



Halifax Regional
School Board

TENDER #3710

DUST COLLECTION SYSTEMS TWO SCHOOLS Brookside & Rocky Lake Jr High

Closing Date: **TUESDAY, NOVEMBER 4, 2014**
Closing Time: **2:00:00 P.M.**
Opening Time: **2:00:00 P.M.**

Closing Location:

Halifax Regional School Board
33 Spectacle Lake Drive
Dartmouth, N.S.
B3B 1X7

HRSB Contacts:

Deborah Beck, Buyer
Fax: (902) 464-0161

Project Location:

Brookside Jr, 2239 Prospect Road, Hatchet Lake
Rocky Lake Jr, 670 Rocky Lake Drive, Bedford

Ron Curran, Managers of Regulatory Compliance
Tel: (902) 464-2000 #5114
Fax: (902) 464-2201

A mandatory bidders' site meeting will be held FRIDAY, OCTOBER 24TH commencing 10:00 a.m. at Brookside Jr High followed by Rocky Lake Jr High.

To obtain SPECIFICATIONS/DRAWINGS **DOWNLOAD FROM HRSB WEBSITE:**
<http://www.hrsb.ca/about-hrsb/financial-services/purchasing/tenders>

The Halifax Regional School Board encourages equity and affirmative action programs.

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NOTICE

Public tender openings are NO LONGER HELD for any tenders relating to goods, services or construction for HRSB. A list of bidders and bid amounts will be posted on the Procurement Services website (<http://novascotia.ca/tenders/tenders/ns-tenders.aspx>) shortly following the closing of the tender. All bid submissions are subject to evaluation after opening and before award of contract. The winning bidder and award amount will be posted on the Procurement Services website (<http://novascotia.ca/tenders/tenders/ns-tenders.aspx>) after evaluation.

1.0 **GENERAL**

The Halifax Regional School Board is seeking bids from qualified suppliers/contractors for the supply of materials, labour, equipment and services required to supply and install **DUST COLLECTION SYSTEMS – TWO SCHOOLS - Brookside Jr & Rocky Lake Jr High.**

1.1 **INSTRUCTIONS TO BIDDERS**

**TENDER
SUBMISSION:**

- (a) Sealed Bids will be received by:

Halifax Regional School Board
33 Spectacle Lake Drive
Dartmouth, N.S.
B3B 1X7

Until **2:00:00 P.M., NOVEMBER 4TH, 2014**, (as verified by the phone clock on the Commissionaire's desk at 33 Spectacle Lake Drive) for the following projects:

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Should the School Board Office be closed for any reason the tender closing will be postponed to the next business day.

- (b) Submit one copy of the original tender on the enclosed tender form. Each item on the form must be completed unless noted otherwise. Bids must be signed by an authorized representative of the Suppliers/Contractors. Incomplete bids will be rejected. Bids must be submitted on or before the advertised time and date in a sealed envelope clearly marked:

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- (c) It is the responsibility of the bidder to ensure their submissions are received on time. Faxed bids will not be accepted.
- (d) Addenda must be issued by the Board no less than three (3) business days before tender closing. Addenda cover letters shall be signed and attached to the tender documents.

1.2 **CONDITIONS OF TENDER**

- (a) No term or condition shall be implied, based upon any industry or trade practice or custom or in a practice or policy of the Board or otherwise, which is inconsistent or conflicts with the provisions contained in these instructions.
- (b) Any changes to this tender or specifications shall be stated by the Board in writing. All correspondence, inquiries, instructions, etc. in connection with the work shall be made through the office of the Halifax Regional School Board, c/o Manager of Accounting & Purchasing or representative.
- (c) Tender price must include freight, duty, and all taxes, rates and charges, which are applicable at the time the contract is awarded. It is the responsibility of the bidder to find out from the appropriate authorities what taxes, rates and charges are applicable to this tender.
- (d) The Contractor is responsible for obtaining all provincial, municipal and other permits as required for the work, and shall adhere to all regulations from regulatory bodies, including the National Building Code, 2005. They shall pay all fees for these permits. Sub-trades are responsible for obtaining permits and following regulations as they affect their work.
- (e) Invoices shall be submitted to: Halifax Regional School Board
c/o Operations Services Coordinator-Maintenance
33 Spectacle Lake Drive,
Dartmouth, NS B3B 1X7

Contact information to be supplied to the successful bidder as part of the award confirmation.

Payment: Payment terms will be considered as Net 30 days from date of invoice.

- (f) Bidders or their employees must not be employees of the Halifax Regional School Board.
- (g) The bidder must comply with Nova Scotia Fire Safety Act and all Municipal Regulations, Ordinances and other laws including the Occupational Health and Safety Act.
- (h) Persons or firms submitting tenders shall be actually engaged in the line of work required by the specifications.
- (i) When applicable, a bidder shall list, in the space provided in Section 3.3, the names of the sub-contractors they propose to use with each sub-contractor's tender price. A change in sub-contractors from this list will require permission in writing from the Board.
- (j) Except as the specifications may be modified by Addenda, the successful

contractor will be held to furnish under this tender all work as specified.

- (k) The contractor shall save, defend, and indemnify the Halifax Regional School Board against all costs which the School Board may sustain or incur by reason of any act or omission of the contractor or its' agents or sub contractors.
- (l) Property loss and/or damage that occurs during the course of work or caused by negligence on the contractors part during the course of the work shall be reported by HRSB Operations Services to the School Insurance Program (SIP) office. Adjusters may be assigned to manage restoration of damaged, defaced or stolen HRSB property. HRSB and/or its insurer reserve the right to assign management of restoration to the adjuster. The contractor shall be responsible for all costs to repair or replace any School Board property, which has been damaged, defaced or stolen during the course of work.
- (m) The term of the contract will be from date of award until *JANARY 31ST 2015*.
- (n) Where the Tender Documents stipulate a particular product, written requests for substitutes will be considered by the Board up to five (5) business days prior to the tender closing date. Such requests shall be accompanied by complete descriptive and technical information including MSDS so that a proper evaluation can be made.

When a request for approval of a product is made, the Board may grant approval and will attempt to issue an Addendum to this effect to known bidders. However, HRSB assumes no liability for the delivery of electronic transmissions.

All products used in the course of this work are to be used, stored, and maintained as per the instructions written on the MSDS sheet.

- (o) Time and Material costs must be provided as listed in Section 3.6
- (p) **Unique Logistics**
Completely describe how your Tender will respond to the unique logistics of each school or administrative site as set out in the Project Scope and fully describe, in the same manner, all items of equipment, service, and support you will provide to respond to those logistics and all pricing and other matters relating to them.
- (q) **HRSB Discretion**
The Bidder hereby acknowledges that:
 - a) HRSB shall have the right to reject any or all Tenders for any reason, or to accept any tender which HRSB in its sole, unrestricted discretion deems most advantageous to it. The lowest, or any, Tender will not necessarily be accepted and HRSB shall have the unrestricted right to:
 - i) accept any Tender, and in the event it only receives informal, non-conforming or qualified Tenders with respect to this Tender, accept any such Tender; or

- ii) Accept a Tender that is not the lowest price;
 - iii) Reject a Tender that is the lowest price even if it is the only tender received;
 - iv) Reject any Tender that contains any irregularities, informalities, conditions or qualifications;
 - v) Reject any Tender that is not accompanied by the required tender security documents;
 - vi) Reject any Tender that is not properly signed by or on behalf of the Bidder;
 - vii) Reject any Tender that contains an alteration in a quote that is not initialed by or on behalf of the Bidder;
 - viii) Reject any Tender that is incomplete or ambiguous; or
 - ix) Reject any Tender that does not strictly comply with other requirements contained in these instructions.
- b) HRSB reserves the right to consider, during the evaluation of Tenders:
- i) Information provided in the Tender itself;
 - ii) Information received in response to enquiries of credit and industry references set out in the Tender;
 - iii) The manner in which the Bidder provides services to others;
 - iv) The experience and qualification of the Bidder;
 - v) The compliance of the Bidder to HRSB's requirements and specifications;
 - vi) Such alternate goods, services, terms or conditions that may be offered, whether such offer is contained in a Tender or otherwise,
 - vii) Splitting the Tender and Project Scope into multiple parts and accepting Tenders (or portions thereof) from more than one Bidder;
 - viii) Rejecting Bidder's recommendation of a Subcontractor or any other third party associated with the Tender and jointly along with the Bidder, determine alternate acceptable third parties; and
 - ix) Any other consideration in HRSB's discretion;
- c) HRSB may rely upon the criteria it deems relevant, even if such criteria has not been disclosed to Bidder. By submitting a Tender, the Bidder acknowledges the HRSB's rights under this Section and absolutely waives any right or cause of action against HRSB and its employees, agents or Trustees by reason of HRSB's failure to accept the Tender submitted by the Bidder, whether such right or cause of action arises in contract, tort including negligence or otherwise; and
- d) HRSB shall not at any time have any obligation to deal exclusively with the Bidder. HRSB expressly reserves its rights, in its sole discretion, to seek a Tender regarding the subject matter hereof, from any person whomsoever

and at any time.

(r) **Limitation of Liability**

Bidder, by submitting a bid to this Tender, agrees that it will not claim damages, costs or expenses for whatever reason, relating in any way to this Tender and any resulting process (including without limitation any subsequent discussions or negotiations, if any, or in respect of any competitive process) and waives any and all claims against HRSB whatsoever, whether for costs, damages or expenses incurred by Bidder in preparing its Tender, in participating in this tender process (including without limitation any subsequent discussion or negotiation, if any), loss of anticipated profit or any other matter whatsoever related to this tender and any resulting process, discussions or negotiations.

(s) **Construction Contract Guidelines**

The Halifax Regional School Board acknowledges and complies with the **Nova Scotia Transportation and Public Works Construction Contract Guidelines.**

1.3 **OTHER REQUIREMENTS**

- (a) The bidder must provide with the submitted tender document a certificate indicating the completion of the Nova Scotia Construction Safety Association's Construction Safety Program or other WCB approved safety audit company that jointly sign the Certificate of Recognition with the WCB.
- (b) The bidder must provide with the submitted tender document a letter showing they are in good standing with the Worker's Compensation Board.
- (c) The bidder must provide with the submitted tender document a tentative schedule indicating timelines for completion of works. **Upon award of work, the successful bidder shall provide within three (3) business days a schedule clearly indicating timelines for completion of all aspects of the project. Shop drawings/samples must be returned to HRSB for Consultant's review within five (5) days upon award.**
- (d) The bidder must provide with the submitted tender document, an insurance certificate showing proof of:
- (i) Commercial General Liability insurance, including but not limited to, products liability and completed operations, contractual liability, owners and contractors liability, attached machinery extensions, endorsement, independent contractor, for a combined single limit of no less than \$2,000,000 per occurrence; Builder's Risk Insurance in the amount of the Contract Price.
 - (ii) Commercial Auto Liability insurance covering all owned, non-owned and hired vehicles for a minimum combined single limit of \$2,000,000 per occurrence; and
 - (iii) It is also agreed that the above insurance coverage is primary.

Upon award, the bidder shall secure and maintain the insurance as noted above at its expense during the term of the contract.

The Halifax Regional School Board must be named as additional named insurance

pertaining to the work for this project. Furthermore, Halifax Regional School Board must receive at least thirty (30) days notice of cancellation or modification of the above insurance. Bidders shall at all times keep in force insurance as may be required.

(e) **BID SECURITY**

The bidder **MUST** provide with the submitted tender document **Bid Security** in the amount of **ten percent (10%) of the Contract Price** (before HST) in the form of a Certified Cheque, Irrevocable Standby Letter of Credit or Bid Bond payable to, or naming the Halifax Regional School Board.

BID BONDS *must be provided by a surety company licensed to issue surety bonds in the Province of Nova Scotia:*

- Provide bond on the standard CCDC Bid Bond Form, latest version, in the amount of not less than **ten percent (10%) of the Contract Price (before HST)**.
- Bid Bonds, submitted by the general contractor bidder, signed and sealed by the principal (Contractor) and Surety and shall be with an established Surety Company satisfactory to and approved by the Halifax Regional School Board.
- Where a Bid Bond is used as Bid Security, include the cost of providing the Bid Bond in the Tender Contract price.

Where **CERTIFIED CHEQUE or BANK DRAFT** is provided as bid security:

- Provide a certified cheque or bank draft, endorsed in the name of the Halifax Regional School Board, for a **sum not less than ten percent (10%) of the amount of the Contract Price (before HST)**.
- Where certified cheque or bank draft is used as Bid Security, include the cost in the Contract price.

Where the **IRREVOCABLE STANDBY LETTER OF CREDIT** is used as bid security:

- Provide an Irrevocable Standby Letter, endorsed in the name of the Halifax Regional School Board, for a sum not less than **ten percent (10%) of the Contract Price (before HST)**.
- The Irrevocable Standby Letter of Credit shall be issued by a certified financial institution subject to the Uniform Custom and Practices for Documentary Credit (1993 revision or latest revision) International Chamber of Commerce (Publication No. 500).
- Where Irrevocable Standby Letter of Credit is used as bid security, include the cost in the Tender Contract Price.

RETURN OF BID SECURITY:

- The bid security of the unsuccessful bidders will be returned to them after the contract has been signed, or previous to such time, at the discretion of the Halifax Regional School Board. The above shall apply provided a contract is awarded within sixty (60) days from the closing date of the bid. If no contract is awarded, all bid security will be returned.

(f) **CONTRACT SECURITY (ONLY REQUIRED FOR BIDS OVER \$100,000)**

For bids over \$100,000 bidders must provide **Contract Security by a surety company licensed to issue surety bonds in the Province of Nova Scotia** in the form of one of the following:

- Letter of Surety.
- Performance Bond and a Labour and Material Payment Bond OR
- Certified Cheque or Bank Draft OR Irrevocable Letter of Credit bearing the bidder's original signature, payable to or naming the Halifax Regional School Board as insured.

Bidder shall maintain performance assurance in force for a period of not less than twelve (12) months after the issue of the substantial performance certificate certified by Halifax Regional School Board and until completion of the contract.

Should it become apparent that the final cost of the project will **exceed the total amount payable by more than 10%**, the bidder shall arrange to have their bonds reissued based on the projected final cost.

Where a **LETTER OF SURETY** was used as **CONTRACT SECURITY**:

- Within ten (10) days after notification of award of the Contract, provide a Performance Bond and a Labour & Material Payment Bonds each in an amount **equal to fifty percent (50%) of the Contract Price (before HST)**, naming the Halifax Regional School Board.
- Performance Bond and Labour and Material Payment Bonds, submitted by the bidders, shall be provided at the expense of the bidder and shall be with an established Surety Company satisfactory to and approved by the Halifax Regional School Board.
- Include the cost of providing the Performance Bond and Labour and Material bond in the Contract price.

Where a **CERTIFIED CHEQUE OR BANK DRAFT** is used as **CONTRACT SECURITY**:

- The Certified Cheque or Bank Draft submitted during the bid period will be cashed and the amount retained by the Halifax Regional School Board shall serve as Performance Assurance, including the payment of all obligations arising under the Contract.
- The Certified Cheque or Bank Draft will be held in lieu of the Performance Bond and Labour and Material Bonds, providing that, at Contract award, the successful Bidder shall supplement their Certified Cheque or Bank Draft to maintain an amount of **twenty (20%) of the Contract price** (before HST) under the contract.
- The amount remaining will be returned without interest after a period of not less than twelve (12) months after the issue of the substantial performance certificate

certified by the Halifax Regional School Board and shall serve as performance assurance until completion of the contract.

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

Where **an IRREVOCABLE STANDBY LETTER OF CREDIT** is used as **CONTRACT SECURITY**:

- The Irrevocable Standby Letter of Credit for a sum not less than **ten percent (10%) of the Contract price (before HST)** submitted during the bid period will be retained by the Halifax Regional School Board and shall serve as performance assurance, including the payment of all obligations arising under the contract. The irrevocable standby letter of credit shall be issued by a certified financial institution subject to the Uniform Customs and Practices for Documentary Credit (1993 revision) International Chamber of Commerce (Publication No. 500).
 - Where irrevocable standby letter of credit is used as Performance Assurance, include the cost of providing and Irrevocable Standby Letter of Credit in the Contract Price. The contractor shall provide to the Halifax Regional School Board documentation throughout the duration of the contract that the irrevocable standby letter of credit remains in full effect at all times as specified.
 - Upon expiry of the Irrevocable Standby Letter of Credit, a separate Irrevocable Standby Letter of Credit shall be provided for work requiring extended warranties for such amounts as are required by the contract.
- (g) The bidder must provide with the submitted tender document a completed copy of Appendix “E” Safety Plan information sheet. The contractor prior to commencement of work must have a safety plan in place for use by the contractor personnel regarding potential hazards and work practices specific to the site.
- (h) ***HRSB is directly responsible for the safety of its students and staff. Should contractors be required to work in or on school property while children are present, it is a MANDATORY HRSB REQUIREMENT that contractors assign the work to employees and/or sub-contractors who DO NOT have a CRIMINAL RECORD and who ARE NOT LISTED ON THE CHILD ABUSE REGISTRY. By checking the “Agreed” box at the bottom of clause 3.4 below you are confirming that you understand and will abide by this mandatory HRSB requirement. Failure to comply with this requirement may result in immediate contract termination.***
- (i) Contractors must submit warranty information with the tender bid submission and successful bidders must submit all appropriate warranty documents with final payment invoice.
- (j) Bidders are advised that, as per the Halifax Regional School Board Tobacco Free Schools and Workplace Policy, the HRSB endorses and supports implementation of the Nova Scotia Smoke Free Places Act 2002, which prohibits tobacco possession for persons under the age of 19 and declares that no person shall smoke in schools, school board

offices or on school grounds.

1.4 AMENDMENTS OR WITHDRAWAL OF TENDER PRIOR TO BID CLOSING

- (a) Tender may be amended or withdrawn **by post or facsimile (902) 464-0161 PRIOR** to Tender Closing date and time.
- (b) Clearly indicate on the fax transmission or submitted envelope, whether your correspondence is an amendment or withdrawal and the title of the Tender. Sign and seal as required for tender, and submit at address listed under closing location on the cover of this document.

1.5 THE CONTRACT

1.5.1 Binding Effect of Proposal and Contract Finalization

The Bidder hereby acknowledges that its Tender constitutes a contract with HRSB, and the terms and conditions of this Tender and the bidder response (with the Tender taking precedence in the event of any inconsistency or conflict of terms) shall govern such agreement. Such contract shall remain binding upon Bidder until the earlier of:

- a) Written notice from HRSB that the Bidder's Tender is rejected as unsatisfactory; or
- b) Issuance by HRSB of its PO to the Bidder with respect to this Tender, pursuant to Section 1.2(p), and upon such issuance, the Bidder shall be regarded as the Contractor hereunder; or
- c) Execution of the Contract by both HRSB and the Bidder pursuant to Section 1.2(p); or
- d) Written notice from HRSB that it has entered a Contract with a Contractor and that the Bidder has been unsuccessful under this Tender.

1.5.2 Contract Documents

1.5.2.1 The attached form of contract (Schedule A) is a version that shall be issued to or executed by the successful bidder pursuant to the terms and conditions of this Tender. It is **NOT TO BE** executed and returned by the bidder as part of its (proposal or Tender response).

1.5.2.2 After the contract has been awarded and signed, the contractor will be contacted by the appropriate Regional Manager to attend a site visit to complete Appendix D of the contract – ‘Undertaking to Comply and Contractors Safety Checklist’ prior to the commencement of any work.

1.5.2.3 The Contract the Contractor will have with the HRSB, if awarded, will include:

- a) Such further documentation as may be negotiated and executed by the HRSB and the Contractor pursuant to Section 1.2(p); and

- b) This Tender and all of its Schedules, including without limitation any PO issued by HRSB to the Contractor, and any revisions, amendments or additional documents made thereto, if any; and
- c) The Tender, in its entirety and all promises made in the tender will be deemed covenants in the Contract and all information, representations and warranties made in the Tender will be deemed terms, representations and warranties of the Contract surviving the signing or issuance by HRSB of any additional or formal documents prepared by the HRSB.

1.5.2.4 For the purposes of evaluation and interpretation of Tenders, in the case of conflicts, discrepancies, errors or omissions between this Tender and any documentation issued or executed pursuant to Section 1.5.1, and the Tender, this Tender and such documentation shall take precedence over the Bidder response.

1.6 Your Contractual Terms

- 1.6.1 List separately any contractual terms which must be included as part of the Contract if awarded to you and which would be a condition to HRSB's acceptance of your bid.
- 1.6.2 List separately any contractual terms which you would like the HRSB to consider but which would not be a condition to the acceptance by the HRSB of your bid and which would only be part of the Contract with the HRSB with the specific further agreement of the HRSB.

2.0 SCOPE OF WORK

- (a) Location:

Brookside & Rocky Lake Jr High: The work shall include the supply and installation of new **DUST CONTROL SYSTEMS – TWO SCHOOLS** as per plans and specifications.

- (b) School/Work site access control: **Contractor's employees shall always report to the main office of a school, indicate who they are and state their purpose on site prior to starting any work in the school.** Contractor is not permitted to work on the school site without HRSB assigned representative on site unless authorized by HRSB Manager of Operations.

The outside work area shall be appropriately demarked and/or surrounded by a barrier to prevent unauthorized entry to the work area. All workers shall contain their activity to the work site area. The contractor shall only use the school staff designated washroom and lunchroom facilities. Access to the school shall only be allowed as planned in coordination with HRSB Operations and the school administration.

The contractor and sub-contractor employees shall maintain professional and courteous behaviour, including work and communications practices, at all times on the project site. Communications and work shall be conducted so as to minimize the effect on regular school occupants and their activities.

- (c) Project/Safety Coordination: The contractor shall provide to HRSB within one week of award of contract a fixed schedule for all aspects of completion of work. The safety plan outline provided with this document must be posted on site during the execution of work and will be accessible to all workers on the site.

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

The contractor will provide access to the work site and safety plan for inspection by HRSB Operations Services administration, HRSB health and safety Manager, consultants, regulatory inspectors as may occur throughout the duration of the project.

All necessary project coordination communications between project personnel and HRSB or site administration shall be from the project foreman/supervisor through the school principal and/or the Manager of Operations.

- (d) Hours of work - All work shall be carried out during **regular working hours** unless otherwise indicated in writing by the Manager of Operations Services or a designate. Hours of work shall comply with local ordinances and bylaws for each site.

- (e) Site Material Control: The contractor shall be responsible for storage of all materials required to complete the renovation. The school shall not be used for storage of materials unless otherwise approved by the principal and manager of Operations Services. Any requirement for modifications to the building in order to allow delivery and installation of the new equipment is the responsibility of the contractor.

The contractor is responsible for security of all project materials and access to the project site and/or the school through the project site at all times until completion of work and acceptance of the finished project by HRSB. Such additional security costs for security personnel or other means of security as deemed necessary by the contractor will be the sole responsibility of the contractor.

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

All waste materials and debris created during demolition and/or construction shall be disposed of in a dumpster provided by the contractor, to be removed at the end of the construction project, using a methodology that is in compliance with the applicable HRM solid waste by laws. Otherwise, the material must be removed and disposed of off site at the end of each working day. The waste materials may not be stored on site unless they are held in an approved project dumpster.

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

- (f) 1 Contractor is advised that the building will be occupied when work on this project takes place. Contractor to verify all areas of construction are secured and air tight partitioned to ensure that the health and safety of the students and staff are maintained during the construction period.

2 Temporary Construction Utilities & Closures:

Contractor to erect and maintain 'dust-tight' barriers as noted. Prior to start-up, the 'dust-tight' separations must be in place as noted and reviewed by HRSB Project Manager and the Consultant. 'Dust-tight' enclosure will be reviewed during the course of construction. Contractor must maintain the current lighting levels, heating and ventilation standards in place.

3 Interior Closures and Construction Areas:

3.1 For interior/interior locations provide the following:

3.1.1 Gypsum board both sides to 9'-4", AFF.

3.1.2 3 5/8 metal stud at 16" o.c., extend every 4th stud to underside of OWSJ.

3.1.3 Provide 10ml poly from top of gypsum board to u/s deck, sealed at the top of the wall to underside of deck.

3.1.4 Provide negative pressure within the construction space exhausted to the exterior.

3.2 Tarps are not to be used in lieu of the described closures.

3.3 Construction Access & Storage:

- 3.3.1 Proper access to the area and storage of materials to be provided by the owner.
- 3.3.2 Location to be determined by Project Manager on site.
- 3.4 Provide and maintain fire protection equipment during performance of the work as required by insurance companies, authorities having jurisdiction and governing codes, regulations and by-laws. Ensure no access is blocked for this purpose.
- 3.5 Contractor to coordinate a staging area for the Subcontractors for equipment, tools and material storage. Locate trailers and/or lockable waterproof sheds on site as per HRSB Project Manager's instructions.
- 3.6 Provide sanitary facilities in accordance with local authority having jurisdiction.

4 Indoor Environmental Protection:

- 4.1 There are several sources of potential contamination during a construction/renovation project. These include:
 - 4.1.1 Demolition Activities:
 - 4.1.1.1 Demolition activities release dust and fibrous materials into the air. Asbestos control is essential. Insulation in ceilings and walls, and ceiling tile all have a high fiber content that may produce substantial fibrous materials during demolition. Total suspended particulate levels may be very high with a significant portion of the total being of the respirable particle sizes.
- 4.2 Construction:
 - 4.2.1 Construction introduces additional dust and fibrous materials. Many construction materials used today emit a range of volatile organic compounds, especially formaldehyde. All glues, vapours, and gases rise from solvents used to prepare surfaces for bonding, and emissions from welding and soldering can introduce a range of metals into the air.
- 4.3 Finish Work and Materials:
 - 4.3.1 Final finishing and decorating of the renovated spaces can introduce strong odours and more VOCs. Solvents, paints and varnishes, and adhesives and other glues all add to the accumulation of these irritating compounds.
- 4.4 The Contractor shall ensure site clean up is carried out at the end of each working day. This includes partially used containers of solvents, paints, caulking, adhesives, and ensuring that these are removed from the site. All construction debris shall be removed from the site at the end of each day, either to an approved dumpster outside the building, or removed completely from the property.

5 Preparation:

- 5.1 Inspect perimeter partitions of the construction area, above the ceiling and seal all penetrations above and below the ceiling. Carefully remove the minimum number of ceiling tiles necessary to perform the inspection and the work of sealing the partitions. HEPA vacuum above remaining ceiling tiles and grid and above existing ductwork to remove loose dust prior to removal.
- 5.2 Install new temporary 'dust tight' walls and include details of the plans for location.
- 5.3 Seal all doors leading to construction areas.

- 5.4 Any existing perimeter partitions of the construction area that do not extend to the underside of deck, Contractor to extend to ensure dust-free light area between the construction area and the remainder of the school.
- 5.5 Before any construction begins, doors between the rooms where work is being carried out and the adjacent corridor must be carefully sealed. Seal the doors completely at top, bottom, and sides. All vents, ducts, openings, etc. to be sealed. Do periodic inspections to ensure seals remain tight. Provide written information to the Project Manager.
- 5.6 Negative Pressure: Implement a system that extracts air directly from the work area, and discharges this air directly outside the work area to the outside of the building. All exhausted air is to pass through a HEPA filtering system before discharge to exterior. Place negative air pressure units in the area to be constructed in order to maintain a continuous negative pressure within the construction space. The construction area MUST be kept at a negative pressure relative to the occupied spaces.

6 During Construction:

- 6.1 Erect impermeable dust barriers to completely seal off the work area from adjacent areas.
- 6.2 Dust barriers are to be maintained and remain in place until work is completed and the facility representative has approved removal. Any damage to barriers must be repaired as soon as possible.
- 6.3 **Contractors will be held responsible for any damage, dirt or dust migration beyond the construction enclosure and all cleaning cost to rectify same will be borne by the General Contractor.**
- 6.4 Post signs on the doors indicating that there is to be absolutely no unauthorized entrance or exit through the sealed-off areas except for fire or security reasons. Ensure that the construction crew and others comply with these restrictions.
- 6.5 Clean the construction area daily.
- 6.6 Dirty or dusty footprints outside the construction area that have been left behind by people who were in the construction area are to be promptly cleaned.
- 6.7 Use water mist and commercial dust suppressing products, approved by the Owner, to control dust. Execute work by methods to minimize raising dust from construction operations.
- 6.8 In the event equipment or materials cannot be removed from the construction area, use drop sheets to cover these items.
- 6.9 Debris transported from the second floor will be by the exterior in all cases possible. Contractor to provide sealed chute to covered bins below.
- 6.10 Failure to provide adequate dust control will result in the contractor bearing the cost of any clean up, repair or replacement deemed necessary as a result of dust generated from the project.
- 6.11 Ensure that windows, doors, penetrations, electrical outlets and intake and exhaust vents are properly sealed with plastic and taped within work area.
- 6.12 For exterior work adjacent to windows in an existing facility, test window openings for air tightness and seal windows that leak.
- 6.13 Verify that all fresh air intakes facing construction operation are shut down, and sealed not to allow dust or debris intake.

6.14 Ventilation:

- 6.14.1 Seal duct openings in work areas until completed.
- 6.14.2 Maintain negative pressure between work area and adjacent occupied areas by using portable ventilation equipment.
- 6.14.3 Verify that air is exhausted directly outside and away from intake vents, or filtered through a HEPA filter before being recirculated. Where odour is a concern, ensure an approved air scrubbing material is utilized.
- 6.14.4 The main building's air handling system shall be disconnected from use in areas of construction. This will require sealing of existing duct work on both the supply and return air systems.

6.15 Remedial Measures:

- 6.15.1 Water leaks and flooding shall be reported immediately to the Project Manager.
- 6.15.2 Detected water damage must be thoroughly investigated in consultation with the Project Manager. A plan of action will then be implemented as approved by the Project Manager.
- 6.15.3 All investigations, removal and abatement procedures shall be conducted in a manner that does not promote dispersal of dust and spores.

6.16 Cleaning During Progress of Work:

- 6.16.1 Clean work area with HEPA filter-equipped vacuums and wet mops, or both, at end of each work shift and as necessary.
- 6.16.2 Ensure ventilation system is functioning properly and is cleaned if contaminated by soil or dust after work is complete.

7 After Construction:

- 7.1 Clean work area with HEPA filter equipped vacuums and wet mop.
- 7.2 Ensure air vents and ductwork are cleaned and seals removed.
- 7.3 If required, Contractor to conduct final indoor air quality test. Submit test results to the HRSB Project Manager.

8 Cutting and Patching

- 8.1 Provide openings larger than 8" in diameter in non-structural elements of Work for penetrations of structural, mechanical and electrical Work. Openings smaller than 8" diameter will be provided by the Sub-trades requiring same.
- 8.2 When floor cutting is required, Contractor to confirm there are no under-floor electrical or junction boxes. Contractor must utilize a electrically power operated floor saw.
- 8.3 Fit work airtight to pipes, sleeves, ducts, conduit, and after penetrations through surfaces.
- 8.4 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with approved fire-stopping and smoke sealing materials, full thickness of the construction element, as required to maintain the required fire resistance and smoke spread rating.
- 8.5 Refinish surfaces to match adjacent finishes: For continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.
- 8.6 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

9 Progressive Cleanliness & Restoration of Damage

- 9.1 Maintain Work daily in tidy condition, free from accumulation of waste products and debris. Remove waste material and debris from site at end of each working day, and dispose of off-site. Ensure permits are obtained from authorities having jurisdiction for disposal of waste and debris.
- 9.2 Provide on-site containers for collection of waste materials and debris, and provide clearly marked separate bins for recycling.

10 Close Out Procedures:

- 10.1 Remove dust, stains, paint spots, soil grease, fingerprints and accumulations of construction materials, interior and exterior to the building. Perform cleaning in accordance with installer's instructions for each material. Final cleaning shall include:
 - 10.1.1 Washing exterior paved surfaces disturbed under this contract.
 - 10.1.2 Cleaning and polishing of glass and finish metals, interior of areas noted.
 - 10.1.3 Cleaning of hardware, mechanical fixtures, lighting fixtures, cover plates and equipment, including polishing of their finish metal, porcelain, vitreous and glass components.
 - 10.4.4 Removing of visible manufacturer's labels left on materials, components and equipment.
 - 10.5.5 Cleaning of new flooring and of all other flooring disturbed under this contract.

10.2 Maintenance materials:

- 10.2.1 Maintenance materials provided shall be new, not damaged or defective, and of the same quality and manufacture as products provided in the work. If requested, furnish evidence as to type, source and quality of products provided.
- 10.2.2 Provide 3% of all hard tile, floor and walls and 4 liters of each paint colour specified.

10.3 Testing Balancing and Adjusting

Provide testing and ensure agency is a current member of AABC certified to perform services.

10.4 Demonstration of systems and equipment

Provide complete demonstration of all systems and equipment in the presence of the Owner and maintenance representations at the following times:

10.5 Submittals

- 10.5.1 Provide with application for substantial completion certificate.
 - 10.5.1.1 Certificate of final inspection report from electrical utility or inspection.
 - 10.5.1.2 Other reports required or specified.
 - 10.5.1.3 Maintenance manuals and operating instructions.
- 10.5.2 Submit with application for release of final payment:
 - 10.5.2.1 Final project record drawings including shop drawings.
 - 10.5.2.2 Performance bonds which shall remain in effect for one year after takeover date.
 - 10.5.2.3 Completed Liability Insurance Policy extended for one year over date.

- 10.5.2.4 Written guarantee covering all workmanship and materials used in the work.
- 10.5.2.5 Certificate from Worker's Compensation Board.
- 10.5.2.6 Maintenance Bonds as specified.
- 10.5.2.7 Maintenance Manual.
- 10.5.2.8 Spare parts and maintenance materials and list.
- 10.5.2.9 Extended warranties.

10.6 Substantial performance and final inspection procedures:

10.6.1 Provide:

An inspection of the work, identify deficiencies and defects; repair as required. Notify the consultants in writing and request Substantial Performance Final Inspection.

10.6.2 Present at the Substantial Performance Inspection will be:

10.6.2.1 The consultants and his sub-consultants that he requires and notifies.

10.6.2.2 The Owner and his consultants upon notification by the design builder.

10.6.2.3 The design builder and such sub-contractors that he considers are required.

10.6.3 The Contractor will compile a Substantial Performance deficiency list at this inspection and issue it to the Owner and his consultants.

10.6.4 Upon the Owner's completion of the deficiencies, the design builder shall submit an application for final payment and a certificate for payment will be issued by the consultant to the Board.

10.7 Substantial performance:

10.7.1 The owner will issue a Certificate of Substantial Performance when satisfied outstanding deficiencies noted during inspections prior to the Substantial Performance inspection have been corrected, and the work is substantially performed.

10.7.2 The owner reserves the right to occupy and use portions of the building(s), whether partially or entirely completed, or whether completed on schedule or not, provided such occupancy does not interfere with the Design Builders continuing work. Partial occupancy or installation by the Owner of his equipment shall not imply acceptance of Substantial Performance, in whole or in part, nor shall it imply acknowledgement that terms of the agreement are fulfilled.

10.7.3 The Certificate of Substantial Performance will be attached to the list of remaining deficiencies to be rectified before final acceptance.

10.7.4 Make submissions specified in this section.

10.8 Completion certificate:

- 10.8.1 The owner will issue a Certificate of Performance when he is satisfied that outstanding deficiencies noted during inspections have been corrected and the work is complete.
- 10.8.2 A list of remaining deficiencies to be rectified before final acceptance will be attached to the completion certificate.
- 10.8.3 Make submissions specified in this section.

10.9 Warranties:

- 10.9.1 Establishment of warranties:
 - 10.9.1.1 Warranties shall commence on date of approval of the Substantial Performance Certificate.
- 10.9.2 Warranty period:
 - 10.9.2.1 The Owner will notify the design builder of defects observed during warranty period and request him to remedy the defects in accordance with the contract documents.
 - 10.9.2.2 Thirty days before the expiration of warranties, the Owner and the design builder will inspect the work as arranged by the design builder noting defects of products and workmanship.
 - 10.9.2.3 The designer builder shall immediately remedy such noted defects.

2.1 **SITE VISITS**

- (a) Bidders will be deemed to have familiarized themselves with existing site and all other conditions which may affect performance of the Contract. No plea of ignorance of such conditions as a result of failure to make all necessary examinations and calculations will be accepted as a basis for any claims for extra compensation or an extension of time.
- (b) **A mandatory bidder's site meeting is scheduled as per the directions on the cover sheet of this document.**

3.0 **FORM OF TENDER - BIDDER DECLARES**

- (a) That this tender was made without collusion or fraud.
- (b) That the proposed work was carefully examined.
- (c) That the bidder is familiar with local conditions.
- (d) That contract documents and attachments were carefully examined.
- (e) That all the above were taken into consideration in preparation of this tender.

3.1 **BIDDER AGREES**

- (a) To enter into a contract to supply all labour, material and equipment and to do all work necessary to complete the Work as described and specified herein for the prices as per the Form of tender, Schedule of Prices, Article 3.5.
- (b) That this tender is valid for acceptance for 60 days from the time of tender Closing.
- (c) That failure to enter into a formal contract and give specified documents within time required will constitute grounds for forfeiture of this agreement.
- (d) That if Certified Cheque or bid bond is forfeited, the Owner will retain difference in money between amount of tender and amount for which owner legally contracts with another party to perform the work and will refund balance, if any, to bidder.
- (e) I/WE certify that the company listed herein is in good standing with the City of Halifax Tax Collector and all Municipal, Provincial and Federal Tax Agencies. Failure to complete this certification and maintain this status will be cause for rejection of your tender and/or cancellation of any contractual undertaking with the Board. We further agree with and accept the terms set out in this tender document.

Halifax Regional School Board

CONTRACTOR INFORMATION SHEET

***TENDER #3710
DUST COLLECTION SYSTEMS
TWO SCHOOLS
Brookside & Rocky Lake Jr High***

FIRM _____

ADDRESS _____

E-MAIL ADDRESS _____

POSTAL CODE _____ PHONE _____ FAX _____

NAME OF PERSON SIGNING FOR FIRM _____

POSITION OF PERSON SIGNING FOR FIRM _____

The undersigned company represents and warrants that it is authorized to carry on business of this nature and that it is not prohibited by any law applicable in Nova Scotia from performing this Contract. The undersigned also acknowledges receipt and understanding of, and has taken into consideration all information presented in, this tender and agrees to be bound by its terms and conditions. The undersigned further confirms and agrees that the person whose name is set out below is fully authorized to represent the company and to bind it to this bid and the Contract awarded pursuant to it and in all matters relating to or arising out of the subject matter of this tender.

I/WE, the undersigned, having carefully examined the ***#3710DUST COLLECTION SYSTEMS/TWO SCHOOLS – Brookside & Rocky Lake Jr High*** tender documents, and having read, understood, and accepted the Conditions of the tender which form part of the tender documents, hereby offer to provide the materials and service in strict accordance with the ***#3710DUST COLLECTION SYSTEMS/TWO SCHOOLS –Brookside & Rocky Lake Jr High*** documents, which form part of this tender.

I/WE, hereby agree that notification of acceptance of this bid shall be in writing and may be sent by prepaid post or fax, and if sent by prepaid post, acceptance shall be deemed to have been made on the date of mailing of such notification.

3.2 **REFERENCES:**

The Bidder shall furnish particulars of at least three contracts successfully completed or currently being carried to completion. The projects quoted should preferably be approximate in nature to the Works now proposed for and be of comparable or greater size.

Contact Name & Phone #	Date	Contract Value
_____	from _____ to _____	_____
_____	from _____ to _____	_____
_____	from _____ to _____	_____
_____	from _____ to _____	_____

3.3 **SUB CONTRACTORS:**

The Bidder shall enter the name and address of each Sub-Contractor used in making up this Tender. Only one Sub-Contractor shall be named for each part of the work to be sublet.

Subcontractor/Suppliers/Manufacturers	Service/Material

3.5 **SCHEDULE OF PRICES**

CONTINGENT UNIT PRICES: [see article 1.2 (p)]

Provide unit prices for contingency items in the event that additional work items are required in association with the scope of work as outlined in section 2.0 and the total value of unit prices shall be included in the Total Fixed Cost price.

Item No.	Description	Unit of Measurement	Estimated Quantity	Unit Price
1.	_____	_____	_____	\$ _____
2.	_____	_____	_____	\$ _____
3.	_____	_____	_____	\$ _____
4.	_____	_____	_____	\$ _____
5.	_____	_____	_____	\$ _____
6.	_____	_____	_____	\$ _____

3.6 **TIME AND MATERIAL PRICES:**

Provide unit prices for time and material work if no fixed price is requested in association with the work as outlined herein.

Item No.	Description	Unit of Measurement	Estimated Quantity	Unit Price
1.	_____	_____	_____	\$ _____
2.	_____	_____	_____	\$ _____
3.	_____	_____	_____	\$ _____
4.	_____	_____	_____	\$ _____
5.	_____	_____	_____	\$ _____
6.	_____	_____	_____	\$ _____

3.7 **PROPOSED FIXED PRICE**

The fixed price shall be the full inclusive value of the work. The prices submitted shall be all-inclusive and shall include for all the general and special requirements to meet the specifications of the work, including any contingent costs.

<u>Description</u>	<u>Total Fixed Price</u>
<i>DUST COLLECTION SYSTEMS TWO SCHOOLS</i> Brookside & Rocky Lake Jr High	\$ _____
ADD HST (15% OF TOTAL PRICE)	\$ _____
TOTAL CONTRACT PRICE	\$ _____

SUBSTANTIAL PERFORMANCE DATE: _____

BIDDERS HST REGISTRATION NO. _____

3.8 **SIGNATURE:**

SIGNED AND DELIVERED
in the presence of:

CONTRACTOR

Company name

Witness

Signature of Signing Officer

Name and Title (printed)

SCHEDULE A

AGREEMENT FOR SUPPLY OF SERVICES

This Agreement made effective on the _____ day of _____ in the year 20

For:

Project Name:

Location:

Tender #

by and between:

HALIFAX REGIONAL SCHOOL BOARD ("HRSB")

and

COMPANY NAME:

ADDRESS:

CITY:

PROV:

Postal Code:

(the "Contractor")

The parties agree as follows:

1. Contractor shall provide to HRSB the services set forth in Appendix "C" – Description of Services, and accompanying Exhibits (which along with all other obligations of Contractor set forth in this Agreement shall constitute the "Services") in accordance with the terms of this Agreement.
2. This Agreement consists of the following parts (together, the "Agreement"), each of which shall be construed as an integral part of this Agreement:

This signature page

Appendix "A" – General Terms and Conditions

Appendix "B" – Risk Management & Safety

**Appendix "C" – Description of Services
Exhibit A – RFP or Invitation to Tender**

Exhibit B – Response to RFP or Tender

**Appendix "D" – Undertaking to Comply Form and Contractor Safety
Checklist**

Appendix "E" – Safety Plan

Appendix "F" – Contractor Checklist

The above Appendixes and Exhibits are intended to be complementary, and what is required by any one shall be as binding as if required by all.

3. Contractor confirms that it has read this Agreement before signing it.

4. The individual signing below for Contractor warrants by his/her signature hereon that he/she has authority to bind Contractor to this Agreement.

HALIFAX REGIONAL SCHOOL BOARD

CONTRACTOR

Signature: _____

Signature: _____

Name (print): Kathryn Burlton

Name (print): _____

Title (print): *Purchasing Manager*

Title (print): _____

Date: _____

Date: _____

SAMPLE ONLY

CONTRACTOR'S ATTENTION IS SPECIFICALLY DRAWN TO THE APPENDIX "A" TERMS AND CONDITIONS GOVERNING THIS AGREEMENT. EXECUTING PARTIES' ATTENTION IS DRAWN TO APPENDIX "C" AND APPENDIX "C" TO BE INITIALED OR EXECUTED BY EACH PARTY IN ACKNOWLEDGMENT OF THE TERMS THEREIN.

APPENDIX "A"

TERMS AND CONDITIONS

SERVICES

Services: Contractor shall provide the Services to HRSB in accordance with the terms of this Agreement, on the HRSB properties specified in Appendix "C" (the "**Description of Services**"). Except as may be otherwise expressly provided in Appendix "C", Contractor shall provide all the equipment, personnel, supplies, consumables, supervision and labour necessary to complete the Services in a good and workmanlike manner. No changes or modifications to the Services or otherwise to this Agreement shall be valid unless made in accordance with Article 5 of this Agreement. The Contractor shall employ a competent supervisor who shall be in attendance at the place of work at all times while Services are being performed.

Term: This Agreement shall commence upon and later expire upon the dates specified in Appendix "C" (such period being the "**Term**"), unless earlier terminated in accordance with the provisions of this Agreement. Should Contractor continue to provide, and HRSB continue to pay, for the Services beyond the Term, such provision of Services shall be deemed to be on a temporary basis only and terminable at any time by HRSB with or without cause, and the provisions of this Agreement shall apply in full force (save as to the termination provisions in Article 9) until such termination.

FINANCIAL TERMS, PAYMENT, LIENS

Contract Price: For and in consideration of the Contractor providing the Services in accordance with the terms of this Agreement, the HRSB agrees to pay to the Contractor the sum of

SAMPLE ONLY

\$

(*plus HST*) hereinafter referred to as the **Contract Price**". Such Contract Price shall include any and all expenses Contractor may incur in the performance of the Services.

Invoices: The Contractor shall submit a single invoice to HRSB for all Services rendered under this Agreement unless Appendix "C" provides otherwise. Contractor's invoice shall indicate applicable sales and use taxes as separate amounts and indicate the net taxable value including all applicable discounts. HRSB shall not be obligated to pay any taxes to Contractor unless Contractor is registered with the applicable authorities and provides its registration number on the invoice. Contractor's invoice shall be in a form acceptable to HRSB and contain sufficient details to ascertain the scope of Services performed and, if requested, Contractor shall provide documentation in support of an invoice. If HRSB disputes any portion of the invoice, it shall pay such invoice less the disputed amount, subject to adjustment upon resolution of the dispute. Non-payment by HRSB of any amount in dispute shall not alleviate, diminish or modify in any respect Contractor's obligations to perform as required by and in accordance with this Agreement.

Payment of Invoices: Upon the HRSB certifying that the Services have been completed, the HRSB shall pay to the Contractor, thirty (30) calendar days from the date of such certification,

unless otherwise stipulated in Appendix "C", the full Contract Price due and payable hereunder, less any holdback required to be retained under the *Builder's Lien Act* of Nova Scotia (the "*Builder's Lien Act*"), other statutory obligation or as otherwise stipulated in Appendix "C", provided the Contractor has submitted the following:

a written statement from the supplier(s) of all materials used for the Services certifying that payment has been made in full for same or waivers of liens from such supplier(s) in due form;

a worker's wage statement containing all the information required by the HRSB pertaining to the Contractor's, and all of its subcontractors', workers. Such statement requires the name of the workers, hours worked, rate of pay, total wages received, and a signature from each worker certifying that they have received payment in full for all time worked on the job indicated on the form; and

certification that the statement is correct.

Release of Holdbacks: No holdback shall be paid to the Contractor until the Contractor has provided to the HRSB a statutory declaration in a form as set forth in Canadian Construction Documents Committee ("CCDC") Document 9A, together with evidence of compliance with the *Workers' Compensation Act*, and, if applicable, a copy of the Certificate of Title for the Lands, dated thirty (30) calendar days from the issuance of the Certificate of Substantial Performance (as defined in the *Builder's Lien Act*) of work by the Contractor, confirming that no liens have been placed against the Lands in association with Contractor's Services.

Liens: Contractor shall keep the Lands and all HRSB property free from any and all laborers', materialmen's and mechanics' liens and similar claims and encumbrances. To the fullest extent permitted by law, Contractor waives all rights to assert such liens against the Lands and all HRSB property. If Contractor fails to release and discharge any claim of lien of others against the Lands and HRSB property within FOUR (4) business days of receiving notice from HRSB, HRSB may at its option discharge or release the claim of lien, or otherwise deal with the lien claimant, and Contractor shall be liable to and shall pay HRSB any and all costs and expenses of HRSB in doing so, including all reasonable legal fees and expenses. Notwithstanding the foregoing, for the purpose of enforcing the terms of this Agreement, HRSB may apply for the following liens and rights when circumstances deem it necessary:

if the Contractor contracts for one or more jobs with HRSB, the HRSB shall have a lien on the Contract Price and extras on that job as well as on their other jobs with the HRSB;

the HRSB shall have a lien on the Contractor's equipment or supplies on any job; and

in the case of Contractor, without sufficient cause (in the opinion of the HRSB), suspending work on any job which continues for more than two (2) days, HRSB may take possession of any materials delivered to or for the Contractor on such job and use same, giving the Contractor credit for its value at not more than cost thereof to the Contractor, against any liability of the Contractor to the HRSB and may use any of the Contractor's equipment that was in use on any of the HRSB's premises until the completion of the unfinished work.

Tax: Contractor shall comply with all applicable tax laws, including but not limited to laws relating to: (i) the collection and remittance of HST; and (ii) the withholding of applicable taxes from those of its employees performing work under this Agreement. Contractor shall be liable for and shall indemnify HRSB in respect of any claims, penalties, interest or costs made or assessed against HRSB arising from Contractor's non-compliance with tax laws.

Audit: Contractor shall keep and maintain true and correct books, records and accounts with respect to the Services and any materials supplied in relation to the Services, along with invoices and monthly summaries, for a period of seven (7) years after Contractor ceases to provide the Services. Contractor shall, upon request of HRSB, make available and permit HRSB during such period to inspect, make copies of, and audit all such records. If there is any revision to charges as a result of an audit, within thirty (30) days of the audit Contractor shall pay to HRSB the full amount of any credit or HRSB shall pay to Contractor the full amount of any shortfall, as the case may be. The provisions of this Section shall survive the termination of this Agreement.

DUTIES OF THE CONTRACTOR

Sub-Contractors: Contractor shall not subcontract the whole or any part of the Services without first receiving the written consent of HRSB, which consent may be withheld in HRSB's sole discretion. Where such consent is granted, Contractor shall not be released or relieved from any obligations or liabilities of Contractor under this Agreement nor shall HRSB be prevented from pursuing any legal or equitable remedies it may be entitled to against Contractor. Contractor shall remain liable and responsible to HRSB for the actions and omissions of any subcontractor and shall ensure that any subcontractor strictly adheres to all terms of this Agreement, including any safety requirements referred to in this Agreement. When requested by HRSB, Contractor shall provide HRSB with all details concerning any and all subcontracted work.

Site Representative and Instructions: The Contractor shall identify in the Undertaking to Comply attached in Appendix "D" to this Agreement, a job site representative to act on the Contractor's behalf. This representative shall have the authority to represent the Contractor with relation to taking instruction on behalf of Contractor and entering agreements or taking such other actions on matters related to this Agreement. HRSB shall identify in Appendix "C" Description of Services, or through subsequent notice to Contractor, its project manager, who has the authority to represent HRSB and instruct Contractor on matters related to this Agreement. If the Contractor representative is not on the job site at the time of a visit by HRSB's project manager, the orders of the HRSB project manager to any worker present shall be carried out. Contractor shall not seek direction from any person on matters related to this Agreement, other than from the HRSB project manager.

DELAYS

Delays: If the Contractor is delayed in the performance of the Services, and such delay is outside the Contractor's direct control, then the schedule to perform the Services may be extended for such reasonable time as the HRSB may decide in consultation with the Contractor. No such extension shall operate to extend the Term of this Agreement. Weather is not considered a reason for delay. No extension shall be made for delay unless written notice of

delay is given to the HRSB not later than two (2) working days after the commencement of delay, providing however, that in the case of a continuing cause of delay only one notice of claim shall be necessary, and for only such period as approved by HRSB in writing, in its discretion.

Delay by HRSB: The HRSB will not, except by written notice to the Contractor, stop or delay the Services as a result of pending instructions or proposed changes in the Services.

Adherence to Schedule: If the Contractor is delayed in the performance of the Services by any cause within the Contractor's control, the Contractor shall at no cost to the HRSB take effective action to restore the Services to the original time schedule for their completion, whether or not such schedule is appended to this Agreement.

CHANGES IN THE WORK

Change Orders: The HRSB, without invalidating this Agreement, may make changes in the Services with the Contract Price and Term being adjusted accordingly, by written notice of change (a "**Change Order**"). No changes in the Services shall proceed without a Change Order signed by the HRSB and no claim for a change in the Contract Price or change in the Term shall be valid unless so ordered and at the same time valued by the Contractor as provided in Section 5.2.

Change Approvals: When a change in the Services is proposed or required, the Contractor shall present to the HRSB for its approval the value of the change whether an extra charge or a credit. Changes submitted for approval are to be accompanied by a detailed breakdown of labour and materials, to which shall be added supervision, overhead and profit charges. Change charges submitted shall be calculated in the following manner:

for work done by the Contractor, add to the net direct cost not more than ten (10%) percent for overhead, profit, supervision and bonding costs; and

for work done by any subcontractor, add to the net direct cost, not more than FIVE (5%) percent for overhead and profit payable to the subcontractor, and add not more than FIVE (5%) percent to the subcontractor's amount for supervision of the subcontractor by the Contractor and for bonding costs.

The HRSB will satisfy itself as to the correctness of such claim and, when approved by the HRSB, a Change Order shall be issued to the Contractor amending the Contract Price and Term as appropriate.

DEFECTIVE WORK & DISMISSAL OF WORKERS

Defective Work: Defective work is work that has been rejected by the HRSB as failing to conform to this Agreement. Contractor shall promptly correct defective work, as required to conform to this Agreement, with no change in Contract Price. If, in the HRSB's opinion, it is not expedient to correct defective work, the HRSB may deduct from the Contract Price the difference in value between the Services as performed and that required by this Agreement, the amount of which will be reasonably determined by the HRSB.

Dismissal of Workers: The Contractor shall, on the request of the HRSB, immediately dismiss from the job any person employed by the Contractor who may, in the opinion of the HRSB, be incompetent or for misconduct, and such persons shall not again be employed on the job without the prior written permission of the HRSB. Foul language will be considered as misconduct.

PRODUCT OPTIONS AND SUBSTITUTIONS

Product Selection: Contractor may:

for any products specified by non-proprietary specification in Appendix "C", select any product of any manufacturer which meets the requirements of this Agreement.

for products specified by proprietary specification and accompanied by words indicating that substitutions will not be accepted in Appendix "C", select any product or manufacturer named. Substitutions are not permitted; and

except where substitutions are not permitted, when a product is specified by proprietary specification, other unnamed products will be accepted, subject to such substitutions being the same generic type, and capable of performing the same functions and meeting or exceeding the standards of quality and performance, as the named product. Substitutions shall not require revisions to this Agreement or a Change Order.

Product Substitutions: When making a substitution, the Contractor shall represent in writing that:

Contractor has investigated substitute products and/or manufacturer and has determined that the substituted product meets the criteria specified in Section 7.1 (c);

Contractor will make any changes to the Services necessitated by the substitution as required for the Services to be complete in all respects; and

Contractor waives all claims for additional costs and time caused by substitution, which may subsequently become apparent.

COMPLIANCE WITH LAWS, SAFETY AND PRIME CONTRACTOR

Compliance with Laws: Contractor shall comply with, and shall ensure subcontractors comply with, all applicable federal, provincial, and municipal laws, regulations and by-laws and to all other applicable orders, rules and regulations of any authority having jurisdiction respecting the Services, including without restriction all applicable environmental legislation, employment standards codes and workers' compensation legislation or equivalent legislation. CONTRACTOR SHALL FURNISH HRSB WITH WRITTEN CONFIRMATION FROM THE APPLICABLE WORKERS' COMPENSATION AUTHORITIES, OR EQUIVALENT AUTHORITIES, THAT CONTRACTOR AND ANY SUBCONTRACTORS ARE IN GOOD STANDING WITH SUCH AUTHORITIES, AND NO CONTRACTOR INVOICE SHALL BE PAYABLE UNTIL SUCH CONFIRMATION IS RECEIVED.

Safety: Contractor shall comply with and shall ensure all of its agents, employees and subcontractors comply with all applicable fire, safety, health, and environmental laws and regulations, including all safety, health and environmental requirements pursuant to any government permit, license, or authorization. Contractor shall be solely responsible for ensuring the safety and health of its agents, employees and subcontractors and for ensuring that its activities do not compromise the safety of HRSB's operations.

Occupational Health and Safety Legislation: Contractor shall comply with all applicable provisions of the *Occupational Health and Safety Act* (Nova Scotia) (the "**Act**") regulations thereto. Contractor shall execute and provide to HRSB the Undertaking to Comply Form with attached Pre-Construction Meeting Contractor Safety Checklist attached as Appendix "D". Contractor shall also supply to HRSB a Certificate of Recognition (COR) form as required under the Act and other applicable legislation.

Designation of Prime Contractor: The parties agree to designate in Appendix "D" that the Contractor shall be the "prime contractor" for the work site on the Lands for the purposes of the Act, during the Term, under this Agreement. The Contractor hereby agrees that:

such obligation shall extend to protect all contractors, employees, workers and persons as specified in the Act concerning the work site notwithstanding that they have been retained by HRSB after the date of execution of Appendix "D" by the Contractor; and

HRSB may in its sole discretion notify the Contractor in writing that the Contractor shall, following the date of such notice, assume the role of the "prime contractor" under the Act with respect to the work site notwithstanding that the Contractor was not so designated in Appendix "D" at the time of its execution by the Contractor, and the Contractor hereby agrees to do so.

Responsibilities of the Prime Contractor: Contractor shall:

direct all subcontractors, other contractors, employers, workers and any other personnel at the work site on safety related matters, to the extent required to fulfill its "prime contractor" responsibilities pursuant to the Act, regardless of:

whether or not any contractual relationship exists between the Contractor and any of these entities, or

whether or not such entities have been specifically identified in this Agreement;

ensure all obligations under the Act are strictly adhered to by all personnel;

be diligent in ensuring that its subcontracts comply with all health, safety and environmental legislation;

take appropriate disciplinary action against subcontractors who contravene health, safety or environmental legislation, which includes but is not limited to the suspending of the work performed by the subcontractors, before allowing them to continue to work on the site; and

ensure that Contractor or subcontractors never place the HRSB students, staff, volunteers or the general public at risk of injury or illness related to work conducted under this Agreement.

The HRSB shall provide Contractor, where applicable, with a list of all subcontractors under contract to the HRSB, working on the work site at the same time as Contractor, as well as their contact information. Failure by the HRSB to provide such information to Contractor shall not relieve Contractor of its obligation under this Section 8.5.

HRSB Access: At all times during the Term, HRSB Project Managers, agents and designates shall have the right to access, ingress and egress any work site, building or facility where Contractor performs the Services, and any part thereof, for any purpose, and neither Contractor nor its subcontractors shall refuse such access, ingress or egress whatsoever.

TERMINATION

Insolvency: If the Contractor should be adjudged bankrupt, or makes a general assignment for the benefit of creditors because of insolvency or if a receiver is appointed, the HRSB may, without prejudice to any other right or remedy it may have, by giving the Contractor or receiver or trustee in bankruptcy written notice, immediately terminate this Agreement.

Breach by Contractor: If the Contractor should neglect to prosecute the Services properly or otherwise fail to comply with the requirements of this Agreement, the HRSB may notify the Contractor in writing that it is in default of its obligations and instruct it to correct such default within FOUR (4) business days immediately following the receipt of such notice. If the correction of the default cannot be completed in the FOUR (4) business days specified, the Contractor will be considered to be actually attempting to cure the default if it:

commences the correction of the default on a best efforts basis, in HRSB's sole opinion, within FOUR (4) business days of receiving a notice of default;

provides the HRSB with a schedule for such correction which HRSB approves by written notice to Contractor; and

completes the correction in accordance with such approved schedule and without any additional cost or delay to the HRSB.

If the Contractor fails to correct the default in the time specified or subsequently agreed upon, the HRSB, without prejudice to any other right or remedy it may have, may terminate the Contractor's right to continue with the Services in whole or in part, and/or terminate this Agreement. Such termination must be in writing to the Contractor upon thirty (30) days notice.

Other Remedies: If this Agreement is terminated in whole or in part by the HRSB as a result of the default of the Contractor, the HRSB shall be immediately entitled to withhold any and all further payments which may be due and owing to the Contractor, complete or hire a third party to complete the Services in a manner it determines to be expedient, or to do whatever else it deems prudent or expedient in the circumstances to complete the Services.

Safety Default: This Agreement may be immediately terminated by HRSB for non-compliance by Contractor of any of its obligations under Article 8 of this Agreement.

DISPUTE RESOLUTION

Disputes Generally: Disputes between the Contractor and the HRSB as to the interpretation, application or administration of this Agreement or any failure to agree where agreement between the parties is called for, which are to be resolved between the parties, shall be settled by mediation and/or by arbitration.

Use of Mediation. Should HRSB choose to mediate a dispute:

Mediation shall take place on a confidential, without prejudice, basis with a single trained mediator who is a member of the Nova Scotia Arbitration and Mediation Society, jointly selected by the Contractor and the HRSB (the “**Mediator**”). The Mediator must be impartial and independent with no involvement in the dispute. This impartiality must be assessed by each of the parties prior to mediation. If a bias or perception of bias develops during the mediation, either party or the Mediator may terminate the mediation.

The Contractor, the HRSB and the Mediator shall agree on the fees, timing and any specific procedures and shall share the costs of mediation equally. All parties shall agree to and sign an agreement to mediate drawn up by the Mediator prior to mediation.

10.3 Arbitration: By written notice by one party to the other (a "Notice of Arbitration"), all disputes arising out of this Agreement, including its interpretation, must be submitted to binding arbitration in accordance with the provisions of the *Commercial Arbitration Act* (Nova Scotia), subject to the following:

- (a) The arbitration panel will consist of one arbitrator. If the parties fail to reach agreement on the selection of the arbitrator within 10 days following delivery of the Notice of Arbitration, any party may apply to The Supreme Court of Nova Scotia to appoint the arbitrator. The arbitrator will be qualified by education, training and industry experience to rule upon the particular dispute to be resolved.
- (b) The arbitrator will be instructed that time is of the essence in the arbitration proceeding and, in any event, the arbitration award must be made within 90 days of the submission of the dispute to arbitration and within 15 days of the conclusion of any hearing, or if there is no hearing, within 15 days of the delivery of written submissions.
- (c) The arbitration will take place in Halifax, Nova Scotia or such place as the parties may agree and will be conducted in the English language.
- (d) The arbitration award will be given in writing and will be final and binding on the parties. The award will give reasons and will deal with the question of costs of the arbitration and all related matters. The contractor and the HRSB shall share the costs of arbitration equally, unless otherwise determined by the Arbitrator.
- (e) The parties will keep all matters relating to the arbitration strictly confidential. The existence of the proceeding and any element of it (including any pleadings, briefs or other documents submitted or exchanged, any testimony or other oral submission in any award) will not be disclosed except to the arbitrator, the parties, their counsel and any person necessary to the conduct of the proceeding, except as may be required by law or as may be lawfully required in judicial proceedings relating to the arbitration.

PERFORMANCE BOND

Bond Requirement: Contractor shall, on execution of this Agreement, provide and pay for a performance bond in the amount of fifty (50%) percent of the Contract Price and a labour and materials payment bond in the amount of fifty (50%) percent of the Contract Price issued by a bond company acceptable to the HRSB, to continue in force for one (1) year after substantial completion of the Services, covering the performance of all obligations of the Contractor and all warranties of the Contractor under this Agreement. **Required** **Not Required**

WARRANTY

Warranty: The Contractor hereby warrants that:

it shall correct promptly, at Contractor's sole expense, defects or deficiencies in the Services as a result of workmanship or materials, which appear prior to the first (1st) anniversary of the date of completion of the Services, or such longer periods as may be specified for certain products or work in Appendix "C"; and

during the construction and warranty periods, defects or deficiencies in the Services, causing an emergency condition on the Lands or premises requiring immediate remedial/emergency repairs, outside of normal working hours, will be responded to by the HRSB's operations or maintenance staff. Costs for this emergency response will be the responsibility of the Contractor, and Contractor is hereby liable to indemnify HRSB for all such costs.

CONFIDENTIALITY AND OWNERSHIP OF WORK PRODUCT

Confidentiality: Contractor shall:

not make use of any HRSB Confidential Information for its own personal gain or for any purpose other than is required to provide the Services;

not disclose any HRSB Confidential Information to any person except employees, consultants, subcontractors and agents who have a need to know such information consistent with the provision of the Services, but only after such person has properly assumed obligations identical in principle to those in this Section and Contractor ensures that such person at all times complies with those obligations

employ diligent efforts and exercise reasonable care to hold all HRSB Confidential Information in the strictest confidence;

not use HRSB's name for any marketing or promotional purposes and not make any public announcements or disclosure in respect of this Agreement or Contractor's relationship with HRSB without first obtaining written consent from HRSB; and

be liable to HRSB and indemnify HRSB for any breach of this Section by Contractor or its employees, consultants, subcontractors or agents.

Terms of Agreements: Neither party shall disclose the terms of this Agreement or amounts paid under it to any person without the other party's written consent, except to a party's employees, professional advisors and insurers who have a need to know such information, but only where the party ensures that such persons are under obligations of confidentiality identical in principle to those in this Section. HRSB shall not disclose Contractor's information respecting pricing or any information supplied by Contractor that is clearly marked "Confidential" to any person except HRSB's employees, consultants, subcontractors and agents who have a need to know such information.

"HRSB Confidential Information" refers to any and all information, material and data disclosed to Contractor by HRSB, or obtained by Contractor in connection with providing the Services, directly or indirectly, orally, in any written form, or in any magnetically or electronically recorded form, or by drawings or inspection of parts or equipment, and including but not limited to: (i) information, knowledge or data of an intellectual, technical, scientific, commercial or industrial nature, or of a financial, cost, pricing, or marketing nature relating to the business operations of HRSB; or (ii) any information supplied by HRSB that is clearly marked "Confidential"; but shall not include information in the public domain or information that at the time of disclosure was already known to Contractor on a non-confidential basis.

Ownership of Work Product: All property and intellectual property rights in all reports, designs, drawings, studies, specifications, software, materials, inventions and other work product created, produced or arising in connection with the performance of the Services, whether completed or in progress, and regardless of who was involved therewith, shall be owned exclusively by HRSB and either delivered to HRSB or made available for inspection by HRSB. HRSB's ownership of and title to the foregoing shall arise automatically upon its creation and not be subject to the payment of the Contract Price to Contractor. To the extent Contractor has any title to the foregoing, Contractor shall take and cause to be taken all necessary steps (including a waiver of any moral rights) to transfer title thereto to HRSB.

Survival: The provisions of this Article shall survive the expiration or termination of this Agreement.

MISCELLANEOUS PROVISIONS

Notices: Communications in writing between the parties shall be considered to have been received by the addressee on the date of delivery if delivered by hand or by facsimile, or if sent by post, to have been delivered within FOUR (4) business days of the date of mailing, when addressed to the addresses in Appendix "C":

Assignment: This Agreement is not assignable by Contractor without the prior written consent of HRSB, which consent may be withheld arbitrarily. Any purported assignment by Contractor of any of its rights, duties, or obligations under this Agreement without HRSB's written consent, shall be voidable by HRSB at its option. Contractor shall not in any event be released from its duties and obligations under this Agreement. HRSB may assign this Agreement upon providing notice to without obtaining Contractor's consent.

Binding Effect: This Agreement shall be binding upon and enure to the benefit of each of HRSB and Contractor and their respective successors and permitted assigns.

Interpretation: In this Agreement, all references to 'dollars' or '\$' are to Canadian dollars unless stated otherwise. The insertion of headings is solely for convenience of reference and shall not affect the interpretation of any provision.

