



Halifax Regional  
School Board

# TENDER #3683

## DUST COLLECTION SYSTEM ELECTRICAL UPGRADE PKG 3C Ellenvale Junior High School

Closing Date: *TUESDAY, JULY 22, 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  
Tel: (902) 464-2000 #2011  
Fax: (902) 464-0161

**Project Location:**

Ellenvale Junior High School  
88 Belle Vista Drive  
Dartmouth NS

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

**A mandatory bidders' site meeting will be held TUESDAY, JULY 15, 2014, 10:00 A.M. at Ellenvale Jr High – Main Entrance.**

To obtain SPECIFICATIONS/DRAWINGS **DOWNLOAD FROM HRSB WEBSITE:**  
<http://www.hrsb.ns.ca/tools/tenders/listing.aspx> .

*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 a **DUST COLLECTION SYSTEM/ELECTRICAL UPGRADE** at Ellenvale Junior High School, 88 Belle Vista Drive, Dartmouth, Nova Scotia.

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., JULY 22, 2014**, (as verified by the phone clock on the Commissionaire's desk at 33 Spectacle Lake Drive) for the following projects:

***TENDER #3683 DUST COLLECTION/ELECTRICAL UPGRADE PKG 3C –  
Ellenvale Junior High School***

***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:

***TENDER #3683 DUST COLLECTION/ELECTRICAL UPGRADE PKG 3C –  
Ellenvale Junior High School***

- (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 *AUGUST 27<sup>TH</sup>, 2014*.
- (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:

Ellenvale Junior High School: The work shall include the supply and installation of new **DUST CONTROL SYSTEM/ELECTRICAL UPGRADE** 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 4<sup>th</sup> 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 are 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 #3683  
DUST COLLECTION  
SYSTEM/ELECTRICAL UPGRADE PKG 3C  
Ellenvale Junior High School***

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 ***#3683DUST COLLECTION SYSTEM/ELECTRICAL UPGRADE PKG 3C – Ellenvale Junior High School*** 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 ***#3683DUST COLLECTION SYSTEM/ELECTRICAL UPGRADE PKG 3C –Ellenvale Junior High School*** 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>
<b><i>DUST COLLECTION SYSTEM &amp; ELECTRICAL UPGRADE PKG 3C</i></b> Ellenvale Junior High School	\$ _____
ADD HST (15% OF TOTAL PRICE)	\$ _____
<b>TOTAL CONTRACT PRICE</b>	<b>\$ _____</b>

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

§

(*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 (1<sup>st</sup>) 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:**

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

\_\_\_\_\_  
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**

<b>MEETING DATE:</b>	<b>TENDER #:</b>
----------------------	------------------

**SITE LOCATION:**

**COMPANY NAME:**

**CONTRACTOR REPRESENTATIVE::**

**HRSB REPRESENTATIVE::**

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

- |   |  |
|---|--|
| <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>Progressive Disciplinary Action Reviewed <input type="checkbox"/></p> <p>3. Contractor Health and Safety Policy <input type="checkbox"/></p> <p>Prime Contractor and Safety Management Certificate <input type="checkbox"/></p> <p>4. Health &amp; Safety Representatives/Joint Site Health &amp; Safety Committee <input type="checkbox"/></p> <p>Name and Phone _____ <input type="checkbox"/></p> <p>5. Personal Protective Equipment:</p> <p>Hard Hats <input type="checkbox"/></p> <p>Footwear <input type="checkbox"/></p> <p>Safety Glasses <input type="checkbox"/></p> | <p>8. Contractor Staff Training: Emergency Response <input type="checkbox"/></p> <p>WHMIS Training Verification <input type="checkbox"/></p> <p>O H &amp; 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>9. Review Contractor Signage &amp; Barricades <input type="checkbox"/></p> <p>10. Written Work Site Hazard Assessment and Control Plan/Schedule Submitted <input type="checkbox"/></p> <p>11. 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.

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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](http://www.wcb.ns.ca).
- Completed HRSB Safety Plan***
- Applicable Warranty Information***

HALIFAX REGIONAL SCHOOL BOARD

SPECIFICATION

WOOD DUST COLLECTION SYSTEM  
MODIFICATIONS

Tender Package 3C

June 20, 2014

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**END OF TABLE**

**PART 1 GENERAL**

**1.1 Work Covered By Contract Documents**

- .1 Work of this Contract comprises demolition and construction of dust collection system at the following location within the HRSB:

School	CFM	Static (in. of w.g.)	Volts	Hp	Supply
Ellenvale Junior High School	3930	8	600	15	By others

- .1 Electrical services upgrade.  
.2 Construction of electrical room.

**1.2 Contract Method**

- .1 Construct Work under stipulated price contract.

**1.3 Work by Others**

- .1 Co-operate with other Contractors in carrying out their respective works and carry out instructions.
- .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, in writing, any defects which may interfere with proper execution of Work.
- .3 Dust collector units to be supplied by others. Contractor responsible to coordinate delivery of units from manufacturer location to appropriate school site. FOB from manufacturer site to school site. For shipping details, contact the dust collector manufacturer directly at:

Air Control Technology (ACT)  
78 Bradwick Drive  
Concord, ON  
1-800-555-1302  
info@aircontroltech.co

- .4 Contractor to provide one (1) full year maintenance warranty for dust collection unit. Refer to manufacturer's literature for maintenance requirements.

**1.4 Work Sequence**

- .1 Construct Work in stages to accommodate Owner's continued use of premises during construction. Some work may be required outside normal to avoid disruption to daily activities. Coordinate with Board representative.
- .2 Maintain fire access/control.



**1.5 Contractor Use of Premises**

- .1 Co-ordinate use of premises under direction of assigned personnel.
- .2 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .3 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .4 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work.
- .5 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.
- .3 Sign in and out of the office on a daily basis.
- .4 Smoking is not permitted on any school property, including surrounding sidewalks and property lines.

**1.7 Pre-Purchased Equipment**

- .1 Certain items of equipment have been pre-purchased:
  - .1 Dust Collector
  - .2 Backflow damper
  - .3 Portable dust collectors
  - .4 Overarms for table saws
- .2 Purpose for pre-purchasing this equipment is to ensure delivery to site within required project completion schedule. Obtain necessary shop drawings from Consultant and proceed to co-ordinate details for installation, expedite, receive, unload, install, connect and test specified equipment, and be responsible for warrantee.
- .3 Equipment specifications for pre-purchased items are included at end of project specification, printed on blue paper for confirmation only.
- .4 Receive equipment F.O.B. and store and process equipment until installation.

**1.8 Alterations, Additions or Repairs to Existing Building**

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

**1.9 Existing Services**

- .1 Notify, Owner of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Owner 48 hours' notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance.
- .3 Establish location and extent of service lines in area of work before starting Work.
- .4 Where unknown services are encountered, immediately advise and confirm findings in writing.
- .5 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .6 Record locations of maintained, re-routed and abandoned service lines.
- .7 Construct barriers where required to protect occupants of building.

**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 Project Cleanliness**

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris.
- .2 Provide on-site containers for collection of waste materials and debris.
- .3 Dispose of waste materials and debris at appropriate locations.
- .4 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .5 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

**1.2 Final Cleaning**

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste materials from site at regularly scheduled times or dispose of.
- .5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .6 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

**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 Requirements**

- .1 Acceptance of Work Procedures:
  - .1 Contractor's Inspection: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
    - .1 Notify in writing of satisfactory completion of inspection and submit verification that corrections have been made.
    - .2 Request Board representative's inspection.
  - .2 Completion Tasks: submit written certificates that tasks have been performed as follows:
    - .1 Work: completed and inspected for compliance with Contract Documents.
    - .2 Defects: corrected and deficiencies completed.
    - .3 Equipment and systems: tested, and fully operational.
    - .4 Commissioning Plan completed.
    - .5 Operation of systems: demonstrated to Board's representative's personnel.
    - .6 Work: complete and ready for final inspection.
  - .3 Final Inspection:
    - .1 When completion tasks are done, request final inspection of Work.
    - .2 When Work incomplete according to Board's representative's inspection, complete outstanding items and request re-inspection.
  - .4 Declaration of Substantial Performance: when Board's representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
  - .5 Commencement of Lien and Warranty Periods: date of Board's representative's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
  - .6 Final Payment:
    - .1 When Board's representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
  - .7 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

**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 Site Conditions**

- .1 Notify Owner before disrupting building access or services.

**PART 2 PRODUCTS**

**2.1 Scope**

- .1 Removal of existing dust collection system, ducting, hood connections, electrical, and associated components.
- .2 Turn over components of dust collection system to Board's representative and remove from site all components that are identified by Board's representative as waste material.
- .3 The following is the school with dust collectors to be removed:

School	Dust Collector Removed Yes/No
1. Ellenvale Junior High School	Yes

**PART 3 EXECUTION**

**3.1 Examination**

- .1 Inspect site with Board's representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.
- .4 Disconnect, cap, plug or divert, as required, existing public utilities within the property where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Support, shore up and maintain pipes and conduits encountered.
  - .1 Immediately notify appropriate representatives and utility company concerned in case of damage to any utility or service, designated to remain in place.
  - .2 Immediately notify the appropriate representatives should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.

**3.2 Preparation**

- .1 Protection of In-Place Conditions:

- .1 Prevent movement, settlement, or damage to adjacent structures, utilities, and landscaping features and parts of building to remain in place. Provide bracing and shoring required.
  - .2 Keep noise, dust, and inconvenience to occupants to minimum.
  - .3 Protect building systems, services and equipment.
  - .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
- .2 Demolition/Removal:
    - .1 Remove items as indicated.
    - .2 Remove parts of existing building to permit new construction.

### **3.3 Cleaning**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Refer to demolition drawings and specifications for items to be salvaged for reuse, as requested by Board.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 Related Sections**

- .1 Section 03 20 00 – Concrete Reinforcing.
- .2 Section 03 30 00 – Cast-in-Place Concrete.

**1.2 References**

- .1 Canadian Standards Association (CSA International)
  - .1 CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA-O86S1-05, Supplement No. 1 to CAN/CSA-O86-01, Engineering Design in Wood.
  - .3 CSA O121-M1978 (R2003), Douglas Fir Plywood.
  - .4 CSA O151-04, Canadian Softwood Plywood.
  - .5 CSA O153-M1980 (R2003), Poplar Plywood.
  - .6 CAN/CSA-O325.0-92 (R2003), Construction Sheathing.
  - .7 CSA O437 Series-93 (R2006), Standards for OSB and Waferboard.
  - .8 CSA S269.1-1975 (R2003), Falsework for Construction Purposes.
  - .9 CAN/CSA-S269.3-M92 (R2003), Concrete Formwork, National Standard of Canada
- .2 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

**1.3 Submittals**

- .1 Submit shop drawings for formwork and falsework.
- .2 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.
- .3 Indicate sequence of erection and removal of formwork/falsework as directed by Board's representative.

**1.4 Delivery, Storage and Handling**

- .1 Waste Management and Disposal:
  - .1 Place materials defined as hazardous or toxic in designated containers.
  - .2 Divert wood materials from landfill to a recycling reuse composting facility as approved by Board's representative.
  - .3 Divert plastic materials from landfill to a recycling reuse composting facility as approved by Board's representative.



- .4 Divert unused form release material from landfill to an official hazardous material collections site as approved by the Board's representative.

## **PART 2 PRODUCTS**

### **2.1 Materials**

- .1 Formwork materials:
  - .1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121 and CAN/CSA-O86.
- .2 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 diameter in concrete surface.
  - .2 For Architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.
- .3 Form liner:
  - .1 Plywood: Douglas Fir to CSA O121 Canadian Softwood Plywood to CSA O151.
- .4 Form release agent: non-toxic, biodegradable, low VOC.
- .5 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene, with viscosity between 70 and 110s Saybolt Universal 15 to 24 mm<sup>2</sup>/s at 40 degrees C, flashpoint minimum 150 degrees C, open cup.
- .6 Falsework materials: to CSA-S269.1.

## **PART 3 EXECUTION**

### **3.1 Fabrication and Erection**

- .1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2 Obtain Board's representative 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 falsework in accordance with CSA S269.1.
- .5 Do not place shores and mud sills on frozen ground.
- .6 Provide site drainage to prevent washout of soil supporting mud sills and shores.

- .7 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 CSA-A23.1/A23.2.
- .8 Align form joints and make watertight.
  - .1 Keep form joints to minimum.
- .9 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
- .10 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .11 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

### **3.2 Removal and Reshoring**

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
  - .1 Three days for slabs when replaced immediately with adequate shoring to standard specified for falsework.
- .2 Remove formwork when concrete has reached 70% of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.
- .3 Provide necessary reshoring 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 reshoring in each principal direction at not more than 3000 mm apart.
- .5 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 Related Requirements**

- .1 Section 01 74 11 – Cleaning.

### **1.2 References**

- .1 American Concrete Institute (ACI)
  - .1 SP-66-04, ACI Detailing Manual 2004.
- .2 ASTM International
  - .1 ASTM A82/A82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
  - .2 ASTM A143/A143M-07, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
  - .3 ASTM A185/A185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
  - .4 ASTM A775/A775M-07b, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
- .3 CSA International
  - .1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
  - .2 CAN/CSA-A23.3-04 (R2010), Design of Concrete Structures.
  - .3 CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
  - .4 CSA-G40.20/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .5 CAN/CSA-G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .6 CSA W186-M1990 (R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .4 Reinforcing Steel Institute of Canada (RSIC)
  - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

### **1.3 Action and Informational Submittals**

- .1 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice and SP-66.
- .2 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Nova Scotia, Canada.
    - .1 Indicate placing of reinforcement and:
      - .1 Bar bending details.
      - .2 Lists.
      - .3 Quantities of reinforcement.

- .4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by HRSB, with identifying code marks to permit correct placement without reference to structural drawings.
- .2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise indicated.
  - .1 Provide type A B C tension lap splices where indicated unless otherwise indicated.
- .3 When Chromate solution is used as replacement for galvanizing non-pre-stressed reinforcement, provide product description for review by Board's representative prior to its use.

#### **1.4 Delivery, Storage and Handling**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

### **PART 2 PRODUCTS**

#### **2.1 Materials**

- .1 Substitute different size bars only if permitted in writing by Board's representative.
- .2 Reinforcing steel: billet steel, grade 300, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Reinforcing steel: weldable low alloy steel deformed bars to CSA-G30.18.
- .4 Cold-drawn annealed steel wire ties: to ASTM A82/A82M.
- .5 Deformed steel wire for concrete reinforcement: to ASTM A82/A82M.
- .6 Welded steel wire fabric: to ASTM A185/A185M.
  - .1 Provide in flat sheets only.
- .7 Welded deformed steel wire fabric: to ASTM A82/A82M.
  - .1 Provide in flat sheets only.
- .8 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.
- .9 Mechanical splices: subject to approval of TCRSB/CSAP.
- .10 Plain round bars: to CSA-G40.20/G40.21.

#### **2.2 Fabrication**

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2, SP-66 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

- .1 SP-66 unless indicated otherwise.
- .2 Obtain Board's representative written approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Board's representative, weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

## **PART 3 EXECUTION**

### **3.1 Preparation**

- .1 Galvanizing to include chromate treatment.
  - .1 Duration of treatment to be 1 hour per 25 mm of bar diameter.
- .2 Conduct bending tests to verify galvanized bar fragility in accordance with ASTM A143/A143M.

### **3.2 Field Bending**

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

### **3.3 Placing Reinforcement**

- .1 Place reinforcing steel in accordance with CSA-A23.1/A23.2.
- .2 Use plain round bars as slip dowels in concrete.
  - .1 Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.
  - .2 When paint is dry, apply thick even film of mineral lubricating grease.
- .3 Prior to placing concrete, obtain Board's representative approval of reinforcing material and placement.
- .4 Ensure cover to reinforcement is maintained during concrete pour.
- .5 Protect epoxy and paint coated portions of bars with covering during transportation and handling.

### **3.4 Field Touch-up**

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

### **3.5 Cleaning**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.

- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 Related Requirements**

- .1 Section 03 10 00 – Concrete Forming and Accessories.
- .2 Section 03 20 00 – Concrete Reinforcing.
- .3 Section 01 74 11 –Cleaning.

### **1.2 References**

- .1 Abbreviations and Acronyms:
  - .1 Cement: hydraulic cement or blended hydraulic cement (XXb - where b denotes blended).
    - .1 Type GU or GUb - General use cement.
    - .2 Type MS or MSb - Moderate sulphate-resistant cement.
    - .3 Type MH or MHb - Moderate heat of hydration cement.
    - .4 Type HE or Heb - High early-strength cement.
    - .5 Type LH or LHb - Low heat of hydration cement.
    - .6 Type HS or HSb - High sulphate-resistant cement.
  - .2 Fly ash:
    - .1 Type F - with CaO content less than 8%.
    - .2 Type CI - with CaO content ranging from 8 to 20%.
    - .3 Type CH - with CaO greater than 20%.
  - .3 GGBFS - Ground, granulated blast-furnace slag.
- .2 Reference Standards:
  - .1 ASTM International
    - .1 ASTM C260-06, Standard Specification for Air-Entraining Admixtures for Concrete.
    - .2 ASTM C309-07, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
    - .3 ASTM C494/C494M-08a, Standard Specification for Chemical Admixtures for Concrete.
    - .4 ASTM C1017/C1017M-07, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
    - .5 ASTM D412-06ae1, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
    - .6 ASTM D624-00 (2007), Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.
    - .7 ASTM D1751-04, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

- .8 ASTM D1752-04a, Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-37.2-M88, Emulsified Asphalt, Mineral Colloid-Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.
  - .2 CAN/CGSB-51.34-M86 (R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .3 CSA International
  - .1 CSA A23.1/A23.2-2004, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA A283-06, Qualification Code for Concrete Testing Laboratories.
  - .3 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

## **PART 2 PRODUCTS**

### **2.1 Design Criteria**

- .1 Alternative 1 - Performance: to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.
- .2 Alternative 2 - Prescription: to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

### **2.2 Materials**

- .1 Cement: type 10 Portland cement.
  - .1 Reduction in cement from Base Mix to Actual Supplementary Cementing Materials (SCMs) Mix, as percentage.
- .2 Supplementary cementing materials: CAN/CSA AA23.5.
- .3 Water: to CSA A23.1.
- .4 Aggregates: to CSA A23.1/A23.2.
- .5 Admixtures:
  - .1 Air entraining admixture: to ASTM C260.
  - .2 Chemical admixture: to ASTM C494. Board's representative to approve accelerating or set retarding admixtures during cold and hot weather placing.
- .6 Pre-moulded joint fillers:
  - .1 Bituminous impregnated fiber board: to ASTM D1751.
  - .2 Sponge rubber: to ASTM D1752, Type I.
  - .3 Self-expanding Standard cork: to ASTM D1752, Type III.
- .7 Weep hole tubes: plastic.



- .8 Dovetail anchor slots: minimum 0.6 mm thick galvanized steel with insulation filled slots.

### **2.3 Mixes**

- .1 Proportion normal density concrete in accordance with CAN/CSA-A23.1.
  - .1 Cement:
    - .1 Type 10 Portland cement.
    - .2 Minimum compressive strength at 28 days: 35 MPa.
    - .3 Minimum cement content: 385 kg/m<sup>3</sup> of concrete.
    - .4 Class of exposure: C1.
    - .5 Normal size of coarse aggregate: 19mm.
    - .6 Slump at point and time of discharge: 50 to 100mm.
    - .7 Air content: 5-8%.
    - .8 Chemical admixtures: following admixtures in accordance with ASTM C494, type, quantity, air entraining, super plasticizers.

### **2.4 Grout Mixes**

- .1 Grout: Minimum compressive strength of 12.5 MPa at 28 days. Maximum aggregate size and grout slump: CAN/CSA A179.

### **2.5 Grout Mixing**

- .1 Mix batched and delivered grout in accordance with CAN/CSA-A23.1 transit mixed.
- .2 Mix grout ingredients in quantities needed for immediate use in accordance with CAN/CSA A179.
- .3 Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- .4 Do not use calcium chloride or chloride based admixtures.

## **PART 3 EXECUTION**

### **3.1 Preparation**

- .1 Obtain Board's representative written approval before placing concrete.
  - .1 Provide 24 hours minimum notice prior to placing of concrete.
- .2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.
- .3 During concreting operations:
  - .1 Development of cold joints not allowed.
  - .2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
- .4 Pumping of concrete is permitted only after approval of equipment and mix.
- .5 Ensure reinforcement and inserts are not disturbed during concrete placement.

- .6 Prior to placing of concrete obtain Board's Representative approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .7 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .8 Do not place load upon new concrete until authorized by Board's Representative.

### **3.2 Installation/application**

- .1 Do cast-in-place concrete work to CSA A23.1/A23.2.
- .2 Anchor bolts or drilled bolts:
  - .1 Set anchor bolts to templates in co-ordination with appropriate trade prior to placing concrete.
  - .2 Grout anchor bolts in preformed holes or holes drilled after concrete has set only after receipt of written approval from Board's Representative.
    - .1 Formed holes: 100 mm minimum diameter.
    - .2 Drilled holes: to manufacturers' recommendations.
  - .3 Protect anchor bolt holes from water accumulations, snow and ice build-ups.
  - .4 Set bolts and fill holes with shrinkage compensating grout epoxy grout.
  - .5 Locate anchor bolts used in connection with expansion shoes, rollers and rockers with due regard to ambient temperature at time of erection.
- .3 Grout under base plates and machinery using procedures in accordance with manufacturer's recommendations which result in 100 % contact over grouted area.
- .4 Finishing and curing:
  - .1 Finish concrete to CSA A23.1/A23.2.
  - .2 Use procedures as reviewed by Board's representative or those noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.
  - .3 Use curing compounds compatible with applied finish on concrete surfaces. Applied finish on concrete: .Provide written declaration that compounds used are compatible.
  - .4 Provide light broom finish unless otherwise indicated.
  - .5 Rub exposed sharp edges of concrete with carborundum to produce 3 mm minimum radius edges unless otherwise indicated.
- .5 Joint fillers:
  - .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Board's representative.
  - .2 Locate and form isolation joints as indicated.
  - .3 Install joint filler.
  - .4 Use 12 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12 mm of finished slab surface unless indicated otherwise.

**3.3 Grout Placement**

- .1 Install grout in accordance with manufacturer's instructions.
- .2 Install grout in accordance with CAN/CSA A179.
- .3 Work grout into masonry cores and cavities to eliminate voids.
- .4 Do not displace reinforcement while placing grout.

**3.4 Surface Tolerance**

- .1 Concrete tolerance to CSA A23.1 Straightedge Method.

**3.5 Field Quality Control**

- .1 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Board's representative for review to CSA A23.1/A23.2.
- .2 Board's representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .3 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.
- .4 Inspection or testing by Board's representative will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

**3.6 Cleaning**

- .1 Clean in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 Not used.**

**PART 2 PRODUCTS**

**2.1 Scope of Work**

- .1 Removal of existing dust collection system including dust collector, ducting, equipment connects, electrical and associated supports. Confirm with Board's representative what is to be removed and disposed of.
- .2 Installation of dust collector, ducting, grounding, safety components, equipment hoods, electrical and associated supports.
- .3 Start-up system and commissioning support.

**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 Repair wall penetrations around new ducting and patch old penetrations resulting from removal of existing ducts. Install sheet metal cap on exterior and interior of wall with insulation. Duct to be capped on interior side. Weatherseal around edges. Paint to match.

**3.2 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 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.

### **1.2 Exceptions**

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

### **1.3 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.

### **1.4 Pre-tab Review**

- .1 Review contract documents before project construction is started and confirm in writing to Board's representative adequacy of provisions for TAB and other aspects of design and installation pertinent to success of TAB.
- .2 Review specified standards and report to Board's Representative 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.

### **1.5 Start-up**

- .1 Follow start-up procedures as recommended by equipment manufacturer unless specified otherwise.
- .2 Follow special start-up procedures specified elsewhere in Division 23.

### **1.6 Operation of Systems During Tab**

- .1 Operate systems for length of time required for TAB and as required by Board's Representative for verification of TAB reports.

### **1.7 Start of Tab**

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

### **1.8 Application Tolerances**

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

### **1.9 Accuracy Tolerances**

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

### **1.10 Instruments**

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

### **1.11 Submittals**

- .1 Submit, prior to commencement of TAB:

- .2 Proposed methodology and procedures for performing TAB if different from referenced standard.

### **1.12 Preliminary Tab Report**

- .1 Submit for checking and approval of Board's representative, prior to submission of formal TAB report, sample of rough TAB sheets. Include:
  - .1 Details of instruments used.
  - .2 Details of TAB procedures employed.
  - .3 Calculations procedures.
  - .4 Summaries.

### **1.13 Tab Report**

- .1 Format in accordance with referenced standard.
- .2 TAB report to show results in SI units and to include:
  - .1 Project record drawings.
  - .2 System schematics.
- .3 Submit 6 copies of TAB Report to Board's Representative for verification and approval, in English in D-ring binders, complete with index tabs.

### **1.14 Verification**

- .1 Reported results subject to verification by Board's Representative.
- .2 Provide personnel and instrumentation to verify up to 30% of reported results.
- .3 Number and location of verified results as directed by Board's representative.
- .4 Pay costs to repeat TAB as required to satisfaction of Board's representative.

### **1.15 Settings**

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

### **1.16 Completion of Tab**

- .1 TAB considered complete when final TAB Report received and approved by Board's representative.

**1.17 Air Systems**

- .1 Standard: TAB to most stringent of this section or TAB standards of ASHRAE.
- .2 Do TAB of systems, equipment, components, controls specified Division 23.
- .3 Qualifications: personnel performing TAB current member in good standing of AABC or NEBB qualified to standards of AABC or NEBB.
- .4 Quality assurance: perform TAB under direction of supervisor qualified to standards of AABC or NEBB.
- .5 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.
- .6 Locations of equipment measurements: to include as appropriate:
  - .1 Inlet and outlet of dampers, filter, fan, other equipment causing changes in conditions.
  - .2 At controllers, controlled device.
- .7 Locations of systems measurements to include as appropriate: main ducts, main branch, sub-branch, run-out.

