Halifax Regional School Board

RFP #3702

BIOMASS HEATING FUEL STANDING OFFER

Millwood High School

Closing Date: ***TUESDAY, OCTOBER 28, 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

DOWNLOAD RFP #3702 FROM HRSB WEBSITE:

http://www.hrsb.ca/about-hrsb/financial-services/purchasing/tenders/tender-listing

HRSB Contacts:
Deborah Beck, Buyer
Tel: (902) 464-2000 #2011
Fax: (902) 464-0161

Tyler Bell, HRSB Energy Manager
Tel: (902) 464-2000 #5119

Project Location:
Millwood High School
141 Millwood Drive
Lower Sackville NS

AN OPTIONAL BIDDERS' SITE MEETING WILL BE HELD AT THE SCHOOL MAIN ENTRANCE ON FRIDAY, OCTOBER 17TH AT 10 AM

To obtain BID DOCUMENTS DOWNLOAD FROM HRSB WEBSITE:
http://www.hrsb.ca/about-hrsb/financial-services/purchasing/tenders/tender-listing

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

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1.0 Introduction/RFP Objective & Scope

As part of the HRSB Energy Management Project, a Biomass heating system was recently installed at Millwood High School, Lower Sackville, Nova Scotia. The purpose of this RFP is establish a standing offer for the supply of pelletized Biomass fuel for a period of three (3) years with option to extend for two (2) additional years at the discretion of the Board, to be delivered to the Biomass Fuel Silo at Millwood High School. The heating area for Millwood High is 82,450 square feet.

Boiler: Viessman Pyrot 540
Input: ~ 2168 MBH

Silo: Capacity: ~ 38,000 kg

Construction specifications are included in Appendix C of this RFP.

1.1 Biomass Fuel Overview

It is predicted that Millwood High School will consume over 180,000 kg of Biomass Fuel in the 2014/2015 school year.

The forecast consumption figures are an estimate, and are provided to give a general sizing of the opportunity in order to assist proponents in developing competitive pricing and appropriate responses to specific service requirements outlined below. While The Board does not guarantee this volume or future volumes, it can be used as a benchmark for the level of purchases and support The Board expects in upcoming years.

We anticipate that the contractor selected through this RFP process will be able to meet the service requirements for the specified volumes as a minimum.

1.2 Proposal Submission Requirements/Delivery/Proposal Amendments

Proponents are required to submit one (1) original and three (3) exact copies of their Authorized Proposal, including the completed and signed original Proposal Fee form, signed copy of each addendum (if any), a CD or memory stick containing a Microsoft Word, Excel or PDF format electronic copy of the entire proposal and any other documentation requested. Proposals must be submitted in a sealed envelope with the Proposal number clearly marked on the outside of the Envelope. Electronic and facsimile Proposals will not be accepted.

Deliver proposals to: Halifax Regional School Board, 33 Spectacle Lake Drive, Dartmouth, NS B3B 1X7 by the time and date indicated on the cover sheet of this document.

Amendment to a submitted Proposal will be permitted if received in writing prior to Proposal closing date and time, endorsed by the same party or parties who signed and sealed the Proposal. Fax amendments to (902) 464-0161.

1.3 RFP Schedule

Below is the approximate schedule that is expected to be followed for this RFP. Any changes to these dates will be communicated to all RFP participants via direct notifications through Addenda via e-mail. Changes/extensions to the RFP closing dates will made not less than 3 days prior to the closing date and time.

Milestone	Dates
RFP issue date	15-Oct-14
Deadline for Proponents to submit RFP questions	21-Oct-14
RFP briefing session (optional)	17-Oct-14 10AM @ school
Answers provided to Proponents' questions	No later than 21-Oct-14 2:00 P.M.
RFP responses are due	28-Oct-14
Notification of Award	No later than 7-Nov-14
Proponent presentations and negotiations	TBD

1.4 RFP Key Contacts

Questions about this RFP should be submitted by contractors by email to dbeck@hrsb.ca Information obtained from any other source is not official and may be inaccurate.