Independent Contractor: The parties agree that Contractor is an independent contractor, that nothing in this Agreement shall be construed as establishing or implying a relationship of master and servant between the parties, or any joint venture or partnership between the parties, and that nothing in this Agreement shall be deemed to constitute either of the parties as the agent of the other party or authorize either party to incur any expenses on behalf of the other party or to commit the other party in any way whatsoever. Contractor and its servants, agents or employees shall at no time be deemed to be servants, agents or employees of HRSB, or be deemed to be under the control or supervision of HRSB when carrying out the Services. Without the prior written consent of HRSB.

No waiver: No party shall be deemed to have waived the exercise of any right that it holds under this Agreement unless such waiver is made in writing. No waiver made with respect to any instance involving the exercise of any such right shall be deemed to be a waiver with respect to any other instance involving the exercise of that right or with respect to any other right.

Governing Law: This Agreement shall be governed by and interpreted in accordance with the laws of the Province of Nova Scotia and the laws of Canada applicable therein, excluding any conflict of laws rules that may apply therein. The parties hereby attorn to the non-exclusive jurisdiction of the courts of the Province of Nova Scotia, without prejudice to the rights of HRSB to take proceedings in any other jurisdiction. The parties hereby waive any right to a trial by jury.

Time of the Essence: Time shall be of the essence in this Agreement.

Set-Off: HRSB shall be entitled at all times to set off any amount owing from Contractor to HRSB against any amount due or owing to Contractor with respect to this Agreement.

Entire Agreement; Invoice Terms of No Effect: This Agreement constitutes the entire agreement of the parties concerning its subject matter and no other representation, warranties or agreements, either oral or written, shall be binding upon HRSB or Contractor. This Agreement supercedes and invalidates all prior agreements, understandings, negotiations, representations and warranties, whether oral or written, with respect thereto. The terms of this Agreement shall supersede any terms attached to Contractor's invoice, which terms shall not be applicable to this Agreement and shall not be considered to be Contractor's exceptions to the provisions of this Agreement.

Counterparts: The parties may execute this Agreement by facsimile or other electronic means and in separate counterparts each of which when so executed and delivered shall be an original, and all such counterparts taken together shall constitute one instrument.

APPENDIX "B"

RISK MANAGEMENT AND SAFETY

A. INDEMNIFICATION AND INSURANCE

1. Indemnity and Waiver:

Contractor shall be liable to HRSB for and shall indemnify and save harmless HRSB from and against any and all claims, suits, demands, awards, actions, proceedings, losses, judgments, costs, damages, settlements or expenses (including legal costs on a solicitor and own client basis) suffered or incurred by HRSB that arise out of, result from, are based upon or are in any way connected with this Contract, including without limitation:

- (a) those resulting from any act or omission on the part of Contractor or its employees, agents and subcontractors;
- (b) those resulting from any action, suit or proceeding brought by any third party;
- (c) those brought in respect of personal injury (including injury resulting in death) or damage or destruction of tangible or intangible property, including HRSB's property;
- (d) those made under workers' compensation legislation;
- (e) those legal costs and fines resulting from the failure of Contractor, its employees, agents or subcontractors to comply with any applicable laws, regulations, by-laws, rules or orders of any government, authority or body having jurisdiction, whether identified in this Contract or applicable by-law;
- (f) those resulting from the release, discharge, seepage or other escape of any substance including chemicals, hazardous or toxic materials, substances, pollutants, contaminants or wastes, whether liquid, gaseous or of any other nature or for any breach of any applicable environmental legislation;
- (g) those resulting from any labourers', materialmen's, or mechanics' liens arising from or relating to the performance of the Contract;
- (h) those brought for actual, alleged, direct or contributory infringement of any patent, trademark, copyright, trade secret or other intellectual property right, including breach of obligations of confidentiality; and
- (i) any other claims, expenses, costs, and losses suffered, incurred or sustained by HRSB.

The foregoing liability, indemnification and hold harmless provisions shall apply to anything done or not done in connection with this Contract and by whomsoever made, regardless of whether it was caused by the negligence of Contractor or otherwise.

Contractor shall make no claim or demand against HRSB for any injury (including death), claim, expense, loss or damage to property suffered or sustained by Contractor or any other person which arises out of, or is connected, with this Contract or anything done or not done as required hereunder, or any other errors or omissions of Contractor, and hereby waives as against HRSB all such claims and demands.

The foregoing indemnity and waiver given by Contractor shall not apply to the extent of HRSB's own negligence. The onus of establishing that HRSB was negligent shall be upon Contractor. HRSB shall not be deemed to have caused or contributed thereto merely by reason of its knowledge, approval or acceptance of the materials, drawings,

specifications, supplies, equipment, procedures or services of Contractor.

For the purposes of this Section, any reference to "HRSB" shall include HRSB, together with the employees, directors, officers, superintendents, trustees, representatives and agents of HRSB; and any reference to "Contractor" shall include Contractor's directors, officers, employees, affiliates, representatives, agents and subcontractors.

2. Insurance:

Contractor shall, at its own expense, obtain and maintain during the term of this Contract, in a form and with an insurance company satisfactory to HRSB, policies of:

- (a) Commercial General Liability insurance with a limit of not less than Two Million Dollars (\$2,000,000) for any one loss or occurrence and in the aggregate with respect to bodily injury, personal injury and property damage, including loss of use thereof, which policy shall by its wording or by endorsement:
 - (i) include HRSB, its officers, directors, employees, agents and trustees as an additional insured with respect to the obligations assumed by Contractor under this Contract;
 - (ii) provide that, in relation to the interests of each additional insured, the Insurance shall not be invalidated by an action or inaction any other person other than the respective additional insured;
 - (iii) include a "cross liability" clause which shall have the effect of insuring each entity named in the policy as an insured in the same manner and to the same extent as if a separate policy had been issued to each;
 - (iv) extend to cover blanket Contractual liability, including the insurable liabilities assumed by Contractor under this Contract;
 - (v) extend to cover products and completed operations; such products and completed operations coverage, whether by specific policy endorsement respecting the services or by renewal of any annual practice policy, shall be kept in force during the supply of services and for a further period of 24 months following completion of supply of the services;
 - (vi) extend to cover non-owned auto liability coverage; and
 - (vii) not exclude any existing property of HRSB, but shall treat same as "third party property".
- (b) Employer's Liability Coverage which shall not be less than \$5,000,000 for each employee where Workers' Compensation coverage does not exist or the profession/trade has been indicated to be exempted from Workers' Compensation coverage.
- (c) Automobile public liability and property damage insurance in an amount not less than Two Million Dollars (\$2,000,000) all inclusive covering the ownership, use and operation of any motor vehicles and trailers which are owned, leased or controlled by the Contractor and used in connection with this Contract; and
- (d) Property "All Risks" insurance covering Contractor's owned property, including Contractor's equipment, where applicable, and property of others in the care, custody, or control of Contractor or for which the Contractor has assumed liability, all including while in transit or storage, on a replacement cost basis. With respect to any property of HRSB, such policy shall contain a loss payee

clause in favour of HRSB;
(collectively, the "Insurance").

Contractor shall ensure that the above Insurance policies:

- (a) are endorsed to provide HRSB with not less than thirty (30) days written notice in advance of cancellation, change or amendments restricting coverage;
- (b) do not include a deductible that exceeds such maximum amount that a reasonably prudent business person would consider reasonable; and
- (c) take the form of an occurrence basis policy and not a claims-made policy.

Contractor shall, before any services are performed, provide HRSB with a copy of the certificates of insurance and, if requested by HRSB, the insurance policies evidencing all the coverage stipulated above, and HRSB may withhold payment of any invoice until it receives evidence of such coverage. Failure for any reason to furnish this proof at any time shall be a breach of the contract, allowing the HRSB to terminate the contract or at the HRSB's option, to supply such insurance and charge the cost to Contractor. The HRSB may require Contractor to have the HRSB added as an insured party to the insurance policy and/or require Contractor to furnish a certified copy of the policy for such insurance.

Contractor shall not make or cause to be made any modification, or alteration to the Insurance, nor do or leave anything undone, which may invalidate the Insurance coverage. Contractor shall be responsible for any deductible and excluded loss under the Insurance.

Contractor shall cause all subcontractors performing services to obtain and maintain the Insurance policies required by this Section.

Contractor agrees that the insurance coverage required to be maintained by it under the provisions of this Contract shall in no manner limit or restrict its liabilities under this Contract. HRSB reserves the right to maintain the insurance in good standing at Contractor's expense and to require Contractor to obtain additional insurance where, in HRSB's reasonable opinion, the circumstances so warrant.

B. COMPLIANCE WITH LEGISLATION AND REGULATIONS

1. Compliance

Contractor shall comply with and shall ensure all of its agents, employees and subcontractors comply with all applicable laws and regulations, including all safety, health and environmental requirements pursuant to any government permit, license, or authorization. Contractor shall at its cost obtain all permits and licenses required by any governing authority in order to enable Contractor to provide its goods and services and otherwise perform its obligations under the Contract.

2. Labour Code

Contractor shall comply with all applicable provisions of the *Labour Code* (Nova Scotia) and the *Employment Standards Act* (Nova Scotia) and all regulations and amendments thereto.

3. Workers' Compensation Legislation

Contractor shall comply with the *Worker's Compensation Act* (Nova Scotia) and regulations and amendments thereto, and:

- (a) if any employees perform or assist in the performance of this Contract, the Contractor shall submit, at any time requested by the HRSB, a letter from the Workers' Compensation Board (Nova Scotia) stating that Contractor has an account in good standing with the Worker's Compensation Board;
- (b) the Contractor will make the necessary returns to the Workers' Compensation Board in accordance with government regulations and will pay all fees and contributions required in connection therewith. The cost of compensation will be included in the price payable under the Contract; and
- (c) the Contractor shall submit a clearance from the Workers' Compensation Board that all fees and contributions have been paid before final payment is made by the HRSB under the Contract.

4. Canada Safety Council and Associated Standards

All electrical, electronic and gas-fired equipment must bear the required approval markings, being C.S.A. approved for entirely electrical or electronic equipment and C.G.A. or C.S.A. approved for gas fired equipment. All other similar equipment approvals must also be obtained. It shall be the responsibility of the Contractor to obtain all applicable approvals, at its own expense.

5. Nova Scotia Occupational Health and Safety Legislation

Contractor shall comply at all times with the Nova Scotia Occupational Health and Safety Act, Regulation and Code, and it's amendments thereto.

C. SAFETY REQUIREMENTS

1. Safety Responsibility

Contractor shall be solely responsible for ensuring the safety and health of its agents, employees and subcontractors and for ensuring that its activities do not compromise the safety of HRSB's operations. Contractor shall provide to its agents, employees and subcontractors, at its own expense, any and all safety gear required to protect against injuries during the performance of the services and shall ensure that its agents, employees and subcontractors are knowledgeable of and utilize safe practices in the provision of the services, such practices to be at least as stringent as those set out in HRSB's safety standards provided to Contractor from time to time.

2. Project Site Protection and Safety

The Contractor shall protect the HRSB's property, staff and students, the Contractor's staff and the public, from damage or injury by providing adequate precautions to make the work site a safe environment at all times. In addition to complying with any safety standards provided to the Contractor by HRSB, the Contractor shall:

- (a) provide all guards and fences and other safety equipment;
- (b) respond to reports of hazards by HRSB;
- (c) do the following when work generating vibration, noise or safety concerns (including without limitation jack hammering, shot blasting, sandblasting, concrete cutting and use of powder actuated fasteners) may affect HRSB property, staff, students or operations.
 - (i) coordinate with HRSB representatives;
 - (ii) schedule and coordinate hours of work with HRSB input; and

- (iii) stop operations generating vibration, noise or safety concerns when instructed by HRSB.
- (d) Contractor responsible to ensure all spaces directly beneath the roof work area are protected from potential damage of dust, debris or water infiltration or any other impact resulting from the roof replacement project. Such protection shall include installation of effective cover using minimum 4 mil plastic vapour barrier sheeting over all furniture, equipment, instruction aids, floors areas and any other items underneath the work space. Contractor must remove all sheeting upon completion of work and will be responsible for costs of restoration of damages caused by process of roof project or lack of adequate protection of property.

3. Hazardous Materials

The Contractor shall:

- (a) develop and implement a written "Hazardous Materials Information" document to ensure that all persons at the work site are made aware of the existence of any hazardous materials such as asbestos, lead-based products, and PCB's;

D. CONTRACTOR EVALUATION

1. Audit

The HRSB reserves the right to audit Contractors and their subcontractor's health and safety performances during the term of the Contract and upon its conclusion.

2. Evaluation

The HRSB reserves the right to evaluate the performance of the Contractor and such evaluation will be based upon accident/injury data and adherence to this Schedule "C", the HRSB health and safety policies, applicable legislation, and periodic inspections and reports from HRSB employees. Information collected as part of such evaluations may be used for future reference.

E. HRSB REMEDIES FOR CONTRACTOR NON-COMPLIANCE

1. Emergency Work Stoppage

The HRSB has the authority to stop progress of the work whenever, in its opinion, such stoppage is desirable for any safety-related reason. The Contractor hereby agrees that no claim for loss of time or materials may be made with respect to such stoppage unless the claim for the time and materials and their value are certified in writing by the HRSB as allowable.

2. Termination for Non-Compliance

HRSB may terminate this Contract for non-compliance with health, safety, environmental and other applicable legislation and good industry practice on the part of the Contractor or any subcontractor of the Contractor, as constituting a material breach of this Contract. In addition, the HRSB reserves the right to stop the work of the Contractor in the event of Contractor's non-compliance with applicable legislation or good industry practice. Such work stoppages shall not postpone any agreed to completion dates and any additional cost

resulting from such work stoppages shall be borne by the Contractor. Work shall not resume until the Contractor rectifies the reason for non-compliance, to HRSB's satisfaction.

3. Non-Exclusive Remedies

Contractor acknowledges and agrees that the foregoing remedies available to HRSB are non-exclusive to, and may be exercised in conjunction with, any other rights or remedies available to HRSB, under the Contract, at law or in equity, in the event of threatened or actual breach of this Contract, including injunctive relief.

APPENDIX "C"

DESCRIPTION OF SERVICES

- Description of Services to be performed by Contractor**, including any applicable standards of performance:

Description of Work:

As per Tender # drawings, specifications and scope of work

- Municipal and Legal Description of the Lands:**

Location of Work

- Term:** completion of work by ,

- Invoicing:** Services are to be paid for by HRSB:

- By scheduled progress payments (as agreed by both parties)
- By single invoice upon project completion

- Holdbacks:** In compliance with "Section 13 – Holdbacks" of the *Builder's Lien Act of Nova Scotia (incl. amendments)*, a holdback in the amount of ten percent (10%) of the contract may be held up to ninety (90) days after completion of the work, to the satisfaction of the Board.

- HRSB Project Manager /Contractor Contact Information:**

CONTRACTOR INFORMATION	HRSB INFORMATION
Name:	HRSB Representatives:
Jurisdiction of incorporation:	Name:
Address:	Department: Operations Services
Attention:	Address: 33 Spectacle Lake Drive
Telephone:	Dartmouth, N.S., B3B 1X7
Facsimile:	Telephone: 902 464-2000 Ext.
E-mail:	Facsimile: 902-
GST Registration #:	E-mail:
WCB Registration #:	

Contractor's Initials

HRSB's Initials

Exhibit A

Invitation To Tender

PROJECT SPECIFICATIONS/DRAWINGS WERE INCLUDED IN TENDER DOCUMENT AND ARE CONSIDERED PART OF THIS CONTRACT EVEN THOUGH THEY ARE NOT ATTACHED TO THIS DOCUMENT

Exhibit B

Response to Invitation to Tender

**A COPY OF THE SUCCESSFUL CONTRACTOR'S BID SUBMISSION IS ON FILE IN
THE PURCHASING DEPARTMENT - TENDER #3437**

APPENDIX "D"

**UNDERTAKING TO COMPLY FORM
AND CONTRACTOR SAFETY CHECKLIST**

UNDERTAKING TO COMPLY

Name of Contractor:

(the "Contractor")

Description of Agreement:

Site Location:

(the "Agreement")

7. The Contractor hereby undertakes to HRSB:
to comply with all health, safety and environmental legislation in the performance of this Agreement; and
to maintain a safe and healthy work environment during the performance of this Agreement.
8. The Contractor hereby agrees with HRSB:
that compliance with all health, safety and environmental legislation is a condition of this Agreement and that non-compliance with the same may, in HRSB's discretion, lead to the termination of this Agreement; and
to permit HRSB to audit the Contractor's health, safety and environmental records during the term of this Agreement and upon its conclusion and to cooperate fully with any such audit(s).
9. The Contractor understands that, at HRSB's discretion, any Contractor safety deficiencies will be addressed by HRSB in the following progressive steps:
the problems will be identified to the Contractor (site supervisor);
the Contractor's head office will be contacted about the problem, orally and later in writing;
if required by law to report the problem to a Provincial and or Federal Ministry, HRSB will immediately do so;
if not required by law to report the problem, and the problem remains unresolved, HRSB may report the problem; and
the Agreement may, in HRSB's discretion, be suspended or terminated and/or payment withheld by HRSB.

- 10. The Contractor acknowledges and agrees with HRSB that, depending upon the nature and/or seriousness of the deficiency, HRSB reserves the right to bypass any or all of the steps described in Section 3.
- 11. **Prime Contractor Designation:** The Contractor and the HRSB hereby agree that the Contractor shall, pursuant to Section 8.4 of the Agreement shall be the Prime Contractor.

The undersigned hereby confirms that he/she has the authority to bind the Contractor:

CONTRACTOR

**HALIFAX REGIONAL
SCHOOL BOARD**

FULL COMPANY NAME

PRINT NAME

AUTHORIZED SIGNATURE

POSITION

DATE

PRINT NAME

AUTHORIZED SIGNATURE

POSITION

DATE

SAMPLE ONLY

PRE-CONSTRUCTION MEETING
CONTRACTOR SAFETY CHECKLIST PAGE 1

MEETING DATE:	TENDER #:
---------------	-----------

SITE LOCATION:

COMPANY NAME:

CONTRACTOR REPRESENTATIVE::

HRSB REPRESENTATIVE::

√ Means complied to	X Means not complied with	n/a means not applicable
---------------------	---------------------------	--------------------------

- | | | |
|--|---|--|
| <p>1. Notice of Project filed with Nova Scotia Infrastructure (if applicable) <input type="checkbox"/></p> <p>2. Review Board Safety Compliance Undertaking to Comply Form Signed <input type="checkbox"/></p> <p style="padding-left: 20px;">Progressive Disciplinary Action Reviewed <input type="checkbox"/></p> <p>3. Contractor Health and Safety Policy <input type="checkbox"/></p> <p style="padding-left: 20px;">Prime Contractor and Safety Management Certificate <input type="checkbox"/></p> <p>4. Health & Safety Representatives/Joint Site Health & Safety Committee <input type="checkbox"/></p> <p style="padding-left: 20px;">Name and Phone _____</p> <p>5. Personal Protective Equipment:</p> <p style="padding-left: 20px;">Hard Hats <input type="checkbox"/></p> <p style="padding-left: 20px;">Footwear <input type="checkbox"/></p> <p style="padding-left: 20px;">Safety Glasses <input type="checkbox"/></p> | <p>8.</p> <p>9.</p> <p>10.</p> <p>11.</p> | <p>Contractor Staff Training: Emergency Response <input type="checkbox"/></p> <p>WHMIS Training Verification <input type="checkbox"/></p> <p>O H & S <input type="checkbox"/></p> <p>MSDS Received <input type="checkbox"/></p> <p>Scaffold <input type="checkbox"/></p> <p>Confined Space Code of Practice <input type="checkbox"/></p> <p>TDG Training Verification <input type="checkbox"/></p> <p>Working Alone <input type="checkbox"/></p> <p>Review Contractor Signage & Barricades <input type="checkbox"/></p> <p>Written Work Site Hazard Assessment and Control Plan/Schedule Submitted <input type="checkbox"/></p> <p>Building Fire Plan <input type="checkbox"/></p> |
|--|---|--|

SAMPLE ONLY

CONTRACTOR SAFETY CHECKLIST – PAGE 2

- | | | | |
|---|--------------------------|---|--------------------------|
| Hearing | <input type="checkbox"/> | 12. Accident Investigation/Notification/Reporting Procedure | <input type="checkbox"/> |
| Dust & Fumes | <input type="checkbox"/> | | |
| Face Protection | <input type="checkbox"/> | | |
| Others: _____ | <input type="checkbox"/> | 13. Contingency Plan for Control & Clean up of a Spill | <input type="checkbox"/> |
| _____ | <input type="checkbox"/> | | |
| _____ | <input type="checkbox"/> | 14. Fire Protection/Extinguishers | <input type="checkbox"/> |
| | | | |
| 6. Equipment Certification | | 15. First Aid Kits on Site | <input type="checkbox"/> |
| Trench Boxes | <input type="checkbox"/> | | |
| | | 16. First Aiders on Staff | <input type="checkbox"/> |
| Boom Cranes | <input type="checkbox"/> | Names: _____ | |
| Scaffolds | <input type="checkbox"/> | | |
| Others: _____ | <input type="checkbox"/> | 17. Fall Protection /Safety Harness | <input type="checkbox"/> |
| _____ | <input type="checkbox"/> | | |
| _____ | <input type="checkbox"/> | 18. Methane gas Detection in Sewer | <input type="checkbox"/> |
| | | | |
| 7. Provision of Hazardous Material Information to Contract | <input type="checkbox"/> | 19. Clean Up - Good Housekeeping | <input type="checkbox"/> |
| Confirmation of Employee Awareness of Hazardous Material | <input type="checkbox"/> | | |
| Asbestos | <input type="checkbox"/> | 20. Weekly Safety Talks/Meetings | <input type="checkbox"/> |
| Lead | <input type="checkbox"/> | | |
| PCB | | | |
| Confirmation that Prime Contractor reviewed Asbestos Inventory at the work site | <input type="checkbox"/> | 21. Other Issues | <input type="checkbox"/> |

SAMPLE ONLY



APPENDIX E

Project Safety Plan Outline

During the planning of each project, environmental and occupational health and safety issues will be assessed like any other key project component.

Prior to beginning a new project, tendering Contractors shall examine the work area to identify potentially hazardous site specific situations.

Once identified, these hazards should be prioritized on this Hazard Assessments/Project Safety Plan Outline and corrective *actions* noted to eliminate or control each hazard. The dates of when and names of the persons who are responsible for completing the *action* should also be assigned.

Copies of the completed Safety Plan Outline shall be submitted as part of the tender document submittal, sent to the HRSB Operations Services Regional Manager, made available on the job site and communicated to the workers.

Project Name: _____

Project Location: _____

Project Start date: _____

Project End date: _____

Company Name: _____

Completed by: _____
(Contractor's project manager)

Date: _____

Copy to: _____

PLANNING:

Does the Contractor's Occupational Health and Safety Program deal with the work activities associated with this project? Yes No

Describe tasks to be undertaken: _____

HAZARDS ASSESSMENT:

Identify the hazards that could present themselves on this project (e.g. live electrical wires, over water, confined space, etc) and describe what steps will be taken to prevent an incident (e.g. cover up, de-energize, safe work practices, netting, etc). Prioritize from #1 as needing immediate action.

#	Hazard	Required Action	Completed by	Date
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

ENVIRONMENTAL ASSESSMENT:

Identify the environmental issues that could present themselves on this project (e.g. oil spills, asbestos, etc.) and describe the action that will be taken to eliminate or reduce the risk of occurrence (e.g. mop kits, air sampling, etc.)

#	Hazard	Required Action	Completed by	Date
1				
2				
3				
4				
5				

EMERGENCY RESPONSE:

In the event of an incident, pre-plan the response and write up the procedures. Minimally, the following list should be completed and posted on site:

Contact	Phone #	Contact	Phone #
Fire	911	Poison Control	428-8161
Ambulance	911	Dangerous Goods	1-800-565-1633
Doctor	911	Waste Disposal	
Police	911	Insurance	
HRSB Office	493-5110	Min/Dept of Labour	1-800-952-2687
Min./Dept.of Transport.		Min/Dept of Environment	1-800-565-1633

- Identify and arrange source of first aid, ambulance and rescue.
- Accidents will be reported to: _____
- Accidents will be investigated by: _____
- Back-up call to: _____
- HRSB # emergency/after hours: day 493-5110 after 4:00 pm 442-2476

SAFETY MEETINGS:

On this project, given the nature of the work and the anticipated size of the work force, the following frequency will apply:

Site meetings _____

Site Audits _____

Follow up with HRSB Manager: _____

SITE IMPLEMENTATION:

- Health and Safety Rep & Safety Committee:
Establish liaison between HRSB, Contractor, site administration
First Aid, PPE, other safety items as required.

- Documentation:
Applicable MSDS
Safety program
Applicable work procedures
Permits
First Aid Certification

TRAINING:

The following training/testing will be mandatory on site:

1) _____

2) _____

3) _____

TENTATIVE SCHEDULE OF WORK:

- 1) Date Project Will Commence: _____
- 2) Number of Weeks to Complete Project: _____ weeks
- 3) Expected Completion Date: _____

NOTE:

Within two weeks of tender award the successful bidder shall provide a schedule clearly indicating timelines for completion of all aspects of the project.

APPENDIX F

CONTRACTOR'S CHECKLIST

Enclose the following documents with your bid:

- Bid Security as required in Clause 1.3 (e)*** in the amount of 10% of the Contract Price (before HST).
- Contract Security for bids over \$100,000 as required in Clause 1.3 (f)***.
- Certificate of Insurance*** indicating a minimum of \$2,000,000 **Commercial General Liability Insurance** per occurrence and **Commercial Auto Liability Insurance** covering all owned, non-owned and hired vehicles for a minimum combined single limit of \$2,000,000 per occurrence and **Builder's Risk Insurance** in the amount of the contract price.
- Tentative Work Schedule (Timelines)*** – Subsequently, within five (5) business days of tender award the successful bidder shall provide a schedule clearly indicating timelines for completion of all aspects of the project.
- Workers' Compensation Board Letter*** of Good Standing
- Certificate of Recognition from one of the seven safety audit companies that jointly sign with the WCB:***
 - East Coast Mobile Medical Inc.
 - HSE Integrated
 - Nova Scotia Construction Safety Association
 - Nova Scotia Trucking Safety Association
 - Occupational Health & Educational Services (2002) Inc.
 - Safety Services Nova Scotia
 - Stantec Inc.

This list can be found on WCB's website: www.wcb.ns.ca.
- Completed HRSB Safety Plan***
- Applicable Warranty Information***



SPECIFICATIONS

For

***DUST COLLECTION SYSTEM REMEDIATION
HALIFAX REGIONAL SCHOOL BOARD (HRSB)***

Design Package 06

- ***Brookside Junior High School (BJHS)***
- ***Rocky Lake Junior High School (RLJHS)***

***HRSB Tender # 3706
MCW Project #10-14-006***

***MCW Maricor (Consultants)
7051 Bayers Road, Suite 102
Halifax, Nova Scotia
B3L 2C1***

***Issued For Tender
October 2014***

SECTIONS **TITLE**

BIDDING AND CONTRACTING REQUIREMENTS

Tender/Bid Documentation by HRSB

00 01 05	Seals Page
00 01 10	Index
00 01 15	List of Drawings
00 10 00	Invitation to Bid
00 21 00	Instructions to Bidders
00 43 00	Supplementary Bid Form
00 43 99	Bid Submittal Checklist
00 50 00	Agreement Forms
00 73 00	Supplementary Conditions

GENERAL REQUIREMENTS

01 11 00	Summary of Work
01 12 00	Multiple Contract Summary
01 14 00	Work Restrictions
01 29 00	Payment Procedures
01 31 19	Project Meetings
01 32 16	Construction Progress Schedules
01 33 00	Submittal Procedures
01 35 29	Health and Safety Requirements
01 35 35	Fire Safety Requirements
01 41 00	Regulatory Requirements
01 45 00	Quality Control
01 56 00	Temporary Barriers and Enclosures
01 61 00	Common Product Requirements
01 71 00	Examination And Preparation
01 73 00	Execution Requirements
01 74 11	Cleaning
01 74 21	Construction/Demolition Waste Management And Disposal
01 77 00	Closeout Procedures
01 78 00	Closeout Submittals
01 91 13	General Commissioning (Cx) Requirements

ASBESTOS

02 81 01	Hazardous Materials
02 82 00	Asbestos Abatement

CONCRETE

03 10 00	Concrete Forms and Accessories
03 20 00	Concrete Reinforcement
03 30 00	Cast-in-Place Concrete

PAINTING

09 97 19 Painting Exterior Metal Surfaces

SECTIONS **TITLE**

MECHANICAL

23 05 00 Common Work Results for Mechanical
23 05 13 Common Motor Requirements
23 05 29 Hangers and Supports for Piping and Equipment
23 05 93 Testing Adjusting and Balancing
23 31 13 Metal Ducts
23 33 00 Air Duct Accessories
23 35 13 Dust Collection

ELECTRICAL

26 05 00 Common Work Results – Electrical
26 05 20 Wire and Box Connectors 0-1000 V
26 05 21 Wires and Cables (0-1000 V)
26 05 22 Connectors And Terminations
26 05 29 Hangers and Supports for Electrical Systems
26 05 31 Splitters, Junction, Pull Boxes and Cabinets
26 05 32 Outlet Boxes, Conduit Boxes and Fittings
26 05 34 Conduits, Conduit Fastenings and Conduit Fittings
26 28 23 Disconnect Switches - Fused and Non-Fused

EXTERIOR IMPROVEMENTS

32 31 26 Chain Link Fences and Gates

APPENDICES

Appendix A Owner-Supplied Equipment
1. Dust Collector and Associated Components – Air Control Technology (ACT)

Appendix B Asbestos Report Information
1. HRSB Brookside Junior High Asbestos Report
2. HRSB Rocky Lake Junior High

Appendix C Halifax Regional School Board Safety Plan Template

END OF SECTION

SCHOOL NAME **Brookside Junior High School, Hatchet Lake, NS**
SCHOOL BOARD **Halifax Regional School Board**
SCHOOL REFERENCE **06-BJHS**

<u>DRAWING NO.</u>	<u>TITLE</u>	<u>REV. NO.</u>
M-101	Wood Lab Layout and Machine Requirements	R0
M-102	Demolition Plan	R0
M-103	Wood Lab Dust Collection Duct layout	R0
M-104	Dust Collector Plan	R0
M-201	Dust Collector Elevation	R0
M-501	Ductwork Details and Bonding Lug Detail	R0
M-502	Access Hatch, Concrete Pad and Fence Post Details	R0
M-503	Table Saw and Band Saw Connection Details	R0
M-504	Jointer, Planer, and CNC Router Connection Details	R0
M-505	Chop Saw, Lathe and Floating Drop Connection Details	R0
M-506	Exterior Duct Support Details	R0
E-101	Dust Collector Control Panel, Disconnect Locations and Details	R0
E-102	Dust Collection Electrical One Line Diagram	R0
E-104	Bonding Details	R0

SCHOOL NAME **Rocky Lake Junior High School, Bedford, NS**
SCHOOL BOARD **Halifax Regional School Board**
SCHOOL REFERENCE **06-RLJHS**

<u>DRAWING NO.</u>	<u>TITLE</u>	<u>REV. NO.</u>
M-101	Wood Lab Layout and Machine Requirements	R0
M-102	Demolition Plan	R0
M-103	Dust Collection Ductwork Floor Plan	R0
M-104	Dust Collector Plan	R0
M-201	Dust Collector Elevation	R0
M-501	Ductwork and Bonding Lug Details	R0
M-502	Access Hatch, Concrete Pad and Fence Post Details	R0
M-503	Table Saw, Router and Band Saw Connection Details	R0
M-504	Jointer and Lathe Connection Details	R0
M-505	Planer and Miter Saw Connection Details	R0
E-101	Dust Collector Control Panel and Disconnect Location	R0
E-102	Dust Collector Power and Control One Line Diagram	R0
E-103	Bonding Details	R0

END OF SECTION

Part 1 General

1.1 PROJECT:

- .1 Dust Collection System Remediation for Halifax Regional School Board (HRSB), Package 6, for two (2) only HRSB schools, Brookside Junior High School and Rocky Lake Junior High School). Scope of work for both schools include the installation of new owner supplied dust collectors, c/w discharge silencers, backdraft dampers and associated other components. Asbestos removal/remediation may be required in specific work areas. Based on available asbestos reports and “as found” on site conditions, the contractor shall determine the degree of asbestos hazard (if any) and upon discovery, to implement appropriate removal/remediation measures consistent with the type and quantity of product found. Refer to applicable specification sections and implement appropriate NS standards and guidelines.

1.2 OWNER:

- .1 Halifax Regional School Board (HRSB)

1.3 CONSULTANT:

MCW Maricor (Consultants).

1.4 DOCUMENT AVAILABILITY:

- .1 No deposit required. Documents available online.

1.5 BID SECURITY:

- .1 10% of Bid Price, in the form of Bid Bond, or Certified Cheque, or irrevocable Letter of Credit in the name of both Owners (see above).

1.6 BIDDERS' BRIEFING:

- .1 A mandatory bidders' briefing will be held at:
 - .1 Brookside Junior High School; 2239 Prospect Rd., Hatchet Lake; NS., B3T 1R8
 - .2 October 24, 2014. Exact time to be determined by HRSB
 - .3 Rocky Lake Junior High School; 670 Rocky Lake Drive, Bedford; NS., B4A 2T6
 - .4 October 24, 2014. Exact time to be determined by HRSB

1.7 CLOSING DATE:

- .1 The tender closing location, date and time:
 - .1 Halifax Regional School Board (HRSB)
 - .2 November 03, 2014 at 2:00pm

1.8 WORK COVERS:

- .1 Dust collection system remediation of existing school wood-working areas, including but not limited to:
 - .1 Visiting and assessing all schools in detail relative to scope of work. It is imperative to refer to item no. 16 below.
 - .2 Complete all removals and demolition work. Make good to match existing.
 - .3 If required, identify and complete all removals/remediation of asbestos located in tech. ed. shop area and other affected areas within the scope of this work. Remediate affected areas as necessary. As dictated by the type and quantity of product removal, the asbestos contractor must be licensed accordingly to conduct the associated work of removal and/or disposal of asbestos containing materials.
 - .4 Complete all up-front pre-delivery work in readiness for owner supplied equipment, as well as specified equipment.
 - .5 Unless noted otherwise, Dust Collectors, Silencers, Backdraft Dampers, Acoustic Enclosures have been pre-purchased by NS TIR and are to be delivered to each individual school site. Alternatively, TIR may require direct delivery to the TIR storage facility at Miller Lake, NS. Civic address is 107 Perrin Drive, Fall River, NS. In that event, contractor is required to pick up (at no extra cost) the dust collectors within 2 weeks of tender award and to arrange for delivery from Miller Lake storage facility to the school or to an interim storage location(if school site isn't ready for dust collector install at that time). Provide subsequent pick-up and delivery to applicable school sites. The contractor is to protect and store the dust collector and include in the tender costs for all boom truck/crane pick- ups and deliveries. It is necessary for the contractor to carry sufficient Insurance coverage from the time the owner supplied dust collectors leave the possession of NS TIR. Install dust collectors as per contract documents. NS TIR will advise of anticipated dust collector availability times. Remobilization on site may be necessary upon dust collector delivery.
 - .6 Include dust collection system ductwork and hoods at equipment.
 - .7 Include electrical services for dust collectors and associated equipment. It is necessary to take out a NSP Electrical Permit and provide inspection certificate.
 - .8 Install owner supplied safety signage at the dust collector and fence.
 - .9 Architectural work for installation, including but not limited to cutting, patching, painting, repairs, wall/ceiling cutting and repair for ductwork. Where existing opening infill is required, reinstate new infill materials to match existing. Similar component material (include masonry, if applicable) is required. However, in small openings, prefinished insulated panels (to match existing) may be considered. Identify proposed components and installation methodology c/w data sheets of proposed new insulated infill panel. Submit for review/approval by HRSB.
 - .10 Testing, air balancing, participation in commissioning, participation in approvals, participation in training and demonstration for users, provision of operations and maintenance manuals, as-builts. Air balancing shall be performed by a certified air balancing contractor who is a member of CAABC and/or AABC.

- .11 Complete pre-commissioning verification forms and provide complete approved balancing reports to the consultant in a timely manner prior to final Commissioning.
- .12 If dust collector isn't available for hook-up when ductwork is complete, terminate and cap ductwork through exterior wall and provide electrical to exterior wall mounted service disconnects in preparation for an easier dust collector hook-up.
- .13 Final ductwork extensions, electrical connections, startup, testing, and balancing, etc. will be required after the dust collector installation is complete.
- .14 Prepare site work related to location of dust collectors and related blast zones, including but not limited to concrete pads, concrete walkways, chain link fencing and gates; Co-ordinate and confirm exact size of concrete pad, extent of new concrete walkways, fence enclosure and gates to suit dust collector size and functional barrel removal. Co-ordinate final gates location with user group (HRSB) to ensure easiest route for barrel removal. In winter months, include for winter protection against the freezing of all new concrete slabs and walkways. Do not pour concrete on frozen ground. Remove frozen material and install new compacted gravels below slab as required. Enclose/protect affected areas and provide temporary heat as necessary. Protect new concrete with insulated blankets, straw, or other acceptable means to prevent concrete damage due to freezing.
- .15 Restore applicable areas of work and industrial arts rooms to level of cleanliness as present at initial start of work. Cleanup all dust, debris, etc. as a direct result of contractor's scope of work. Repair/Finish all associated damage to match existing. Vacuum clean all affected areas when complete.
- .16 Contractors must in all cases familiarize themselves with the existing project sites and associated conditions. Do not scale drawings. Ensure that dust collector locations, and required ductwork runs (including verticals and transitions) are measured accurately and based on existing on site conditions. Include new concrete walkways located from the dust collector pad to an adjacent parking lot, roadway. This distance may not be indicated on drawings, first measure/confirm horizontal distances on site. Confirm and coordinate exact distances and locations with HRSB. Ensure that there is no interference of new concrete pads or equipment with existing building wall projections, roof lines, fascias, soffits, existing equipment or underground piping/services etc. located at the interior or exterior. No plea of ignorance of such conditions as a result of failure to make all up front and necessary site examinations will be accepted as a basis for extra compensation or extension of time after tender award.
- .17 The contractor is to submit a schedule of construction, complete with start, finish, and commissioning dates. Provide schedule within 10 working days of tender award. Substantial completion (including final commissioning) will be completed on the property designated by HRSB within twelve (12) weeks after receipt of purchase order (or such other timeline as may be otherwise stipulated by HRSB on any purchase order issued).
- .18 Also refer to specification section 01 11 00, Summary of Work, Work Covered by Contract Documents, for additional and specific technical summary of work.

1.9 LOCATION OF WORK

- .1 School Names and locations as follows:
 - .1 Brookside Junior High School; 2239 Prospect Rd., Hatchet Lake; NS., B3T 1R8
 - .2 Rocky Lake Junior High School; 670 Rocky Lake Drive, Bedford; NS., B4A 2T6

1.10 SPECIAL REQUIREMENTS

- .1 All personnel on work site and in school buildings require a Child Abuse and Criminal Records Check/Police Clearance with Vulnerable Sector Search. Successful contractor to provide all required documentation to HRSB.
- .2 All personnel on site are to contact HRSB Operations or as otherwise directed for school access.

END OF SECTION

Part 1 General

1.1 INVITATION

.1 Bid Call

.1 Offers signed under seal, executed, and dated will be received by Owner as follows:

.1 Location:

.1 Halifax Regional School Board (HRSB)
933 Spectacle Lake, Dartmouth, NS, B3B 1X7
Telephone 902-464-2000; Ext. 2011; Fax: 902-464-0161
Attention: Deborah Beck, Buyer

.2 Closing Time: 2:00 pm

.3 Date: November 03, 2014

.2 Offers submitted after above prescribed time may be returned to bidder unopened.

.3 Submit Supplementary Bid Information Form with Bid.

.4 Offers will be opened publicly immediately after the time for receipt of Bids.

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

1.2 INTENT

.1 Intent of this Bid call is to obtain an offer to perform work to complete dust collection remediation work for a contract, in accordance with Contract Documents.

.2 Location of work at the following school sites for Halifax Regional School Board is:

.1 Brookside Junior High School; 2239 Prospect Rd., Hatchet Lake; NS., B3T 1R8

.2 Rocky Lake Junior High School; 670 Rocky Lake Drive, Bedford; NS., B4A 2T6

.3 Initiate all work as described or within time as stated by HRSB request for construction documentation and in specifications.

.4 The work will be awarded to one successful bidder or as otherwise prescribed by HRSB.

.5 Include in work all aspects of installation of Owner-supplied equipment, and main dust collectors, including but not limited to delivery from NS TIR Miller Lake, NS, pick-up, delivery, boom truck/crane costs, receiving, handling, storage, insurance, assembly, installation, connection, start-up, verification, commissioning, training, demonstration, warranty administration and warranty service.

1.3 CONTRACT DOCUMENTS IDENTIFICATION

- .1 Contract Documents are identified as:
 - .1 Dust Collection System Remediation
Halifax Regional School Board (HRSB)
Package '06' (HRSB Tender # 3706)
Reference #06- BJHS & RLJHS (R0)
- .2 Contract Documents as prepared by Consultant and HRSB, and as listed in the table of contents, including any applicable HRSB Tender Documentation.

1.4 DEFINITIONS

- .1 Owner:
 - .1 Halifax Regional School Board
33 Spectacle Lake, Dartmouth, NS, B3B 1X7
Telephone 902-464-2000; Ext. 2011; Fax: 902-464-0161
Attention: Deborah Beck, Buyer
- .2 Consultant:
 - .1 MCW Maricor (Consultants)
7051 Bayers Road, Suite 102, Halifax, NS, B3L-2C1
Telephone 902-893-8455, facsimile 902-876-2796
Attention: Ross Penner, P.Eng.
- .3 Project Sponsor
 - .1 Nova Scotia Transportation and Infrastructure Renewal
- .4 Contractor
 - .1 The successful Bidder for this work.

1.5 CONTRACT/BID DOCUMENTS

- .1 Agreement Form.
- .2 Definitions
 - .1 Contract Documents: CCDC2 and/or as defined in HRSB Request for Tender Documentation.
 - .2 Bid Documents: Contract Documents supplemented with Bid Form, Instructions to Bidders, Supplementary Bid Form and/or any prescribed HRSB tender/bid documentation.

- .3 Bid, Offer, or Bidding : Act of submitting an offer .
- .4 Bid Price : Monetary sum identified in Bid Form as an offer to perform work.
- .3 Availability
 - .1 Bid Documents may be obtained at office of the Owner only, *at the Halifax Regional School Board office.*
 - .2 Bid documents may also be obtained at the Nova Scotia Public Tenders website.
 - .3 Bid Documents are made available only for purpose of obtaining offers for this project. Their use does not confer license or grant for other purposes.
- .4 Examination
 - .1 Upon receipt of Bid Documents verify that documents are complete.
 - .2 Immediately notify HRSB upon finding discrepancies or omissions in Bid Documents
- .5 Queries/Addenda
 - .1 Direct technical questions to Consultant at:
 - .1 MCW Maricor, 7051 Bayers Road, Suite 102, Halifax, NS, B3L-2C1
Telephone 902-893-8455, facsimile 902-893-3670
Attention: Ross Penner, P.Eng.
 - .2 Direct administrative questions to Owner at:
 - .1 Halifax Regional School Board
33 Spectacle Lake, Dartmouth, NS; NS; B3B 1X7
Telephone 902-464-2000, Facsimile 902-464-0161
Attention: Deborah Beck, Buyer
 - .3 Addenda may be issued during bidding period. All addenda become part of Contract Documents. Include costs in Bid Price.
 - .4 Verbal answers are only binding when confirmed by written addenda online only.
 - .5 Clarifications requested by bidders must be in writing not less than seven (7) working days before date set for receipt of Bids. Reply will be in form of an addendum, a copy of which will be forwarded to known bidders no later than three (3) working days before receipt of Bids.
- .6 Product/System Options
 - .1 Where Bid Documents stipulate a particular product, substitutions *submitted in writing* will be considered by HRSB/Consultant up to five (5) working days before receipt of Bids.
 - .2 When a request to substitute a product is made, HRSB/Consultant may approve substitution and will issue an Addendum to known bidders.
 - .3 In submission of substitutions to products specified, Bidders shall include in their Bid, any changes required in work to accommodate such substitutions. All costs for work relating to approval of substitutions must be included in bid price. A

later claim by Bidder for an addition to contract price because of changes in work necessitated by use of substitutions shall not be considered.

- .4 Unless substitutions are submitted in this manner and subsequently accepted, provide products as specified.

.7 Site Examination & Bidders Briefing

- .1 Bidders briefing has been scheduled for this tender package. Reference HRSB tender advertisement. Confirm the location, date and time with HRSB.
- .2 General/ Mechanical contractors and associated sub-trades are invited.
- .3 Information relative to bid documents will be recorded and if required issued by way of addendum to known bidders.
- .4 Bidders shall become fully aware of the content of all tender documents for the preparation of the Bidder's offer.
- .5 Bidders will be deemed to have familiarized themselves with the existing site and working conditions and all other conditions which may affect the performance of the work. No plea of ignorance of such conditions as a result of failure to make all necessary examinations will be accepted as a basis for any claims for extra compensation or an extension of time. Also refer to section 00 10 00, Work Covers, 1.4.1.

1.6 QUALIFICATIONS

.1 Qualifications

- .1 Provide reference projects and reference contact person for related experience as outlined in the Supplementary Bid Form 00 43 00.
- .2 Owner reserves the right to reject a proposed subcontractor for reasonable cause.

1.7 BID SUBMISSION

.1 Bid Ineligibility

- .1 Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, shall at discretion of Owner, be declared informal.
- .2 Bids with Bid Forms and enclosures which are improperly prepared shall at discretion of Owner, be declared informal.
- .3 Bids that fail to include security deposit, bonding or insurance requirements shall at discretion of Owner, be declared informal.

.2 Submissions

- .1 Bidders shall be solely responsible for delivery of their Bids in manner and time prescribed.
- .2 Submit two copies of executed offer on Bid Forms provided, signed and with corporate seal together with required security in a sealed opaque envelope, clearly identified with Bidder's name, project name and Owner's name on outside.

- .3 An abstract of submitted Bids will be made available to Bidders following Bid opening.

1.8 BID ENCLOSURES/REQUIREMENTS

- .1 Bid Security Deposit (Submit with Bid) – *SUBMIT ONE FORM OF BID SECURITY DEPOSIT FOR HRSB.*
 - .1 Bids shall be accompanied by security deposit as follows:
 - .2 Submit with Bid one of the following forms of Bid Security Deposit:
 - .1 Certified Cheque, or
 - .2 Irrevocable Letter of Credit, or
 - .3 Bid Bond on CCDC form 220
 - .3 Bid Security to be in the amount of ten percent (10%) of the Bid Price.
 - .4 Refer to 1.11 Bid Security below.
 - .2 Consent of Surety (Submit with Bid)
 - .1 Where a Bid Bond is used as Bid Security:
 - .1 Submit with Bid Form and Bid Bond, a Consent of Surety, stating that surety providing Bid Bond is willing to supply Performance and Labour & Materials Payment Bond specified.
 - .2 Include cost of bonds in Bid Price.
 - .3 Performance Assurance (Submit within 10 days of Notification of Award)
 - .1 Accepted Bidder must provide Performance Assurance in a form as described below.
 - .1 Certified Cheque or Bank Draft in amount of 10 percent of the total amount payable (Contract Price plus HST); or
 - .2 Irrevocable Standby Letter or Credit; or
 - .3 Bonds:
 - .1 Performance Bond in amount of 50 percent of Contract Price
 - .2 Labour & Material Bond in amount of 50 percent of Contract Price
 - .2 Submit required Performance Assurance within ten (10) days of the date of receiving notification that Bidder has been awarded Contract.
 - .3 Refer to Section 1.12 Contract Security (Performance Assurance) below.
 - .4 Insurance (Submit with Bid)
 - .1 Provide signed "Undertaking of Insurance" on standard form provided by insurance company stating intention to provide insurance to Bidder in accordance with insurance requirements of Contract Documents.
 - .5 Bid Form Requirements
 - .1 State in Bid Form, time required to complete work. Completion date in Agreement must be this completion time added to commencement date.

- .2 Bidder, in submitting an offer, accepts time period stated in Contract documents for performing work. Completion date in Agreement shall be this completion time added to commencement date.
- .3 Bidder, in submitting an offer, agrees to complete work by date indicated in Contract Documents.
- .4 Owner requires that work of this contract be completed as quickly as possible and consideration will be given to time of completion when reviewing Bids submitted.
- .5 Refer to Supplementary Conditions for inclusion of taxes.
- .6 Fees for Changes in Work
 - .1 Include in Bid Form, percentage markup for overhead and profit applicable for changes in work, whether additions to or deductions from work on which Bid price is based.
 - .2 Include in Bid Form, fees proposed for subcontract work for changes (both additions and deductions) in work. Contractor shall apply markup as noted, to subcontractor's gross (net plus markup) costs on additional work.
- .7 Bid Signing
 - .1 Bid form shall be signed under seal by Bidder.
 - .2 Signing Requirements:
 - .1 Sole Proprietorship : Signature of sole proprietor in presence of witness who will also sign. Insert words "Sole Proprietor" under signature. Affix seal.
 - .2 Partnership : Signature of all partners in presence of witness who will also sign. Insert word "Partner" under each signature. Affix seal to each signature.
 - .3 Limited Company : Signature of duly authorized signing officer(s) in normal signatures. Insert officer's capacity in which signing officer acts, under each signature. Affix corporate seal.
 - .4 Joint Venture : Each party of joint venture must execute Bid under respective seals in manner appropriate to such party as described above, similar to requirements of Partnership.
- .8 Supplementary Bid Form 00 43 00 (Submit with Bid)
 - .1 All Bidders will be required to complete Supplementary Bid Form with Bid.
 - .2 References: Include references for similar projects.
 - .3 Subcontractors: Include names of all Subcontractors and portion[s] of work Bidder will perform.
 - .4 Manufacturers: Include names of all Manufacturers to be used.
 - .5 Prices:
 - .1 Unit Prices: Include a listing of unit prices specifically requested.
 - .2 Alternative Prices: Include cost variation to Bid price applicable to work.
 - .3 Separate Prices: Include a listing of separate prices specifically requested.

- .4 Itemized Prices: Include a listing of itemized prices specifically requested.
- .6 Cash Allowances: Include amount of Cash Allowances specifically requested.
- .7 Price Breakdown: Show breakdown of prices specifically requested.

1.9 OFFER ACCEPTANCE/ REJECTION

- .1 Duration of Offer
 - .1 Bids shall remain open to acceptance, and irrevocable for a period of sixty (60) days after the Bid closing date.
- .2 Acceptance of Offer
 - .1 Owner reserves the right to accept or reject any or all offers.
 - .2 After acceptance by Owner, Consultant will issue to successful Bidder, written Bid acceptance.
 - .3 After Bid has been accepted, unsuccessful Bids will be returned to respective Bidders with submitted Bid securities.

1.10 BID SECURITY

- .1 Bids shall be accompanied by security deposit. *SUBMIT ONE FORM OF BID SECURITY DEPOSIT FOR HRSB.*
- .2 Endorse Bid Security Deposit in name of Owner.
- .3 Where bid bond is provided as bid security:
 - .1 Provide bond on the standard Bid Bond Form, latest version, in the amount of not less than ten percent (10%) of the Bid Price.
 - .2 Bid Bonds, submitted by the general contract bidder, signed and sealed by the principal (Contractor) and Surety and shall be with an established Surety Company satisfactory to and approved by the Owner.
 - .3 Where Bid Bond is used as Bid Security, include the cost of providing the Bid Bond in the Bid Price.
- .4 Where certified cheque or bank draft is provided as bid security:
 - .1 Provide a certified cheque or bank draft, endorsed in the name of the Owner, for a sum not less than ten percent (10%) of the amount of the Bid Price.
 - .2 Where certified cheque or bank draft is used as Bid Security, include the cost in the Bid Price.
- .5 Where the Irrevocable Standby Letter of Credit is used as bid security:
 - .1 Provide an Irrevocable Standby Letter, endorsed in the name of the Owner, for a sum not less than ten percent (10%) of the Bid Price
 - .2 The Irrevocable Standby Letter of Credit shall be issued by a certified financial institution subject to the Uniform Custom and Practices for Documentary Credit (1993 revision or latest revision) International Chamber of Commerce (Publication No. 500).

- .3 Where Irrevocable Standby Letter of Credit is used as bid security, include the cost in the Bid Price.
- .6 Return of Bid Security:
 - .1 The bid security of the unsuccessful bidders will be returned to them after the contract has been signed, or previous to such time, at the discretion of the Owner.
 - .2 The above shall apply provided a contract is awarded within sixty (60) days from the closing date of the bid.
 - .3 If no contract is awarded, all bid security deposits will be returned.

1.11 CONTRACT SECURITY (PERFORMANCE ASSURANCE)

- .1 Accepted Bidder must provide Performance Assurance as described below.
 - .1 Bonds:
 - .1 Performance Bond in amount of 50 percent of Contract Price
 - .2 Labour & Material Bond in amount of 50 percent of Contract Price
 - .2 Certified Cheque or Bank Draft in amount of 10 percent of the total amount payable (Contract Price plus HST)
 - .3 Irrevocable Standby Letter or Credit
- .2 All bid forms, bid security forms and performance assurance forms must bear the bidder's original signature and name the Owner as insured.
- .3 Bidder shall maintain performance assurance in force for a period of not less than twelve (12) months after the issue of the substantial performance certificate certified by Owner and until completion of the contract.
- .4 Endorse Performance Assurance as specified for bid security.
- .5 Should it become apparent that the final cost of the project will exceed the total amount payable by more than 20%, the bidder shall arrange to have their bonds reissued based on the projected final cost.
- .6 Submit as Performance Assurance one of the following:
 - .1 Where a Bid Bond was used as bid security:
 - .1 Within ten (10) days after notification of award of the Contract, provide a Performance Bond and a Labour & Material Payment Bond, each in an amount equal to fifty percent (50%) of the amount of the Contract, naming the Owner.
 - .2 Bonds to be issued by a duly incorporated surety authorized to transact business in the Province of the Place of Work.
 - .3 Include the cost of providing the Performance Bond and Labour and Material bond in the Contract price.
 - .2 Where a Certified Cheque or Bank Draft is used as Contract Security:

- .1 The Certified Cheque or Bank Draft submitted during the bid period will be cashed and the amount retained by the Owner shall serve as Performance Assurance, including the payment of all obligations arising under the Contract.
- .2 The Certified Cheque or Bank Draft will be held in lieu of the Performance Bond and Labour and Material Bonds, providing that, at Contract award, the successful Bidder shall supplement their Certified Cheque or Bank Draft to maintain an amount of ten (10%) of the total amount payable (Contract Price plus HST) under the contract.
- .3 The amount remaining will be returned without interest after a period of not less than twelve (12) months after the issue of the substantial performance certificate certified by the Owner and shall serve as performance assurance and not until completion of the contract.
- .4 Where certified cheque or bank draft is used as Performance Assurance, include the cost of providing the certified cheque in the Contract price.
- .3 Where an Irrevocable Standby Letter or Credit is used as Contract Security
 - .1 The Irrevocable Standby Letter of Credit submitted during the bid period will be retained by the Owner and shall serve as performance assurance, including the payment of all obligations arising under the contract. The irrevocable standby letter of credit shall be issued by a certified financial institution subject to the Uniform Customs and Practices for Documentary Credit (1993 revision) International Chamber of Commerce (Publication No. 500).
 - .2 Where irrevocable standby letter of credit is used as Performance Assurance, include the cost of providing and Irrevocable Standby Letter of Credit in the Contract Price. The contractor shall provide to the Owner documentation throughout the duration of the contract that the irrevocable standby letter of credit remains in full effect at all times as specified.
 - .3 Upon expiry of the Irrevocable Standby Letter of Credit, a separate Irrevocable Standby Letter of Credit shall be provided for work requiring extended warranties for such amounts as are required by the contract.
 - .4 The Irrevocable Standby Letter of Credit is to be in effect for a period of not less than twelve (12) months after the issue of the substantial performance certificate certified by the Owner and shall serve as performance assurance and not until completion of the contract.

1.12 POLICE CLEARANCE WITH VULNERABLE SECTOR SEARCH

- .1 Contractors are required to provide Police Clearance (e.g. “Certificate of Adult Criminal Convictions / Record” from the RCMP or HRM police) including the Vulnerable Sector Search for all personnel (Contractor personnel and Subcontractor personnel) to the Owner prior to commencing any work on site.
- .2 Include cost of Police Clearance with Vulnerable Sector Search in the Contract Price.

1.13 Asbestos Containing Materials (ACM)

- .1 Asbestos containing materials (ACM) may be present. The consultant has requested manuals/reports from school boards identifying hazardous materials. Contractors shall obtain and thoroughly review a copy of each school's asbestos manual/report. If none are available, contact the applicable school board representative for clarification with regard to possible presence of hazardous material in areas of work. The contractor is responsible for ACM removal in this contract.

END OF SECTION

FOR THE WORK DESCRIBED IN:

**Dust Collection System Remediation
Halifax Regional School Board (HRSB)
Package '6' (HRSB Tender # 3706)
Reference #06 BJHS & RLJHS
Bid Documents**

TO: **Halifax Regional School Board (HRSB)**
33 Spectacle Lake Drive
Dartmouth, NS, B3B 1X7
Attention: Deborah Beck, Buyer

DATE: _____

SUBMITTED BY: _____

1.1 BID OFFER

Having carefully examined the Bid Documents and site conditions affecting the work as well as all modifications thereto as prepared by MCW Maricor (Consultants) as well as the project site conditions affecting the Work, we hereby offer to furnish all labour and materials required to totally complete the designated Work in accordance with the Bid Documents for the following stipulated sum(s):

Halifax Regional School Board (HRSB):

Total _____ (\$ _____)

in lawful money of Canada if notified of the acceptance of the offer within sixty (60) days from the time set for the opening of Bids.

We hereby agree that the offer shall remain open:

- (1) until some other party has entered into a Contract with the Contractor for performance of the Work, or:
- (2) until 60 days after the time and date fixed for receiving bids.

The stipulated sum stated above does not include HST but does include all other taxes, duties, etc.

Harmonized Sales Tax, not included in the above stipulated is:

_____ (\$ _____)

Bidders HST Registration Number: _____

1.2 ADDENDA

.1 I/We hereby acknowledge receipt of the following addenda covering modifications to the contract documents.

.2 Addendum No. _____ Dated _____

1.3 BID ACCEPTANCE

.1 In submitting this bid we recognize the Owner's right to accept any bid at the price submitted or to reject any and all bids.

1.4 TIME

.1 Time and all time limits stated in the Bid Documents are of the essence of this bid.

.2 Date of Commencement of the Contract to be the date bid has been accepted by the Owner as confirmed by a Letter of Acceptance.

.3 Perform Work to Substantial Performance within time as follows:

Schedule in Weeks (12 weeks max.): _____ Weeks

.4 Note that Substantial Performance includes acceptance by consultant and owner, approved commissioning, training, demonstration, provision of operations and maintenance manuals, air balancing and reports, as-built drawings and other requirements as noted in the specifications. Deadline for the above is as per schedule above.

1.5 SUBCONTRACTORS AND MANUFACTURERS

.1 Subcontractors and Manufacturers are listed in Section 00 43 00. Subcontractors and Manufacturers listed are those upon whose proposals this bid is used. We recognize that the List of Subcontractors and Manufacturers will be considered in the selection of the successful Bidder.

- .2 We recognize that Bids may not be accepted unless accompanied by the completed List of Manufacturers, Subcontractors and Prices, and that no names, either of Subcontractors or Bidder's own forces, may be changed after submission of bids, unless sufficient cause is submitted in writing and written approval received from the Owner or Consultant.

1.6 VALUATION OF CHANGES

- .1 Where changes in the Work are made after the Contract award, we offer to evaluate them by estimate and acceptance in a lump sum as set forth in the General Conditions of the Contract.
- .2 We agree that all EXTRA work be based on actual cost of labour and materials plus 10% for our supervision, overhead and profit.
- .3 Where work is to be done by our own forces (not by Subcontractors) our overhead of 5% and profit of 5% only will be added.
- .4 We further agree that all CREDITS be based on actual cost of labour and material.
- .5 Our hourly rate for changes in the Work will be \$ _____/hr. (not including supervision, profit and overhead) for both additions and deletions.

1.7 CONTRACT

- .1 If selected as the Contractor to perform the work described herein, we agree to sign Canadian Standard Construction Document CCDC 2 – 2008 for Stipulated Price Contract as amended by the Supplementary Conditions, for our Bid Price(s).

1.8 EXECUTION

Executed this _____ day of _____, 20____.

Company Name: _____

Address : _____

Telephone: _____

Facsimile: _____

Email: _____

SIGNATURES

Signature of Authorized Representative: _____

Name of Authorized Representative: _____

Title of Authorized Representative: _____

WITNESS'S SIGNATURE OR CORPORATE SEAL

Signature of Witness: _____

Name of Witness: _____

END OF SECTION

FOR THE WORK DESCRIBED IN:

**Dust Collection System Remediation
Halifax Regional School Board,
Package ‘06” (HRSB Tender # 3706)
Reference #06- BJHS & RLJHS
Bid Documents**

TO: **Halifax Regional School Board**
33 Spectacle Lake Drive
Dartmouth, NS, B3B 1X7
Attention: Deborah Beck, Buyer

DATE: _____

SUBMITTED BY: _____

1.1 References

- .1 Furnish particulars of at least three contracts successfully completed within the past five years or currently being carried to completion. The projects quoted should preferably be similar in nature to this Work and be of comparable or greater value.

PROJECT NAME, COMPANY NAME, CONTACT NAME, & PHONE NO.	DATE STARTED / FINISHED	CONTRACT VALUE
1.	From: To:	
2.	From: To:	
3.	From: To:	

1.2 Subcontractors

- .1 The following conditions apply to the List of Subcontractors
 - .1 Parties named, including Bidder's own forces, to be used to perform the work for which they are named and not be changed without the Owner's written consent.
 - .2 All of the Subcontractors shall be carried as part of the Bid Price.
 - .3 Subcontractors are listed as follows: Subcontractors listed are those upon whose proposals this bid is used. We recognise that the List of Subcontractors will be considered in the selection of the successful Bidder.
 - .4 We recognise that Bids may not be accepted unless accompanied by the completed List of Subcontractors, and that no names, either of Subcontractors or Bidder's own forces, may be changed after submission of bids, unless sufficient cause is submitted in writing and written approval received from the Owner and Consultant.

ASPECT OF WORK	NAME OF SUBCONTRACTOR
1. Mechanical / Ductwork	
2. Electrical	
3. Site Work – Chain Link Fences	
4. Site Work – Concrete	
5. Architectural, Infill, Patching and Painting	
6. Air Balancing	
7. Asbestos Removal/Remediation (If Required)	

1.3 List of Manufacturers:

- .1 The following conditions apply to the List of Manufacturers
 - .1 List the names of manufacturers (one per item) carried.
 - .2 If this Bidder neglects to list the specified or acceptable manufacturers or lists more than one manufacturer per item, or lists manufacturers not specified, the Owner and Consultant shall have the option of making the selection of the manufacturer.
 - .3 There will be no substitution of Listed Manufacturers or Subcontractors except as accepted by the Owner and Consultant
 - .4 We recognise that Bids may not be accepted unless accompanied by the completed List of Manufacturers, and that no names may be changed after submission of bids, unless sufficient cause is submitted in writing and written approval received from the Owner and Consultant.

EQUIPMENT	NAME OF MANUFACTURER
1. Dust Collector (NSTIR Pre-Purchased)	Air Control Technology
2. Backdraft Damper (NSTIR Pre-Purchased)	Air Control Technology
3. Silencer & Supports (NSTIR Pre-Purchased)	Air Control Technology
4. Acoustic Motor Enclosure (NSTIR Pre-Purchased, if applicable)	Air Control Technology
5. Ductwork	
6. Fencing	

1.4 Valuation of Changes

- .1 We agree that all Additions and all Credits (Deletions) are to be based on actual cost of labour and material as supplied by this Trade Contractor in Item 1.5 - Unit Prices.

1.5 Unit Prices

- .1 Where changes in the work are made after the Bid award, by unit prices, the following Unit Prices shall apply and include all labour, materials, products, equipment, services, overhead, profit, taxes (not including HST) disbursements and all related charges and represent the final cost or credit to the Owner. HST shall be shown as a separate item. These unit prices are to be used for the total project. Unit prices should indicate the incremental change in cost per item or fixture.

- .2 Unit Prices:

DESCRIPTION	UNIT PRICE
1. Labour Rate – Additions	Rate: \$ _____ per hour

1.6 Other Pricing

- .1 Separate prices; are for work which is not included in the Bid Price listed on Bid Form but which may be added by the Owner at its sole discretion for the price quoted hereunder.
- .2 Itemized prices are for work which is included in the Bid Price listed on Bid Form and which may be deleted by the Owner at its sole discretion for the amount quoted hereunder.
- .3 Alternate prices are for work which may be substituted by the Owner at its sole discretion for work which is included in the Bid Price (no price listed shall mean no change in cost).

- .4 The Owner reserves the right at its sole discretion to accept or reject any of the Separate, Itemized and Alternate prices identified hereunder.
- .5 Cash Allowances: The Cash Allowance is for work that will be done and applied against the amount carried. This amount shall be carried in the Bid Price.
- .6 Price breakdown
 - .1 For budgeting purposes, provide a breakdown by aspect of work for all work.
 - .2 For budgeting purposes, provide a breakdown by school or building. The work will be awarded as one package for all buildings.

1.7 Separate Prices (Not included in Bid Price)

- .1 No Separate Prices.

1.8 Itemized Prices (Included in Bid Price)

DESCRIPTION	ITEMIZED PRICE
1. Item #1 - Air Balancing/Testing	Price: \$ _____
2. Item #2 - Asbestos Removal/Remediation (If required)	Price: \$ _____
3. Item # 3 - Pick up of pre-purchased NSTIR dust collectors at a specified location in Miller Lake, NS and delivery to all applicable school locations.	Price: \$ _____

- .1

1.9 Alternate Prices (Not Included in Bid Price)

DESCRIPTION	ALTERNATE PRICE (Change in Price)
1. Alternate Price #1 – Performance Security – HRSB – Delete requirement for Performance Security.	Price: \$ _____ Credit or Extra
2. Contractor-Proposed Alternate Price –	Price: \$ _____ Credit or Extra

1.10 Cash Allowances (Included in Bid Price)

- .1 No Cash Allowances.

1.11 Price Breakdown – By School

- .1 The Price Breakdown will be used for accounting allocations between schools and boards.
- .2 Buildings normally awarded as One Contract, however, the owner reserves the right to award schools individually:

DESCRIPTION	PRICE
1. Brookside Junior High School, Hatchet Lake, NS	Price: \$ _____
2. Rocky Lake Junior High School, Bedford, NS	Price: \$ _____
3. SUB-TOTAL – HRSB	Price: \$ _____
4. TOTAL (Price to match Bid Price)	Price: \$ _____

1.12 Price Breakdown – By Aspect of Work

.1 The Price Breakdown will be used for schedule of values for progress payments.