**1.18 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.

**1.19 Post-Occupancy Tab**

- .1 Measure air velocity, air flow patterns, NC levels, in occupied zone of following areas: Wood Shop.
- .2 Emergency evacuation: participate in full scale emergency evacuation exercises. Repeat smoke management tests at this time.
- .3 Participate in systems checks twice during Warranty Period - #1 approximately 3 months after acceptance and #2 within 1 month of termination of Warranty Period.

**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.

### **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-04a, 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, 95 (Addendum No. 1, (1997).
  - .2 SMACNA HVAC Air Duct Leakage Test Manual, 1st Edition 1985.
  - .3 SMACNA IAQ Guideline for Occupied Buildings under Construction, 1st Edition 1995.
- .6 American Conference of Governmental Industrial Hygienists
  - .1 ACGIH.

### **1.3 Shop Drawings and Product Data**

- .1 Submit 3 copies of shop drawings and product.
- .2 Indicate the following:
  - .1 Proprietary joints
  - .2 Fittings

### **1.4 Certification and Ratings**

- .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.

## **PART 2 PRODUCTS**

### **2.1 Ductwork/Hoods**

#### **.1 Material:**

- .1 Fabricated steel or pre-manufactured ducting to SMACNA, Class 3, -8" WG, without reinforcement members. Construct ductwork and fittings to provide a smooth interior, free from obstruction. Ducting, hoods and enclosures shall conform to ASTM A525M-87, Specification for General Requirements for Steel Sheet, Zinc-coated (Galvanized) by the Hot-Dip Process.

Duct Size	Minimum Duct Gauge
3" to 8"	22
9" to 16"	18

- .1 Elbows: radiused, non-vented to SMACNA standards.
- .2 Branch fittings: 45 degree entry with or without conical tee.
- .3 Pre-manufactured duct joints: Ductmate, Exanno Nexus, Nordfab, Jacob, F&D, quick Clamp, flanged or approved equivalent.
- .4 Provide adequate corrosion protection for any exterior surface areas where the hot-dipped galvanizing may have become damaged during fabrication and welding.
- .5 Hood wall thickness to be 20 gauge.

### **2.2 Steel Ductwork Accessories**

- .1 All bolts, washers and nuts will conform to the requirements of ASTM A307.
- .2 Steel used for supports, hangers, flanges, stiffeners, etc., will conform to ASTM A36.
- .3 Gaskets for mild steel ducting, unless specified otherwise, will be 1/8" thick full-face gaskets of 65 durometer rubber or neoprene.
- .4 Install bonding wire across each flange.
- .5 Install bonding wire across each flex joint.
- .6 Install bonding wire across each hood attachment.

### **2.3 Seal Classification**

- .1 Class A: Longitudinal seams, transverse joints and connections made airtight by welding or flanged. SMACNA Seal Class A.

### **2.4 Hangers and Supports**

- .1 Band or trapeze hangers to ASHRAE and SMACNA standards.

- .2 Hangers: 10-gauge galvanized steel with minimum 3/8" galvanized steel rods to ASHRAE and SMACNA standards, complete with locking nuts and washers. Maximum support spacing is 10'. Hangers and supports sized as per SMACNA and ducts 1/2 full of material @ 45 lbs/ft<sup>3</sup>.

## 2.5 Upper Hanger Attachments:

- .1 For concrete: Manufactured concrete inserts.
  - .1 Acceptable material: Myatt Fig. 485.
- .2 For steel joist: Manufactured joist clamp or steel plate washer.
  - .1 Acceptable material: Grinnell Fig. 61 or 86 for joist clamps. Grinnell Fig. 60 for plate washers.
- .3 For steel beams: Manufactured beam clamps.
  - .1 Acceptable material: Grinnell Fig. 60.

## 2.6 Inspection Door

- .1 Install hinged-type access openings or clean-outs as shown on the drawings. Ensure each hinged clean-out is the same gauge or higher as the ductwork and has one heavy-duty hinge the length of the door and two toggle fastenings per door. Gasket each clean-out door using 1/4" thick x 3/4" wide closed-cell sponge rubber gasket. Gasket will be applied, with no cracks, to a clean surface around the inside edge of the door using a heavy-duty industrial adhesive cement. Hole and door sizes will be as follows:

Duct diameter	Hole Size	Door Size
4" to 6"	4" x 6"	6' x 8"
7" to 10"	6' x 8"	8" x 10"
11" to 18"	8" x 10"	10" x 12"

## 2.7 Flexible Hose

- .1 Industrial-grade wire ring reinforced with a smooth interior.
- .2 Flex hose to be static bonded, NOT static dissipating.

## PART 3 EXECUTION

### 3.1 Installation

- .1 General
  - .1 Install the ductwork essentially as shown on the drawings in a neat and workmanlike manner. It is anticipated that the layout shown is clear and free of interference; however, it is not intended that the length and elevation of the duct runs, degrees of bends or location dimensions shown on the drawing be used for prefabrication. Carefully check the site and other drawings for possible interference before fabrication and installation of this work.

- .2 Field joints will be flanged to existing flanges, as applicable or as shown on the drawings and in accordance with this technical specification. All flanged joints will be gasketed. No field welding for field joints is permitted inside the wood shop.
  - .3 Tighten bolts on flanged connections using the recommended torque. Use washers under bolt heads and nuts. In making butt joints in the field, remove all grease, moisture and other contamination from the ends of the duct being joined before it is banded.
  - .4 Provide a minimum clearance of 6" between ducts and ceiling walls or floors, unless shown otherwise. Where not possible, obtain the approval of the Board's representative before proceeding with installation.
  - .5 Any entry inside the dust collector will require a confined space entry permit and, as required, PPE.
- .2 Steel Ducting Installation
- .1 Support the ductwork in such a manner as to place no load on connected equipment. Calculate the size and spacing of hangers for dust control ductwork on the basis of the ducts being half-full of material. In no case will the hanger spacing exceed 10 feet for ducts up to 8" diameter or 15 feet for larger ducts, unless shown otherwise on the drawings.
  - .2 Support vertical risers at the base.
  - .3 Brace both vertical and horizontal runs to prevent undue swaying or vibration.
  - .4 Where possible, support all hangers from adjacent steelwork. Do not hang ducting from piping, cable trays or ceiling tiles.
  - .5 All ductwork support will be in accordance with SMACNA Industrial Duct Construction Standards.
- .3 Demolition
- .1 Remove all exposed ducting and hangers not required for the duct upgrade. Contractor is to ensure adequate supports during demolition as the ducting may contain material adding weight. Assume all ducts have additional build-up.
  - .2 Contractor is to separate joints and inspect interior of duct sections prior to removal and, where required, provide temporary capping of the duct, via duct tape or equivalent, such that removal of the duct sections will not create dust spillage within the shop.
  - .3 Any ducting passing through finished ceilings or walls is to be left in place with all penetrations through finished ceilings or wall terminated at a minimum of 6" above finished ceiling. Where possible, the termination will be at the nearest accessible joint to the main duct. Clean ducting.
  - .4 All wall and ceiling penetrations, including penetrations of the removal of existing ducting and equipment, shall be fire-stopped, as per fire Code Regulations.
  - .5 Reinstatement of finished ceilings is to be by the Contractor to the satisfaction of the Board's representative.
  - .6 Contractor is responsible for site visit to review demolition
- .4 Commissioning
- .1 General

- .1 The Contractor is required to have an electrician and sheet metal tradesperson present during the commissioning and start-up to address any modifications identified.
- .2 Drill holes in ducting for air velocity tests and plug holes after finished. (Plastic plugs)

**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 (20th Edition), Safety Standard for Electrical Installations.
  - .2 CAN3-C235-83(R2000), Preferred Voltage Levels for AC Systems, 0 to 50,000 V.
- .2 Electrical and Electronic Manufacturer's Association of Canada (EEMAC)
  - .1 EEMAC 2Y-1-1958, Light Gray Colour for Indoor Switch Gear.
- .3 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)
  - .1 IEEE SP1122-2000, The Authoritative Dictionary of IEEE Standards Terms, 7th Edition.

### **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.
- .4 Use one nameplate or label for each language.

### **1.4 Submittals**

- .1 Shop drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Provinces of Nova Scotia, Canada.
  - .2 Submit wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure co-ordinated installation.
  - .3 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each item of equipment.

- .4 Indicate of drawings clearances for operation, maintenance, and replacement of operating equipment devices.
- .5 If changes are required, confirm with Board representative of these changes before they are made.
- .2 Quality Control:
  - .1 Provide CSA-certified equipment and material.
  - .2 Where CSA-certified equipment and material is not available, submit such equipment and material to inspection authorities for special approval before delivery to site.
  - .3 Submit test results of installed electrical systems and instrumentation.
  - .4 Permits and fees: in accordance with General Conditions of contract.
  - .5 Submit certificate of acceptance from authority having jurisdiction upon completion of work to Engineer.

### **1.5 Quality Assurance**

- .1 Qualifications: electrical Work to be carried out by qualified, licensed electricians who hold valid Master Electrical Contractor license or apprentices in accordance with authorities having jurisdiction 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.

### **1.6 Delivery, Storage and Handling**

- .1 Material Delivery Schedule: provide Board representative with schedule within 2 weeks after award of Contract.

### **1.7 System Start-up**

- .1 Instruct operating personnel in operation, care and maintenance of systems, system equipment and components.

### **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.



- .3 Print or engrave operating instructions and frame under glass or in approved laminated plastic.
- .4 Post instructions where directed.
- .5 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.
- .6 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 Material and equipment to be CSA certified. Where CSA certified material and equipment are not available, obtain special approval from authority having jurisdiction before delivery to site and submit such approval as described in PART 1 - SUBMITTALS.
- .2 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 Control wiring and conduit: as indicated and noted on electrical drawings except for wiring and connections below 50 V which are related to control systems specified in mechanical sections and as shown on mechanical drawings.

### **2.3 Wiring Terminations**

- .1 Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.

### **2.4 Equipment Identification**

- .1 Nameplates: lamicoid 3 mm (.12") matt white finish face, black core (unless noted otherwise), lettering accurately aligned and engraved into core mechanically attached with metal "pop-rivets" for outdoor. Nameplate shall be affixed to building exterior with self-tapping screws.

- .1 Sizes as follows:

#### **NAMEPLATE SIZES**

Size 1	3/8" x 2"	1 line	3/16" high letters
Size 2	1/2" x 3"	1 line	1/4" high letters
Size 3	5/8" x 3"	2 lines	3/16" high letters
Size 4	3/4" x 3.5"	1 line	3/8" high letters
Size 5	1.5" x 3.5"	2 lines	1/2" high letters
Size 6	1" x 4"	1 line	1/2" high letters
Size 7	1" x 4"	2 lines	1/4" high letters

NAMEPLATE SIZES

Size 8                                      2" x 6"                                      2 lines                                      1/2" high letters

- .2 Labels: embossed plastic labels with 6 mm (.25") high letters unless specified otherwise.
- .3 Wording on nameplates and labels to be approved by Owner prior to manufacture.
- .4 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.
- .5 Lamicoid nameplates installed on combination starters, magnetic starters, manual starter and all various systems controls, control panels, disconnect switches, shall contain the following information:
  - .1 Designated name of equipment.
  - .2 Designated name of power source.
  - .3 Branch circuit breaker number(s) where possible.
  - .4 Voltage(s).

**EXAMPLE:**  
**EXHAUST FAN NO. 5**  
**PANEL H – CCT NO. 17**  
**120V – 1 PH**

**EXAMPLE:**  
**SUPPLY FAN NO. 3**  
**M.C.C. NO. 1**  
**600V – 3 PH**

- .1 Terminal cabinets and pull boxes: indicate system and voltage.
- .2 Lamicoid nameplates installed on fusible type disconnect switches are to also indicate "maximum" fuse size, where sized smaller than actual rated switch size.
- .3 Lamicoid nameplates are to be installed on all junction and/or pull boxes sized 6" x 6" and larger indicating name of system, designated panel name and electrical characteristics where applicable.
- .4 Install an additional "Lamicoid" nameplate on all, or any piece of electrical equipment, or apparatus, i.e. Main Switchboard, CDP panels, Panelboards, Motor Control Centres, that may contain overcurrent devices, ie. Circuit breakers and/or fuses, that have been designed for, and incorporate interrupting capacity sized "larger" than 10 kAIC.

**EXAMPLE:**  
**Minimum interrupting capacity**  
**of breakers installed in this panel**  
**is to be not less than 22 kAIC**

**EXAMPLE:**  
**Minimum interrupting capacity**  
**of fuses installed in this MCC**  
**is to be not less than 100 kAIC**

- .5 Lamicoid nameplates are to be installed above all types of receptacles and abutted directly to tops of their respective device plates. Identification is to indicate respective panel source c/w associated circuit breaker number(s) as per the following:

- .1 1/16" thick x 1/2" high c/w 1/4" black letters on white face above all flush receptacles (identical width as finish device plate for both single and double gang outlets):
- Example: H-20
- .6 Allow for an "average" of 40 letters for each lamicoïd nameplate.
- .1 Lamicoïd 1/16" thick plastic engraving sheet, black core, white face, for all electrical systems except for the following:
- .2 Power/voice/data/CATV/multimedia outlets shall have white face, black core.
- .7 1/16" thick nameplates above receptacles as previously indicated shall have top left and right corners rounded off. (1/16" where not applied to metals).
- .8 Lettering on lamicoïd nameplates shall not "start", nor "end" nearer than 1/2" from either, or both ends of said plates. Size of lettering, including overall lengths of various plates shall be as indicated in Nameplate Sizes chart.
- .9 Labelling of all branch circuit phase and neutral conductors is to be done on both ends of all circuit conductors, plus in "all" junction and/or pull boxes located in between. Use writon-on, self-laminating labels sized as necessary. To be installed in a "flagged" manner around individual conductor(s).
- .10 Coverplates for junction and/or pull boxes located above or within finish ceilings containing branch circuits, are to have each branch circuit number neatly identified on coverplate. Flet marker pen may be used for this purpose.
- .11 All of the following conductors are to have their "insulation" colours identified as indicated:
- |                 |     |                         |
|-----------------|-----|-------------------------|
| Phase           | (A) | Red                     |
| Phase           | (B) | Black                   |
| Phase           | (C) | Blue                    |
| Neutral         |     | White / Grey            |
| Bond            |     | Green                   |
| Ground          |     | Green                   |
| Isolated Ground |     | Green c/w Yellow stripe |
- .1 Color coded "conductor insulation" as per the following:
- .1 All sizes of phase conductors up to and including #2 AWG.
- .2 All sizes of neutral, bond and/or ground conductors, up to and including #30 AWG.
- .2 Approved coloured tapes in lieu of insulation colouring may be used to identify conductors that exceed sizes as previously indicated. To take place on "both ends" of all runs, a minimum of 12" from where terminations take place, in addition to within all or any boxes located in-between both ends of runs.

## 2.5 Wiring Identification

- .1 Identify wiring with permanent indelible identifying markings, numbered coloured plastic tapes, 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 Bonding conductors require labelling on both ends of runs where they are “dedicated” solely to the designated branch circuit they accompany. Identify with same number(s) as being used to identify accompanying branch circuit phase(s) and neutral conductor(s).

## 2.6 Conduit and Cable Identification

- .1 Colour code conduits, boxes and metallic sheathed cables.
- .2 All junction and/or pull boxes, conduit fittings (and respective covers), complete with their respective cover plates are to be colour coded as per the following: Boxes are to be coloured both inside and outside, where “one” colour only is required. Boxes are to be coloured on inside only where “two” colours are required. Metal cover plates are to have both colours applied diagonally where “two” colours are required. Complete plate is to be painted where one colour only is required. All junction boxes are to be colour identified prior to installation.
- .3 All various systems concealed junction and/or pull boxes located “within” ceiling spaces are to have their locations identified on room side of T-Bar grid spline or access cover frames with appropriate colour coded, circular shaped, self-adhering discs. Discs are to be both, 3/4” and 1/4” in diameter as indicated in the following legend, with 1/4” discs always being centered in middle of 3/4” discs:

VARIOUS SYSTEMS	3/4” DISCS	1/4” DISCS
51 TO 240 Volts	Yellow	
Ground or Bond	Green	

## 2.7 Finishes

- .1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.
  - .1 Paint outdoor electrical equipment "equipment green" finish to EEMAC Y1-1.

## 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 Install conduit and sleeves prior to pouring of concrete.
  - .1 Sleeves through concrete: schedule 40 steel pipe, sized for free passage of conduit, and protruding 50 mm (2").
- .2 If plastic sleeves are used in fire rated walls or floors, remove before conduit installation.
- .3 Install cables, conduits and fittings embedded or plastered over, close to building structure so furring 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 (6") horizontal clearance between boxes.
- .3 Change location of outlets at no extra cost or credit, providing distance does not exceed 3000 mm (10'), 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 following heights unless indicated otherwise.
  - .1 Wall receptacles:
    - .1 General: 300 mm (12").
    - .2 Above top of continuous baseboard heater: 200 mm (8").
    - .3 Above top of counters or counter splash backs: 175 mm (7").
    - .4 In mechanical rooms: 1400 mm (55").
      - .1 Emergency stop pushbuttons as indicated.

### **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 Field Quality Control**

- .1 Load Balance:
  - .1 Measure phase current to panelboards with normal loads (lighting) operating at time of acceptance; adjust branch circuit connections as required to obtain best balance of current between phases and record changes.

- .2 Provide upon completion of work, load balance report as directed in PART 1 - SUBMITTALS: phase and neutral currents on panelboards, operating under normal load, as well as hour and date on which each load was measured, and voltage at time of test.
- .2 Conduct following tests:
  - .1 Circuits originating from branch distribution panels.
  - .2 Motors, heaters and associated control equipment including sequenced operation of systems where applicable.
  - .3 Insulation resistance testing:
    - .1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.
    - .2 Megger 350-600 V circuits, feeders and equipment with a 1000 V instrument.
    - .3 Check resistance to ground before energizing.
- .3 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.
- .4 Manufacturer's Field Services:
  - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.
  - .2 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, as directed in PART 1 - QUALITY ASSURANCE.

### **3.8 Cleaning**

- .1 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.
- .2 Clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting.

**END OF SECTION**

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**PART 1 GENERAL**

**1.1 Section Includes**

- .1 Materials and installation for wire and box connectors.

**1.2 Related Sections**

- .1 Section 26 05 00 – Common Work Results for Electrical.

**1.3 References**

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-C22.2 No.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 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance to Section 26 05 00 – Common Work Results for Electrical.

**PART 2 PRODUCTS**

**2.1 Materials**

- .1 Pressure type wire connectors to: CSA C22.2 No.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 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 Bolts for copper conductors.
  - .5 Sized for conductors as indicated.
- .4 Clamps or connectors for armoured cable, and flexible conduit, as required to: CAN/CSA-C22.2 No.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 C22.2 No.65.
  - .3 Install fixture type connectors and tighten. Replace insulating cap.
  - .4 Bushing stud connectors are not accepted.

**END OF SECTION**



**PART 1 GENERAL**

**1.1 Related Requirements**

- .1 Section 26 05 00 – Common Work Results for Electrical.
- .2 Section 26 05 20 – Wire and Box Connectors (0-1000V).
- .3 Section 26 05 34 – Conduits, Conduit Fastenings and Conduit Fittings.

**1.2 Delivery, Storage and Handling**

- .1 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance to Section 26 05 00 – Common Work Results for Electrical.

**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 600 V insulation of cross-linked thermosetting polyethylene material rated RW90 XLPE.

**2.2 Teck 90 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 Cross-linked polyethylene XLPE rated RW90, 600V.
- .4 Inner jacket: polyvinyl chloride material.
- .5 Armour: interlocking aluminum.
- .6 Overall covering: thermoplastic polyvinyl material, low flames spread/low gas emission, fire retardant to CSA C22.2 No. 03.
- .7 Fastenings:
  - .1 One hole steel straps to secure surface cables 50 mm (2”) and smaller. Two hole steel straps for cables larger than 50 mm (2”).
  - .2 Channel type supports for two or more cables at 1.5 m (5”) centers.
  - .3 Threaded rods: 6 mm (.24”) diameter to support suspended channels.

- .8 Connectors:
  - .1 Watertight, explosion-proof approved for TECK cable.

### **2.3 Control Cables**

- .1 Type: 600 V, RW90, XLPE, size as indicated.

## **PART 3 EXECUTION**

### **3.1 Field Quality Control**

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Perform tests before energizing electrical system.

### **3.2 General Cable Installation**

- .1 Terminate cables in accordance with Section 26 05 20 - Wire and Box Connectors - (0-1000 V).
- .2 Cable Colour Coding: to Section 26 05 00 - Common Work Results for Electrical.
- .3 Conductor length for parallel feeders to be identical.
- .4 Lace or clip groups of feeder cables at distribution centres, pull boxes, and termination points.
- .5 Wiring in walls: typically drop or loop vertically from above to better facilitate future renovations. Generally wiring from below and horizontal wiring in walls to be avoided unless indicated.
- .6 Provide numbered wire collars for control wiring. Numbers to correspond to control shop drawing legend. Obtain wiring diagram for control wiring.

### **3.3 Installation of Building Wires**

- .1 Install wiring as follows:
  - .1 In conduit systems in accordance with Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings.

### **3.4 Installation of Teck 90 Cable (0 -1000 V)**

- .1 Group cables wherever possible on channels.
- .2 Use Teck 90 for motor connections, between motors and remote disconnect means.
- .3 Install cable exposed, securely supported by staples and hangers.

### **3.5 Installation of Control Cables**

- .1 Install field wiring control cables in conduit.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 Related Sections**

- .1 Section 26 05 00 - Common Work Results for Electrical.

### **1.2 References**

- .1 American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)
  - .1 ANSI/IEEE 837-1989 (R1996), Qualifying Permanent Connections Used in Substation Grounding.
  - .2 Canadian Standards Association, (CSA International)
  - .3 CAN/CSA Z32-1999, Electrical Safety and Essential Electrical Systems in Health Care Facilities.

### **1.3 Waste Management and Disposal**

- .1 Separate waste materials for reuse and recycling in accordance to Section 26 05 00 – Common Work Results for Electrical.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, and corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

## **PART 2 PRODUCTS**

### **2.1 Equipment**

- .1 Copper conductor: bare, stranded, soft annealed, minimum size #6.
- .2 Grounding conductors: bare stranded copper, tinned, soft annealed, size as indicated.
- .3 Insulated grounding conductors: green, type RW90.
- .4 Non-corroding accessories necessary for grounding system, type, size, material as indicated, including but not necessarily limited to:
  - .1 Grounding and bonding bushings.
  - .2 Protective type clamps.
  - .3 Bolted type conductor connectors.
  - .4 Thermit welded type conductor connectors.
  - .5 Bonding jumpers, straps.
  - .6 Pressure wire connectors.

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**PART 3 EXECUTION**

**3.1 Installation General**

- .1 Install complete permanent, continuous grounding system including, electrodes, conductors, connectors, accessories. Where conductor is used, run ground wire in conduit.
- .2 Install connectors in accordance with manufacturer's instructions.
- .3 Protect exposed grounding conductors from mechanical injury.
- .4 Use mechanical connectors for grounding connections to equipment provided with lugs.
- .5 Soldered joints not permitted.
- .6 Make grounding connections in radial configuration only, with connections terminating at single grounding point. Avoid loop connections.

**3.2 Equipment Grounding**

- .1 Install grounding connections to typical equipment included in, but not necessarily limited to following list: frames of motors, starters, and control panels.

**3.3 Field Quality Control**

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Perform ground continuity and resistance tests using method appropriate to site conditions and to approval of Board's representative and local authority having jurisdiction over installation.
- .3 Perform tests before energizing electrical system.

**END OF SECTION**

**Part 1 General**

**1.1 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .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.
- .4 Collect and separate for disposal paper packaging material and corrugated cardboard in accordance with Waste Management Plan.

**Part 2 Products**

**2.1 SUPPORT CHANNELS**

- .1 U shape, size 41 x 41 mm (1-3/4" x 1-3/4"), 2.5 mm (1/8") thick, surface mounted.

**Part 3 Execution**

**3.1 INSTALLATION**

- .1 Secure equipment to masonry and plaster surfaces with lead anchors.
- .2 Secure equipment to poured concrete with expandable inserts.
- .3 Secure equipment to hollow masonry walls or suspended ceilings with toggle bolts.
- .4 Support equipment, conduit or cables using clips, spring loaded bolts, cable clamps designed as accessories to basic channel members.
- .5 Fasten exposed conduit or cables to building construction or support system using straps.
  - .1 One-hole steel straps to secure surface conduits and cables 50 mm (2") and smaller.
  - .2 Two-hole steel straps for conduits and cables larger than 50 mm (2").
  - .3 Beam clamps to secure conduit to exposed steel work.
- .6 Suspended support systems.
  - .1 Support individual cable or conduit runs with 6 mm (.24") dia threaded rods and spring clips.
  - .2 Support 2 or more cables or conduits on channels supported by 6 mm (.24") dia threaded rod hangers where direct fastening to building construction is impractical.
- .7 For surface mounting of two or more conduits use channels at 4 m (13') on centre spacing.

- .8 Threaded rods shall not be longer than 1/4" below final uni-strut hanger.
- .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.
- .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**

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**PART 1 GENERAL**

**1.1 Related Sections**

- .1 Section 26 05 00 – Common Work Results for Electrical.

**1.2 References**

- .1 Canadian Standards Association (CSA International)
  - .1 CSA C22.1-09, Canadian Electrical Code, Part 1.

**1.3 Submittals**

- .1 Product Data:
  - .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Provide drawings stamped and signed by professional engineer registered or licensed in Province of Nova Scotia, Canada.

**1.4 Delivery, Storage and Handling**

- .1 Waste Management and Disposal: separate waste materials for reuse and recycling in accordance to Section 26 05 00 – Common Work Results for Electrical.

**PART 2 PRODUCTS**

**2.1 Junction and Pull Boxes**

- .1 Construction: welded steel enclosure.
- .2 Covers Flush Mounted: 25 mm (1") minimum extension all around.
- .3 Covers Surface Mounted: screw-on flat turned edge covers.

**PART 3 EXECUTION**

**3.1 Junction, Pull Boxes and Cabinets Installation**

- .1 Install pull boxes in inconspicuous but accessible locations.
- .2 Install terminal block as indicated.
- .3 Install additional pull boxes as required by CSA C22.1.

