MAXIMUM EXTENT PRACTICABLE. TAKE NECESSARY PRECAUTIONS TO AVOID MIXING CLEAN AND CONTAMINATED WASTES.
- .8 PROVIDE PROOF SATISFACTORY TO ENGINEER THAT SUITABLE ARRANGEMENTS HAVE BEEN MADE TO DISPOSE OF LEAD BASED PAINT WASTE IN ACCORDANCE WITH REQUIREMENTS OF AUTHORITY HAVING JURISDICTION.



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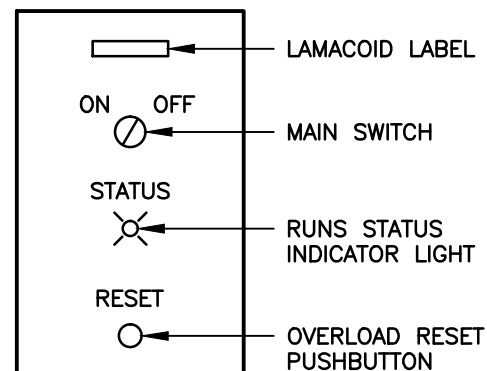
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<div><div>CBC</div><div>L</div><div>CBCL LIMITED</div><div>Consulting Engineers</div></div>		FISH POND VENTILATION UPGRADE				Drawing  M6	
		SPECIFICATIONS (4 OF 4)					



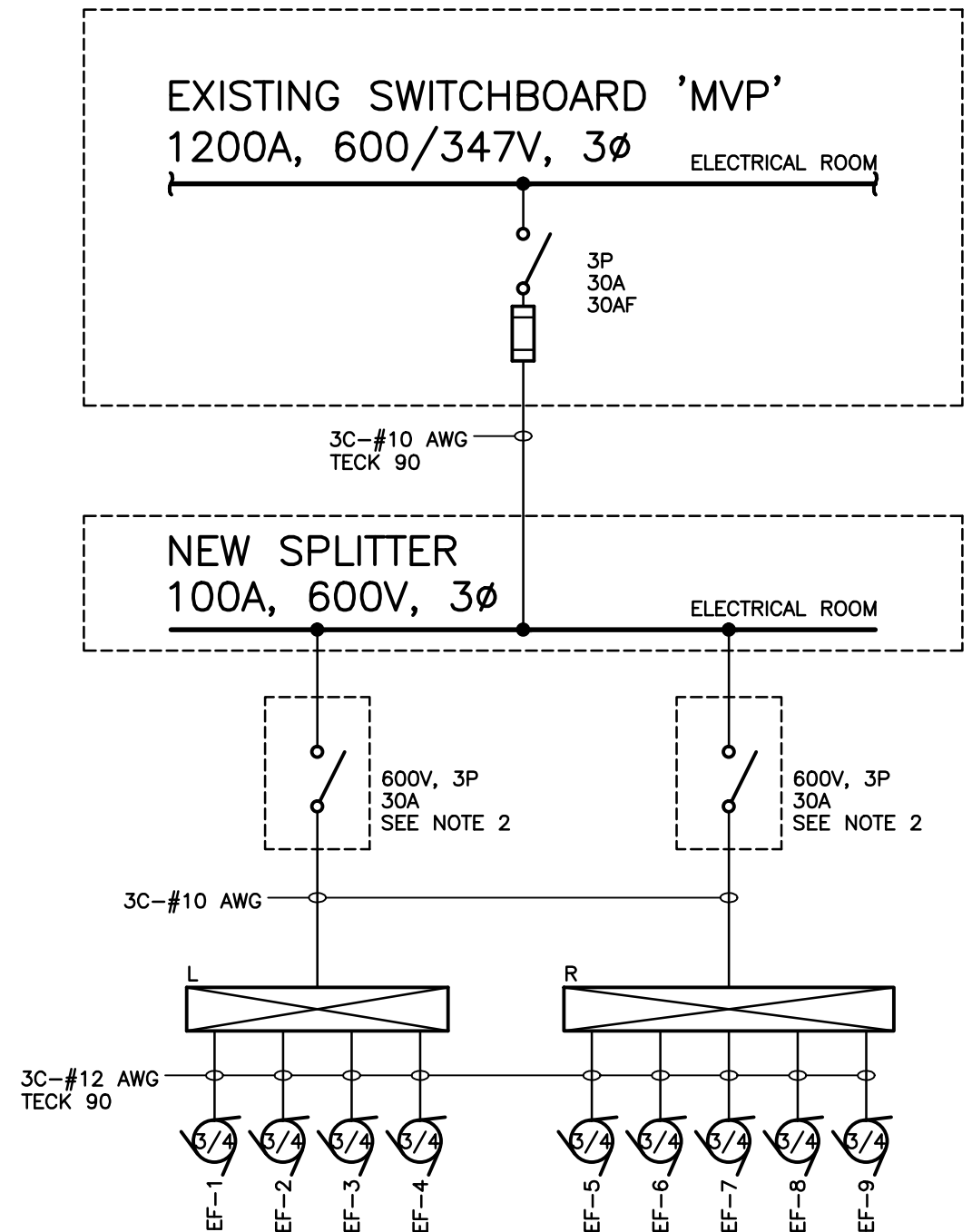
**PLAN—ADMINISTRATION BUILDING**  
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**GENERAL NOTES:**