DESCRIPTION	PRICE
Brookside Junior High School	
1. Mobilization	Price: \$ _____
2. Site Work, Concrete Pad and Fencing	Price: \$ _____
3. Demolition Work	Price: \$ _____
4. Dust Collector Supply (only if applicable)	Price: \$ _____
5. Dust Collector Installation	Price: \$ _____
6. Ductwork and Dust Collection Hoods	Price: \$ _____
7. Electrical Work	Price: \$ _____
8. Testing and Air Balancing (Min. 2.5% of total bid)	Price: \$ _____
9. Pre-Commissioning & documentation (Min. 2.5% of total bid)	Price: \$ _____
10. Final Commissioning, O&M Manuals, Training & Demo, As-builts (Min. 5% of total bid)	Price: \$ _____
11. Asbestos Remediation (if necessary)	Price: \$ _____
12. TOTAL for Brookside Junior High School	Price: \$ _____

DESCRIPTION	PRICE
Rocky Lake Junior High School	
1. Mobilization	Price: \$ _____
2. Site Work, Concrete Pad and Fencing	Price: \$ _____
3. Demolition Work	Price: \$ _____
4. Dust Collector Supply (Only if applicable)	Price: \$ _____
5. Dust Collector Installation	Price: \$ _____
6. Ductwork and Dust Collection Hoods	Price: \$ _____
7. Electrical Work	Price: \$ _____
8. Testing and Air Balancing (Min. 2.5% of total bid)	Price: \$ _____
9. Pre-Commissioning & documentation (Min. 2.5% of total bid)	Price: \$ _____
10. Final Commissioning, O & M Manuals, Training & Demo, As-builts (Min. 5% of total bid)	Price: \$ _____
11. Asbestos Remediation (if necessary)	Price: \$ _____
12. TOTAL for Rocky Lake Junior High School	Price: \$ _____

1.13 EXECUTION

Executed this _____ day of _____, 20____.

Company Name: _____

Address : _____

Telephone: _____

Facsimile: _____

Email: _____

SIGNATURES

Signature of Authorized Representative: _____

Name of Authorized Representative: _____

Title of Authorized Representative: _____

WITNESS'S SIGNATURE OR CORPORATE SEAL

Signature of Witness: _____

Name of Witness: _____

END OF SECTION

Part 1 General

1.1 INTENT

- .1 The Agreement will use the Canadian Standard Construction Documents (CCDC 2) for Stipulated Price Contract and/or as prescribed by the Halifax Regional School Board (HRSB) and the consultant.
- .2 The document consists of the following parts:
 - .1 Agreement.
 - .2 Definitions.
 - .3 General Conditions of the Contract Stipulated Price Contract.
- .3 This Document as modified by Section 00 73 00 - Supplementary Conditions, shall be the basis of Contract between the Owner and the successful Bidder.
- .4 Complete copies of the CCDC 2 2008 document are available for viewing at the office of the Consultant.

Part 2 Products

2.1 NOT USED

- .1 Not Used Execution

3.1 NOT USED

END OF SECTION

SUPPLEMENTARY CONDITIONS TO STANDARD CONSTRUCTION DOCUMENT CCDC 2-2008 STIPULATED PRICE CONTRACT.

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

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

ARTICLE A-5 PAYMENT

Delete paragraph 5.1 in its entirety and insert:

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

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

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

Delete 5.3.2 (2) in its entirety.

DEFINITIONS

Add subparagraph 19a to definitions:

19a. Submittals

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

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

GC 1.1 CONTRACT DOCUMENTS

Add to the end of subparagraph 1.1.2.2:

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

Add subparagraph 1.1.7.5:

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

Add subparagraph to 1.1.7.6:

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

Delete paragraph 1.1.8 in its entirety and insert:

1.1.8 The Contractor will be provided with up to a maximum of three (3) copies, without charge, of the Contract Documents or parts thereof for the performance of the work. Extra copies may be obtained for cost of printing and mailing. Electronic copy will be provided “For Construction”.

Add new paragraph 1.1.11:

1.1.11 Exercise proper precautions to verify figures shown on the drawings before layout of work. Be responsible for any error resulting from failure to exercise such precautions.

GC 2.4 DEFECTIVE WORK

Add new subparagraphs 2.4.1.1 and 2.4.1.2:

- 2.4.1.1 The Contractor shall rectify, in a manner acceptable to the Owner and the Consultant, all defective work and deficiencies throughout the Work, whether or not they are specifically identified by the Consultant.
- 2.4.1.2 The Contractor shall prioritize the correction of any defective work which, in the sole discretion of the Owner, adversely affects the day to day operation of the Owner.

GC 3.1 CONTROL OF THE WORK

Add new paragraph 3.1.3:

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

GC 3.4 DOCUMENT REVIEW

Delete paragraph 3.4.4 in its entirety and substitute new paragraph:

- 3.4.4 The Contractor shall review the Contract Documents and shall report promptly to the Consultant and error, inconsistency or omission the Contractor may discover. Such review by the Contractor shall comply with the standard of care described in paragraph 3.15.1 of the Contract. Except for its obligation to make such review and report the result, the Contractor does not assume any responsibility to the Owner or to the Consultant for the accuracy of the Contract Documents. The Contractor shall not be liable for damage or costs resulting from such errors, inconsistencies, or omissions in the Contract Documents, which the Contractor could not have reasonably have discovered. If the Contractor does discover any error, inconsistency, or omission in the Contract Documents the Contractor shall not proceed with the work affected until the Contractor has received corrected or missing information from the Consultant.

GC 3.7 SUBCONTRACTORS AND SUPPLIERS

Add the following paragraph 3.7.7:

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

Add the following paragraph 3.7.8:

- 3.7.8 The specifications have generally been divided into Sections. It is not hereby intended to recognize, set or define limits to any subcontractors nor to restrict Contractor in letting his Subcontract, nor is he relieved of responsibility for completion or Contract, whether sub-let or not.

GC 3.8 LABOUR AND PRODUCTS

Add the following paragraph 3.8.4:

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

Add the following paragraph 3.8.5:

- 3.8.5 The Contractor shall, on the request of the Consultant or Owner, immediately dismiss from the project any person employed by him who may, in the opinion of the Consultant or Owner, be incompetent or misbehaves, and such person shall not be again employed on the project without the written permission of the Consultant and Owner.

Add the following paragraph 3.8.6:

- 3.8.6 Costs of delays because of non-availability of specified items, when such delays could have been avoided by the Contractor, will be back charged to the Contractor.

Add the following paragraph 3.8.7

- 3.8.7 All materials and equipment that are inherent to the Work and brought onto the job site by the Contractor shall be deemed to be the property of the Owner, but the Owner shall be under no liability for loss thereof nor damage thereto arising from any cause whatsoever. Such materials and equipment shall be the Contractor's sole responsibility and they shall not be removed from the site without the written permission of the Consultant and Owner. This does not apply to tools and equipment owned or rented by the Contractor that are required to implement the Work.

Add the following paragraph 3.8.8:

- 3.8.8 The Contractor shall, when required to maintain schedule, perform work outside of Contractor's normal working hours. In doing so, the Contractor shall absorb all premium time costs.

Add the following paragraph 3.8.9:

- 3.8.9 All personnel for school projects are required to have a Police Clearance with Vulnerable Sector Search prior to commencing work on site.

GC 3.10 SHOP DRAWINGS

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

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

Delete 3.10.3 in its entirety and substitute new paragraph:

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

Add the following subparagraph 3.10.6.1:

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

Delete and insert the words in paragraph 3.10.12

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

PART 3 EXECUTION OF THE WORK

GC 3.12 CUTTING AND REMEDIAL WORK

Add the following new paragraph:

- 3.12.5 Do not cut load-bearing members without the written consent of the Consultant.

Add the following new paragraph:

- 3.12.6 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.

GC 3.13 CLEANUP

Add the following new paragraph:

3.13.4 The Owner shall have the right to back charge cleaning of Contractor's dirt and debris from the Place of the Work if not done by the Contractor within 48 hours of written notice to do so.

Add the following new paragraph:

3.14.5 The Owner shall have the right to back charge cost of damage to the Place of the Work caused by Contractor if not repaired before final payment.

Add new GC 3.14 as follows:

GC 3.14 CONTRACTOR RESPONSIBILITY FOR WATER TIGHTNESS

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

Add new GC 3.15 as follows:

GC 3.15 PERFORMANCE BY CONTRACTOR

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

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

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

GC 4.1 CASH ALLOWANCES

Delete paragraph 4.1.4 in its entirety and substitute:

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

Delete paragraph 4.1.5 in its entirety and substitute:

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

Delete paragraph 4.1.7 in its entirety and substitute:

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

Add new paragraph 4.1.8:

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

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

Delete section GC 5.1 in its entirety.

GC 5.2 APPLICATION FOR PROGRESS PAYMENT

Add the following at the end of paragraph 5.2.2:

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

Add the following paragraph 5.2.8:

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

Add the following new paragraph 5.2.9:

- 5.2.9 With each application for payment, subsequent to the first payment, Contractor shall include a Statutory Declaration certifying that payments for any liability for which he is responsible and which if not paid might fall upon the Owner, pertaining to previous applications, are now paid. Use CCDC Documents 9A Statutory Declaration.

Add the following new paragraph 5.2.10:

- 5.2.10 With each application for payment, Contractor shall include a Clearance Certificate from the Workers Compensation Board from the Province of the Place of Work.

GC 5.3 PROGRESS PAYMENT

Supplement paragraph 5.3.1 by adding the following:

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

Amend subparagraph 5.3.1.3 as follows:

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

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

Add the following paragraph 5.4.4:

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

Add the following paragraph 5.4.5:

- 5.4.5 Before the Contractor submits his application for Substantial Performance of the Work, all testing and commissioning shall be completed in accordance with the Contract Documents. The Certificate of Substantial Performance will not be issued until this requirement is met.

GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF WORK

Add the following subparagraphs 5.5.1.3 and 5.5.1.4:

5.5.1.3 Submit a certificate from barrister stating that there are no Builders' Liens filed relating to the Contract Works.

5.5.1.4 Submit a clearance letter from the Workers' Compensation Board.

GC 5.7 FINAL PAYMENT

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

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

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

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

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

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

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

GC 6.2 CHANGE ORDER

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

- 6.2.3 All contemplated changes in the work shall be issued by the Consultant on a "Contemplated Change Order" form.
- 6.2.4 For lump sum pricing, the Contractor shall, upon receipt of the Contemplated Change Order, submit to the Consultant for approval within seven (7) days, a quotation for changes in the work.
- 6.2.5 Quotation for changes shall be priced in sufficient detail (GC6.6 applies).
- 6.2.6 Consultant shall, within five (5) working days, notify the Contractor whether estimates are accepted by Owner or further information required. Acceptance of Owner shall be indicated by writing, and a signed copy of form (Change Order) returned to Contractor.
- 6.2.7 Contractor shall take reasonable measures to stop work or minimize the work in areas affected by or related to the contemplated changes.

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

Add new paragraph 6.4.5:

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

GC 6.5 DELAYS

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

- 6.5.1 “, but excluding any consequential, indirect or special damages.”

Add new paragraph 6.5.6:

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

Add new paragraph 6.5.7:

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

Add new paragraph 6.5.8:

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

Add new paragraph 6.5.9:

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

Add new paragraph 6.5.10:

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

GC6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE

Amend paragraph 6.6.5 as follows:

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

GC 6.7 VALUATION OF CHANGES

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

GC 6.7 VALUATION OF CHANGES

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

- (a) By estimate and acceptance in a lump sum, submitted with sub-contractors' and suppliers' signed quotations and breakdown estimates including itemized material and labour lists. For changes where the individual trade cost is anticipated to be less than \$500, the requirement for the detailed cost breakdown may be waived, but individual trade quotation must be supplied.
- (b) By unit prices agreed upon or as listed in the contract.
- (c) Cost of work and percentage or by cost and fixed fee.

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

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

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

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

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

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

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

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

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

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

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

For Extras Up to \$5,000:

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

For Extras Above \$5,000:

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

6.7.4 Submit to the Consultant and the Owners representative detailed breakdown of the hourly labour rate as defined in paragraph “.3(a)”.

GC 8.2 NEGOTIATION, MEDIATION, AND ARBITRATION

Add the following paragraphs 8.2.9, 8.2.10, 8.2.11, 8.2.12, 8.2.13, 8.2.14, and 8.3:

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

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

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

- a) has a vested or contingent financial interest in the outcome of the arbitration;
- b) gives the notice of election to the Owner and the Contractor before the arbitrator is appointed;
- c) agrees to be a party to the arbitration within the meaning of the rules referred to in paragraph 8.2.6, and;
- d) agrees to be bound by the arbitral award made in the arbitration.

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

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

- a) on application of the Owner or the Contractor, determine whether the Consultant has satisfies the requirements of paragraph 8.2.10, and;
- b) make any procedural order considered necessary to facilitate the addition of the Consultant as a party to the arbitration.

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

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

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

GC 9.1 PROTECTION OF WORK AND PROPERTY

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

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

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

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

GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

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

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

Add in subparagraph 9.2.7.4:

9.2.7.4 “and the Consultant” after “Contractor”:

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

9.2.8 or that any toxic or hazardous substances or materials already at the Place of the Work (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the Contractor or anyone for whom the Contractor is responsible in a manner which does not comply with legal and regulatory requirement, or which

threatens, humane health and safety or the environment, or material damage to the property of the Owner or others.

GC 9.5 MOULD

Add in subparagraph 9.5.3.4:

9.5.3.4 “and the Consultant” after “Contractor”

GC 10.1 TAXES AND DUTIES

Add the following paragraph 10.1.3:

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

GC 10.2 LAWS, NOTICES, PERMITS AND FEES

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

10.2.5 “Subject to paragraph 3.15.1, the”

GC 10.4 WORKERS' COMPENSATION

Add the following paragraphs 10.4.3, 10.4.4, and 10.4.5:

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

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

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

GC 11.1 INSURANCE

Delete sentences and replace with the following in subparagraph 11.1.1.1:

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

Add the following subparagraphs 11.1.1.1.1, 11.1.1.1.2, and 11.1.1.2.1:

- 11.1.1.1.1 The general liability insurance to be maintained by the Contractor shall include Commercial General Liability Insurance covering Premises and Operations Liability, elevators, board form property damage, board from automobile, owners and contractors protective, blanket contractual, personal injury, completed operations liability contingent employers liability, cross liability clause, non-owned automobile liability, and a 30 day notice of cancellation clause.
- 11.1.1.1.2 All liability insurance policies shall be written in such terms as will fully protect the Contractor and the Owner as an additional named insured.
- 11.1.1.2.1 Liability coverage of not less than two million dollars (\$2,000,000) is required with regard to operations of owned automobiles.

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

- 11.1.1.4 Broad Form (All Risks) Builders Risk Coverage - Prior to the commencement of any Work the Contractor shall maintain and pay for Broad Form (All Risks) Builders Risk Coverage in the joint names of the Owner and the Contractor totalling not less than one hundred percent (100%) of the total value of the Work done and materials delivered on the site (contract value), so that any loss under such policies of insurance will be payable to the Owner and the Contractor as their respective interests appear. The Builders Risk Insurance shall include all materials related to the work while in transit or at other locations.
- 11.1.1.4.1 Should a loss be sustained under the Builders Risk Coverage, the Contractor shall act on behalf of the Owner and Contractor for the purpose of adjusting the amount of such loss with the insurance companies. As soon as such adjustment has been satisfactorily completed, the Contractor shall proceed to repair the damage and complete the Work and shall be entitled to receive from the Owner in addition to any sum due under the Contract, the amount at which the Owner interest has been appraised in the adjustment made with the insurance companies as referred to

above, said amount to be paid to the Contractor as the Work of restoration proceeds. Any loss or damage which may occur shall not affect the rights and obligations of either party under the Contract except as aforesaid and except that the Contractor shall be entitled to a reasonable extension of time for the performance of the Work, as the Owner may decide.

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

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

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

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

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

Paragraph 11.1.2 is clarified as follows:

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

Delete 11.1.5 in its entirety and replace with the following:

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

Add the following paragraph 11.1.9:

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

GC 11.2 CONTRACT SECURITY

Add the following subparagraph 11.2.2.1:

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

Add the following paragraph 11.2.3:

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

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

GC 12.3 IMDEMNIFICATION

Add the following paragraph 12.1.1.3:

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

GC 12.3 WARRANTY

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

12.3.2 “Subject to paragraph 3.15.1, the...”

Add the following paragraph 12.3.7:

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

Add the following paragraph 12.3.8:

12.3.8 Obtain Owner's approval of specimen copies of written and bonded warranties.

Add the following paragraph 12.3.9:

12.3.9 Warranties shall be submitted in writing to Owner upon receipt of Consultants Certificate of Substantial Performance. Also submit manufacturer's extended warranties for equipment and materials provided for this project.

Add the following paragraph 12.3.10:

12.3.10 The carrying out of replacement work and making good of defects shall be executed at times convenient to the Owner and may require work outside normal working hours which shall be carried out at the expense of the Contractor.

Add the following paragraph 12.3.11:

12.3.11 Warranty periods shall recommence on date that remedied work is completed and accepted.

END OF SECTION

Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises renovation of the dust collection system, located at the following schools:
 - .1 Halifax Regional School Board
 1. Brookside Junior High School (14)
 2. Rocky Lake Junior High School (19)
- .2 Work under this contract includes but is not necessarily limited to the following:
 - .1 Removals and demolitions as indicated on contract drawings.
 - .2 Where applicable, clean and cap all existing dust collection ductwork not indicated for removal above and below ceilings. Repair, replace and refinish ceiling /wall components (to match existing) affected by this work.
 - .3 Where exterior/interior openings require infill, fill openings with rigid XPS SM insulation. Caulk any gaps and openings between insulation and wall. Install 20 gauge galvanized sheet metal patches over existing openings. Seal with silicone sealant and stainless steel screws. Paint to match existing interior and exterior walls. Alternatively, prefinished insulated metal panels (to match existing) may be considered in areas where exterior wall infill is required. Submit details for review/approval. For in-filled openings, greater than 2 ft², provide matching building components materials and finishes where possible (including masonry, etc.).
 - .4 Provide and install all new ductwork and fittings for all equipment as indicated on contract drawings. All ductwork components shall be minimum 18ga galvanized steel.
 - .5 Provide hoods and connect equipment as indicated on contract drawings. All hoods shall be minimum 18 ga galvanized steel and of welded construction.
 - .6 Installation of control panel, dust collector breaker, and all electrical wiring and connections indicated on contract drawings.
 - .7 Bond all metallic components of system to ground as shown on contract drawings.
 - .8 Provide all required modifications to the electrical system to make the mechanical system a complete working package.
 - .9 All aspects of owner supplied equipment including but not limited to delivery, assembly, installation, connection, start-up, verification, commissioning, warranty administration, and warranty service of central dust collectors.
 - .10 Site works including concrete pad for dust collector, sidewalks for barrel removal and deflagration area fencing as indicated on contract drawings.
 - .11 Clean all areas indoors and outdoors during and at the completion of work.
 - .12 Balance all air systems to specified flows. Air balancing shall be performed by a certified member of the CAABC.
 - .13 Participate in the commissioning of the overall system.
 - .14 Provide operations and maintenance manuals including one (1) complete set of as-built drawings, stamped, signed and dated “as-built drawings”.
 - .15 Also refer to Specification Section 00 00 15 – Description of Work.

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- .3 The work of this project includes for the provision of all materials, labour and equipment necessary to complete the work as shown and described in the Tender Documents, including but not limited to, selected demolitions, interior and exterior renovations to the existing building as indicated on drawings and in the specifications.
- .4 The whole of the work shall agree in all particulars with the levels, measurements and details contained in the drawings accompanying this specification and with such other drawings or information as may from time to time be supplied by the Consultant, or may be supplied by the Contractor and reviewed by the Consultant.

1.2 CONTRACT METHOD

- .1 After acceptance by the owner the successful bidder(s) will enter into a CCDC-2 2008, standard form of contract for the execution of the work.

1.3 WORK BY OTHERS

- .1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from Consultant.
- .2 Co-ordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Consultant, in writing, any defects which may interfere with proper execution of Work.

1.4 WORK SEQUENCE

- .1 Construct Work in stages to accommodate Owner's continued use of premises during construction.
- .2 Co-ordinate Progress Schedule and co-ordinate with Owner during construction.
- .3 Maintain fire access/control.

1.5 CONTRACTOR USE OF PREMISES

- .1 Limit use of premises for Work to allow:
 - .1 Owner occupancy.
- .2 Coordinate hours of work with owner on a school by school basis. All disruptive work shall be undertaken outside of regular school hours.
- .3 Co-ordinate use of premises under direction of Owner.
- .4 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .5 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .6 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Consultant.

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- .7 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.6 OWNER OCCUPANCY

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

1.7 PRE-PURCHASED EQUIPMENT

- .1 Certain items of equipment have been pre-purchased. Refer to Section 01 12 00.

1.8 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to building operations, occupants and normal use of premises. Arrange with Owner to facilitate execution of work.

1.9 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each document as follows:
- .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed Shop Drawings.
 - .5 List of Outstanding Shop Drawings.
 - .6 Change Orders.
 - .7 Other Modifications to Contract.
 - .8 Field Test Reports.
 - .9 Copy of Approved Work Schedule.
 - .10 Health and Safety Plan and Other Safety Related Documents.
 - .11 Other documents as specified.

1.10 CONTRACT DRAWINGS AND SITE EXAMINATION

- .1 Any Drawings supplied by the Consultant are performance drawings, are diagrammatic in nature and are intended to convey the Scope of Work and to indicate general arrangement and approximate location of apparatus.
- .2 Not all accessories which may be required are shown in the drawings. Investigate structure and finish conditions affecting this work and arrange work accordingly, providing such accessories required to meet the conditions.
- .3 Drawings are small scale and not all accessories which may be required are shown in the Drawings. Investigate site, structure and finish conditions affecting this Work and arrange Work accordingly, providing such accessories required to meet the conditions. Conserve head room and interfere as little as possible with the use of space.

- .4 Do not scale Drawings. Obtain accurate dimensions by site measurement.
- .5 Visit and inspect the site of the Work to verify location and elevation of existing services which may affect Work of this Contract (electrical, ductwork, etc.) before proceeding with Work. Ensure all sub-contractors visit and inspect the site. No allowances will be made for failure to do so.
- .6 Make, at no additional cost, the locations of materials and/or equipment necessary to accommodate structural conditions (pipes or ducts around beams, columns, etc.)
- .7 Alter, at no additional cost, the locations of materials and/or equipment as directed that do not necessitate additional material.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 PRE-PURCHASED EQUIPMENT

- .1 Certain items of equipment have been pre-purchased.
- .2 Purpose for pre-purchasing this equipment is to ensure delivery to site within required project completion schedule. Obtain necessary shop drawings from NS TIR's Representative and proceed to co-ordinate details for installation, expedite, receive, unload, install, connect and test specified equipment, and be responsible for warranty.
- .3 Equipment specifications for pre-purchased items are included at end of project specification.
- .4 Dust collector will be delivered and stored at NS TIR Storage facility in Miller Lake, Nova Scotia for subsequent contractor pick-up and delivery at 107 Perrin Drive, Fall River, NS. Pick-up by contractor from NS TIR Miller Lake is required within 3 weeks of contract award.

1.2 OWNER FURNISHED ITEMS

- .1 Owner Responsibilities:
 - .1 Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.
 - .2 Deliver supplier's bill of materials to Contractor.
 - .3 Inspect deliveries jointly with Contractor.
 - .4 Arrange for replacement of damaged, defective, or missing items.
 - .5 Arrange for manufacturer's field services; arrange for and deliver manufacturer's warranties and bonds to Contractor.
 - .6 Arrange for delivery of overarm dust collector, portable dust collector and downdraft table and backdraft damper to site.
 - .7 Arrange for manufacturer delivery of main dust collectors, to NS TIR Storage Facility in Miller Lake, NS.
- .2 Contractor Responsibilities:
 - .1 Main dust collector
 - .1 Arrange and pay for pick-up (from Miller Lake NSTIR storage facility) and delivery of owner supplied main dust collectors to applicable school sites.
 - .2 Include costs for crane/boom truck, for all necessary pickups and deliveries at all locations.
 - .3 Pick-up dust collector from NS TIR Miller Lake facility within 3 weeks after contract award.
 - .4 After pick-up, it is the contractor's responsibility to protect and store the dust collector in the interim, in readiness for subsequent delivery (by this contractor) to the applicable school sites. Include for crane/boom truck costs.

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- .2 Designate submittals and delivery date for each product in Progress Schedule.
- .3 Review shop drawings, product data, samples, and other submittals. Submit to Consultant notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
- .4 Inspect equipment jointly with Owner; record shortages, and damaged or defective items.
- .5 Handle products at site, including uncrating and storage.
- .6 Protect products from damage, and from exposure to elements.
- .7 Assemble, install, connect, adjust and commission owner furnished items/equipment.
- .8 Repair or replace items damaged by Contractor or Subcontractor on site or during deliveries.

Part 2 Products**2.1 NOT USED**

- .1 Not Used.

Part 3 Execution**3.1 NOT USED**

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 ACCESS AND EGRESS

- .1 Report to main office upon arrival/departure sign in/out.
- .2 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, ramps or ladders, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.2 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Owner to facilitate work as stated.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Where security is reduced by work, provide temporary means to maintain security.
- .4 Closures: protect work temporarily until permanent enclosures are completed.
- .5 Furnish sanitary facilities for use by Contractor's personnel. Keep facilities clean.

1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to building operations, occupants and normal use of premises. Arrange with Owner to facilitate execution of work.

1.4 SPECIAL REQUIREMENTS

- .1 Paint areas Monday to Friday from 16:00 to 07:00 hours only and on Saturdays, Sundays, and statutory holidays.
- .2 Carry out noise generating Work Monday to Friday from 16:00 to 07:00 hours and on Saturdays, Sundays and statutory holidays.
- .3 Submit schedule in accordance with Section 01 32 16 - Construction Progress Schedules *on a school-by-school basis*.
- .4 Ensure that Contractor personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .5 Keep within limits of work and avenues of ingress and egress.
- .6 Deliver materials outside of peak traffic hours. Deliver materials from 16:00 to 07:00 unless otherwise approved by Owner.
- .7 Coordinate all disruptive electrical work with Owner to minimize effects on normal school operation.

1.5 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions. Smoking is not allowed on any School Board property.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2008 - Stipulated Price Contract.

1.2 APPLICATIONS FOR PROGRESS PAYMENT

- .1 Refer to CCDC 2.
- .2 Make applications for payment on account as provided in Agreement monthly as Work progresses.
- .3 Date applications for payment last day of agreed monthly payment period and ensure amount claimed is for value, proportionate to amount of Contract, of Work performed and Products delivered to Place of Work at that date.
- .4 Submit to Consultant at least 14 days before first application for payment. Provide a Schedule of Values for parts of Work, aggregating total amount of Contract Price, to facilitate evaluation of applications for payment.

1.3 SCHEDULE OF VALUES

- .1 Refer to CCDC 2.
- .2 Provide schedule of values supported by evidence as Consultant may reasonably direct and when accepted by Consultant, be used as basis for applications for payment.
- .3 Schedule of values and associated amounts should coincide with the tables as outlined in the supplementary bid form.
- .4 Include statement based on schedule of values with each application for payment.
- .5 Support claims for products delivered to Place of Work but not yet incorporated into Work by such evidence as Consultant may reasonably require to establish value and delivery of products.

1.4 PROGRESS PAYMENT

- .1 Refer to CCDC 2.
- .2 Consultant will issue to Owner, no later than 10 days after receipt of an application for payment, certificate for payment in amount applied for or in such other amount as Consultant determines to be due. If Consultant amends application, Consultant will give notification in writing giving reasons for amendment.

1.5 SUBSTANTIAL PERFORMANCE OF WORK

- .1 Refer to CCDC 2.

- .2 Prepare and submit to Consultant comprehensive list of items to be completed or corrected and apply for a review by Consultant to establish Substantial Performance, or substantial performance of designated portion of Work when Work is substantially performed if permitted by lien legislation applicable to Place of Work designated portion which Owner agrees to accept separately is substantially performed. Failure to include items on list does not alter responsibility to complete Contract.

1.5 SUBSTANTIAL PERFORMANCE OF WORK – (Cont'd)

- .3 No later than 10 days after receipt of list and application, Consultant will review Work to verify validity of application, and no later than 7 days after completing review, will notify Contractor if Work or designated portion of Work is substantially performed.
- .4 Consultant: state date of Substantial Performance of Work or designated portion of Work in certificate.
- .5 Immediately following issuance of certificate of Substantial Performance of Work, in consultation with Consultant establish reasonable date for finishing Work.

1.6 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF WORK

- .1 Refer to CCDC 2.
- .2 After issuance of certificate of Substantial Performance of Work:
 - .1 Submit application for payment of holdback amount.
 - .2 Submit sworn statement that accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred in Substantial Performance of Work and for which Owner might in be held responsible have been paid in full, except for amounts properly retained as holdback or as identified amount in dispute.
- .3 After receipt of application for payment and sworn statement, Consultant will issue certificate for payment of holdback amount.
- .4 Where holdback amount has not been placed in a separate holdback account, Owner shall, 10 days prior to expiry of holdback period stipulated in lien legislation applicable to Place of Work, place holdback amount in bank account in joint names of Owner and Contractor, Design-Builder.
- .5 Amount authorized by certificate for payment of holdback amount is due and payable on day following expiration of holdback period stipulated in lien legislation applicable to Place of Work. Where lien legislation does not exist or apply, holdback amount is due and payable in accordance with other legislation, industry practice, or provisions which may be agreed to between parties. Owner may retain out of holdback amount sums required by law to satisfy liens against Work or, if permitted by lien legislation applicable to Place of Work, other third party monetary claims against Contractor, Design-Builder which are enforceable against Owner.

1.7 PROGRESSIVE RELEASE OF HOLDBACK

- .1 Refer to CCDC 2.
- .2 Where legislation permits, if Consultant has certified that Work of subcontractor or supplier has been performed prior to Substantial Performance of Work, Owner shall pay holdback amount retained for such subcontract Work, or products supplied by such supplier, on day following expiration of holdback period for such Work stipulated in lien legislation applicable to Place of Work.

PROGRESSIVE RELEASE OF HOLDBACK – *(Cont'd)*

- .3 In addition to provisions of preceding paragraph, and certificate wording, ensure that such subcontract Work or products is protected pending issuance of final certificate for payment and be responsible for correction of defects or Work not performed regardless of whether or not such was apparent when such certificates were issued.

1.8 FINAL PAYMENT

- .1 Refer to CCDC 2.
- .2 Submit application for final payment when Work is completed.
- .3 Consultant will, no later than 10 days after receipt of application for final payment, review Work to verify validity of application. Consultant] will give notification that application is valid or give reasons why it is not valid, no later than 7 days after reviewing Work.
- .4 Consultant will issue final certificate for payment when application for final payment is found valid.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

- .1 Schedule and administer project meetings throughout the progress of the work at the call of Consultant.
- .2 Prepare agenda for meetings.
- .3 Distribute written notice of each meeting four days in advance of meeting date to Consultant.
- .4 Provide physical space and make arrangements for meetings.
- .5 Preside at meetings.
- .6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and affected parties not in attendance.
- .8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

- .1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Departmental Representative, Consultant, Contractor, major Subcontractors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Schedule of Work: in accordance with Section 01 32 16 - Construction Progress Schedules.
 - .3 Schedule of submission of shop drawings. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
 - .5 Delivery schedule of specified equipment.

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- .6 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
 - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
 - .8 Owner provided products.
 - .9 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .10 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
 - .11 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
 - .12 Monthly progress claims, administrative procedures, photographs, hold backs.
 - .13 Insurances, transcript of policies.

Part 2 Products**2.1 NOT USED**

- .1 Not Used.

Part 3 Execution**3.1 NOT USED**

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 DEFINITIONS

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
- .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
- .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
- .7 Milestone: significant event in project, usually completion of major deliverable.
- .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
- .9 Project Planning, Monitoring and Control System: overall system operated by Consultant to enable monitoring of project work in relation to established milestones.

1.2 REQUIREMENTS

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.
- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Consultant within 10 working days of Award of Contract Construction Progress Schedule as Master Plan for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to Consultant within 5 working days of receipt of acceptance of Master Plan.

1.4 MASTER PLAN

- .1 Structure schedule to allow orderly planning, organizing and execution of Work.
- .2 Consultant will review and return revised schedules within 5 working days.
- .3 Revise impractical schedule and resubmit within 5 working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.5 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Award.
 - .2 Shop Drawings, Samples.
 - .3 Mobilization.
 - .4 Ductwork.
 - .5 Site Works.
 - .6 Dust Collector Installed.
 - .7 Electrical.
 - .8 Controls.
 - .9 Testing and Commissioning.
 - .10 Supplied equipment long delivery items.
 - .11 Owner supplied equipment required dates.

1.6 PROJECT SCHEDULE REPORTING

- .1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
- .2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.7 PROJECT MEETINGS

- .1 Discuss Project Schedule at site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- .2 Weather related delays with their remedial measures will be discussed and negotiated.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

- .1 Submit Consultant submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present Shop Drawings and product data in SI Metric or Imperial Units.
- .4 Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .5 Notify Consultant, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .6 Verify field measurements and affected adjacent Work is co-ordinated.
- .7 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.
- .8 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant review.
- .9 Keep one reviewed copy of each submission on site.

1.2 SHOP DRAWINGS AND PRODUCT DATA

- .1 Refer to CCDC 2.
- .2 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .3 Submit shop drawings bearing stamp and signature of qualified professional engineer registered or licensed in Province of Nova Scotia of Canada, where required.
- .4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .5 Allow 5 days for Consultant's review of each submission.

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- .6 Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .7 Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested.
- .8 Accompany submissions with transmittal letter containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing and product data.
 - .5 Other pertinent data.
- .9 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .10 After Consultant's review, distribute copies.
- .11 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.

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- .12 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Consultant.
 - .13 Delete information not applicable to project.
 - .14 Supplement standard information to provide details applicable to project.
 - .15 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

Part 2 Products**2.1 NOT USED**

- .1 Not Used.

Part 3 Execution**3.1 NOT USED**

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Health and safety considerations required to ensure that Owner shows due diligence towards health and safety on construction sites.

1.2 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .3 Province of Nova Scotia
 - .1 Occupational Health and Safety Act, S.N.S. 1996.

1.3 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
- .3 Submit one copy of all Contractor's authorized representative's work site health and safety inspection reports to Consultant weekly.
- .4 Submit copies of reports or directions issued by Provincial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets.
- .7 Consultant will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within seven days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within three days after receipt of comments from Consultant.
- .8 Consultant's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Consultant.

1.4 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

1.5 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Consultant prior to commencement of Work.

1.6 REGULATORY REQUIREMENTS

- .1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

1.7 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Consultant may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.8 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.9 COMPLIANCE REQUIREMENTS

- .1 Comply with Occupational Health and Safety Act, Occupational Safety General Regulations, N.S. Regulations.

1.10 UNFORSEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Consultant verbally and in writing.
- .2 Asbestos containing materials (ACM) may be present. Obtain and review copies of each school's asbestos manual and/or asbestos reports. If no manuals/reports are available, contact the school board representative and consultant.

1.11 HEALTH AND SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
 - .1 Have site-related working experience specific to activities associated with related work.
 - .2 Have working knowledge of occupational safety and health regulations.
 - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
 - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

1.12 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Consultant.

1.13 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Consultant.
- .2 Provide Consultant with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Consultant may stop Work if non-compliance of health and safety regulations is not corrected.

1.14 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 FIRE DEPARTMENT BRIEFING

- .1 Owner will co-ordinate arrangements for contractor for briefing on Fire Safety. Owner's Representative will be delivering the Fire Safety briefing.
- .2 Know location of nearest fire alarm box and telephone, including emergency phone number.
- .3 Report immediately fire incidents to Fire Department as follows:
 - .1 Activate nearest fire alarm box; or
 - .2 Telephone 911.
- .4 When reporting fire by telephone, give location of fire, name of building and be prepared to verify location.

1.2 INTERIOR AND EXTERIOR FIRE PROTECTION AND ALARM SYSTEMS

- .1 Fire protection and alarm system will not be:
 - .1 Obstructed;
 - .2 Shut-off; and
 - .3 Left inactive at end of working day or shift.
- .2 Fire hydrants, standpipes and hose systems will not be used for other than fire-fighting purposes.

1.3 RUBBISH AND WASTE MATERIALS

- .1 Keep rubbish and waste materials at minimum quantities.
- .2 Burning of rubbish is prohibited.
- .3 Removal:
 - .1 Remove rubbish from work site at end of work day or shift or as directed.
- .4 Storage:
 - .1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.
 - .2 Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles and remove specified.

1.4 FLAMMABLE AND COMBUSTIBLE LIQUIDS

- .1 Handling, storage and use of flammable and combustible liquids governed by current National Fire Code of Canada.

1.4 FLAMMABLE AND COMBUSTIBLE LIQUIDS – (Cont'd)

- .2 Keep flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing Underwriters' Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires permission of Consultant.
- .3 Transfer of flammable and combustible liquids is prohibited within buildings.
- .4 Transfer of flammable and combustible liquids will not be carried out in vicinity of open flames or any type of heat-producing devices.
- .5 Do not use flammable liquids having flash point below 38 degrees C such as naphtha or gasoline as solvents or cleaning agents.
- .6 Store flammable and combustible waste liquids, for disposal, in approved containers located in safe ventilated area. Keep quantities minimum and Fire Department is to be notified when disposal is required.

1.5 HAZARDOUS SUBSTANCES

- .1 Work entailing use of toxic or hazardous materials, chemicals and/or explosives, or otherwise creating hazard to life, safety or health, in accordance with National Fire Code of Canada.
- .2 Contractor shall obtain a hot work permit system and fire watch in place, as part of work plan. "Hot Work" permit is required for work involving welding, grinding, burning or use of blowtorches and salamanders, in buildings or facilities.
- .3 Provide ventilation where flammable liquids, such as lacquers or urethanes are used, eliminate sources of ignition. Inform Consultant prior to and at cessation of such work.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES AND CODES

- .1 Perform Work in accordance with National Building Code of Canada (NBC), latest edition, including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .2 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.

1.2 HAZARDOUS MATERIAL DISCOVERY

- .1 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop work immediately when material resembling spray or trowel-applied asbestos is encountered during demolition work. Notify owner's representative immediately.
- .2 Mould: stop work immediately when material resembling mould is encountered during demolition work. Notify owner's representative immediately

1.3 BUILDING SMOKING ENVIRONMENT

- .1 Smoking is not permitted on any School Board property.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2 - Stipulated Price Contract.

1.2 INSPECTION

- .1 Refer to CCDC 2.
- .2 Allow Consultant and Owner access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant instructions, or law of Place of Work.
- .4 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

1.3 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

1.4 PROCEDURES

- .1 Notify appropriate agency and Consultant in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

1.5 REJECTED WORK

- .1 Refer to CCDC.
- .2 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .3 Make good other Contractor's work damaged by such removals or replacements promptly.
- .4 If, in the opinion of Consultant, it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Consultant.

1.6 REPORTS

- .1 Submit electronic copy of inspection and test reports to Consultant.
- .2 Provide copies to sub-contractor of work being inspected or tested and/or manufacturer or fabricator of material being inspected or tested.

1.7 EQUIPMENT AND SYSTEMS

- .1 Submit adjustment and balancing reports for mechanical and electrical systems.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CGSB 1.59-latest edition, Alkyd Exterior Gloss Enamel.
 - .2 CAN/CGSB 1.189-latest edition, Exterior Alkyd Primer for Wood.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA-O121-latest edition, Douglas Fir Plywood.

1.2 INSTALLATION AND REMOVAL

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

1.3 HOARDING

- .1 Erect temporary site enclosures using 38 x 89 mm construction grade lumber framing at 600 mm centres and 1200 x 2400 x 13 mm exterior grade fir plywood to CSA O121.
- .2 Apply plywood panels vertically as indicated, flush and butt jointed.
- .3 Provide one lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
- .4 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
- .5 Paint public side of site enclosure in selected colours with one coat primer to CAN/CGSB 1.189 and one coat exterior paint to CGSB 1.59. Maintain public side of enclosure in clean condition.
- .6 Erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m on centre. Provide one lockable truck gate. Maintain fence in good repair.
- .7 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.4 FIRE ROUTES

- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.5 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

1.6 PROTECTION OF BUILDING FINISHES

- .1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers, and hoardings.
- .3 Be responsible for damage incurred due to lack of or improper protection.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2 - Stipulated Price Contract.
- .2 Conform to these reference standards, in whole or in part as specifically requested in specifications.

1.2 QUALITY

- .1 Refer to CCDC 2.
- .2 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .3 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .4 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .5 Should disputes arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.
- .6 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

1.3 AVAILABILITY

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 In event of failure to notify Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Consultant reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 STORAGE, HANDLING AND PROTECTION

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

1.4 STORAGE, HANDLING AND PROTECTION – (Cont'd)

- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .6 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .7 Remove and replace damaged products at own expense and to satisfaction of Consultant.
- .8 Touch-up damaged factory finished surfaces to Consultant's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.5 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of Work.

1.6 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Consultant to require removal and re-installation at no increase in Contract Price or Contract Time.

1.7 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Consultant if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Consultant reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.

1.8 CO-ORDINATION

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.9 CONCEALMENT

- .1 In finished areas conceal pipes, ducts and wiring in walls and ceilings, except where indicated otherwise.
- .2 Before installation inform Consultant if there is interference. Install as directed by Consultant.

1.10 REMEDIAL WORK

- .1 Refer to CCDC 2 and Section 01 73 00 - Execution Requirements.
- .2 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .3 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.11 LOCATION OF FIXTURES

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform Consultant of conflicting installation. Install as directed.

1.12 FASTENINGS

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.
- .3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.13 FASTENINGS - EQUIPMENT

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.14 PROTECTION OF WORK IN PROGRESS

- .1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Consultant.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2 - Stipulated Price Contract.
- .2 Owner's identification of existing survey control points and property limits.

1.2 LOCATION OF EQUIPMENT AND FIXTURES

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Consultant of impending installation and obtain approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by Consultant.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit written request in advance of cutting or alteration which affects:
 - .1 Structural integrity of elements of project.
 - .2 Integrity of weather-exposed or moisture-resistant elements.
 - .3 Efficiency, maintenance, or safety of operational elements.
 - .4 Visual qualities of sight-exposed elements.
 - .5 Work of Owner or separate contractor.
- .3 Include in request:
 - .1 Identification of project.
 - .2 Location and description of affected Work.
 - .3 Statement on necessity for cutting or alteration.
 - .4 Description of proposed Work, and products to be used.
 - .5 Alternatives to cutting and patching.
 - .6 Effect on Work of Owner or separate contractor.
 - .7 Written permission of affected separate contractor.
 - .8 Date and time work will be executed.

1.2 MATERIALS

- .1 Required for original installation.

1.3 PREPARATION

- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

1.4 EXECUTION

- .1 Execute cutting, fitting, and patching to complete Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Remove and replace defective and non-conforming Work.
- .4 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

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- .5 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
 - .6 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
 - .7 Restore work with new products in accordance with requirements of Contract Documents.
 - .8 Fit Work airtight to ducts, conduit and other penetrations through surfaces.
 - .9 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material, full thickness of the construction element.
 - .10 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.
 - .11 Conceal ducts and wiring in wall and ceiling construction of finished areas except where indicated otherwise.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products**2.1 NOT USED**

- .1 Not Used.

Part 3 Execution**3.1 NOT USED**

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2 - Stipulated Price Contract.

1.2 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times. Do not burn waste materials on site.
- .3 Clear snow and ice from access to building, bank/pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .7 Dispose of waste materials and debris off site.
- .8 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .9 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .10 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.3 FINAL CLEANING

- .1 Refer to CCDC 2.
- .2 Remove waste products and debris and leave Work clean and suitable for occupancy.
- .3 Prior to final review, remove surplus products, tools, construction machinery and equipment not required for performance of remaining work.
- .4 Remove waste materials from site at regularly scheduled times. Do not burn waste materials on site.
- .5 Clean and polish wall tile, stainless steel, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

1.3 FINAL CLEANING – (Cont'd)

- .6 Remove stains, spots, marks and dirt from electrical and mechanical fixtures, furniture fitments and walls.
- .7 Clean lighting reflectors, lenses, and other lighting surfaces.
- .8 Vacuum clean and dust building interiors.
- .9 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .10 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .11 Remove dirt and other disfiguration from exterior surfaces.
- .12 Sweep and wash clean paved areas.
- .13 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.
- .14 Remove snow and ice from access to building.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 DEFINITIONS

- .1 Class III: non-hazardous waste - construction renovation and demolition waste.
- .2 Cost/Revenue Analysis Workplan (CRAW): based on information from WRW, and intended as financial tracking tool for determining economic status of waste management practices.
- .3 Demolition Waste Audit (DWA): relates to actual waste generated from project.
- .4 Inert Fill: inert waste - exclusively asphalt and concrete.
- .5 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.
- .6 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .7 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .8 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .9 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
 - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
 - .2 Returning reusable items including pallets or unused products to vendors.
- .10 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .11 Separate Condition: refers to waste sorted into individual types.
- .12 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.
- .13 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill. Refer to Schedule A.
- .14 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related required submittal and reporting requirements.

- .15 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. Refer to Schedule B. WRW is based on information acquired from WA (Schedule A).

1.2 STORAGE, HANDLING AND PROTECTION

- .1 Unless specified otherwise, materials for removal become Contractor's property.
- .2 Protect, stockpile, store and catalogue salvaged items.
- .3 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .4 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
- .1 On-site source separation is recommended.
- .2 Remove co-mingled materials to off-site processing facility for separation.
- .3 Provide waybills for separated materials.

1.3 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil or paint thinner into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
- .1 Number and size of bins.
- .2 Waste type of each bin.
- .3 Total tonnage generated.
- .4 Tonnage reused or recycled.
- .5 Reused or recycled waste destination.
- .4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.
- .5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

1.4 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises.
- .2 Maintain security measures established by existing facility.

1.5 SCHEDULING

- .1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

1.6 Products

1.7 NOT USED

- .1 Not Used.

Part 2 Execution

2.1 WASTE MANAGEMENT AND DISPOSAL

- .1 Provide on-site facilities for collection, handling and storage of anticipated quantities of reusable and/or recyclable materials.
- .2 Source separate materials to be re-used or recycled into specified sort areas.
- .3 Dispose of construction (unable to be reduced/reused/recycled) into separated waste streams as outlined by the local waste management program.

2.2 SELECTIVE DEMOLITION

- .1 Reuse of Building Elements: this project has been designed to result in end of project rates for reuse of building elements as follows: do not demolish building elements beyond what is indicated on Drawings without approval by Owner's Representative.

2.3 APPLICATION

- .1 Handle waste materials not reused, salvaged or recycled in accordance with appropriate regulations and codes.

2.4 CLEANING

- .1 Remove tools and waste materials on completion of Work and leave work area in clean and orderly condition.
- .2 Clean-up work area as work progresses.
- .3 Source separate materials to be reused/recycled into specific sort areas.

END OF SECTION

Part 1 General**1.1 REFERENCES**

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2 - Stipulated Price Contract.

1.2 INSPECTION AND DECLARATION

- .1 Contractor's Inspection: Contractor and Subcontractors: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Consultant in writing:
 - .1 Of satisfactory completion of Contractor's Inspection and that corrections have been made.
 - .2 Equipment and systems have been tested, adjusted and balanced and are fully operational.
 - .2 Request Consultant Inspection and Commissioning.
 - .1 It is the expectation that all work will have been completed and all required documentation provided prior to the request for Consultant Inspection.
 - .2 The Commissioning of the systems in the presence of the Consultant will include verification of the air flow measurements. The air balancing process will have been already completed.
- .2 Consultant's Inspection & Commissioning: Consultant and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.
- .3 Completion: submit written certificate that following have been performed:
 - .1 Work has been completed and inspected for compliance with Contract Documents.
 - .2 Defects have been corrected and deficiencies have been completed. Include signed-off deficiency lists.
 - .3 Equipment and systems have been tested, adjusted and balanced and are fully operational.
 - .4 Work is complete and ready for final inspection.
- .4 Final Inspection: when items noted above are completed, request final inspection of Work by Owner, Consultant and Contractor. If Work is deemed incomplete by Owner and Consultant, complete outstanding items and request re-inspection.
- .5 Declaration of Substantial Performance: when Owner and Consultant consider deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance.

1.2 INSPECTION AND DECLARATION – (Cont'd)

- .6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
- .7 Final Payment: when Owner and Consultant consider final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. Refer to CCDC 2. If Work is deemed incomplete by Owner and Consultant, complete outstanding items and request reinspection.
- .8 Payment of Holdback: after issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with CCDC 2.

1.3 CLEANING

- .1 In accordance with Section 01 74 11 – Cleaning.
- .2 Remove waste and surplus materials, rubbish and construction facilities from the site in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .3 Copy will be returned after final inspection with Consultant's comments.
- .4 Revise content of documents as required prior to final submittal.
- .5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
- .6 Furnish evidence, if requested, for type, source and quality of products provided.
- .7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .8 Pay costs of transportation.

1.2 RECORDING ACTUAL SITE CONDITIONS

- .1 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .2 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .3 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Field changes of dimension and detail.
 - .2 Changes made by change orders.
 - .3 Details not on original Contract Drawings.
 - .4 References to related shop drawings and modifications.
- .4 Specifications: mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .5 Other Documents: maintain as required by individual specifications sections.

1.3 SPARE PARTS

- .1 Provide spare parts, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.

1.3 SPARE PARTS – (Cont'd)

- .3 Deliver to site; place and store.
- .4 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

1.4 MAINTENANCE MATERIALS

- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .5 Obtain receipt for delivered products and submit prior to final payment.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 Section Includes:
 - .1 General requirements relating to commissioning of project's components and systems, specifying general requirements to PV of components, equipment, and systems.
- .2 Acronyms:
 - .1 Cx - Commissioning.
 - .2 O&M - Operation and Maintenance.
 - .3 PI - Product Information.
 - .4 PV - Performance Verification.
 - .5 TAB - Testing, Adjusting and Balancing.

1.2 GENERAL

- .1 Contractor assists in Cx process, operating equipment and systems, troubleshooting and making adjustments as required. Cx is a planned program of tests, procedures and checks carried out systematically on systems and integrated systems of the finished Project. Cx is performed after systems and integrated systems are completely installed, functional and Contractor's Performance Verification responsibilities have been completed and approved. Cx shall verify installed equipment and systems operate in accordance with contract documents and design criteria and intent.
- .2 Generally, the following systems will be part of the Cx process; the list shall be modified as necessary throughout the design phase to reflect the actual project design:
 - .1 Dust Collectors
 - .1 Dust Collectors
 - .2 Fans and Motors
 - .3 Controls
 - .4 Filters
 - .5 Deflagration Vents
 - .6 Internal Components
 - .7 Required Equipment Bonding
 - .2 Ductwork
 - .1 Main Ductwork
 - .2 Branch Ductwork
 - .3 Flexible Ductwork
 - .4 Required Duct Bonding
 - .5 Collection Hoods
 - .6 Blast Gates
 - .7 Floating Drops

- .8 Portable Collection Equipment
- .3 OTHER
 - .1 Equipment power supply
 - .2 Deflagration zone fencing
 - .3 Patching and finishing
 - .4 Dust collector structural supports.
 - .5 System bonding and grounding
- .3 Systems to be operated at full determine if they function correctly and consistently.
- .4 During these checks, adjustments to be made to enhance performance to meet environmental or user requirements.

1.3 COMMISSIONING OVERVIEW

- .1 Cx activities supplement field quality and testing procedures described in relevant technical sections.
- .2 Cx is conducted in concert with activities performed during stage of project delivery. Cx identifies issues in Planning and Design stages which are addressed during Construction and Cx stages to ensure the final system is constructed and proven to operate satisfactorily under weather, environmental and occupancy conditions to meet functional and operational requirements.
- .3 Consultant will issue Interim Acceptance Certificate when:
 - .1 Completed Cx documentation has been received, reviewed for suitability and approved by Consultant.
 - .2 Equipment, components and systems have been commissioned.

1.4 NON-CONFORMANCE TO PERFORMANCE VERIFICATION REQUIREMENTS

- .1 Should equipment, system components, and associated controls be incorrectly installed or malfunction during Cx, correct deficiencies, re-verify equipment and components within the un-functional system, including related systems as deemed required by Consultant to ensure effective performance.
- .2 Costs for corrective work, additional tests, inspections, to determine acceptability and proper performance of such items to be borne by Contractor. Above costs to be in form of progress payment reductions or hold-back assessments.

1.5 PRE-CX REVIEW

- .1 Before start of Cx:
 - .1 Ensure installation of related components, equipment, sub-systems and systems is complete.
 - .2 Understand completely design criteria and intent and special features.
 - .3 Submit complete start-up documentation to Consultant.

- .4 Ensure systems have been cleaned thoroughly.
 - .5 Complete TAB procedures on systems; submit TAB reports to Consultant for review and approval.
 - .6 Ensure "As-Built" system schematics are available.
- .2 Inform Consultant in writing of discrepancies and deficiencies on finished works.

1.6 CONFLICTS

- .1 Report conflicts between requirements of this section and other sections to Consultant before start-up and obtain clarification.
- .2 Failure to report conflict and obtain clarification will result in application of most stringent requirement.

1.7 COMMISSIONING SCHEDULE

- .1 Provide Cx schedule as part of construction schedule in accordance with Section 01 32 16 - Construction Progress Schedules.
- .2 Provide adequate time for Cx activities prescribed in technical sections and commissioning sections including:
 - .1 Verification of reported results.
 - .2 Repairs, retesting, re-commissioning, re-verification.

1.8 STARTING AND TESTING

- .1 Contractor assumes liabilities and costs for inspections. Including disassembly and re-assembly after approval, starting, testing and adjusting, including supply of testing equipment.

1.9 PROCEDURES

- .1 Verify that equipment and systems are complete, clean, and operating in normal and safe manner prior to conducting start-up, testing and Cx.
- .2 Conduct start-up and testing in following distinct phases:
 - .1 Included in delivery and installation:
 - .1 Verification of conformity to specification, approved shop drawings.
 - .2 Visual inspection of quality of installation.
 - .2 Start-up: follow accepted start-up procedures.
 - .3 Operational testing: document equipment performance.
- .3 Correct deficiencies and obtain approval from Consultant after distinct phases have been completed and before commencing next phase.

1.10 OPERATION AND MAINTENANCE OF EQUIPMENT AND SYSTEMS

- .1 After start-up, operate and maintain equipment and systems as directed by equipment/system manufacturer.
- .2 Operate and maintain systems for length of time required for commissioning to be completed.
- .3 After completion of commissioning, operate and maintain systems until issuance of certificate of interim acceptance.

1.11 TEST RESULTS

- .1 If start-up and testing produce unacceptable results, repair, replace or repeat specified starting and testing procedures until acceptable results are achieved.
- .2 Provide manpower and materials, assume costs for re-commissioning.

1.12 INSTRUMENTS / EQUIPMENT

- .1 Submit to Consultant for review and approval:
 - .1 Complete list of instruments proposed to be used.
 - .2 Listed data including, serial number, current calibration certificate, calibration date, and calibration expiry date and calibration accuracy.
- .2 Provide equipment as required to complete work.

1.13 COMMISSIONING PERFORMANCE VERIFICATION

- .1 Carry out Cx under accepted simulated operating conditions, over entire operating range, in all modes.
- .2 Cx procedures to be repeatable and reported results are to be verifiable.
- .3 Follow equipment manufacturer's operating instructions.

1.14 WITNESSING COMMISSIONING

- .1 Consultant to witness activities and verify results. Contractor and contractor's air balancer to be present in order to verify TAB results.

1.15 DEFICIENCIES, FAULTS, DEFECTS

- .1 Correct deficiencies found during start-up and Cx to satisfaction of Consultant.
- .2 Report problems, faults or defects affecting Cx to Consultant in writing. Stop Cx until problems are rectified. Proceed with written approval from Consultant.

1.16 COMPLETION OF COMMISSIONING

- .1 Upon completion of Cx leave systems in normal operating mode.

1.17 ACTIVITIES UPON COMPLETION OF COMMISSIONING

- .1 When changes are made to baseline components or system settings established during Cx process, provide updated Cx form for affected item.

1.18 PERFORMANCE VERIFICATION TOLERANCES

- .1 Application tolerances:
 - .1 Specified range of acceptable deviations of measured values from specified values or specified design criteria. Except for special areas, to be within +/- 10% of specified values.
- .2 Instrument accuracy tolerances:
 - .1 To be of higher order of magnitude than equipment or system being tested.
- .3 Measurement tolerances during verification:
 - .1 Unless otherwise specified actual values to be within +/- 2% of recorded values.

1.19 OWNER'S PERFORMANCE TESTING

- .1 Performance testing of equipment or system by Consultant will not relieve Contractor from compliance with specified start-up and testing procedures.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.

1.2 REFERENCES

- .1 Export and Import of Hazardous Waste Regulations (EIHWR Regulations), SOR/92-637.
- .2 National Fire Code of Canada.
- .3 Transportation of Dangerous Goods Act (TDG Act) 1992 c.34 (SOR/86-332, SOR/90-153).
- .4 Transportation of Dangerous Goods Act (RBC), Chapter 458.

1.3 DEFINITIONS

- .1 Dangerous Goods: Product, substance, or organism that is specifically listed or meets the hazard criteria established in Transportation of Dangerous Goods Regulations.
- .2 Hazardous Material: Product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .3 Hazardous Waste: Any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.
- .4 Workplace Hazardous Materials Information System (WHMIS): A Canada-wide system designed to give employers and workers information about hazardous materials used in the workplace. Under WHMIS, information on hazardous materials is to be provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by a combination of federal and provincial laws.

1.4 SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Consultant current Material Safety Data Sheet (MSDS) for each hazardous material required prior to bringing hazardous material on site and prior to the start of work.
- .3 Submit hazardous materials management plan to the Construction Manager that identifies all hazardous materials, their use, their location, personal protective equipment requirements, and disposal arrangements. The plan shall be submitted prior to the start of work.

1.5 STORAGE AND HANDLING

- .1 Coordinate storage of hazardous materials with the Construction Manager and Site Safety Coordinator and abide by requirements for labelling and storage of materials and wastes.
- .2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

1.5 STORAGE AND HANDLING – (cont'd)

- .3 Store and handle flammable and combustible materials in accordance with current National Fire Code of Canada requirements.
- .4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use. Store all flammable and combustible liquids in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires the written approval of the Consultant or ESCo.
- .5 Transfer of flammable and combustible liquids is prohibited within buildings.
- .6 Transfer of flammable and combustible liquids will not be carried out in the vicinity of open flames or any type of heat-producing devices.
- .7 Flammable liquids having a flash point below 38°C, such as naphtha or gasoline, will not be used as solvents or cleaning agents.
- .8 Store flammable and combustible waste liquids for disposal in approved containers located in a safe, ventilated area. Keep quantities to a minimum.
- .9 Observe smoking regulations at all times. Smoking is prohibited in any area where hazardous materials are stored, used, or handled.
- .10 Abide by the following storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:
 - .1 Store hazardous materials and wastes in closed and sealed containers which are in good condition.
 - .2 Label containers of hazardous materials and wastes in accordance with WHMIS.
 - .3 Store hazardous materials and wastes in containers compatible with that material or waste.
 - .4 Segregate incompatible materials and wastes.
 - .5 Ensure that different hazardous materials or hazardous wastes are not mixed.
 - .6 Store hazardous materials and wastes in a secure storage area with controlled access.
 - .7 Maintain a clear egress from storage area.
 - .8 Store hazardous materials and wastes in a manner and location which will prevent them from spilling into the environment.
 - .9 Have appropriate emergency spill response equipment available near the storage area, including personal protective equipment.
 - .10 Maintain an inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
 - .11 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.
 - .12 Report spills or accidents immediately to Consultant and ESCo. Submit a written spill report to Consultant and Construction Manager within 24 hours of incident.

1.6 TRANSPORTATION

- .1 Transport hazardous materials and wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

- .2 If hazardous waste is generated on site:
 - .1 Coordinate transportation and disposal with Consultant and ESCo.
 - .2 Ensure compliance with applicable Provincial Laws and Regulations for generators of hazardous waste.
 - .3 Use only a licensed carrier authorized by provincial authorities to accept subject material.
 - .4 Prior to shipping material, obtain written notice from intended hazardous waste treatment or disposal facility that it will accept material and that it is licensed to accept this material.
 - .5 Label container[s] with legible, visible safety marks as prescribed by federal and provincial regulations.
 - .6 Ensure that only trained personnel handle, offer for transport, or transport dangerous goods.
 - .7 Provide a photocopy of all shipping documents and waste manifests to Consultant and ESCo.
 - .8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide a photocopy of completed manifest to Consultant and ESCo.
 - .9 Report any discharge, emission, or escape of hazardous materials immediately to Consultant and ESCo and appropriate Provincial Authority. Take reasonable measures to control release.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Only bring on site the quantity of hazardous materials required to perform work.
- .2 Maintain MSDSs in proximity to where the materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

PART 3 - EXECUTION

3.1 DISPOSAL

- .1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.
- .2 Recycle hazardous wastes for which there is an approved, cost effective recycling process available.
- .3 Send hazardous wastes only to authorized hazardous waste disposal or treatment facilities.

3.1 DISPOSAL – (cont'd)

- .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 a timely fashion in accordance with applicable Provincial Regulations.

END OF SECTION

PART 1 - General

1.1 SECTION INCLUDES

- .1 The disturbance or removal or disposal of asbestos-containing materials from buildings within the scope of this Bid.
- .2 The disturbance, or removal and disposal of hazardous materials will be performed in strict compliance with applicable regulatory requirements.
- .3 The Trade Contractor to file a Notice of Project for Abatement as required when working in close proximity to asbestos containing materials. (The Trade Contractor may elect to hire an Asbestos Contractor to file the appropriate WCB documentation).

1.2 DEFINITIONS

- .1 Asbestos Contractor: Is the Subcontractor retained by the Trade Contractor who is licensed by the Governing Authorities to conduct the removal and/or disposal of asbestos containing materials.

1.3 DOCUMENTATION

- .1 The Asbestos Contractor will maintain the following documentation on site.
 - .1 N.S. Regulation for Asbestos.
 - .2 Workers' Compensation Board "Notice of Project for Abatement" (NOPA) and attached to the NOPA the site specific asbestos abatement work procedures intended for use.
 - .3 The Asbestos Contractor's Corporate Occupational Health & Safety Program.
 - .4 The Asbestos Contractor's Exposure Control Plan.
 - .5 Material Safety Data Sheets (MSDS) for regulated products used on the project.
 - .6 Canadian Standards Association CSA Z-190 "Selection, Care and Use of Respirators".

1.4 WORK

- .1 Where Type 1 asbestos control measures are required, they shall be followed and the costs of such shall be included as part of the work.
- .2 Type 2 asbestos abatement shall be performed by the Trade Contractors, follow all appropriate type 2 asbestos protocols and all work shall be included as part of the work.
- .3 Type 3 asbestos abatement shall be performed by the Trade Contractor or specialist Subcontractor, follow all appropriate type 3 asbestos protocols and all work shall be included as part of the work.
- .4 For Type 2 and Type 3 work performed, indicate the Asbestos Contractor in Section 00 43 00 of the Tender Submission.

1.5 EXISTING CONDITIONS

A current copy of all of the Building Asbestos Reports has been included as part in this specification enclosed for the relevant buildings and areas of work.

1.6 PROCEDURES AND REQUIREMENTS

- .1 The disturbance or handling of asbestos materials must be conducted following Type 1, Type 2 or Type 3 operation in accordance with procedures as defined by the Workers' Compensation Board of Nova Scotia as well as Nova Scotia Regulations and Statutes and Owner guidelines.
- .2 The ESCo and the Consultant must be notified prior to any disturbance, removal, handling and disposal of asbestos containing materials in addition to those materials.
- .3 A copy of the site specific work procedures intended for use on this Project must also be submitted to the Project Safety Representative and the ESCo, with the NOPA. The schedule anticipated for asbestos work must be included with the Bid.
- .4 Asbestos containing materials may have to be disturbed to facilitate the installation of new components or the modification of existing components as outlined within these specifications and drawings. Where available, existing asbestos condition audit reports have been provided in this specification section. These reports describe the type of asbestos containing material within a building including its known location and the risk level appropriate for the nature of the disturbance.
- .5 The ESCo and the Consultant, must be notified prior to any disturbance, removal, handling and disposal of asbestos containing materials including ceilings with asbestos texture coat, asbestos acoustic tiles and walls with asbestos drywall compound (confirmed, suspected or unknown) in addition to those materials.

PART 2 - Description of Work

2.1 GENERAL

- .1 The work specified herein shall be the disturbance, removal, handling and disposal of known asbestos-containing materials by competent persons trained, knowledgeable and qualified in Type 1, 2 & 3 work procedures. Asbestos Contractor is responsible to train its workers to meet qualification requirements when working with the Type 1, 2 & 3 situations.
- .2 Any worker deemed by the Owner, Consultant or ESCo in their absolute discretion to be inadequately trained or unfit to perform their duties will be removed from the project.
- .3 All platforms used to access the asbestos materials will be constructed or used in accordance with the requirements of Regulations and the applicable CSA Standard.
- .4 All necessary documentation will be the responsibility of the Asbestos Contractor.
- .5 The health and safety of all tradesmen in the areas affected during asbestos work will be the sole responsibility of the Trade Contractor, and should the Asbestos Contractor require the assistance of any other trade during the removal, he will provide all necessary equipment and training required to these trades.
- .6 The Asbestos Contractor will assume total responsibility for the erection and maintenance of all signs and the integrity of all enclosures and barriers related to the asbestos work.

2.1 GENERAL – (cont'd)

- .7 The Asbestos Contractor will provide all necessary labour, materials, insurance, permits and equipment necessary to carry out the work in accordance with all applicable regulations and this documentation.
- .8 The Asbestos Contractor will provide all necessary labour to secure the required utilities for all asbestos work.
- .9 If any asbestos containing materials not mentioned herein are to be impacted by the scheduled work, the Trade Contractor is to receive direction from the ESCo.
- .10 In order to perform Asbestos abatements all contractors must have their documentation on Site and available at all times for review by the Consultant, ESCo and Site Safety coordinator. All documents must be received at least 24 hours prior to work commencing. Special consideration may only be given to emergency abatement actions.
- .11 All air monitoring and inspections will be conducted by a qualified Occupational Health & Safety (O H & S) consultant (where required).
- .12 The Occupational Health and Safety (O H & S) consultant will be commissioned by the Construction Manager and paid by the Asbestos Contractor.
- .13 The O H & S consultant will have full access to all documentation.
- .14 The Asbestos Contractor will not demobilize from an area of removal until the O H & S consultant has inspected the completed area.
- .15 The Asbestos Contractor will not begin work in a new area without informing the O H & S consultant in writing.
- .16 All HEPA vacuums and negative-air units to be used on the Project are to be D.O.P. (dioctyl phthalate) tested at the beginning of the work, and at the discretion of the O H & S consultant.

PART 3 - Waste Handling and Disposal

3.1 GENERAL

- .1 Disposal of all asbestos waste will be performed in accordance with Nova Scotia Regulations.
- .2 The Owner will provide a waste generator number that must appear on all waste transfer manifests, if required.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A23.1-latest edition, Concrete Materials and Methods of Concrete Construction.
 - .2 CAN/CSA-O86.1-latest edition, Engineering Design in Wood (Limit States Design).
 - .3 CSA O121-latest edition, Douglas Fir Plywood.
 - .4 CSA O151-latest edition, Canadian Softwood Plywood.
 - .5 CSA O153-latest edition, Poplar Plywood.
 - .6 CAN3-O188.0-latest edition, Standard Test Methods for Mat-Formed Wood Particleboards and Waferboard.
 - .7 CSA O437 Series-latest edition, Standards for OSB and Waferboard.
 - .8 CSA S269.1-latest edition, Falsework for Construction Purposes.
 - .9 CAN/CSA-S269.3-latest edition, Concrete Formwork.

1.2 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures
- .2 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CAN/CSA-S269.3 for formwork drawings.
- .3 Indicate formwork design data, such as permissible rate of concrete placement, and temperature of concrete, in forms.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Waste Management and Disposal and the Waste Reduction Workplan.

Part 2 Products

2.1 MATERIALS

- .1 Formwork materials:
 - .1 For concrete without special architectural features, use wood and wood product formwork materials
 - .2 For concrete with special architectural features, use formwork materials to CAN/CSA-A23.1.
- .2 Pan forms: as indicated.