**3.2 Identification**

- .1 Equipment Identification: to Section 26 05 00 - Common Work Results for Electrical.



- .2 Identification Labels: size 2 indicating system name voltage and phase or as indicated.

**END OF SECTION**

**PART 1 GENERAL**

**1.1 Related Sections**

- .1 Section 26 05 00 – Common Work Results for Electrical.

**1.2 References**

- .1 Canadian Standards Association (CSA International)
  - .1 CSA C22.1-09, Canadian Electrical Code, Part 1, 20<sup>th</sup> Edition.

**1.3 Submittals**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

**1.4 Delivery, Storage and Handling**

- .1 Waste Management and Disposal: separate waste materials for reuse and recycling in accordance to Section 26 05 00 – Common Work Results for Electrical.

**PART 2 PRODUCTS**

**2.1 Outlet and Conduit Boxes General**

- .1 Size boxes in accordance with CSA C22.1.
- .2 102 mm (4”) square or larger outlet boxes as required.
- .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 Conduit Boxes**

- .1 Cast FS or FD aluminum boxes with factory-threaded hubs and mounting feet for surface wiring of devices.

**2.3 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 35 mm (1-1/4”) 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 (.24") of opening.
- .4 Provide correct size of openings in boxes for conduit, mineral insulated and armoured cable connections. Do not install reducing washers.
- .5 Vacuum clean interior of outlet boxes before installation of wiring devices.
- .6 Identify systems for outlet boxes as required.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 Related Sections**

- .1 Section 01 74 11 – Cleaning.
- .2 Section 26 05 00 – Common Work Results for Electrical.

### **1.2 References**

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA C22.2 No. 18-98 (R2003), Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware, A National Standard of Canada.
  - .2 CSA C22.2 No. 45-M1981 (R2003), Rigid Metal Conduit.
  - .3 CSA C22.2 No. 56-04, Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
  - .4 CSA C22.2 No. 83-M1985 (R2003), Electrical Metallic Tubing.
  - .5 CSA C22.2 No. 211.2-M1984 (R2003), Rigid PVC (Unplasticized) Conduit.
  - .6 CAN/CSA C22.2 No. 227.3-05, Nonmetallic Mechanical Protection Tubing (NMPT), A National Standard of Canada (February 2006).

### **1.3 Waste Management and Disposal**

- .1 Separate waste materials for reuse and recycling in accordance with Section 26 05 00 – Common Work Results for Electrical.

## **PART 2 PRODUCTS**

### **2.1 Conduits**

- .1 Electrical metallic tubing (EMT): to CSA C22.2 No. 83, with couplings.

### **2.2 Conduit Fastenings**

- .1 One hole malleable iron steel straps to secure surface conduits 50 mm (2") and smaller.
  - .1 Two hole steel straps for conduits larger than 50 mm (2").
- .2 Beam clamps to secure conduits to exposed steel work.
- .3 Channel type supports for two or more conduits at 1.5 m (5') on centre.
- .4 Threaded rods, 6 mm (.24") diameter, to support suspended channels.

### **2.3 Conduit Fittings**

- .1 Fittings: to CAN/CSA C22.2 No. 18, manufactured for use with conduit specified.  
Coating: same as conduit.
- .2 "Ells" are not accepted.

.3 Watertight connectors and couplings for EMT.

.1 Set-screws are not acceptable.

## **2.4 Firestopping**

.1 Firestopping material and installation to full depth of building element within annular space between conduits, sleeves, cables and adjacent fire separation where penetrations are made for installation of electrical systems is the responsibility of this contractor.

.2 ULC approved system.

.3 Acceptable materials.

.1 ENERSTOP firestopping system; mineral fibre and silicon smoke seal available through Canadian Industrial distributors.

.2 3M Brand Fire barrier.

.3 Double A/D.

## **2.5 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 mechanical and electrical service rooms in unfinished areas.

.3 Surface mount conduits except as indicated

.4 Use electrical metallic tubing (EMT) except in cast concrete above 2.4 m (7'-10") not subject to mechanical injury.

.5 Use rigid pvc conduit underground.

.6 Install conduit sealing fittings in hazardous areas.

.1 Fill with compound.

.7 Bend conduit cold:

.1 Replace conduit if kinked or flattened more than 1/10th of its original diameter.

.8 Mechanically bend steel conduit over 19 mm (3/4") diameter.

- .9 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.
- .10 Remove and replace blocked conduit sections.
  - .1 Do not use liquids to clean out conduits.
- .11 Dry conduits out before installing wire.

### **3.3 Surface Conduits**

- .1 Run parallel or perpendicular to building lines.
- .2 Locate conduits behind infrared or gas fired heaters with 1.5 m (5') clearance.
- .3 Run conduits in flanged portion of structural steel.
- .4 Group conduits wherever possible on suspended surface channels.
- .5 Do not pass conduits through structural members except as indicated.
- .6 Do not locate conduits less than 75 mm (3") parallel to steam or hot water lines with minimum of 25 mm (1") at crossovers.

### **3.4 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 Switches, receptacles, wiring devices, cover plates and their installation.

**1.2 Related Sections**

- .1 Section 26 05 00 - Common Work Results for Electrical.

**1.3 References**

- .1 Canadian Standards Association (CSA International)
  - .1 CSA-C22.2 No.42-99 (R2002), General Use Receptacles, Attachment Plugs and Similar Devices.
  - .2 CSA-C22.2 No.42.1-00, Cover Plates for Flush-Mounted Wiring Devices (Bi-national standard, with UL 514D).
  - .3 CSA-C22.2 No.55-M1986 (July 2001), Special Use Switches.
  - .4 CSA-C22.2 No.111-00, General-Use Snap Switches (Bi-national standard, with UL 20, twelfth edition).

**1.4 Waste Management and Disposal**

- .1 Separate waste materials for reuse and recycling in accordance with Section 26 05 00 – Common Work Results for Electrical.

**PART 2 PRODUCTS**

**2.1 Receptacles**

- .1 Single receptacles CSA type 5-20 R, 125 V, 20 A, U ground with following features:
  - .1 Brown urea moulded housing.
  - .2 Suitable for No. 10 AWG for back and side wiring.
  - .3 Four back wired entrances, 2 side wiring screws.
- .2 Other receptacles with ampacity and voltage as indicated.
- .3 Receptacles of one manufacturer throughout project.

**2.2 Cover Plates**

- .1 Cover plates for wiring devices to: CSA-C22.2 No.42.1.
- .2 Cover plates from one manufacturer throughout project.
- .3 Sheet steel utility box cover for wiring devices installed in surface-mounted utility boxes.
- .4 Aluminum cover plates for wiring devices mounted in surface-mounted FS or FD type conduit boxes.

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**PART 3 EXECUTION**

**3.1 Installation**

- .1 Receptacles:
  - .1 Install receptacles in gang type outlet box when more than one receptacle is required in one location.
  - .2 Mount receptacles at height in accordance with Section 26 05 00 - Common Work Results for Electrical as indicated.
  - .3 Where split receptacle has one portion switched, mount vertically and switch upper portion.
- .2 Cover plates:
  - .1 Protect stainless steel cover plate finish with paper or plastic film until painting and other work is finished.
  - .2 Install suitable common cover plates where wiring devices are grouped.
  - .3 Do not use cover plates meant for flush outlet boxes on surface-mounted boxes.

**END OF SECTION**



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**Part 1            General**

**1.1                RELATED SECTIONS**

- .1            Section 26 05 00 – Common Work Results – For Electrical.

**1.2                REFERENCES**

- .1            CSA C22.2 No. 248 standards.

**1.3                SUBMITTALS**

- .1            Submittal fuse performance data characteristics for each fuse type and size above 600 A. Performance data to include: average melting time-current characteristics.

**1.4                DELIVERY, STORAGE AND HANDLING**

- .1            Ship fuses in original containers.
- .2            Do not ship fuses installed in switchboard.
- .3            Store fuses in original containers in storage cabinet moisture-free location.

**1.5                MAINTENANCE MATERIALS**

- .1            Three spare fuses of each type and size installed above 600 A.
- .2            Six spare fuses of each type and size installed up to and including 600 A.

**Part 2            Products**

**2.1                FUSES - GENERAL**

- .1            Fuse type references J1, has been adopted for use in this specification.
- .2            Fuses: product of one manufacturer for entire project.

**2.2                FUSE TYPES**

- .1            Class J fuses (formerly HRCI-J)
  - .1            Type J1, time delay, capable of carrying 500% of its rated current for 10 s minimum.
  - .2            Type J2, fast acting.

**Part 3 Execution**

**3.1 INSTALLATION**

- .1 Install fuses in mounting devices immediately before energizing circuit. Ensure correct fuses fitted to physically matched mounting devices.
- .2 Ensure correct fuses fitted to assigned electrical circuit.
- .3 Provide spare fuses.

**END OF SECTION**

## **PART 1        GENERAL**

### **1.1            Section Includes**

- .1        Materials for moulded-case circuit breakers, circuit breakers, and ground-fault circuit-interrupters, fused circuit breakers, and accessory high-fault protectors.

### **1.2            Related Sections**

- .1        Section 26 05 00 – Common Work Results for Electrical.

### **1.3            References**

- .1        Canadian Standards Association (CSA International).
  - .1        CSA-C22.2 No. 5-02, Moulded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures (Tri-national standard with UL 489, tenth edition, and the second edition of NMX-J-266-ANCE).

### **1.4            Submittals**

- .1        Include time-current characteristic curves for breakers.

### **1.5            Waste Management and Disposal**

- .1        Separate waste materials for reuse and recycling in accordance with Section 26 05 00 – Common Work Results for Electrical.

## **PART 2        PRODUCTS**

### **2.1            Breakers General**

- .1        Moulded-case circuit breakers, Circuit breakers, and Ground-fault circuit-interrupters, fused circuit breakers, and Accessory high-fault protectors: to CSA C22.2 No. 5
- .2        Bolt-on moulded case circuit breaker: quick- make, quick-break type, for manual and automatic operation with temperature compensation for 40 degrees C ambient.
- .3        Common-trip breakers: with single handle for multi-pole applications.
- .4        Magnetic instantaneous trip elements in circuit breakers to operate only when value of current reaches setting.
  - .1        Trip settings on breakers with adjustable trips to range from 3-8 times current rating.
- .5        Circuit breakers with interchangeable trips as indicated.
- .6        Circuit breakers to have minimum symmetrical rms interrupting capacity rating of 10 kA I.C.

**2.2                    Thermal Magnetic Breakers Design A**

- .1                    Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection.
  
- .2                    Ampacity and voltage rating as indicated.

**PART 3                EXECUTION**

**3.1                    Installation**

- .1                    Install circuit breakers as indicated.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 Section Includes**

- .1 Materials and installation for fused and non-fused disconnect switches.

### **1.2 Related Sections**

- .1 Section 26 05 00 - Common Work Results for Electrical.

### **1.3 References**

- .1 Canadian Standards Association (CSA International).
  - .1 CAN/CSA C22.2 No.4-M89 (R2000), Enclosed Switches.
  - .2 CSA C22.2 No.39-M89 (R2003), Fuseholder Assemblies.

### **1.4 Waste Management and Disposal**

- .1 Separate waste materials for reuse and recycling in accordance with Section 26 05 00 – Common Work Results for Electrical.

## **PART 2 PRODUCTS**

### **2.1 Disconnect Switches**

- .1 Fusible, non-fusible, or horsepower rated disconnect switch in CSA Enclosure, 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 Quick-make, quick-break action.
- .5 ON-OFF switch position indication on switch enclosure cover.
- .6 Provide CSA Type 2 enclosure for indoor installation and CSA type 3R for outdoor installation.

### **2.2 Equipment Identification**

- .1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results for 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, as indicated.
- .2 Switchboard type fused disconnects shall be installed, if applicable, as indicated.  
Switchboard type fused disconnect shall match respective switchboard.

**END OF SECTION**

**Part 1            General**

**1.1                SECTION INCLUDES**

- .1        Materials and installation of ventilation status lights for indicating ventilation system failure.

**1.2                RELATED SECTIONS**

- .1        Section 26 05 00 - Common Work Results for Electrical.

**1.3                REFERENCES**

- .1        Canadian Standards Association (CSA International)
  - .1        CSA C22.2 No.14-95 (R2001), Industrial Control Equipment.
- .2        National Electrical Manufacturers Association (NEMA)
  - .1        NEMA ICS 1-2001, Industrial Control and Systems: General Requirements.

**1.4                SHOP DRAWINGS**

- .1        Include schematic, wiring, interconnection diagrams.

**1.5                WASTE MANAGEMENT AND DISPOSAL**

- .1        Separate and recycle waste materials in accordance with Section 26 05 00 – Common Work Results for Electrical.
- .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 in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4        Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Board’s representative.

**Part 2            Products**

**2.1                EMERGENCY PUSHBUTTONS**

- .1        As indicated on drawings.
- .2        Acceptable Manufacturer:
  - .1        Eaton.
  - .2        Approved equal.

**2.2                CONTACTORS**

- .1        Contactors: to CSA C22.2 No. 14.

- .2 Electrically held controlled by pilot devices as indicated and NEMA rated for type of load controlled. Half size contractors not accepted.
- .3 Complete with auxiliary contacts as indicated on drawings.

### **2.3 AC CONTROL RELAYS**

- .1 Universal pole type: electrically held with poles as indicated, convertible from NO to NC changing wiring connections. Coil rating: as indicated. Contact rating: as indicated and as required.

## **Part 3 Execution**

### **3.1 INSTALLATION**

- .1 Install units according to manufacturer's instructions and specifications. Confirm location(s) with Board's representative.
- .2 Make all power and control connections, as indicated.

### **3.2 FIELD QUALITY CONTROL**

- .1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.
- .2 Check out complete system for operational sequencing.

**END OF SECTION**



## **PART 1 GENERAL**

### **1.1 Section Includes**

- .1 Materials and installation for chain link fences and gates.

### **1.2 Related Sections**

- .1 Section 03 30 00 - Cast-in-Place Concrete.

### **1.3 Measurement Procedures**

- .1 Measure supply and erection of chain link fence in metres erected including gates.
- .2 Measure supply and erection of chain link fence gates as units of each size erected.

### **1.4 References**

- .1 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM A53/A53M-02, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - .2 ASTM A90/A90M-01, Standard Test Method for Weight Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
  - .3 ASTM A121-99, Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.
  - .4 A653/A653M-03, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .5 ASTM C618-03, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
  - .6 ASTM F1664-01, Standard Specification for Poly(Vinyl Chloride) (PVC)-Coated Steel Tension Wire Used with Chain-Link Fence.
- .2 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-138.1-96, Fabric for Chain Link Fence.
  - .2 CAN/CGSB-138.2-96, Steel Framework for Chain Link Fence.
  - .3 CAN/CGSB-138.3-96, Installation of Chain Link Fence.
  - .4 CAN/CGSB-138.4-96, Gates for Chain Link Fence.
  - .5 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
- .3 Canadian Standards Association (CSA International).
  - .1 CAN/CSA-A23.1/A23.2-00 (August 2001), Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
  - .2 CAN/CSA-G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CAN/CSA-A3000-98 (R2002), Cementitious Materials Compendium. Includes:
    - .1 CAN/CSA-A23.5-98, Supplementary Cementing Materials

- .4 Department of Justice Canada (Jus).
  - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).
- .6 The Master Painters Institute (MPI) - Architectural Painting Specification Manual - March 1998.
  - .1 MPI #18, Organic Zinc Rich Primer.
- .7 Transport Canada (TC).
  - .1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

### **1.5 Delivery, Storage and Handling**

- .1 Store and manage hazardous materials in accordance with local regulations.

### **1.6 Waste Management and Disposal**

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .3 Separate for reuse and recycling and place in designated containers Steel, Metal, and Plastic waste 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 Divert unused metal and wiring materials from landfill to metal recycling facility as approved by Board's representative.
- .7 Divert unused concrete materials from landfill to local quarry facility as approved by Board's representative.
- .8 Unused paint or coating material must be disposed of at official hazardous material collections site as approved by Board's representative.
- .9 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .10 Fold up metal banding, flatten and place in designated area for recycling.

## **PART 2 PRODUCTS**

### **2.1 Materials**

- .1 Concrete mixes and materials: in accordance with Section 03 30 00 - Cast-in-Place Concrete CAN/CSA-A23.1.
  - .1 Nominal coarse aggregate size: 20-5.
  - .2 Compressive strength: 20 MPa minimum at 28 days.
  - .3 Additives: fly ash to CAN/CSA-A23.5.
- .2 Chain-link fence fabric: to CAN/CGSB-138.1.
  - .1 Type 1, Class A, light medium heavy style, Grade 1 2 3.
  - .2 Height of fabric: as indicated 1.8 m.
- .3 Posts, braces and rails: to CAN/CGSB-138.2, galvanized steel pipe. Dimensions as indicated.
- .4 Top and bottom tension wire: to CAN/CGSB-138.2, single strand, galvanized steel wire.
- .5 Tie wire fasteners: steel wire aluminum wire, aluminum alloy wire vinyl coated.
- .6 Tension bar: to ASTM A653/A653M, 5 x 20 mm minimum galvanized steel.
- .7 Gates: to CAN/CGSB-138.4.
- .8 Gate frames: to ASTM A53/A53M, galvanized steel pipe, standard weight 2" outside diameter pipe for outside frame, 1-1/2" outside diameter pipe for interior bracing.
  - .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.
- .9 Fittings and hardware: to CAN/CGSB-138.2, galvanized steel.
  - .1 Tension bar bands: 1/8" x 3/4" minimum galvanized steel or 1/4" x 3/4" minimum aluminum.
  - .2 Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.
  - .3 Turnbuckles to be drop forged.
- .10 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: 550 g/m<sup>2</sup> minimum to ASTM A90.
- .3 For other fittings: to CAN/CSA-G164.
- .2 Aluminum coating:
  - .1 For barbed wire: to ASTM A121, Class 2.
- .3 Vinyl coating: to ASTM F1664.
  - .1 0.045 mm dry film thickness minimum.

### **PART 3 EXECUTION**

#### **3.1 Grading**

- .1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.
  - .1 Provide clearance between bottom of fence and ground surface of 1" to 2".

#### **3.2 Erection of Fence**

- .1 Erect fence along lines as indicated and to CAN/CGSB-138.3.
- .2 Excavate post holes to dimensions indicated.
- .3 Space line posts 10 feet apart, measured parallel to ground surface.
- .4 Space straining posts at equal intervals not to exceed 50 feet if distance between end or corner posts on straight continuous lengths of fence over reasonably smooth grade, is greater than 50 feet.
- .5 Install additional straining posts at sharp changes in grade and where directed by Board's representative.
- .6 Install corner post where change in alignment exceeds 10 degrees.
- .7 Install end posts at end of fence and at buildings.
  - .1 Install gate posts on both sides of gate openings.
- .8 Place concrete in post holes then embed posts into concrete to depths indicated.
  - .1 Extend concrete 2" above ground level and slope to drain away from posts.
  - .2 Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.
- .9 Do not install fence fabric until concrete has cured minimum of 5 days.
- .10 Install brace between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface.
  - .1 Install braces on both sides of corner and straining posts in similar manner.
- .11 Install overhang tops and caps.

- .12 Install top rail between posts and fasten securely to posts and secure waterproof caps and overhang tops.
- .13 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands.
- .14 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 12" intervals.
  - .1 Knuckled selvedge at bottom.
  - .2 Twisted selvedge at top.
- .15 Secure fabric to top rails, line posts and bottom tension wire with tie wires at 450 mm intervals.
  - .1 Give tie wires minimum two twists.
- .16 Install barbed wire strands and clip securely to lugs of each projection.
- .17 Install grounding rods as indicated.

### **3.3 Installation of Gates**

- .1 Install gates in locations as indicated.
- .2 Level ground between gate posts and set gate bottom approximately 40 mm above ground surface.
- .3 Determine position of centre gate rest for double gate.
  - .1 Cast gate rest in concrete as directed.
  - .2 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 as indicated.
  - .1 Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.

### **3.5 Metal Barrier**

- .1 Install metal barrier where indicated on drawing for protection from deflagration. Secure metal siding to fence, to withstand 0.5 psi pressure.

### **3.6 Cleaning**

- .1 Clean and trim areas disturbed by operations.
  - .1 Dispose of surplus material and replace damaged turf with sod as directed by Board's representative.

**END OF SECTION**



**Stantec**

# HALIFAX REGIONAL SCHOOL BOARD DUST COLLECTION SYSTEM MODIFICATIONS

JUNE 2014

Project Number: 134230629

## DRAWING LIST

### MECHANICAL

GENERAL MECHANICAL NOTES AND LEGEND.....	HRSB-TP3C-M01
ELLENVALE JUNIOR HIGH SCHOOL - FLOOR PLAN - DUCTING LAYOUT.....	HRSB-TP3C-M02
ELLENVALE JUNIOR HIGH SCHOOL - ELEVATION.....	HRSB-TP3C-M03
SLIDING MITRE & HOOD DETAILS.....	HRSB-TP3C-M04
LATHE & HOOD DETAILS.....	HRSB-TP3C-M05
TABLE SAW & HOOD DETAILS.....	HRSB-TP3C-M06
JOINTER & HOOD DETAILS.....	HRSB-TP3C-M07
BAND SAW & HOOD DETAILS.....	HRSB-TP3C-M08
ROUTER ELEVATION & HOOD DETAILS.....	HRSB-TP3C-M09
PLANER ELEVATION.....	HRSB-TP3C-M10
SANDER ELEVATION & HOOD DETAILS.....	HRSB-TP3C-M11
BONDING & CONCRETE DETAILS.....	HRSB-TP3C-M12
BONDING DETAILS.....	HRSB-TP3C-M13
DUCT ACCESSORY DETAILS.....	HRSB-TP3C-M14

### ELECTRICAL

GENERAL ELECTRICAL NOTES AND LEGEND.....	HRSB-TP3C-E01
ELLENVALE JUNIOR HIGH SCHOOL - ELECTRICAL SITE PLAN.....	HRSB-TP3C-E02
ELLENVALE JUNIOR HIGH SCHOOL - MAIN ELECTRICAL UPGRADES & SLD.....	HRSB-TP3C-E03
ELLENVALE JUNIOR HIGH SCHOOL - NEW ELECTRICAL ROOM UPGRADE.....	HRSB-TP3C-E04
ELLENVALE JUNIOR HIGH SCHOOL - WOOD SHOP ELECTRICAL PLAN.....	HRSB-TP3C-E05
ELLENVALE JUNIOR HIGH SCHOOL- ELECTRICAL DETAILS.....	HRSB-TP3C-E06
ELLENVALE JUNIOR HIGH SCHOOL - MOTOR CNTL SCHEDULE & SLD.....	HRSB-TP3C-E07


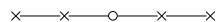



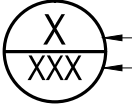

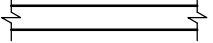





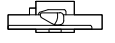
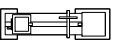




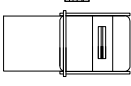

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JUNE 18, 2014

TENDER PACKAGE #3C

## GENERAL MECHANICAL NOTES:

1. MANDATORY SITE VISIT REQUIRED TO SCHOOL.
2. CONTRACTOR RESPONSIBLE FOR VERIFYING ALL MEASUREMENTS PRIOR TO FABRICATION AND INSTALLATION. DO NOT SCALE DRAWING.
3. NEW CHAIN LINK FENCE TO BE 10'-0" UNLESS OTHERWISE NOTED.
4. BACKDRAFT DAMPER TO BE PROVIDED BY OTHERS.
5. ROUND TO RECTANGULAR TRANSITION TO BE LOCATED BETWEEN BACKDRAFT DAMPER AND DUST COLLECTOR. RECTANGULAR INLET ON DUST COLLECTOR UNIT IS 13"x14". ROUND CONNECTION BASED ON BACKDRAFT DAMPER SIZING.
6. INSTALL INSPECTION DOOR ADJACENT TO BACKDRAFT DAMPER.
7. INSTALL MAGNAHELIC GAUGE INSIDE BUILDING AT DUCT EXIT POINT.
8. INSTALL BLAST GATE AT EVERY BRANCH DUCT AS PER DRAWINGS.
9. ALL DUCTING TO BE INSTALLED BELOW SUSPENDED CEILING.
10. CENTER DUST COLLECTOR ON NEW 6"(MIN.) CONCRETE PAD C/W REBAR, 12" CENTERS. ALLOW FOR 3' CLEARANCE ON ALL SIDES BETWEEN DUST COLLECTOR AND EDGE OF CONCRETE PAD FOR DRUM REMOVAL. PROVIDE RAMP FOR DRUM REMOVAL AS PER DRAWINGS.
11. ALL HOOD MATERIAL TO BE A MINIMUM OF 18 GA.
12. SUPPLY 5"Ø HOSE ADAPTER AND CLAMP FOR 5"Ø PORTABLE DUST COLLECTOR AND FLOATING DROP FLEX HOSE TO ALLOW FOR QUICK CONNECTION AND DISCONNECTION TO MACHINES. ALSO PROVIDE 4x5 REDUCERS & 5"Ø MACHINE ADAPTER FOR DOWN DRAFT TABLE.
13. WHERE APPLICABLE, PROVIDE PAVED PATH FROM DUST COLLECTOR PAD RAMP TO DESIGNATED AREA FOR DUST DISPOSAL.
14. EXISTING DUCTWORK TO BE REMOVED WHERE APPLICABLE.
15. EXISTING FENCING SURROUNDING EXISTING DUST COLLECTOR TO BE REMOVED WHERE APPLICABLE.
16. CONTRACTOR TO ENSURE MINIMUM CLEARANCE OF 6" BETWEEN DUCTING AND LIGHTS.
17. EACH SCHOOL FENCING TO HAVE VISIBLE SIGNAGE INDICATING THE POTENTIAL FIREBALL HAZARD IN THE AREA. CONTRACTOR TO SUPPLY AND INSTALL.
18. DUST COLLECTOR ASSEMBLY TO BE CSA CERTIFIED. CSA CERTIFICATION OF INDIVIDUAL COMPONENTS ALONE WILL NOT BE ACCEPTED.
19. POSITIONS OF MACHINES ON FLOOR PLAN ARE APPROXIMATE. CONTRACTOR TO VERIFY.