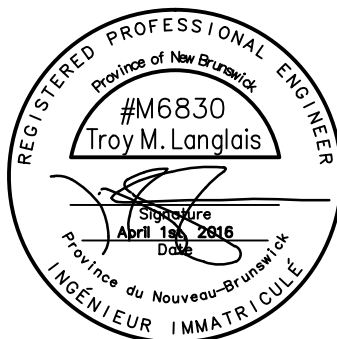
1. USE THE EXISTING SPARE 30A 3P FUSED SWITCH TO FEED THE NEW EXHAUST FANS.
2. LOCATE IN ELECTRICAL ROOM.



**1** TYPICAL FAN  
DETAIL—CONTROL PANEL  
E1



**2** SINGLE LINE  
E1



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FISH POND VENTILATION UPGRADE						Drawing	
ELECTRICAL PLAN & DETAILS						E1	

ELECTRICAL SCOPE

- 1 GENERAL:
- .1 THE SCOPE OF THE ELECTRICAL WORK INCLUDES, BUT IS NOT NECESSARILY LIMITED TO, THE SUPPLY, INSTALLATION AND PLACING INTO SERVICE OF THE WORK DESCRIBED ON THE DRAWINGS AND SPECIFICATIONS.

.2 ELECTRICAL DRAWINGS AND SPECIFICATIONS ARE TO BE READ IN CONJUNCTION WITH THOSE OF OTHER TRADES.

.3 ELECTRICAL CONTRACTOR SHALL REVIEW WORK DESCRIBED IN OTHER TRADE PACKAGES AND IDENTIFY AND INCLUDE ALL ELECTRICAL INTERCONNECTIONS TO EQUIPMENT PROVIDED BY OTHERS.

.4 PROVIDE ALL LABOUR, MATERIALS, EQUIPMENT, HARDWARE, TOOLS AND CONSUMABLES AS REQUIRED, DELIVERING A COMPLETE, FUNCTIONAL AND SAFE ELECTRICAL INSTALLATION.

.5 PLAN, SCHEDULE AND PERFORM WORK IN CO-OPERATION WITH OTHER TRADES.

.6 ALL EQUIPMENT, MATERIAL AND HARDWARE SHALL BE NEW AND APPROVED FOR THE PURPOSE BY A CANADIAN STANDARDS COUNCIL ACCREDITED AGENCY.

.7 GIVE ALL NOTICES, OBTAIN ALL PERMITS AND ARRANGE FOR ALL INSPECTIONS AS REQUIRED TO COMPLETE THE ELECTRICAL INSTALLATION.

.8 ELECTRICAL INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF THE CANADIAN ELECTRICAL CODE AND THE AUTHORITY HAVING JURISDICTION.

.9 PROVIDE ALL LABOUR, TOOLS, INSTRUMENTS AND CONSUMABLES REQUIRED TO PERFORM THE TESTING, COMMISSIONING AND PLACING INTO SERVICE OF ALL ELECTRICAL EQUIPMENT AND SYSTEMS INCLUDING THE ELECTRICAL PORTIONS OF SYSTEMS PROVIDED BY OTHERS.

.10 PROVIDE SHOP DRAWINGS. IN PARTICULAR, SUBMIT INFORMATION FOR:

.1 CONTROL PANELS

.2 SPLITTERS

.3 SAFETY SWITCHES

.11 PROVIDE WARRANTIES AND OWNER'S MANUALS AS PER MECHANICAL SPECIFICATIONS. IN PARTICULAR, SUBMIT INFORMATION FOR:

.1 CONTROL PANELS

.2 SPLITTERS

.3 SAFETY SWITCHES

.12 MAINTAIN ON SITE DRAWINGS ANNOTATED TO INDICATE ALL DEVIATIONS FROM THE CONSTRUCTION DRAWINGS. AT THE COMPLETION OF THE WORK, NEATLY TRANSFER THE INFORMATION TO ANOTHER SET OF DRAWING AND STAMP AS "AS BUILT", ONE SET OF 'AS BUILT' DRAWINGS IN OWNER'S MANUAL AND TWO (2) SETS TO THE OWNER.

.13 PROVIDE WARRANTY FOR WORKMANSHIP AND MATERIALS.

.14 RELOCATE ANY NEW DEVICE UP TO 3m AT NO ADDITIONAL COST OR CREDIT PROVIDED THE INFORMATION IS PROVIDED PRIOR TO INSTALLATION.