2.0 Response Requirements

The Board has specific requirements related to the provision of service/goods included in the scope of this RFP and key aspects of operations.

The Board is committed to purchasing goods, services, and construction sustainably, in a manner that is better for our economy, our environment, and our communities.

Please read all procurement documents carefully and confirm that you have read and agree to the terms and conditions outlined in each applicable document.

The following documents apply to this procurement and must be reviewed carefully by all Proponents:

- Applicable Trade Agreements
- Sustainable Procurement Policy
- Atlantic Standard Terms and Conditions
- Supplemental Terms and Conditions for this RFP outlined in Section 4

In case the Board makes a decision to award business as a result of this RFP the successful Proponent will be required to enter into a contract with The Board. The Standard Contract is included in this RFP. Please indicate that you have read and agree to the standard contract terms.

2.1 Conflict of Interest

Proponents are required to disclose in their response any potential or perceived conflict of interest prior to RFP closing date and time.

2.2 Project References

Proponents must provide three (3) client references for the work done by the Proponent in the past three (3) years. The work must be similar in nature to the requirements defined in this RFP. Select clients that are similar to Millwood High School in size and nature of operations, and

provide a contact name, along with his/her phone number, fax number and email address. The reference information provided should identify the approximate size of the contract, describe the clients' overall satisfaction with the Proponent's services and the results (efficiency and effectiveness) achieved, including the adherence to the service level requirements.

Proponents are required to prove an operating performance track record and a strong history of service and support.

2.3 Biomass Fuel Delivery

The Board requires delivery so as to ensure the uninterrupted supply of the required Biomass Fuel to the Biomas silo at the school. Millwood High School is located on 141 Millwood Drive in Lower Sackville Nova Scotia and proponents must be familiar with delivery instructions for this site. The Board reserves the sole and absolute right to add and remove locations throughout the effective period of the agreement.

The successful proponent(s) will be required to establish a delivery schedule for Millwood high School. Further, arrangements to meet unique requirements such as minimum fuel inventory levels and late night deliveries must also be made following the award.

Proponents must not assign or sub-contract delivery of Biomass Fuel to third-parties without prior written consent from The Board; sub-contractors proposed for work on this bid must be clearly indicated.

Finally proponents must identify a contingency plan regarding failure to deliver product, and must ensure to protect property during delivery of fuel so that no damage is done. Key consideration of the contingency plan not only relates to delivery by supply of the pellets should the primary production plant be disrupted, deeming the fuel supply unavailable from the specific production site.

2.4 Pricing

Bid responses must be made in Canadian dollars, exclusive of HST.

Whereas this is a new install, historical usage is not available. The Board does not guarantee any volume as actual usage for the term of this agreement.

All pricing provided must be valid for the entire duration of the initial agreement period, i.e. three (3) years.

2.5 Billing and Payment Requirements

The Board explicitly wishes to reduce the number of invoices it processes and increase automation of invoicing and payment processing where possible. Proponents must describe the ability to transmit invoices electronically or receive EFT (Electronic Funds Transfer) payments. Proponents should provide recommendations on how to improve information transfer between The Board, the Contractor and all involved parties.

2.6 Regulatory Constraints

Proponents must comply with the Personal Information International Disclosure Protection Act (S.N.S. 2006, c.3).

The Board reserves the right to take samples and have independent analysis and tests made of any Biomass fuel delivered. Product of inferior quality will not be accepted, and failure to meet quality standards may be cause for cancellation of the agreement and for recovery of liquidated damages.

Finally, proponents must accept that all governing Federal, Provincial, and Municipal standards, rules, regulations, and guidelines in effect as they apply to the delivery of the product being supplied, including the provision of Material Safety Data Sheets and WHMIS updates, shall prevail during the effective period of this agreement.