## GENERAL MECHANICAL LEGEND:

	EXISTING CHAIN LINK FENCE
	NEW CHAIN LINK FENCE
	BACKDRAFT DAMPER
	INSPECTION DOOR
	DUCT HANGER
	DETAIL/SECTION SHEET NUMBER
	VENTING DIRECTION
	NEW DUCTING
	DUST COLLECTOR FIREBALL
	BAND SAW
	CNC MACHINE
	DRILL PRESS
	GRINDER
	JOINTER
	LATHE
	MITRE SAW
	PLANER
	ROUTER
	SANDER
	TABLE SAW
	BLAST GATE, LOCKABLE



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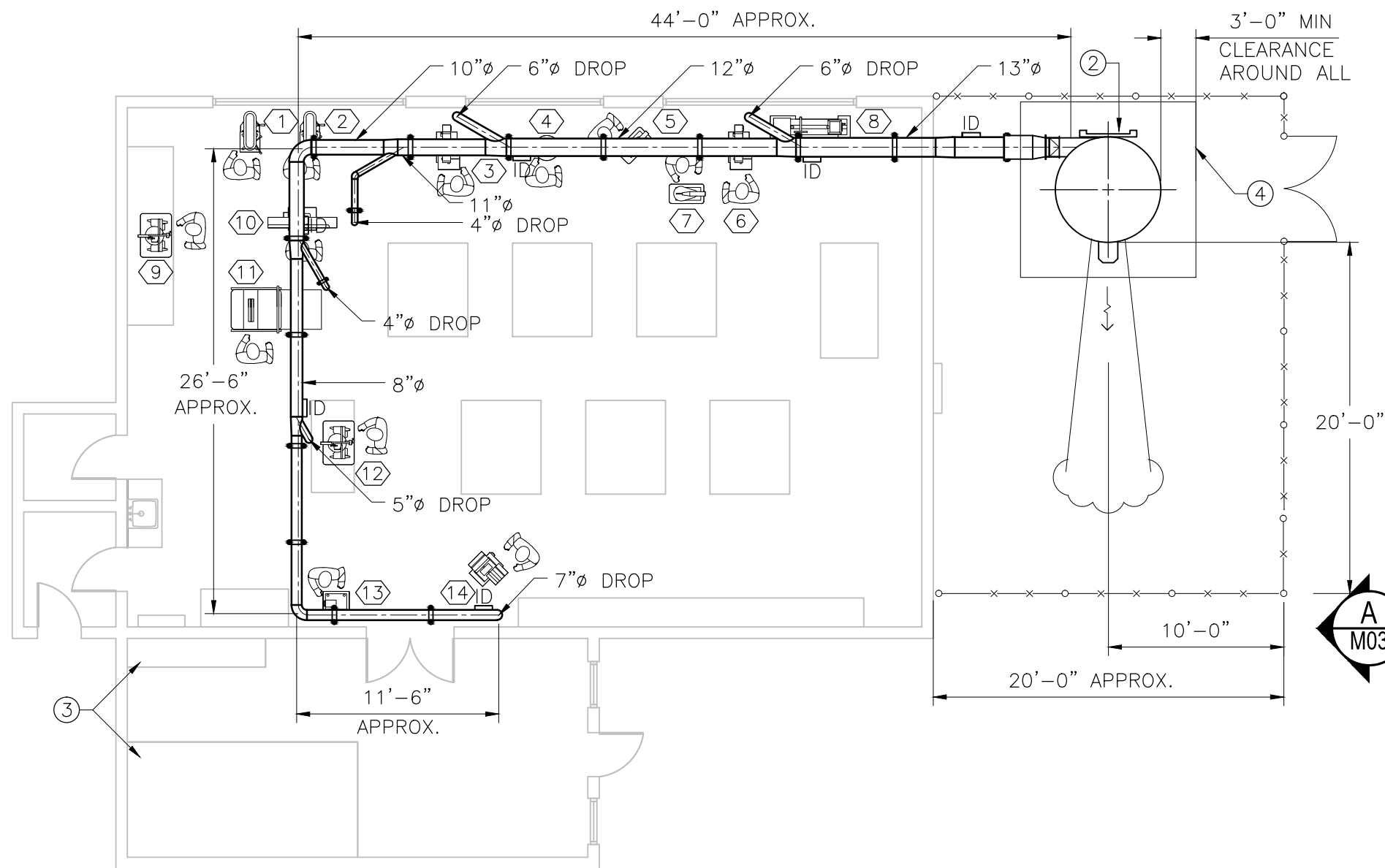
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Client/Project  
 WOOD DUST COLLECTION  
 SYSTEM MODIFICATIONS  
 Drawing No.  
 HRSB-TP3C-M01  
 Title  
 GENERAL MECHANICAL NOTES  
 AND LEGEND

Sheet  
 01 of 21  
 Drawn By  
 BC  
 Checked By  
 PL  
 Approved By  
 RTD





MACHINE DESCRIPTION	PORTABLE UNIT CFM	DUST COLLECTOR CFM	DETAIL DRAWING NUMBER
① DRILL PRESS	NC	NC	-
② DRILL PRESS	NC	NC	-
③ BAND SAW	-	700	HRSB-TP3C-M08
④ ROUTER	350	-	HRSB-TP3C-M09
⑤ SCROLL SAW	NC	NC	-
⑥ BAND SAW	-	700	HRSB-TP3C-M08
⑦ SCROLL SAW	NC	NC	-
⑧ LATHE	880	-	HRSB-TP3C-M05
⑨ MITRE SAW	500	-	HRSB-TP3C-M04
⑩ JOINTER	-	440	HRSB-TP3C-M07
⑪ TABLE SAW	-	450	HRSB-TP3C-M06
⑫ MITRE SAW	-	500	HRSB-TP3C-M04
⑬ PLANER	785	-	HRSB-TP3C-M10
⑭ SANDER	-	1140	HRSB-TP3C-M11
DUST COLLECTOR TOTAL		3930	

NC = NOT CONNECTED TO DUST COLLECTION SYSTEM

**NOTES:**

- ① EXISTING CEILING IS SUSPENDED T-BAR WITH 2'X2' ACOUSTIC TILES. ALL DUCTING TO BE INSTALLED BELOW SUSPENDED CEILING.
- ② NEW DUST COLLECTOR PROVIDED BY OTHERS 3930CFM @ 8" EXTERNAL SP. MOTOR: 15HP (575/3/60) TEFC.
- ③ WOOD STORAGE SHELVES.
- ④ PROVIDE RAMP ON THIS SIDE FOR DRUM REMOVAL.
- ⑤ NEW SAWSTOP TABLESAW C/W OVERARM DUST COLLECTION TO REPLACE EXISTING TABLESAW, PROVIDED BY OTHERS.

**WOOD SHOP FLOOR PLAN - DUCTING LAYOUT**

SCALE: 1/8" = 1'-0"



ORIGINAL SHEET - ANSI B



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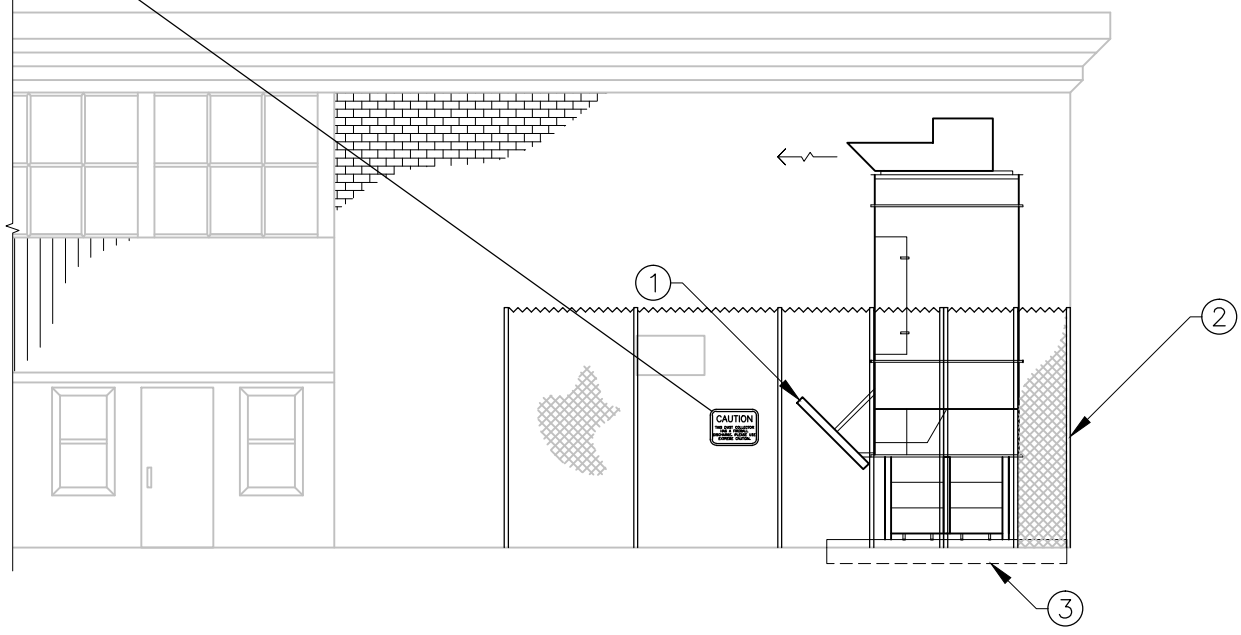
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Client/Project  
 WOOD DUST COLLECTION  
 SYSTEM MODIFICATIONS  
 Drawing No.  
 HRSB-TP3C-M02  
 Title  
 ELLENVALE JUNIOR HIGH SCHOOL  
 FLOOR PLAN - DUCTING LAYOUT

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 Approved By  
 RTD

**CAUTION**  
 THIS DUST COLLECTOR  
 HAS A FIREBALL  
 DISCHARGE. PLEASE USE  
 EXTREME CAUTION.



**NOTES:**

- ① DEFLECTOR REFERENCE.
- ② NEW 10'-0" HIGH CHAIN LINK FENCE
- ③ NEW 6" CONCRETE PAD FOR DUST COLLECTOR.

**A**  
**M04** ELLENVALE JUNIOR HIGH SCHOOL - ELEVATION  
 SCALE: 1/8"=1'-0"



ORIGINAL SHEET - ANSI B

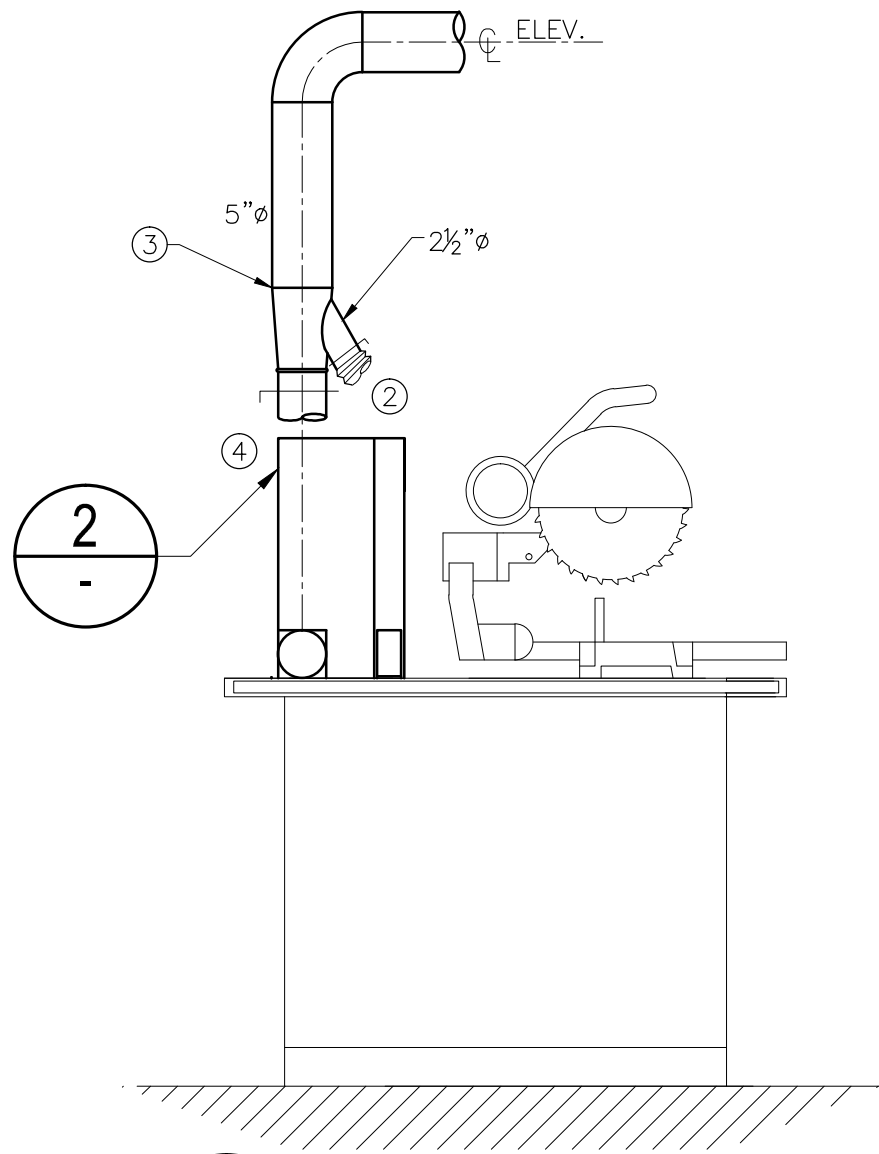


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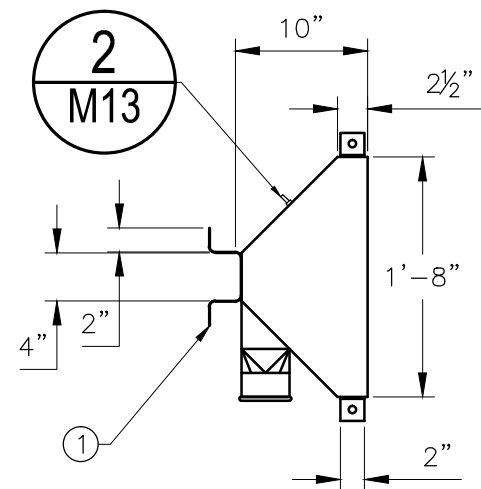
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Client/Project  
 WOOD DUST COLLECTION  
 SYSTEM MODIFICATIONS  
 Drawing No.  
 HRSB-TP3C-M03  
 Title  
 ELLENVALE JUNIOR HIGH SCHOOL  
 ELEVATION

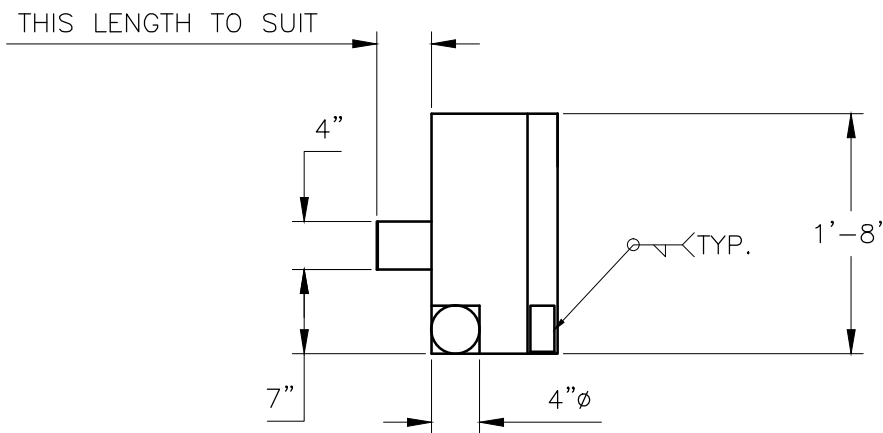
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**1**  
-  
**MITRE SAW - ELEVATION**  
SCALE: 3/4"=1'-0"



**2**  
-  
**MITRE SAW HOOD**  
SCALE: 3/4"=1'-0"



**NOTES:**

- ① ALTERNATE SUPPORT POSITION FOR WALL MOUNTING. LENGTH TO SUIT.
- ② CONNECT FLEX DUCT TO MITRE SAW DUST PORT.
- ③ IF CONNECTED TO A PORTABLE DUST COLLECTOR, TERMINATE DUCTING AT THIS POINT AND INSTALL A 5"Ø MACHINE ADAPTER.
- ④ CONNECT FLEX DUCT TO 4"Ø PORT ON DUST HOOD.

MITRE SAW DRAWING USED AT:	
DRAWING NUMBER	MACHINE NUMBER
HRSB-TP3C-M02	12



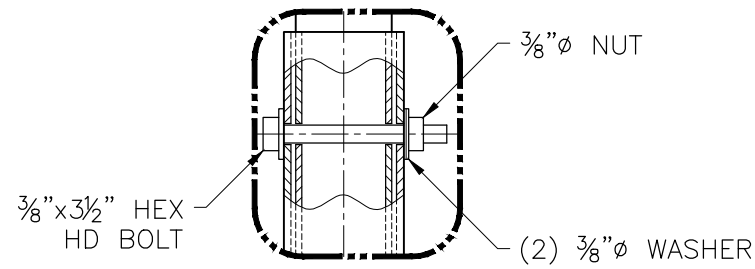
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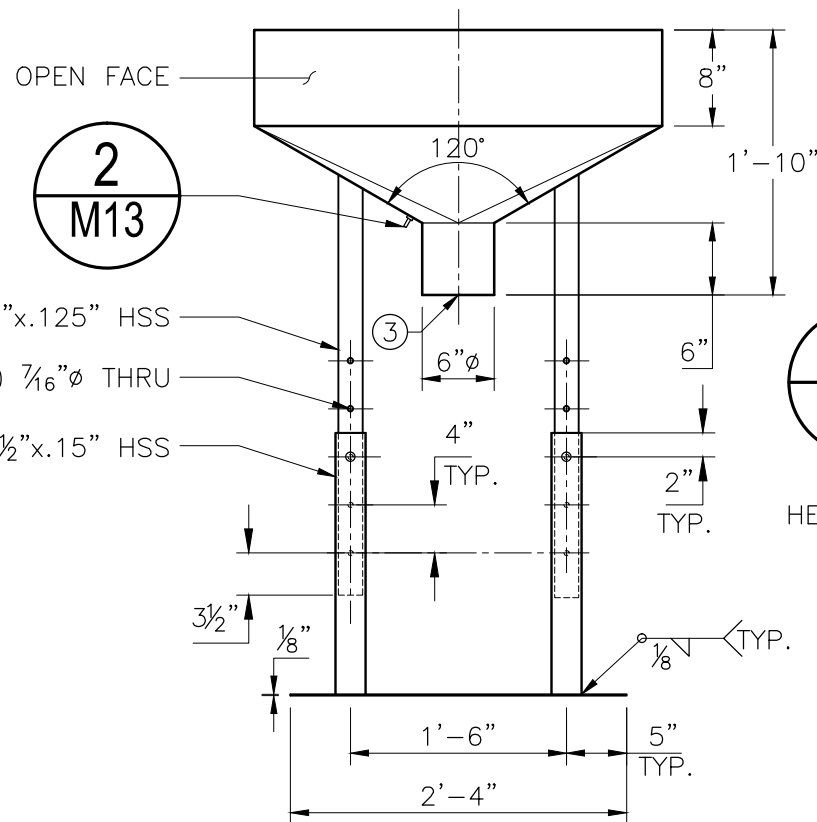
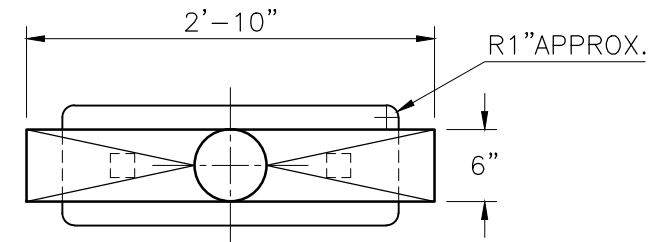
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SYSTEM MODIFICATIONS  
Drawing No.  
HRSB-TP3C-M04  
Title  
MITRE SAW &  
HOOD DETAILS

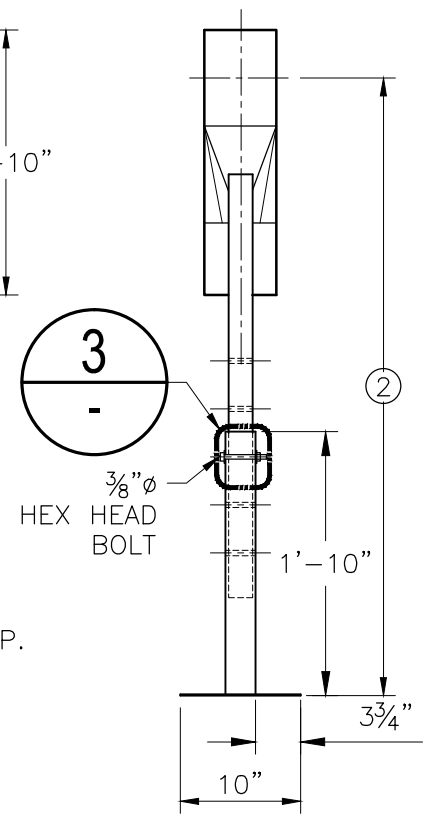
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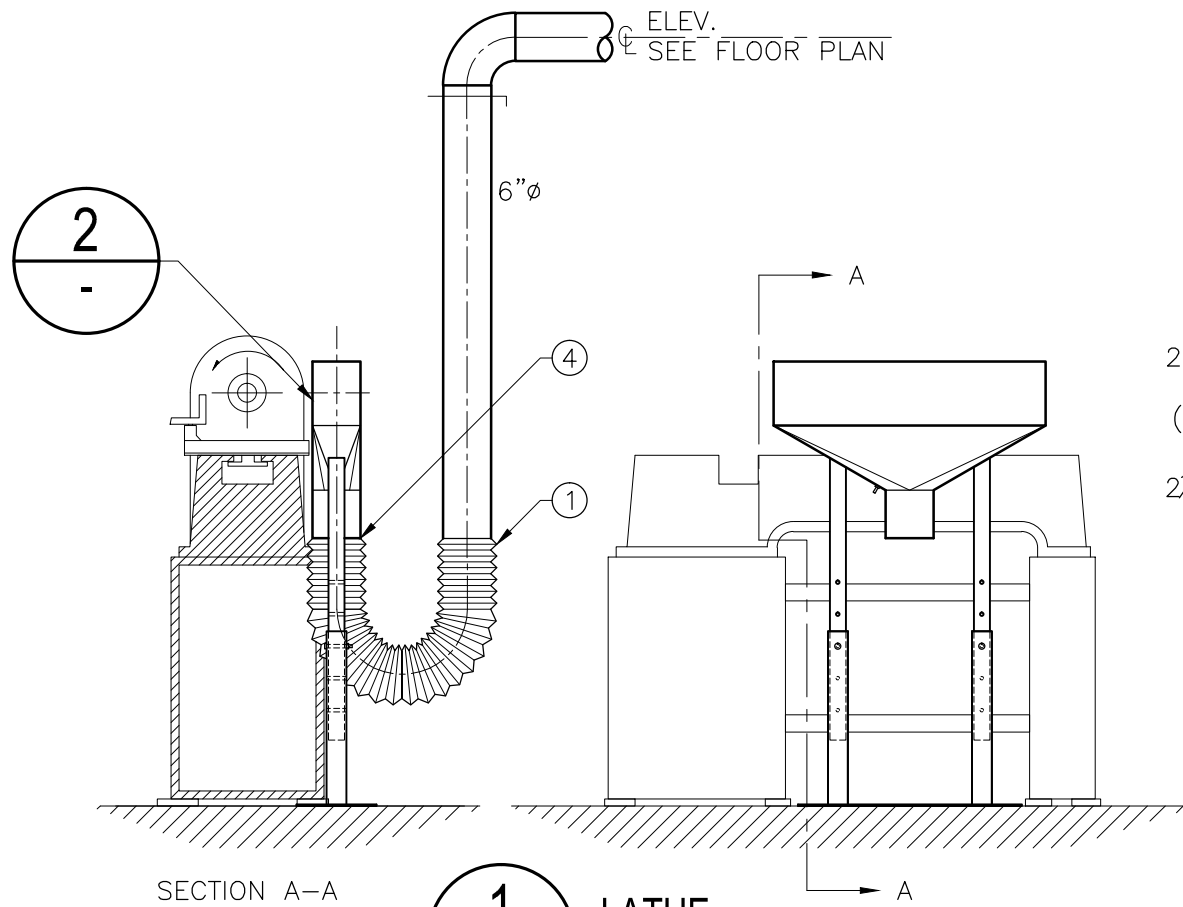
**3**  
-  
**DETAIL**  
SCALE: 3"=1'-0"



**2**  
-  
**M13**  
SCALE: 3/4"=1'-0"



**3**  
-  
SCALE: 3/4"=1'-0"



**1**  
-  
**LATHE**  
SCALE: 1/2"=1'-0"

**NOTES:**

- ① FLEX DUCT LENGTH TO ALLOW FOR HEIGHT ADJUSTMENT OF HOOD.
- ② CENTRE LINE OF OPEN FACE TO MATCH CENTRE LINE OF LATHE SPINDLE. CONTRACTOR TO VERIFY ON SITE.
- ③ MACHINE ADAPTER TO BE INSTALLED AT THIS POINT IF CONNECTED TO DUST COLLECTOR. NORDFAB PART No.3249 OR EQUIVALENT. IF CONNECTED TO PORTABLE UNIT, A 6"x5" QUICK FIT REDUCER IS ALSO REQUIRED. NORDFAB PART No.3222 OR EQUIVALENT.
- ④ USE NORDFAB QUICK FIT HOSE ADAPTERS FOR FLEX DUCT CONNECTIONS. NORDFAB PART No. 3282-0600 OR EQUIVALENT.
- ⑤ ATTACH LATHE DUST HOOD TO FLOOR ONCE IN POSITION.