WIRING METHODS

- 1 CONDUCTORS AND CABLING:
- .1 ALL CONDUCTORS TO BE ELECTRICAL GRADE COPPER, STRANDED LARGER THAN #10AWG.

.2 INSULATION TO BE RW90 XLPE 600 V WITHOUT JACKET UNLESS OTHERWISE NOTED.

.3 ACCEPTABLE WIRING TYPES:

.1 BUILDING WIRE MINIMUM SIZE #12AWG IN CONDUIT.

.2 TECK 90 CABLE WITH ALUMINUM ARMOR, COPPER CONDUCTOR AND ALUMINUM TECK CONNECTIONS.
- 2 RACEWAYS:
- .1 ACCEPTABLE RACEWAY TYPES:

.1 RIGID PVC.

.2 LIQUID TIGHT FLEXIBLE METAL CONDUIT, MINIMUM 3/4" DIAMETER

.2 PROVIDE APPROPRIATE FITTINGS, COUPLINGS, BUSHINGS, ACCESSORIES AND SUPPORTS FOR EACH RACEWAY SYSTEM AS REQUIRED TO PROVIDE A COMPLETE INSTALLATION.
- 3 INSTALLATION:
- .1 INSTALL CABLING AND RACEWAYS IN A NEAT AND PROFESSIONAL MANNER SO AS TO CONSERVE HEADROOM AND NOT INTERFERE WITH WORK OF OTHER TRADES.

.2 WHERE PRACTICABLE, ALL WIRING IS TO BE CONCEALED.

.3 INSTALL ABOVE GRADE WIRING PARALLEL OR PERPENDICULAR TO BUILDING STRUCTURE.

.4 USE STEEL FITTINGS AND COUPLINGS ON EMT. DIE CAST FITTINGS NOT ACCEPTABLE.

.5 INSTALL BONDING CONDUCTOR IN ALL RACEWAYS.

.6 USE LIQUID TIGHT FLEXIBLE CONDUIT FOR FINAL CONNECTION TO ALL MOTORS, PUMPS, TRANSFORMERS AND VIBRATING EQUIPMENT.

.7 USE RAIN TIGHT CONNECTORS AND COUPLINGS ON ALL VERTICAL RUNS OF EXPOSED CONDUIT.

.8 USE LIQUID TIGHT FLEX OR TECK CABLE FOR ALL EXTERIOR APPLICATIONS.

SAFETY SWITCHES

- 1 GENERAL:
- .1 INDUSTRIAL HEAVY DUTY SWITCHES.
- 2 EQUIPMENT:
- .1 NEMA 1 ENCLOSURE, INTERLOCKED DISCONNECT HANDLE WITH DOOR.

.2 600V, 30A, 3P.

.3 SIDE LEVEL ACTION WITH SPRING LOADING AND PADLOCK FOR LOCKOUT IN ON OR OFF POSITION.

CONTROL PANELS

- 1 GENERAL:
- .1 CONTROL PANELS TO CONTROL MULTIPLE FANS.
- 2 EQUIPMENT:
- .1 NEMA 4X FIBERGLASS HINGED ENCLOSURE.

.2 C/W INDIVIDUAL STARTER AND OVERLOAD PROTECTION.

.3 TERMINAL STRIPS FOR FIELD CONNECTIONS.

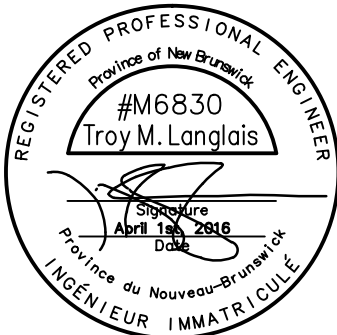
.4 SINGLE ON/OFF SWITCH ON ENCLOSURE DOOR TO START ALL FANS.

.5 SINGLE LED PILOT LIGHT TO SHOW RUN STATUS.

.6 SINGLE RESET BUTTON TO RESET OVERLOADS.

.7 MAIN DISCONNECT INTERLOCKED TO DOOR.

.8 CSA APPROVED ASSEMBLY FABRICATED BY CERTIFIED PANEL SHOP.



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<div><div>CBCL</div><div>CBCL LIMITED</div><div>Consulting Engineers</div></div>		FISH POND VENTILATION UPGRADE				Drawing <div>E2</div>	
		SPECIFICATIONS					



A. SECTION 15010 GENERAL MECHANICAL PROVISIONS

1. CONFORMANCE:

- .1 CONFORM TO TERMS AND CONDITIONS OF THE GENERAL CONTRACT DOCUMENT.