2.1 MATERIALS – (Cont'd)

- .3 Tubular column forms: round, spirally wound laminated fiber forms, internally treated with release material
- .4 Form ties:
 - .1 For concrete not designated 'Architectural', use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm dia. in concrete surface.
 - .2 For Architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.
- .5 Form release agent: non-toxic, biodegradable, low VOC.
- .6 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene, flashpoint minimum 150C, open cup.
- .7 False work materials: to CSA-S269.1

Part 3 Execution**3.1 FABRICATION AND ERECTION**

- .1 Verify lines, levels and centres before proceeding with formwork/false work and ensure dimensions agree with drawings.
- .2 Obtain Consultant's approval for use of earth forms framing openings not indicated on drawings.
- .3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .4 Fabricate and erect false work in accordance with CSA S269.1 and COFI Exterior Plywood for Concrete Formwork.
- .5 Refer to architectural drawings for concrete members requiring architectural exposed finishes.
- .6 Do not place shores and mud sills on frozen ground.
- .7 Provide site drainage to prevent washout of soil supporting mud sills and shores.
- .8 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1.
- .9 Align form joints and make watertight. Keep form joints to minimum.
- .10 Locate horizontal form joints for exposed columns 2400mm above finished floor elevation.

3.1 FABRICATION AND ERECTION – (Cont'd)

- .11 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
- .12 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .13 Construct forms for architectural concrete, and place ties as indicated and/or as directed. Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.
- .14 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .15 Clean formwork in accordance with CAN/CSA-A23.1, before placing concrete.
- .16 If slip forming and flying forms are used, submit details of equipment and procedures for Consultant's approval.

3.2 REMOVAL AND RESHORING

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
 - .1 28 days for walls and sides of beams.
 - .2 28 days for columns.
 - .3 28 days for beam soffits, slabs, decks and other structural members, or 28 days when replaced immediately with adequate shoring to standard specified for false work.
 - .4 28 days for footings and abutments.
- .2 Remove formwork when concrete has reached 100% of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate re-shoring.
- .3 Provide all necessary re-shoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.
- .4 Space re-shoring in each principal direction at not more than 3000 mm apart.
- .5 Re-use formwork and false work subject to requirements of CAN/CSA-A23.1.

END OF SECTION

Part 1 General**1.1 REFERENCES**

- .1 American Concrete Institute (ACI)
 - .1 ACI 315R-latest edition, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.
- .2 American National Standards Institute/American Concrete Institute (ANSI/ACI)
 - .1 ANSI/ACI 315-latest edition, Details and Detailing of Concrete Reinforcement.
- .3 American Society for Testing and Materials (ASTM)
 - .1 ASTM A 775/A 775M-latest edition, Specification for Epoxy-Coated Reinforcing Steel Bars.
- .4 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A23.1-latest edition, Concrete Materials and Methods of Concrete Construction.
 - .2 CAN3-A23.3-latest edition, Design of Concrete Structures for Buildings.
 - .3 CSA G30.3-latest edition, Cold Drawn Steel Wire for Concrete Reinforcement.
 - .4 CSA G30.5-latest edition, Welded Steel Wire Fabric for Concrete Reinforcement.
 - .5 CSA G30.14-latest edition, Deformed Steel Wire for Concrete Reinforcement.
 - .6 CSA G30.15-latest edition, Welded Deformed Steel Wire Fabric for Concrete Reinforcement.
 - .7 CAN/CSA-G30.18-latest edition, Billet-Steel Bars for Concrete Reinforcement.
 - .8 CAN/CSA-G40.21-latest edition, Structural Quality Steels.
 - .9 CAN/CSA-G164-latest edition, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .10 CSA W186-latest edition, Welding of Reinforcing Bars in Reinforced Concrete Construction. SHOP DRAWINGS

1.2 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Waste Management and Disposal and the Waste Reduction Workplan.

Part 2 Products**2.1 MATERIALS**

- .1 Substitute different size bars only if permitted in writing by Consultant.
- .2 Reinforcing steel: billet steel, grade 400, deformed bars to CAN/CSA-G30.18, unless indicated otherwise.
- .3 Reinforcing steel: weldable low alloy steel deformed bars to CAN/CSA-30.18.

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- .4 Cold-drawn annealed steel wire ties: to CSA G30.3.
 - .5 Deformed steel wire for concrete reinforcement: to CSA G30.14.
 - .6 Welded steel wire fabric: to CSA G30.5. Provide in flat sheets only.
 - .7 Welded deformed steel wire fabric: to CSA G30.15. Provide in flat sheets only.
 - .8 Chairs, bolsters, bar supports, spacers: to CAN/CSA-A23.1.
 - .9 Mechanical splices: subject to approval of Consultant.
 - .10 Plain round bars: to CAN/CSA-G40.21.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CAN/CSA-A23.1, ANSI/ACI 315, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada unless indicated otherwise.
- .2 Obtain Consultant's approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Consultant, weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

- .1 Upon request inform Consultant of proposed source of material to be supplied.

Part 3 Execution

3.1 FIELD BENDING

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Consultant.
- .2 When field bending is authorized, bend without heat, applying a slow and steady pressure.
- .3 Replace bars which develop cracks or splits.

3.2 PLACING REINFORCEMENT

- .1 Place reinforcing steel as indicated on reviewed placing drawings and in accordance with CAN/CSA-A23.1.
- .2 Prior to placing concrete, obtain Consultant's approval of reinforcing material and placement.
- .3 Ensure cover to reinforcement is maintained during concrete pour.
- .4 Protect coated portions of bars with covering during transportation and handling.

3.3 FIELD TOUCH-UP

- .1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcing steel with compatible finish to provide continuous coating.

END OF SECTION

Part 1 General

1.1 STANDARD

- .1 Concrete materials and methods of construction: to CAN/CSA-A23.1 unless otherwise specified.

1.2 INSPECTION

- .1 Concrete testing: to CAN/CSA-A23.2 by testing laboratory designated and paid for by contractor.
- .2 Give Engineer minimum 24 h notice before each concrete pour.

1.3 SHOP DRAWINGS

- .1 Submit placing drawings prepared in accordance with plans to clearly show size, shape, location and all necessary details of reinforcing.
- .2 Detail reinforcing steel in accordance with Manual of Standard Practice of Reinforcing Steel Institute of Ontario (RSIO).

Part 2 Products

2.1 MATERIALS

- .1 Portland cement: to CAN/CSA-A5
- .2 Shrinkage compensating grout: pre-mixed, non-metallic aggregate, 50 MPa compressive strength at 28 days.
- .3 Dovetail anchor slots: minimum 0.6 mm thick galvanized steel, insulation filled.
- .4 All other concrete materials: to CAN/CSA-A23.1

2.2 MIX PROPORTIONS

- .1 Minimum 28 day compressive strengths and exposure classifications:
 - .1 Exposed site concrete: 32 MPa; C-2.
- .2 Nominal size of coarse aggregate: Clause 14 of CAN/CSA-A23.1
- .3 Slump: to Table 6 of CAN/CSA-A23.1
- .4 Air content: all concrete to contain purposely entrained air in accordance with Table 10 of CAN/CSA-A23.1
- .5 Admixtures: to Clause 6 of CAN/CSA-A23.1

Part 3 Execution

3.1 INSERTS

- .1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, water stops, joint fillers and other inserts required to be built-in. Sleeves and openings greater than 100 mm x 100 mm not indicated, must be approved by Engineer.

3.2 FINISHES

- .1 Formed surfaces exposed to view in accordance with CAN/CSA-A23.1
- .2 Equipment pads: smooth trowelled surface; finishing tolerance classification: Very Flat.
- .3 Pavements, walks, curbs and exposed site concrete: screed to plane surfaces and float using aluminum, magnesium, or wood floats. Round edges and provide joint spacings using standard tools. Trowel smooth followed by lightly brushed non-slip finish.

3.3 CONTROL JOINTS

- .1 Cut control joints in slabs on grade at locations indicated, in accordance with CAN/CSA-A23.1.

3.4 EXPANSION AND ISOLATION JOINTS

- .1 Install pre-moulded joint filler in expansion and isolation joints full depth of slab flush with finished surface.

3.5 CURING

- .1 Cure and protect concrete in accordance with CAN/CSA-A23.1, except that curing compounds shall not be used where bond is required by subsequent topping or coating.
- .2 Protect new concrete works from freezing. Protect with insulated blankets, or other acceptable means.

3.6 GROUT

- .1 Grout voids under baseplates.
- .2 Grout into place, bolts and other items of concrete hardware, that are not placed prior to pouring concrete.
- .3 Mix and place grout.

END OF SECTION

Part 1 General

1.1 RELATED SECTION

- .1 Section 01 35 29 06 – Health and Safety Requirements: Submission Requirements for WHMIS MSDS.

1.2 REFERENCES

- .1 CGSB 1-GP-12c-latest edition, Standard Paint Colors.
- .2 CGSB 1-GP-48M-latest edition, Primer, Marine, for Steel.
- .3 CAN/CGSB-1.59-latest edition, Alkyd, Exterior Gloss Enamel.
- .4 CGSB 1-GP-61Ma-latest edition, Enamel, Alkyd, Marine, Exterior and Interior.
- .5 CGSB 1-GP-171M-latest edition, Coating, Inorganic Zinc.

Part 2 Products

2.1 MATERIALS

- .1 Paint:
 - .1 Primer: to CGSB 1-GP-48M, primer, marine for steel or galvanized steel where indicated.
 - .2 Enamel: to CGSB 1-GP-61Ma, enamel, alkyd, marine, exterior. If majority of paint application is to be by brushing, use paint to CAN/CGSB-1.59. Colors as indicated.

Part 3 Execution

3.1 PREPARATION

- .1 New metal surfaces.
 - .1 Clean surfaces of new metal to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with the following:
 - .1 Commercial blast cleaning: SSPC-SP-6 (Steel Structures Painting Council).
 - .2 Solvent cleaning: SSPC-SP-1.
 - .3 Hand tool cleaning: SSPC-SP-2.
 - .4 Power tool cleaning: SSPC-SP-3.
 - .5 Brush-off blast cleaning: SSPC-SP-7.

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- .2 Metal surfaces to be repainted.
 - .1 Clean surfaces by removing loose, cracked, brittle or non-adherent paint, rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with following:
 - .1 Commercial blast cleaning: SSPC-SP-6 (Steel Structures Painting Council).
 - .2 Solvent cleaning: SSPC-SP-1.
 - .3 Hand tool cleaning: SSPC-SP-2.
 - .4 Power tool cleaning: SSPC-SP-3.
 - .5 Brush-off blast cleaning: SSPC-SP-7.
 - .2 Commercial blast clean rusted and bare metal surfaces where existing paint system has failed.
 - .1 Brush-off blast clean remaining metal surfaces to be painted.
 - .2 Scrape edges of old paint back to sound material where remaining paint is thick and sound, feather exposed edges.
 - .3 Compressed air to be free of water and oil before reaching nozzle.
 - .4 Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes, by blowing with clean dry compressed air, or by vacuum cleaning.
 - .5 Do not apply paint until prepared surfaces have been accepted by Consultant.
 - .6 Prior to commencing paint application the degree of cleanliness of surfaces to be in accordance with SSPC-Vis1.
 - .7 Protection of surfaces.
 - .1 Protect surfaces not to be painted and if damaged, clean and restore such surfaces as directed by Consultant.
 - .2 Apply primer, paint, or pre-treatment as soon as possible after surface has been cleaned and before deterioration of surface occurs.
 - .3 Clean surfaces again if rusting occurs after completion of surface preparation.
 - .4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats of paint. Remove contaminants from surface and apply paint immediately.
 - .5 Protect cleaned and freshly painted surfaces from dust to approval of Consultant.
 - .8 Mixing paint.
 - .1 Do not dilute or thin paint for brush application; use as received from manufacturer.
 - .2 Mix ingredients in container before and during use and ensure breaking up of lumps, complete dispersion of settled pigment, and uniform composition.

- .3 Do not mix or keep paint in suspension by means of air bubbling through paint.
- .4 Thin paint for spraying according to manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Consultant.
- .9 Number of paint coats.
 - .1 New metal surfaces.
 - .1 Shop: Two primer coats to minimum dry film thickness of 35 microns per coat.
 - .2 Field: Two alkyd enamel, aluminum paint coats to minimum dry film thickness of 25 microns per coat.
 - .2 Repainting existing metal surfaces.
 - .1 One primer coat to minimum dry film thickness of 35 microns to all bare and commercial sand blasted areas.
 - .2 Two alkyd enamel coats to minimum dry film thickness of 25 microns per coat.

3.2 APPLICATION

- .1 Apply paint by spraying, brushing, or combination of both. Use sheepskins or daubers only when no other method is practical in places of difficult access.
- .2 Use dipping or roller coating method of application only when specifically authorized by Consultant in writing.
- .3 Caulk open seams at contact surfaces of built up members with material approved by Consultant, before second undercoat of primer is applied.
- .4 Where surface to be painted is not under cover, do not apply paint when:
 - .1 Air temperature is below 5C or when temperature is expected to drop to 0C before paint has dried.
 - .2 Temperature of surface is over 50C unless paint is specifically formulated for application at high temperatures.
 - .3 Fog or mist occurs at site; it is raining or snowing; there is danger of rain or snow; relative humidity is above 85%.
 - .4 Surface to be painted is wet, damp or frosted.
 - .5 Previous coat is not dry.
- .5 Provide cover when paint must be applied in damp or cold weather. Protect, shelter, or heat surface and surrounding air to comply with temperature and humidity conditions specified in 3.2.4. Protect until paint is dry or until weather conditions are suitable.
- .6 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
- .7 Apply each coat of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

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- .8 Brush application.
 - .1 Work paint into cracks, crevices and corners and paint surfaces not accessible to brushes by spray, daubers or sheepskins.
 - .2 Brush out runs and sags
 - .3 Remove runs, sags and brush marks from finished work and repaint.
 - .9 Spray application.
 - .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
 - .2 Provide traps or separators to remove oil and water from compressed air and drain periodically during operations.
 - .3 Keep paint ingredients properly mixed in spray pots or containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
 - .4 Apply paint in uniform layer, with overlapping at edges of spray pattern.
 - .5 Brush out immediately all runs and sags.
 - .6 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray. In areas not accessible to spray gun, use brushes, daubers or sheepskins.
 - .7 Remove runs, sags and brush marks from finished work and repaint.
 - .10 Shop painting.
 - .1 Do shop painting after fabrication and before any damage to surface occurs from weather or other exposure.
 - .2 Spray paint contact surfaces of field assembled, bolted, friction type joints with primer coat only. Do not brush primer after spraying.
 - .3 Do not paint metal surfaces which are to be embedded in concrete.
 - .4 Paint metal surfaces to be in contact with wood with either full paint coats specified or three shop coats of specified primer.
 - .5 Do not paint metal within 50mm of edge to be welded. Give unprotected steel one coat of boiled linseed oil or other approved protective coating after shop fabrication is completed.
 - .6 Remove weld spatter before painting. Remove weld slag and flux by methods as specified in paragraph 3.1.2 Metal Surfaces to be repainted.
 - .7 Protect machine finished or similar surfaces that are not to be painted but that do require protection, with coating of rust inhibitive petroleum, molybdenum disulfide, or other coating approved by Consultant.
 - .8 Copy previous erection marks and weight marks on areas that have been shop painted.
 - .11 Field painting.
 - .1 Paint steel structures as soon as practical after erection.
 - .2 Touch up metal which has been shop coated with same type of paint and to same thickness as shop coat. This touch-up to include cleaning and painting of field

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- connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas.
 - .3 Field paint surfaces (other than joint contact surfaces) which are accessible before erection but which are not to be accessible after erection.
 - .4 Do not apply final coat of paint until concrete work is completed, except as directed by Consultant. If concreting or other operations damage any paint, clean and repaint damaged area. Remove concrete spatter and droppings before paint is applied.
 - .5 Where painting does not meet with requirements of specifications and when so directed by Consultant remove all defective paint, thoroughly clean affected surfaces and repaint in accordance with these specifications.
- .12 Handling painted metal.
- .1 Do not handle painted metal until paint has dried, except for necessary handling for painting or stacking for drying.
 - .2 Scrape off and touch up paint which is damaged in handling, with same number of coats and kinds of paint as were previously applied to metal.

END OF SECTION

Part 1 General

1.1 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop drawings; submit drawings where indicated.
- .3 In addition to transmittal letter referred to in Section 01 33 00 - Submittal Procedures: use MCAC "Shop Drawing Submittal Title Sheet". Identify section and paragraph number.
- .4 Closeout Submittals:
 - .1 Performance data to include:
 - .1 Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.
 - .2 Equipment performance verification test results.
 - .3 Special performance data as specified.
 - .2 Site records:
 - .1 Consultant will provide 1 set of reproducible mechanical drawings. Provide sets of white prints as required for each phase of work. Mark changes as work progresses and as changes occur. Include changes to existing mechanical systems, control systems and low voltage control wiring.
 - .2 Use different colour waterproof ink for each service.
 - .3 Make available for reference purposes and inspection.
 - .3 As-built drawings:
 - .1 Prior to start of commissioning; finalize production of as-built drawings.
 - .2 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).
 - .3 Submit to Consultant for approval and make corrections as directed.
 - .4 Perform commissioning using as-built drawings.
 - .5 Submit completed reproducible as-built drawings.

1.2 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
- .2 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.3 MAINTENANCE

- .1 Furnish spare parts in accordance with Section 01 78 00 - Closeout Submittals as follows:
- .2 Provide one set of special tools required to service equipment as recommended by manufacturers and in accordance with Section 01 78 00 - Closeout Submittals.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Waste Management and Disposal:
 - .1 Construction/Demolition Waste Management and Disposal: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

Part 3 Execution

3.1 PAINTING REPAIRS AND RESTORATION

- .1 Prime and touch up marred finished paintwork to match original.
- .2 Restore to new condition, finishes which have been damaged.

3.2 CLEANING

- .1 Clean interior and exterior of all systems. Vacuum interior of ductwork and air handling units.

3.3 FIELD QUALITY CONTROL

- .1 Site Tests: conduct following tests in accordance with Section 01 45 00 - Quality Control and submit report as described in PART 1 - SUBMITTALS.

3.4 DEMONSTRATION

- .1 Consultant will use equipment and systems for test purposes prior to acceptance. Supply labour, material, and instruments required for testing.
- .2 Trial usage to apply to following equipment and systems:
 - .1 Dust collection.
- .3 Instruction duration time requirements as specified in appropriate sections.
- .4 Consultant will record these demonstrations on video tape for future reference.

3.5 PROTECTION

- .1 Protect equipment and systems' openings from dirt, dust, and other foreign materials with materials appropriate to system.

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 Section Includes:
 - .1 Electrical motors, drives and guards for mechanical equipment and systems.
 - .2 Supplier and installer responsibility indicated in Motor, Control and Equipment Schedule on electrical drawings and related mechanical responsibility is indicated on Mechanical Equipment Schedule on mechanical drawings.

1.2 REFERENCES

- .1 American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE)
 - .1 ASHRAE 90.1-01, Energy Standard for Buildings except Low-Rise Residential Buildings (IESNA cosponsored; ANSI approved; Continuous Maintenance Standard).
- .2 Electrical Equipment Manufacturers' Association Council (EEMAC)

1.3 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures. Include product characteristics, performance criteria, and limitations.
- .3 Quality Control: in accordance with Section 01 45 00 - Quality Control.
 - .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .2 Instructions: submit manufacturer's installation instructions.
- .4 Closeout Submittals
 - .1 Provide maintenance data for motors, drives and guards for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 QUALITY ASSURANCE

- .1 Regulatory Requirements: work to be performed in compliance with applicable Provincial regulations.
- .2 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Waste Management and Disposal:
 - .1 Construction/Demolition Waste Management and Disposal: separate waste materials for recycling in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 GENERAL

- .1 Motors: high efficiency, in accordance with local Hydro company standards and to ASHRAE 90.1.

2.2 MOTORS

- .1 Provide motors for mechanical equipment as specified.
- .2 Motors under 373 W: speed as indicated, continuous duty, built-in overload protection, resilient mount, single phase, 120 V, unless otherwise specified or indicated.
- .3 Motors 373 W and larger: EEMAC Class B, squirrel cage induction, speed as indicated, continuous duty, drip proof, ball bearing, maximum temperature rise 40°C, electrical data indicated on drawings.

2.3 BELT DRIVES

- .1 Fit reinforced belts in sheave matched to drive. Multiple belts to be matched sets.
- .2 Use cast iron or steel sheaves secured to shafts with removable keys unless otherwise indicated.

2.4 BELT DRIVES – (Cont'd)

- .3 For motors under 7.5 kW: standard adjustable pitch drive sheaves, having plus or minus 10% range. Use mid-position of range for specified r/min.
- .4 Correct size of sheave determined during commissioning.
- .5 Minimum drive rating: 1.5 times nameplate rating on motor. Keep overhung loads within manufacturer's design requirements on prime mover shafts.
- .6 Motor slide rail adjustment plates to allow for centre line adjustment.
- .7 Manufacturer to supply one set of spare belts for each set installed in accordance with Section 01 78 00 - Closeout Submittals.

2.4 DRIVE GUARDS

- .1 Provide guards for unprotected drives.
- .2 Guards for belt drives;
 - .1 Expanded metal screen welded to steel frame.
 - .2 Minimum 1.2 mm thick sheet metal tops and bottoms.
 - .3 38 mm dia. holes on both shaft centres for insertion of tachometer.
 - .4 Removable for servicing.
- .3 Provide means to permit lubrication and use of test instruments with guards in place.
- .4 Install belt guards to allow movement of motors for adjusting belt tension.
- .5 Unprotected fan inlets or outlets:
 - .1 Wire or expanded metal screen, galvanized, 19 mm mesh.
 - .2 Net free area of guard: not less than 80% of fan openings.
 - .3 Securely fasten in place.
 - .4 Removable for servicing.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 INSTALLATION

- .1 Fasten securely in place.
- .2 Make removable for servicing, easily returned into, and positively in position.

3.3 CLEANING

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes:

- .1 Hangers and supports for mechanical piping, ducting and equipment.

1.2 REFERENCES

.1 American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME)

- .1 ANSI/ASME B31.1-04, Power Piping.

.2 American Society for Testing and Materials International (ASTM)

- .1 ASTM A125-1996 (R2001), Specification for Steel Springs, Helical, Heat-Treated.
- .2 ASTM A307-04, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .3 ASTM A563-04a, Specification for Carbon and Alloy Steel Nuts.

.3 Factory Mutual (FM).

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

- .1 Material Safety Data Sheets (MSDS).

.5 Manufacturer's Standardization Society of the Valves and Fittings Industry (MSS)

- .1 MSS SP58-2002, Pipe Hangers and Supports - Materials, Design and Manufacture.
- .2 ANSI/MSS SP69-2003, Pipe Hangers and Supports - Selection and Application.
- .3 MSS SP89-2003, Pipe Hangers and Supports - Fabrication and Installation Practices.

.6 Sheet Metal and Air Conditioning Manufacturers National Association (SMACNA)

.7 Underwriter's Laboratories of Canada (ULC)

1.3 SYSTEM DESCRIPTION

.1 Design Requirements:

- .1 Construct pipe hanger and support to manufacturer's recommendations utilizing manufacturer's regular production components, parts and assemblies.
- .2 Base maximum load ratings on allowable stresses prescribed by MSS SP58.ASME B31.1.
- .3 Ensure that supports, guides, anchors do not transmit excessive quantities of heat to building structure.

- .4 Design hangers and supports to support systems under conditions of operation, allow free expansion and contraction, prevent excessive stresses from being introduced into pipework or connected equipment.
- .5 Provide for vertical adjustments after erection and during commissioning. Amount of adjustment in accordance with MSS SP58.

1.4 QUALITY ASSURANCE

- .1 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Waste Management and Disposal:
 - .1 Construction/Demolition Waste Management and Disposal: separate waste materials for recycling in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 GENERAL

- .1 Fabricate hangers, supports and sway braces in accordance with ANSI B31.1 and MSS SP58.
- .2 Use components for intended design purpose only. Do not use for rigging or erection purposes.
- .3 Minimize floor penetrations for supports. Floor penetrations are not permitted in buildings where in-floor heating is present.

2.2 EQUIPMENT SUPPORTS

- .1 Fabricate equipment supports not provided by equipment manufacturer from structural grade steel meeting requirements of Section 05 12 23 - Structural Steel for Buildings. Submit calculations with shop drawings.

2.3 EQUIPMENT ANCHOR BOLTS AND TEMPLATES

- .1 Provide templates to ensure accurate location of anchor bolts.

2.4 DUCTING SUPPORTS

- .1 Supports for ducting shall be present at every fitting. Support every vertical drop. Distance between supports shall not exceed 10ft.

2.5 OTHER EQUIPMENT SUPPORTS

- .1 Fabricate equipment supports from structural grade steel.
- .2 Submit structural calculations with shop drawings.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 INSTALLATION

- .1 Install in accordance with:
 - .1 Manufacturer's instructions and recommendations.
- .2 Vibration Control Devices:
 - .1 Install as indicated.

END OF SECTION

Part 1 General**1.1 SUMMARY**

- .1 TAB is used throughout this Section to describe the process, methods and requirements of testing, adjusting and balancing for HVAC.
- .2 TAB means to test, adjust and balance to perform in accordance with requirements of Contract Documents and to do other work as specified in this section.

1.2 QUALIFICATIONS OF TAB PERSONNEL

- .1 Submit names of personnel to perform TAB to Consultant within 30 days of award of contract.
- .2 Provide documentation confirming qualifications, successful experience.
- .3 TAB: performed in accordance with the requirements of standard under which TAB Firm's qualifications are approved:
 - .1 Canadian Associated Air Balance Council, (CAABC) National Standards for Total System Balance.
- .4 Recommendations and suggested practices contained in the TAB Standard: mandatory.
- .5 Use TAB Standard provisions, including checklists, and report forms to satisfy Contract requirements.
- .6 Use TAB Standard for TAB, including qualifications for TAB Firm and Specialist and calibration of TAB instruments.
- .7 Where instrument manufacturer calibration recommendations are more stringent than those listed in TAB Standard, use manufacturer's recommendations.

1.3 PURPOSE OF TAB

- .1 Test to verify proper and safe operation, determine actual point of performance, evaluate qualitative and quantitative performance of equipment, systems and controls at design, average and low loads using actual or simulated loads
- .2 Adjust and regulate equipment and systems to meet specified performance requirements and to achieve specified interaction with other related systems under normal and emergency loads and operating conditions.
- .3 Balance systems and equipment to regulate flow rates to match load requirements over full operating ranges.

1.4 EXCEPTIONS

- .1 TAB of systems and equipment regulated by codes, standards to satisfaction of authority having jurisdiction.

1.5 CO-ORDINATION

- .1 Schedule time required for TAB (including repairs, re-testing) into project construction and completion schedule to ensure completion before acceptance of project.
- .2 Do TAB of each system independently and subsequently, where interlocked with other systems, in unison with those systems.

1.6 PRE-TAB REVIEW

- .1 Review contract documents before project construction is started and confirm in writing to Consultant adequacy of provisions for TAB and other aspects of design and installation pertinent to success of TAB.
- .2 Review specified standards and report to Consultant in writing proposed procedures which vary from standard.
- .3 During construction, co-ordinate location and installation of TAB devices, equipment, accessories, measurement ports and fittings.

1.7 START-UP

- .1 Follow start-up procedures as recommended by equipment manufacturer unless specified otherwise.
- .2 Follow special start-up procedures as specified.

1.8 OPERATION OF SYSTEMS DURING TAB

- .1 Operate systems for length of time required for TAB and as required by Consultant for verification of TAB reports.

1.9 START OF TAB

- .1 Notify Consultant 7 days prior to start of TAB.
- .2 Start TAB when building is essentially completed, including:
 - .1 Installation of ceilings, doors, windows, other construction affecting TAB.
 - .2 Application of weather-stripping, sealing, and caulking.
 - .3 Pressure, leakage, other tests specified elsewhere Division 23.
 - .4 Provisions for TAB installed and operational.

- .3 Start-up, verification for proper, normal and safe operation of mechanical and associated electrical and control systems affecting TAB including but not limited to:
 - .1 Proper thermal overload protection in place for electrical equipment.
 - .2 Air systems:
 - .1 Filters in place, clean.
 - .2 Duct systems clean.
 - .3 Ducts, air shafts, ceiling plenums are airtight to within specified tolerances.
 - .4 Correct fan rotation.
 - .5 Fire, smoke, volume control dampers installed and open.
 - .6 Coil fins combed, clean.
 - .7 Access doors, installed, closed.
 - .8 Outlets installed, volume control dampers open.

1.10 APPLICATION TOLERANCES

- .1 Do TAB to following tolerances of design values:
 - .1 Air systems: plus 10%, minus 5 %.

1.11 ACCURACY TOLERANCES

- .1 Measured values accurate to within plus or minus 2% of actual values.

1.12 INSTRUMENTS

- .1 Prior to TAB, submit to Consultant list of instruments used together with serial numbers.
- .2 Calibrate in accordance with requirements of most stringent of referenced standard for either applicable system or HVAC system.
- .3 Calibrate within 3 months of TAB. Provide certificate of calibration to Consultant.

1.13 SUBMITTALS

- .1 Submit, prior to commencement of TAB:
 - .1 Proposed methodology and procedures for performing TAB if different from referenced standard.

1.14 TAB REPORT

- .1 TAB report to show results in to include:
 - .1 Project record drawings.
 - .2 System schematics.
- .2 Submit electronic copies of TAB Report to Consultant for verification and approval.

1.15 VERIFICATION

- .1 Reported results subject to verification by Consultant.
- .2 Provide personnel and instrumentation to verify reported results.
- .3 Number and location of verified results as directed by Consultant.
- .4 Pay costs to repeat TAB as required to satisfaction of Consultant.

1.16 SETTINGS

- .1 After TAB is completed to satisfaction of Consultant, replace drive guards, close access doors, lock devices in set positions, and ensure sensors are at required settings.
- .2 Permanently mark settings to allow restoration at any time during life of facility. Do not eradicate or cover markings.

1.17 COMPLETION OF TAB

- .1 TAB considered complete when final TAB Report received and approved by Consultant.

1.18 AIR SYSTEMS

- .1 Do TAB of systems, equipment, components and controls specified in Division 23.
- .2 Qualifications: personnel performing TAB current member in good standing of CAABC.
- .3 Quality assurance: perform TAB under direction of supervisor qualified by CAABC.
- .4 Measurements: to include as appropriate for systems, equipment, components, controls: air velocity, static pressure, flow rate, pressure drop (or loss), temperatures (dry bulb, wet bulb, dewpoint), duct cross-sectional area, RPM, electrical power, voltage, noise, vibration.
- .5 Locations of equipment measurements: to include as appropriate:
 - .1 Inlet and outlet of blast gates, filter, coil, fan, other equipment causing changes in conditions.
 - .2 At controllers, controlled device.
- .6 Locations of systems measurements to include as appropriate: main ducts, main branch, sub-branch, run-outs to equipment.

1.19 OTHER TAB REQUIREMENTS

- .1 General requirements applicable to work specified this paragraph:
 - .1 Qualifications of TAB personnel: as for air systems specified this section.
 - .2 Quality assurance: as for air systems specified this section.
- .2 Building pressure conditions:
 - .1 Adjust systems, equipment, controls to ensure specified pressure conditions at all times.
- .3 Measurement of noise and vibration from equipment specified in Division 23.

Part 2 Products**2.1 NOT USED**

- .1 Not used.

Part 3 Execution**3.1 NOT USED**

- .1 Not used.

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 Section Includes:
 - .1 Materials and installation of high-pressure metallic ductwork, joints and accessories.
- .2 Related Sections:
 - .1 Section 01 33 00 - Submittal Procedures.
 - .2 Section 01 35 29.06 - Health and Safety Requirements.
 - .3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .4 Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment.
 - .5 Section 23 05 94 - Pressure Testing of Ducted Air Systems.

1.2 REFERENCES

- .1 American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE).
- .2 American Society for Testing and Materials (ASTM).
 - .1 ASTM A653/A653M-latest edition, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process. (Metric).
- .3 Department of Justice Canada (Jus).
 - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
 - .2 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).
- .5 Sheet Metal Air Conditioning Contractors' National Association (SMACNA).
 - .1 SMACNA HVAC Duct Construction Standards, Metal and Flexible, latest edition.
 - .2 SMACNA HVAC Air Duct Leakage Test Manual, latest edition.
 - .3 SMACNA IAQ Guideline for Occupied Buildings under Construction, latest edition.

1.3 SUBMITTALS

- .1 Submit shop drawings and product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Co-ordinate submittal requirements and provide submittals required by Section 01 47 15 - Sustainable Requirements: Construction.
- .3 Submit Indoor Air Quality (IAR) Management Plan in accordance with Section 01 47 15 - Sustainable Requirements – Construction.

1.4 QUALITY ASSURANCE

- .1 Certification of Ratings:
 - .1 Catalogue or published ratings to be those obtained from tests carried out by manufacturer or independent testing agency signifying adherence to codes and standards.
- .2 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Protect on site stored or installed absorptive material from moisture damage.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
 - .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material for recycling in accordance with Waste Management Plan.
 - .4 Place materials defined as hazardous or toxic in designated containers.
 - .5 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
 - .6 Ensure emptied containers are sealed and stored safely.
 - .7 Fold up metal and plastic banding, flatten and place in designated area for recycling.

1.6 INDOOR AIR QUALITY (IAQ) MANAGEMENT PLAN

- .1 During construction meet or exceed the requirements of SMACNA IAQ Guideline for Occupied Buildings under Construction.

Part 2 Products**2.1 DUCTWORK**

- .1 Material:
 - .1 Galvanized steel with Z90 designation zinc coating lock forming quality: to ASTM A653/A653M.
 - .2 Thickness: to SMACNA.
- .2 Construction – round.
 - .1 Ducts: SMACNA Class 3 duct, class A seal; smooth interior for material transport.
 - .2 Fittings:
 - .1 Elbows: smooth radius or minimum five -piece (for 90 degrees), three-piece (for 45 degrees). Centreline radius: 2 x diameter.
 - .2 Branches: conical transition with conical branch at 30 degrees and 60 degrees elbow.
 - .3 Acceptable Materials:
 - .1 NORD FAB.
 - .2 K-B Duct.

2.2 HANGERS AND SUPPORTS

- .1 Hangers and Supports: in accordance with Section 23 05 29 - Hangers and Supports for HVAC Piping Equipment.
 - .1 Band hangers: of same material as duct but next sheet metal thickness heavier than duct.
 - .2 Upper hanger attachments: no drilling or welding of structural members to be permitted.
 - .1 For concrete: manufactured concrete inserts.
 - .2 For steel joist: manufactured joist clamp or steel plate washer.
 - .3 For steel beams: manufactured beam clamps:

Part 3 Execution

3.1 GENERAL

- .1 Do work in accordance with ASHRAE and SMACNA and as indicated on the drawings.
- .2 Do not break continuity of insulation vapour barrier with hangers or rods.

3.2 HANGERS

- .1 Band hangers: install in accordance with SMACNA.
- .2 Hanger spacing: in accordance with ASHRAE, SMACNA and as indicated on the drawings.

3.3 SEALING AND TAPING

- .1 Apply sealant in accordance with SMACNA and to manufacturer's recommendations.

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 Section Includes:
 - .1 Materials and installation for duct accessories including flexible ductwork, access doors, blast gates and system bonding.
- .2 Related Sections:
 - .1 Section 01 32 16.07 - Construction Progress Schedules - Bar (GANNT) Chart.
 - .2 Section 01 33 00 - Submittal Procedures.
 - .3 Section 01 35 29.06 - Health and Safety Requirements.
 - .4 Section 01 45 00 - Quality Control.
 - .5 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .6 Section 01 78 00 - Closeout Submittals.

1.2 REFERENCES

- .1 National Fire Protection Association (NFPA).
 - .1 NFPA 77: Recommended Practice on Static Electricity
- .2 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).
 - .1 SMACNA - HVAC Duct Construction Standards - Metal and Flexible, latest edition.

1.3 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet. Indicate the following:
 - .1 Flexible ducting.
 - .2 Duct access doors.
 - .3 Blast Gates
- .3 Test Reports: submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.
 - .1 Certification of ratings: catalogue or published ratings to be those obtained from tests carried out by manufacturer or independent testing agency signifying adherence to codes and standards.
- .4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

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- .5 Instructions: submit manufacturer's installation instructions.
 - .6 Manufacturer's Field Reports: manufacturer's field reports specified.
 - .7 Closeout submittals: submit maintenance and consulting data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.4 QUALITY ASSURANCE

- .1 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Waste Management and Disposal:
 - .1 Separate waste materials for recycling in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.
 - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
 - .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material for recycling in accordance with Waste Management Plan (WMP).
 - .4 Separate for recycling and place in designated containers Metal and Plastic waste in accordance with Waste Management Plan (WMP).
 - .5 Divert unused metal materials from landfill to metal recycling facility as approved by Consultant.

Part 2 Products**2.1 GENERAL**

- .1 Manufacture in accordance with SMACNA - HVAC Duct Construction Standards.

2.2 FLEXIBLE DUCTING

- .1 Industrial grade, bonded hose.
- .2 Wire ring enforced.
- .3 Smooth interior for material transport.
- .4 Bonding as indicated on drawings.
- .5 Standard of acceptance:
 - .1 NORD FAB.
 - .2 K-B Duct.

2.3 ACCESS DOORS IN DUCTS

- .1 Sandwich construction of same material as duct, one sheet metal thickness heavier.
- .2 Gaskets: neoprene.
- .3 Hardware:
 - .1 Continuous hinge and two adjustable draw latches.
 - .2 Hinge at bottom.
- .4 As indicated on drawings.
- .5 Factory fabricated is acceptable. Submit shop drawings in accordance with section 01 33 00 – Submittal Procedures.
- .6 Standard of acceptance:
 - .1 NORD FAB.
 - .2 K-B Duct.

2.4 BLAST GATES

- .1 Factory built.
- .2 Full collar of cast aluminum or steel, with galvanized steel slide, set screw and integral locking device.
- .3 Provide one blast gate for each item of equipment connected to the central dust collection system and as indicated.
- .4 Following system balancing, mark position with permanent markers and tighten in place.
- .5 Standard of acceptance:
 - .1 NORD FAB.
 - .2 K-B Duct.

2.5 SYSTEM BONDING

- .1 Reference NFPA 77: Recommended Practice on Static Electricity.
- .2 Entire system shall be electrically bonded for static dissipation.
- .3 All bonding wire shall be #6AWG bare copper or with green insulation.
- .4 See drawings for specific instructions for bonding individual system elements.

Part 3 Execution**3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.2 INSTALLATION

- .1 Flexible Ducting:
 - .1 Install in following locations:
 - .1 As indicated.
 - .2 Install in accordance with recommendations of SMACNA.
 - .3 When system is operating:
 - .1 Ducting on sides of flexible ducting to be in alignment where possible.
 - .2 Ensure slack material in flexible ducting.
 - .2 Access Doors:
 - .1 Size:
 - .1 As indicated.
 - .2 Locations:
 - .1 To facilitate cleaning of ductwork.
 - .2 As indicated.
 - .3 Instrument Test Ports:
 - .1 General:
 - .1 Install in accordance with recommendations of SMACNA and in accordance with manufacturer's instructions.
 - .2 Locate to permit easy manipulation of instruments.
 - .3 Locations:
 - .1 For traverse readings:
 - .1 Main and sub-main ducts.
 - .2 And as indicated.

3.3 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
 - .1 Have manufacturer of products, supplied under this Section, review Work involved in the handling, installation/application, protection and cleaning, of its products and submit written reports, in acceptable format, to verify compliance of Work with Contract.
 - .2 Manufacturer's Field Services: provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
 - .3 Schedule site visits, to review Work, at stages listed:
 - .1 After delivery and storage of products, and when preparatory Work, or other Work, on which the Work of this Section depends, is complete but before installation begins.
 - .2 Upon completion of the Work, after cleaning is carried out.
 - .4 Obtain reports, within 3 days of review and submit, immediately to Consultant.

3.4 CLEANING

- .1 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1**General****1.1 SECTION INCLUDES**

- .1 Industrial exhaust fans.
- .2 Ductwork and duct fittings.
- .3 Inlet fittings.
- .4 Dust elimination and collection devices.
- .5 Accessories.

1.2 RELATED SECTIONS

- .1 Section 01 10 13 - Summary of Work: Owner provided dust collection inlet fittings.
- .2 Section 23 05 13 - Motors: Fan motors.

1.3 REFERENCES

- .1 ACGIH - Industrial Ventilation, A Manual of Recommended Practice.
- .2 AMCA 99 - Standards Handbook.
- .3 AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
- .4 AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
- .5 AMCA 301 - Method of Calculating Fan Sound Ratings from Laboratory Test Data.
- .6 ASTM A90/A90M - Weight (Mass) of Coating on Iron and Sheet Articles with Zinc or Zinc-Alloy Coatings.
- .7 ASTM A167 - Stainless and Heat-resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .8 ASTM A653/A653M - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .9 ASTM A1011/A1011M - Standard Specification for Steel, Sheet, and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- .10 AWS D9.1 - Sheet Metal Welding Code.
- .11 NBS PS 15 - Voluntary Product Standard for Custom Contact-Moulded Reinforced-Polyester Chemical-Resistant Process Equipment.

1.3 REFERENCES – (Cont'd)

- .1 NFPA 91 - Exhaust Systems for Air Conveying or Vapours, Gases, Mists, and Non-combustible Particulate Solids.
- .2 NFPA 68 – Explosion Protection by Deflagration Venting.
- .3 NFPA 77 – Static Electricity.
- .4 NFPA 664 – Fires and Explosions in Wood Processing and Wood Working Facilities.
- .5 SMACNA - HVAC Duct Construction Standards - Metal and Flexible.
- .6 SMACNA - Round Industrial Duct Construction Standard.
- .7 SMACNA - Rectangular Industrial Duct Construction Standard.
- .8 UL 181 - Factory-Made Air Ducts and Air Connectors.
- .9 UL 214 - Test for Flame Propagation of Fabrics and Films.

1.4 EXTRA MATERIALS

- .1 Section 01 78 10: Submittals for project closeout.

Part 2 Products**2.1 SYSTEMS MANUFACTURERS**

- .1 Manufacturers: as indicated on the drawings.
 - .1 Substitutions: to be approved by the Engineer.

2.2 CENTRIFUGAL FANS

- .1 Accessories
 - .1 Inlet/Outlet Screens: Galvanized steel welded grid.

2.3 DUCT WORK AND DUCT ACCESSORIES

- .1 Section 23 33 00 Air Duct Accessories:
 - .2 Section 23 31 13 02 Metal Ducts – High Pressure.

2.4 INLET FITTINGS

- .1 Fabricate to withstand reduced deflagration pressure (2 psi).
- .2 Fabricate inlet as indicated on drawings.
- .3 Fabricate with hemmed edges, closed corners, and reinforced for span and attachment; with duct connection; prime coated.
- .4 As indicated.

Part 3 Execution**3.1 FIELD MEASUREMENTS**

- .1 Verify that field measurements are as indicated on shop drawings.

3.2 INSTALLATION

- .1 Install equipment to manufacturers written instructions.
- .2 Install to NFPA 91 and Round Industrial Duct Construction Standard and ACGIH Industrial Ventilation Manual except as indicated.
- .3 Do not operate fans for any purpose until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.
- .4 Install fans with resilient mountings and flexible electrical leads. Refer to Section 23 05 48.
- .5 Install dust collector flat and level on concrete foundation.
- .6 Dust collector will be subject to the environmental conditions expected in Nova Scotia including wind loads in excess of 75 MPH and deflagration loads. Securely fasten dust collector to concrete foundation.
- .7 Provide pitot to be opening where indicated for testing of system with plastic cap to ensure against air leakage.
- .8 Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA C22.1-09, Canadian Electrical Code, Part 1 (21st Edition), Safety Standard for Electrical Installations.

1.2 DEFINITIONS

- .1 Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined by IEEE SP1122.

1.3 DESIGN REQUIREMENTS

- .1 Operating voltages: to CAN3-C235.
- .2 Motors, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.
 - .1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.
- .3 Language operating requirements: provide identification nameplates and labels for control items in English.

1.4 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop drawings:
 - .1 Submit wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, shunt trip breakers, control panels, accessories, piping, ductwork, and other items that must be shown to ensure co-ordinated installation.
 - .2 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each item of equipment.
 - .3 Indicate of drawings clearances for operation, maintenance, and replacement of operating equipment devices.
 - .4 If changes are required, notify Consultant of these changes before they are made.
- .3 Quality Control: in accordance with Section 01 45 00 - Quality Control.
 - .1 Provide CSA certified equipment and material.
 - .2 Submit test results of installed electrical systems and instrumentation.
 - .3 Permits and fees: in accordance with General Conditions of contract.

1.5 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
- .2 Qualifications: electrical Work to be carried out by qualified, licensed electricians or apprentices in accordance as per the conditions of Provincial Act respecting manpower vocational training and qualification.
 - .1 Employees registered in provincial apprentices program: permitted, under direct supervision of qualified licensed electrician, to perform specific tasks.
 - .2 Permitted activities: determined based on training level attained and demonstration of ability to perform specific duties.
- .3 Site Meetings:
 - .1 In accordance with Section 01 32 16 - Construction Progress Schedule.
- .4 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Construction/Demolition Waste Management and Disposal: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.7 SYSTEM STARTUP

- .1 Instruct operating personnel in operation, care and maintenance of systems, system equipment and components.
- .2 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with aspects of its care and operation.

1.8 OPERATING INSTRUCTIONS

- .1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.
- .2 Operating instructions to include following:
 - .1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
 - .2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.
 - .3 Safety precautions.
 - .4 Procedures to be followed in event of equipment failure.
 - .5 Other items of instruction as recommended by manufacturer of each system or item of equipment.
 - .6 Post instructions where directed.

- .7 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.
- .8 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

Part 2 Products

2.1 MATERIALS AND EQUIPMENT

- .1 Provide material and equipment in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Material and equipment to be CSA certified.
- .3 Factory-assemble control panels and component assemblies.

2.2 ELECTRIC MOTORS, EQUIPMENT AND CONTROLS

- .1 Verify installation and co-ordination responsibilities related to motors, equipment and controls, as indicated.

2.3 WARNING SIGNS

- .1 Warning Signs: in accordance with requirements of authority having jurisdiction, Consultant.
- .2 Decal signs, minimum size 175 x 250 mm.

2.4 WIRING TERMINATIONS

- .1 Ensure lugs, terminals, screws used for termination of wiring are suitable for copper or conductors.

2.5 WIRING IDENTIFICATION

- .1 Identify wiring with permanent indelible identifying markings, numbered on both ends of phase conductors of feeders and branch circuit wiring.
- .2 Maintain phase sequence and colour coding throughout.
- .3 Colour coding: to CSA C22.1.
- .4 Use colour coded wires in communication cables, matched throughout system.

2.6 CONDUIT AND CABLE IDENTIFICATION

- .1 Colour code conduits, boxes and metallic sheathed cables.
- .2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15 m intervals.
- .3 Colours: 25 mm wide prime colour and 20 mm wide auxiliary colour.

	Prime	Auxiliary
up to 250 V	Yellow	
up to 600 V	Yellow	Green
Phase (A)	Red	
Phase (B)	Black	
Phase (C)	Blue	

Part 3 Execution

3.1 INSTALLATION

- .1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.

3.2 NAMEPLATES AND LABELS

- .1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.3 CONDUIT AND CABLE INSTALLATION

- .1 If plastic sleeves are used in fire rated walls or floors, remove before conduit installation.
- .2 Install cables, conduits and fittings, close to building structure so furring (if required) can be kept to minimum.

3.4 LOCATION OF OUTLETS

- .1 Locate outlets in accordance with Section 26 05 32 - Outlet Boxes, Conduit Boxes and Fittings.
- .2 Do not install outlets back-to-back in wall; allow minimum 150 mm horizontal clearance between boxes.
- .3 Change location of outlets at no extra cost or credit, providing distance does not exceed 3000 mm, and information is given before installation.

3.5 MOUNTING HEIGHTS

- .1 Mounting height of equipment is from finished floor to centreline of equipment unless specified or indicated otherwise.
- .2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.
- .3 Install electrical equipment at heights indicated on the drawings and to meet barrier-free requirements.

3.6 CO-ORDINATION OF PROTECTIVE DEVICES

- .1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.

3.7 CLEANING

- .1 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Materials and installation for wire and box connectors.

1.2 RELATED SECTIONS

- .1 Section 01 74 19 - Construction/Demolition Waste Management And Disposal.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-C22.2No.18-98, Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware.
 - .2 CSA C22.2No.65-93 (R1999), Wire Connectors.
- .2 Electrical and Electronic Manufacturers' Association of Canada (EEMAC)
 - .1 EEMAC 1Y-2, 1961 Bushing Stud Connectors and Aluminum Adapters (1200 Ampere Maximum Rating).
- .3 National Electrical Manufacturers Association (NEMA)

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Divert unused wiring materials from landfill to metal recycling facility as approved by Consultant.

Part 2 Products

2.1 MATERIALS

- .1 Pressure type wire connectors to: CSA C22.2No.65, with current carrying parts of copper sized to fit copper conductors as required.
- .2 Fixture type splicing connectors to: CSA C22.2No.65, with current carrying parts of copper sized to fit copper conductors 10 AWG or less.
- .3 Bushing stud connectors: to EEMAC 1Y-2, NEMA to consist of:
 - .1 Connector body and stud clamp for stranded copper conductors.
 - .2 Clamp for stranded copper conductors.
 - .3 Stud clamp bolts.
- .4 Clamps or connectors for armoured cable, aluminum sheathed cable, flexible conduit as required to: CAN/CSA-C22.2No.18.

Part 3 Execution

3.1 INSTALLATION

- .1 Remove insulation carefully from ends of conductors and:
 - .1 Apply coat of zinc joint compound on aluminum conductors prior to installation of connectors.
 - .2 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CSA C22.2No.65.
 - .3 Install fixture type connectors and tighten. Replace insulating cap.
 - .4 Install bushing stud connectors in accordance with EEMAC 1Y-2, NEMA.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 26 05 20 - Wire and Box Connectors - 0 - 1000 V.

1.2 REFERENCES

- .1 CSA C22.2 No .0.3-96, Test Methods for Electrical Wires and Cables.

1.3 PRODUCT DATA

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal, and with the Waste Reduction Workplan.
- .2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.
- .3 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 BUILDING WIRES

- .1 Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG.
- .2 Copper conductors: size as indicated, with 600V insulation of chemically cross-linked thermosetting polyethylene material rated RW90.

2.2 TECK CABLE

- .1 Cable: to CAN/CSA-C22.2 No. 131.
- .2 Conductors:
 - .1 Grounding conductor: copper.
 - .2 Circuit conductors: copper, size as indicated.
- .3 Insulation:
 - .1 Type: ethylene propylene rubber.
 - .2 Chemically cross-linked thermosetting polyethylene rated type RW90, 1000V.
- .4 Inner jacket: polyvinyl chloride material.
- .5 Armour: interlocking aluminum.
- .6 Overall covering: thermoplastic [polyvinyl chloride] material.

- .7 Fastenings:
- .1 One-hole malleable iron steel straps to secure surface cables 50 mm and smaller.
Two hole steel straps for cables larger than 50 mm.

- .8 Connectors:
- .1 Watertight, approved for TECK cable.

2.3 ARMOURED CABLES

- .1 Conductors: insulated, copper, size as indicated.
- .2 Type: AC90- lead sheath over cable assembly and under armour.
- .3 Armour: interlocking type fabricated from galvanized steel.

Part 3 Execution

3.1 INSTALLATION OF BUILDING WIRES

- .1 Install wiring as follows:
 - .1 In conduit systems in accordance with Section 26 05 34.

3.2 INSTALLATION OF TECK CABLE 0 -1000 V

- .1 Install cables.
 - .1 Group cables wherever possible on channels.
- .2 Terminate cables in accordance with Section 26 05 20- Wire and Box Connectors - 0 - 1000 V.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Materials and installation for connectors and terminations.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 19 - Construction/Demolition Waste Management And Disposal.
- .3 Section 26 05 33 - Raceway and Boxes for Electrical Systems.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA C22.2 No.41-M1987 (R1999), Grounding and Bonding Equipment.

1.4 PRODUCT DATA

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Consultant.

Part 2 Products

2.1 CONNECTORS AND TERMINATIONS

- .1 Copper compression connectors to CSA C22.2No., as required, sized for conductors.

Part 3 Execution

3.1 INSTALLATION

- .1 Install terminations and splices in accordance with manufacturer's instructions.
- .2 Bond and ground as required.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 74 19 - Construction/Demolition Waste Management And Disposal.

1.2 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.
- .2 Divert unused metal materials from landfill to metal recycling facility as approved by Consultant.
- .3 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 SUPPORT CHANNELS

- .1 U shape, size 41 x 41 mm, 2.5 mm thick, surface mounted.

Part 3 Execution

3.1 INSTALLATION

- .1 Secure equipment to hollow or solid masonry, tile and plaster surfaces with nylon shields.
- .2 Secure equipment to poured concrete with expandable inserts.
- .3 Secure equipment to hollow masonry walls or suspended ceilings with toggle bolts.
- .4 Secure surface mounted equipment with twist clip fasteners to inverted T bar ceilings. Ensure that T bars are adequately supported to carry weight of equipment specified before installation.
- .5 Support equipment, conduit or cables using clips, spring loaded bolts, cable clamps designed as accessories to basic channel members.
- .6 Fasten exposed conduit or cables to building construction or support system using straps.
 - .1 One-hole malleable iron steel straps to secure surface conduits and cables 50 mm and smaller.
 - .2 Two-hole steel straps for conduits and cables larger than 50 mm.
 - .3 Beam clamps to secure conduit to exposed steel work.

- .7 Suspended support systems.
 - .1 Support individual cable or conduit runs with 6 mm dia. threaded rods and spring clips.
 - .2 Support 2 or more cables or conduits on channels supported by 6 mm dia. threaded rod hangers where direct fastening to building construction is impractical.
- .8 For surface mounting of two or more conduits use channels at 3m on centre spacing.
- .9 Provide metal brackets, frames, hangers, clamps and related types of support structures where indicated or as required to support conduit and cable runs.
- .10 Ensure adequate support for raceways and cables dropped vertically to equipment where there is no wall support.
- .11 Do not use wire lashing or perforated strap to support or secure raceways or cables.
- .12 Do not use supports or equipment installed for other trades for conduit or cable support except with permission of other trade and approval of Consultant.
- .13 Install fastenings and supports as required for each type of equipment cables and conduits, and in accordance with manufacturer's installation recommendations.

END OF SECTION

Part 1 General

1.1 SHOP DRAWINGS AND PRODUCT DATA

- .1 Submit shop drawings and product data for cabinets in accordance with Section 01 33 00 - Submittal Procedure.

1.2 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal, and with the Waste Reduction Workplan.
- .2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.
- .3 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 SPLITTERS

- .1 Sheet metal enclosure, welded corners and formed hinged cover suitable for locking in closed position.
- .2 Main and branch lugs to match required size and number of incoming and outgoing conductors as indicated.
- .3 At least three spare terminals on each set of lugs in splitters less than 400 A.

2.2 JUNCTION AND PULL BOXES

- .1 Welded steel construction with screw-on flat covers for surface mounting.
- .2 Covers with 25 mm minimum extension all around, for flush-mounted pull and junction boxes.

2.3 CABINETS

- .1 Type E: sheet steel, hinged door and return flange overlapping sides, handle, lock and catch, for surface mounting.

Part 3 Execution

3.1 SPLITTER INSTALLATION

- .1 Install splitters and mount plumb, true and square to the building lines.
- .2 Extend splitters full length of equipment arrangement except where indicated otherwise.

3.2 JUNCTION, PULL BOXES AND CABINETS INSTALLATION

- .1 Install pull boxes in inconspicuous but accessible locations.
- .2 Mount cabinets with top not higher than 2 m above finished floor.
- .3 Install pull boxes so as not to exceed 30 m of conduit run between pull boxes.

3.3 IDENTIFICATION

- .1 Provide equipment identification in accordance with Section 26 05 01 - Common Work Results - Electrical.
- .2 Install size 2 identification labels indicating system name, voltage and phase.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 CSA C22.1-2009, Canadian Electrical Code, Part 1.

1.2 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/ Demolition Waste Management and Disposal, and with the Waste Reduction Workplan.
- .2 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

Part 2 Products

2.1 OUTLET AND CONDUIT BOXES GENERAL

- .1 Size boxes in accordance with CSA C22.1.
- .2 102 mm square or larger outlet boxes as required for special devices.
- .3 Gang boxes where wiring devices are grouped.
- .4 Blank cover plates for boxes without wiring devices.
- .5 Combination boxes with barriers where outlets for more than one system are grouped.

2.2 SHEET STEEL OUTLET BOXES

- .1 Electro-galvanized steel single and multi-gang flush device boxes for flush installation, minimum size 76 x 50 x 38 mm or as indicated. 102 mm square outlet boxes when more than one conduit enters one side with extension and plaster rings as required.
- .2 Electro-galvanized steel utility boxes for outlets connected to surface-mounted EMT conduit, minimum size 102 x 54 x 48 mm.
- .3 102 mm square outlet boxes with extension and plaster rings for flush mounting devices in finished walls.

2.3 CONDUIT BOXES

- .1 Cast FS or FD ferrous alloy boxes with factory-threaded hubs and mounting feet for surface wiring of receptacle.

2.4 FITTINGS - GENERAL

- .1 Bushing and connectors with nylon insulated throats.
- .2 Knock-out fillers to prevent entry of debris.
- .3 Conduit outlet bodies for conduit up to 32 mm and pull boxes for larger conduits.
- .4 Double locknuts and insulated bushings on sheet metal boxes.

Part 3 Execution

3.1 INSTALLATION

- .1 Support boxes independently of connecting conduits.
- .2 Fill boxes with paper, sponges or foam or similar approved material to prevent entry of debris during construction. Remove upon completion of work.
- .3 For flush installations mount outlets flush with finished wall using plaster rings to permit wall finish to come within 6 mm of opening.
- .4 Provide correct size of openings in boxes for conduit and armoured cable connections. Reducing washers are not allowed.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CAN/CSA C22.2 No. 18-latest edition, Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware, A National Standard of Canada.
 - .2 CSA C22.2 No. 45-latest edition, Rigid Metal Conduit.
 - .3 CSA C22.2 No. latest edition, Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
 - .4 CSA C22.2 No. 83-latest edition, Electrical Metallic Tubing.
 - .5 CSA C22.2 No. 211.2-latest edition, Rigid PVC (Unplasticized) Conduit.
 - .6 CAN/CSA C22.2 No. 227.3-latest edition, Non-metallic Mechanical Protection Tubing (NMPT), A National Standard of Canada (February 2006).

1.2 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product data: submit manufacturer's printed product literature, specifications and datasheets.
 - .1 Submit cable manufacturing data.
- .3 Quality assurance submittals:
 - .1 Test reports: submit certified test reports.
 - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .3 Instructions: submit manufacturer's installation instructions.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/ Demolition Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.

Part 2 Products

2.1 CABLES AND REELS

- .1 Provide cables on reels or coils.
 - .1 Mark or tag each cable and outside of each reel or coil, to indicate cable length, voltage rating, conductor size, and manufacturer's lot number and reel number.
- .2 Each coil or reel of cable to contain only one continuous cable without splices.

2.2 CONDUITS

- .1 Rigid metal conduit: to CSA C22.2 No. 45, galvanized steel, threaded.
- .2 Electrical metallic tubing (EMT): to CSA C22.2 No. 83, with couplings ends.
- .3 Rigid PVC conduit: to CSA C22.2 No. 211.2.
- .4 Flexible metal conduit: to CSA C22.2 No. 56, steel, liquid-tight flexible metal.

2.3 CONDUIT FASTENINGS

- .1 One hole malleable iron, steel straps to secure surface conduits 50 mm and smaller.
 - .1 Two hole steel straps for conduits larger than 50 mm.
- .2 Beam clamps to secure conduits to exposed steel work.
- .3 Channel type supports for two or more conduits at 3 m on centre.

2.4 CONDUIT FITTINGS

- .1 Fittings: to CAN/CSA C22.2 No. 18, manufactured for use with conduit specified.
Coating: same as conduit.
- .2 Ensure factory "ells" where 90 degrees bends for 25 mm and larger conduits.
- .3 Watertight connectors and couplings for EMT.
 - .1 Set-screws are not acceptable.

2.5 EXPANSION FITTINGS FOR RIGID CONDUIT

- .1 Weatherproof expansion fittings with internal bonding assembly suitable for 100 mm linear expansion.
- .2 Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19 mm deflection.
- .3 Weatherproof expansion fittings for linear expansion at entry to panel.

2.6 FISH CORD

- .1 Polypropylene.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

- .1 Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.
- .2 Conceal conduits except in unfinished areas.
- .3 Surface-mount conduits except in finished areas with accessible ceiling spaces.
- .4 Use electrical metallic tubing (EMT), above 2.4 m not subject to mechanical injury.
- .5 Use rigid PVC conduit underground.
- .6 Use liquid tight flexible metal conduit for connection to motors or vibrating equipment.
- .7 Minimum conduit size for lighting and power circuits: 19 mm.
- .8 Bend conduit cold:
 - .1 Replace conduit if kinked or flattened more than 1/10th of its original diameter.
- .9 Mechanically bend steel conduit over 19 mm diameter.
- .10 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.
- .11 Install fish cord in empty conduits.

- .12 Remove and replace blocked conduit sections.
 - .1 Do not use liquids to clean out conduits.

- .13 Dry conduits out before installing wire.

3.3 SURFACE CONDUITS

- .1 Run parallel or perpendicular to building lines.
- .2 Run conduits in flanged portion of structural steel.
- .3 Group conduits wherever possible on surface channels.
- .4 Do not pass conduits through structural members except as indicated.
- .5 Do not locate conduits less than 75 mm parallel to steam or hot water lines with minimum of 25 mm at crossovers.

3.4 CONCEALED CONDUITS

- .1 Run parallel or perpendicular to building lines.
- .2 Do not install horizontal runs in masonry walls.
- .3 Do not install conduits in terrazzo or concrete toppings.

3.5 CLEANING

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Materials and installation for fused disconnect switches.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 35 29.06 - Health and Safety Requirements.
- .3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .4 Section 26 05 01 - Common Work Results - Electrical.
- .5 Section 26 28 13.01 - Fuses - Low Voltage.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA International).
 - .1 CAN/CSA C22.2 No.4- latest edition, Enclosed Switches.
 - .2 CSA C22.2 No.39-latest edition, Fuse holder Assemblies.

1.4 SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.

1.5 HEALTH AND SAFETY

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material for recycling in accordance with Waste Management Plan.
- .4 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 DISCONNECT SWITCHES

- .1 Fusible, horsepower rated disconnect switch in CSA Enclosure 1, to CAN/CSA C22.2 No.4 size as indicated.
- .2 Provision for padlocking in off switch position by three locks.
- .3 Mechanically interlocked door to prevent opening when handle in ON position.
- .4 Fuses: size as indicated, in accordance with Section 26 28 23.01 - Fuses - Low Voltage.
- .5 Fuse holders: to CSA C22.2 No.39 Relocateable and suitable without adaptors, for type and size of fuse indicated.
- .6 Quick-make, quick-break action.
- .7 ON-OFF switch position indication on switch enclosure cover.

2.2 EQUIPMENT IDENTIFICATION

- .1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results – Electrical.
- .2 Indicate name of load controlled on Size 4 nameplate.

Part 3 Execution

3.1 INSTALLATION

- .1 Install disconnect switches complete with fuses if applicable.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM A 53-latest edition, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
- .2 ASTM A 90-latest edition, Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.
- .3 ASTM A 121-latest edition, Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.
- .4 ASTM A 525M-latest edition, Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot Dip Process.
- .5 ASTM A 585-latest edition, Specification for Aluminum-Coated Steel Barbed Wire.
- .6 CAN/CSA-A23.1-latest edition, Concrete Materials and Methods of Concrete Construction.
- .7 CAN/CSA-G164-latest edition, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .8 CAN/CGSB-138.1-latest edition, Fence, Chain Link, Fabric.
- .9 CAN/CGSB-138.2-latest edition, Fence, Chain Link, Framework, Zinc-Coated, Steel.
- .10 CAN/CGSB-138.3-latest edition, Fence, Chain Link - Installation.
- .11 CAN/CGSB-138.4-latest edition, Fence, Chain Link, Gates.
- .12 CAN/CGSB-1.181-latest edition, Ready-Mixed Organic Zinc-Rich Coating.

1.2 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/ Demolition Waste Management and Disposal, and with the Waste Reduction Workplan.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard and packaging material for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility as approved by Engineer.

Part 2 Products

2.1 MATERIALS

- .1 Concrete mixes and materials: to CAN/CSA-A23.1.
 - .1 Nominal coarse aggregate size: 20-5.
 - .2 Compressive strength: 20MPa minimum at 28days.
- .2 Chain-link fence fabric: to CAN/CGSB-138.1.
 - .1 Style as indicated on drawings.
 - .2 Height of fabric: 2.4m or as indicated on drawings.
 - .3 Min. 2" fabric mesh.
- .3 Posts, braces and rails: to CAN/CGSB-138.2, galvanized steel pipe. Dimensions as indicated.
- .4 Bottom tension wire: to CAN/CGSB-138.1, Table2, single strand, galvanized aluminum coated, vinyl coated, steel wire, 5mm diameter.
- .5 Tie wire fasteners: to CAN/CGSB-138.1, Table 2 steel wire, 4 aluminum wire, aluminum alloy wire, single strand, vinyl coated.
- .6 Tension bar: to ASTM A 525M, 5x20mm minimum galvanized steel.
- .7 Gates: to CAN/CGSB-138.4.
 - .1 Fabricate gates as indicated with electrically welded joints, and hot-dip galvanized after welding.
 - .2 Fasten fence fabric to gate with twisted selvage at top.
 - .3 Furnish gates with galvanized malleable iron hinges, latch and latch catch with provision for padlock which can be attached and operated from either side of installed gate.
 - .4 Furnish double gates with chain hook to hold gates open and centre rest with drop bolt for closed position.
- .8 Fittings and hardware: to CAN/CGSB-138.2, galvanized steel. Tension bar bands: 3x20mm minimum galvanized steel. Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail. Overhang tops to provide waterproof fit, to hold top rails. Turnbuckles to be drop forged.
- .9 Organic zinc rich coating: to CAN/CGSB-1.181.

2.2 FINISHES

- .1 Galvanizing:
 - .1 For chain link fabric: to CAN/CGSB-138.1 Grade 2.
 - .2 For pipe: 550g/minimum to ASTM A 90.
 - .3 For other fittings: to CAN/CSA-G164.

Part 3 Execution

3.1 GRADING

- .1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts. Provide clearance between bottom of fence and ground surface of 30mm to 50mm.

3.2 ERECTION OF FENCE

- .1 Erect fence along lines as indicated on drawings and in accordance with CAN/CGSB-138.3.
- .2 Excavate post holes to dimensions indicated
- .3 Space line posts 3m apart or closer if indicated on drawings, measured parallel to ground surface.
- .4 Install additional straining posts at sharp changes in grade and where directed by Consultant.
- .5 Install corner post where change in alignment exceeds 10.
- .6 Install end posts at end of fence and at buildings. Install gate posts on both sides of gate openings.
- .7 Place concrete in post holes then embed posts into concrete to depths indicated. Extend concrete 50mm above ground level and slope to drain away from posts. Brace to hold posts in plumb position and true to alignment and elevation until concrete has cured.
- .8 Do not install fence fabric until concrete has cured a minimum of 5 days.
- .9 Install brace between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface. Install braces on both sides of corner and straining posts in similar manner.
- .10 Install caps.
- .11 Install top rail between posts and fasten securely to posts and secure waterproof caps.
- .12 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands.