LATHE DRAWING USED AT:	
DRAWING NUMBER	MACHINE NUMBER
HRSB-TP3C-M02	8



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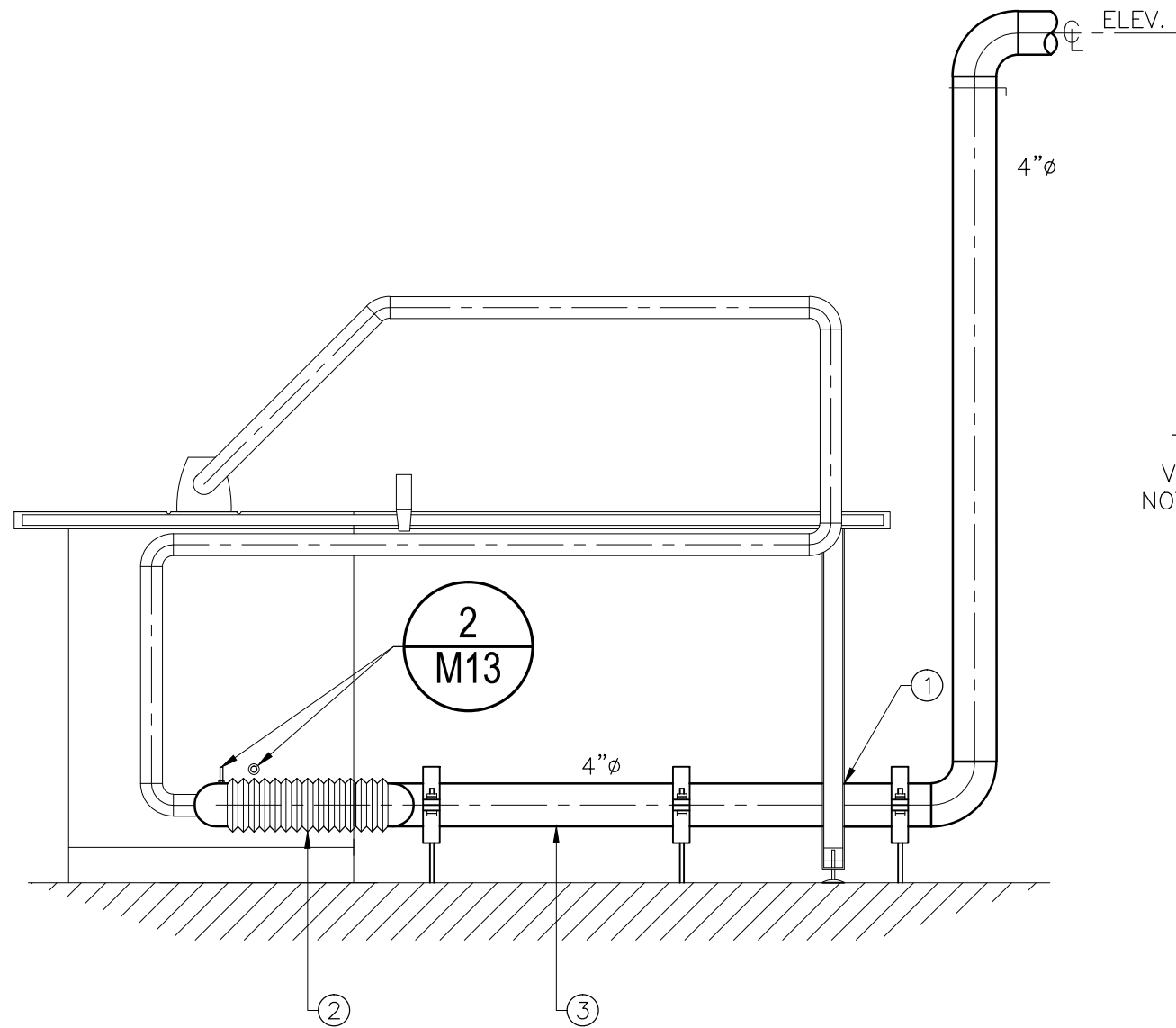
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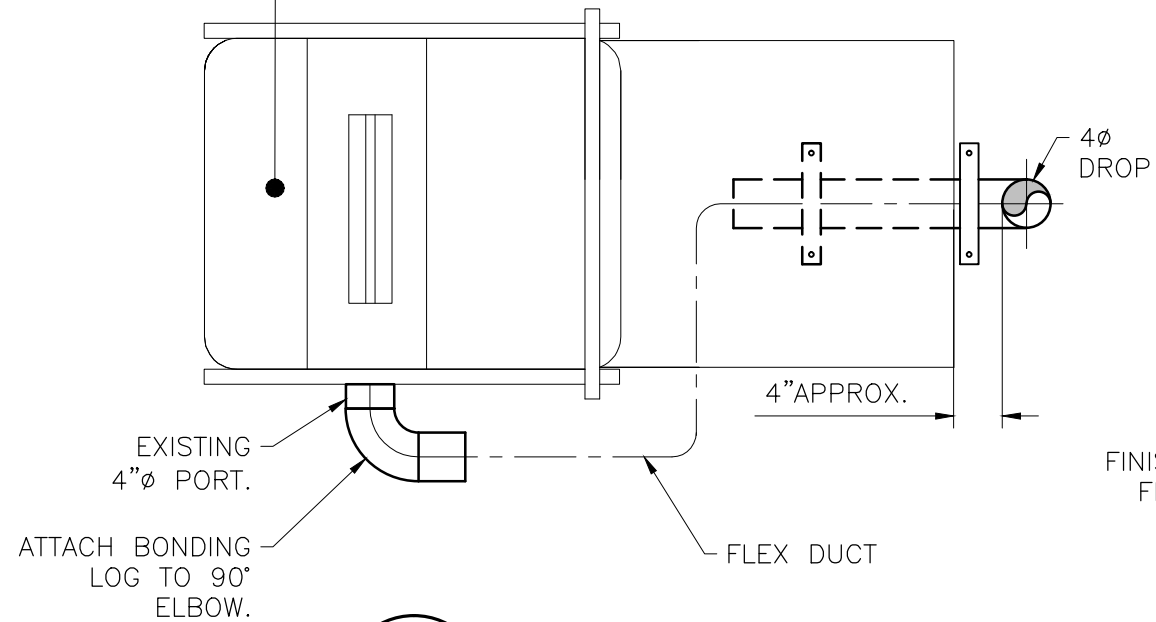
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WOOD DUST COLLECTION  
SYSTEM MODIFICATIONS  
Drawing No.  
HRSB-TP3C-M05  
Title  
LATHE &  
HOOD DETAILS

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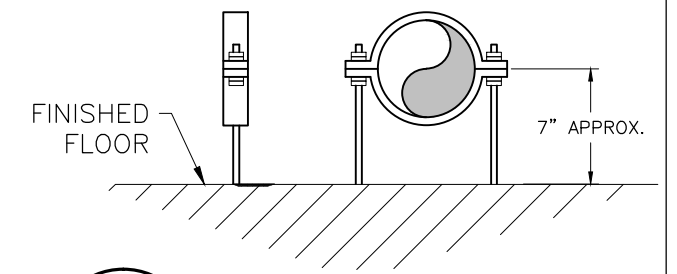


**1** TABLE SAW - ELEVATION  
SCALE: 3/4"=1'-0"

TABLESAW TOP VIEW (OVERARM NOT SHOWN FOR CLARITY.)



**2** DUCT CONNECTION DETAIL  
SCALE: 3/4"=1'-0"



**3** FLOOR MOUNTING DETAIL  
SCALE: 1"=1'-0"

**NOTES:**

- ① RUN DUCT BETWEEN LEGS OF TABLE SAW EXTENSION.
- ② RUN FLEX DUCT FROM HARD DUCT TERMINATION POINT TO DUST PORT ON TABLE.
- ③ THIS SECTION OF DUCT TO BE SUPPORTED WITH FLOOR BRACKETS.

TABLE SAW DRAWING USED AT:	
DRAWING NUMBER	MACHINE NUMBER
HRSB-TP3C-M02	①①



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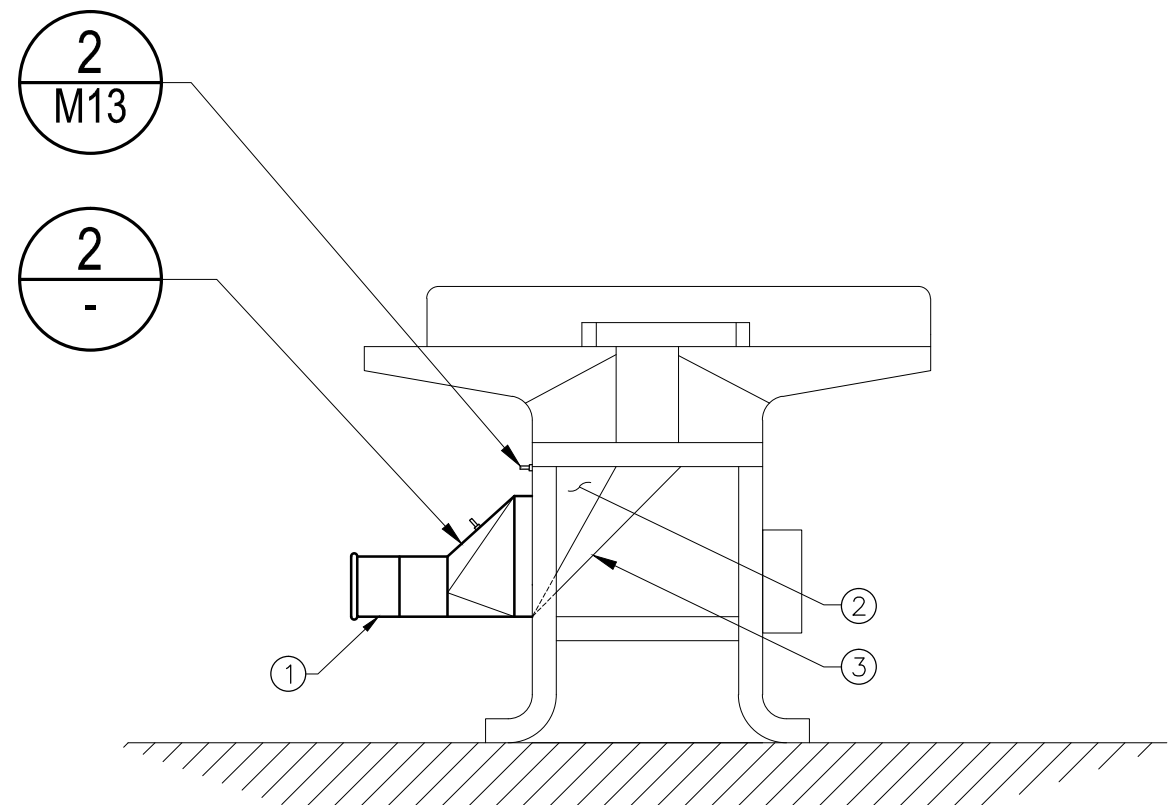
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WOOD DUST COLLECTION  
SYSTEM MODIFICATIONS  
Drawing No.  
HRSB-TP3C-M06  
Title  
TABLE SAW &  
HOOD DETAILS

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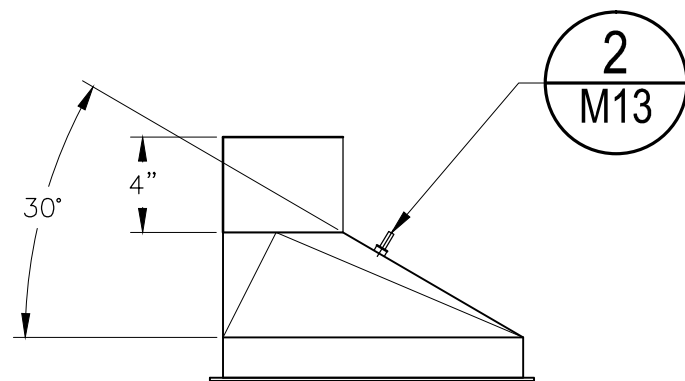
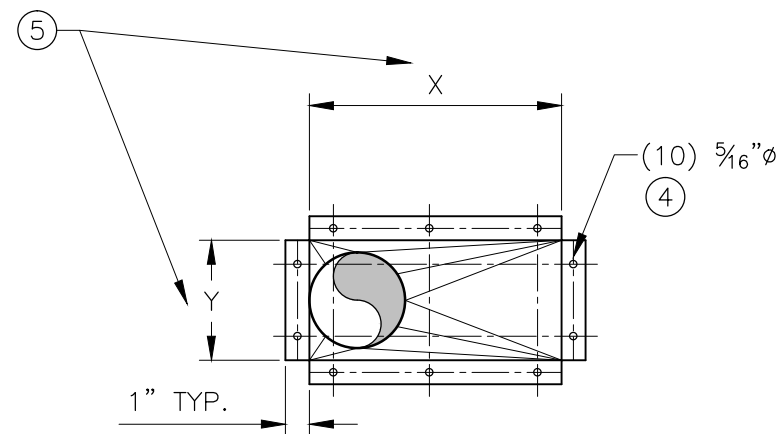
**NOTES:**

- ① NORDFAB 5"φ MACHINE ADAPTER TO, OR EQUIVALENT CONNECT TO PORTABLE UNIT.
- ② OPEN SIDES OF CHUTE TO BE ENCLOSED.
- ③ EXISTING DUST CHUTE.
- ④ HOLES SPACED APPROXIMATELY AS SHOWN.
- ⑤ THESE (2) DIMENSIONS TO BE VERIFIED ON SITE. NEW HOOD MUST COMPLETELY ENCLOSE EXISTING OPENING.

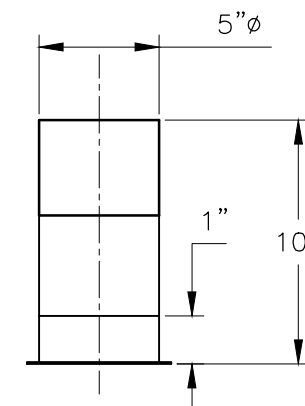
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DRAWING NUMBER	MACHINE NUMBER
HRSB-TP3C-M02	⑩



**1**  
-  
**JOINTER - ELEVATION**  
SCALE: 3/4"=1'-0"



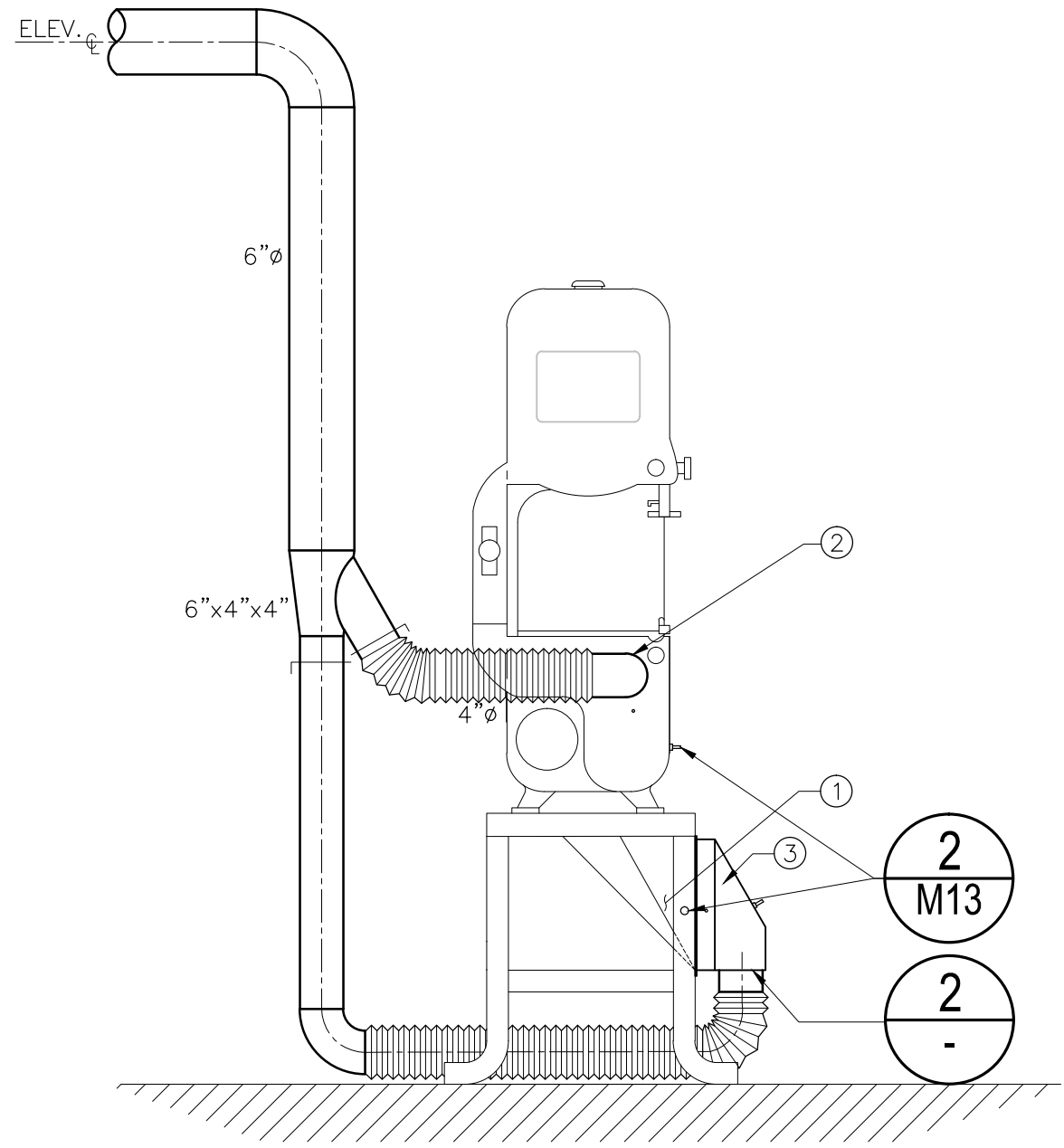
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**JOINTER HOOD**  
SCALE: 1-1/2"=1'-0"



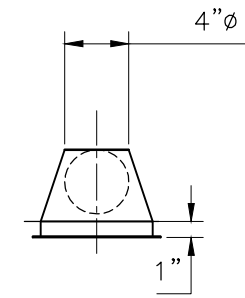
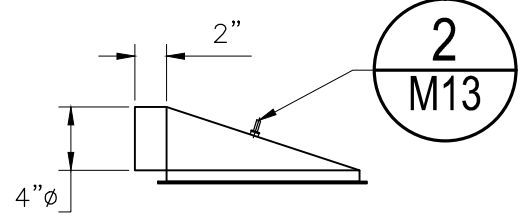
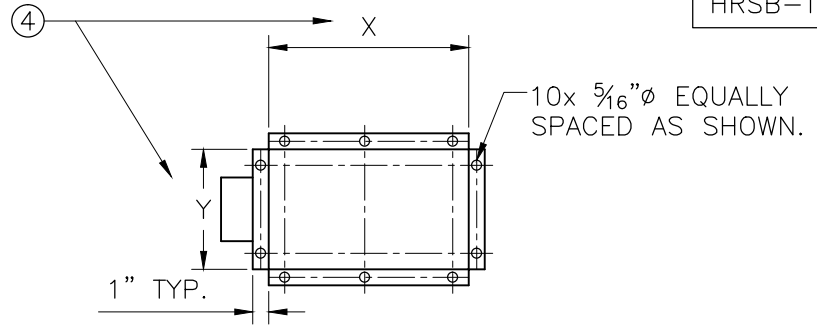
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Client/Project  
WOOD DUST COLLECTION  
SYSTEM MODIFICATIONS  
Drawing No.  
HRSB-TP3C-M07  
Title  
JOINTER &  
HOOD DETAILS

Sheet  
07 of 21  
Drawn By  
BC  
Checked By  
PL  
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**1**  
- **BAND SAW - ELEVATION**  
SCALE: 3/4"=1'-0"



**2**  
- **BAND SAW HOOD**  
SCALE: 1"=1'-0"

**NOTES:**

- ① THIS AREA TO BE COMPLETELY ENCLOSED.
- ② ATTACH 4"Ø FLEX HOSE TO EXISTING 4"Ø PORT.
- ③ FIELD MOUNT HOOD.
- ④ THESE (2) DIMENSIONS TO BE VERIFIED ON SITE. NEW HOOD MUST COMPLETELY ENCLOSE EXISTING OPENING.

**BAND SAW DRAWING  
USED AT:**

DRAWING NUMBER	MACHINE NUMBER
HRSB-TP3C-M02	③ & ⑥



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**WOOD DUST COLLECTION  
SYSTEM MODIFICATIONS**  
Drawing No.  
**HRSB-TP3C-M08**  
Title  
**BAND SAW &  
HOOD DETAILS**

Sheet  
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Checked By  
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**RTD**



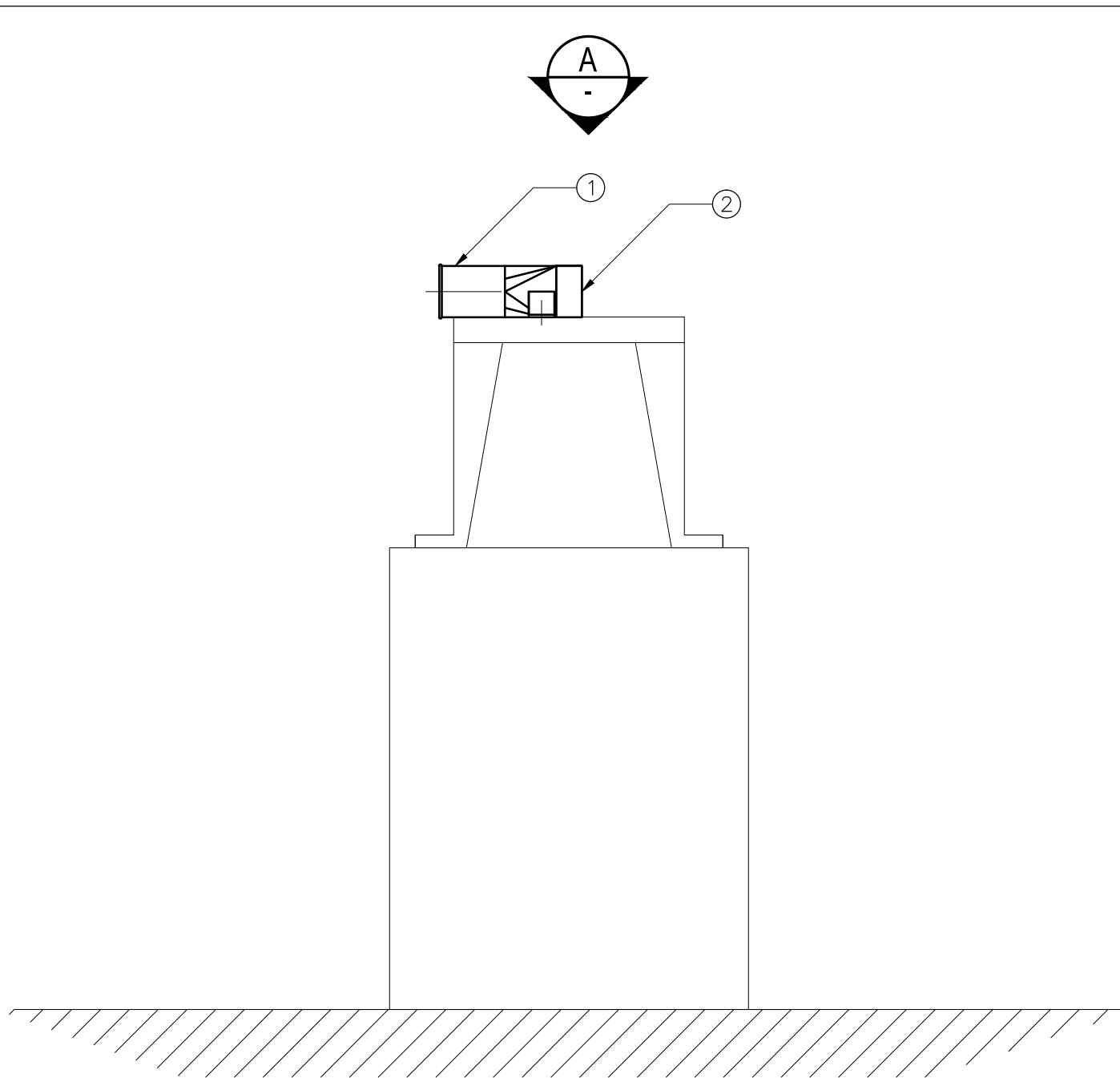
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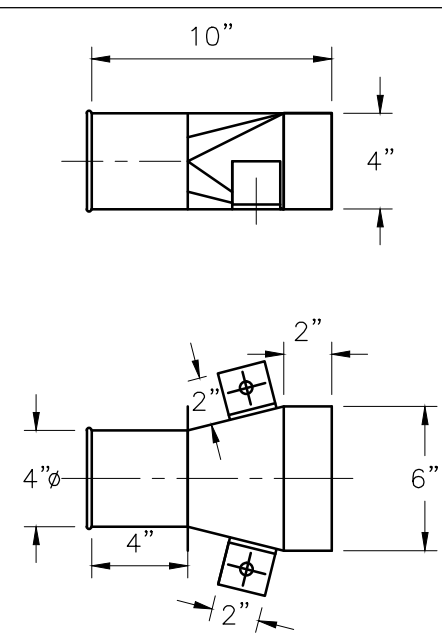
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 WOOD DUST COLLECTION  
 SYSTEM MODIFICATIONS  
 Drawing No.  
 HRSB-TP3C-M09  
 Title  
 ROUTER ELEVATIONS & HOOD  
 DETAIL