2. SCOPE:

- .1 PROVIDE COMPLETE, FULLY TESTED AND OPERATIONAL MECHANICAL SYSTEMS TO MEET THE REQUIREMENTS DESCRIBED HEREIN AND IN COMPLETE ACCORDANCE WITH APPLICABLE CODES AND ORDINANCES.
- .2 CONTRACT DOCUMENTS OF THIS DIVISION AND DRAWINGS ARE DIAGRAMMATIC AND APPROXIMATELY TO SCALE UNLESS DETAILED OTHERWISE. THEY ESTABLISH SCOPE, MATERIAL AND INSTALLATION QUALITY AND ARE NOT DETAILED INSTALLATION INSTRUCTIONS.
- .3 FOLLOW MANUFACTURER'S RECOMMENDED INSTALLATION DETAILS AND PROCEDURES FOR EQUIPMENT, SUPPLEMENTED BY REQUIREMENTS OF CONTRACT DOCUMENTS.
- .1 INSTALL EQUIPMENT GENERALLY IN LOCATIONS AND ROUTES SHOWN CLOSE TO BUILDING STRUCTURE WITH MINIMUM INTERFERENCE WITH OTHER SERVICES OR FREE SPACE. REMOVE AND REPLACE IMPROPERLY INSTALLED EQUIPMENT TO THE SATISFACTION OF THE CONSULTANT AT NO EXTRA COST.
- .2 THE DRAWINGS INDICATE THE GENERAL LOCATION AND ROUTE TO BE FOLLOWED BY DUCTWORK. WHERE DETAILS ARE NOT SHOWN ON THE DRAWINGS OR ONLY SHOWN DIAGRAMMATICALLY, THE PIPES AND DUCTWORK SHALL BE INSTALLED IN SUCH A WAY AS TO CONSERVE HEADROOM AND INTERFERE AS LITTLE AS POSSIBLE WITH THE FREE USE OF SPACE THROUGH WHICH THEY PASS. ALL DUCT AND PIPES AT CEILING SHALL BE KEPT AS TIGHT AS POSSIBLE TO BEAMS OR OTHER LIMITING MEMBERS AT HIGH END.
- .3 CONNECT TO EQUIPMENT SPECIFIED IN OTHER SECTIONS AND TO EQUIPMENT SUPPLIED AND INSTALLED BY OTHER CONTRACTORS OR BY THE OWNER. UNCRATE EQUIPMENT, MOVE IN PLACE AND INSTALL COMPLETE; START-UP AND TEST.
- .4 CONNECT INTO EXISTING SYSTEMS WITH MINIMUM DISRUPTION TO THE EXISTING SYSTEMS.
- .5 WORK SHALL BE COORDINATED WITH THE OWNER SEVEN DAYS PRIOR TO WORK COMMENCING.
- .6 FIELD VERIFY ALL BUILDING AND SITE DIMENSIONS PRIOR TO ANY FABRICATION AND INSTALLATION OF EQUIPMENT OR MATERIALS. NO ADDITIONAL CHARGE SHALL BE ENTERTAINED FOR FAILURE TO VERIFY THESE DIMENSIONS ON SITE.
- .7 THE WORK SHALL INCLUDE BUT NOT LIMIT TO THE FOLLOWING:
- .1 COMPLETE HEATING/VENTILATING/AIR CONDITIONING INSTALLATION.
- .2 COMPLETE AUTOMATIC CONTROL AND RELATED WIRING INSTALLATION.
- .3 COMMISSIONING AND BALANCING

3. MATERIALS

- .1 MATERIALS AND EQUIPMENT INSTALLED SHALL BE NEW, FULL WEIGHT AND OF QUALITY SPECIFIED. USE SAME BRAND OR MANUFACTURER FOR EACH SPECIFIED APPLICATION.
- .2 STATICALLY AND DYNAMICALLY BALANCE ROTATING EQUIPMENT FOR MINIMUM VIBRATION AND LOW OPERATING NOISE LEVEL.
- .3 EACH MAJOR COMPONENT OF EQUIPMENT SHALL BEAR MANUFACTURER'S NAME, ADDRESS, CATALOG AND SERIAL NUMBER IN A CONSPICUOUS PLACE.
- .4 FITTINGS SHALL BE OF APPROVED MATERIALS AND MEET CODES HAVING JURISDICTION.
- .6 EQUIPMENT SHALL BE CSA LISTED AND ULC APPROVED.
- .7 PROVIDE AND INSTALL DUCT SUPPORTS AND HANGERS TO SMACNA STANDARDS.

4. TESTING

- .1 PERFORM NECESSARY TESTS ON EQUIPMENT INCLUDING THOSE REQUIRED BY AUTHORITIES HAVING JURISDICTION AND CERTIFICATE OF APPROVAL OBTAINED.
- .2 PERFORM APPROVED TESTS ON ALL DUCTWORK SYSTEMS, OBTAIN AND SUBMIT CERTIFICATES OF APPROVAL AND ACCEPTANCE.