- .13 Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300mm intervals. Knuckled selvedge at bottom. Twisted selvedge at top.
- .14 Secure fabric to top rails, line posts and bottom tension wire with tie wires at 450mm intervals. Give tie wires minimum two twists.

3.3 INSTALLATION OF GATES

- .1 Install gates in locations as indicated. Co-ordinate and confirm location with owner to ensure easy access and removal of dust collector barrels.
- .2 Level ground between gate posts and set gate bottom approximately 40mm above ground surface.
- .3 Determine position of centre gate rest for double gate. Cast gate rest in concrete as directed. Dome concrete above ground level to shed water.
- .4 Install gate stops where indicated.

3.4 TOUCH UP

- .1 Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of organic zinc-rich paint to damaged areas in accordance with Section 09 97 19 - Painting. Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.

3.5 CLEANING

- .1 Clean and trim areas disturbed by operations. Dispose of surplus material and replace damaged turf with sod.

END OF SECTION



Transportation and
Infrastructure Renewal
Engineering and Design Division
Building Design Section

PROJECT TITLE:

ROCKY LAKE JR. HIGH DUST COLLECTION SYSTEM SYSTEM REMEDIATION

LOCATION

BEDFORD, HALIFAX COUNTY

PROJECT NUMBER: 10-14-006

TENDER NUMBER: 3706

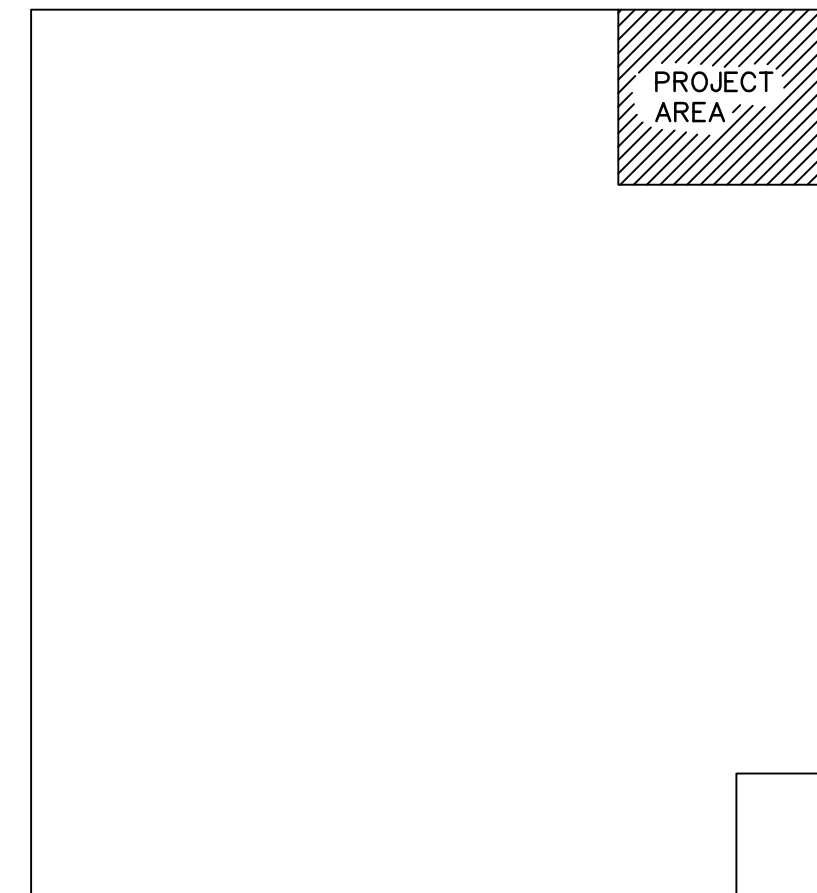
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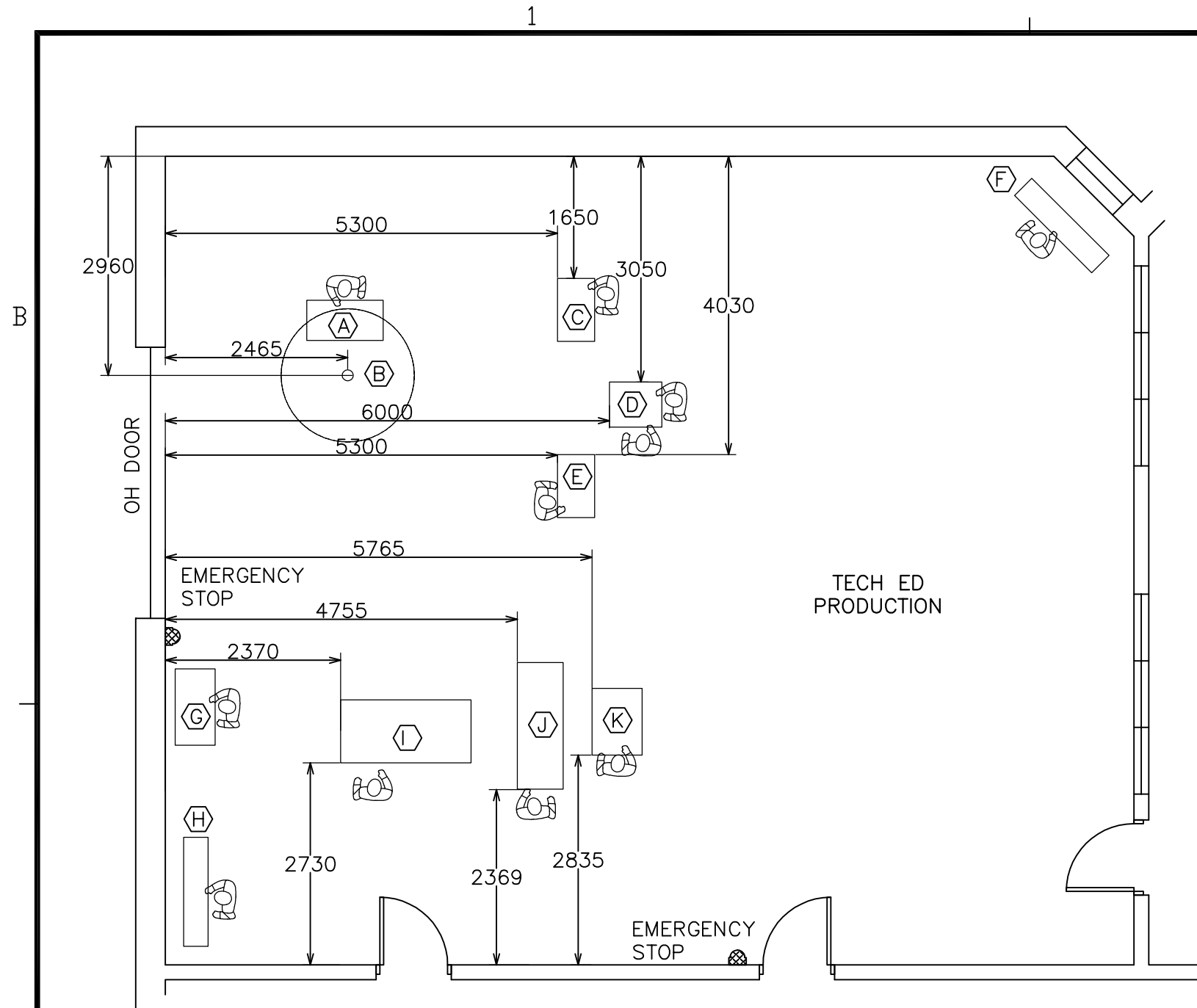
7051 BAYERS ROAD, UNIT 102
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BUS: (902) 876-3182 FAX: (902) 876-2796
WWW.MCW.COM ENG. JOB NO. 10-14-006

LIST OF DRAWINGS:

- M-101 WOOD LAB LAYOUT AND MACHINE REQUIREMENTS
- M-102 DEMOLITION PLAN
- M-103 DUST COLLECTION DUCTWORK FLOOR PLAN
- M-104 DUST COLLECTOR PLAN
- M-201 DUST COLLECTOR ELEVATION
- M-501 DUCTWORK AND BONDING LUG DETAILS
- M-502 ACCESS HATCH, CONCRETE PAD AND FENCE POST DETAILS
- M-503 TABLE SAW, ROUTER AND BAND SAW CONNECTION DETAILS
- M-504 JOINTER AND LATHE CONNECTION DETAILS
- M-505 PLANER AND MITER SAW CONNECTION DETAILS
- E-101 DUST COLLECTOR CONTROL PANEL AND DISCONNECT LOCATION
- E-102 DUST COLLECTOR POWER & CONTROL ONE-LINE DIAGRAM
- E-103 BONDING DETAILS



KEY PLAN



1
M-101
WOOD LAB FLOOR PLAN
SCALE: 1:75

LEGEND

	SMACNA CLASS 3 DUST COLLECTION DUCTWORK		CHAIN LINK FENCING
	ACCESS DOOR		CHAIN LINK FENCING C/W METAL CLADDING
	WOODWORKING EQUIPMENT IDENTIFIER		EXISTING DUCT TO BE REMOVED
	BLAST GATE, LOCKABLE		DESIGNATES DIRECTION OF BARREL REMOVAL
	APPROX. LOCATION OF LIGHT FIXTURE		APPROXIMATE LOCATION OF SPRINKLER HEAD

DUST COLLECTOR SUMMARY

ID	DESCRIPTION	AIRFLOW REQ'D CFM	CONNECTION METHOD
A	ROUTER TABLE	-	PORT./FLOAT
B	FLOATING DROP	350	DIRECT
C	BAND SAW (GENERAL)	550	DIRECT
D	SANDER (GENERAL)	900	DIRECT
E	BAND SAW (GENERAL)	550	DIRECT
F	LATHE	-	PORTABLE
G	MITER SAW	-	PORTABLE
H	LATHE	-	PORTABLE
I	TABLE SAW (SAW STOP)	500	DIRECT
J	JOINTER	350	DIRECT
K	PLANER	750	DIRECT
DUST COLLECTOR TOTAL - 3950CFM			

NOVA SCOTIA
Transportation and Infrastructure Renewal
Engineering and Design Division
Building Design Section

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SCALE:

2014/10/17	ISSUED FOR TENDER
2014/08/08	ISSUED FOR 99% REVIEW
DATE	MARK ISSUE

STAMP

SCALE:	AS NOTED
DRAWN BY:	M.F.
CHECKED BY:	R.P.
REVIEWED BY:	D.B.
APPROVED BY:	M.G.
AS-BUILT REVIEW	
DATE:	OCTOBER 2014

PROJECT
ROCKY LAKE JR. HIGH SCHOOL
DUST COLLECTION SYSTEM REMEDIATION
BEDFORD, NS
PROJECT NO.: 10-14-006

SHEET TITLE
WOOD LAB LAYOUT AND MACHINE REQUIREMENTS

INTERNAL NO.: 10-14-006

M-101

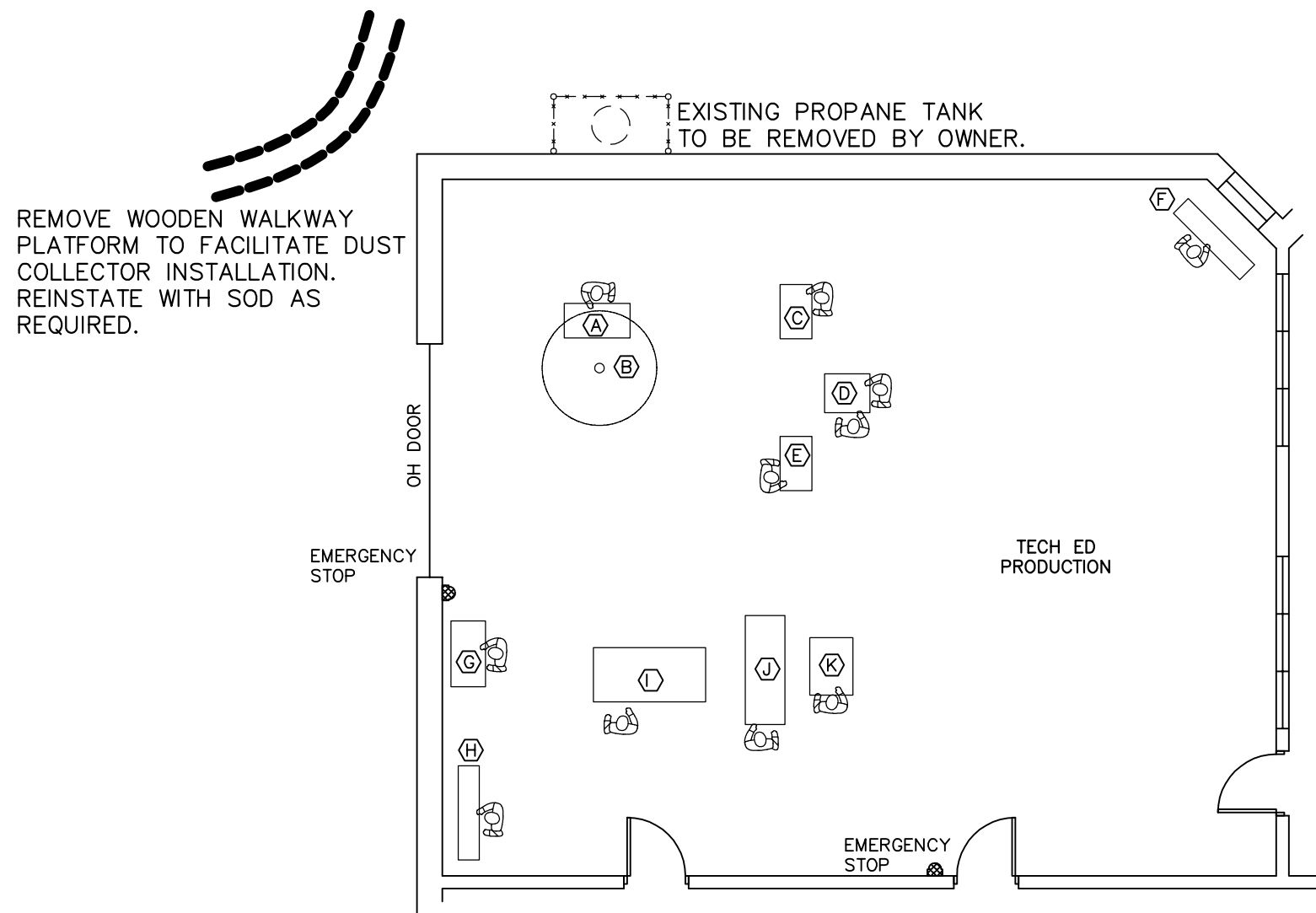
SHEET 1 OF 10

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2

B

A



1
M-102 **DEMOLITION FLOOR PLAN**
SCALE: 1:100

NOVA SCOTIA

Transportation and
Infrastructure Renewal
Engineering and Design Division
Building Design Section

LOGO:



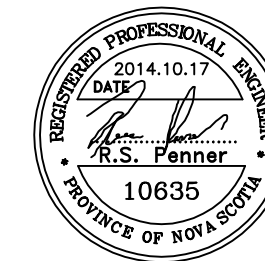
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SCALE

2014/10/17	ISSUED FOR TENDER
2014/08/08	ISSUED FOR 99% REVIEW

DATE MARK ISSUE

STAMP



SCALE:	AS NOTED
DRAWN BY:	M.F.
CHECKED BY:	R.P.
REVIEWED BY:	D.B.
APPROVED BY:	M.G.
AS-BUILT REVIEW	
DATE:	OCTOBER 2014

PROJECT
ROCKY LAKE JR. HIGH
SCHOOL
DUST COLLECTION
SYSTEM REMEDIATION
BEDFORD, NS

PROJECT NO.: 10-14-006

SHEET TITLE
DEMOLITION PLAN

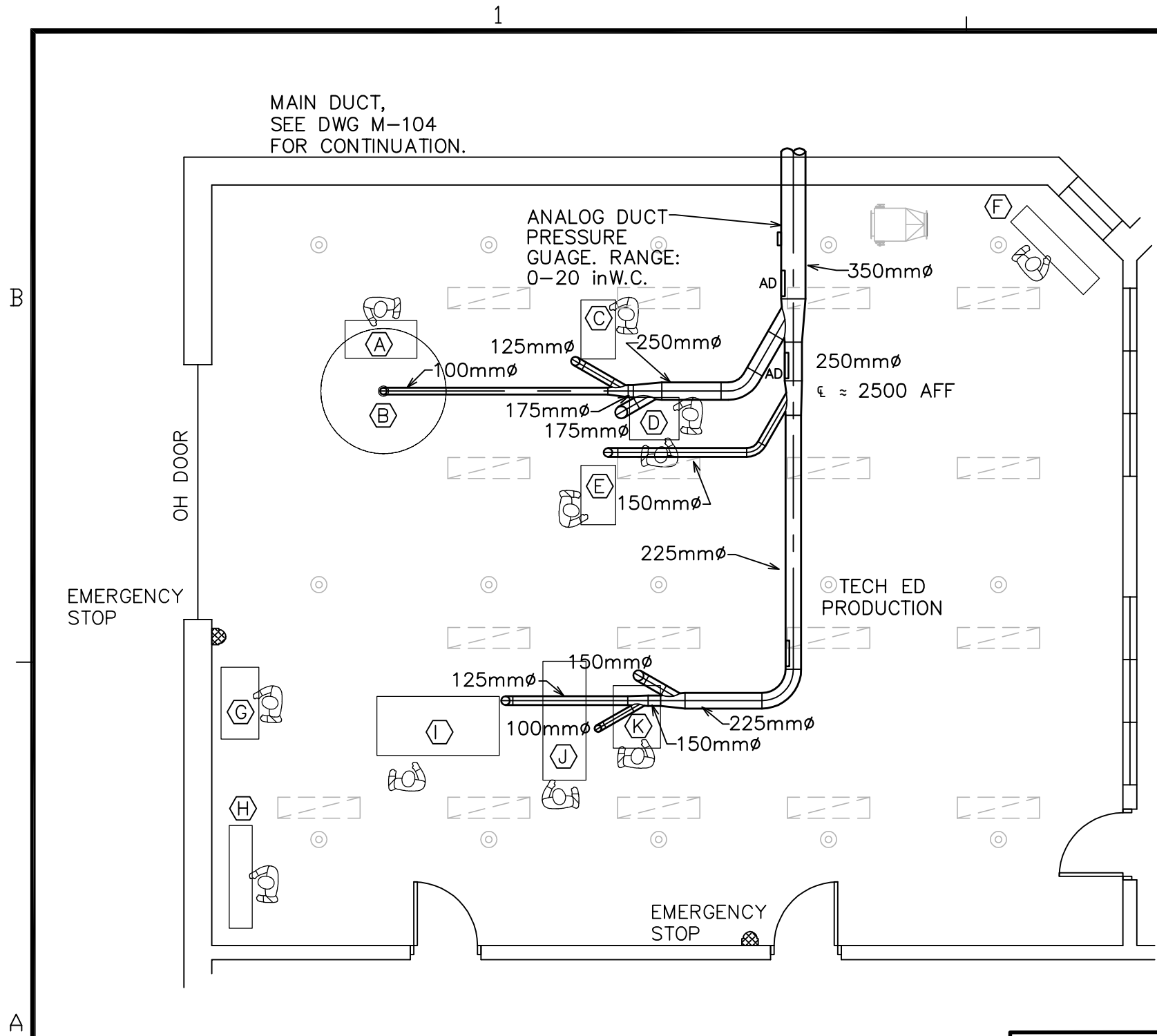
INTERNAL NO.: 10-14-006

M-102

SHEET 2 OF 10

1

2



1
M-103

DUST COLLECTION DUCTWORK FLOOR PLAN

SCALE: 1:75

NOTES:

1. MAKE UP AIR NOT IN CONTRACT. ALL MAKE UP AIR TO ADDRESSED BY OTHERS.
2. FINAL LOCATION OF DUCTWORK MAY VARY SLIGHTLY FROM DRAWINGS. MAKE, AT NO EXTRA COST, ADJUSTMENTS TO DUCTWORK TO ACCOMMODATE EXISTING CONDITIONS.
3. VISIT AND INSPECT EXISTING CONDITIONS. NO ALLOWANCE WILL BE MADE FOR FAILURE TO DO SO. CONFIRM EXACT LOCATION OF ALL EXISTING CONDITIONS (MECHANICAL, ELECTRICAL, ARCHITECTURAL, ETC.)

NOVA SCOTIA

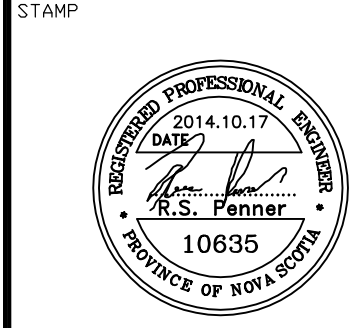
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Engineering and Design Division
Building Design Section



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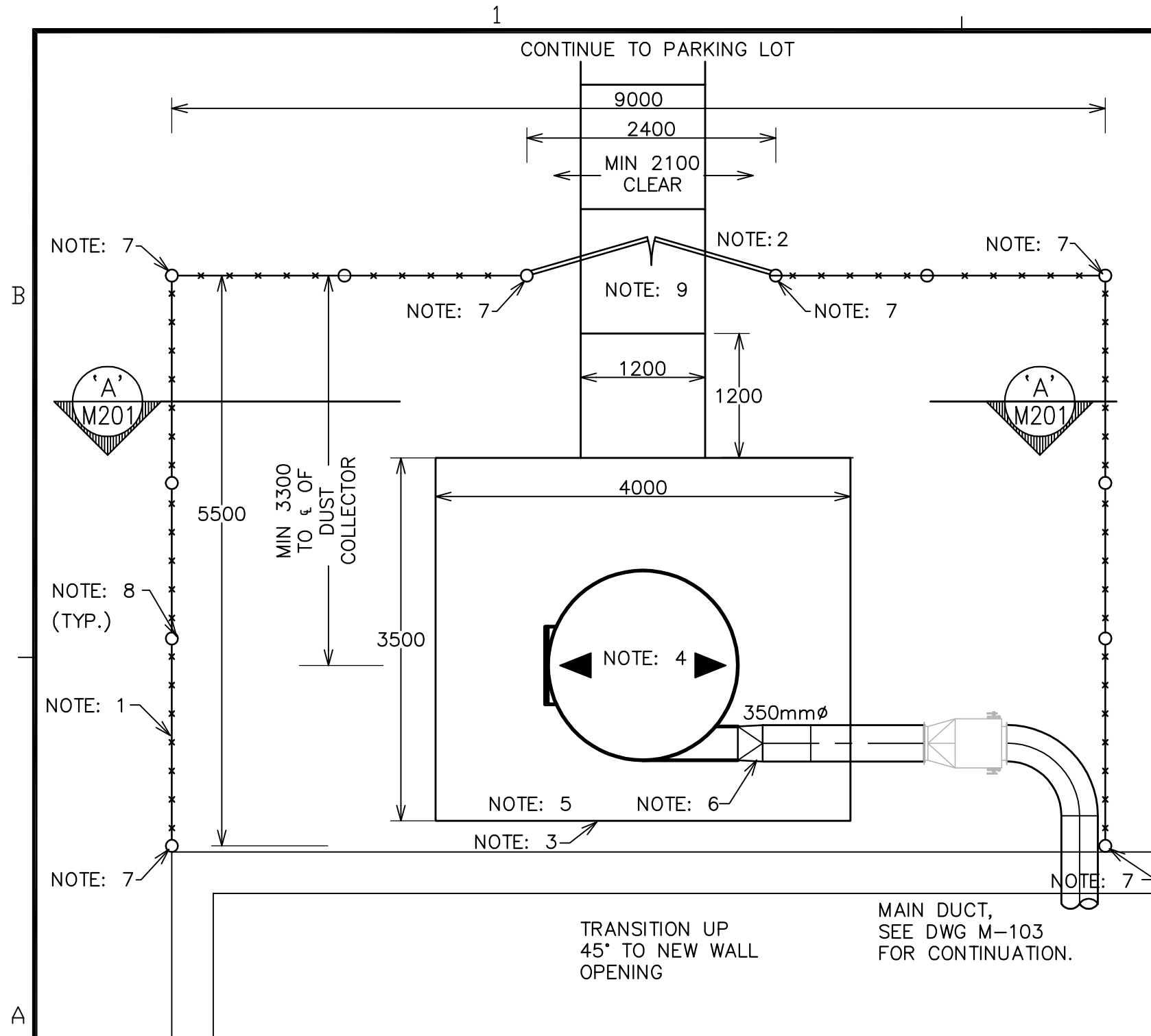
SCALE:	AS NOTED
DRAWN BY:	M.F.
CHECKED BY:	R.P.
REVIEWED BY:	D.B.
APPROVED BY:	M.G.
AS-BUILT REVIEW	
DATE:	OCTOBER 2014

PROJECT
ROCKY LAKE JR. HIGH
SCHOOL
DUST COLLECTION
SYSTEM REMEDIATION
BEDFORD, NS
PROJECT NO.: 10-14-006

SHEET TITLE
DUST COLLECTION
DUCTWORK FLOOR
PLAN

INTERNAL NO.: 10-14-006

M-103



1 **DUST COLLECTOR PLAN**
M-104 SCALE: 1:50

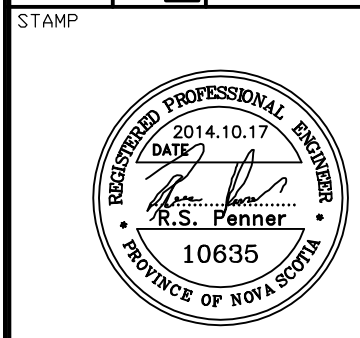
NOTES:

1. INSTALL NEW GALVANIZED STEEL FENCE, 2400 HIGH, 42 OD MID RAIL, 42 OD TOP RAIL SCHED 40, 9 GAUGE GALVANIZED STEEL FABRIC, 6 GAUGE GALVANIZED STEEL BOTTOM WIRE.
2. INSTALL NEW LOCKABLE GATES IN THIS LOCATION. SCHOOL TO ENSURE GATES REMAIN CLOSED WITH FENCED AREA UNOCCUPIED WHILE DUST COLLECTOR IS RUNNING AND 15 MIN AFTER DUST COLLECTOR STOPS. 42 OD SCHED 40 STEEL FRAMING W/ HEAVY DUTY HARDWARE.
3. PROVIDE NEW CONCRETE PAD TO SUPPORT NEW DUST COLLECTOR. PROVIDE (2) NEW 3/4"Ø ADHESIVE ANCHOR BOLTS PER LEG (8 TOTAL). STANDARD OF ACCEPTANCE: HILTI 10M REINFORCEMENTS 300 OC. EACH DIRECTION 75mm CONCRETE COVER. COORDINATE ANCHOR BOLT LOCATION DUST COLLECTOR.
4. NEW DUST COLLECTOR SUPPLIED BY OTHERS AND INSTALLED BY THIS CONTRACTOR. CONFIRM FOLLOWING DUST COLLECTOR SPECS: 3950CFM, 208V 20HP W/ BACKFLOW PREVENTOR, DEFLECTOR AND SILENCER.
5. TRANSITION REQUIRED TO CONNECT TO DUST COLLECTOR.
6. BACKDRAFT DAMPER BY OTHERS. TRANSITION REQUIRED TO CONNECT TO BACKDRAFT DAMPER. CONFIRM ALL DIMENSIONS.
7. TERMINAL POST 89 OD SCHED 40 STEEL CONCRETE FILLED POST HOLES 250Ø TO MINIMUM DEPTH OF 1100.
8. INTERMEDIATE POST 60 OD SCHED 40 MAX SPACING 2400. CONCRETE FILLED POST HOLES 250Ø TO MINIMUM DEPTH OF 1100.
9. CONCRETE WALKWAY FOR BARREL REMOVAL. 100mm. CONCRETE W/ 6% AIR ENTRAINMENT. 150mm. MIN. TYPE 1 COMPACTED GRAVEL. UNDISTURBED SOIL. CONTROL JOINT 25 DEEP W/ RADIUS TOOL. OUTSIDE EDGE TO BE RADIUS TOOLED. TOP OF WALKWAY TO BE EVEN WITH CONCRETE PAD. DEPRESS EVEN TO GRADE AT TERMINATION. SOME CONCRETE DEMOLITION MAY BE REQUIRED TO FACILITATE BARREL REMOVAL. COORDINATE ON SITE.
10. COORDINATE/CONFIRM WITH OWNER THE ABSENCE OF U/G PIPING/ELECTRICAL PRIOR TO ANY EXCAVATION.
11. INSTALL WARNING SIGNS AS SUPPLIED BY OWNER (3 PLACES).
12. NEW WALL PENETRATIONS. CAULK ANY GAPS BETWEEN INSULATION AND WALL.

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PROJECT
 ROCKY LAKE JR. HIGH SCHOOL
 DUST COLLECTION SYSTEM REMEDIATION
 BEDFORD, NS
 PROJECT NO.: 10-14-006

SHEET TITLE
 DUST COLLECTOR PLAN

INTERNAL NO.: 10-14-006

M-104

LOGO:



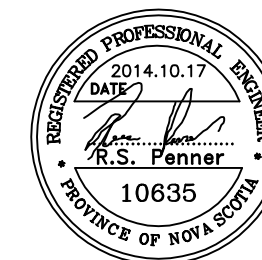
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APPROVED BY:	M.G.
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DATE:	OCTOBER 2014

PROJECT
ROCKY LAKE JR. HIGH SCHOOL
DUST COLLECTION SYSTEM REMEDIATION
BEDFORD, NS

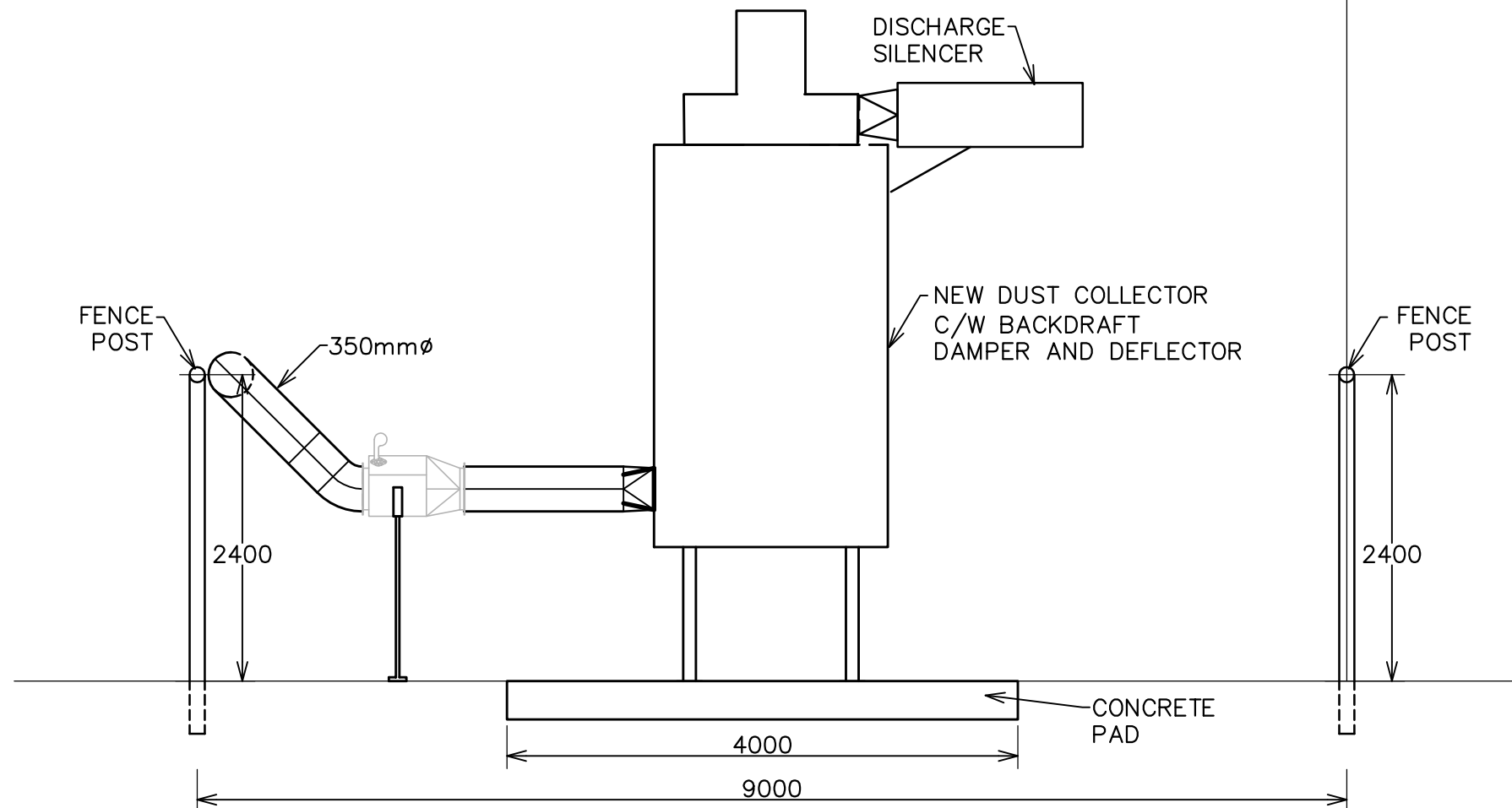
PROJECT NO.: 10-14-006

SHEET TITLE
DUST COLLECTOR ELEVATION

INTERNAL NO.: 10-14-006

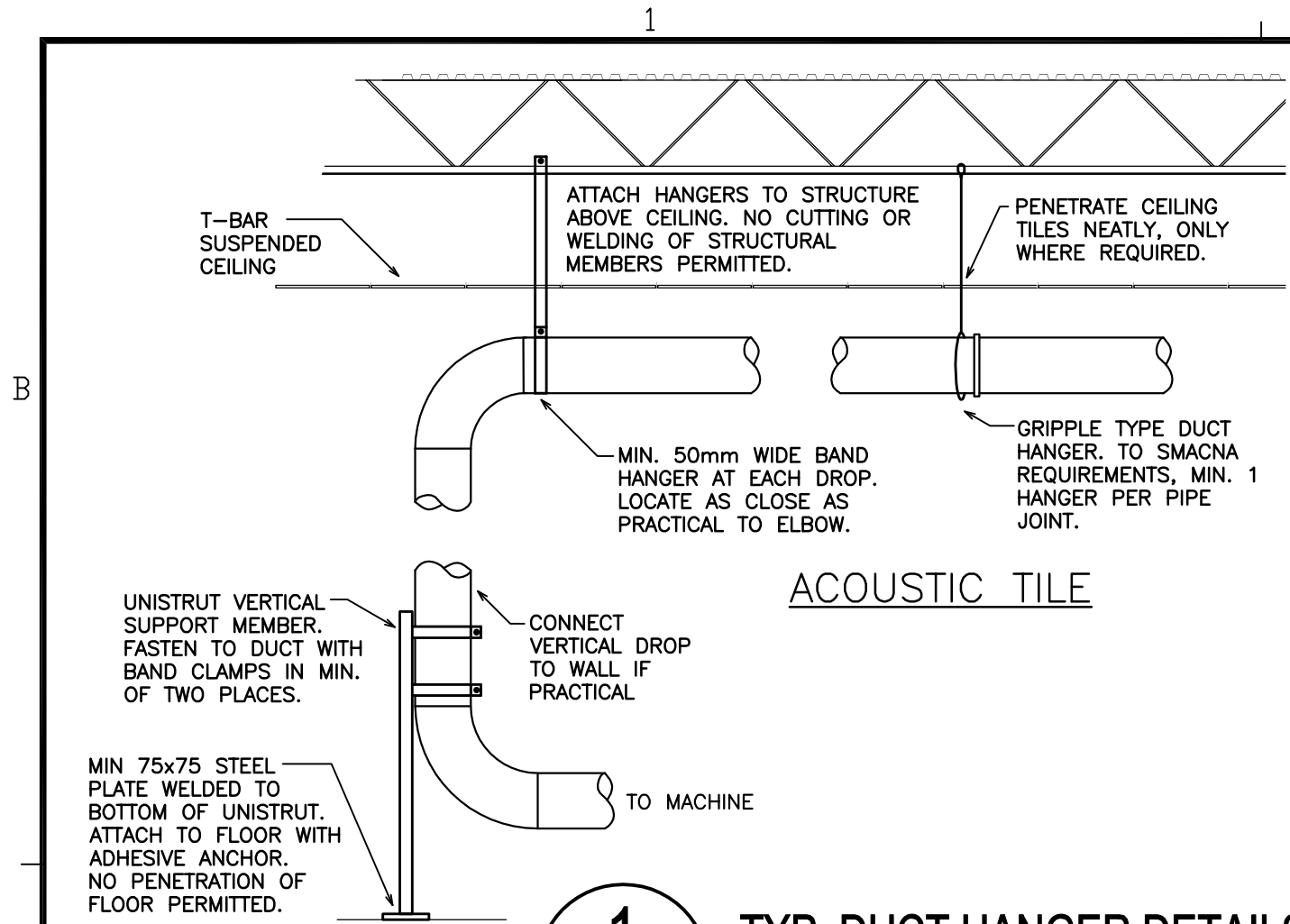
M-201

SHEET 5 OF 10

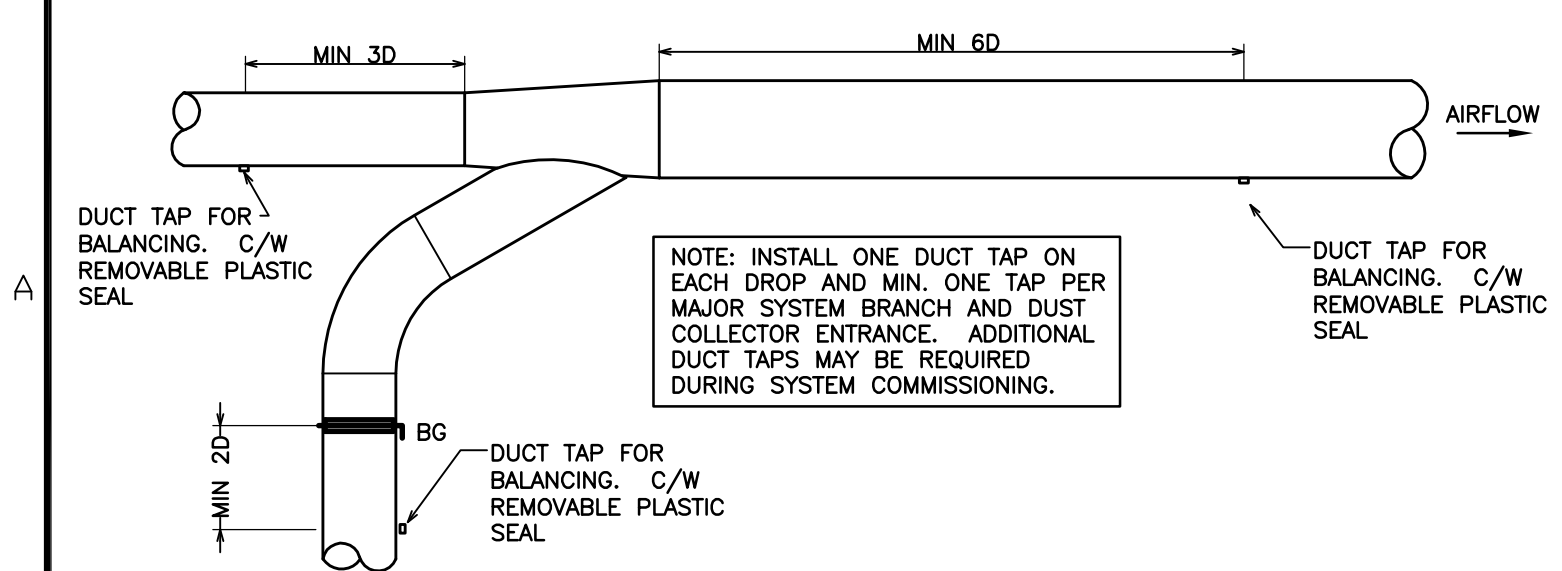


1 DUST COLLECTOR ELEVATION
M-201 SCALE: 1:50

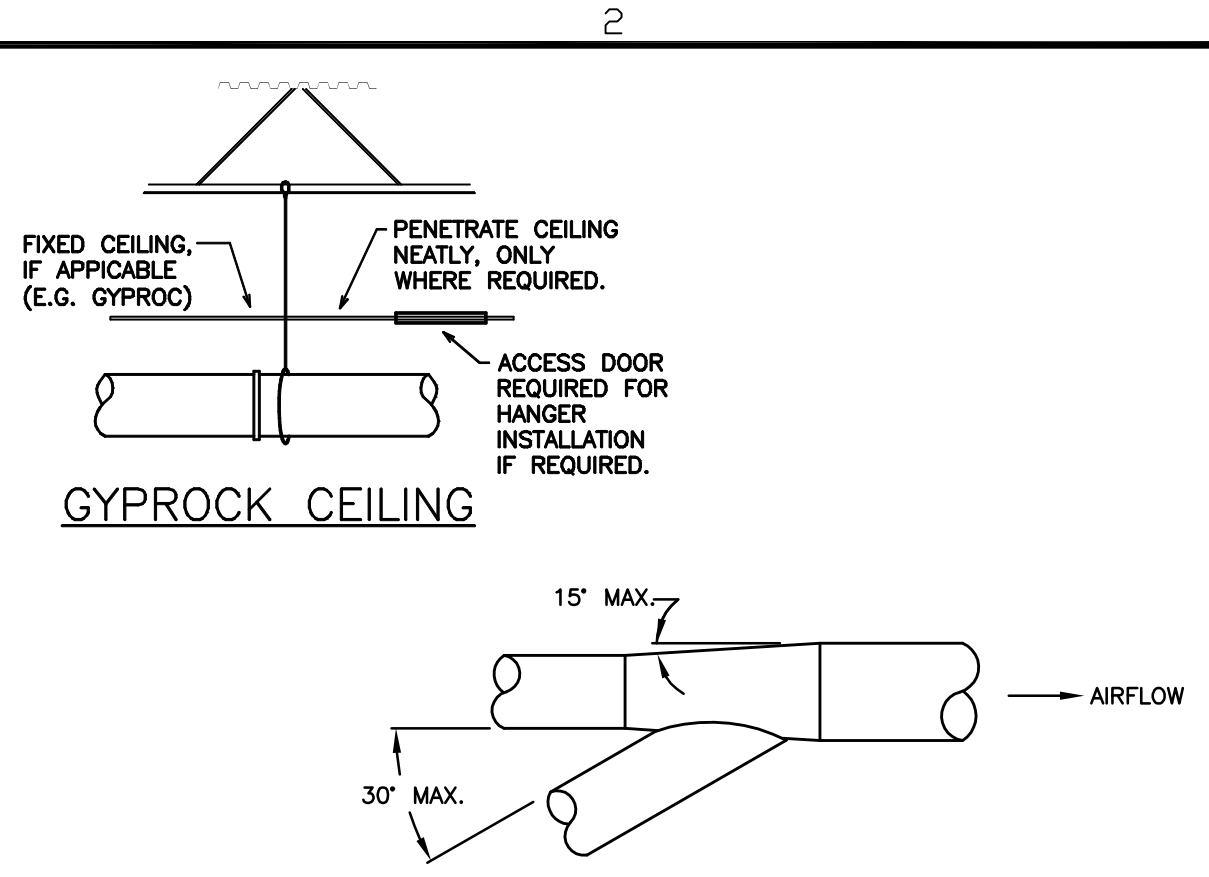
COORDINATE ANY ON-SITE DIFFERENCE
IN ELEVATION BETWEEN FLOOR OF
WOOD LAB & TOP OF CONCRETE PAD.



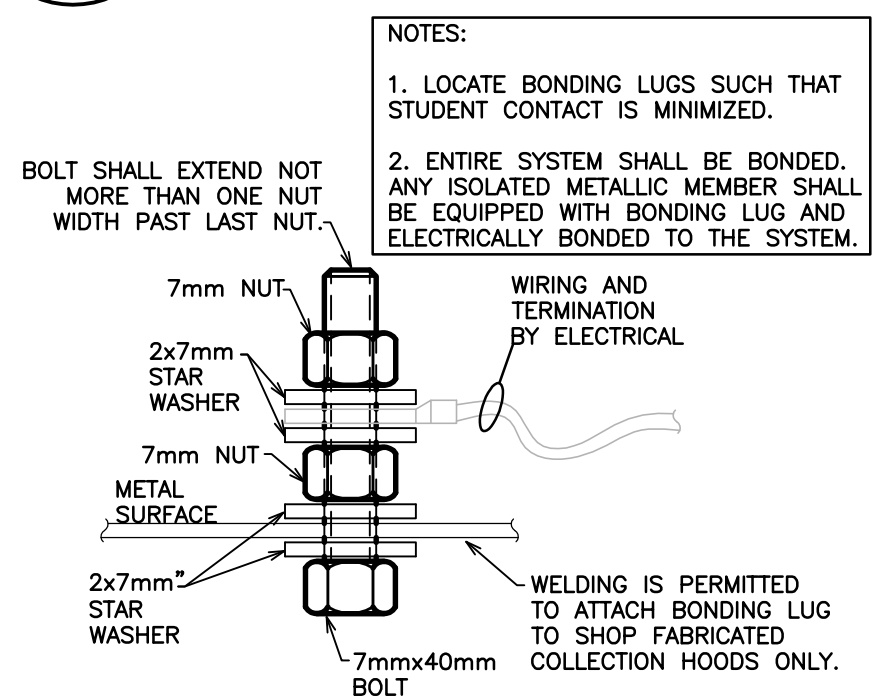
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M-501 TYP. DUCT HANGER DETAILS
SCALE: N.T.S.



2
M-501 DUCT TAP DETAIL
SCALE: N.T.S.



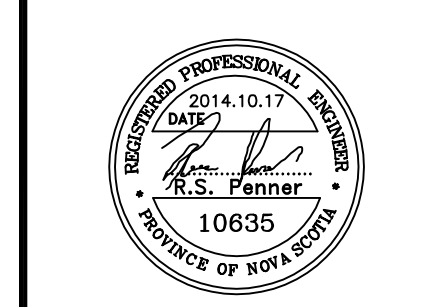
3
M-501 TYP. DUCT TRANSITION DETAIL
SCALE: N.T.S.



4
M-501 BONDING LUG DETAIL
SCALE: N.T.S.

NOTES:
1. LOCATE BONDING LUGS SUCH THAT STUDENT CONTACT IS MINIMIZED.
2. ENTIRE SYSTEM SHALL BE BONDED. ANY ISOLATED METALLIC MEMBER SHALL BE EQUIPPED WITH BONDING LUG AND ELECTRICALLY BONDED TO THE SYSTEM.

SCALE	
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PROJECT
ROCKY LAKE JR. HIGH SCHOOL
DUST COLLECTION SYSTEM REMEDIATION
BEDFORD, NS
PROJECT NO.: 10-14-006

SHEET TITLE
DUCTWORK AND BONDING LUG DETAILS

INTERNAL NO.: 10-14-006

M-501

NOTE:

MANUFACTURER SUPPLIED ACCESS PANELS ARE ACCEPTABLE PROVIDED OPENING SIZE SPECIFIED IS MAINTAINED.

STD. OF ACCEPTANCE:
NORDFAB, K-B DUCT OR
ENGINEER APPROVED ALTERNATE

MOUNTING PLATE
AS REQUIRED

MIN. 18ga.

DOOR W/ GASKET
SEE SPEC.

TWO ADJUSTABLE DRAW
LATCHES PER DOOR

TYP. BONDING LUGS

GASKET INSPECTION DOOR WITH MIN.
7x19mm CLOSED CELL RUBBER. APPLY
CONTINUOUS GASKET TO DOOR USING
HEAVY DUTY ADHESIVE CEMENT.

CONTINUOUS
HINGE FULL
LENGTH OF DOOR.

#6AWG CU BONDING WIRE
ALLOW ENOUGH SLACK SO AS
NOT TO INTERFERE WITH
OPERATION OF DOOR.

DUCT OPENING AND INSPECTION DOOR SIZES TO BE AS
FOLLOWS:

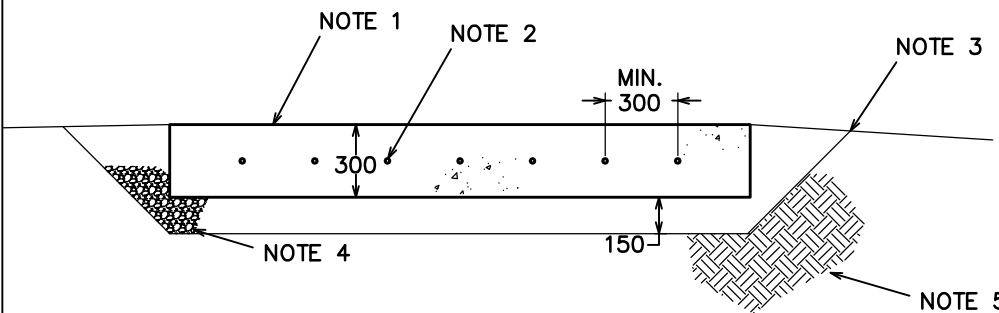
DUCT DIA. (mm)	OPENING SIZE (mm)	DOOR SIZE (mm)
100 TO 150	100x150	150x200
175 TO 250	150x200	200x250
275+	200x250	250x300

1
M-502 ACCESS HATCH DETAIL
SCALE: N.T.S.

NOTES:

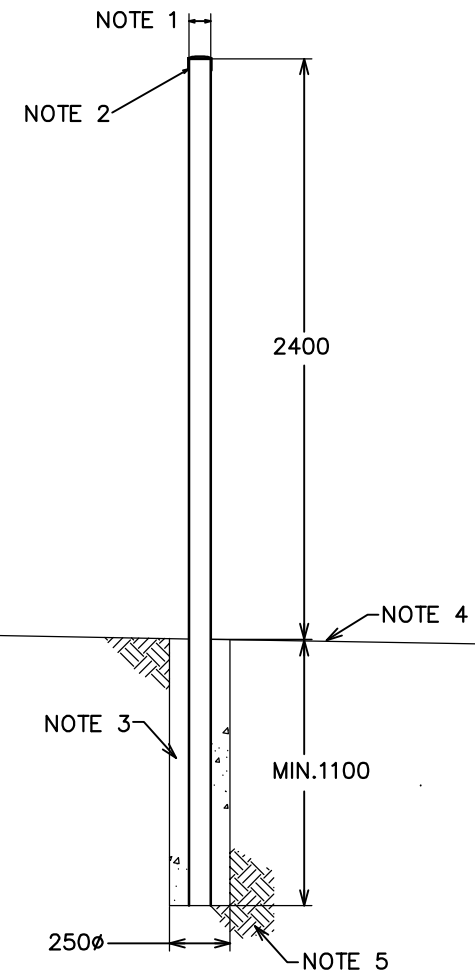
1. PROVIDE NEW CONCRETE PAD WITH AIR ENTRAINMENT, SIZE AS INDICATED.
2. TYP. 10M REINFORCEMENTS 300 O/C EACH DIRECTION 150mm CONCRETE COVER.
3. WHERE BARREL REMOVAL IS INDICATED BRING HARD SURFACE TO THE LEVEL OF THE CONCRETE PAD. WITH A SMOOTH TRANSITION SLOPE AWAY FROM PAD IN ALL DIRECTIONS.
4. REMOVE EXISTING ORGANIC LAYER. FILL WITH MIN 150 TYPE 1 GRAVEL, COMPACTED TO DESIRED GRADE. CONTRACTOR RESPONSIBLE FOR REMOVAL AND DISPOSAL OF ALL SOILS AS REQUIRED FROM SITE.
5. UNDISTURBED NATIVE SOILS.

2
M-502 CONCRETE PAD DETAIL
SCALE: N.T.S.



NOTES:

1. 89 OD SCHED 40 GA;V. STEEL FOR TERMINAL POSTS. 60 OD SCHED 40 GALV. STEEL FOR INTERMEDIATE POSTS. MAXIMUM SPACING BETWEEN POSTS SHALL BE 2.4m.
2. PROVIDE CAP TO PREVENT WATER FROM ENTERING POST.
3. CONCRETE FILLED POST HOLE (1100 DEEP, 250Ø). CONSULT WITH THE OWNER TO ENSURE THAT THERE ARE NO KNOWN U/G SERVICES, PIPING, CONDUITS, ETC. LOCATED AT PROPOSED POST HOLE LOCATIONS.
4. EXISTING GRADE. REPLACE SOD WHERE REQUIRED. REINSTATE SURFACE FINISHES(SOD, ASPHALT, ETC.).
5. UNDISTURBED NATIVE SOILS.



3
M-502 FENCE POST DETAIL
SCALE: N.T.S.

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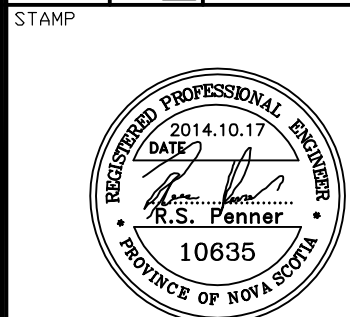
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PROJECT
ROCKY LAKE JR. HIGH
SCHOOL
DUST COLLECTION
SYSTEM REMEDIATION
BEDFORD, NS
PROJECT NO.: 10-14-006

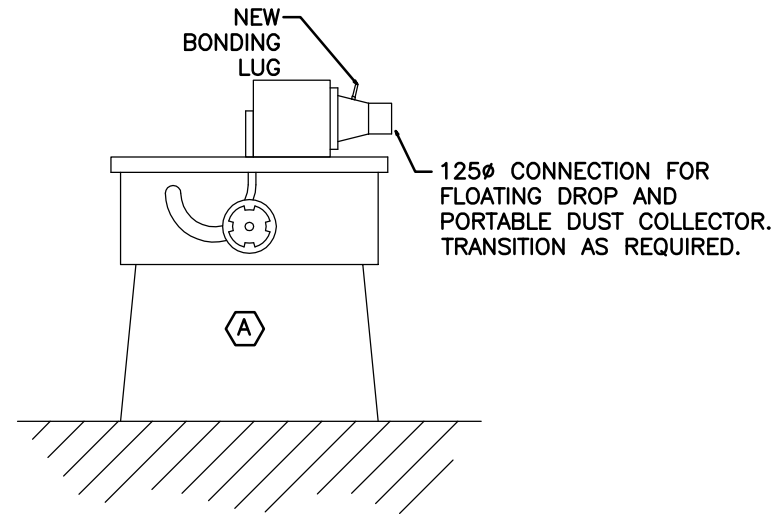
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ACCESS HATCH,
CONCRETE PAD AND
FENCE POST DETAILS

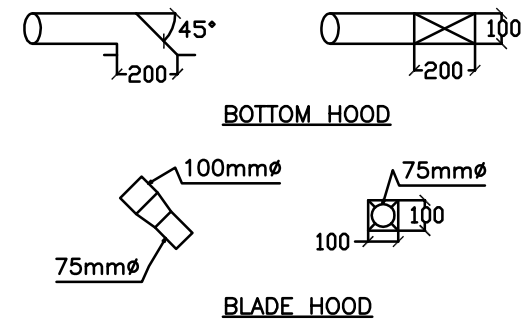
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M-502

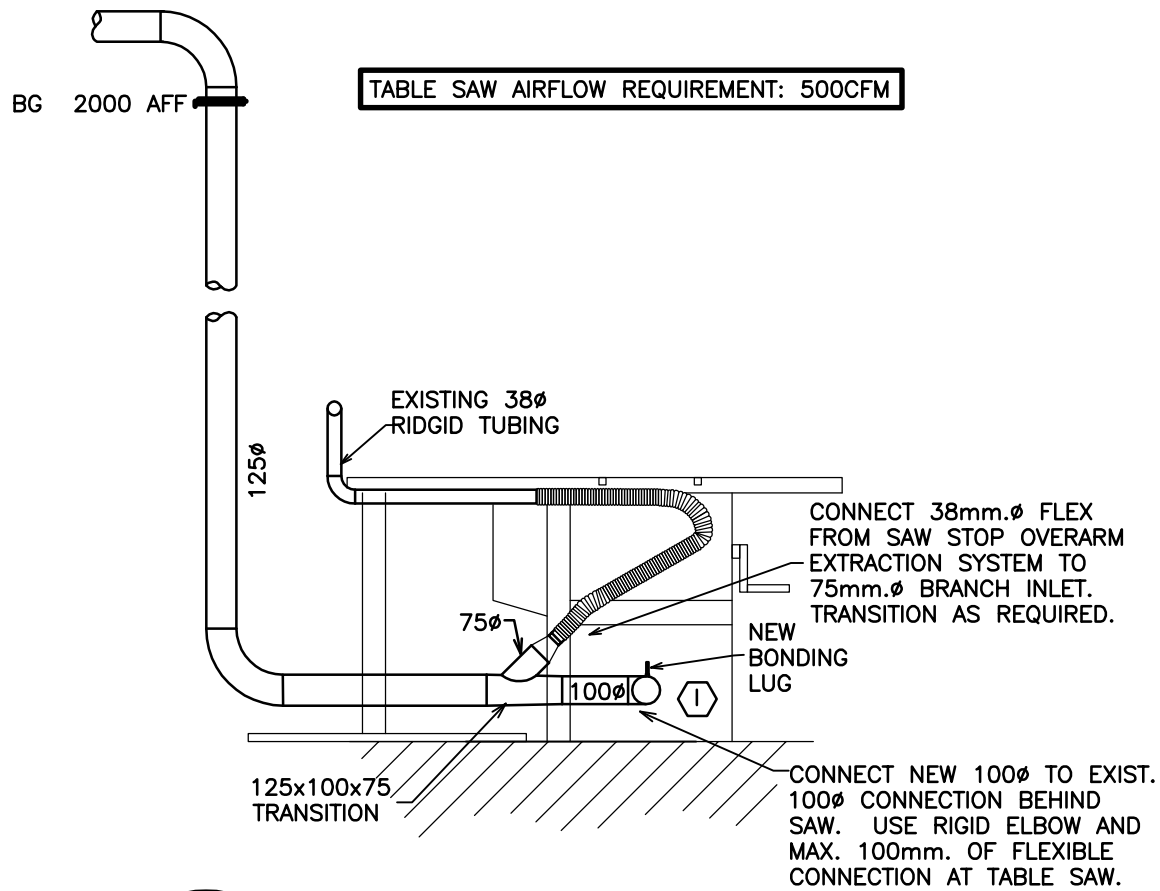
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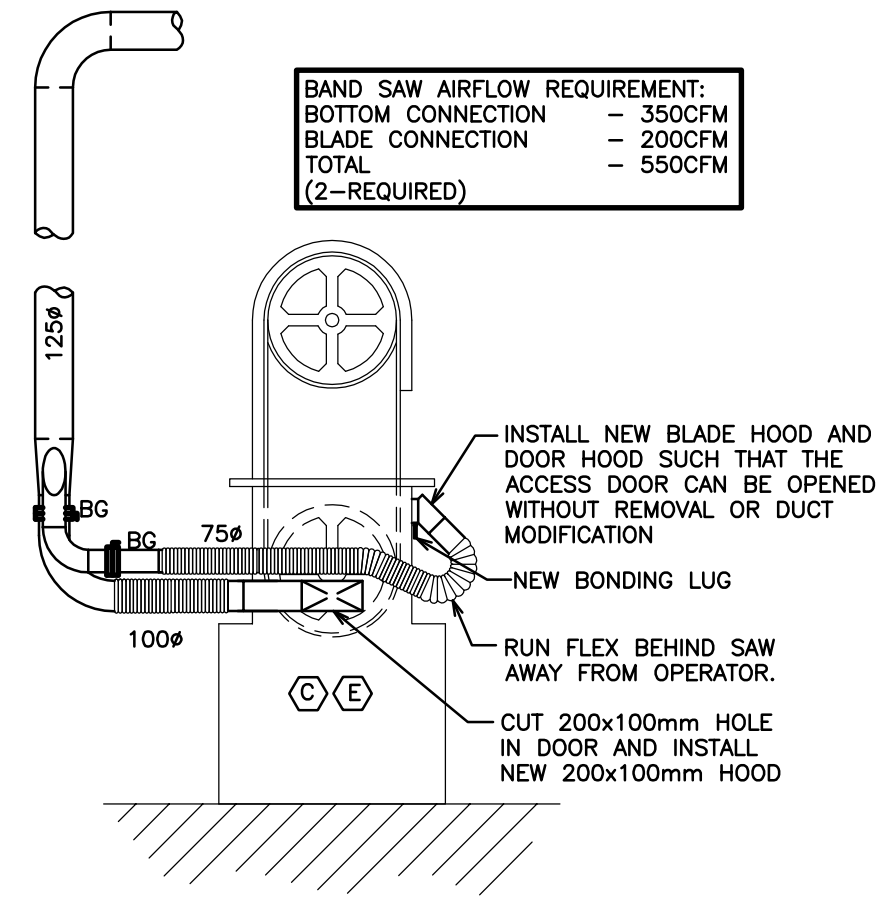
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M-503
ROUTER TABLE CONNECTION DETAIL
SCALE: N.T.S.



3
M-503
BAND SAW HOOD DETAILS
SCALE: N.T.S.

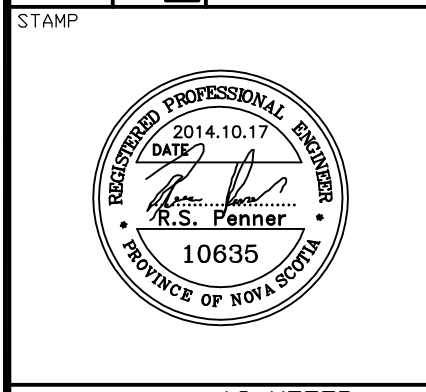


2
M-503
TABLE SAW CONNECTION DETAIL
SCALE: N.T.S.



4
M-503
BAND SAW CONNECTION DETAIL
SCALE: N.T.S.

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PROJECT
ROCKY LAKE JR. HIGH SCHOOL
DUST COLLECTION SYSTEM REMEDIATION
BEDFORD, NS
PROJECT NO.: 10-14-006

SHEET TITLE
TABLE SAW, ROUTER AND BAND SAW CONNECTION DETAILS

INTERNAL NO.: 10-14-006

M-503

LOGO:



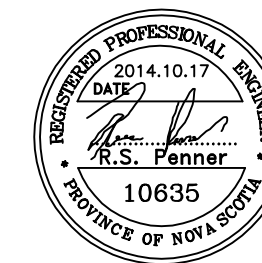
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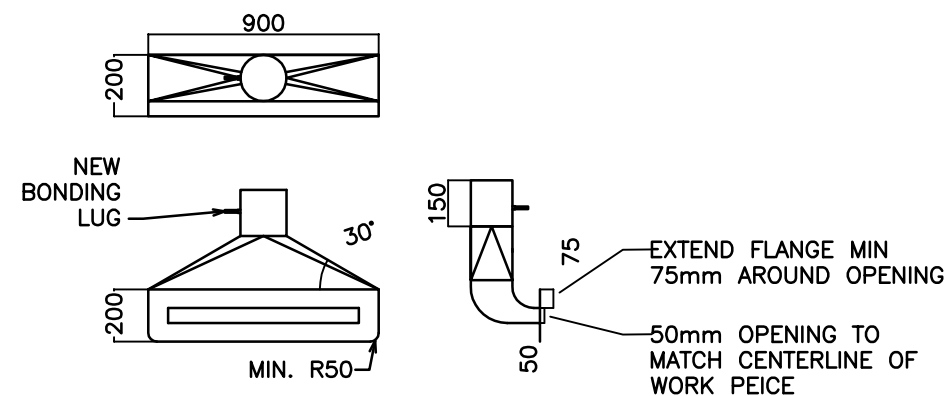
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PROJECT
ROCKY LAKE JR. HIGH
SCHOOL
DUST COLLECTION
SYSTEM REMEDIATION
BEDFORD, NS
PROJECT NO.: 10-14-006

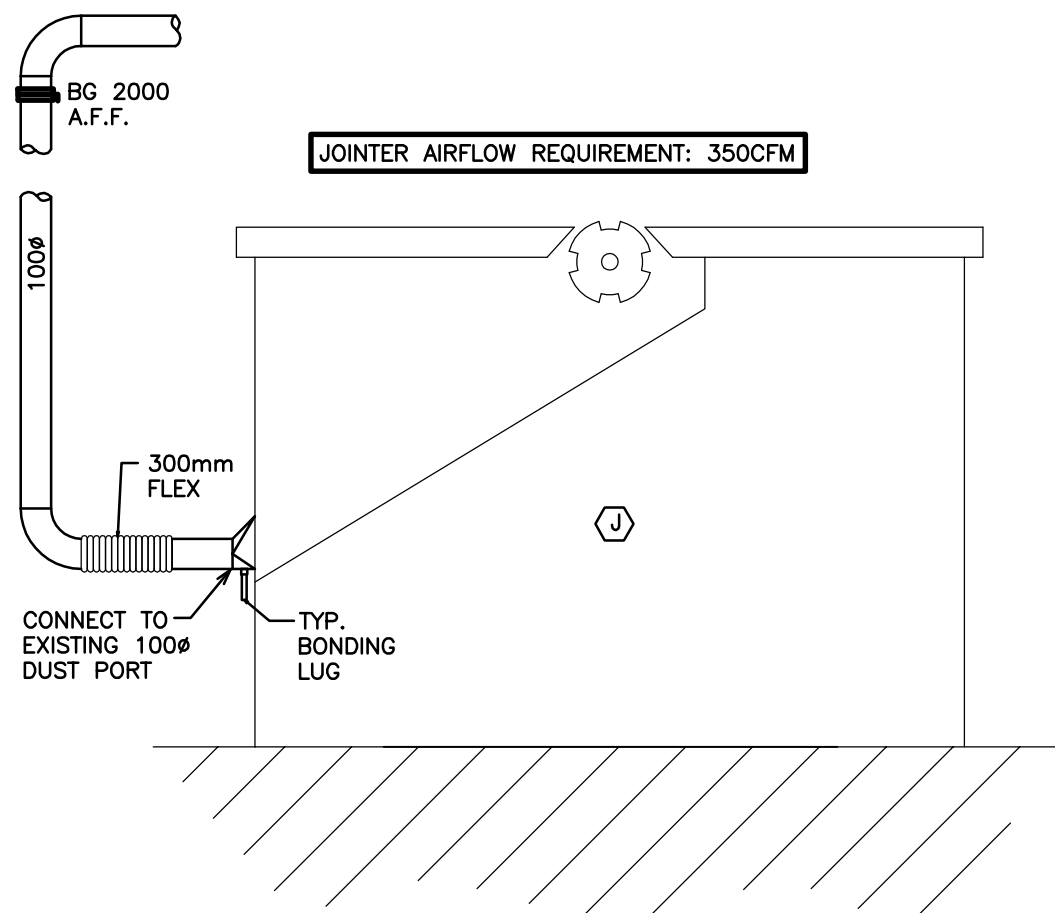
SHEET TITLE
JOINTER AND LATHE
CONNECTION DETAILS

INTERNAL NO.: 10-14-006

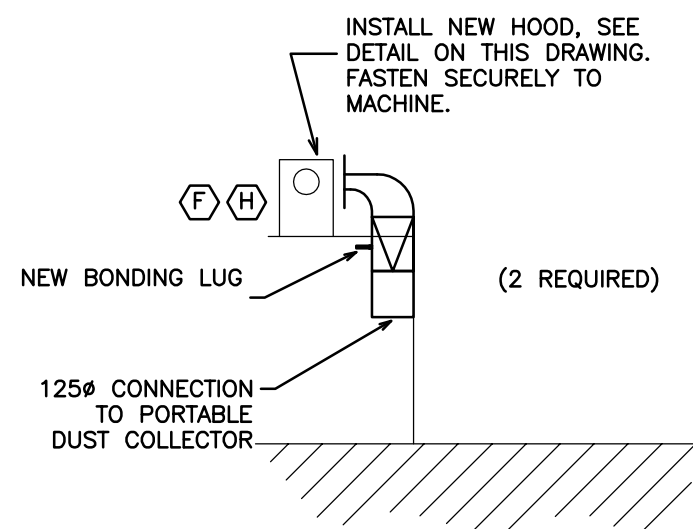
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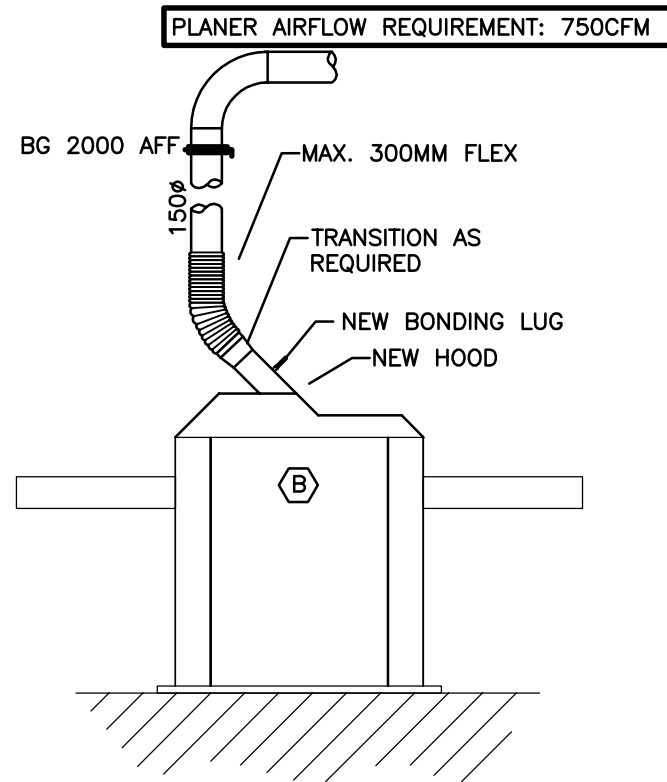
2 LATHE HOOD DETAILS
M-504 SCALE: N.T.S.