Sheet  
 09 of 21  
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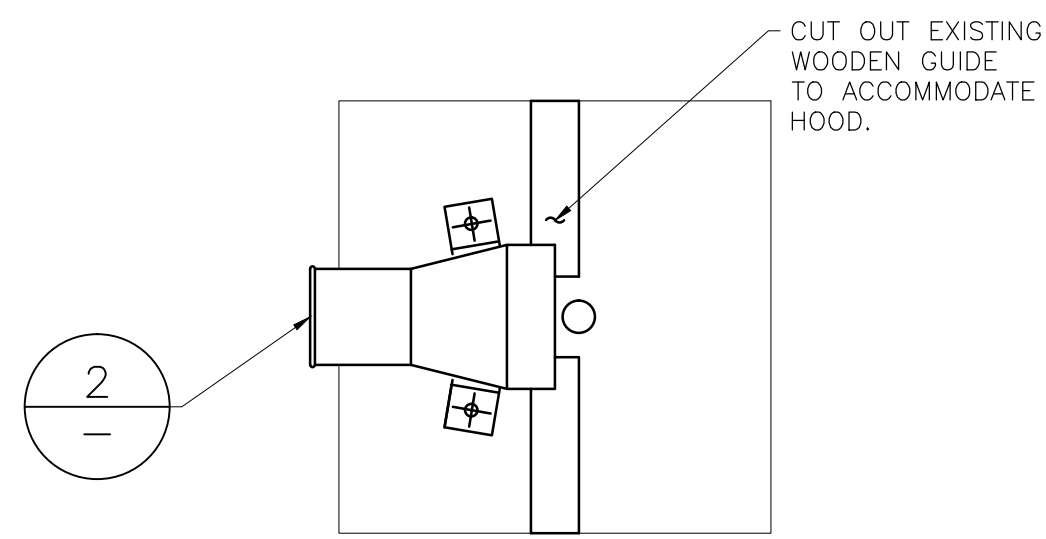
**1**  
 -  
**ROUTER - ELEVATION**  
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**2**  
 -  
**ROUTER DUST HOOD**  
 SCALE: 1/8"=1'-0"

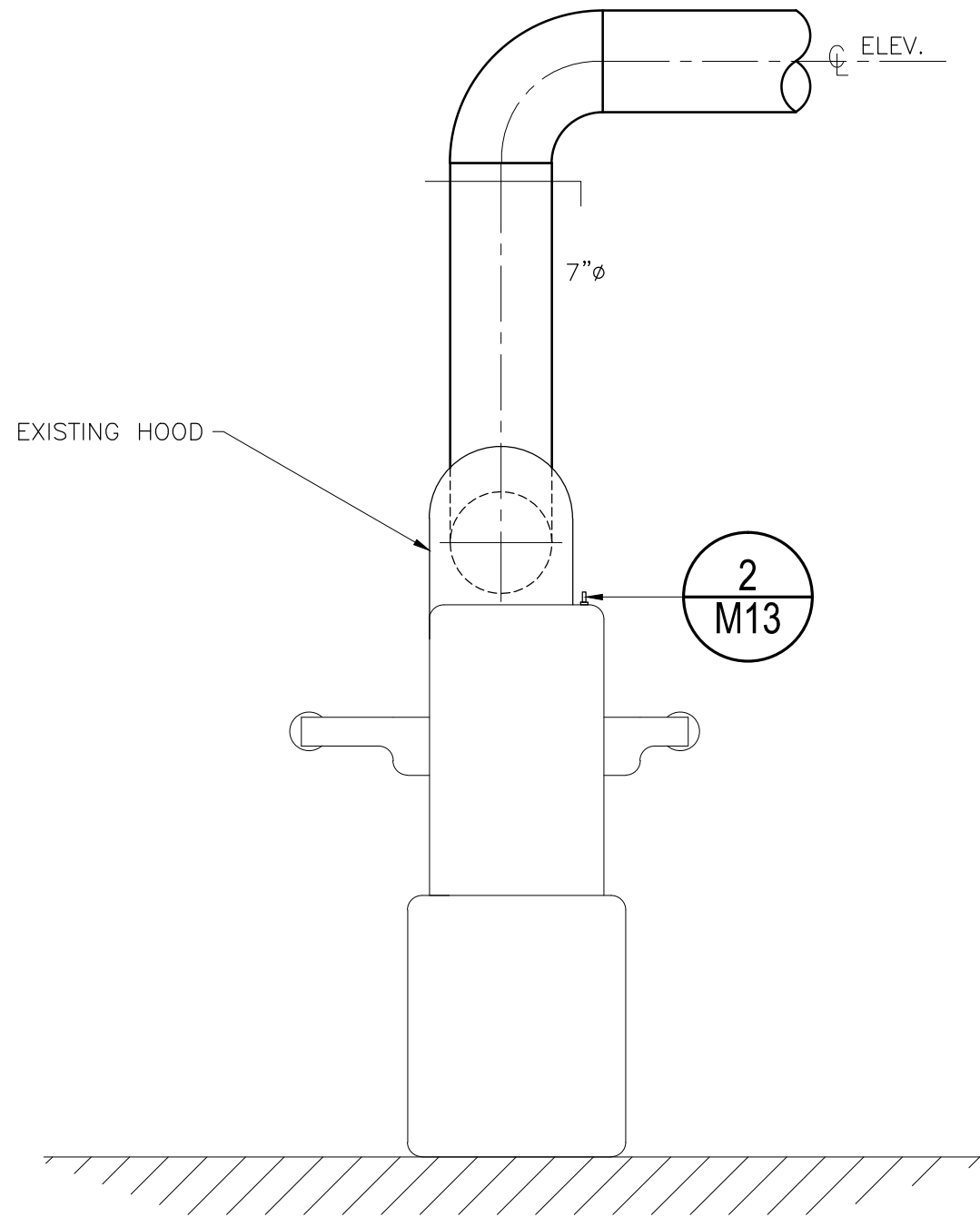
- NOTES:**
- ① NORDFAB 5"Ø QUICK-FIT MACHINE ADAPTER OR EQUIVALENT.
  - ② EXISTING ROUTER TABLE GUIDE.

ROUTER DRAWING USED AT:	
DRAWING NUMBER	MACHINE NUMBER
TCRSB-TP3C-M02	④



**A**  
 -  
**VIEW A**  
 SCALE: 1/8"=1'-0"





**1** PLANER ELEVATION  
SCALE: 1"=1'0"

**NOTES:**

- ① CONNECT 7"φ DROP TO DUST PORT ON EXISTING HOOD.
- ② BOND DUCTING TO MACHINE.

PLANER DRAWING USED AT:	
DRAWING NUMBER	MACHINE NUMBER
HRSB-TP3C-M02	13



ORIGINAL SHEET - ANSI B



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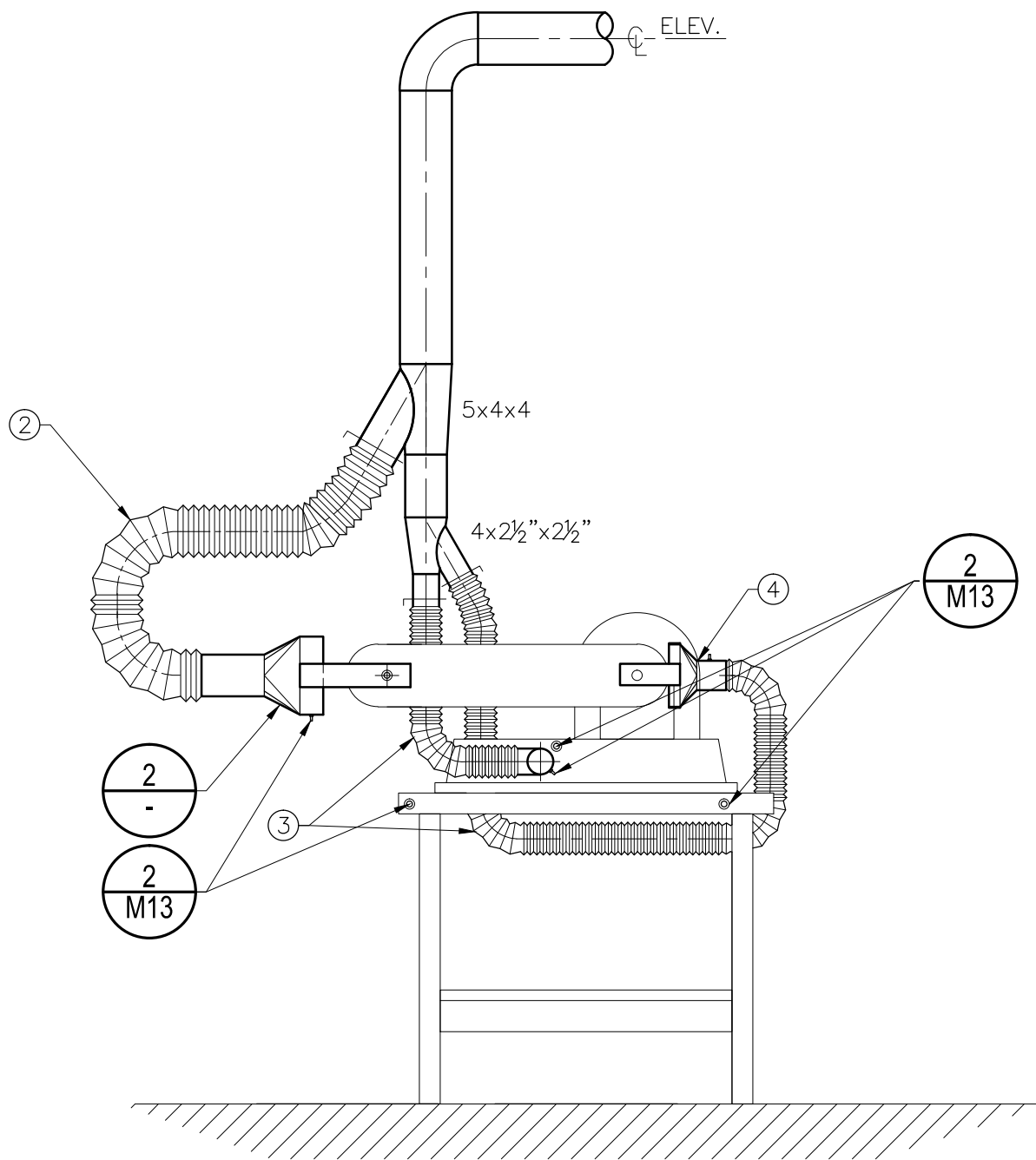
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0	ISSUED FOR TENDER	RTD	05/01/2013
1	ISSUED FOR TENDER	RTD	06/18/2014

Client/Project  
WOOD DUST COLLECTION  
SYSTEM MODIFICATIONS  
Drawing No.  
HRSB-TP3C-M10  
Title  
PLANER ELEVATION

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Drawn By  
BC  
Checked By  
PL  
Approved By  
RTD

06, 2014  
134230629

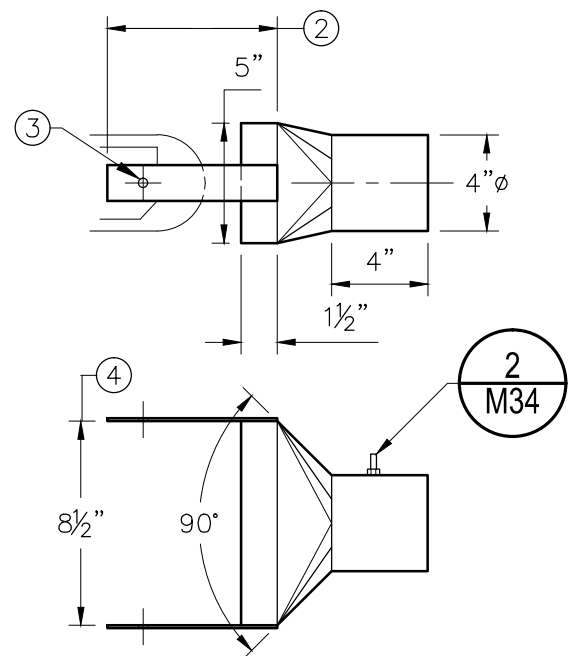


**1**  
-  
**BELT/DISC SANDER - ELEVATION**  
SCALE: 3/4"=1'-0"

**NOTES:**

- ① CONNECT TO FAR SIDE OF EXISTING DISC/ BELT SANDER COMBINATION HOOD.
- ② ENSURE FLEX DUCT IS OF SUFFICIENT LENGTH TO ALLOW BELT SANDER TO PIVOT THROUGH FULL RANGE OF MOTION.
- ③ CONNECT 2-1/2" FLEX DUCT TO EXISTING DUST PORTS.
- ④ CONNECT TO EXISTING DUST PORT. IF PORT IS MISSING, ORDER NEW PART OR FABRICATE EQUIVALENT.

SANDER DRAWING USED AT:	
DRAWING NUMBER	MACHINE NUMBER
HRSB-TP3C-M02	14



**2**  
-  
**BELT SANDER HOOD**  
SCALE: 1-1/2"=1'-0"



ORIGINAL SHEET - ANSI B



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Client/Project  
WOOD DUST COLLECTION  
SYSTEM MODIFICATIONS  
Drawing No.  
HRSB-TP3C-M11  
Title  
SANDER ELEVATION & HOOD  
DETAILS

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11 of 21  
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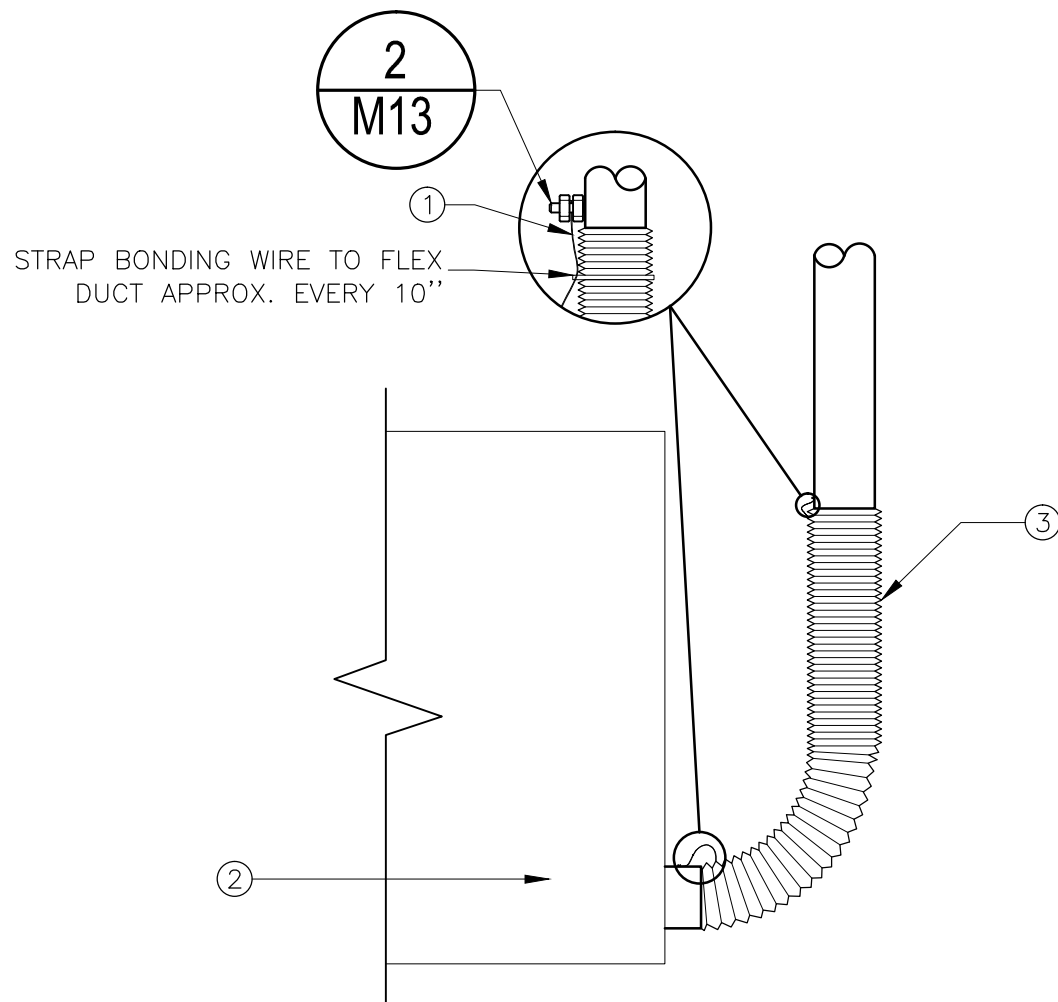
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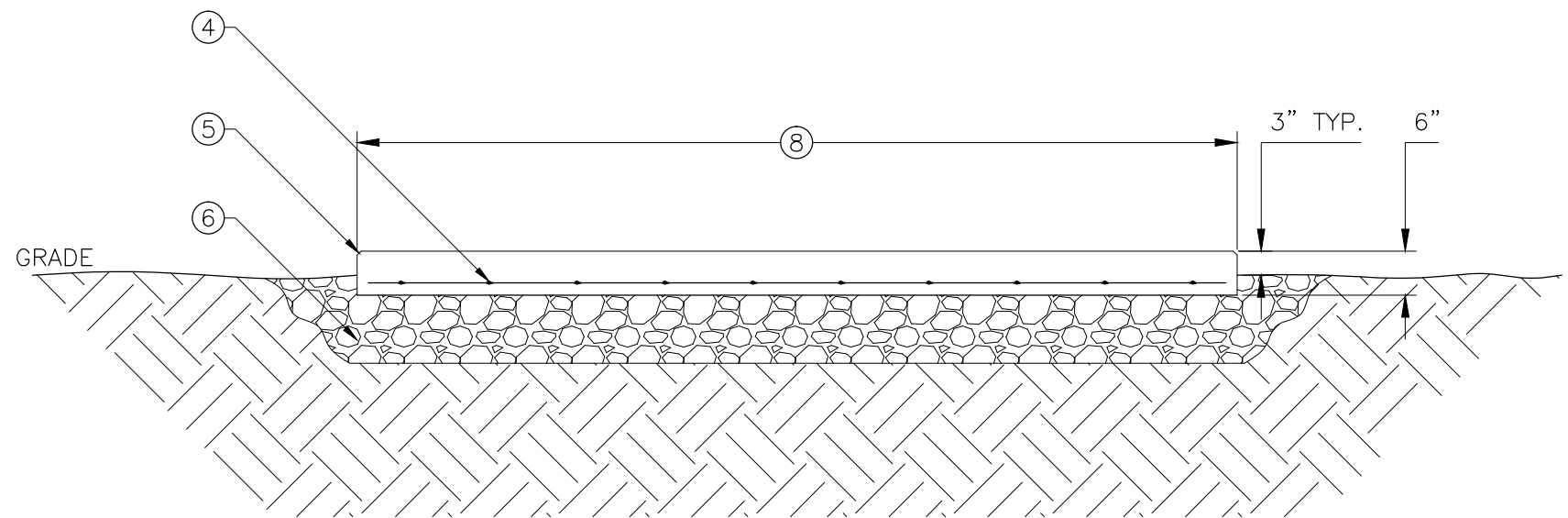


**NOTES:**

- ① #6 BONDING COPPER WIRE. LENGTH TO BE DETERMINED BY CONTRACTOR.
- ② BOND TO EXISTING EQUIPMENT.
- ③ FLEX HOSE.
- ④ 10M @ 12" O.C. E.W. (MID-SLAB)
- ⑤ 3/4" CHAMFER TYP.
- ⑥ MIN. 1'-0" THICK TYPE 1 GRAVEL COMPACTED TO 98% STANDARD PROCTOR MAXIMUM DRY DENSITY IN LIFTS NOT EXCEEDING 6" THICK.
- ⑦ ANCHOR DUST COLLECTION UNIT TO SLAB WITH HILTI HAS-E THREADED RODS SIZED TO SUIT BASE PLATE HOLES AND ADHERED W/HILTI HY-150 EPOXY SYSTEM (MIN 4 1/2" ANCHOR EMBEDMENT).
- ⑧ CONCRETE PAD 13'-0" x 13'-0". ALSO PROVIDE RAMPS TO ALLOW DRUMS TO BE ROLLED OFF THE PAD.



**1** HOSE BONDING DETAIL  
 - SCALE: NTS

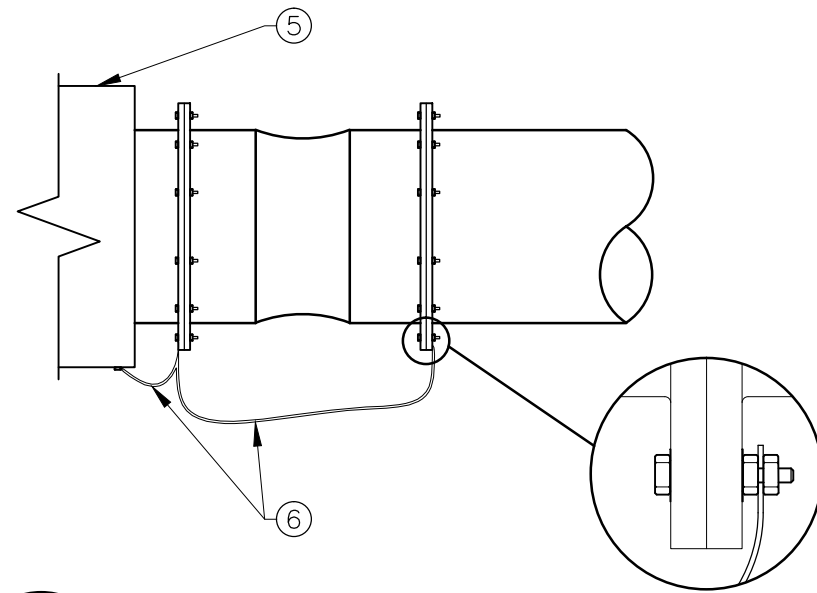


**2** CONCRETE PAD SECTION  
 - SCALE: NTS

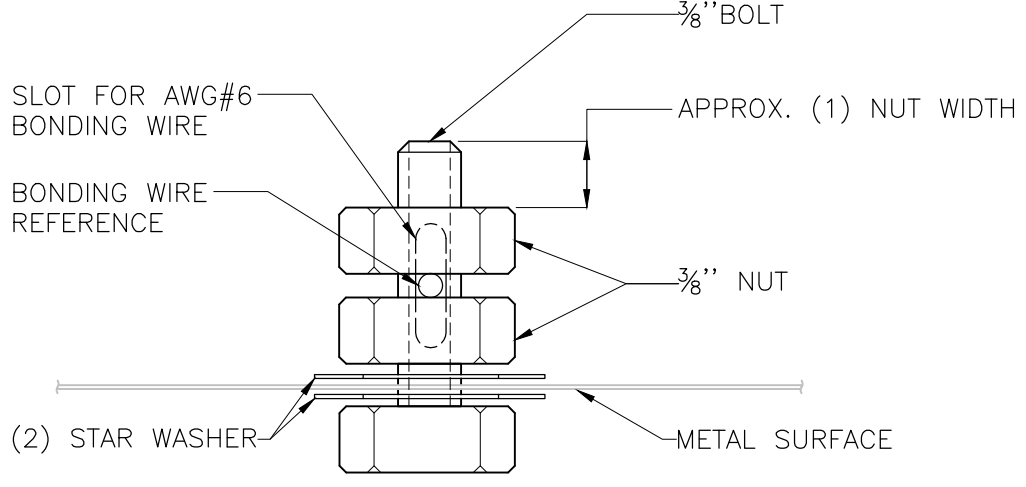
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Client/Project  
 WOOD DUST COLLECTION  
 SYSTEM MODIFICATIONS  
 Drawing No.  
 HRSB-TP3C-M12  
 Title  
 BONDING & CONCRETE  
 DETAILS

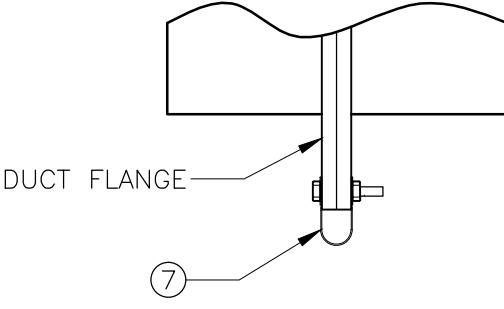
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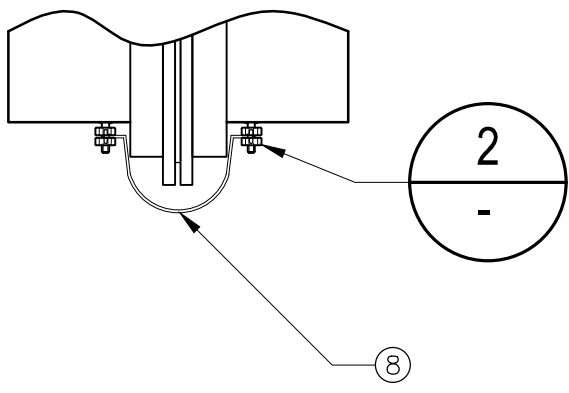
**1** BONDING ACROSS FLEX  
- SCALE: NTS



**2** BONDING LUG DETAIL  
- SCALE: NTS



**3** BONDING ACROSS A WELDED FLANGE  
- SCALE: NTS



**4** BONDING ACROSS A NON-WELDED FLANGE  
- SCALE: NTS

**NOTES:**

- ① CONTRACTOR RESPONSIBLE FOR VERIFYING MEASUREMENTS PRIOR TO FABRICATION AND INSTALLATION.
- ② ALL HOODS, ENCLOSURES, AND DUCT FLANGES ARE TO BE BONDED TO GROUND.
- ③ INSTALL AWG#6 COPPER GREEN BONDING WIRE FROM ONE DUCT GROUND LUG TO BUILDING STRUCTURAL FRAME. ENSURE THE STRUCTURE FRAME IN USE IS AN APPROVED BONDING SOURCE OR USE OTHER APPROVED BONDING SOURCE OUTLINED IN NATIONAL BUILDING CODE.
- ④ INSTALL ALL WIRES/STRAPS SO THEY ARE VISIBLE FROM FLOOR LEVEL.
- ⑤ EQUIPMENT REFERENCE.
- ⑥ NEW BONDING STRAP/WIRE. BOND TO EXISTING EQUIPEMENT.
- ⑦ #6 BONDING CONDUCTOR, TERMINAL END HOLE SIZE TO MATCH BOLT. USE SERRATED STRAP ENDS, OR USE SERRATED WASHER BETWEEN STRAP END AND FLANGE.
- ⑧ #6 BONDING CONDUCTOR, TERMINAL END HOLE SIZE TO MATCH BOLT. USE SERRATED STRAP ENDS, OR PLACE 3/8" SERRATED WASHER ON BOLT BEFORE STRAP END.
- ⑨ FOR HOOD OR MACHINE BONDING, BONDING LUGS MAY BE WELDED.