5. CUTTING AND PATCHING

- .1 PROVIDE HOLES AND SLEEVES, CUTTING AND FITTING REQUIRED FOR MECHANICAL WORK. RELOCATE IMPROPERLY LOCATED HOLES AND SLEEVES.
- .2 DRILL FOR EXPANSION BOLTS, HANGER RODS, BRACKETS, AND SUPPORTS.
- .3 REPAIR BUILDING WHERE DAMAGED FROM EQUIPMENT INSTALLATION, IMPROPERLY LOCATED HOLES, ETC., BY THIS SECTION OF THE WORK. THE SPECIALIST TRADE AT THE EXPENSE OF THIS SECTION OF WORK SHALL CARRY OUT THIS REPAIR. USE MATCHING MATERIALS AS SPECIFIED IN THE RESPECTIVE SECTIONS.

6. SHOP DRAWINGS

- .1 SUBMIT SHOP DRAWINGS FOR EVERY PIECE OF MECHANICAL EQUIPMENT.
- .2 IDENTIFY MATERIALS AND EQUIPMENT BY MANUFACTURER, TRADE NAME AND MODEL NUMBER. INCLUDE COPIES OF APPLICABLE BROCHURE OR CATALOG MATERIAL. DO NOT ASSUME APPLICABLE CATALOGUES ARE AVAILABLE IN THE CONSULTANT'S OFFICE. MAINTENANCE AND OPERATING MANUALS ARE NOT SUITABLE SUBMITTAL MATERIAL.
- .3 CLEARLY MARK SUBMITTAL MATERIAL USING ARROWS, UNDERLINING OR CIRCLING TO SHOW DIFFERENCES FROM SPECIFIED, E.G. RATINGS, CAPABILITIES AND OPTIONS BEING PROPOSED. CROSS OUT NON-APPLICABLE MATERIAL. SPECIFICALLY NOTE ON THE SUBMITTAL SPECIFIED FEATURES SUCH AS SPECIAL TANK LININGS, PUMPS, SEALS, MATERIAL, OR PAINTING.
- .4 INCLUDE DIMENSIONAL AND TECHNICAL DATA SUFFICIENT TO CHECK IF EQUIPMENT MEETS REQUIREMENTS. INCLUDE WIRING, PIPING, AND SERVICE CONNECTION DATA AND MOTOR SIZES.
- .5 INSTALLED MATERIALS AND EQUIPMENT SHALL MEET SPECIFIED REQUIREMENTS REGARDLESS OF WHETHER OR NOT SHOP DRAWINGS ARE REVIEWED BY THE CONSULTANT.
- .6 SHOP DRAWINGS NOT REQUESTED WILL NOT BE REVIEWED AND PROCESSED BY THE CONSULTANT.
- .7 DO NOT ORDER EQUIPMENT OR MATERIAL UNTIL THE CONSULTANT HAS REVIEWED AND RETURNED SHOP DRAWINGS.
- .8 SHOP DRAWINGS SHALL BE ENDORSED BY THE GENERAL CONTRACTOR AND MECHANICAL SUB-CONTRACTOR INDICATING THAT THE SHOP DRAWINGS HAVE BEEN REVIEWED AND SUBMITTED WITHOUT QUALIFICATIONS.
- .9 SUBMIT DIGITAL COPIES OF SHOP DRAWINGS WITHIN FOURTEEN (14) DAYS AFTER AWARD OF CONTRACT.
- .10 SUBMIT WEIGHTS OF ALL MAJOR EQUIPMENT FOR REVIEW SUCH THAT THE APPROPRIATE CONSULTANT CAN REVIEW THE LOADS.

7. STANDARDS OF MATERIALS, EQUIPMENT AND INSTALLATION

- .1 EQUIPMENT USED SHALL NOT EXCEED SPACE LIMITATIONS IN ANY DIMENSION. REPLACE ANY EQUIPMENT OR APPARATUS THAT DOES NOT MEET THIS SPECIFICATION AT NO COST. ASSUME FULL RESPONSIBILITY FOR THE EXPENSE OF REDESIGN AND ADJUSTMENT TO OTHER PARTS OF THE BUILDING WHEN PROPOSING THE USE OF APPROVED EQUAL OR ALTERNATE EQUIPMENT.
- .2 PROVIDE EQUIPMENT FROM THE SPECIFIED MANUFACTURERS. ALL MECHANICAL EQUIPMENT SHALL HAVE THE APPROVED MANUFACTURERS NAME PERMANENTLY AFFIXED TO IT.
- .3 EQUIPMENT ON ALTERNATE & APPROVED MANUFACTURERS LIST MUST BE EQUAL IN QUALITY AND PERFORMANCE TO THE MODEL SPECIFIED. EQUIPMENT, WHICH IS NOT EQUAL, WILL BE REPLACED WITH THE SPECIFIED EQUIPMENT AT NO COST TO THE OWNER.
- .4 THE EQUIPMENT MANUFACTURER SHALL ENSURE THAT THE STRENGTH AND ANCHORAGE OF THE INTERNAL COMPONENTS OF THE EQUIPMENT EXCEEDS THE FORCE LEVEL USED TO RESTRAIN AND ANCHOR THE UNIT ITSELF TO THE SUPPORTING STRUCTURE.