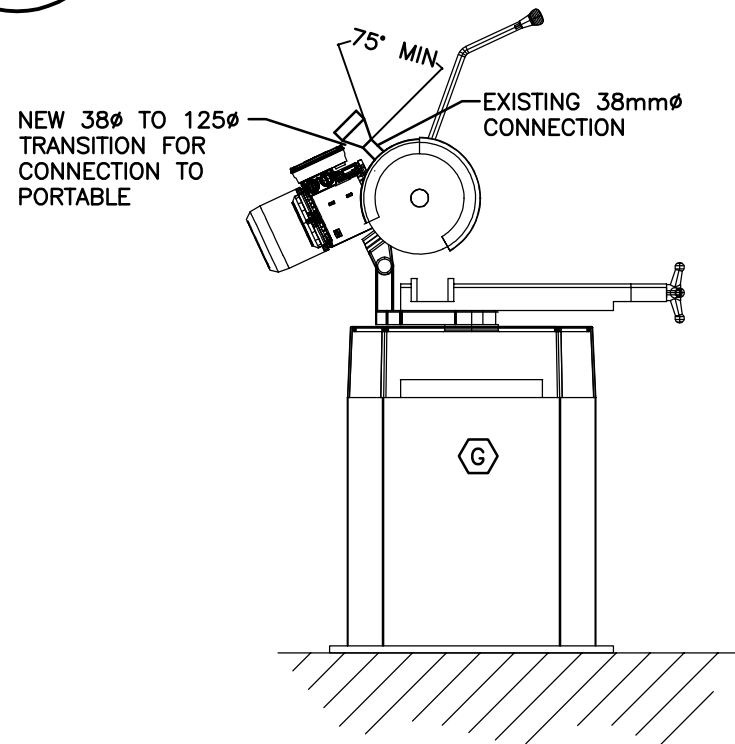
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M-504 SCALE: N.T.S.



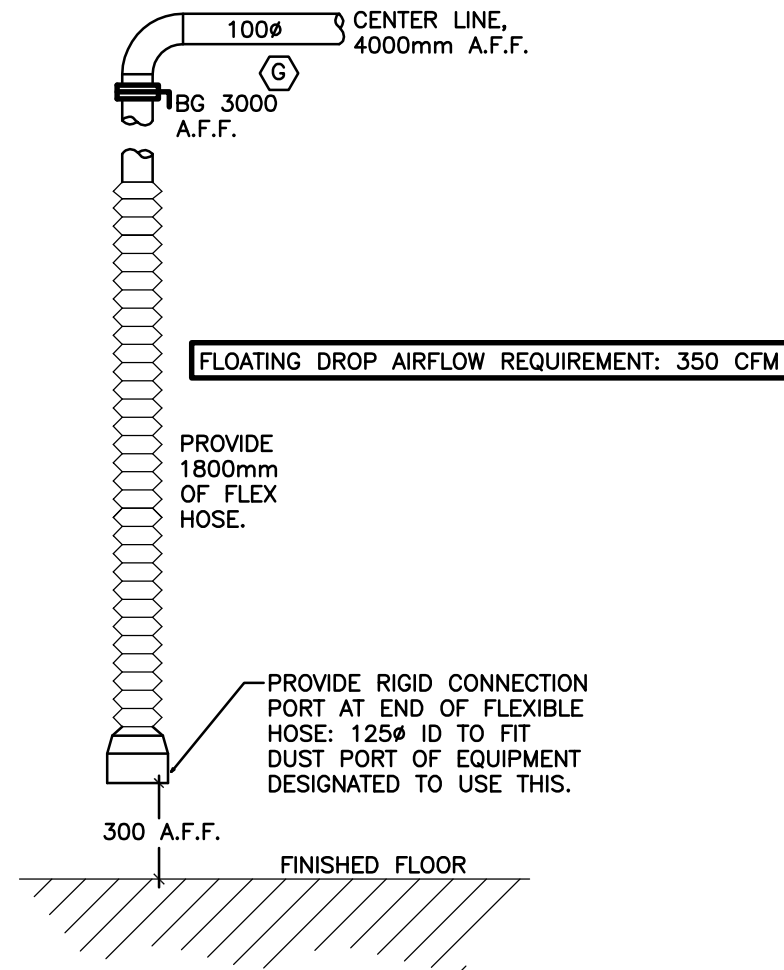
3 LATHE CONNECTION DETAIL
M-504 SCALE: N.T.S.



1
M-505
PLANER CONNECTION DETAIL
SCALE: N.T.S.



2
M-505
MITER SAW CONNECTION DETAIL
SCALE: N.T.S.



3
M-505
FLOATING DROP DETAIL
SCALE: N.T.S.

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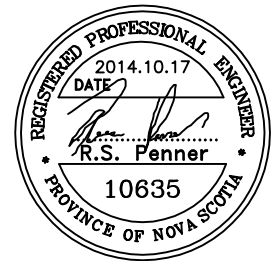
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APPROVED BY:	M.G.
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PROJECT
ROCKY LAKE JR. HIGH
SCHOOL
DUST COLLECTION
SYSTEM REMEDIATION
BEDFORD, NS

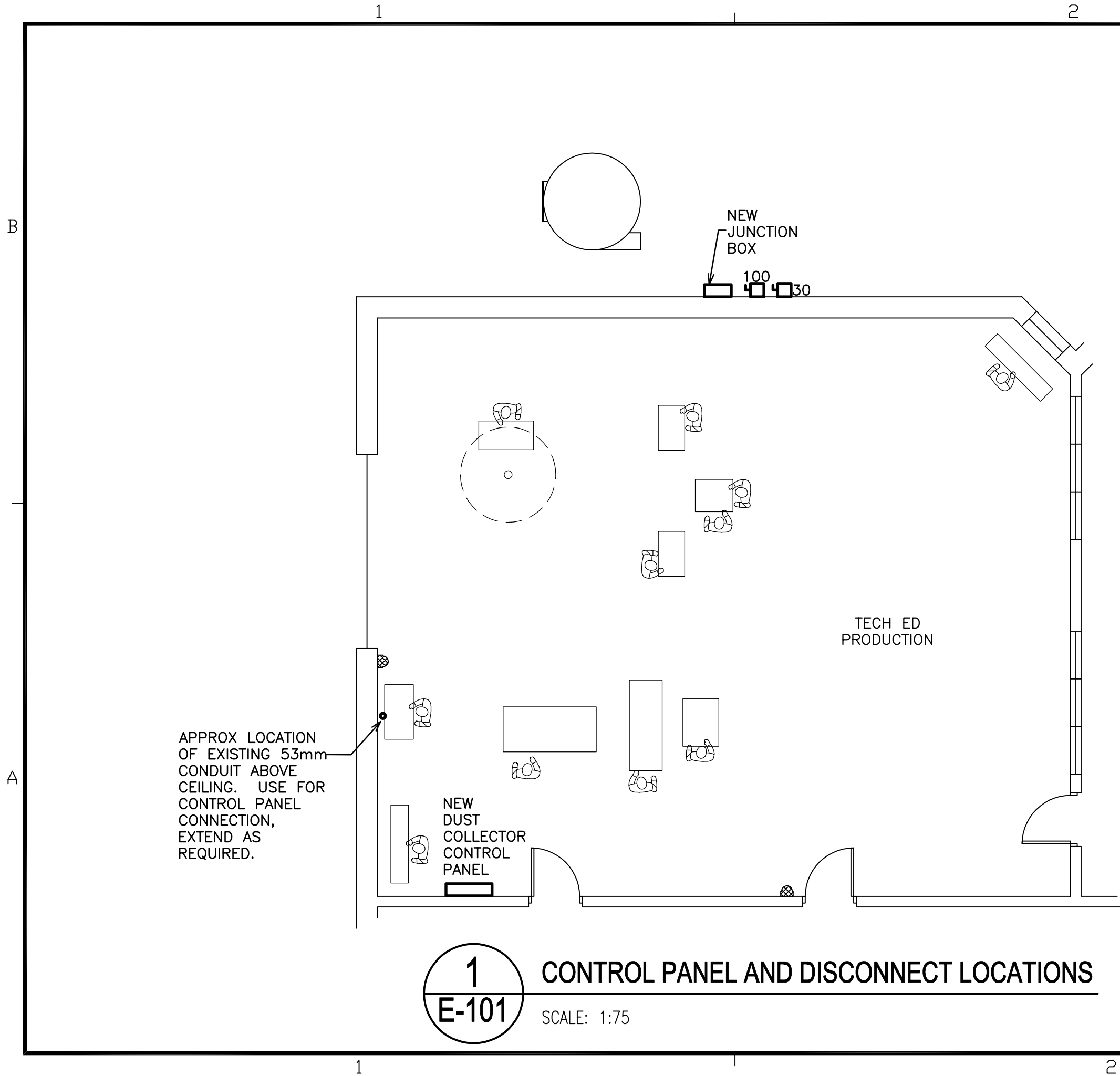
PROJECT NO.: 10-14-006

SHEET TITLE
PLANER AND MITER
SAW CONNECTION
DETAILS

INTERNAL NO.: 10-14-006

M-505

SHEET 10 OF 10



APPROX LOCATION OF EXISTING 53mm CONDUIT ABOVE CEILING. USE FOR CONTROL PANEL CONNECTION, EXTEND AS REQUIRED.

1
E-101

CONTROL PANEL AND DISCONNECT LOCATIONS

SCALE: 1:75

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Engineering and Design Division
Building Design Section

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PROJECT

ROCKY LAKE JUNIOR HIGH SCHOOL
DUST COLLECTION SYSTEM REMEDIATION
BEDFORD, NS

PROJECT NO.: 10-14-006

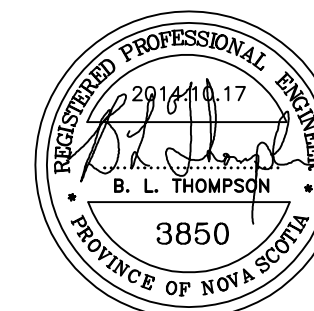
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DUST COLLECTOR CONTROL PANEL AND DISCONNECT LOCATIONS

INTERNAL NO.: 10-14-006

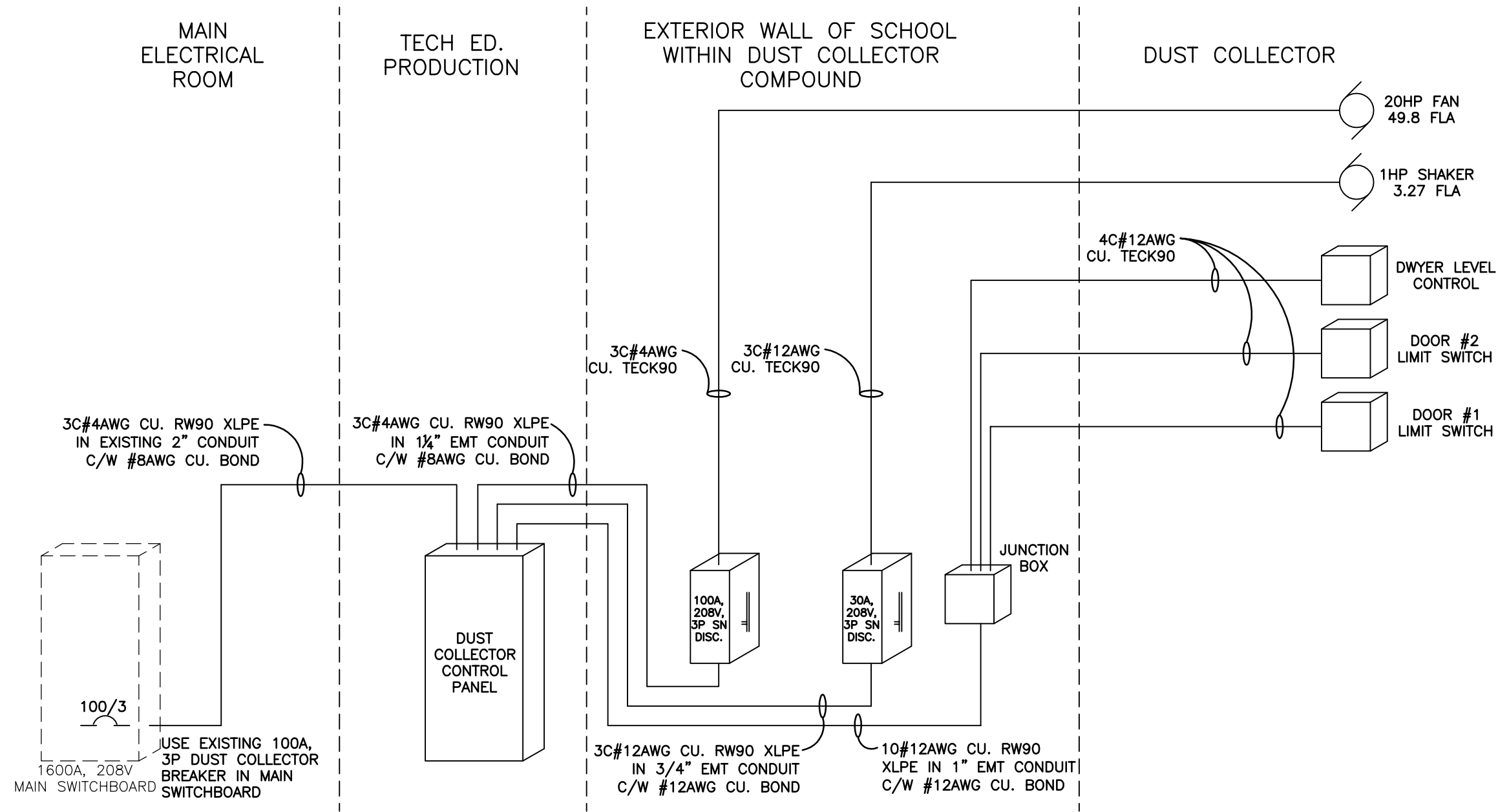
E-101

SHEET 1 OF 3



B



A

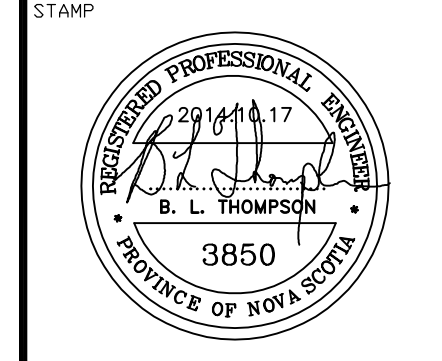


1
E-102

DUST COLLECTOR POWER AND CONTROL ONE-LINE DIAGRAM

SCALE: N.T.S.

SCALE	
2014/10/17	ISSUED FOR REVIEW
DATE	MARK  ISSUE



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DRAWN BY:	
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PROJECT
 ROCKY LAKE JUNIOR
 HIGH SCHOOL
 DUST COLLECTION
 SYSTEM REMEDIATION
 BEDFORD, NS

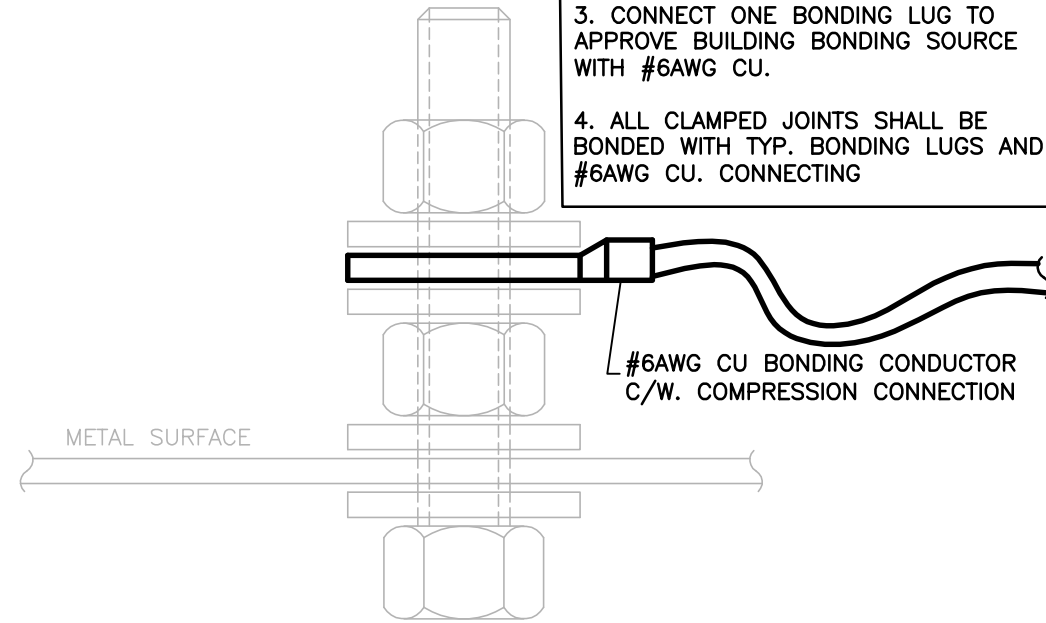
PROJECT NO.: 10-14-006

SHEET TITLE
 BONDING DETAILS

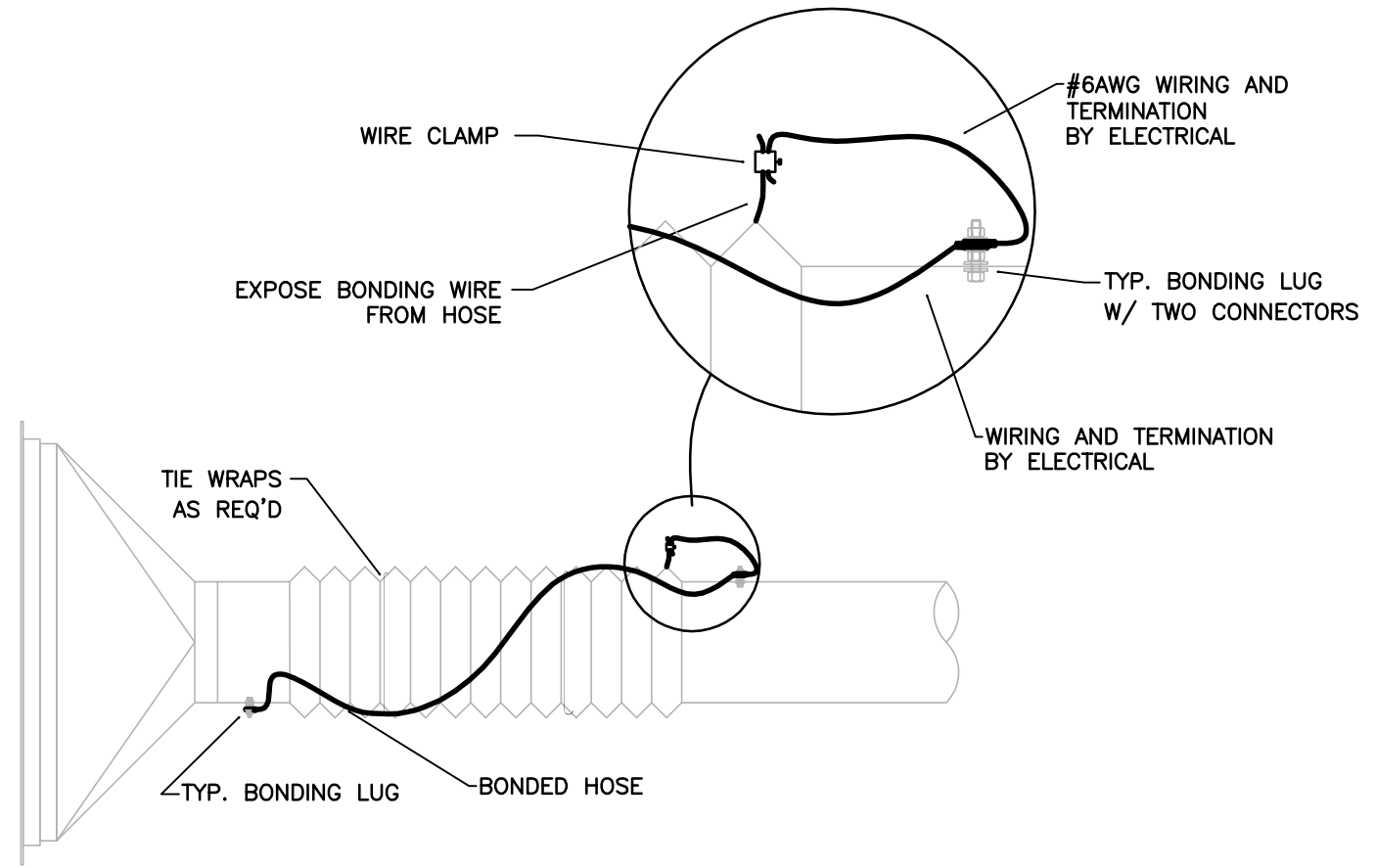
INTERNAL NO.: 10-14-006

E-103

NOTES:
 1. ENTIRE SYSTEM SHALL BE BONDED. ANY ISOLATED METALLIC MEMBER SHALL BE EQUIPPED WITH BONDING LUG AND ELECTRICALLY BONDED TO THE SYSTEM.
 3. CONNECT ONE BONDING LUG TO APPROVE BUILDING BONDING SOURCE WITH #6AWG CU.
 4. ALL CLAMPED JOINTS SHALL BE BONDED WITH TYP. BONDING LUGS AND #6AWG CU. CONNECTING



1
E-103
 TYP. BONDING LUG DETAIL
 SCALE: N.T.S.



2
E-103
 BONDING HOSE BONDING DETAIL
 SCALE: N.T.S.



Transportation and
Infrastructure Renewal
Engineering and Design Division
Building Design Section

PROJECT TITLE:

**BROOKSIDE JUNIOR HIGH SCHOOL
DUST COLLECTION SYSTEM
SYSTEM REMEDIATION**

LOCATION

HATCHET LAKE, NS

PROJECT NUMBER: **10-14-006**

TENDER NUMBER: 3706

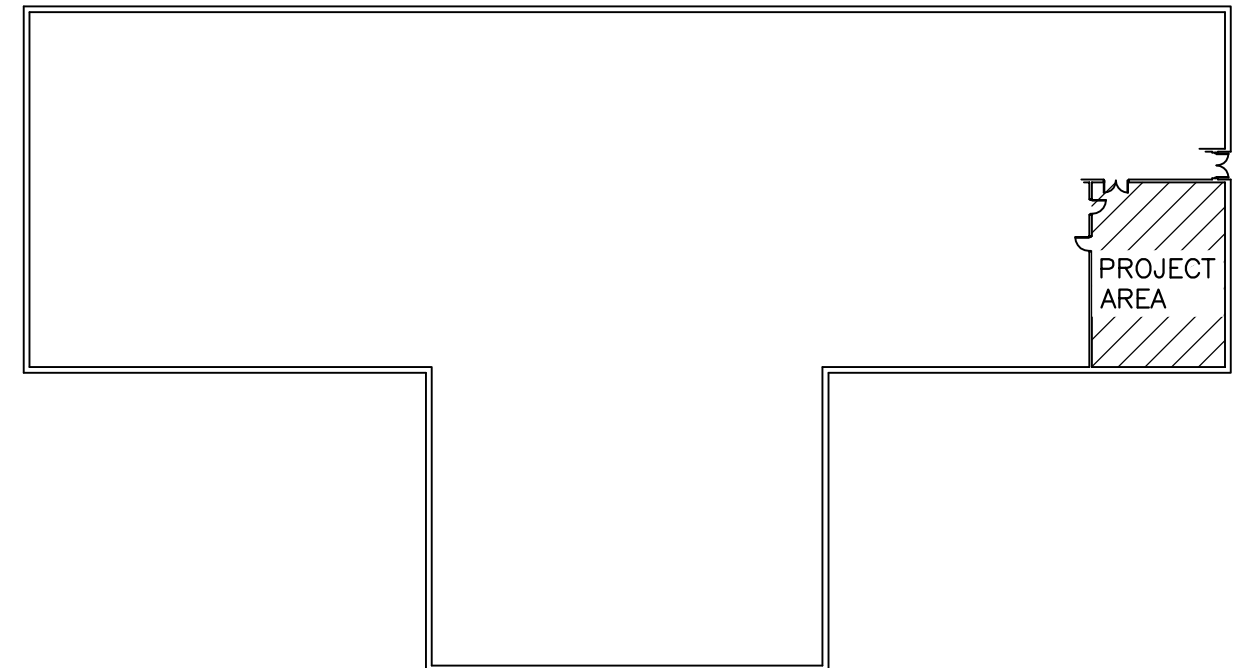
DATE: OCTOBER 2014



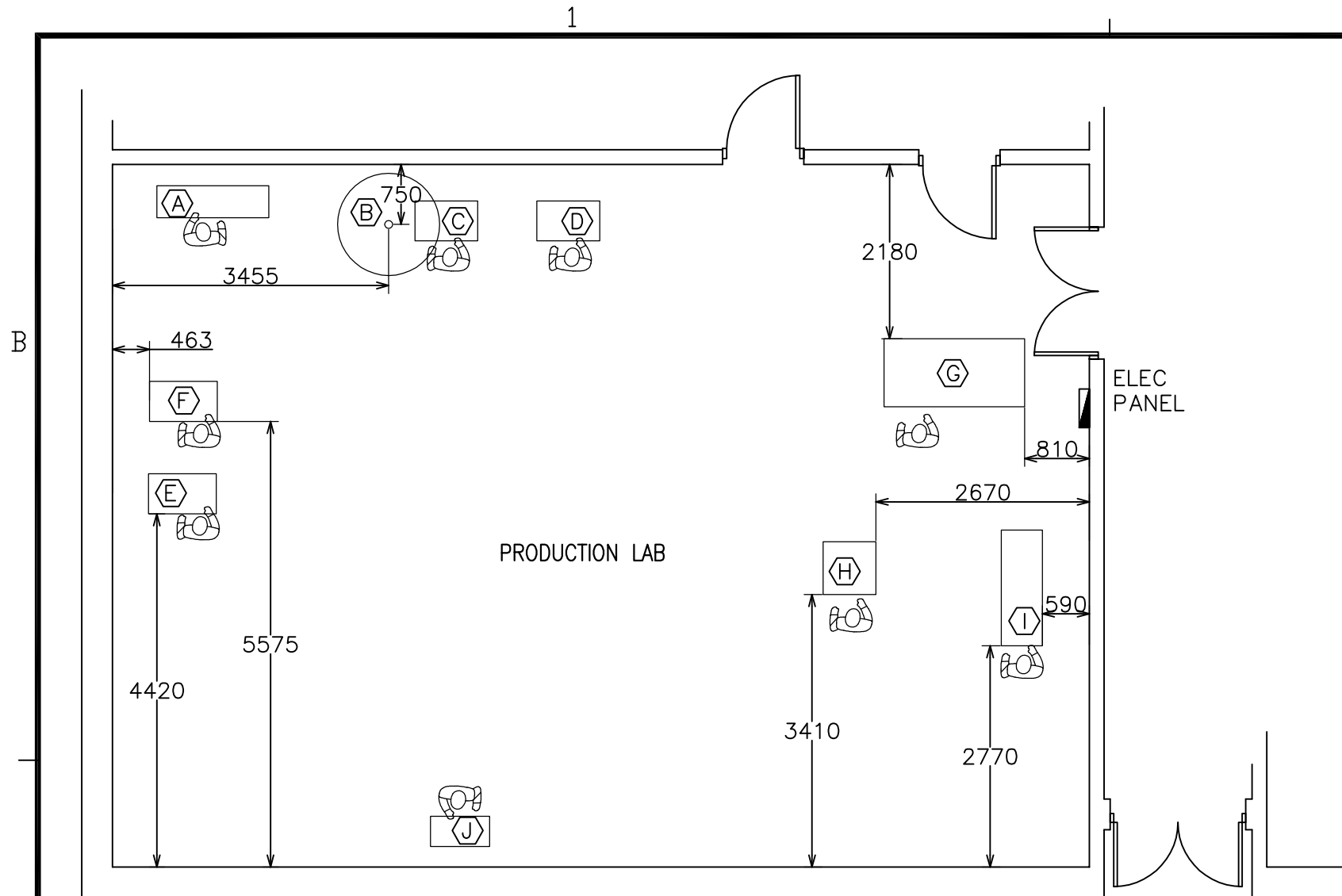
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LIST OF DRAWINGS:

- M-101 WOOD LAB LAYOUT AND MACHINE REQUIREMENTS
- M-102 DEMOLITION PLAN
- M-103 WOOD LAB DUST COLLECTION DUCT LAYOUT
- M-104 DUST COLLECTOR PLAN
- M-201 DUST COLLECTOR ELEVATION
- M-501 DUCTWORK DETAILS & BONDING LUG DETAIL
- M-502 ACCESS HATCH, CONCRETE PAD AND FENCE POST DETAILS
- M-503 TABLE SAW AND BAND SAW CONNECTION DETAILS
- M-504 JOINTER, PLANER AND CNC ROUTER CONNECTION DETAILS
- M-505 CHOP SAW, LATHE AND FLOATING DROP CONNECTION DETAILS
- M-506 EXTERIOR DUCT SUPPORT DETAIL
- E-101 DUST COLLECTOR CONTROL PANEL AND DISCONNECTS LOCATIONS AND DETAILS
- E-102 DUST COLLECTOR ELECTRICAL ONE-LINE DIAGRAM
- E-103 BONDING DETAILS



KEY PLAN



DUST COLLECTOR SUMMARY			
ID	DESCRIPTION	AIRFLOW REQ'D CFM	CONNECTION METHOD
A	LATHE (GENERAL)	-	PORTABLE
B	FLOATING DROP	400	DIRECT
C	CHOP SAW (DEWALT)	-	PORT./FLOAT
D	CNC ROUTER (GENERAL)	-	PORT./FLOAT
E	BAND SAW (ROCKWELL)	550	DIRECT
F	BAND SAW	550	DIRECT
G	TABLE SAW (SAWSTOP)	500	DIRECT
H	PLANER (GENERAL)	800	DIRECT
I	JOINTER (GENERAL)	400	DIRECT
J	ROUTER TABLE	-	PORTABLE
DUST COLLECTOR TOTAL - 3200CFM			

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PROJECT
 BROOKSIDE JUNIOR HIGH SCHOOL
 DUST COLLECTION SYSTEM REMEDIATION
 HATCHET LAKE, NS
 PROJECT NO.: 10-14-006

SHEET TITLE
 WOOD LAB LAYOUT AND MACHINE REQUIREMENTS

INTERNAL NO.: 10-14-006

M-101

1 WOOD LAB FLOOR PLAN
 M-101 SCALE: 1:75

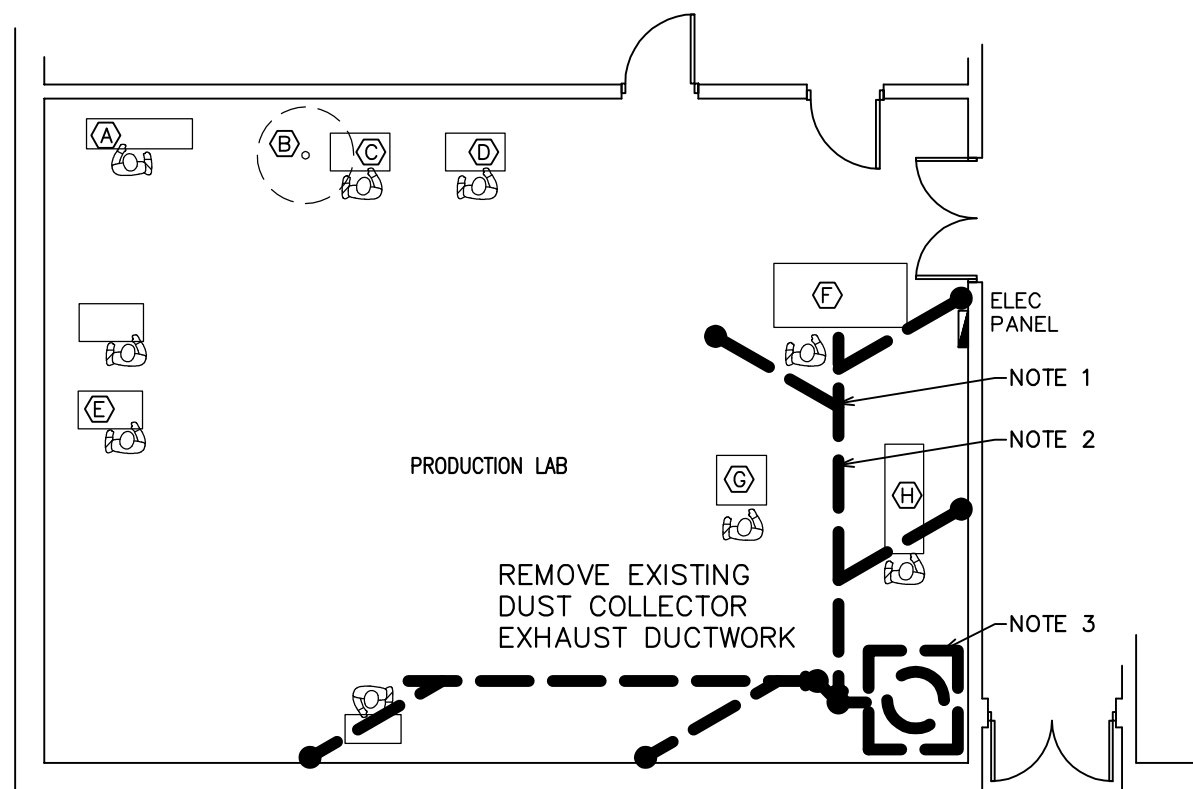
LEGEND

	SMACNA CLASS 3 DUST COLLECTION DUCTWORK		CHAIN LINK FENCING
	ACCESS DOOR		CHAIN LINK FENCING C/W METAL CLADDING
	WOODWORKING EQUIPMENT IDENTIFIER		EXISTING DUCT TO BE REMOVED
	BLAST GATE, LOCKABLE		DESIGNATES DIRECTION OF BARREL REMOVAL
	APPROX. LOCATION OF LIGHT FIXTURE		APPROXIMATE LOCATION OF SPRINKLER HEAD

A

B

A



DEMOLITION NOTES:

1. REMOVE ALL EXISTING INTERIOR DUST COLLECTOR DUCTWORK AND ACCESSORIES. EXISTING DUCT LAYOUT IS APPROXIMATE.
2. REPAIR & FINISH CEILINGS AND WALLS WHERE AFFECTED BY DUCTWORK REMOVAL.
3. REMOVE EXISTING DUST COLLECTOR. SOME DISASSEMBLY MAY BE REQUIRED. FOLLOW OWNERS PROCEDURES FOR ANY HOT WORK, IF REQUIRED.
4. REMOVE EXISTING INTERIOR DUST COLLECTOR WIRING AND ACCESSORIES.

1 DEMOLITION PLAN
M-102 SCALE: 1:100

LOGO:



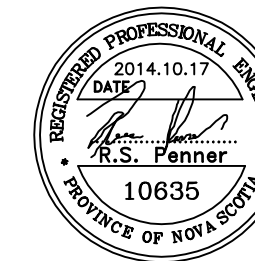
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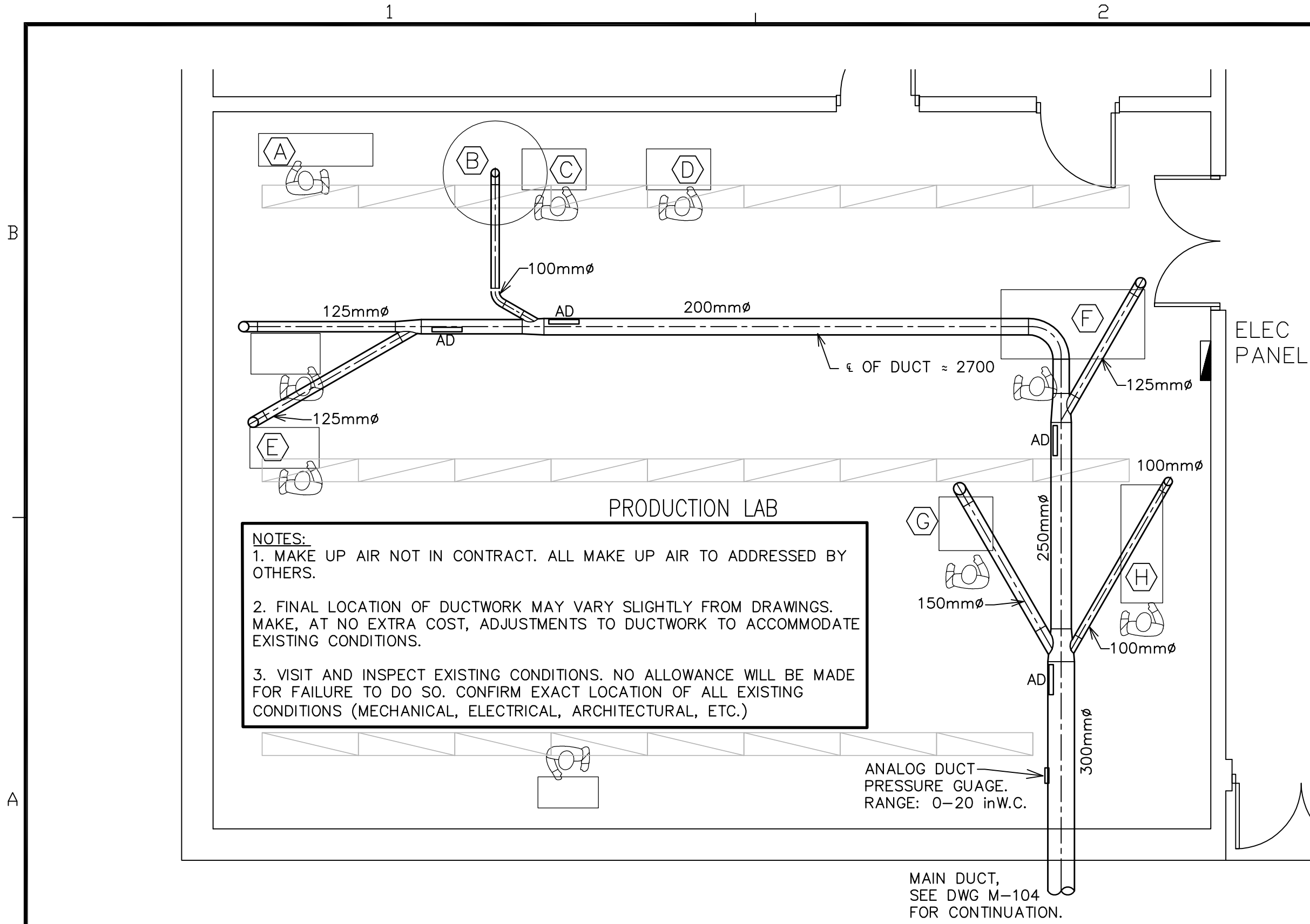
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 DUST COLLECTION SYSTEM REMEDIATION
 HATCHET LAKE, NS
 PROJECT NO.: 10-14-006

SHEET TITLE
DEMOLITION PLAN

INTERNAL NO.: 10-14-006

M-102



NOTES:
 1. MAKE UP AIR NOT IN CONTRACT. ALL MAKE UP AIR TO ADDRESSED BY OTHERS.
 2. FINAL LOCATION OF DUCTWORK MAY VARY SLIGHTLY FROM DRAWINGS. MAKE, AT NO EXTRA COST, ADJUSTMENTS TO DUCTWORK TO ACCOMMODATE EXISTING CONDITIONS.
 3. VISIT AND INSPECT EXISTING CONDITIONS. NO ALLOWANCE WILL BE MADE FOR FAILURE TO DO SO. CONFIRM EXACT LOCATION OF ALL EXISTING CONDITIONS (MECHANICAL, ELECTRICAL, ARCHITECTURAL, ETC.)

MAIN DUCT,
 SEE DWG M-104
 FOR CONTINUATION.

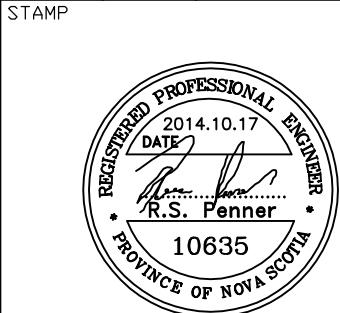
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M-103 **DUST COLLECTOR DUCTWORK PLAN**
 SCALE: 1:50

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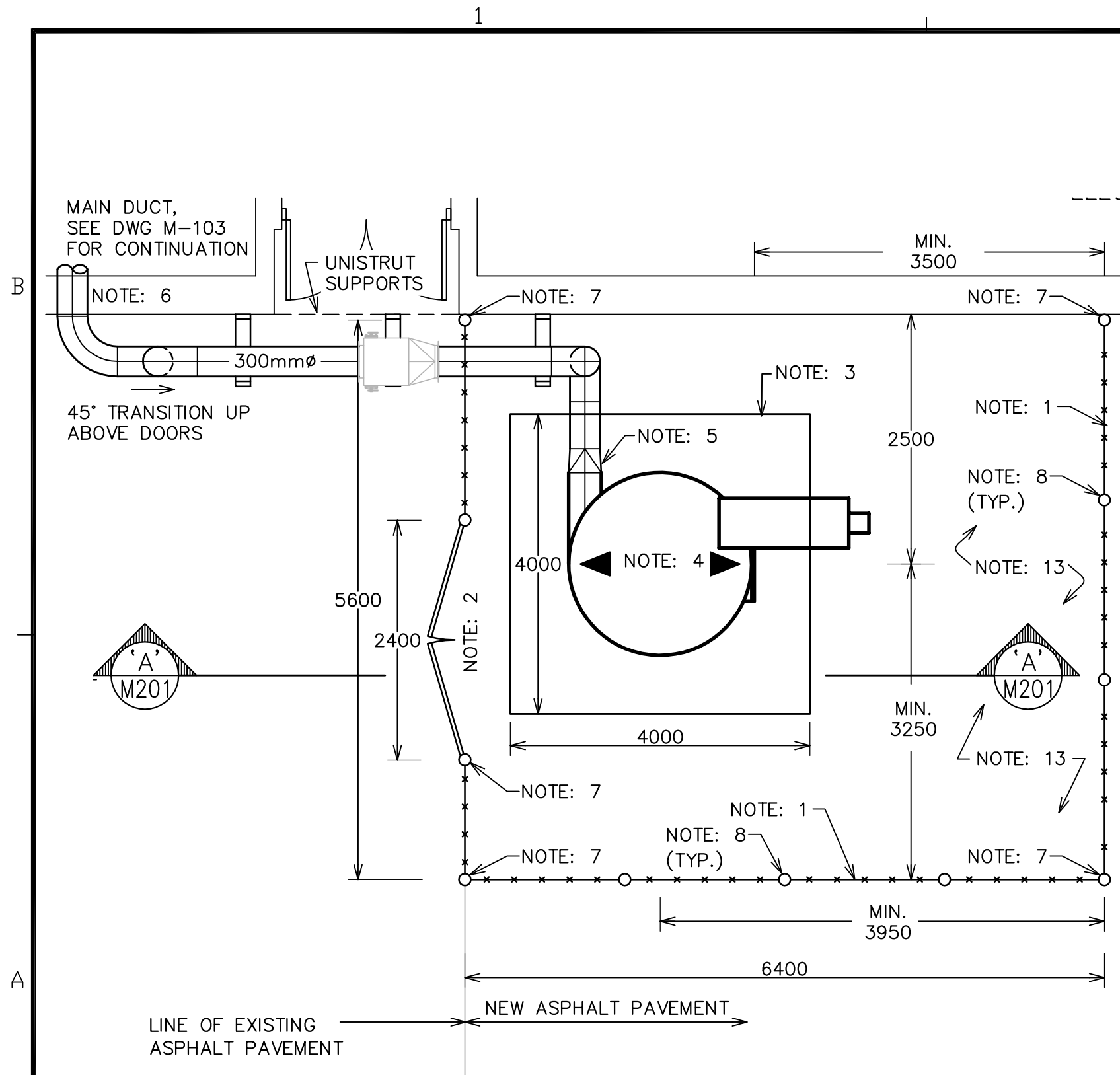
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PROJECT
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 HIGH SCHOOL
 DUST COLLECTION
 SYSTEM REMEDIATION
 HATCHET LAKE, NS
 PROJECT NO.: 10-14-006

SHEET TITLE
 WOOD LAB DUST
 COLLECTION DUCT
 LAYOUT

INTERNAL NO.: 10-14-006

M-103

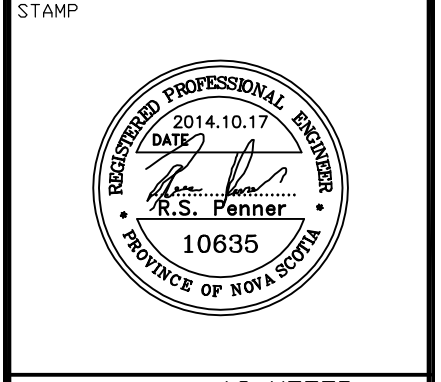


1 DUST COLLECTOR PLAN
M-104 SCALE: 1:50

- NOTES:
- INSTALL NEW GALVANIZED STEEL FENCE, 2400 HIGH, 42 OD MID RAIL, 42 OD TOP RAIL SCHED 40, 9 GAUGE GALVANIZED STEEL FABRIC, 6 GAUGE GALVANIZED STEEL BOTTOM WIRE.
 - INSTALL NEW LOCKABLE GATES IN THIS LOCATION. SCHOOL TO ENSURE GATES REMAIN CLOSED WITH FENCED AREA UNOCCUPIED WHILE DUST COLLECTOR IS RUNNING AND 15 MIN AFTER DUST COLLECTOR STOPS. 42 OD SCHED 40 STEEL FRAMING W/ HEAVY DUTY HARDWARE.
 - PROVIDE NEW CONCRETE PAD TO SUPPORT NEW DUST COLLECTOR. PROVIDE (2) NEW 3/4"Ø ADHESIVE ANCHOR BOLTS PER LEG (8 TOTAL). STANDARD OF ACCEPTANCE: HILTI 10M REINFORCEMENTS 300 OC. EACH DIRECTION 75mm CONCRETE COVER. COORDINATE ANCHOR BOLT LOCATION DUST COLLECTOR.
 - NEW DUST COLLECTOR SUPPLIED BY OTHERS AND INSTALLED BY THIS CONTRACTOR. CONFIRM FOLLOWING DUST COLLECTOR SPECS: 2650CFM, 208V 3Ø 20HP W/ BACKFLOW PREVENTER, DEFLECTOR, AND SILENCER.
 - BACKDRAFT DAMPER BY OTHERS. TRANSITION REQUIRED TO CONNECT TO BACKDRAFT DAMPER. CONFIRM ALL DIMENSIONS.
 - NEW WALL PENETRATIONS. CAULK ANY GAPS BETWEEN INSULATION AND WALL.
 - TERMINAL POST 89 OD SCHED 40 STEEL CONCRETE FILLED POST HOLES 250Ø TO MINIMUM DEPTH OF 1100.
 - INTERMEDIATE POST 60 OD SCHED 40 MAX SPACING 2400. CONCRETE FILLED POST HOLES 250Ø TO MINIMUM DEPTH OF 1100.
 - PROVIDE SMOOTH TRANSITION FROM NEW CONCRETE PAD FOR BARREL REMOVAL. MAKE UP ELEVATION DIFFERENCES WITH MAX. 3:1 SLOPING CONCRETE SECTIONS.
 - COORDINATE/CONFIRM WITH OWNER AND UTILITY THE ABSENCE OF U/G PIPING/ELECTRICAL PRIOR TO ANY EXCAVATION.
 - INSTALL WARNING SIGNS AS SUPPLIED BY OWNER (3 PLACES).
 - EXTEND ASPHALT PAVING THROUGHOUT FENCED ENCLOSURE.

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 SYSTEM REMEDIATION
 HATCHET LAKE, NS
 PROJECT NO.: 10-14-006

SHEET TITLE
 DUST COLLECTOR
 PLAN

INTERNAL NO.: 10-14-006

M-104

LOGO:



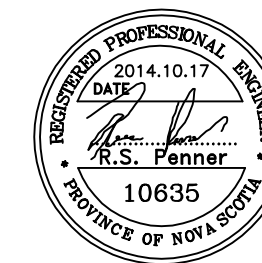
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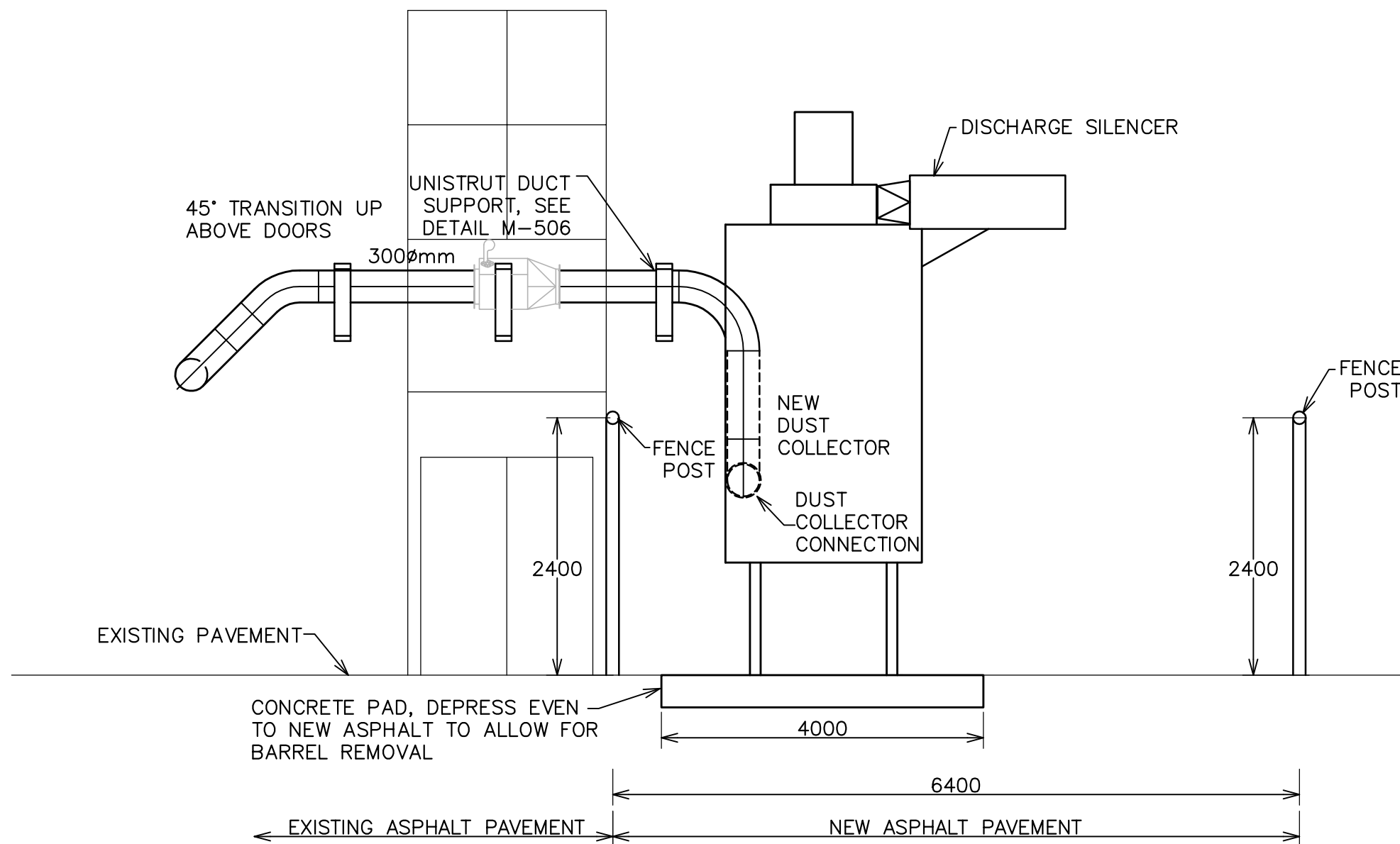
PROJECT
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HIGH SCHOOL
DUST COLLECTION
SYSTEM REMEDIATION
HATCHET LAKE, NS
PROJECT NO.: 10-14-006

SHEET TITLE
DUST COLLECTOR
ELEVATION

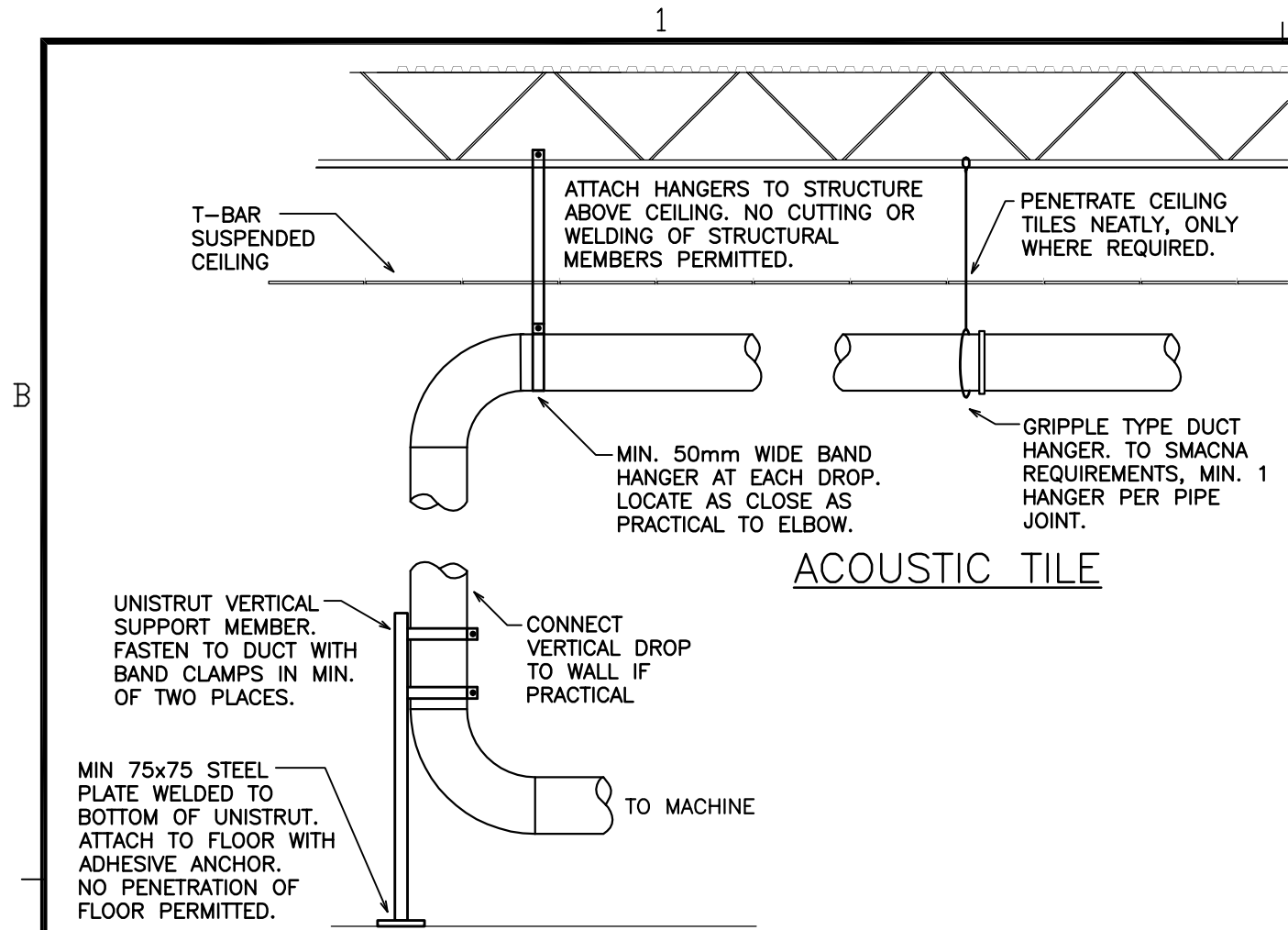
INTERNAL NO.: 10-14-006

M-201

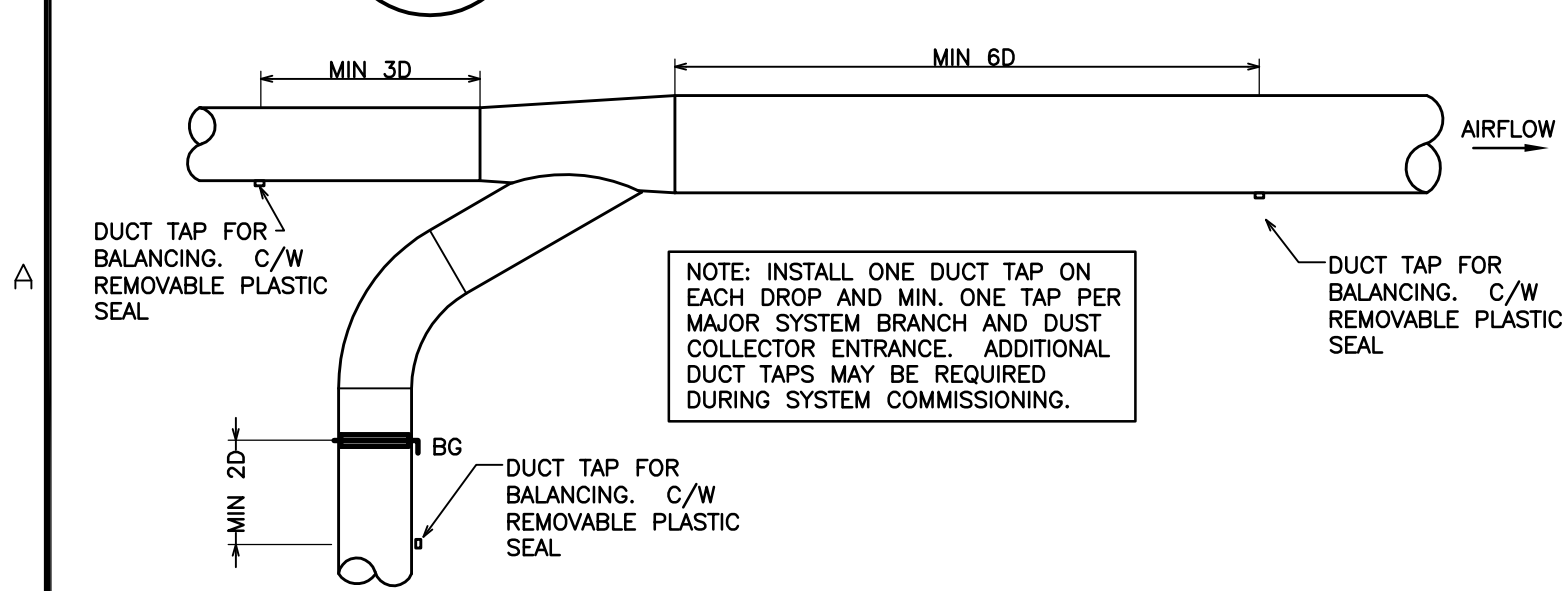
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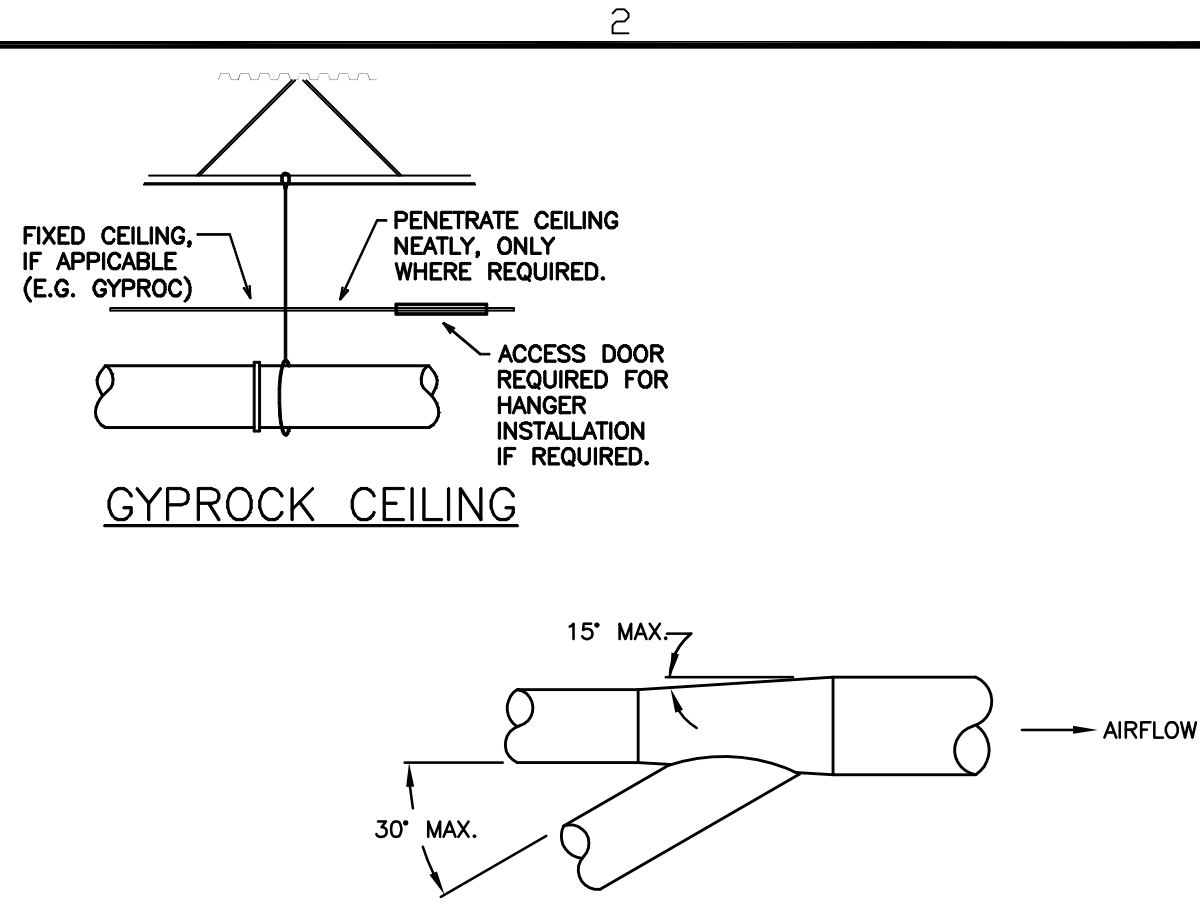
1 DUST COLLECTOR ELEVATION
M-201 SCALE: 1:50



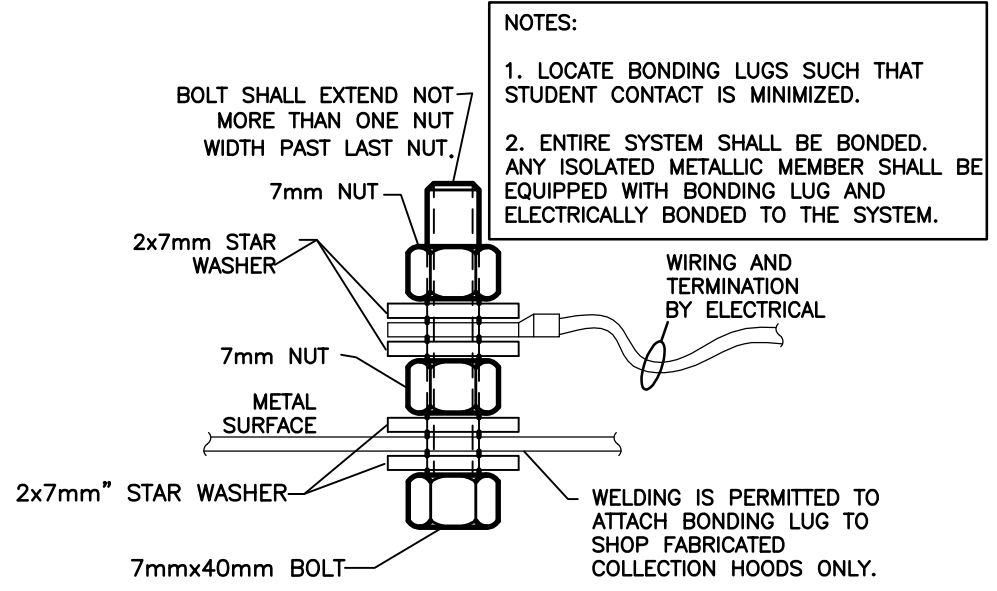
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M-501
TYP. DUCT HANGER DETAILS
SCALE: N.T.S.



2
M-501
DUCT TAP DETAIL
SCALE: N.T.S.

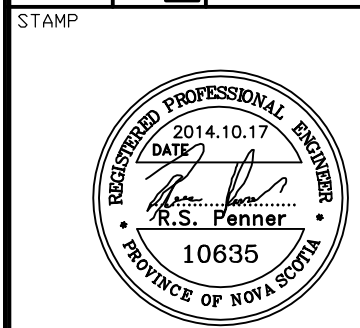


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M-501
DUCT TRANSITION DETAIL
SCALE: N.T.S.



4
M-501
BONDING LUG DETAIL
SCALE: N.T.S.

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PROJECT
BROOKSIDE JUNIOR HIGH SCHOOL
DUST COLLECTION SYSTEM REMEDIATION
HATCHET LAKE, NS
PROJECT NO.: 10-14-006

SHEET TITLE
DUCTWORK DETAILS AND BONDING LUG DETAIL

INTERNAL NO.: 10-14-006

M-501

NOTE:

MANUFACTURER SUPPLIED ACCESS PANELS ARE ACCEPTABLE PROVIDED OPENING SIZE SPECIFIED IS MAINTAINED.