2.7 Reporting

Proponents must report all faults, and/or defects to users equipment or installation thereof immediately upon observance of such incidents. Proponents must identify a plan to inspect and report on the condition of all equipment relevant to the delivery and storage along with associated equipment owned by the user and reasonably deemed to be associated with the requirements of this RFP.

Proponents must demonstrate the ability to provide users with usage reports relating to consumption, billing, or other details as requested.

2.8 Indemnity and Insurance

i. The Contractor will indemnity and save harmless the Board from and against all demands, claims, losses, costs, damages, actions, suits or other proceedings by whomsoever made, sustained, brought or prosecuted in any manner based upon, occasioned by or attributable to anything done or omitted to be done by the Contractors, its officers, employees or agents in connection with the fulfilment of the Agreement.

ii. The Board shall not be liable for any injury or damage (including death) to the person or for the loss of damage to the property of the contractor in any manner based upon, occasioned by or in any way attributable to the Contractor's services under this Agreement unless such injury, loss, or damage is caused solely and directly by the negligence of an officer or employee of the Board while acting within the scope of his or her employment.

iii. The Contractor shall use due care in processing the Board's work. The Contractor shall not be liable for any indirect or consequential damages related to the services performed under this Agreement unless caused by the Contractor's negligence.

iv. The Contractor shall at all times maintain and keep in force general liability coverage, including third party bodily injury and property damage in an amount not less than $5,000,000 per occurrence. The Board shall be included as an additional insured.

v. The Contractor shall at all times maintain and keep in force throughout the term of this Agreement automobile insurance of at least $5,000,000 combined single limit, on all owned, non-owned, leased or hired automobiles.

vi. All insurance required to be maintained by the Contractor under this section shall be considered primary and any insurance of self-insurance maintained by the Board shall be excess of and non-contributory to the Contractor's insurance. In the event of an insurance claim the Contractor will be responsible for the payment of any application deductible. The Contractor shall provide proof of the required coverage with the proposal submission and provide the Board with updated copies throughout the term of the Contract Agreement.

2.9 Workers' Compensation Act

The Contractor will provide the Board with evidence of coverage under the Workers' Compensation Act and a Clearance Certificate from the Nova Scotia Workers' Compensation Board indicating that the Contractor and all sub-contractors (if any) are in good standing.

2.10 Performance Failure

In the event of default or failure on the part of the proponent to complete the agreement to the satisfaction of The Board, The Board may accept the next lowest bidder, holding the contractor liable for any increase in cost to The Board.

2.11 Biomass Fuel Pricing

Proponents must provide equivalent cost per BTU according to the following formula:

$___ /kg divided by tested heating value (BTU/kg) to provide equivalent = $___/BTU

Heating Valve testing data must be provided by the supplier with the RFP submission.

2.12 Biomass Fuel Specifications

Proponents are required to provide the following information in your response:

- Biomass specification
- Certification (i.e. PFI – Pellet Fuels Institute)
- Testing data and heating value (BTU/kg)
- Fuel grade
- Identify parent sources of the biomass
- Moisture content
- Material density
- Particle size or dimensions
- Fines as a % of weight
- Mechanical durability
- Ash content/weight
- Additives
- Contaminants

3.0 Proposal Evaluation

The proposal will be examined in accordance with the Terms and Conditions outlined in Section 4 of this RFP following the evaluation process and criteria outlined below.

3.1 Evaluation Team

The Evaluation Team will consist of the designated representatives of the Operations Services and Procurement Services. It is understood and accepted by the proponent that all decisions about the degree to which a proposal meets the requirements of this RFP are the judgment of this Evaluation Team.

To assist in the evaluation of the Responses, the Evaluation Team may, but is not required to:

- Conduct reference checks relevant to the proposal with any or all of the references cited in a response to verify any and all information regarding the Proponent and rely on and consider any relevant information from such cited references in the evaluation of responses.