.5 PROVIDE FOLLOWING WHEN REQUIRED:

ITEMS	APPROVED MANUFACTURER
DAMPER - LOW LEAKAGE	AMERICAN WARMING, TAMCO
FANS	GREENHECK, DELHI, PENN, BROAN,
	COOK, NUTONE, LAU, ACME, TWIN
	CITY, SOLER & PALAU
LOUVRES	AIROLITE, WESTVENT, RUSKIN,
	VENTEX/ALUMIAVENT, CANARM
GRILLES, DIFFUSERS & REGISTERS	E.H. PRICE, NAILOR, TITUS, KRUEGER,
	TUTTLE & BAILEY

8. PERFORMANCE VERIFICATION OF INSTALLED EQUIPMENT

- .1 INSTALLED MECHANICAL EQUIPMENT WHOSE PERFORMANCE IS QUESTIONED BY THE CONSULTANT, MAY BE SUBJECT TO PERFORMANCE VERIFICATION AS SPECIFIED HEREIN.
- .2 WHEN PERFORMANCE VERIFICATION IS REQUESTED, EQUIPMENT SHALL BE TESTED TO DETERMINE COMPLIANCE WITH SPECIFIED PERFORMANCE REQUIREMENTS.
- .3 THE CONSULTANT SHALL APPROVE TESTING PROCEDURES.
- .4 SHOULD TEST RESULTS REVEAL THAT EQUIPMENT DOES NOT MEET SPECIFIED PERFORMANCE REQUIREMENTS, EQUIPMENT WILL BE REJECTED AND THE FOLLOWING SHALL APPLY:
- .5 REMOVE REJECTED EQUIPMENT. REPLACE WITH EQUIPMENT THAT MEETS REQUIREMENTS OF CONTRACT DOCUMENTS INCLUDING SPECIFIED PERFORMANCE REQUIREMENTS.
- .1 REPLACEMENT EQUIPMENT WILL BE SUBJECT TO PERFORMANCE VERIFICATION AS WELL, USING SAME TESTING PROCEDURES ON ORIGINALLY INSTALLED EQUIPMENT.
- .2 CONTRACTOR SHALL PAY ALL COSTS RESULTING FROM PERFORMANCE VERIFICATION PROCEDURE.

9. OPERATING AND MAINTENANCE DATA

- .1 INSTRUCT THE BUILDING OPERATORS IN THE OPERATION AND PREVENTATIVE MAINTENANCE OF EACH PIECE OF EQUIPMENT AND SYSTEM SUPPLIED AND INSTALLED. COMPLETE AND TURN OVER DOCUMENTATION PRIOR TO SUBSTANTIAL PERFORMANCE.
- .2 SUBMIT 3 SETS O & M MANUAL IN 3-RING BINDERS, TO INCLUDE THE FOLLOWING:
- .1 DESCRIPTION OF OPERATION.
- .2 SHOP DRAWING OF ALL EQUIPMENT.
- .3 EXTENDED WARRANTIES.
- .4 MAINTENANCE AND OPERATION INSTRUCTIONS.
- .5 LIST OF MANUFACTURERS SOURCE AND TRADE NAMES.
- .6 BALANCE REPORT.
- .7 NAME OF ENGINEER AND MECHANICAL CONTRACTOR AND PHONE NUMBER.
- .8 COPY OF RECORD DRAWING.
- .9 LIST OF INSPECTION CERTIFICATES.

10. RECORD DRAWINGS

- .1 THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND KEEP ONE SET OF WHITE PRINTS, INCLUDING REVISION DRAWINGS, IN JOB SITE OFFICE.
- .2 THE RECORD DRAWINGS SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING CHANGES AND SHALL BE RECORDED DAILY:
- .1 SIZE, LOCATION, ARRANGEMENT, ROUTE AND EXTENT OF DUCTWORK, CONDUIT, EQUIPMENT, ETC.
- .2 ALL CHANGES WHICH AFFECT THE OPERATION OF THE MECHANICAL SYSTEM.
- .3 THE AS-BUILT DAILY MARKED-UP PRINTS SHALL CONFORM TO THE STANDARDS OF THE CONTRACT DRAWINGS AND SHALL INCLUDE ALL DETAILS FROM REVISION DRAWINGS, SUPPLEMENTARY DRAWINGS, CHANGE ORDERS, ADDENDA AND SITE REVISIONS, ETC.