STD. OF ACCEPTANCE:
NORDFAB, K-B DUCT OR
ENGINEER APPROVED ALTERNATE

MOUNTING PLATE
AS REQUIRED

MIN. 18ga.

DOOR W/ GASKET
SEE SPEC.

TYP. BONDING LUGS

GASKET INSPECTION DOOR WITH MIN. 7x19mm CLOSED CELL RUBBER. APPLY CONTINUOUS GASKET TO DOOR USING HEAVY DUTY ADHESIVE CEMENT.

CONTINUOUS HINGE FULL LENGTH OF DOOR.

TWO ADJUSTABLE DRAW LATCHES PER DOOR

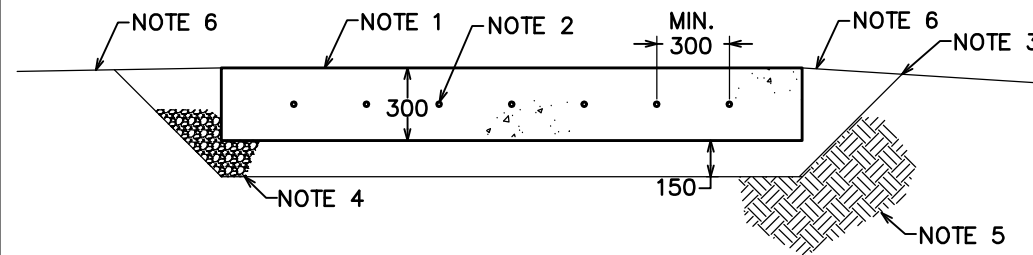
#6AWG CU BONDING WIRE
ALLOW ENOUGH SLACK SO AS NOT TO INTERFERE WITH OPERATION OF DOOR.

DUCT OPENING AND INSPECTION DOOR SIZES TO BE AS FOLLOWS:

DUCT DIA. (mm)	OPENING SIZE (mm)	DOOR SIZE (mm)
100 TO 150	100x150	150x200
175 TO 250	150x200	200x250
275+	200x250	250x300

1 ACCESS HATCH DETAIL
M-502 SCALE: N.T.S.

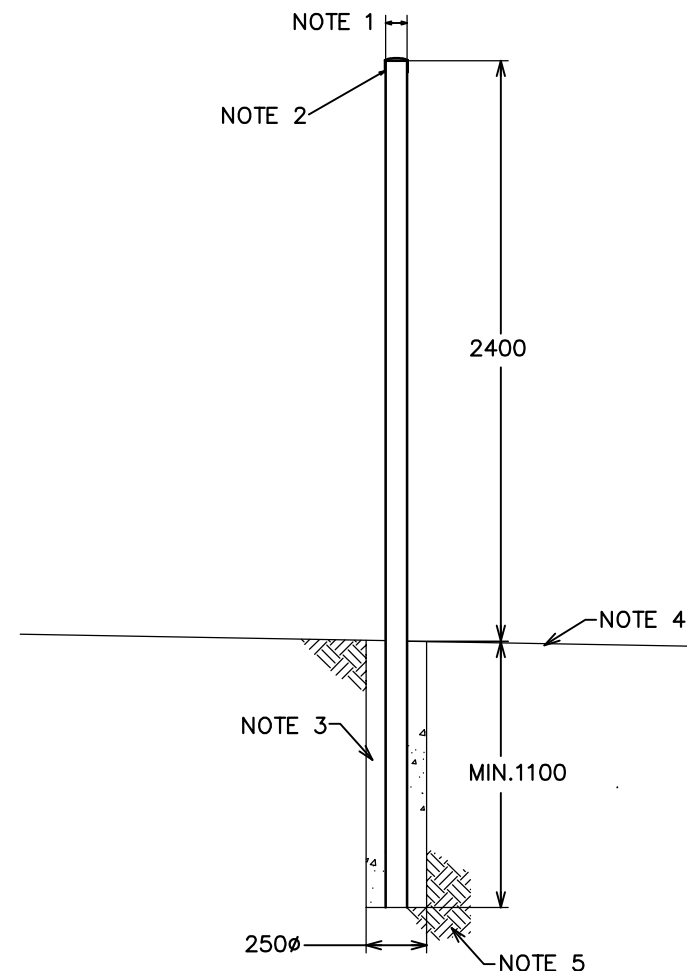
- NOTES:**
1. PROVIDE NEW CONCRETE PAD WITH AIR ENTRAINMENT, SIZE AS INDICATED.
 2. TYP. 10M REINFORCEMENTS 300 O/C EACH DIRECTION 150mm CONCRETE COVER.
 3. WHERE BARREL REMOVAL IS INDICATED BRING HARD SURFACE TO THE LEVEL OF THE CONCRETE PAD. WITH A SMOOTH TRANSITION SLOPE AWAY FROM PAD IN ALL DIRECTIONS.
 4. REMOVE EXISTING ORGANIC LAYER. FILL WITH MIN 150 TYPE 1 GRAVEL, COMPACTED TO DESIRED GRADE. CONTRACTOR RESPONSIBLE FOR REMOVAL AND DISPOSAL OF ALL SOILS AS REQUIRED FROM SITE.
 5. UNDISTURBED NATIVE SOILS.
 6. NEW ASPHALT PAVEMENT.



2 CONCRETE PAD DETAIL
M-502 SCALE: N.T.S.

NOTES:

1. 89 OD SCHED 40 GA;V. STEEL FOR TERMINAL POSTS. 60 OD SCHED 40 GALV. STEEL FOR INTERMEDIATE POSTS. MAXIMUM SPACING BETWEEN POSTS SHALL BE 2.4m.
2. PROVIDE CAP TO PREVENT WATER FROM ENTERING POST.
3. CONCRETE FILLED POST HOLE (1100 DEEP, 250φ). CONSULT WITH THE OWNER TO ENSURE THAT THERE ARE NO KNOWN U/G SERVICES, PIPING, CONDUITS, ETC. LOCATED AT PROPOSED POST HOLE LOCATIONS.
4. EXISTING GRADE. REPLACE SOD WHERE REQUIRED. REINSTATE SURFACE FINISHES(SOD, ASPHALT, ETC.).
5. UNDISTURBED NATIVE SOILS.



3 FENCE POST DETAIL
M-502 SCALE: N.T.S.

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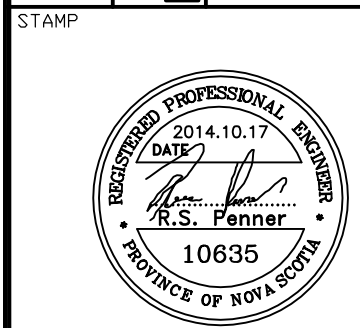
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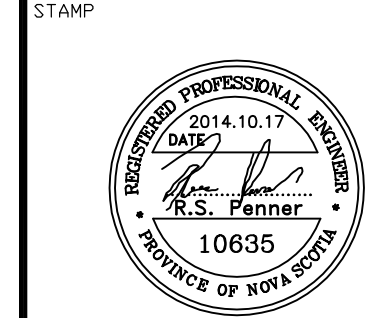
PROJECT
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DUST COLLECTION SYSTEM REMEDIATION
HATCHET LAKE, NS
PROJECT NO.: 10-14-006

SHEET TITLE
ACCESS HATCH.
CONCRETE PAD
AND FENCE POST
DETAILS

INTERNAL NO.: 10-14-006

M-502

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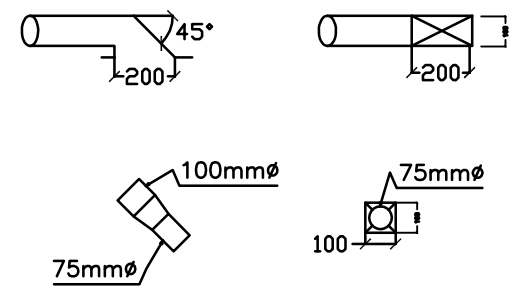
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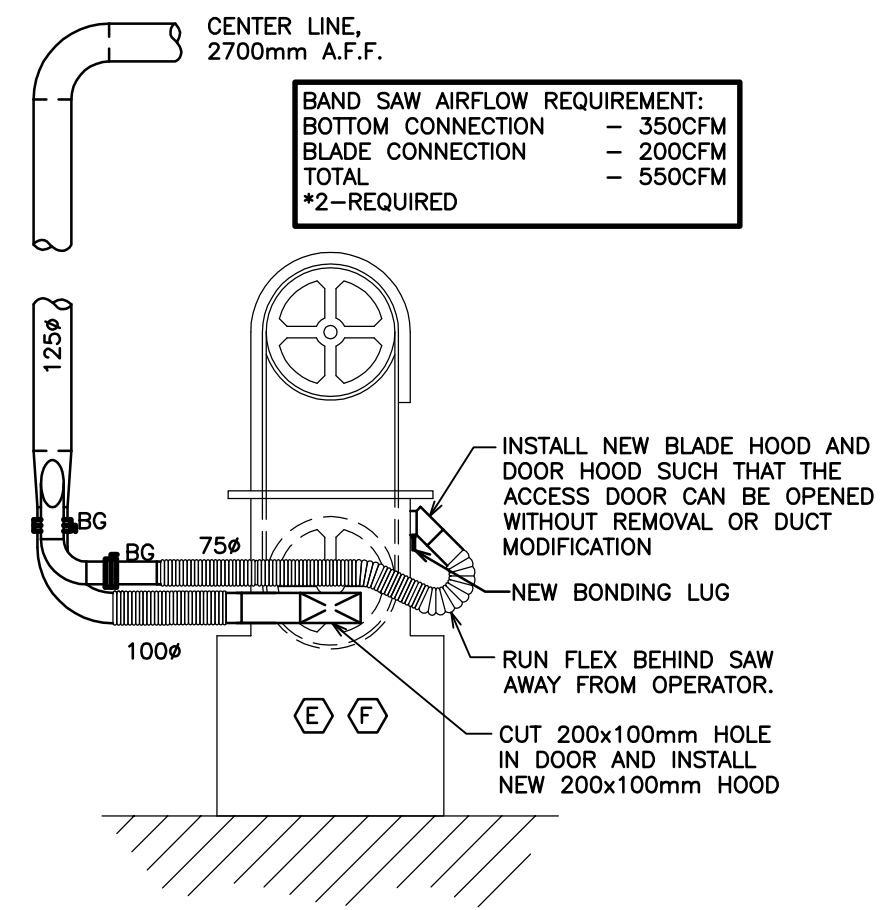
SHEET TITLE
 TABLE SAW AND
 BAND SAW
 CONNECTION
 DETAILS

INTERNAL NO.: 10-14-006

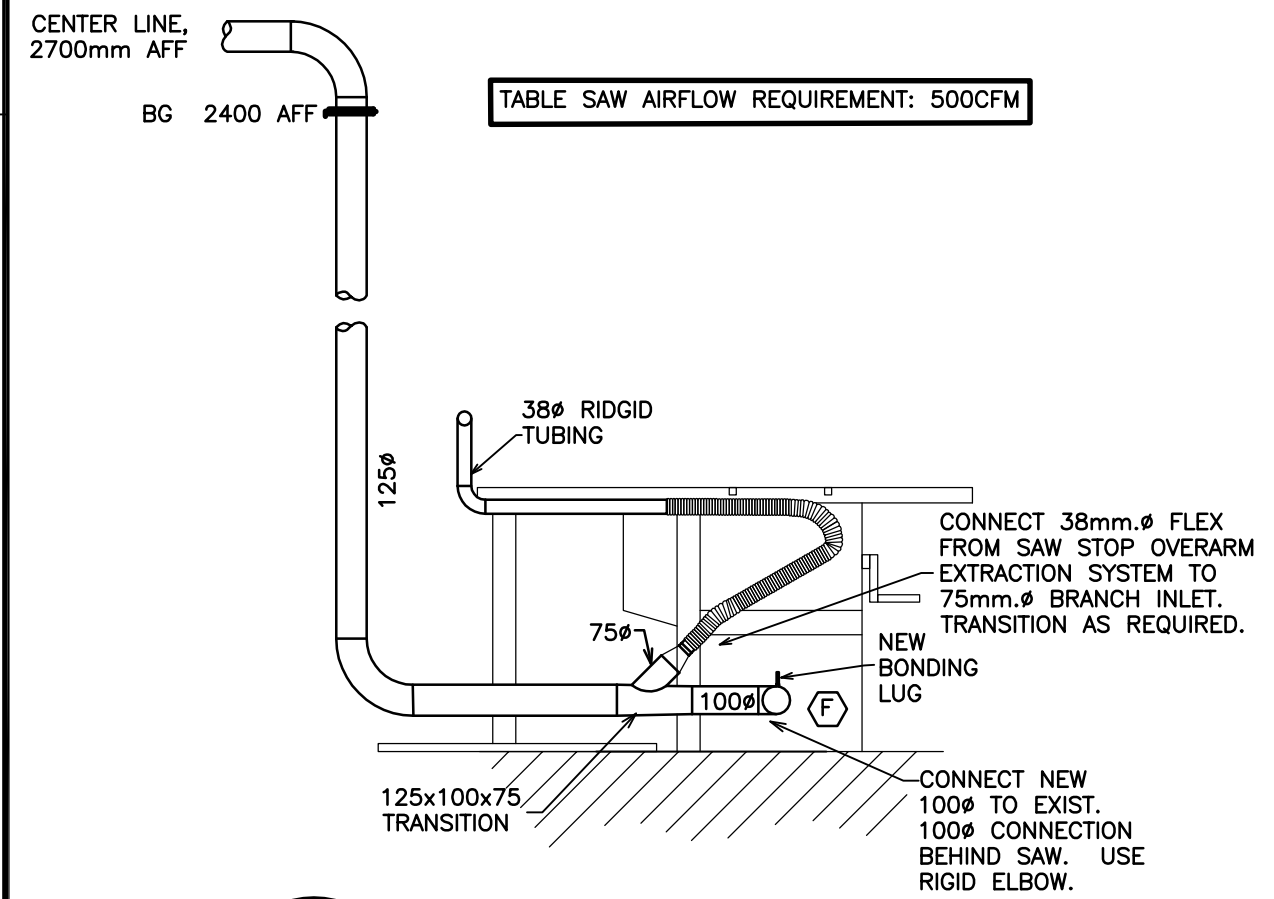
M-503



3
M-503 **BAND SAW HOOD DETAIL**
 SCALE: N.T.S.



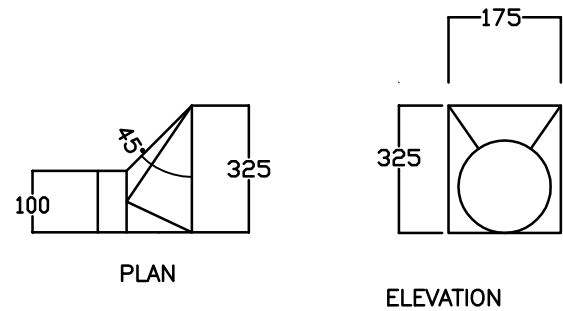
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M-503 **BAND SAW CONNECTION DETAIL**
 SCALE: N.T.S.



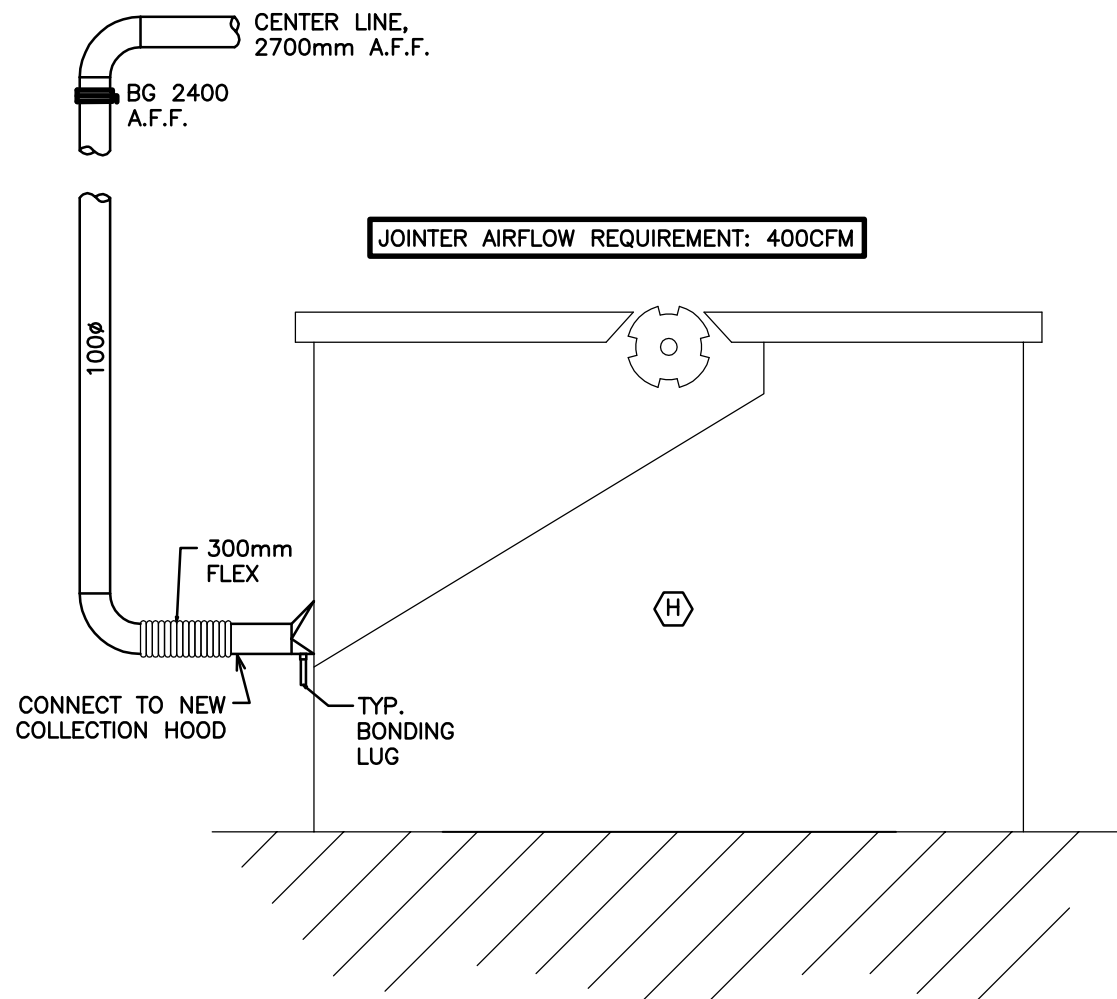
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M-503 **TABLE SAW CONNECTION DETAIL**
 SCALE: N.T.S.

B

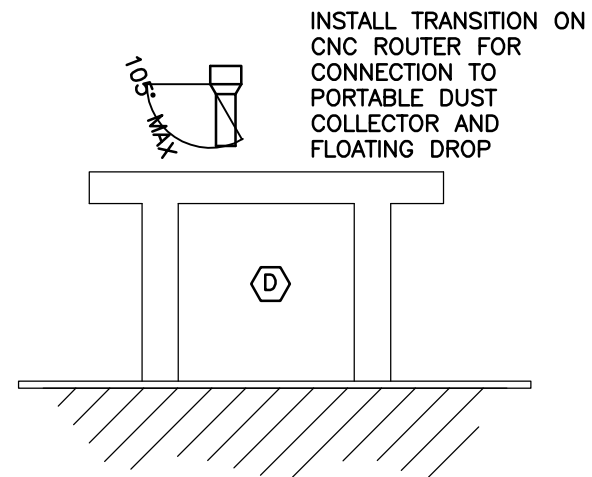
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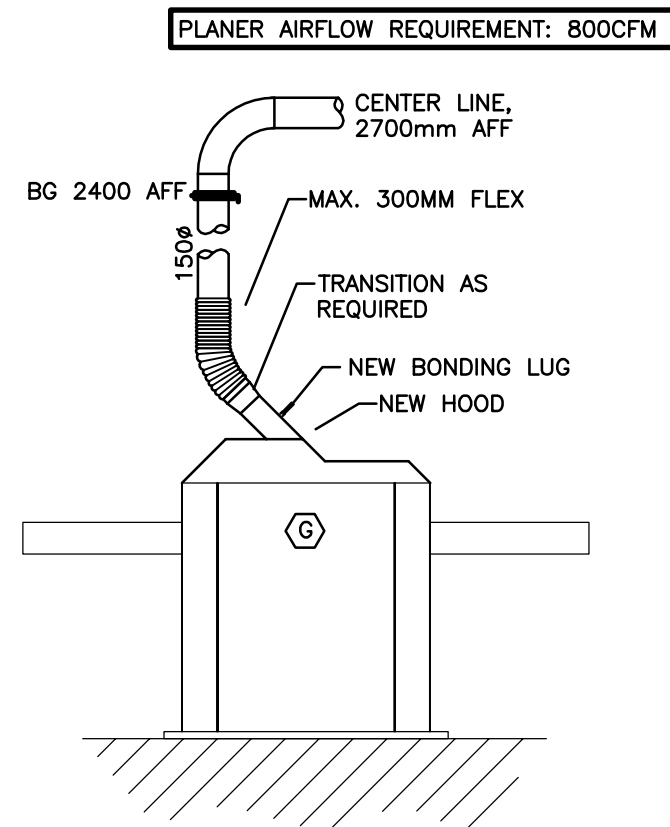
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M-504 JOINTER HOOD DETAILS
SCALE: N.T.S.



2
M-504 JOINTER CONNECTION DETAIL
SCALE: N.T.S.

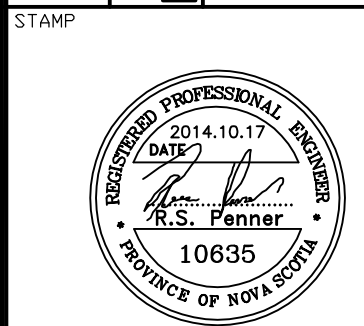


3
M-504 CNC ROUTER CONNECTION DETAIL
SCALE: N.T.S.



4
M-504 PLANER CONNECTION DETAIL
SCALE: N.T.S.

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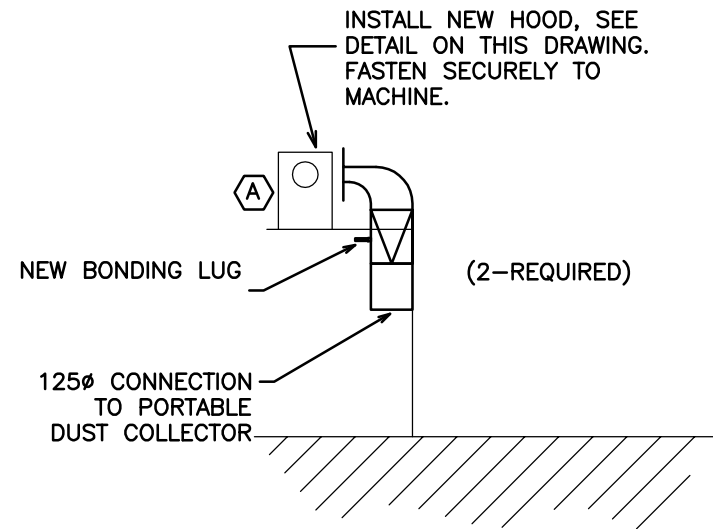
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PROJECT
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HATCHET LAKE, NS
PROJECT NO.: 10-14-006

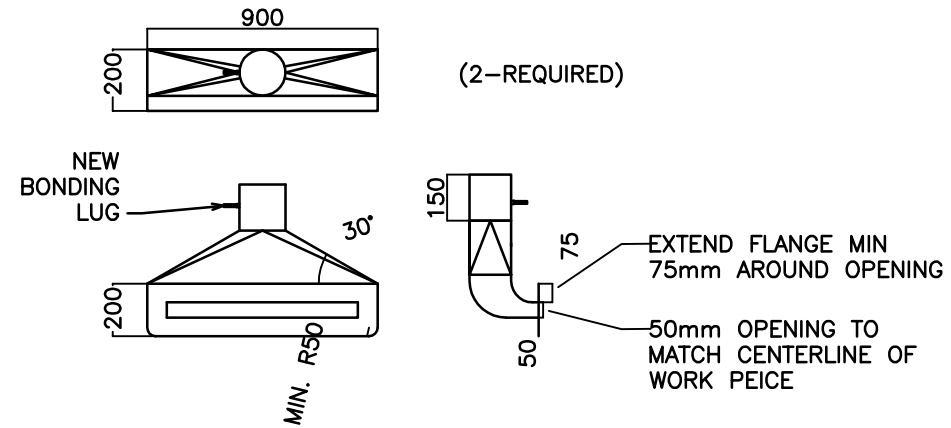
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JOINTER, PLANER AND
CNC ROUTER
CONNECTION
DETAILS

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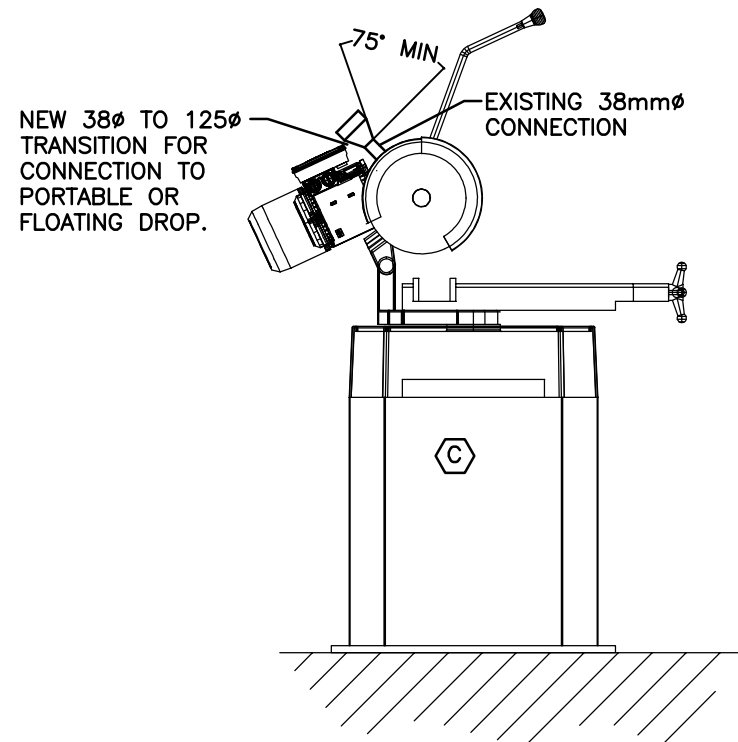
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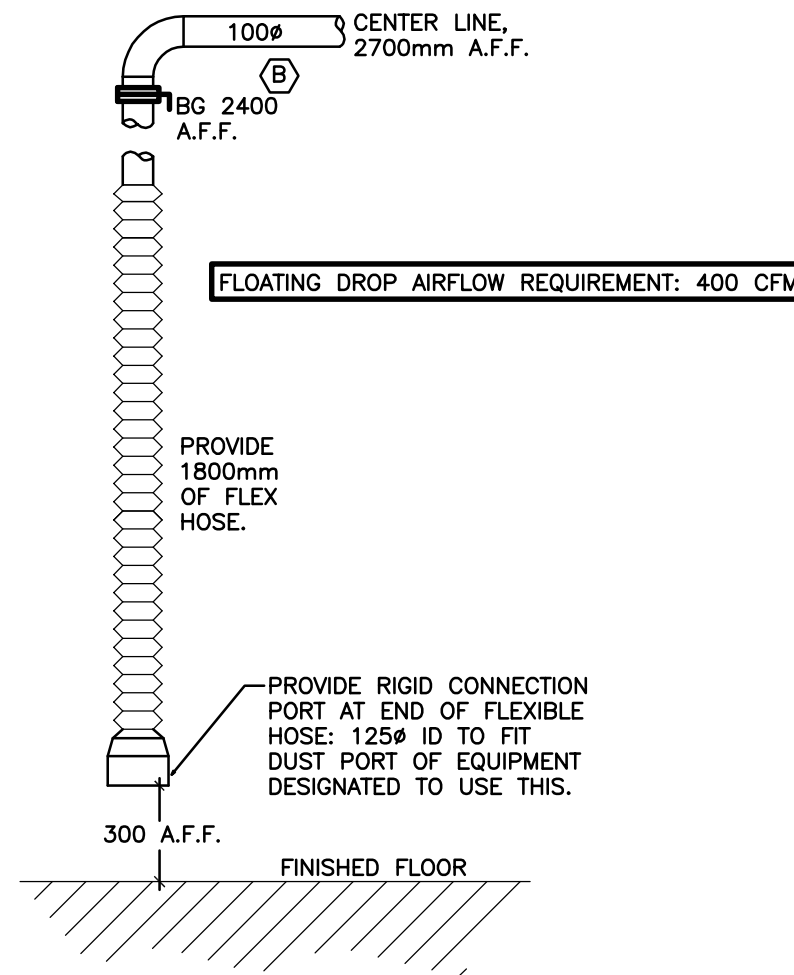
1 LATHE CONNECTION DETAIL
M-505 SCALE: N.T.S.



3 LATHE HOOD DETAIL
M-505 SCALE: N.T.S.



2 CHOP SAW CONNECTION DETAIL
M-505 SCALE: N.T.S.



4 FLOATING DROP CONNECTION DETAIL
M-505 SCALE: N.T.S.

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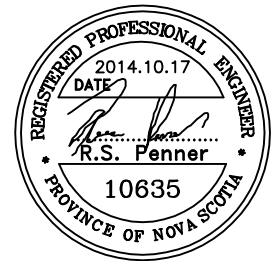
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DATE MARK Δ ISSUE

STAMP



SCALE: AS NOTED

DRAWN BY: M.F.

CHECKED BY: R.P.

REVIEWED BY: D.B.

APPROVED BY: M.G.

AS-BUILT REVIEW

DATE: OCTOBER 2014

PROJECT

BROOKSIDE JUNIOR
HIGH SCHOOL
DUST COLLECTION
SYSTEM REMEDIATION
HATCHET LAKE, NS

PROJECT NO.: 10-14-006

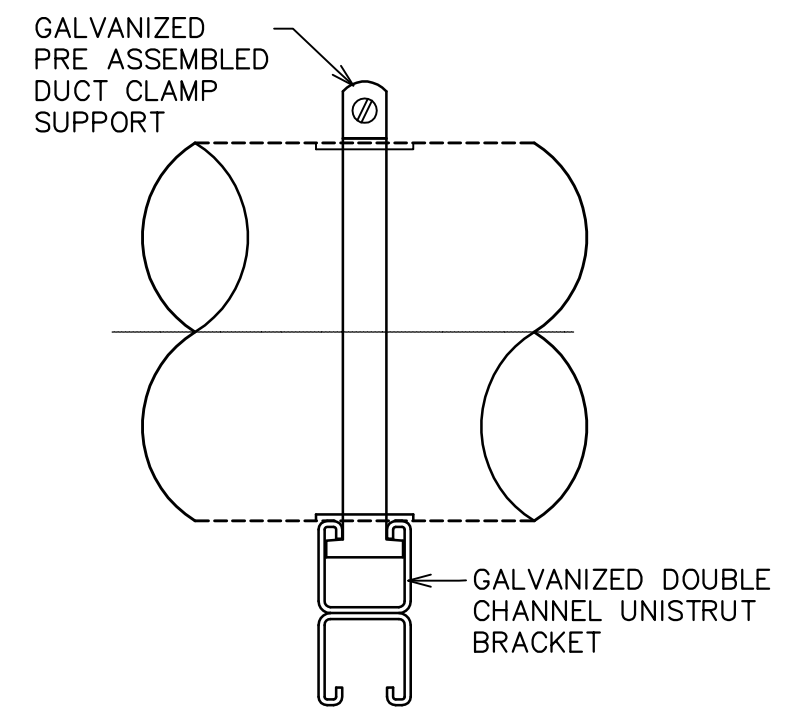
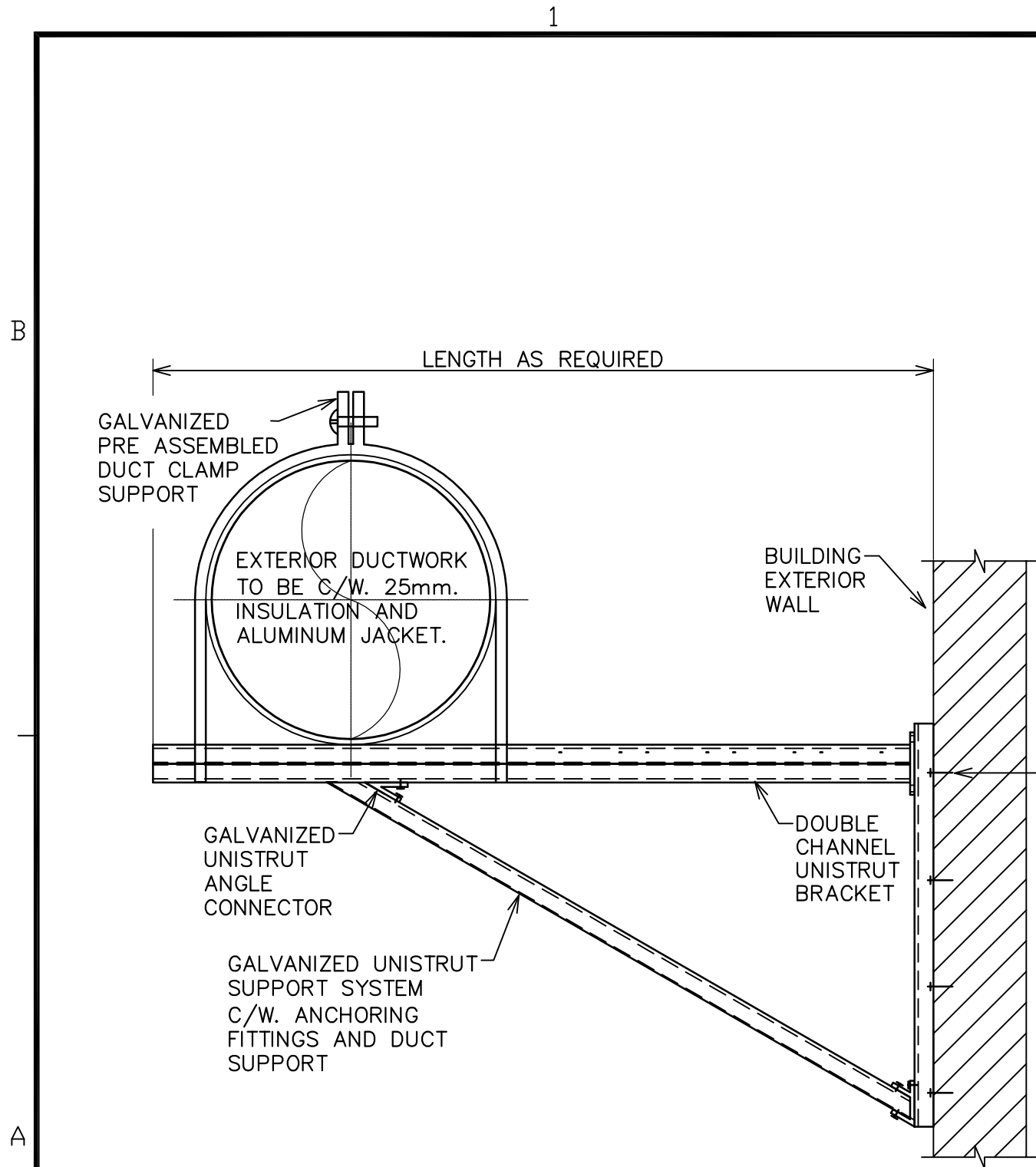
SHEET TITLE

CHOP SAW, LATHE
AND FLOATING DROP
CONNECTION DETAILS

INTERNAL NO.: 10-14-006

M-505

SHEET 10 OF 11



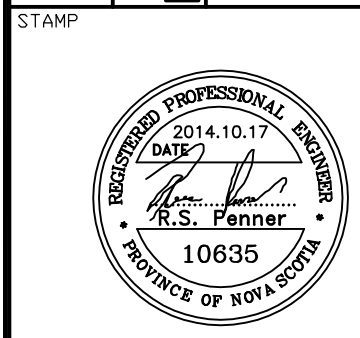
1
M-506

EXTERIOR DUCT SUPPORT DETAIL

SCALE: N.T.S.

SCALE:

2014/10/17	ISSUED FOR TENDER
2014/07/07	ISSUED FOR 99% REVIEW
DATE	MARK ISSUE



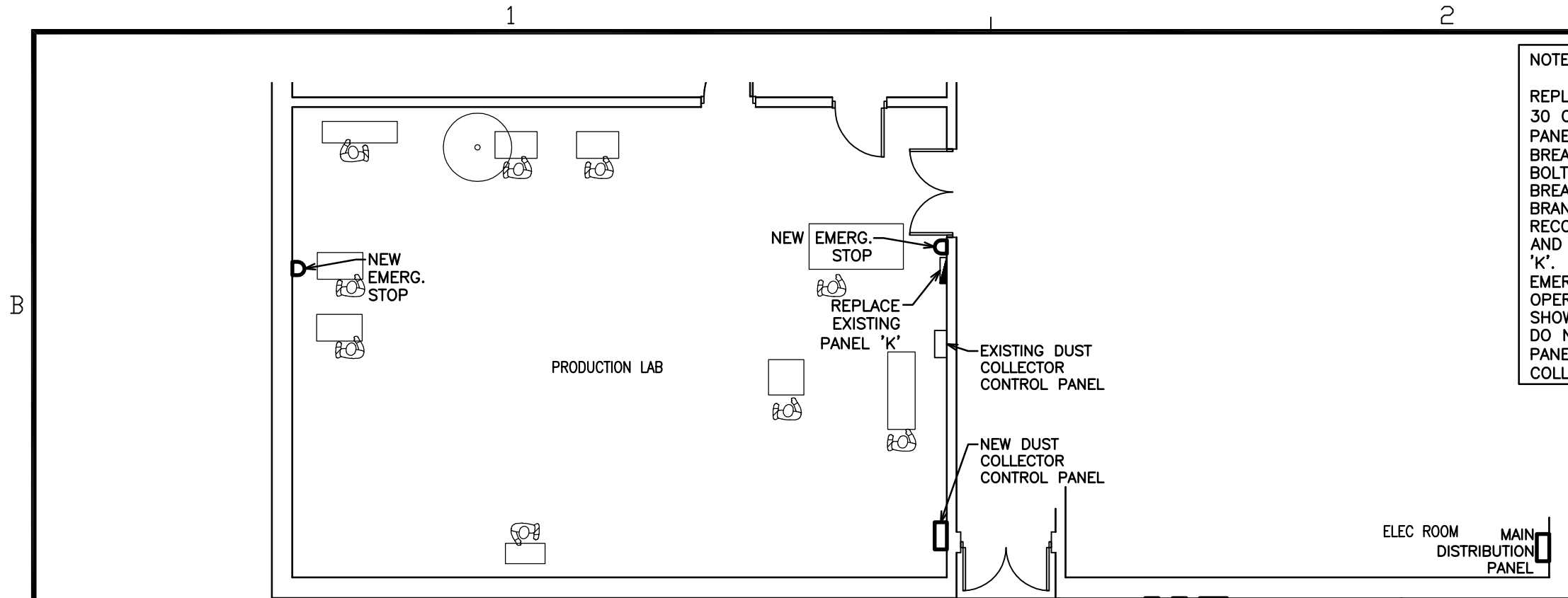
SCALE:	AS NOTED
DRAWN BY:	M.F.
CHECKED BY:	R.P.
REVIEWED BY:	D.B.
APPROVED BY:	M.G.
AS-BUILT REVIEW	
DATE:	OCTOBER 2014

PROJECT
BROOKSIDE JUNIOR HIGH SCHOOL
DUST COLLECTION SYSTEM REMEDIATION
HATCHET LAKE, NS
PROJECT NO.: 10-14-006

SHEET TITLE
EXTERIOR DUCT SUPPORT DETAIL

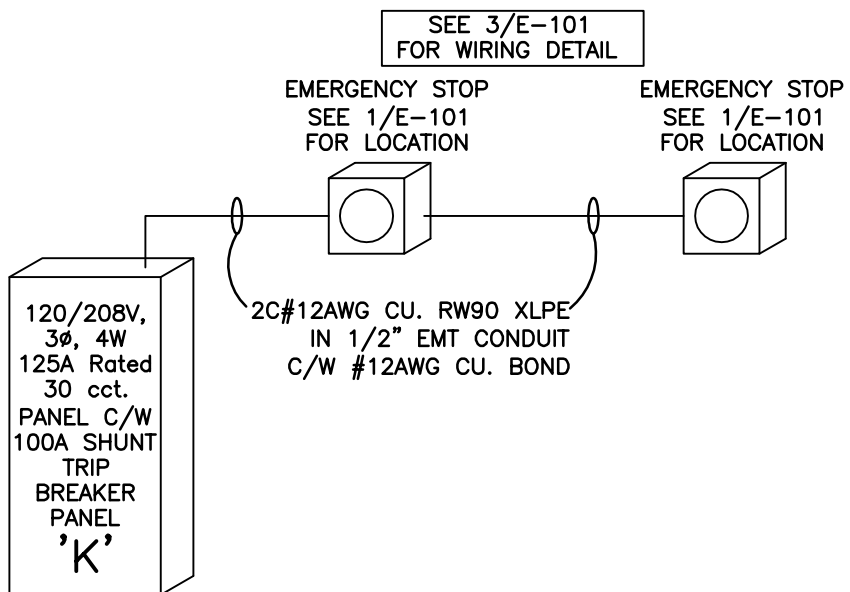
INTERNAL NO.: 10-14-006

M-506

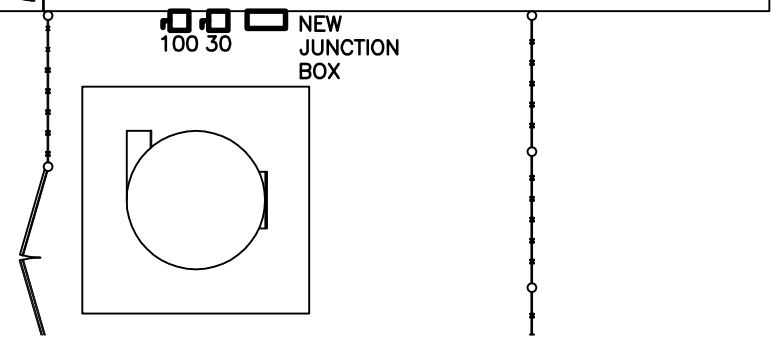


NOTES:
 REPLACE EXISTING PANEL 'K' WITH A 30 CCT., 125A, 120/208V, 3 ϕ , 4W PANEL C/W A 100A SHUNT TRIP BREAKER. PANEL TO INCORPORATE BOLT-ON BRANCH BREAKERS. BRANCH BREAKER SIZES TO MATCH EXISTING BRANCH BREAKERS. REUSE AND RECONNECT EXISTING PANEL FEEDER AND BRANCH CIRCUITS TO NEW PANEL 'K'.
 EMERGENCY STOPS TO BE WIRED TO OPERATE SHUNT TRIP BREAKER AS SHOWN.
 DO NOT REPLACE 3P, 50A BREAKER IN PANEL 'K' WHICH FED EXISTING DUST COLLECTOR.

1
E-101
 CONTROL PANEL AND DISCONNECT LOCATIONS
 SCALE: 1:100



2
E-101
 POWER DETAIL
 SCALE: N.T.S.



3
E-101
 EMERGENCY STOP WIRING DETAIL
 SCALE: N.T.S.

NOVA SCOTIA
 Transportation and Infrastructure Renewal
 Engineering and Design Division
Building Design Section

LOGO:
MCW Maricor
 7051 BAYERS ROAD, UNIT 102
 HALIFAX, NS, B3L 2C1
 Bus: (902) 876-3182 Fax: (902) 876-2796
 WWW.MCW.COM ENG. JOB NO. 10-14-006

SCALE:

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 AS-BUILT REVIEW
 DATE: OCTOBER 2014


PROJECT
 BROOKSIDE JUNIOR HIGH SCHOOL
 DUST COLLECTION SYSTEM REMEDIATION
 HATCHET LAKE, NS
 PROJECT NO.: 10-14-006


SHEET TITLE
 DUST COLLECTOR CONTROL PANEL,
 DISCONNECT LOCATIONS,
 AND DETAILS

INTERNAL NO.: 10-14-006

E-101

SHEET 1 OF 3

SCALE: 

2014/10/17	ISSUED FOR TENDER
2014/07/04	FDR 99% REVIEW
DATE	MARK  ISSUE



SCALE: AS NOTED

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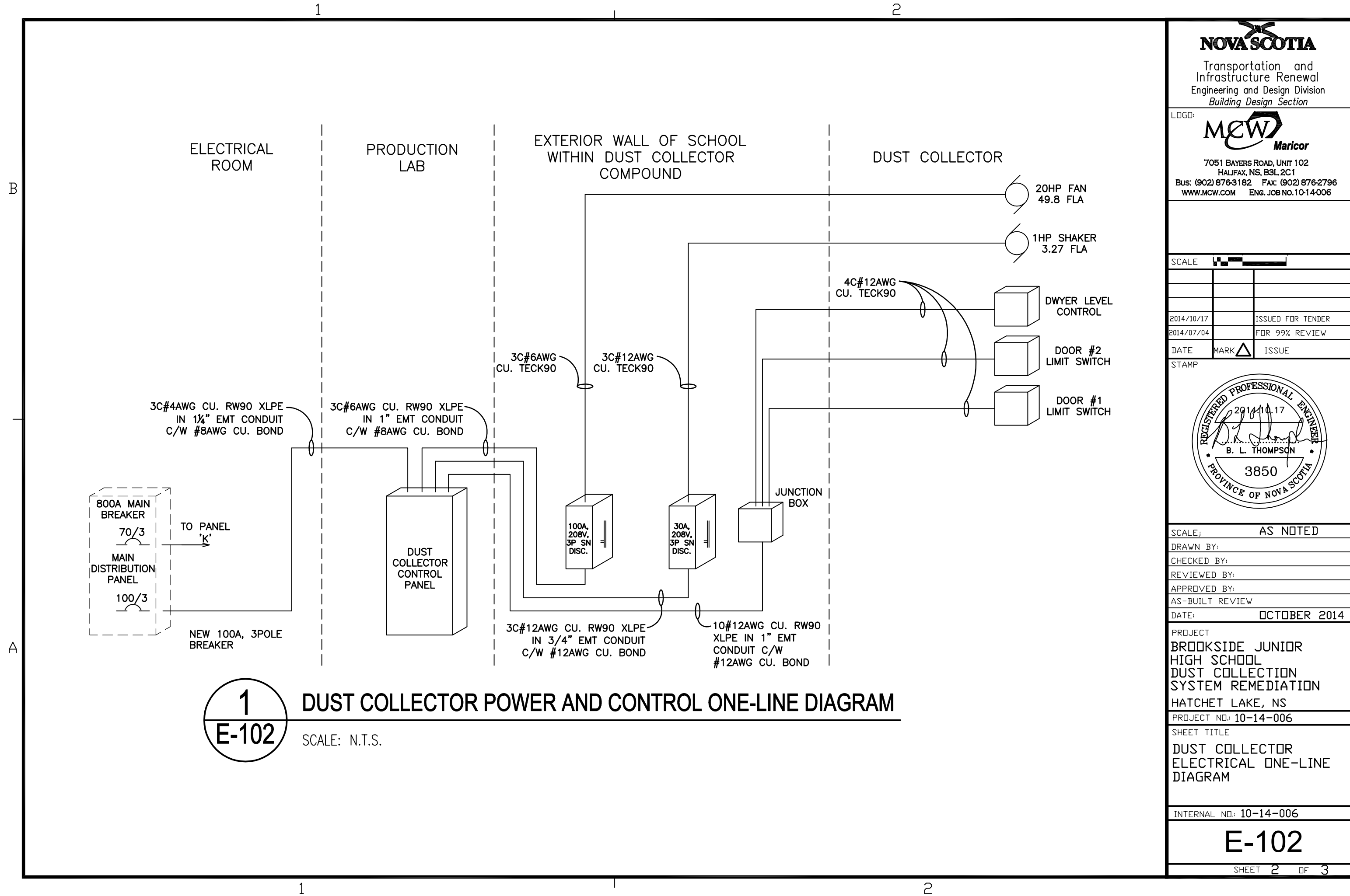
DATE: OCTOBER 2014

PROJECT
 BROOKSIDE JUNIOR
 HIGH SCHOOL
 DUST COLLECTION
 SYSTEM REMEDIATION
 HATCHET LAKE, NS
 PROJECT NO.: 10-14-006

SHEET TITLE
 DUST COLLECTOR
 ELECTRICAL ONE-LINE
 DIAGRAM

INTERNAL NO.: 10-14-006

E-102



1
E-102

DUST COLLECTOR POWER AND CONTROL ONE-LINE DIAGRAM

SCALE: N.T.S.

LOGO:



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HALIFAX, NS, B3L 2C1
BUS: (902) 876-3182 FAX: (902) 876-2796
WWW.MCW.COM ENG. JOB NO. 10-14-006

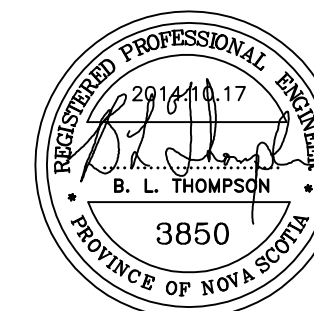
SCALE:

2014/10/17 ISSUED FOR TENDER

2014/07/04 FOR 99% REVIEW

DATE MARK ISSUE

STAMP



SCALE: AS NOTED

DRAWN BY:

CHECKED BY:

REVIEWED BY:

APPROVED BY:

AS-BUILT REVIEW

DATE: OCTOBER 2014

PROJECT
BROOKSIDE JUNIOR
HIGH SCHOOL
DUST COLLECTION
SYSTEM REMEDIATION
HATCHET LAKE, NS

PROJECT NO.: 10-14-006

SHEET TITLE
BONDING DETAILS

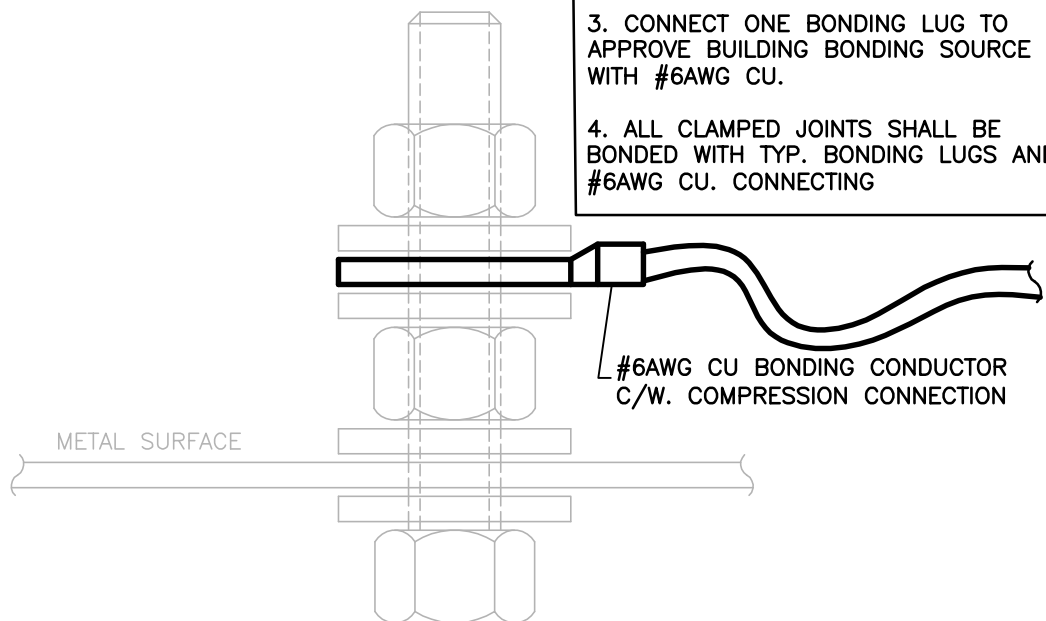
INTERNAL NO.: 10-14-006

E-103

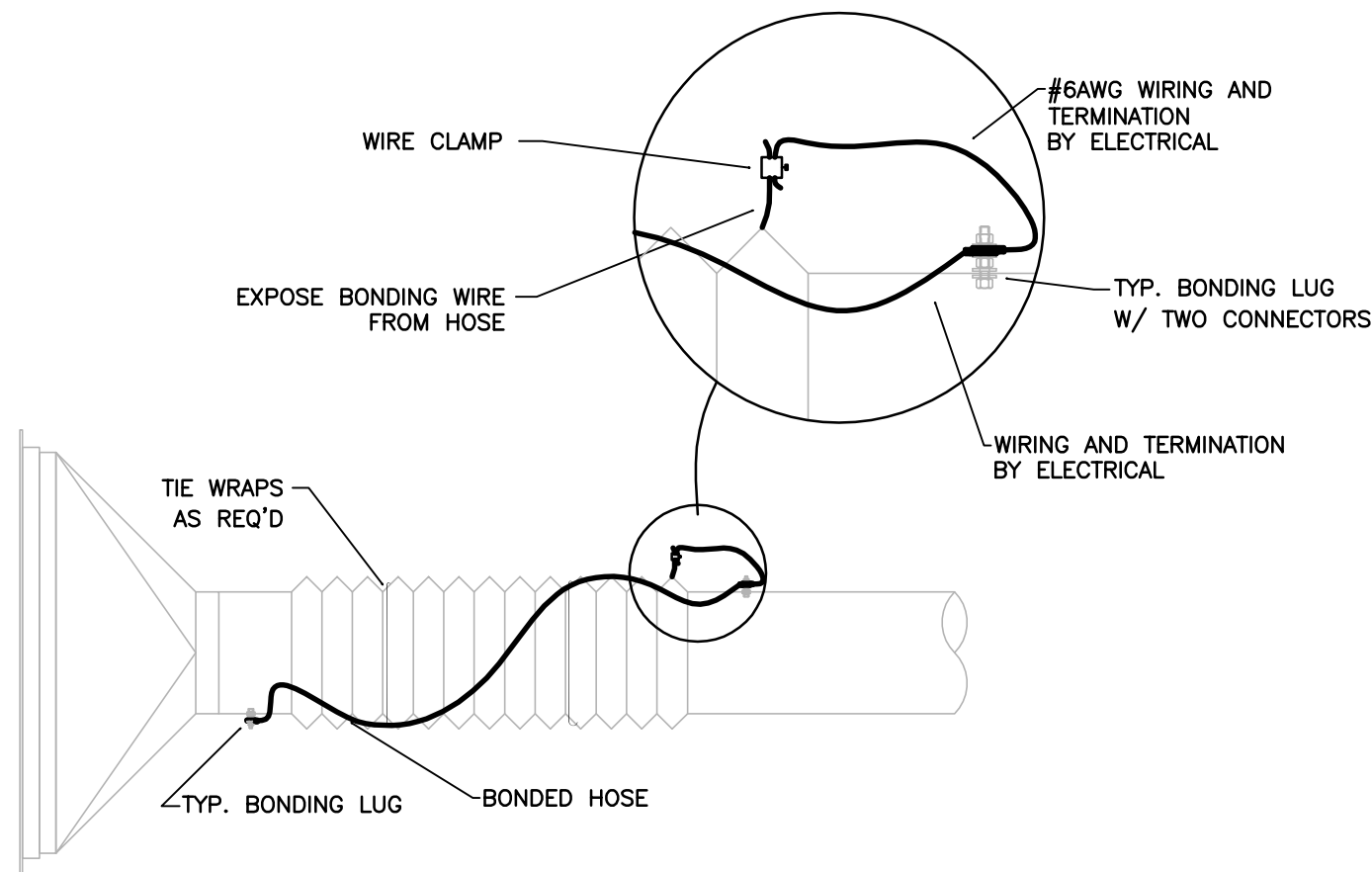
SHEET 3 OF 3

NOTES:

1. ENTIRE SYSTEM SHALL BE BONDED. ANY ISOLATED METALLIC MEMBER SHALL BE EQUIPPED WITH BONDING LUG AND ELECTRICALLY BONDED TO THE SYSTEM.
3. CONNECT ONE BONDING LUG TO APPROVE BUILDING BONDING SOURCE WITH #6AWG CU.
4. ALL CLAMPED JOINTS SHALL BE BONDED WITH TYP. BONDING LUGS AND #6AWG CU. CONNECTING



1 TYP. BONDING LUG DETAIL
E-103 SCALE: N.T.S.

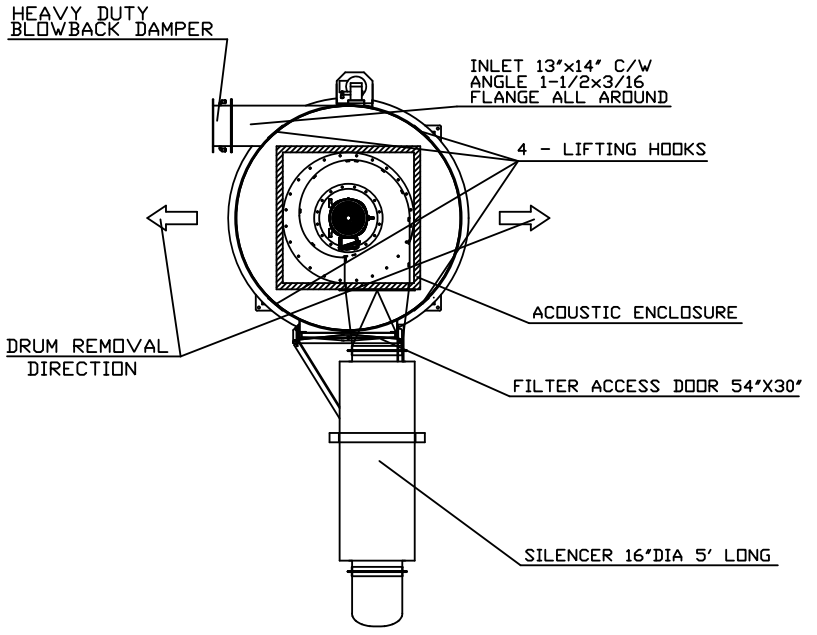


2 BONDING HOSE BONDING DETAIL
E-103 SCALE: N.T.S.

APPENDIX A

OWNER-SUPPLIED EQUIPMENT

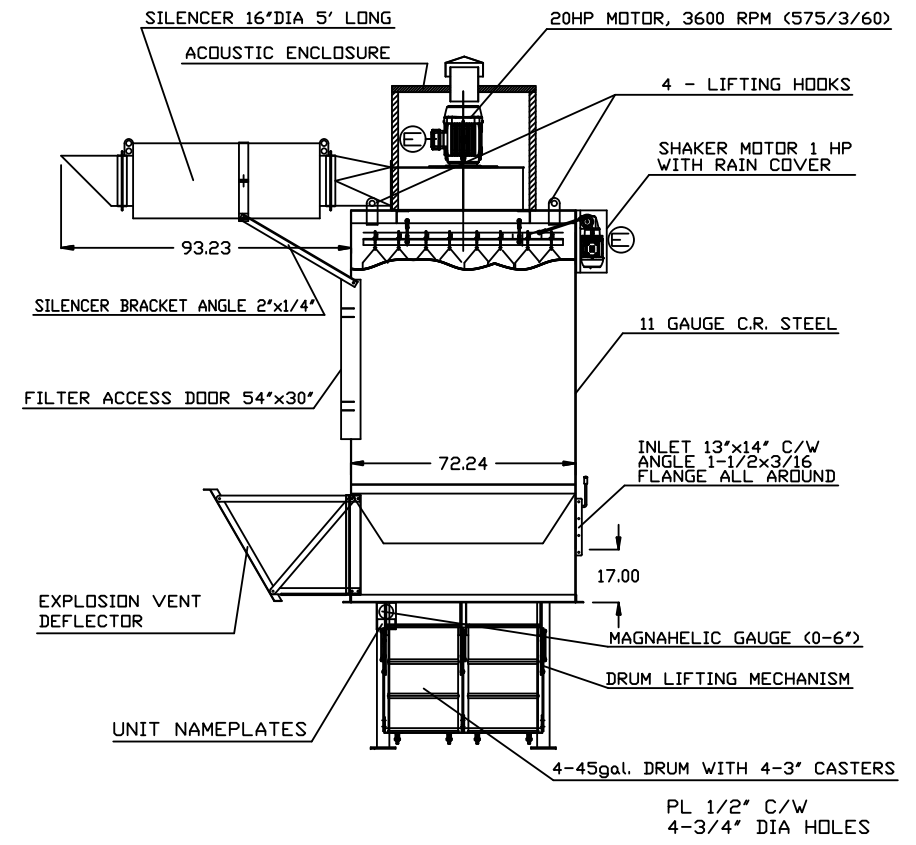
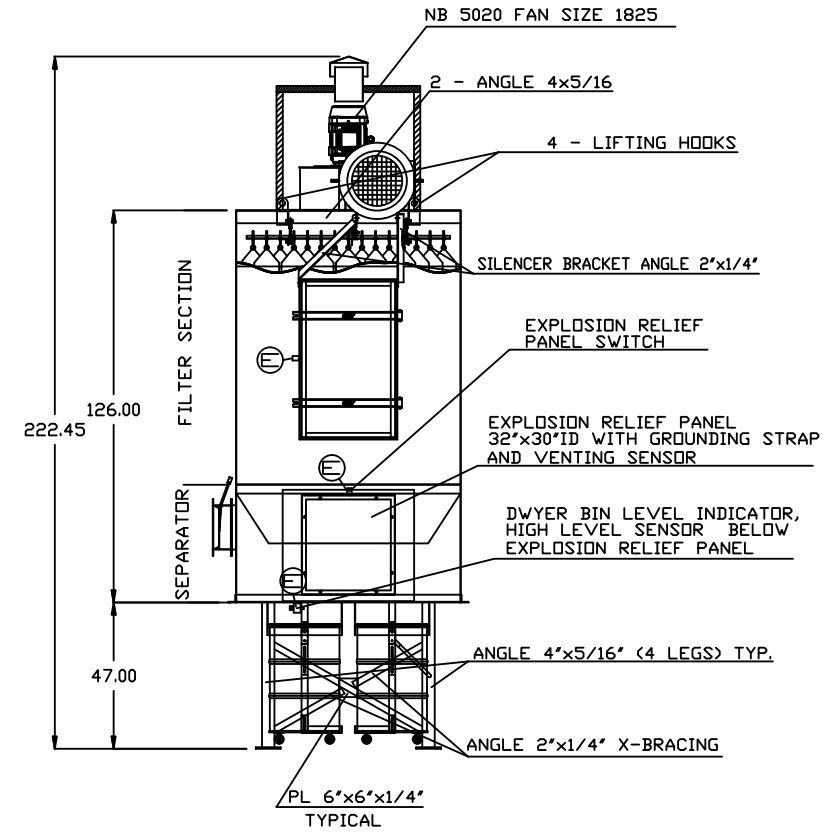
Dust Collector and Associate Components – Air Control Technologies



EXPLOSION RELIEF VENT CALCULATION
 - PER NFPA 68,2007 CHPR. 8.
 KST=150 P_{MAX}=8.2
 PSTAT=0.07 PRED=0.14
 V (DIRTY SIDE)=6.2
 REQ'D AV=0.50 M² (8.2.2) EQN
 AVAILABLE=0.62 M²

DUST COLLECTOR SPECIFICATIONS:

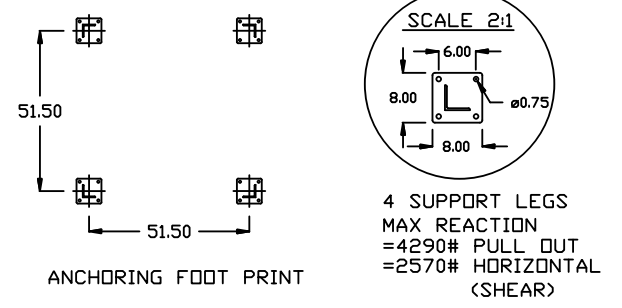
- DUST COLLECTOR MODEL RSB-6-48-6.3-20
- FAN - CLASS III - SISW, NB DESIGN 5020 (WHEEL WIDTH 60%)
 - CAPACITY - 3700 C.F.M. @ 16" W.G.
 - NB DESIGN 5020 SIZE 1825
 - MOTOR SIZE 20 H.P. 575/3/60, 3600 RPM
- FILTER - BAGS ----- 6'-2" LONG, 8" DIA, 48 PC'S
 - AREA ----- 714 SQ.FT.
 - EFFICIENCY ----- 99.5
 - MATERIAL - WEIGHT 14-16 OZ/SQ.YD.
 - NEEDLEFELT WITH SS SCRIM AND GROUND WIRE
 - MODEL F16SS-76-8 (STATIC ELIMINATOR)
 - MULLEN BURST 400PSI, 2758kp
 - AIR PERMEABILITY 25-40 CFM/SQ.FT.
 - MAX OPERATING TEMP 143 C
- SHIPPING WEIGHT 4700 LBS



SILENCER DATA INSERTION LOSS ATTENUATION - dB

SIZE INSIDE DIA.	OCTAVE BAND MID FREQUENCIES - HERTZ							
	63	125	250	500	1000	2000	4000	8000
16"	3	6	15	23	23	17	13	11

⊖ - ELECTRICAL FIELD WIRING REQUIREMENTS



NO.	DATE	BY	DESCRIPTION
3	MAY 30/14		ADDED EXPLOSION RELIEF VENT CALCULATION
2	MAY 30/14		REVISED BARREL REMOVAL DIRECTION
1	MAY 22/14		ISSUED FOR CUSTOMER REVIEW

MARK VOID ALL PRINTS DATED PREVIOUS TO FINAL DATE ABOVE

REVISIONS



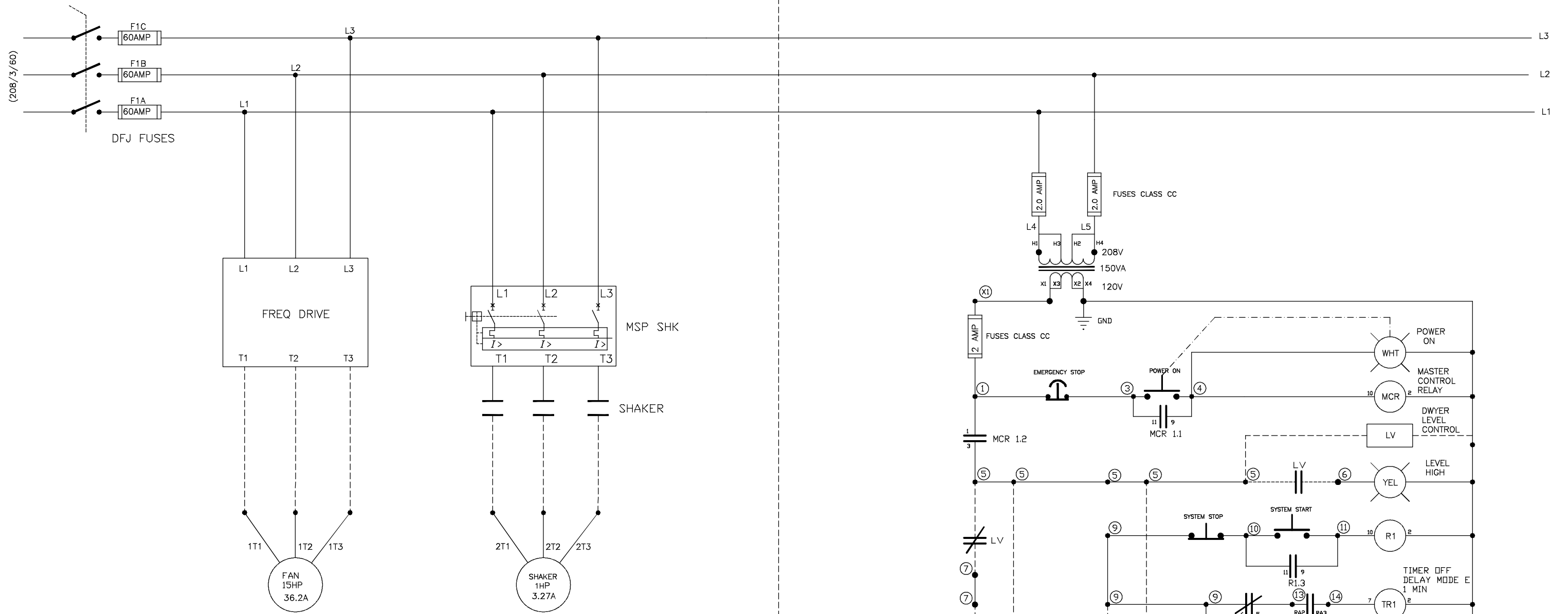
THIS DOCUMENT CONTAINS PROPRIETARY AND CONFIDENTIAL DATA OF AIR CONTROL TECH. NO DISCLOSURE REPRODUCTION OR USE OF ANY PART THEREOF, MAY BE MADE WITHOUT WRITTEN PERMISSION OF THE COMPANY.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES ARE:
 .XX .XXX ANGLES
 ±0.2 ±0.05 ±1/2°