ORIGINAL SHEET - ANSI B



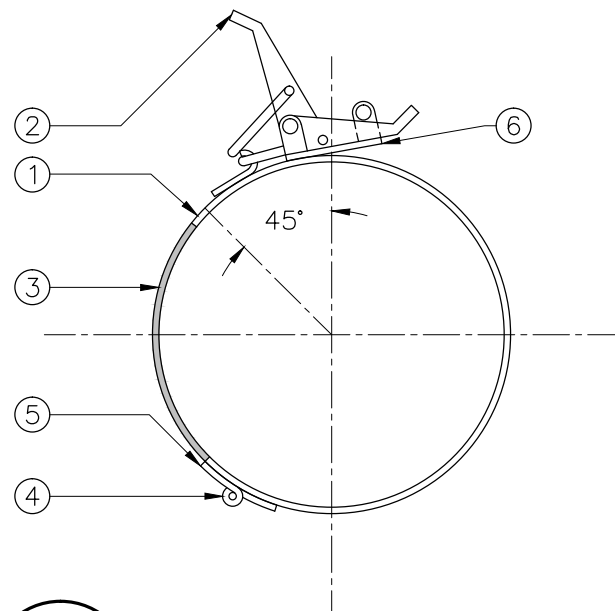
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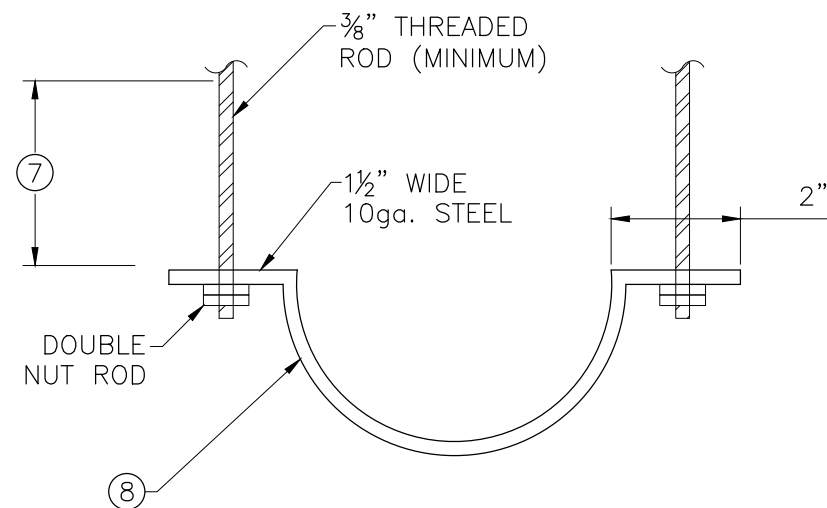
Client/Project  
WOOD DUST COLLECTION  
SYSTEM MODIFICATIONS  
Drawing No.  
HRSB-TP3C-M13  
Title  
BONDING DETAILS

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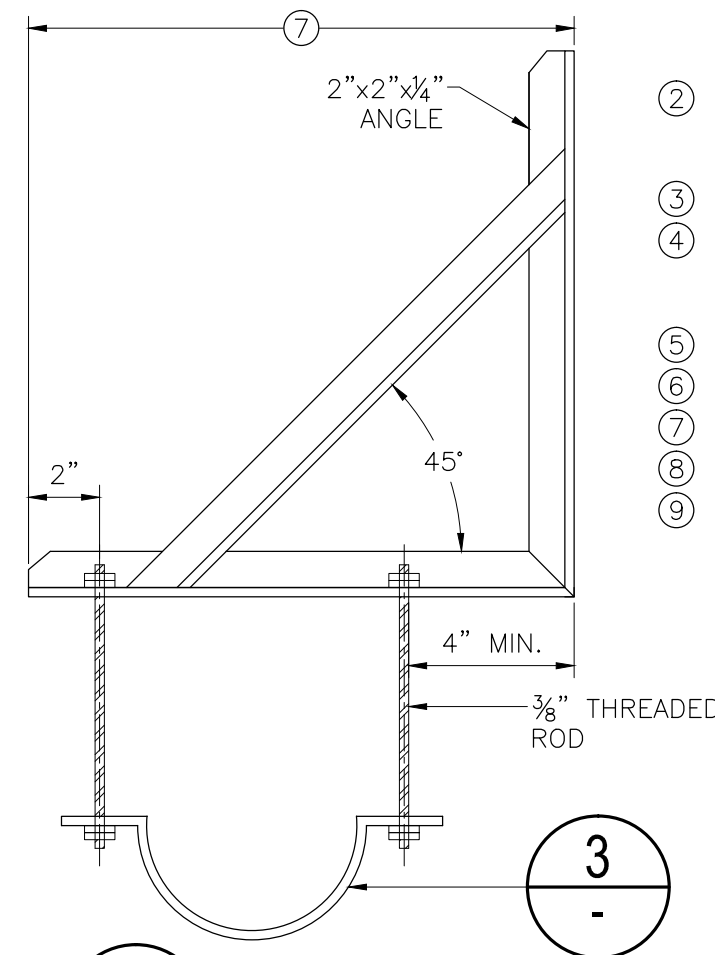
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**1**  
INSPECTION DOOR DETAIL  
SCALE: NTS



**3**  
HANGER DETAIL  
SCALE: NTS

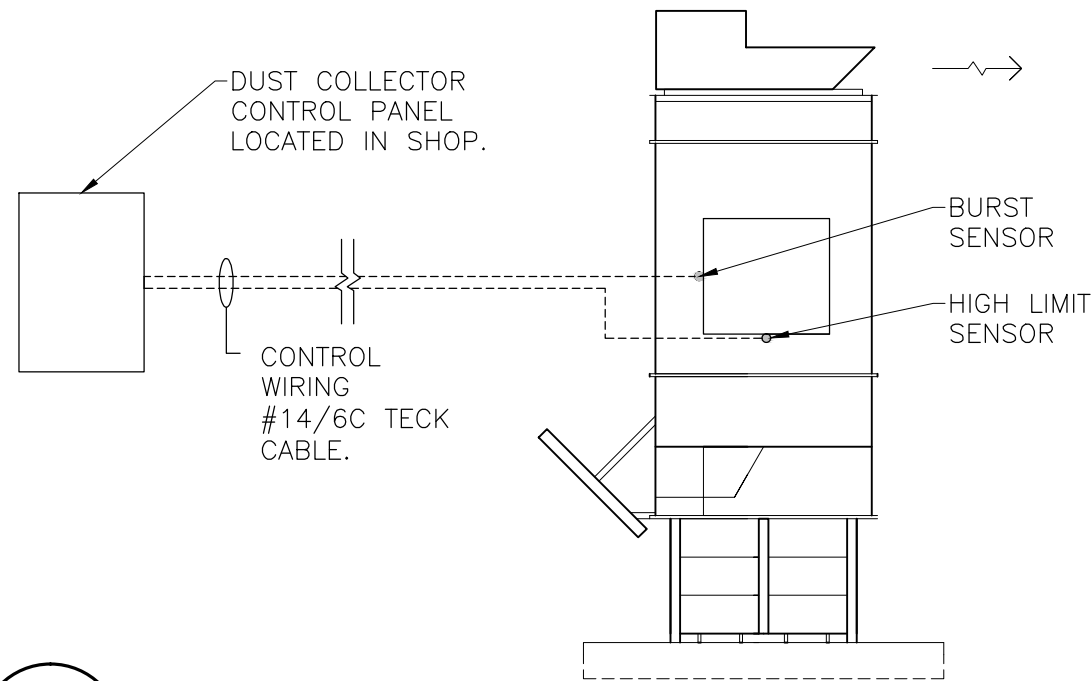


**2**  
WALL HANGER DETAIL  
SCALE: NTS

**NOTES:**

- ① GASKET EACH DOOR USING 1/4" THICK BY 3/4" WIDE CLOSED CELL SPONGE RUBBER. TO BE APPLIED WITH NO CRACKS TO A CLEAN SURFACE AROUND INSIDE EDGE OF THE DOOR USING A HEAVY DUTY INDUSTRIAL ADHESIVE CEMENT.
- ② ADJUSTABLE DRAW LATCH (2 PER DOOR) McMASTER-CARR PART No.13435A41 OR EQUIVALENT.
- ③ DOOR W/ GASKET. SEE SPEC.
- ④ CONTINUOUS HINGE FULL LENGTH OF DOOR. WELD ON 0.075" THICKNESS, 1 1/2" OPEN WIDTH, & 0.187 PIN DIAMETER.
- ⑤ FILL PLATE AS REQUIRED.
- ⑥ MOUNTING PLATE AS REQUIRED.
- ⑦ LENGTH AS REQUIRED.
- ⑧ RADIUS VARIES BY DUCT SIZE.
- ⑨ HOLE AND DOOR SIZES TO BE AS FOLLOWS:

DUCT DIA.	HOLE SIZE	DOOR SIZE
4" TO 6"	4"x6"	6"x8"
7" TO 10"	6"x8"	8"x10"
11" TO 18"	8"x10"	10"x12"
19"+	10"x12"	12"x14"



**4**  
SENSOR CONTROL WIRING DETAIL  
SCALE: NTS



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Client/Project  
WOOD DUST COLLECTION  
SYSTEM MODIFICATIONS  
Drawing No.  
HRSB-TP3C-M14  
Title  
DUCT ACCESSORY DETAILS





















Sheet  
14 of 21  
Drawn By  
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Checked By  
PL  
Approved By  
RTD

06, 2014  
134230629

## ELECTRICAL GENERAL NOTES

- ALL DRAWINGS IN THIS PACKAGE ARE TO BE READ IN CONJUNCTION WITH THE DRAWINGS AND SPECIFICATIONS OF ALL OTHER TRADES.
- ALL WORK UNDER THIS SCOPE SHALL COMPLY WITH THE LATEST EDITIONS OF THE NATIONAL BUILDING CODE OF CANADA AND THE CANADIAN ELECTRICAL CODE.
- ELECTRICAL CONTRACTOR SHALL VERIFY NAME PLATE RATINGS OF ALL NEW EQUIPMENT PRIOR TO INSTALLATION AND REPORT ANY CONFLICTS OR DISCREPANCIES TO ENGINEER. VERIFY CONDUCTOR SIZES AS PER MANUFACTURER'S RECOMMENDATIONS.
- ALL WIRING INDICATED ON DRAWINGS HAS BEEN SIZED FOR  $C_u$  ACCORDING TO THE LATEST EDITION OF THE CANADIAN ELECTRICAL CODE.
- ALL CONDUITS SHALL BE EMT UNLESS NOTED OR SPECIFIED OTHERWISE.
- COORDINATE FINAL INSTALLATION LOCATION OF ELECTRICAL EQUIPMENT AND DEVICES ON SITE WITH OWNER'S REPRESENTATIVE AND ALL OTHER ASSOCIATED TRADES.
- COORDINATE ELECTRICAL WORK REQUIREMENTS WITH ALL OTHER TRADES ON SITE TO AVOID CONFLICT.
- ALL WIRING OR CONDUIT RUNS INDICATED ON DRAWINGS ARE DIAGRAMMATIC ONLY. COORDINATE EXACT RACEWAY LOCATIONS ON SITE. CONTRACTOR TO TRACE ALL SCOPE RELATED EXISTING CIRCUITS TO DETERMINE THE SOURCE PRIOR TO ANY DEMOLITION, RELOCATION OR INSTALLATION.
- ELECTRICAL CONTRACTOR SHALL SEAL ALL PENETRATIONS CREATED BY NEW INSTALLATIONS OR REMAINING FROM REMOVALS OF EXISTING EQUIPMENT.
- AVOID SCALING FROM DRAWINGS. WHENEVER POSSIBLE EXACT DIMENSIONS SHALL BE VERIFIED ON SITE.
- DRAWINGS DO NOT SHOW ALL 'EXISTING TO REMAIN' SERVICES. TAKE EXTREME PRECAUTION NOT TO DISRUPT ANY 'EXISTING TO REMAIN' SERVICES DURING CONSTRUCTION.
- PROVIDE POWER TO EQUIPMENT AS INDICATED ON TENDER DOCUMENTS. COORDINATE ALL NECESSARY SHUT DOWN TIME FOR INSTALLATION WITH TCRSB OR TCRSB PROJECT REPRESENTATIVE.
- ALL RECEPTACLES SHALL HAVE THEIR GROUND INSTALLED UP.

## ELECTRICAL LEGEND

PLAN SYMBOLS	SCHEMATIC SYMBOLS
* 20A  20A SIMPLEX RECEPTACLE TYPE 5-20R WALL MOUNTED 18" A.F.F. UNLESS NOTED OTHERWISE.	 NORMALLY OPEN MAGNETIC CONTACTOR
 FLUSH MOUNTED 120/208V 3PH, 4W PANEL	 NORMALLY CLOSED MAGNETIC CONTACTOR
 SURFACE MOUNTED 120/208V 3PH, 4W PANEL	 RELAY COIL
 NSPI METERING CABINET	 5A, 250V NORMALLY CLOSED MUSHROOM HEAD EMERGENCY PUSHBUTTON
 EMERGENCY STOP PUSHBUTTON	 FUSE
 EMERGENCY STOP PUSHBUTTON IN CONTACTOR ENCLOSURE	 GROUNDING CONNECTION
 120/208V OR 575V THREE PHASE ELECTRIC MOTOR	 UTILITY METER
 DISCONNECT WP INDICATES WEATHERPROOF TYPE	 NSPI METERING INSTRUMENT CABINET
 LINETYPE OR 'E' INDICATES EXISTING ELECTRICAL EQUIPMENT	
 LINETYPE OR 'N' INDICATES NEW ELECTRICAL EQUIPMENT	
 KEY NOTE INDICATOR. # REFERS TO SPECIFIC KEY NOTES ON RESPECTIVE DRAWINGS	
	DETAIL SYMBOLS
	 ———— DETAIL/SECTION SHEET NUMBER
* NOTE: RECEPTACLES SHALL BE RECESSED WHERE INSTALLED IN DRYWALL PARTITIONS. WHERE RECEPTACLES ARE INSTALLED ON BLOCK, OR CONCRETE WALLS RECEPTACLES AND ASSOCIATED CONDUIT SHALL BE SURFACE MOUNTED,	



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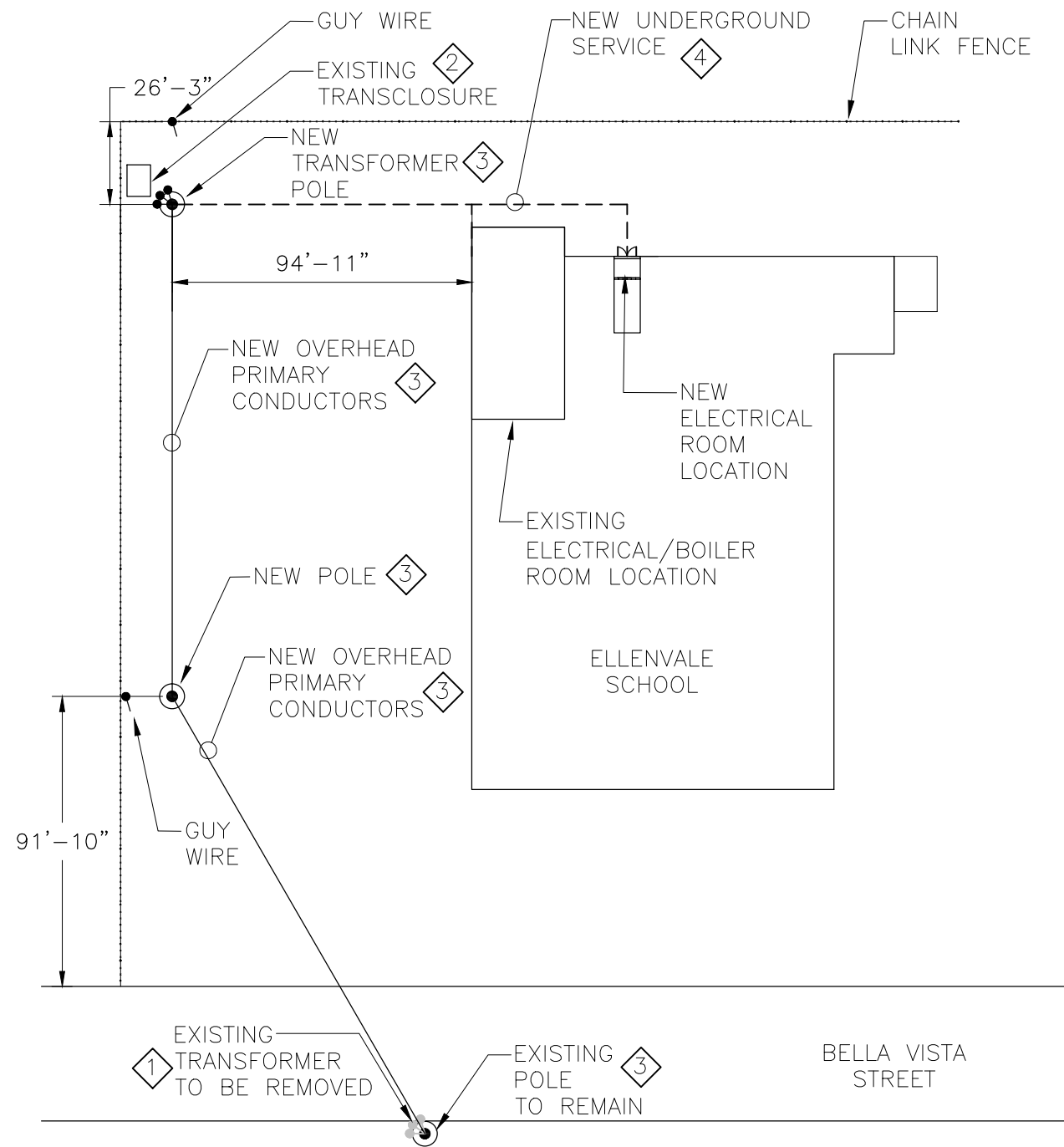
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Client/Project  
WOOD DUST COLLECTION SYSTEM  
MODIFICATIONS  
Drawing No.  
HRSB-TP3C-E01  
Title  
ELECTRICAL NOTES AND LEGEND

Sheet  
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Drawn By  
JLT  
Checked By  
MG  
Approved By  
MG

04, 2013  
134230629



### ELECTRICAL KEY NOTES

- ① COORDINATE WITH NSPI TO DISCONNECT AND REMOVE EXISTING POLE MOUNTED TRANSFORMER, COMPLETE WITH UNDERGROUND SECONDARY CABLES TO EXISTING TRANSCLUSURE (NOT SHOWN).
- ② COORDINATE WITH NSPI TO DISCONNECT AND REMOVE EXISTING TRANSCLUSURE COMPLETE WITH EXISTING UNDERGROUND SECONDARY CABLES TO BUILDING.
- ③ COORDINATE WITH NSPI TO PROVIDE A NEW OVERHEAD PRIMARY SERVICE COMPLETE WITH POLE MOUNTED TRANSFORMER TO ACCOMODATE THE NEW 600A SERVICE AS INDICATED.
- ④ PROVIDE UNDERGROUND SECONDARY CONDUCTORS IN CONDUIT. USE 2 X (4 #500 RW90 + #3 BOND IN 103C). REINSTATE PARKING LOT UPON COMPLETION OF CABLE WORK.
- ⑤ REFER TO NSPI WORK ORDER #1214213 AND SERVICE ORDER #5976955 FOR FURTHER DETAILS ON DEMOLITION/INSTALLATION FOR THIS JOB.
- ⑥ DIMENSIONS INDICATED ON THIS DRAWING ARE APPROXIMATE. COORDINATE EXACT DIMENSIONS ON SITE.

**A**  
**E07** **ELECTRICAL SITE PLAN - DEMOLITION/PROPOSED** ⑤⑥  
SCALE: N.T.S.

ORIGINAL SHEET - ANSI B



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**Note**  
REFER TO ELECTRICAL GENERAL  
NOTES ON DRAWING E01.

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0	ISSUED FOR TENDER	MG	06/02/2014

Client/Project  
**WOOD DUST COLLECTION SYSTEM  
& MAIN ELECTRICAL UPGRADE**

Drawing No.  
**HRSB-TP3C-E2**

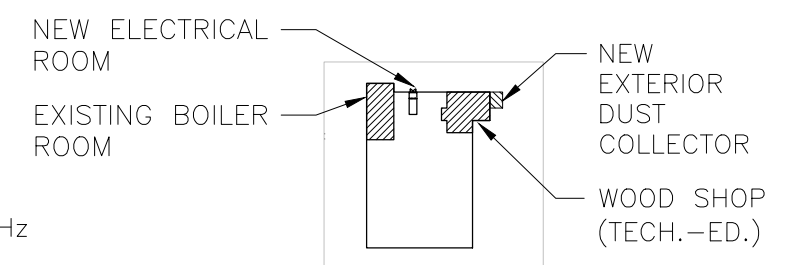
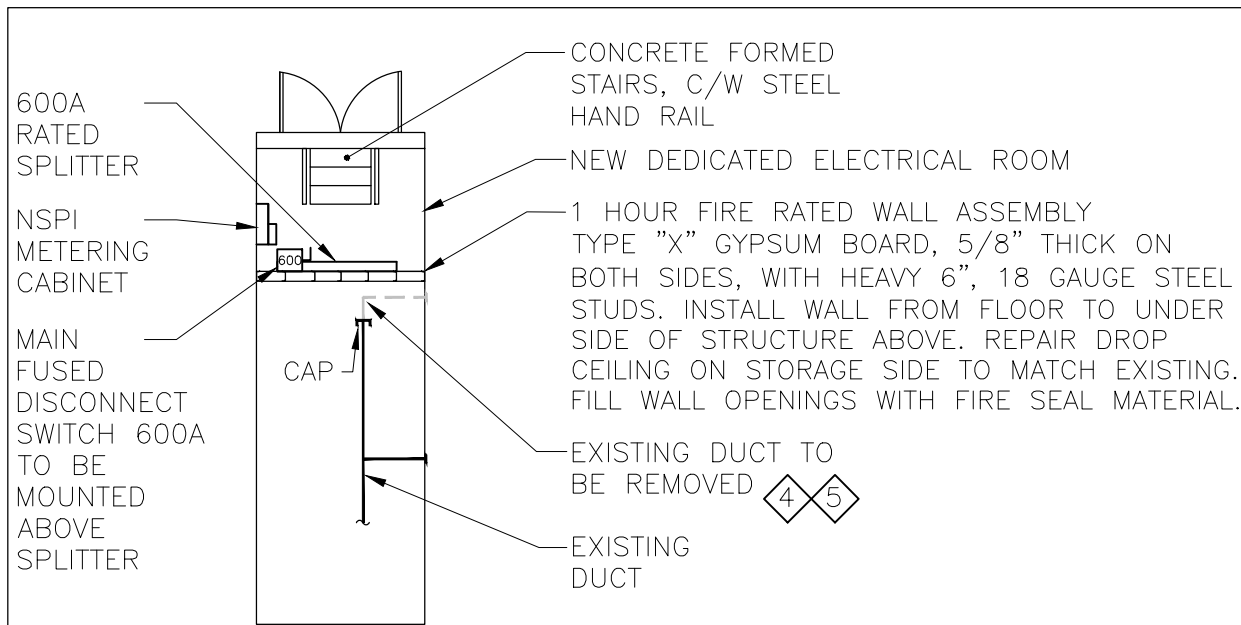
Title  
**ELLENVALE JUNIOR HIGH SCHOOL  
ELECTRICAL SITE PLAN**