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<div><div>CBC</div><div>L</div><div>CBCL LIMITED</div><div>Consulting Engineers</div></div>		SPAWNING BUILDING WASHROOM VENTILATION UPGRADE					Drawing  M2
		SPECIFICATIONS (1 OF 3)					

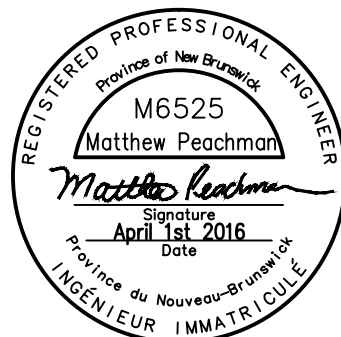
K:\PROJECTS\ZU10\10281600 MACAQUAC BIOINVENTIII\ACI11\ZU CAD\04 MECI\102816\_02 SPANNING VENI OF GRADE MI=MI+JWG BALLOUT NAME: MS EVAL DATE:MDCII-30-19 1:34:23 AM SAV OFFENATOR: FLENKE


- # 11. PAINTING AND IDENTIFICATION
- 1 EACH PIECE OF EQUIPMENT SHALL BE IDENTIFIED BY LAMACOID LABELS PERMANENTLY ADHERED TO THE EQUIPMENT AND SHALL BE GOVERNED BY THE SIZE OF THE EQUIPMENT.
- # 12. EQUIPMENT PROTECTION AND CLEAN-UP
- 1 PROTECT EQUIPMENT AND MATERIAL IN STORAGE ON SITE AND AFTER INSTALLATION UNTIL FINAL ACCEPTANCE. LEAVE FACTORY COVERS IN PLACE. TAKE SPECIAL PRECAUTIONS TO PREVENT ENTRY OF FOREIGN MATERIAL INTO WORKING PARTS OF PIPING AND DUCT SYSTEMS.
  - 2 ALL MECHANICAL EQUIPMENT STORED ON SITE SHALL BE KEPT IN A DRY, HEATED AND VENTILATED STORAGE AREA.
  - 3 THOROUGHLY CLEAN PIPING, DUCTS AND EQUIPMENT OF DIRT, CUTTINGS, AND OTHER FOREIGN MATERIAL.
- # 13. TEMPORARY OR TRIAL USAGE
- 1 TEMPORARY OR TRIAL USAGE BY THE OWNER OF MECHANICAL EQUIPMENT SUPPLIED UNDER CONTRACT SHALL NOT REPRESENT ACCEPTANCE.
  - 2 REPAIR OR REPLACE PERMANENT EQUIPMENT USED TEMPORARILY.
  - 3 REPAIR OR OTHERWISE RECTIFY DAMAGE CAUSED BY DEFECTIVE MATERIALS OR WORKMANSHIP DURING TEMPORARY OR TRIAL USAGE.
- # 14. CONNECTION AND INTERRUPTION TO EXISTING SYSTEMS
- 1 COORDINATE WITH OWNER ALL SHUT DOWNS AND CONNECTIONS TO EXISTING EQUIPMENT.
- # 15. LIABILITY
- 1 ASSUME FULL RESPONSIBILITY FOR LAYING OUT THE WORK AND FOR ANY DAMAGE CAUSED TO THE OWNER OF OTHER TRADES BY IMPROPER LOCATION, OR CARRYING OUT OF THE WORK.
  - 2 BE RESPONSIBLE FOR PROMPT INSTALLATION OF HIS WORK IN ADVANCE OF CONCRETE POURING OR SIMILAR WORK. PROVIDE AND SET SLEEVES WHERE REQUIRED. SHOULD ANY CUTTING OR REPAIRING OF EITHER UNFINISHED OR FINISHED WORK BE REQUIRED, THIS CONTRACTOR SHALL DIRECT THE PARTICULAR SUB-CONTRACTOR WHOSE WORK IS INVOLVED TO DO SUCH CUTTING AND REPAIRING WITHOUT EXPENSE TO THE OWNER. BEFORE BEING UNDERTAKEN, SUCH WORK SHALL BE LAID OUT FOR THE CONSULTANT'S REVIEW.
  - 3 EXAMINE THE SITE AND THE LOCAL CONDITIONS AFFECTING WORK UNDER THIS CONTRACT. EXAMINE CAREFULLY THE MECHANICAL, ELECTRICAL, STRUCTURAL AND ARCHITECTURAL DRAWINGS AND CONFIRM THAT THE WORK UNDER THIS CONTRACT CAN BE SATISFACTORILY CARRIED OUT WITHOUT CHANGES TO THE BUILDING AS SHOWN ON THESE PLANS. BEFORE COMMENCING THE WORK, EXAMINE THE WORK OF THE OTHER TRADES AND REPORT AT ONCE ANY DEFECT OF INTERFERENCE AFFECTING THE WORK OF THIS SECTION, OF THE GUARANTEE OF SAME. NO EXTRAS WILL BE SUBSEQUENTLY ALLOWED TO COVER ANY SUCH ERROR, OMISSION OR OVERSIGHT ON THE THOROUGH INSPECTION OF THE GROUNDS, BUILDING, CONDITIONS, ETC.
  - 4 ARRANGE WORK IN CO-OPERATION WITH OTHER TRADES IN THE BUILDING IN SUCH A MANNER AS NOT TO INTERFERE WITH OTHER WORK BEING CARRIED ON IN THE BUILDING AND PLACES WHERE OTHER PIPES AND EQUIPMENT BE INSTALLED ALONG WITH THE PIPES AND DUCTS PERTAINING TO THIS TRADE. CO-OPERATE WITH THE OTHER TRADES TO GET ALL THE PIPES, DUCTS, CONDUIT, ETC., INSTALLED TO THE BEST ADVANTAGE.