CUSTOMER: [REDACTED]

DRAWN	GREG	TITLE:	SCALE 1 : 1
CHECKED	MAREK R.	DUST COLLECTOR LAYOUT	DATE MAY 22/14
APPROVED		DWG NO.	RSB-6-48-6.3-20
JOB # 5949 ACT-53			

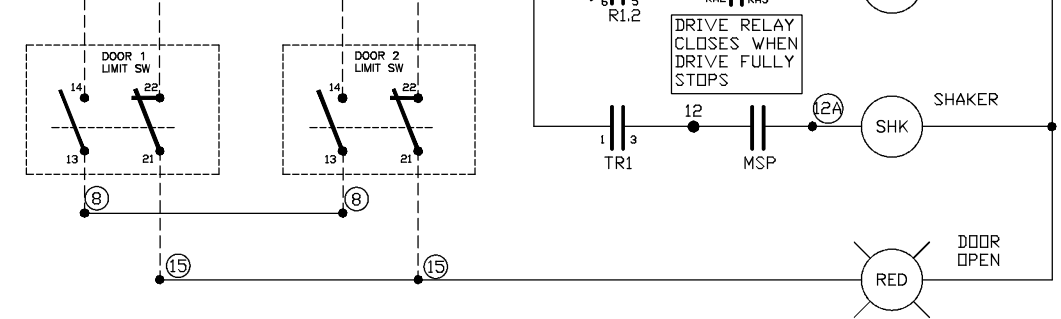
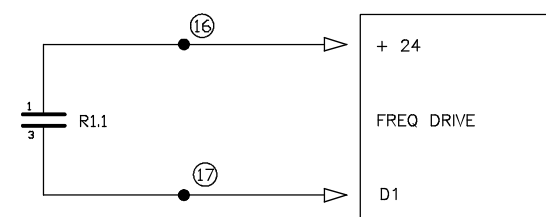
EXAMPLE



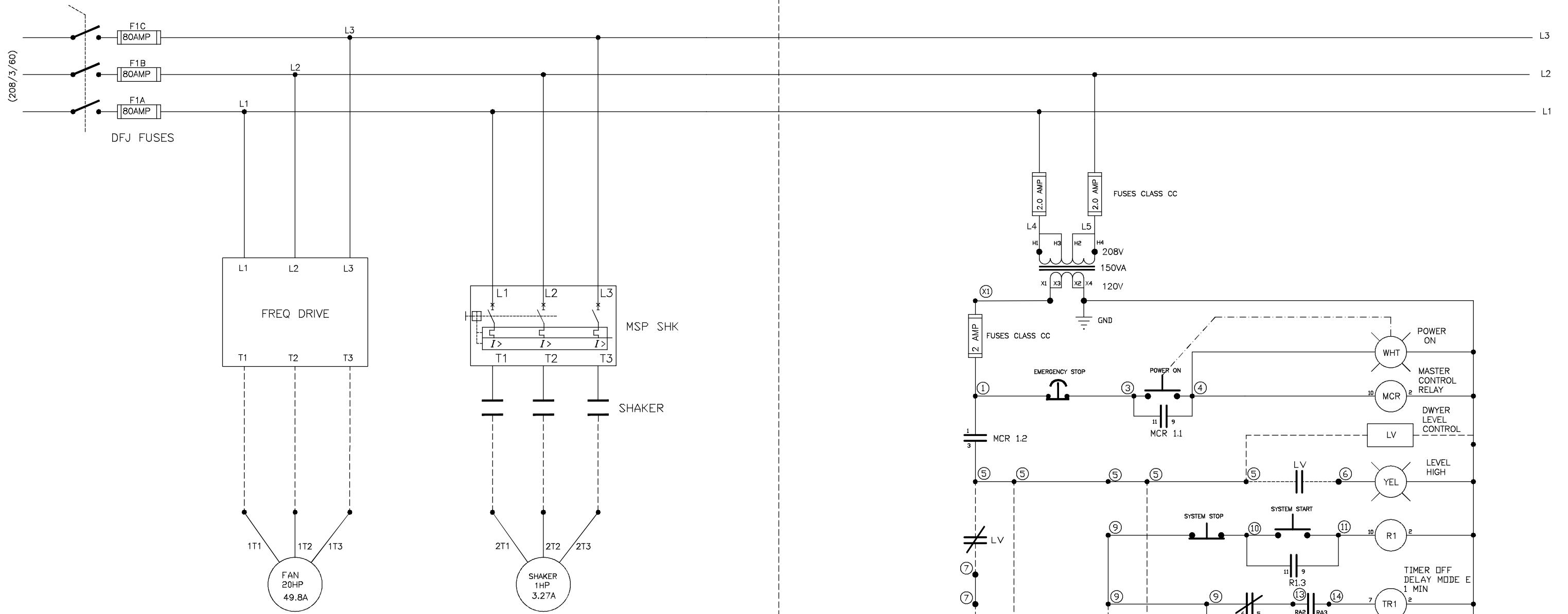
PLEASE NOTE:

- - - - FIELD WIRING
- WIRING BLOCK TERMINAL
- WIRING CONNECTION

THIS SCHEMATIC APPLIES TO ALL 15 HP
(208/3/60) DUST COLLECTORS AS FOLLOWING:
ACT-14,17,18,27,30,31,34,35,37,42,43



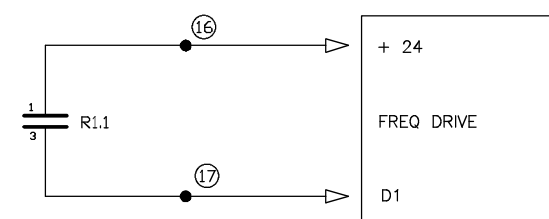
1	SEP 18/12	AS BUILT	
NO.	DATE	BY	DESCRIPTION
MARK VOID ALL PRINTS DATED PREVIOUS TO FINAL DATE ABOVE			
AIR CONTROL TECHNOLOGY Tel: (905) 695-1947		THIS DOCUMENT CONTAINS PROPRIETARY AND CONFIDENTIAL DATA OF AIR CONTROL TECH. NO DISCLOSURE REPRODUCTION OR USE OF ANY PART THEREOF, MAY BE MADE WITHOUT WRITTEN PERMISSION OF THE COMPANY.	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES ARE: .XX .XXX ANGLES .02 .005 1/2"		USED ON CUSTOMER GOVERNMENT OF NOVA SCOTIA	
DRAWN		TITLE:	SCALE NTS
CHECKED		RSB-6-48-6.3-15 208/3/60	DATE SEP 17/12
APPROVED		CONTROL PANEL	
JOB NO.	5074	DWG NO.5074-2_011	



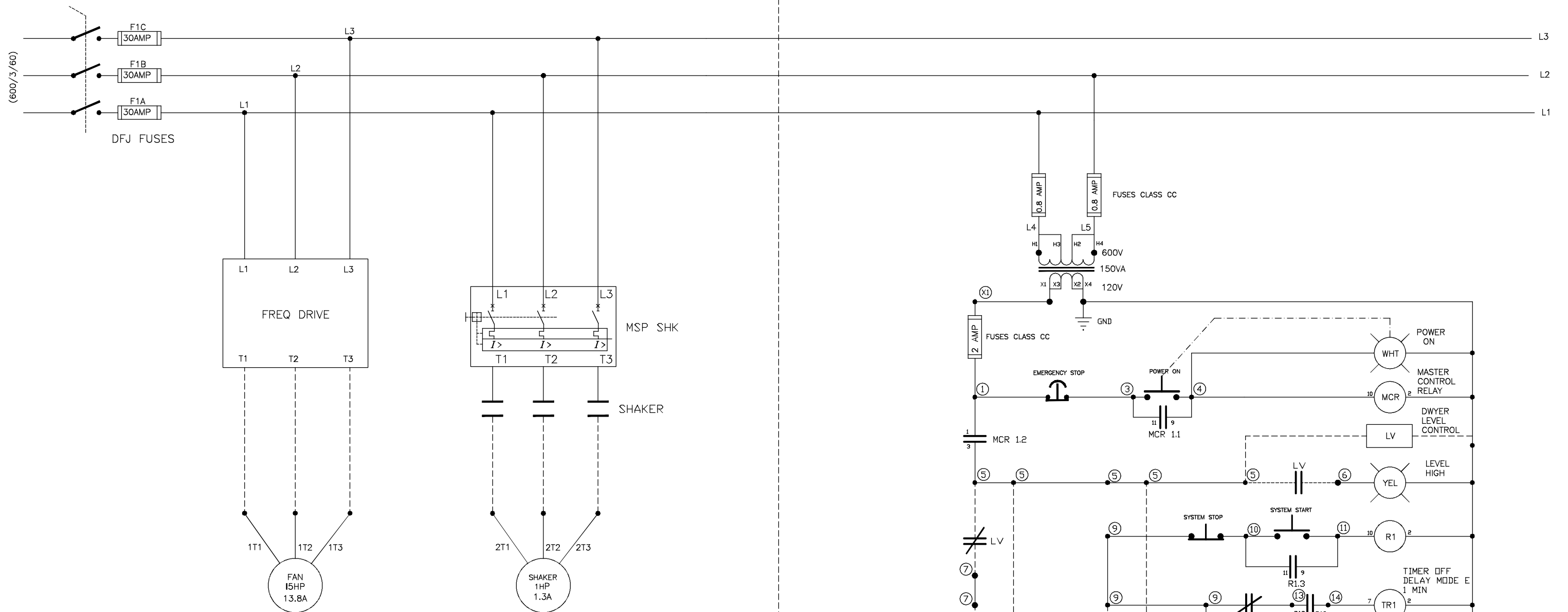
PLEASE NOTE:

- - - - FIELD WIRING
- WIRING BLOCK TERMINAL
- WIRING CONNECTION

THIS SCHEMATIC APPLIES TO ALL 20 HP (208/3/60) DUST COLLECTORS AS FOLLOWING: ACT-28,29



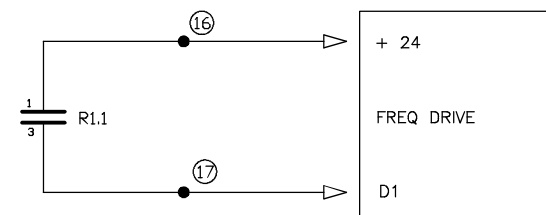
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NO.	DATE	BY	DESCRIPTION
MARK VOID ALL PRINTS DATED PREVIOUS TO FINAL DATE ABOVE			
ACT AIR CONTROL TECHNOLOGY Tel: (905) 695-1947			THIS DOCUMENT CONTAINS PROPRIETARY AND CONFIDENTIAL DATA OF AIR CONTROL TECH. NO DISCLOSURE REPRODUCTION OR USE OF ANY PART THEREOF, MAY BE MADE WITHOUT WRITTEN PERMISSION OF THE COMPANY.
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES ARE: .XX .XXX ANGLES 1/2" .02 .005			
DRAWN		TITLE: RSB-6-48-6.3-20 208/3/60	
CHECKED		SCALE NTS	
APPROVED		DATE SEP 17/12	
JOB NO. 5074		DWG NO.5074-2_011	



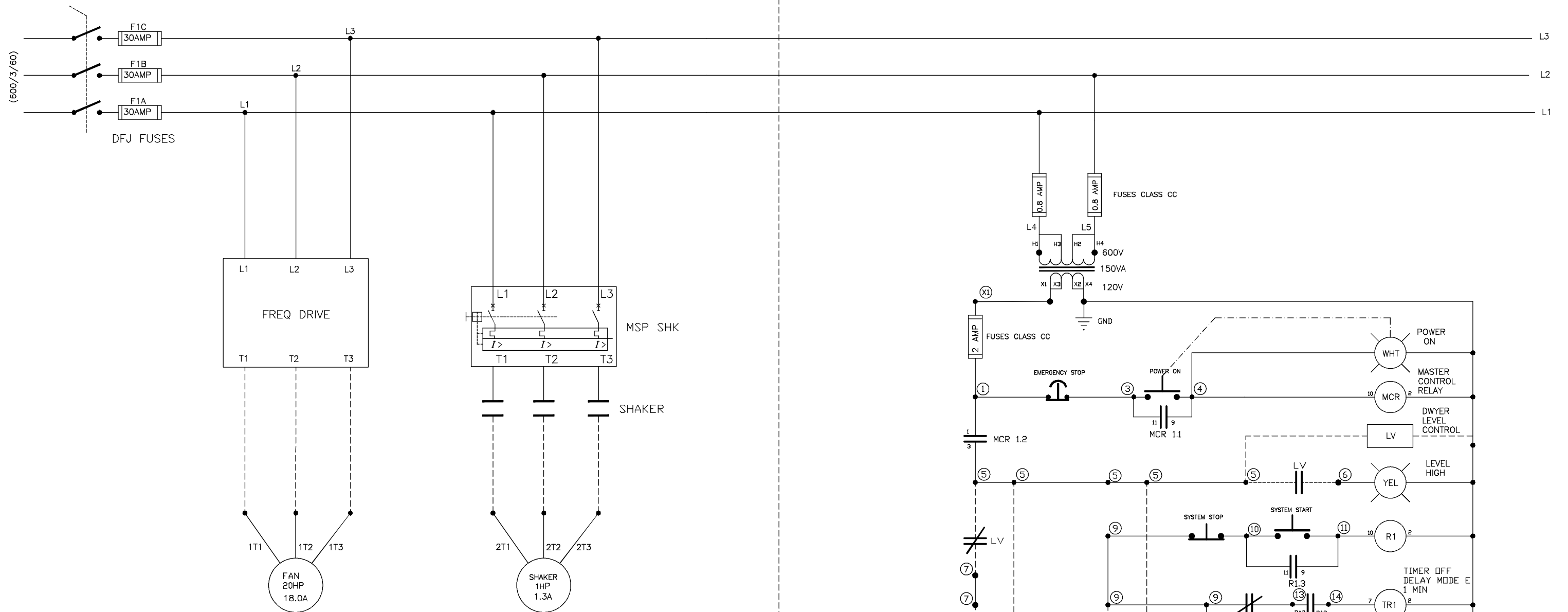
PLEASE NOTE:

- - - - FIELD WIRING
- WIRING BLOCK TERMINAL
- WIRING CONNECTION

THIS SCHEMATIC APPLIES TO ALL 15 HP
(600/3/60) DUST COLLECTORS AS FOLLOWING:
ACT-19,24,25,33,36,38,41



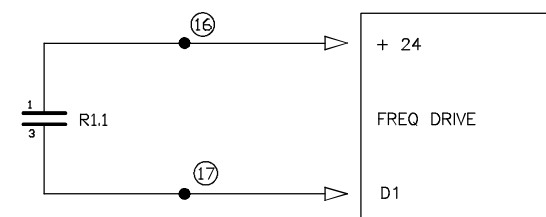
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NO.	DATE	BY	DESCRIPTION
MARK VOID ALL PRINTS DATED PREVIOUS TO FINAL DATE ABOVE			
AIR CONTROL TECHNOLOGY Tel: (905) 695-1947			THIS DOCUMENT CONTAINS PROPRIETARY AND CONFIDENTIAL DATA OF AIR CONTROL TECH. NO DISCLOSURE REPRODUCTION OR USE OF ANY PART THEREOF, MAY BE MADE WITHOUT WRITTEN PERMISSION OF THE COMPANY.
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES ARE: .XX .XXX ANGLES .02 .005 1/2"			
DRAWN		TITILE: RSB-6-48-6.3-15 600/3/60	
CHECKED		SCALE NTS	
APPROVED		CONTROL PANEL DATE SEP 17/12	
JOB NO. 5074		DWG NO.5074-2_009	



PLEASE NOTE:

- - - - FIELD WIRING
- WIRING BLOCK TERMINAL
- WIRING CONNECTION

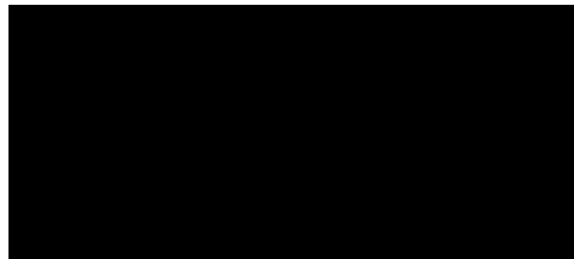
THIS SCHEMATIC APPLIES TO ALL 20 HP
(600/3/60) DUST COLLECTORS AS FOLLOWING:
ACT-06,15,16,20,21,22,23,26,32,39



1	SEP 18/12	AS BUILT	
NO.	DATE	BY	DESCRIPTION
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 Tel: (905) 695-1947			THIS DOCUMENT CONTAINS PROPRIETARY AND CONFIDENTIAL DATA OF AIR CONTROL TECH. NO DISCLOSURE REPRODUCTION OR USE OF ANY PART THEREOF, MAY BE MADE WITHOUT WRITTEN PERMISSION OF THE COMPANY.
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES ARE:			USED ON
.XX .XXX ANGLES			CUSTOMER GOVERNMENT OF NOVA SCOTIA
.02 .005 1/2"			
DRAWN	TITLE:		SCALE NTS
CHECKED	RSB-6-48-6.3-20 600/3/60		DATE SEP 17/12
APPROVED	CONTROL PANEL		
JOB NO. 5074	DWG NO.5074-2_010		

MAINTENANCE MANUAL FOR RSB SERIES DUST COLLECTORS

PLEASE READ ENTIRE MANUAL
BEFORE HANDLING, ERECTING OR
OPERATING EQUIPMENT



EXAMPLE

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EXAMPLE

Operation and Maintenance Manual For RSB Series Dust Collectors

Although certain models such as RSB Dust Collectors may be mentioned throughout these instructions, the instructions apply to all dust collectors by Air Control Technology carrying the RSB prefix in their model numbers.

It will be necessary to go through all the instructions and perform the operations applicable to your unit.

HANDLING

Due to the fact that a large bulk and relatively thin walls are involved, more than average care should be exercised in the unloading and lifting of our dust collector units. It is easy to create unsightly dents, or cause other damage to sheet metal parts. It is exceedingly difficult to repair such damage or to restore it to its original appearance.

The factory has tried to make the handling of the units as simple as possible. Lifting lugs, drilled holes in the companion rings (can be used by removing bolt), and other aids are attached where feasible. It is important to locate and use these aids whenever the unit is unloaded, lifted, or otherwise handled.

It is strongly urged that these lifting aids be used, rather than attempting to use slings or other devices wrapped around the unit. One misplaced sling that causes the unit to slip and be damaged could result in many hours of rework, and in most cases, a very unsightly installation.

NOTE: NEVER. UNDER ANY CIRCUMSTANCES, use the EXHAUSTER FAN SHAFT to lift the equipment as it could cause severe damage to exhauster fan.

PRELIMINARY INSTRUCTIONS BEFORE ERECTING

(Also see erecting diagrams and specifications throughout manual)

The following points should be checked on all units, regardless of model:

1. Ensure that none of the filter tubes have become detached from either the shaker frame or the collar plate during shipment. If this has occurred, first release clamp holding filter tube to collar, pull open end of filter tube over the collar on the collar plate, being sure to pull the filter tube taut before re-clamping (RSB Model). If snap ring cuff type filter tube is used, be sure groove on cuff is properly engaged in hole plate, then pull filter taut at upper end by pulling down on hanger strap.

NOTE: When rocker style shaker is used (RSB series), filter tubes should not be pulled too tight as it may prevent shaker motor start up or damage linkage.

2. Make sure the bolts holding the fan onto the top of the unit shell have not vibrated loose during shipment (if supplied). Also, examine entire unit for similar problems. Although every effort is made before shipment to prevent these problems from occurring, the vibration encountered by the equipment during shipment can result in some of the nuts being loose when the equipment is received at its final destination. When setting up units which have weather guards and weather covers added, check that these items are securely fastened to unit or serious damage and/or injury could occur.
3. Check all door seals and locks to make sure that the doors are opening and closing properly, and that an airtight seal is being obtained.
4. If you have an RSB unit, make sure the plastic film bag guard is removed from the bottom of the bags (cut out with knife). This film is located on the bottom side of lower collar plate.

EXAMPLE

5. It is necessary that the unit operates in an airtight condition at all times when the exhauster is running. Therefore, the machine should be examined for leakage as sometimes during shipment and handling, the sealing compound can fail. (It is advised that the unit be examined by the dealer or supplier from whom it was obtained). The simplest method to locate obvious leaks on large equipment is to enter the unit and look for any pinpoints of light.

BE SURE MAIN POWER SUPPLY IS TURNED OFF BEFORE DOING THIS.

If any leaks are found, request from dealer or supplier that they make arrangements to have them rectified.

6. Units that have belt drive fan packs should be checked to make sure that the belt tension is correct.
7. Make sure that the connection between the fan inlet and duct stub is in place and tightly secured and sealed.
8. A qualified industrial electrician must be used when wiring up this equipment. See index re diagrams and schematics etc.
9. Weld stand structure firmly at all bolted gusset plates after erection.

PRELIMINARY INSPECTION BEFORE & AFTER START UP FOR ALL MODELS

1. Check to make sure that the exhauster (if supplied) rotation is correct and that the BEARING SET SCREWS ARE TIGHTLY SECURED TO THE SHAFT. Do not run fan until all duct is connected to unit.
2. Turn all fan wheels by hand to make sure it is clearing the casing.
3. An amp reading should immediately be taken on all motors when the unit is just starting after all duct is connected. This will indicate the highest amp reading the unit will ever operate under, as the filters are clean. This is a check to ensure that the fan speeds, etc. are correct and the motor is not being overloaded.
4. If the unit is equipped with an automatic shaker control, make sure that the start and stop sequence of the shaker motor is correct. (See under 'Procedure to Empty Waste').
7. Check that none of the filter tubes have become loosened and that they remain taut.
8. Make sure all access doors and the material discharge gates are closed.
If not, the suction will be lost.
9. Shaker Mechanism
Make sure the shaker motor does not run while the exhauster motor is running and that the shaker motor cannot, under any circumstances, be run more than one (1) minute duration. An automatic shaker control is recommended, but a momentary contact push button control can be used as an economy measure and is usually supplied with the equipment. On initial start-up, caution should be taken that damage has not occurred in shipping. Operate by hand, if possible, to make sure that there is no binding and that all parts are functioning properly.
10. If speed reducers have been supplied anywhere, be sure they are filled to the proper level with manufacturer's recommendation before starting.
NOTE: Some reducers are lifetime lubricated and need no added lubricants.

EXAMPLE

11. Collectors with elevated storage area and material discharge gates should be checked to ensure that gears on sliding door are properly engaged (if supplied), that the gate is closing properly and that it remains closed during operation of the unit. After the unit is erected, remove the bolts that hold the door in the closed position during shipment.

PLEASE NOTE ■ Do not overfill storage area. Space must be allowed in the storage area of the dust collector to accommodate the material which will fall from the filter tubes during the shake down cycle. (Also see Storage Hoppers)

UNITS WHICH USE 45 GALLON CONTAINERS FOR STORAGE

In some of the dust collectors, 45 gallon storage containers are used to store the waste material. In some of these units, it will be found that these containers do not fill evenly and that some material blow-by will occur. This does not reduce the efficiency of the equipment but will require periodic manual cleanup. The frequency of this cleanup will have to be determined by the customer, as it will depend on the volume of material passing through the collector.

ROTARY BIN AGITATOR (If supplied)

- (a) Open truck loading door all the way.
- (b) Turn start button for agitator on. If arm does not turn, shut motor off immediately.
- (c) If material is stopping agitator arm from moving, remove the material around arm, simply by using a long stick, poke the material away until arm is clear.
- (d) Then turn start button for agitator ON, and agitator should start and do its job.
- (e) If agitator does not start by carrying out the above steps, consult Air Control Technology.
- (f) DO NOT try to restart agitator motor more than 3 times per hour or you may burn out motor.

If bin level indicator (Bin Level Indicator (if supplied), it is prefitted at the factory at a predetermined level, and may have to be relocated after several weeks of operation due to unusual conditions that cannot be foreseen. The relocating would be the responsibility of the customer. (NOTE: before relocating Bin Level Indicator, please contact factory). The Bin Level Indicator is wired in a manner that will turn off the system when the desired bin level is reached or can be wired to a signaling device such as a light or a buzzer (supplied by others) mounted at a desired location. The signaling device would be our recommendation as it could give some lead time for preparing to empty storage area. (Also, see under Storage Area Section in manual).

DIRECT DRIVE FAN PACKS

- (a) Select proper sized heater elements to match amperage as stated on motor manufacturer's nameplate. NEVER install oversized heaters as this can cause motor failure and will nullify motor warranty (if supplied)
- (b) On initial start-up with clean filters and a minimum of ducting on fan inlet, overload on VFD may kick out. Should this occur, you must restrict the airflow on the air inlet or outlet opening sizes by installing a blast gate complete with locking device. This is usually a temporary measure until filters build up a dust cake and create the required resistance.

EXAMPLE

OVERLOADING OF THE FAN

Low system resistance may cause overloading of the fan motor on any installation. Amperage draw must be checked on start-up of a completed system installation. If amperage draw is too high, resistance must be added to the system or fan speed changed. See under direct drive fan packs for restricting or check with factory.

PROCEDURE TO EMPTY WASTE MATERIAL FROM ELEVATED STORAGE AREA WHEN SUPPLIED

- (a) Switch off blower: (allow blower to decelerate for approximately one (1) minute).
- (b) Start shaker and run for about one (1) minute. It should be noted that extending the running period of the shaker motor serves no purpose other than to cause excessive wear on the equipment. This would apply to electric driven shakers only. Manual shakers are usually not supplied if the unit is elevated.
- (c) Open waste material discharge gate at base of unit and allow material to fall out into truck or tote box. If material fails to discharge, check for bridging in unit storage section. If this has occurred, break the bridge.

BE AWARE THAT WHEN THE BRIDGE BREAKS, THE MATERIAL WILL FALL. TAKE NECESSARY PRECAUTIONS TO AVOID INJURY.

By following the preceding instructions before operation, a great deal of difficulty can be avoided. These items have all been checked by the manufacturer prior to shipment of unit, but it has been found that bolts, screws, etc. loosen and that sealing material sometimes is damaged in transit. The contents of this manual should be read and checked by the installer of the unit, whether it be the customer or contractor, but it would be the responsibility of the customer to make sure these instructions and inspections are carried out.

DAILY INSPECTION OF ALL DUST COLLECTORS (EACH DAY FOR THE FIRST WEEK OF OPERATION)

1. Check the storage section for waste level to determine the frequency of emptying that will be required to keep the unit operating efficiently.
2. Check the hopper for material freezing or hardening in the bin as this material will not be easily removed from the hopper if allowed to remain on internal surfaces.
3. Make sure the filter tubes have been shaken at least once each day (for approximately thirty to sixty seconds). If filter tubes are plugged due to over-filling of storage section, cleanout out manually. DO NOT USE SHAKER.

INSPECTION TO TAKE PLACE ON ALL DUST COLLECTORS AT THE END OF THE FIRST WEEK OF OPERATION

1. Check belt tension and correct if belts are loose.
2. Check interior of the dust collector for filter tube failure and abrasion. Notify Air Control Technology if any tubes are unduly worn. (Be sure tubes are taut).
3. Check shaking mechanism for loose parts and tighten.
4. Check all bearings (but do not overgrease).

INSPECTION TO TAKE PLACE AT THE END OF THE FIRST MONTH OF OPERATION

1. Check belt tension and correct if belts are loose.
2. Check the interior of the dust collector for filter tube failure and abrasion. Notify Air Control Technology if any tubes are unduly worn. (Be sure tubes are taut).
3. Check shaking mechanism for loose parts and tighten.
4. Check all bearings (but do not overgrease).

EXAMPLE

INSPECTION TO TAKE PLACE EVERY THREE

1. Lubricate all electric motors, speed reducers, exhaust fans, etc. as per manufacturer's instructions. It should be noted that some speed reducers are lifetime lubricated.
2. Check all filter tubes for wear and ensure they are pulled taut.
3. Lubricate waste material discharge gate slides (use only graphite as grease causes waste material to collect in the slides).

YEARLY INSPECTION

1. Lubricate all electric motors, speed reducers, exhaust fans, etc. as per manufacturer's instructions. Do not overgrease. It should be noted that some speed reducers are lifetime lubricated.
2. Check all filter tubes for wear.
3. Lubricate the bin door slides, (use only graphite as grease causes waste material to collect in slides).
4. Remove and dry clean all filter tubes if required. Remove clamp ring, pull filter tubes taut and reclamp (RSB model). If snap ring cuff type filter tubes are used, be sure groove on cuff is properly engaged in hole plate and that tubes are taut.

EXHAUST FAN (If supplied)

1. Periodic check of anchor bolts and bearings should be made for vibration damage.
2. Exhauster bearings should be periodically lubricated in accordance with the bearing manufacturers standards. Care should be taken not to over-lubricate the bearings to the extent of damaging grease retainer seals. Bearings should be removed, inspected and replaced if necessary, as soon as undue shaft vibration becomes apparent.

(Also see under Motors)

ELECTRIC MOTORS AND EQUIPMENT

1. All electrical equipment should be maintained in accordance with instructions of the original manufacturer.
2. Periodic check of motors should be made and they should be lubricated as per manufacturers standards.
3. A qualified industrial electrician must be used when wiring up this equipment. (Also see index re diagrams on schematics).

SHAKER ASSEMBLY (Also see under Preliminary Inspection)

1. Periodic check of the shaking mechanism should be made as to lubrication and wear of all moving parts. Any damaged or worn parts should be replaced.
2. Shaking time: - shaking time must never exceed one (1) minute duration at one time. Electric timer or momentary contact switch must be installed or Air Control Technology will not warrant the shaker mechanism.

EXAMPLE

3. Shaking action must never take place while exhaust fan is running as filters are under pressure. Dust adhered to walls of filter tubes will not fall away under this condition. Best results are obtained when shaking action takes place just after total deflation of filter tubes and for a period of time during total deflation.
4. When rocker style shaker is used (RSB series), filter tubes should not be pulled too tight, as it may prevent shaker motor start up or damage linkage. Take amp reading on startup of shaker motor, if amp reading is higher than noted, loosen filter tubes.

FILTER TUBES

1. Frequent checks of filter tube wear and deterioration should be made. Worn or damaged tubes should be replaced. Be sure filter tubes are taut at all times or cleaning of filter tubes could be affected. (Also see under Shaker Ass'y. #4).
2. A manometer reading rising above a pre-determined level after normal shaking, indicates that the filter tubes should be removed and replaced. (Also check Problems and Their Cures).
3. See diagram for installing and tightening on page 13.

DUST COLLECTOR HOUSINGS AND SUPPORTS

1. The dust collector housing must be maintained in an air and water tight condition. Protection against corrosion is required in the form of periodic repainting. Units and supports are painted one (1) finish coat of a standard colour. The housings are normally fabricated from wiped galvanized steel which has good resistance against corrosion from the inside under most conditions.

DOORS

1. Access doors, inspection doors and waste material discharge gate must be kept closed at all times when the unit is in operation as suction will be lost if they are not. Door seals and gasket seals should be regularly checked and replaced if worn or deteriorated.

STORAGE HOPPERS (If supplied)

1. Regular checks of material freezing or hardening in the storage hopper should be made. Also, check for any obstructions inside the hopper. If the hopper is equipped with a sliding door, then this should be checked regularly and maintained in good repair to ensure a satisfactory seal for efficient unit operation.

EXPLOSION VENTING is an available option. Because of various rulings by local government and insurance companies, etc., it is the responsibility of the customer to acquire this option if deemed necessary. Please state the required ratio (square footage of explosion venting per cubic foot of unit) and if the unit is installed inside or outside a building, when ordering explosion vents.

For further information, please check with factory.

SAFETY LADDER AND RAILINGS are an available option. They are usually pre-fitted at the factory, disassembled for shipping purposes to be reinstalled at the jobsite by the installer or customer. In some cases, extra supports may have to be supplied by the installer and installed where needed at the installer's or customer's discretion. On-site welding is always required.

EXAMPLE

SPARE

To avoid loss in operation time due to unexpected or accidental mechanical failure, we recommend that the customer maintain a supply of spare parts in his own warehouse.

For example:

- | | |
|-----------------|-------------------|
| 1. Filter Tubes | 3. Companion Seal |
| 2. Bearings | 4. Fan Wheel |

WARRANTY

All equipment is guaranteed as per the original manufacturer's guarantee and/or warranty. All parts fabricated by Air Control Technology are guaranteed for workmanship for a period of one (1) year on cost of parts, not replacement labour. All parts fabricated by Air Control Technology are guaranteed providing that all instructions and inspections have been performed as per this manual. If on-site service is required, a service charge will be applicable.

POSSIBLE PROBLEMS AND THEIR CURES

PROBLEMS

CURES

- | | |
|---|--|
| 1. Dust coming through the discharge of the unit. | - check for filter tubes which have become loose on the collars, remove clamp, pull filter tube taut and reclamp. If snap ring cuff type filter tubes are used, be sure groove on cuff is properly engaged in hole plate and pull taut.
- check for holes in filter tubes. |
| 2. Bin door stuck. | - in winter, check for ice forming in the door slides.
- check for material freezing or hardening to the door. |
| 3. Inadequate Suction. | - fan is running with wrong rotation, electrical wiring should be reversed as the fan will only be approximately 50% efficient when running backwards.
- exhaust fan belts loose. These should be tightened to correct tension.

- if access door is open, then door should be closed.
- filter tubes are dirty. Thoroughly clean, also be sure procedure to empty is being followed. NOTE: shake down dust from filters may have to be removed from the storage area before exhaust fan is restarted. This prevents it from rising back into the filters.
- there is an obstruction in the ductwork system leading to the unit.
- hole in unit (patch). |

EXAMPLE

4. NO Suction

- a fuse has blown
the storage bin is full and needs emptying. If this has occurred, filter tubes may be packed full with waste material. They must be cleaned manually before restarting unit. DO NOT USE SHAKER.

5. Unit is unduly

- broken or damaged fan blade
- fan is out of balance
- bearings on the shaker or fan are badly worn, loose set screws, or grease seals have been broken due to over greasing.
- there are loose mounting bolts on the unit.
- there is a loose fan wheel.
- there are loose guards
- there are loose bolts on the shaking mechanism or a bearing has failed.

6. Emptying

- BE SURE THAT PROCEDURE TO EMPTY WASTE MATERIAL, IS BEING FOLLOWED as stated previously in the manual.

EXAMPLE

CONSTRUCTION SPECIFICATIONS FOR DUST COLLECTING

Correct design and competent installation of sheet metal ducts and hoods are necessary for the proper functioning of any dust collecting system. The following minimum specifications are recommended.

GENERAL

All exhaust systems should be constructed with the materials recommended herewith and shall be installed in a permanent and workman like manner. Interior of all ducts should be smooth and free from obstructions with joints either welded or soldered air tight.

MATERIALS

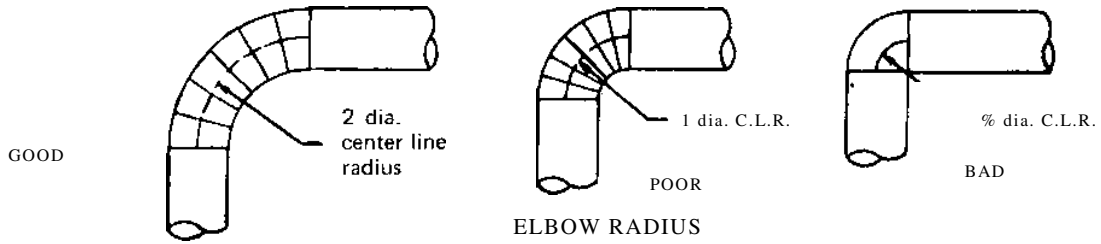
1. For the average dust collecting system on non-corrosive applications, the following metal thickness shall be applied.
 - 4" to 6" diameter 26 ga.
 - 7" to 14" diameter 24 ga.
 - 15" to 19" diameter 22 ga.
 - 20" to 25" diameter 20 ga.
 - 26" to 29" diameter 18 ga.
 - 30" to 36" diameter 16 ga.
2. Elbows and angles shall be a minimum of two gauges heavier.
3. Hoods shall be a minimum of two gauges heavier than straight sectional connection branches.
4. Where flexible piping is necessary, a non-collapsible type of flexible piping shall be used and it should be kept to a minimum.

CONSTRUCTION

1. All longitudinal seams shall be air tight.
2. Girth joints of duct shall be made with an inner lap in the direction of the air flow, and shall be kept air tight.

EXAMPLE

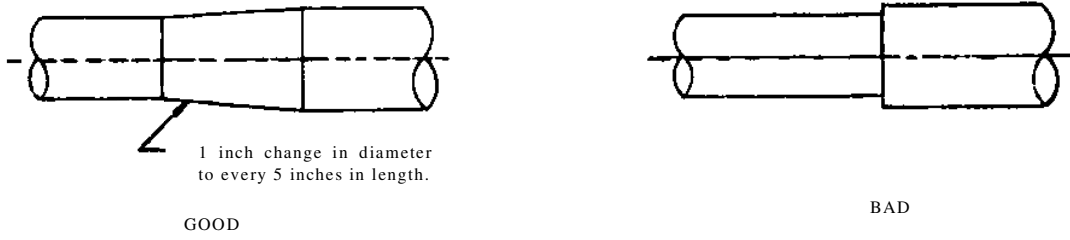
3. Elbows and angles shall have a center line and radius of two pipe diameters whenever possible. Larger radii are recommended for heavy concentrations of abrasive dust. Construct elbows six inches or less in diameter in at least five sections. Over six inches in diameter seven sections. Prefabricated elbows of smooth construction may be used. Angles pieced proportionately.



4. Hoods must be free of sharp edges or burrs and reinforced to provide the necessary stiffness and must be of good design.

SYSTEM DETAILS

2. Transitions and mains and sub-mains to be tapered. Taper 5" long for each one inch change in diameter whenever possible and transitions should be straight on the bottom to prevent build up of dust.

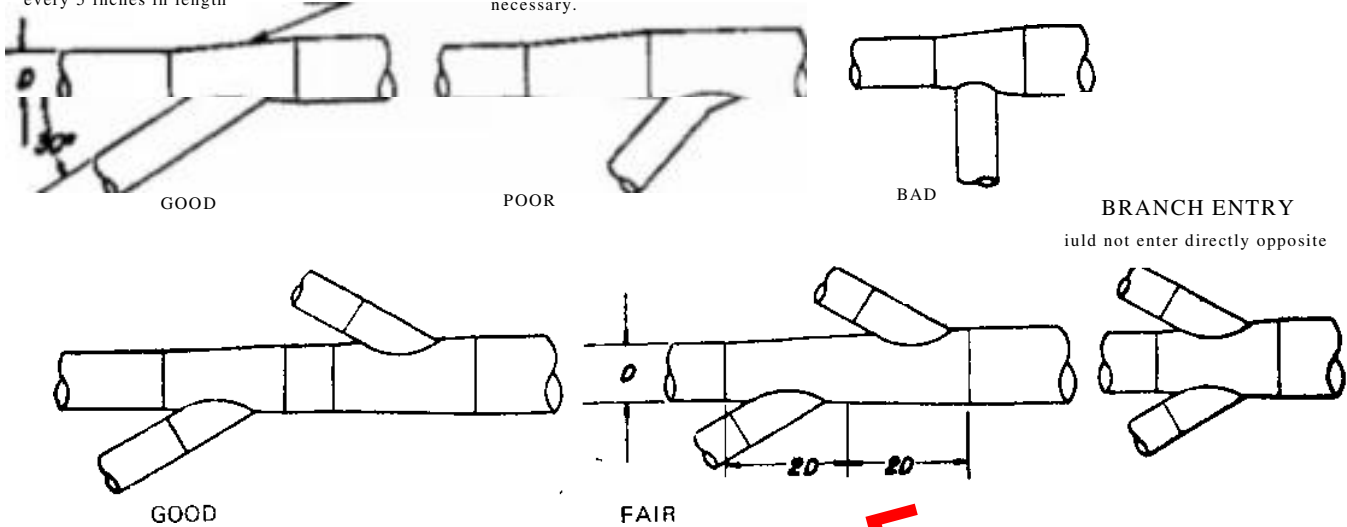


1. All branches shall enter the main at the large end of the transition at an angle not to exceed 45° 30° is preferred. Connect branches only to the top or sides of main with no two branches entering diametrically opposite.

BRANCH ENTRY

1 inch change in diameter to every 5 inches in length

Branches should enter at gradual expansions and at an angle of 30° or less (preferred) to 45° if necessary.



EXAMPLE

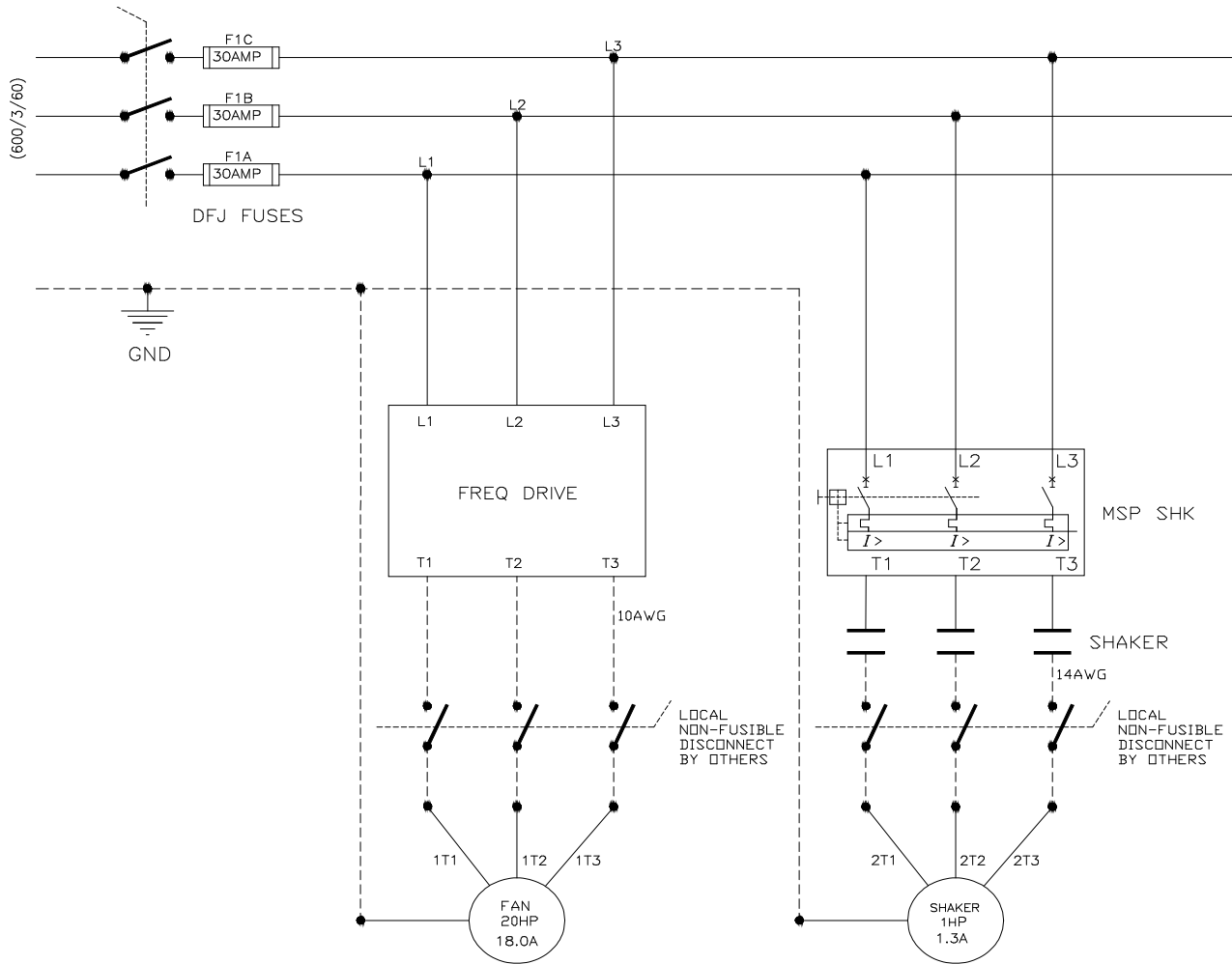
1. Where blast gates are used, use either full collar or half collar gates.
2. Rectangular ducts can be used only when clearance prevents use of round ducts. Rectangular ducts must be made as nearly square as possible. Weight of metal, lap and other construction details are to be equal to round duct construction whose diameter equals the longest side.

DESIGN

1. Good hood design cannot be stressed too greatly for the performance of a dust collecting system.
2. All machines must have proper hooding and should be designed with a good smooth flow for the material access. It must also be designed so that the throw of waste material is directly into the hood and that there are no flat surfaces to deflect the flow of material away from the exhaust pickup.
3. Floorsweeps may be added to the system in any location as long as the floorsweeps are of a type which has a door capable of being closed during system operation. These doors should be opened only during cleaning periods. Other exhaust lines around the area where the floorsweep is located may have to be blastgated and kept closed when floorsweep is operating.

EXAMPLE

ELECTRICAL SCHEMATIC



PLEASE NOTE:

- APPROVAL IS BASED AS PER CONTROL DRAWING AND C.E.C.
(CANADIAN ELECTRICAL CODE)

50 - AC DRIVE CONTROL

MODBUS	GROUPS	PARAMETER DESCRIPTION	RANGE	DEFAULT	USER SETTINGS
030DH	50.14	MAXIMUM OUTPUT FREQUENCY	50 TO 400.0 HZ	60.00	53.00
030FH	50.16	MOTOR_NAMEPLATE VOLTAGE	575V SERIES: 0.1 TO 637	575	575

60 - MOTOR CONTROL

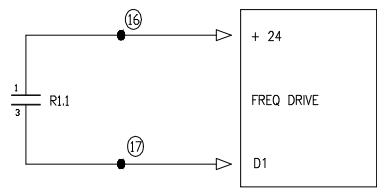
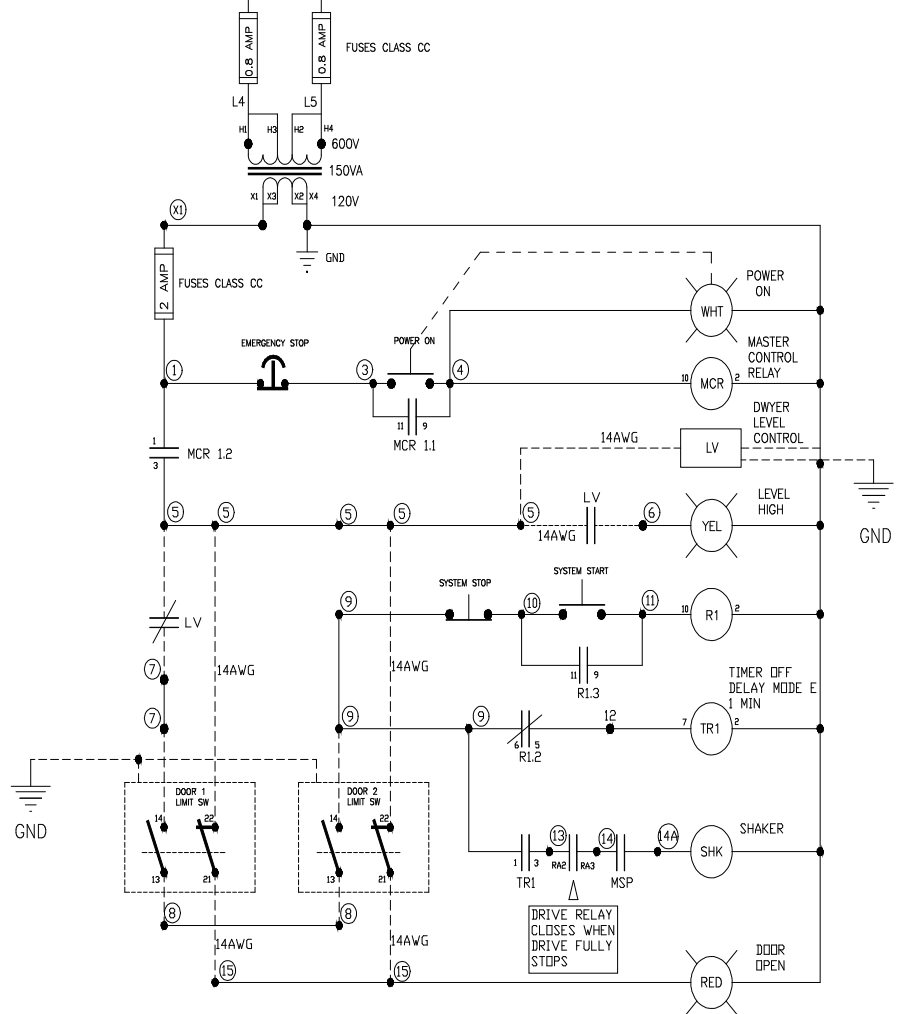
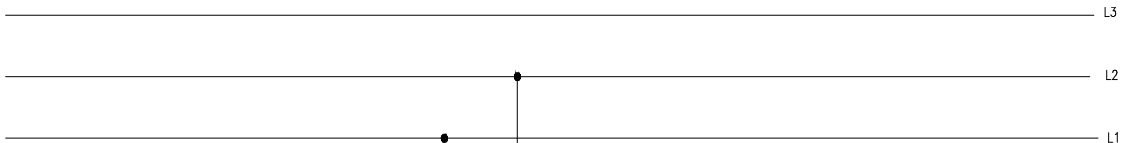
0400H	60.01	MOTOR_RATED CURRENT	REAL CURRENT (10 TO 120%)	FLA	18.0
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- THIS SCHEMATIC APPLIES TO ALL 20 HP (600/3/60) DUST COLLECTORS AS FOLLOWING: ACT-06,07
- MOTOR RPM RANGE (2900-3200)

LEGEND

- - - - - FIELD WIRING
- WIRING BLOCK TERMINAL
- WIRING POINTS MUST BE 75°C COPPER ONLY

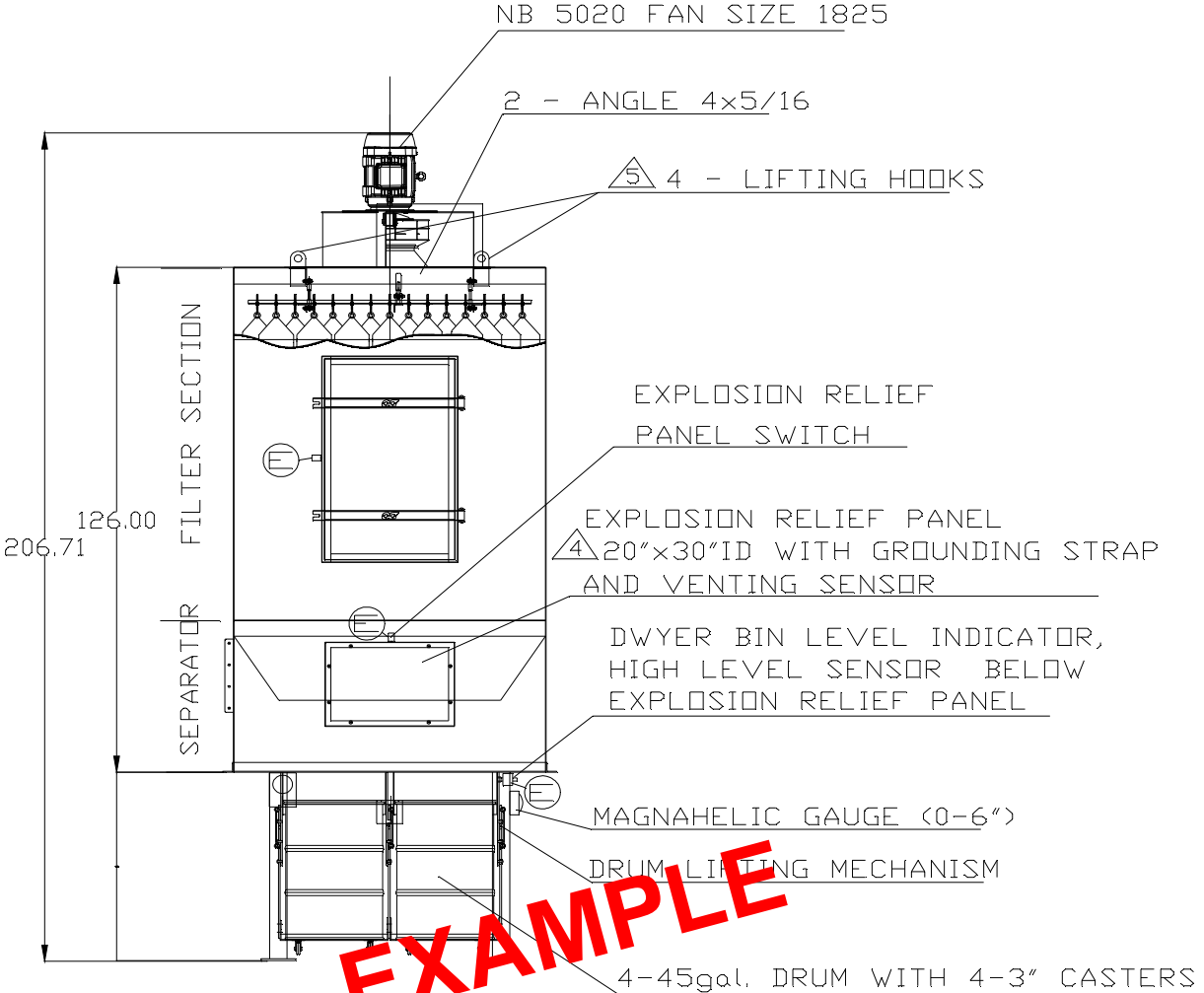
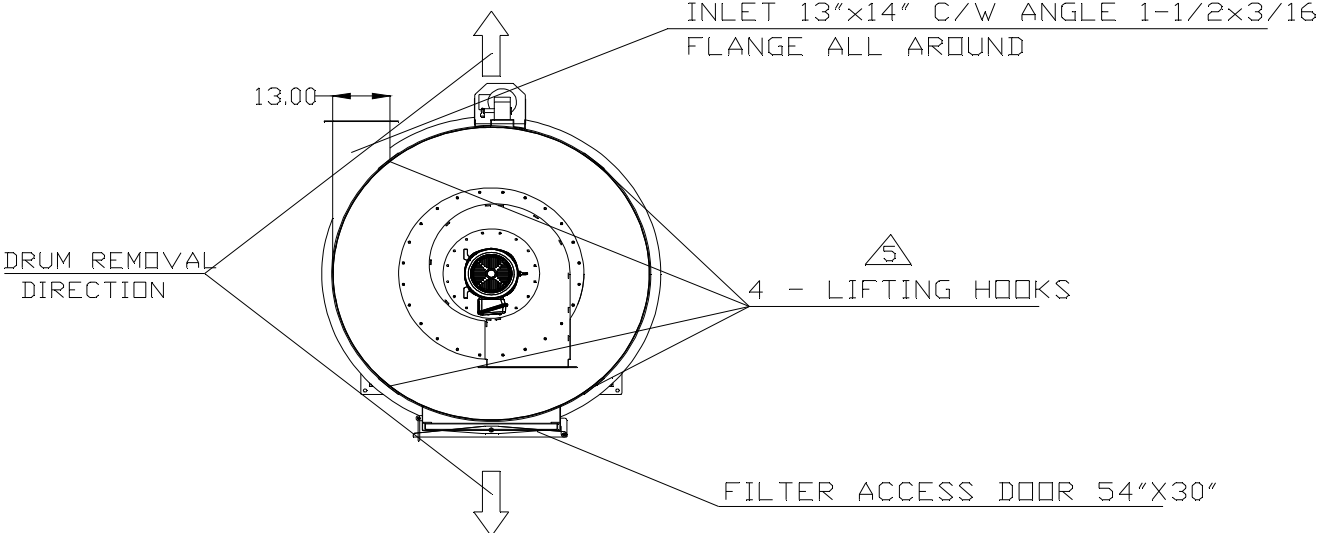
EXAMPLE



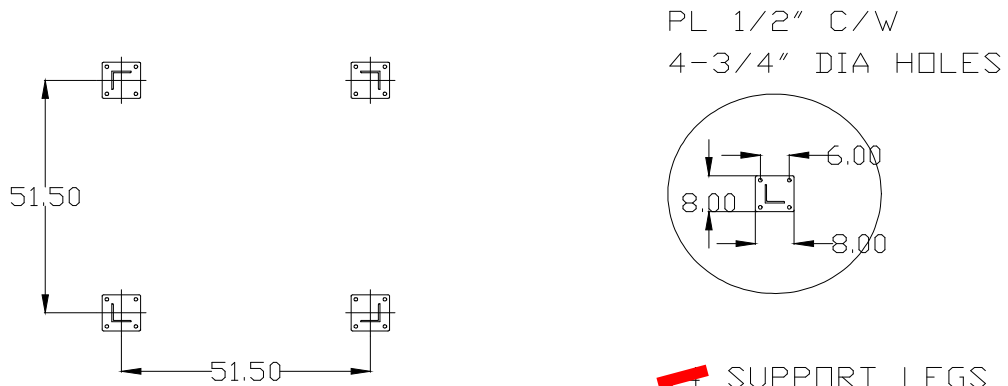
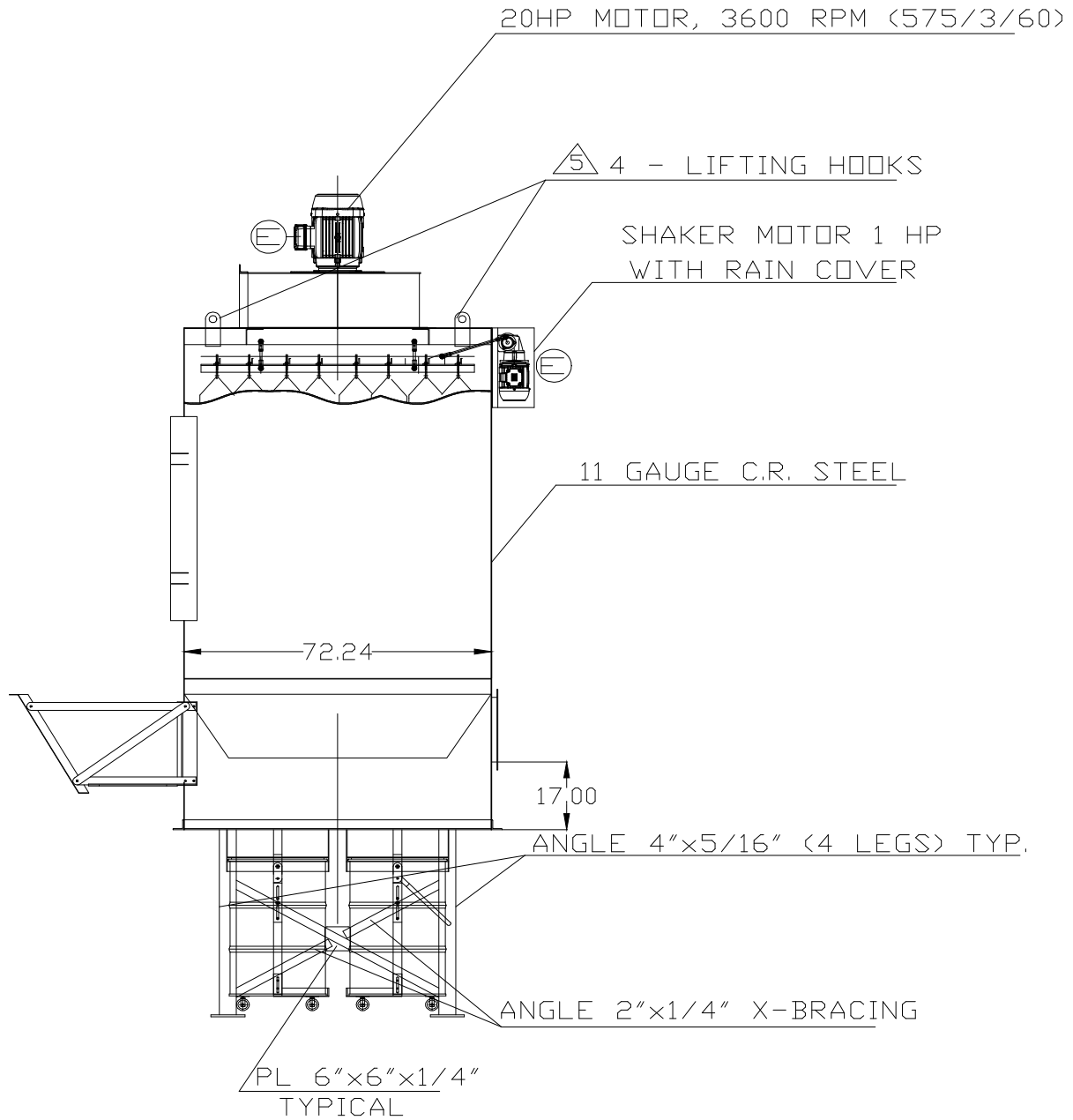
2	NOV 22/12		CSA SYSTEM APPROVAL
1	SEP 18/12		AS BUILT
NO.	DATE	BY	DESCRIPTION
MARK VOID ALL PRINTS DATED PREVIOUS TO FINAL DATE ABOVE			
AIR CONTROL TECHNOLOGY Tel:(905) 695-1947		THIS DOCUMENT CONTAINS PROPRIETARY AND CONFIDENTIAL DATA OF AIR CONTROL TECH. NO DISCLOSURE REPRODUCTION OR USE OF ANY PART THEREOF, MAY BE MADE WITHOUT WRITTEN PERMISSION OF THE COMPANY.	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND TOLERANCES ARE: .XX .XXX ANGLES .02 .005 1/2"		USED ON CUSTOMER GOVERNMENT OF NOVA SCOTIA	
DRAWN		TITLE: RSB-6-48-6.3-20 600/3/60 CONTROL PANEL	SCALE NTS
CHECKED			DATE SEP 17/12
APPROVED			
JOB NO.	5074	DWG NO.5074-2_006	

EXAMPLE

DUSTCOLLECTOR MODEL RSB



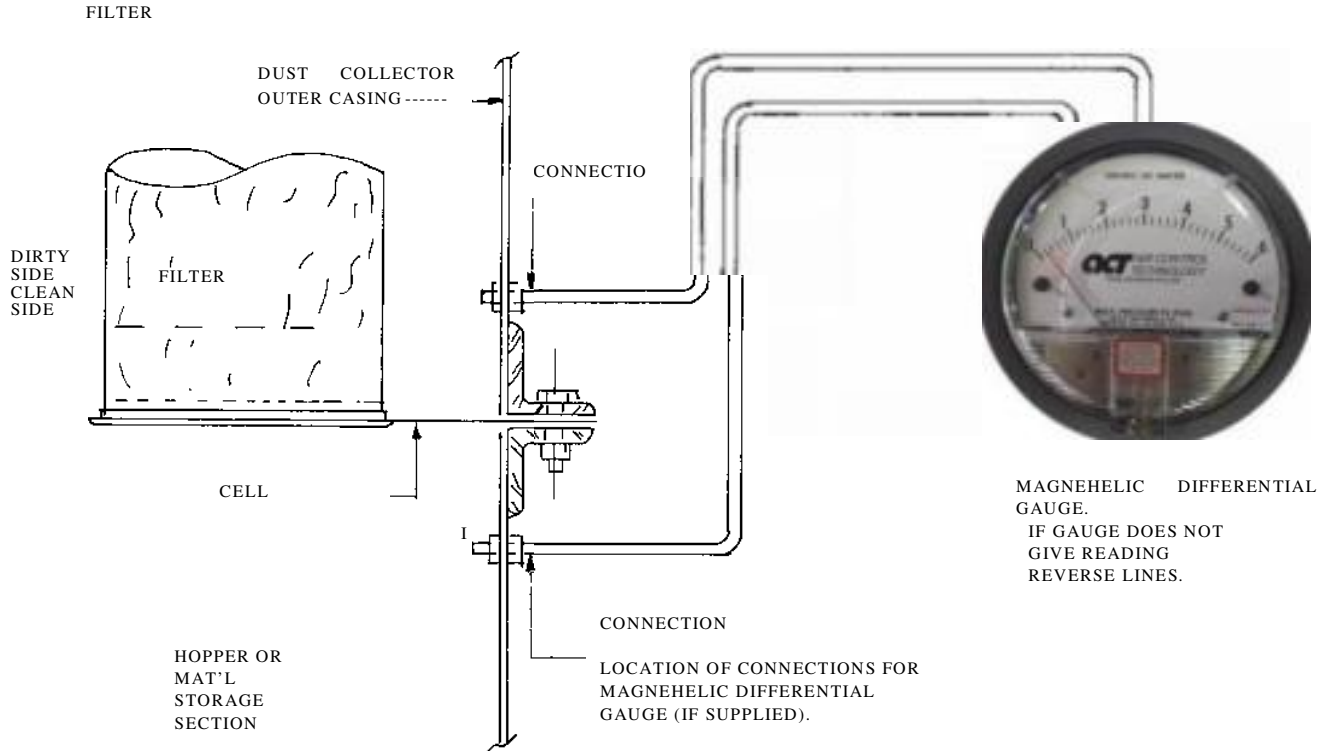
EXAMPLE



ANCHORING FOOT PRINT

SUPPORT LEGS
MAX REACTION
=4290# PULL OUT
=2570# HORIZONTAL
(SHEAR)

EXAMPLE



MAGNEHELIC DIFFERENTIAL GAUGE.
IF GAUGE DOES NOT GIVE READING REVERSE LINES.

NOTE: THIS GAUGE MAY BE SEPARATE AS SHOWN OR MOUNTED IN CONTROL PANEL BOX DEPENDING ON OPTIONS THAT ARE SELECTED.

MAGNEHELIC DIFFERENTIAL PRESSURE GAUGE (MANOMETER)

BEFORE STARTING UNIT SET INDICATING NEEDLE AT "0"

START UNIT, IF THERE IS NO READING AND INDICATING NEEDLE HAS DROPPED TO LESS THAN "0" ONTO THE NEEDLE STOP, REVERSE LINES TO GAUGE. YOU SHOULD NOW GET A READING.

AS THE FILTERS IN THE UNIT GET DIRTY, THE NEEDLE WILL TEND TO RISE TO BETWEEN 2" TO 6" DEPENDING ON MODEL OF UNIT & DUST LOADING.

WHEN NOTICEABLE DIFFERENCE IN SUCTION OCCURS, THE FILTERS SHOULD BE SHAKEN. AN UNUSUAL HIGH MANOMETER READING SHOULD ALSO BE PRESENT, BUT THIS CAN ALSO OCCUR IF CONNECTIONS TO MANOMETER ARE PLUGGED.

EXAMPLE