Sheet  
**16 of 21**

Drawn By  
**JLT**

Checked By  
**MG**

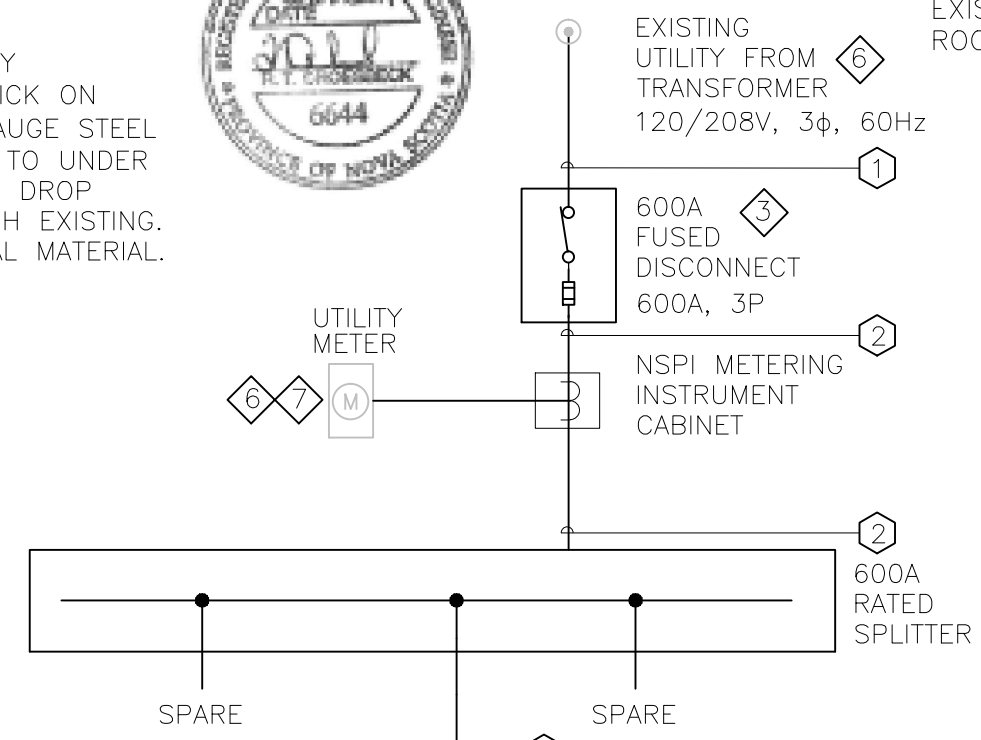
Approved By  
**MG**



**BUILDING KEY PLAN**  
SCALE: 1"=200'-0"

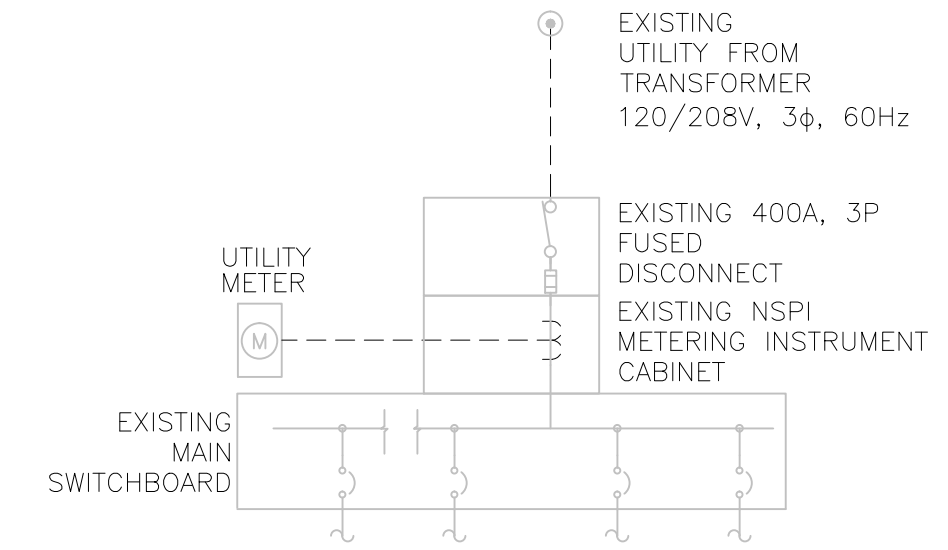


**A**  
E2  
NEW ELECTRICAL ROOM  
SCALE: N.T.S.

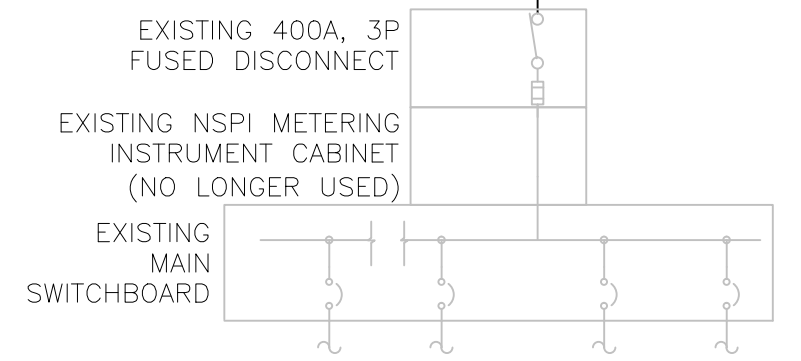


ELECTRICAL FEEDER SCHEDULE	
FEEDER NO.	FEEDER SIZE
1	2 x (4 #500 RW90 + #3 BOND IN 103C)
2	3 x 4C #3/0 TECK90
3	2 x 4C #3/0 TECK90

- ELECTRICAL KEY NOTES**
- UPGRADE EXISTING SERVICE AS INDICATED
  - NEW DISTRIBUTION EQUIPMENT TO BE LOCATED IN NEW ELECTRICAL ROOM (IN EXISTING MUSIC STORAGE ROOM) AS SHOWN. MODIFY LIGHTING AND SWITCHING AS REQUIRED.
  - 600A FUSED DISCONNECT TO BE SERVICE ENTRANCE RATED.
  - EXISTING DUCTING AND GRILLE TO BE REMOVED TO ALLOW FOR INSTALLATION OF WALL.
  - REPAIR GRILLE WALL OPENING WITH BLACK TO MATCH EXISTING. PAINT TO MATCH EXISTING COLOR.
  - COORDINATE WITH NSPI FOR ANY ASSOCIATED REQUIREMENTS AND METERING RELATED TO THE SCOPE OF THIS UPGRADE. MODIFY AND PAY FEES AS REQUIRED.
  - PROVIDE CT AND CABINET AS REQUIRED, IN ACCORDANCE WITH THE UTILITY REQUIREMENT.
  - REFER TO DRAWING E15 FOR FURTHER DETAILS ON THE ELECTRICAL ROOM.



**B**  
E2  
SINGLE LINE DIAGRAM - EXISTING  
SCALE: N.T.S.



**C**  
E2  
SINGLE LINE DIAGRAM  
SCALE: N.T.S.

**Note**  
REFER TO ELECTRICAL GENERAL NOTES ON DRAWING E01.

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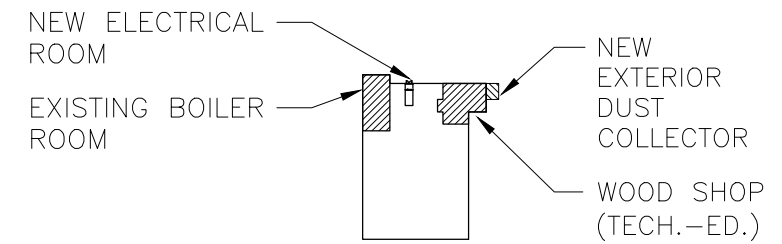
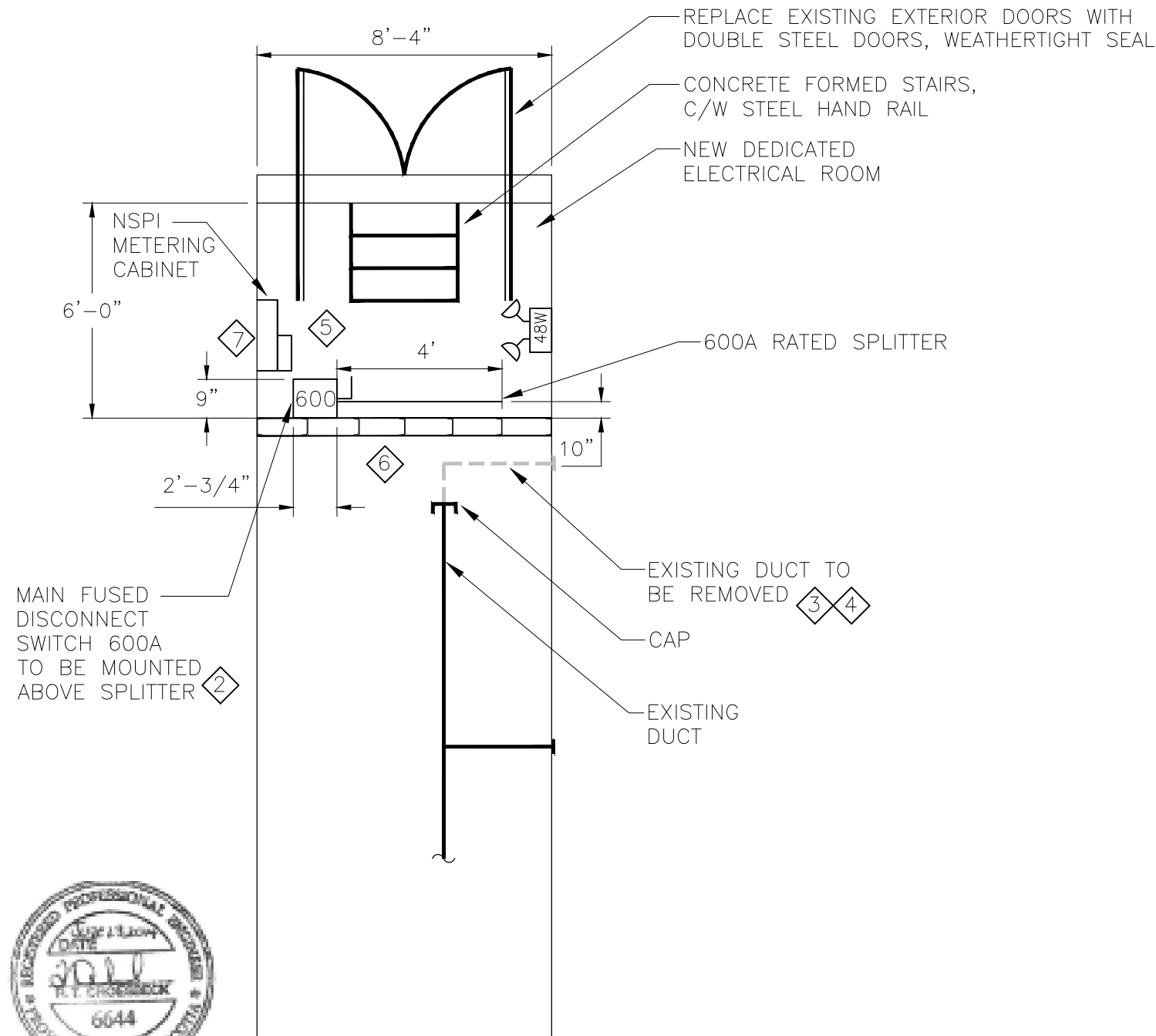
Client/Project  
WOOD DUST COLLECTION SYSTEM & MAIN ELECTRICAL UPGRADE  
Drawing No.  
HRSB-TP3C-E03  
Title  
ELLENVALE JUNIOR HIGH SCHOOL MAIN ELECTRICAL UPGRADE SLD

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**BUILDING KEY PLAN**

SCALE: 1"=200'-0"

**ELECTRICAL KEY NOTES**

- 1 NEW DISTRIBUTION EQUIPMENT TO BE LOCATED IN NEW ELECTRICAL ROOM (IN EXISTING MUSIC STORAGE ROOM) AS SHOWN. MODIFY LIGHTING AND SWITCHING AS REQUIRED. EMERGENCY LIGHTING IS REQUIRED IN THIS AREA. PROVIDE BATTERY PACK AS INDICATED, TO BE INSTALLED AT A MINIMUM HEIGHT OF 6-1/2', AND CONNECT TO THE LINE SIDE OF THE LIGHTING SWITCH.
- 2 600A FUSED DISCONNECT TO BE SERVICE ENTRANCE RATED.
- 3 EXISTING DUCTING AND GRILLE TO BE REMOVED TO ALLOW FOR INSTALLATION OF WALL.
- 4 REPAIR GRILLE WALL OPENING WITH BLACK TO MATCH EXISTING. PAINT TO MATCH EXISTING COLOR.
- 5 ALL ELECTRICAL DEVICES IN THIS ROOM SHALL BE INSTALLED AT A MAXIMUM ELEVATION OF 5'-0" AND IN ACCORDANCE WITH THE CANADIAN ELECTRICAL CODE, 2012.
- 6 1 HOUR FIRE RATED WALL ASSEMBLY TYPE "X" GYPSUM BOARD, 5/8" THICK ON BOTH SIDES, WITH HEAVY 6", 18 GAUGE STEEL STUDS. INSTALL WALL FROM FLOOR TO UNDER SIDE OF STRUCTURE ABOVE. REPAIR DROP CEILING ON STORAGE SIDE TO MATCH EXISTING. FILL WALL OPENINGS WITH FIRE SEAL MATERIAL.
- 7 EXISTING STORAGE SHELF TO BE DISMANTLED, ALLOWING INSTALLATION OF FIRE RATED WALL.

A NEW ELECTRICAL ROOM 1 2  
E02 SCALE: N.T.S.



**Note**  
REFER TO ELECTRICAL GENERAL NOTES ON DRAWING E01.

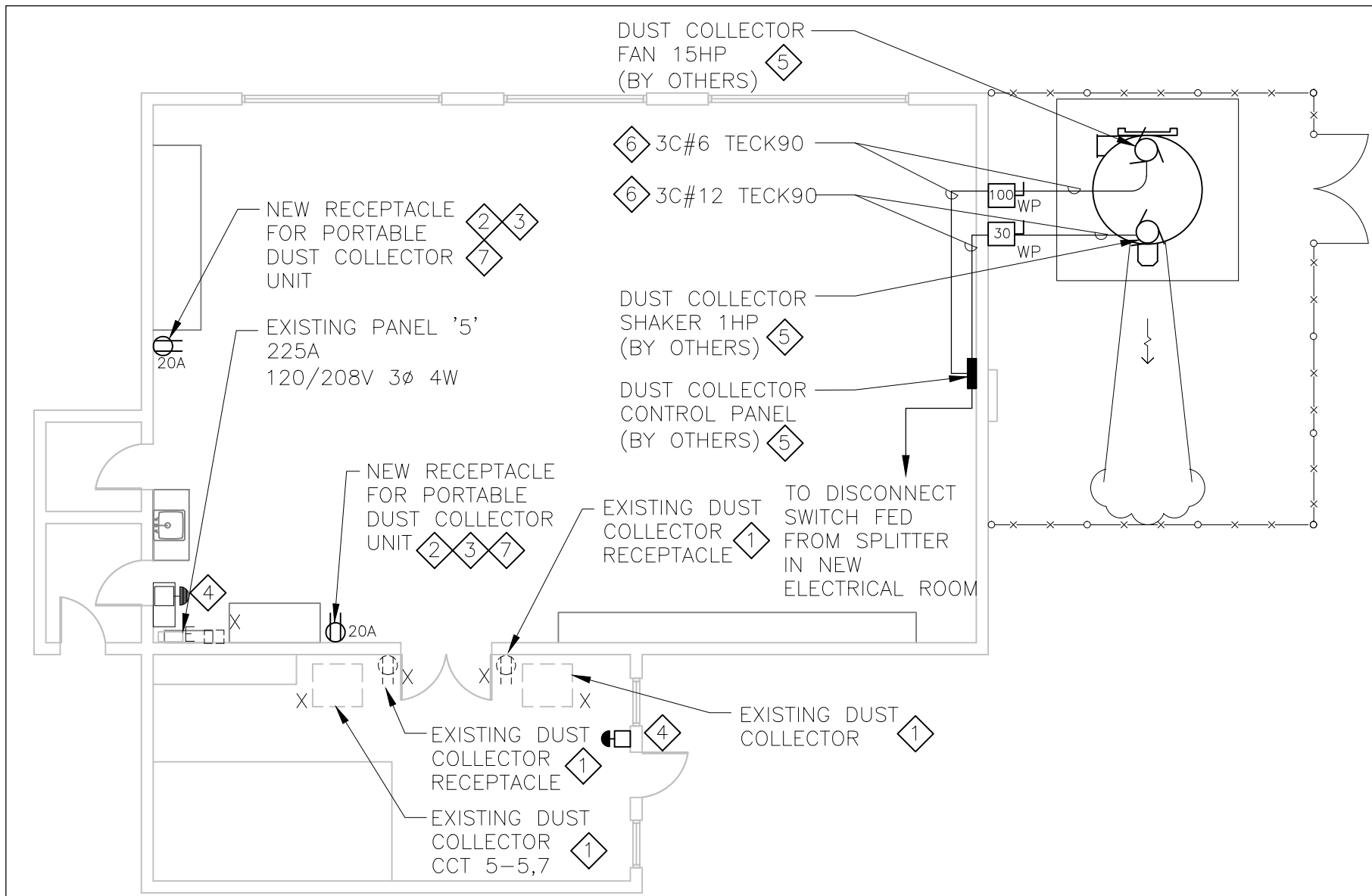
Rev.	Description	App.	Date
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Client/Project  
WOOD DUST COLLECTION SYSTEM & MAIN ELECTRICAL UPGRADE  
Drawing No.  
HRSB-TP3C-E4  
Title  
ELLENVALE JUNIOR HIGH SCHOOL  
NEW ELECTRICAL ROOM LAYOUT

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Drawn By  
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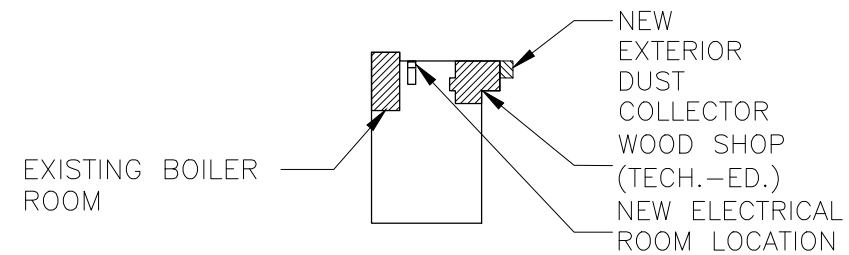


### ELECTRICAL KEY NOTES

- ① EXISTING DUST COLLECTOR WILL BE REMOVED BY OTHERS UNDER THIS CONTRACT. ELECTRICAL CONTRACTOR SHALL DE-ENERGIZE EXISTING ELECTRICAL FEEDERS AND REMOVE ALL REDUNDANT DISCONNECTS, RECEPTACLES, JUNCTION BOXES, CONTROLS, FEEDERS AND CONDUIT ASSOCIATED WITH EXISTING DUST COLLECTOR EQUIPMENT. REMOVE FEEDERS AND CONDUIT BACK TO PANEL '5', LOCATED IN THE INDUSTRIAL ARTS ROOM. ASSOCIATED EXISTING 2P, 20A CIRCUIT BREAKER SHALL BE REMOVED. COVER UNUSED SPACES WITH APPROVED BREAKER COVERS.
- ② PROVIDE AN ADDITIONAL 1P, 20A BREAKER IN PANEL '1', LOCATED IN THE BOILER ROOM. USE EXISTING SPACES FOR PORTABLE DUST COLLECTOR RECEPTACLES. ADDITIONAL CIRCUIT BREAKER SHALL MATCH EXISTING PANEL MANUFACTURER AND I.C. RATING. ELECTRICAL CONTRACTOR SHALL PROVIDE AN UPDATED PANEL SCHEDULE UPON COMPLETION OF WORK.
- ③ WIRING, RACEWAYS AND RECEPTACLES FOR PORTABLE DUST COLLECTOR TO BE SURFACE MOUNTED ON AVAILABLE CEILING SPACE. COORDINATE EXACT ROUTING AND INSTALLATION LOCATIONS ON SITE. LABEL RECEPTACLES FOR THEIR LOAD. USE 2 #4 + #8 BOND IN 27C.
- ④ MOUNTING HEIGHT OF EMERGENCY STOP PUSHBUTTON TO MATCH HEIGHT OF LIGHT SWITCHES. REFER TO SCHEMATIC ON DRAWING E6.
- ⑤ PROVIDE POWER TO 15HP DUST COLLECTOR CONTROL PANEL, FAN MOTOR AND SHAKER MOTOR AS INDICATED. PROVIDE 100A FUSED DISCONNECT SWITCH WITH 3P, 80A FUSE FROM MAIN ELECTRICAL DISTRIBUTION SPLITTER IN MAIN FLOOR ELECTRICAL ROOM TO FEED THE 15HP DUST COLLECTOR. REFER TO DETAIL 'A' ON DRAWING E6 & DETAIL 'A' ON DWG E7.
- ⑥ ALL AC90 OR TECK90 CABLES ARE TO BE NO LONGER THAN 15 FEET IN ALL EXPOSED INDOOR LOCATIONS.
- ⑦ ENSURE THAT ALL RECEPTACLE INSTALLATIONS ARE BARRIER FREE.

### WOOD SHOP FLOOR PLAN - ELECTRICAL PLAN

SCALE: 1/8"=1'-0"



### BUILDING KEY PLAN

SCALE: 1"=200'-0"



**Note**  
REFER TO ELECTRICAL GENERAL NOTES ON DRAWING E01.

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WOOD DUST COLLECTION SYSTEM & MAIN ELECTRICAL UPGRADE

Drawing No.  
HRSB-TP3C-E5

Title  
ELLENVALE JUNIOR HIGH SCHOOL WOOD SHOP ELECTRICAL PLAN

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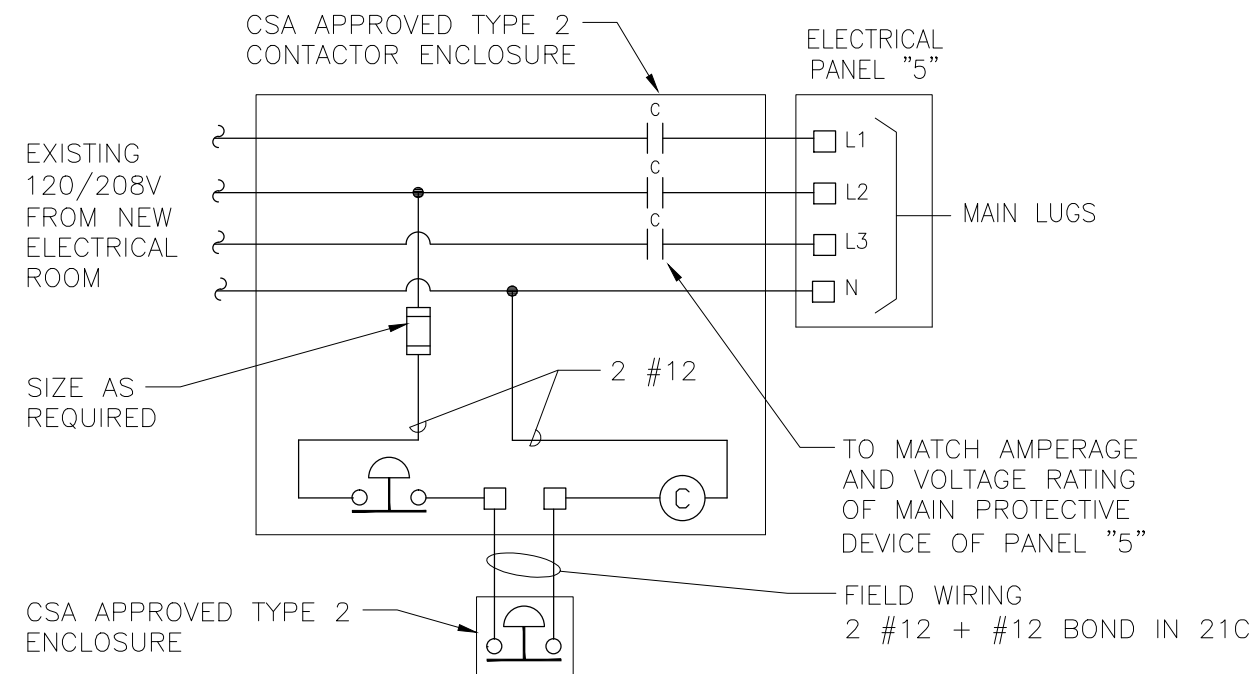
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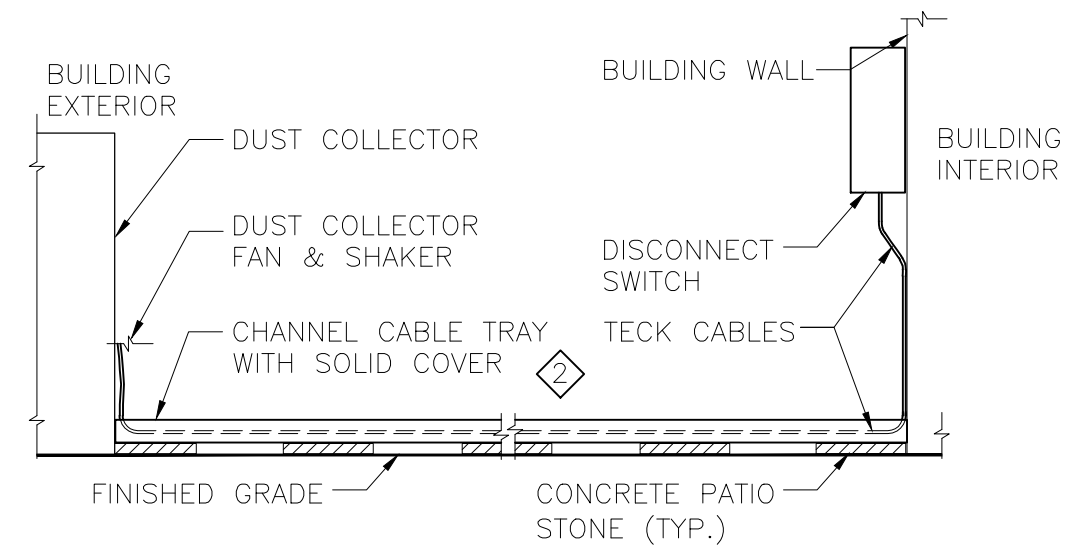


## ELECTRICAL KEY NOTES

- 1 PROVIDE ONE EMERGENCY STOP PUSHBUTTON C/W CONTACTOR ENCLOSURE AND ONE REMOTE EMERGENCY STOP PUSHBUTTON AS INDICATED. DISCONNECT MAIN LINE CONDUCTOR C/W ASSOCIATED CONDUITS FROM PANEL '5'. EXTEND AND CONNECT EXISTING CONDUCTORS IN CONDUITS TO CONTACTOR ENCLOSURE AS INDICATED. EXTEND CONDUCTORS IN CONDUITS FROM CONTACTOR ENCLOSURE TO PANEL '5' AS INDICATED. SIZE CONDUCTORS, BONDS AND CONDUITS IN ACCORDANCE WITH THE LATEST EDITION OF THE C.E.C. UPSIZE CONDUCTORS IN CONDUIT AS REQUIRED TO MAINTAIN MAXIMUM 3% VOLTAGE DROP.
- 2 RUN FEEDER BETWEEN DUST COLLECTOR FAN OR DUST COLLECTOR SHAKER AND THE CORRESPONDING DISCONNECT SWITCH, UTILIZING 4" HOT DIP GALVANIZED, VENTILATED CHANNEL CABLE TRAY WITH SOLID COVER. USE SPECIFIED CABLES. INSTALL CHANNEL CABLE TRAY WITH COVER FASTENED TO 12"x12" CONCRETE PATIO STONES PLACED ON FINISHED GRADE. SECURE CHANNEL CABLE TRAY BETWEEN BUILDING WALL AND DUST COLLECTOR FAN OR SHAKER STRUCTURE.



EMERGENCY STOP PUSHBUTTON CONTROL SCHEMATIC 1  
SCALE: N.T.S.



OUTDOOR CONNECTION BETWEEN DUST COLLECTOR FAN OR SHAKER AND DISCONNECT SWITCH (TYPICAL) 2  
SCALE: N.T.S.

**Note**  
REFER TO ELECTRICAL GENERAL NOTES ON DRAWING E01.

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WOOD DUST COLLECTION SYSTEM & MAIN ELECTRICAL UPGRADE  
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ELLENVALE JUNIOR HIGH SCHOOL ELECTRICAL DETAILS

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JLT  
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