- Conduct any background investigations that it considers necessary in the course of the evaluation process and consider any relevant information resulting in the evaluation of Responses.

3.2 Evaluation Scenarios

The Board is proposing to contract with one preferred Contractor/supplier for Biomass Fuel.

3.3 Evaluation Process

The Evaluation Team will evaluate all responses based on the materials submitted. Responses must be specific and complete in order to provide the information necessary to evaluate whether Proponents will meet the Board's requirements.

Selection of the successful Proponent will be based on evaluation of all responses according to the set of criteria outlined in sections 4.3.and 4.4.

The bid will be evaluated using the following process:

Stage 1: Verify each bid's compliance to the Mandatory Requirements identified below, and disqualify any bids that fail to meet these.

Stage 2: For bids that meet the Mandatory Requirements, evaluate and score each one, using the Evaluation Criteria below.

Stage 3: Based on the results of the scoring, select a short list of Proponents whose proposals meet the minimum qualifying score and have the highest overall ranking. The number of short listed Proponents will be determined by The Board in its sole discretion following its review of the responses. The Board will then issue a notification to bidders informing them that they have been short listed for further discussion.

Stage 4: Invite shortlisted Contractors to present their proposals to The Board and negotiate terms of the potential agreement.

Selection of successful Proponents from the short list of Contractors will be decided by the Evaluation Team based on the evaluation of all submitted materials and results of the negotiations against the set of outlined criteria.

3.4 Mandatory Requirements

The Board reserves the right to accept or reject all or any part of a Proposal as may be in the best interest of the Board and to waive any informality therein.

The proposal must meet all of the following mandatory requirements and clearly demonstrate that these are met in a substantially unaltered form. If the proposal fails to meet any one of these criteria, it will receive **no further consideration** during the evaluation process and be deemed non-compliant.

1. Proposals that are not signed or that are received after the closing date will be declared non-compliant.

2. All proposals must be submitted in Canadian dollars (CDN) exclusive of HST.

3. Proponents must submit all responses to this RFP in the required format.

4. Proponents must acknowledge compliance to the Terms and Conditions and applicable procurement documents.

5. Proposals that fail to include signed addenda will be declared non-compliant.

3.5 Evaluation Criteria

If the proposal meets the Mandatory Requirements it will be further evaluated using the criteria below. Scores will be recorded for each criterion and a total score will be determined.

Criterion	Weight points	Maximum Score (points)
Qualifications and References	1.5%	15
Delivery	2%	20
Invoicing and Payment	0.5%	5
Regulatory Constraints	0.5%	5
Reporting	0.5%	5
Performance Failure	5%	50
Biomass Quality/Performance	20%	200
Subtotal A – Qualifying Score	**30%**	**300**
Cost of Proposal	70%	700
Subtotal B – Short-list Score	**70%**	**700**
Maximum Score Possible	**100%**	

Notes:

1. **A minimum qualifying score of 180** points is required at Subtotal A for the bid to be deemed compliant.

   - If the proposal's score meets or exceeds the minimum qualifying score, the Pricing response will then be evaluated using the formula below:

     score = weight x (low bid / proponent bid)

4.0 RFP General Terms and Conditions

4.1 Standard Terms and Conditions

4.1.1 Atlantic Provinces Terms and Conditions

This Request for Proposals is subject to the Atlantic Provinces Standard Terms and Conditions Goods and Services. Supplementary Terms and Conditions that apply specifically to this RFP are laid out below.

In the event of any conflict or disagreement between the Atlantic Provinces Terms and Conditions for Goods and Services and the Supplementary Terms and Conditions listed below, the latter have precedence and will be assumed to be correct.

4.2 Supplementary Terms and Conditions

4.2.1 Mandatory Requirements

This Request for Proposal may contain mandatory requirements. Proposals not meeting all mandatory requirements will be rejected without further consideration.