- ## 16. LIABILITY INSURANCE

- ## 17. GUARANTEE WARRANTY

- .1 THE CONSULTANT OR HIS REPRESENTATIVE MAY CHOOSE TO INSPECT ALL WORK PRIOR TO IT BEING CONCEALED. ALL WORK SHALL BE APPROVED BY ANY OTHER REGULATORY BODY HAVING JURISDICTION. ALL PIPING BELOW GROUND MUST BE APPROVED PRIOR TO COVERING. ALL PIPING IN WALL SPACES MUST BE APPROVED PRIOR TO BOARDING. ALL OPENINGS SHALL BE SEALED APPROPRIATELY IN PARTICULAR IN FIRE RATED WALLS AND FLOORS. SEALING SHALL BE APPROVED PRIOR TO COVERING.
- .2 PROVIDE A MINIMUM OF 48 HOURS NOTICE TO CONSULTANT FOR REQUIRED INSPECTION.



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B. SECTION 15500 HEATING, VENTILATION AND AIR CONDITIONING

1. DUCTING

- .1 DUCTWORK SHALL BE GALVANIZED STEEL, LOCK FORMED 2” W.G. SMACNA STANDARD FOR LOW VELOCITY AND MEDIUM VELOCITY DUCTWORK QUALITY. FABRICATED IN ACCORDANCE WITH SMACNA DUCT MANUALS AND ASHRAE HANDBOOKS. DUCTWORK SHALL MEET THE REQUIREMENTS OF NFPA 90A, 91 AND 96 AND CONFORM TO APPLICABLE CODES.
- .2 PRIOR TO FABRICATION OF DUCTWORK, CHECK ALL CEILING SPACES AND HEIGHTS AND CONFLICTS WITH OTHER TRADES. INCLUDE AND PROVIDE NECESSARY OFFSET TO MAINTAIN CEILING HEIGHT, HEADROOM ETC.
- .3 PROVIDE BALANCING DAMPERS WHERE INDICATED ON DRAWINGS AND AT ALL DUCT BRANCHES. SUCH DAMPER LOCATION MAY NOT BE SHOWN ON DRAWINGS.
- .4 SIZE ROUND DUCTS, INSTALLED IN PLACE OF RECTANGULAR DUCTS, FROM ASHRAE TABLE OF EQUIVALENT RECTANGULAR AND ROUND DUCTS. NO VARIATION OF DUCT CONFIGURATION OR SIZES PERMITTED EXCEPT BY PERMISSION FROM CONSULTANT.
- .5 ALL FANS AND AIR CONDITIONING UNITS SHALL BE MOUNTED WITH VIBRATION ISOLATION.
- .6 ALL FANS AND AIR MOVING HVAC UNITS SHALL HAVE FLEXIBLE CONNECTIONS.
- .7 PROVIDE BACK DRAFT DAMPER TO ALL EXHAUST OUTLETS TO EXTERIOR.
- .8 PROVIDE GALVANIZED STEEL SCREEN, 12 MM SQUARE MESH FOR EXTERIOR INTAKE & EXHAUST OUTLETS UNLESS OTHERWISE NOTED.
- .9 PROVIDE FLASHING, CURB AND COUNTER FLASHING FOR ALL DUCTING PASSING THROUGH ROOF AND EXTERNAL ENVELOPE OF THE BUILDING.
- .10 ALL DUCTWORK AND EQUIPMENT INSTALLED SHALL BE FREE OF SCALE, DEBRIS AND DIRT. DURING CONSTRUCTION, COVER ALL DUCT AND EQUIPMENT OPENINGS WITH POLYETHYLENE OR EQUIVALENT TO PREVENT THE ENTRY OF DIRT OR DUST. ANY DUCTWORK OR EQUIPMENT WHICH IS NOT SUFFICIENTLY CLEAN SHALL BE CLEANED USING VACUUM CLEANERS, BRUSHES, AND/OR NON–TOXIC SOLVENTS. ENSURE DUCT DUST COVERS ARE REMOVED PRIOR TO SYSTEM STARTUP.

2. AIR & WATER BALANCING:

- .1 AIR BALANCING TO BE PERFORMED ON ALL AIR SYSTEMS. BALANCE TO WITHIN 10% OF QUANTITIES SHOWN ON DRAWINGS. PROVIDE BALANCING REPORT.



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		SPECIFICATIONS (3 OF 3)					