4.2.2 Conflict of Interest

The Board reserves the right to disqualify any Proponent that in the Board's sole opinion has an actual or potential conflict of interest or an unfair advantage, whether existing now or is

likely to arise in the future, or may permit the Proponent to continue and impose such terms and conditions, as The Board in its sole discretion may require. Proponents are required to disclose, to the RFP Contacts, any potential or perceived conflict of interest issues prior to RFP closing date and time.

4.2.3 Right to Amend

The Board reserves the right to amend or supplement the RFP, giving equal information and cooperation by way of issued addendum to all proponents as a result of any such amendment.

4.2.4 Proposal Information

Material, data and information accessed or provided by The Board and used in the preparation of the proposals is confidential and the property of The Board.

4.2.5 Financial Information

Proponents may be requested to demonstrate financial stability during the evaluation process.

4.2.6 Evaluation of Proposals

An Evaluation Team formed for that purpose will evaluate all acceptable proposals. The Board reserves the right to make an award based directly on the proposals submitted, to negotiate further with the preferred proponent/s (sequentially or contemporaneously) and/or to request the best and final offer from the highest ranked Proponents.

The Board reserves the right to negotiate pricing, value added and other savings opportunities with the successful proponent/s at time of award and throughout the duration of the contract.

4.2.7 Acceptance of Proposals

The Board is not bound to accept the lowest price or any proposal of those submitted.

Subsequent to the submission of Proposals, interviews and negotiations may be conducted with some of Proponents, but there shall be no obligation to receive further information, whether in writing or oral, from any proponent. The Board shall not be obligated in any manner to any proponent whatsoever until a written agreement has been duly executed relating to an approved proposal.

4.2.8 Contract for Goods or Services

No contract whatsoever is created by or arises from this RFP which under no circumstances constitutes an offer by The Board or any of them to enter into a contract with any party whatsoever. The Board does not have any obligation, responsibility, commitment or legal liability toward any proponent or any proponent's member of participant arising from the RFP or any proposal submission submitted in response to it, or from the RFP process.

Written notice of acceptance of a proposal by The Board, and the subsequent full execution of a written contract will constitute a contract for the services. No proponent will acquire any legal or equitable rights or privileges relative to the services until the occurrence of both such events.

4.2.9 Proposal Selection

Once a decision has been made, the successful Proponent will be notified by Procurement Services. The Evaluation Team will treat all proposals with strict confidentiality and

comparative information on proposals will not be divulged except where required under the Right to Information and Protection of Privacy Act.

4.2.10 News Releases

Contractors shall not make news releases concerning the RFP or the awarding of the same without the written consent of The Board and then only in coordination with The Board .

4.2.11 Negotiation Delay

If a written contract cannot be negotiated within thirty (30) days of notification to the short listed vendor, the Procurement Services may, in its sole discretion, with not less than two (2) business days' notice, terminate negotiations with that vendor and either negotiate a contract with another vendor of its choice or choose to terminate the RFP process and not enter into a contract with any of the contractors.

APPENDIX A – SAMPLE CONTRACT
BIOMASS PELLET SUPPLY CONTRACT FOR:
HALIFAX REGIONAL SCHOOL BOARD
MILLWOOD HIGH SCHOOL
141 MILLWOOD DRIVE
MIDDLE SACKVILLE, N.S.

Contract between *<SUPPLIER>* and ***HALIFAX REGIONAL SCHOOL BOARD*** for the supply of solid biomass to ***MILLWOOD HIGH SCHOOL, 141 MILLWOOD DRIVE, MIDDLE SACKVILLE, N.S***.

Preamble:

a. *<SUPPLIER COMPANY NAME>* is the *private/public* company, whose registered office is at *<ADDRESS>*, Company Number *XXXX*, hereinafter referred to as **"the supplier";**
b. *HALIFAX REGIONAL SCHOOL BOARD* is the *private/public* company whose registered office is at *33 Spectacle Lake Dr., Dartmouth, NS B3B 1X7*, hereinafter referred to as **"the end user";**
c. *MILLWOOD HIGH SCHOOL, 141 MILLWOOD DRIVE, MIDDLE SACKVILLE, N.S.* is the site (owned and) operated by the end user where the delivery of biomass is required by the end user, hereinafter referred to as **"the site".**

1. Contract

1.1 The supplier agrees to supply to the end user and the end user agrees to purchase from the supplier biomass to the specifications, in the quantities, for the period, at the price, and on the terms and conditions set out below.

1.2 For the purpose of maintaining control over the necessary quality, the end user agrees neither to purchase nor use biomass from any other source or supplier except where the supplier is unable to provide deliveries or meet biomass specification requirements within three working days of the due date.

2. Biomass specification

2.1 <Provided by the supplier at time of issuing Proposal. Specification provided with RFP or negotiated prior to award will form the basis for contract and be included in this contract>

3. Duration of contract

3.1 This contract is for a period of *<XX>* and will commence on *<DATE>* and end on *<DATE>*, (with a formal review after the first three months of the contract to assess the need for any adjustments to the contract). Any adjustments need to be agreed jointly between the end user and supplier. If the supplier or end user cannot agree or meet adjustments, each party should be able to terminate after 3 months if it wishes to.

3.2 This contract may be extended by agreement of both parties not less than three months before the end of the original contract period.

3.3 In the event of either party failing to meet their contractual obligations under this agreement the other party has the right to terminate the contract at three months notice

unless such breach of contract is remedied by the defaulting party to the reasonable satisfaction of the non-defaulting party. If any material breach is committed by either party which, in the reasonable opinion of the non-defaulting party, can not be remedied within 10 working days the non-defaulting party may terminate this agreement immediately by way of written notice.

4. Quantity

4.1 The minimum annual quantity of biomass supplied during the defined contract will be 180,000 kg at the specification defined in Clause 2.

4.2 The end user may order amounts in addition to that specified in 4.1 by requesting an additional delivery from the supplier, specifying the quantity required, and the date and time by when the end user requires the delivery in accordance with Clause 7.4. If the supplier is able to satisfy the request, it shall notify the end user accordingly and deliver the amount requested as soon as is reasonably practicable. The supplier may charge the contract price for any additional delivery made in accordance with Clause 5. If the supplier cannot satisfy the request, it shall notify the end user of the reason why.

4.3 Maximum delivery to be 28,000 kg.

5. Price

5.1 The price for biomass delivered into the fuel store of the end user will be based upon the following:

- $XX per kilogram of biomass.

5.2 Loads of different weights will be charged on a pro rata basis in accordance with the above rate.

6. Fuel sources

6.1 The biomass will be derived from the wood refuse products and be a renewable energy source.
The parent source of the biomass is declared as being _____.

7. Delivery of biomass

7.1 Biomass will be supplied in loose form and delivered to the end user by a suitable vehicle for delivery into the end user's fuel silo.

7.2 A risk assessment and method statement shall be prepared in advance by the supplier following an initial site visit and discussion with the end user, to take account of the hazards on site and the risks posed to pedestrians, vehicles and property on the site during biomass delivery and offloading. This shall be formally reviewed annually, or whenever a change to the hazards and risks on site are identified.

7.3 On the dispatch of any consignment of biomass, the supplier shall send a Delivery Note and a Fuel Quality Declaration to the end user by electronic mail or facsimile. A paper copy of the Delivery Note shall be provided to the end user at the site(s) with the delivery of each consignment.

7.4 The notice period for requesting delivery of biomass from the end user will be a minimum of XX days.

7.5 Responsibility for checking levels of biomass within the fuel store and informing the supplier of the need for a fuel delivery rests with the end user.

7.6 In the event of the requirement for a delivery at less than the notice period in clause 7.4 an additional fee of $XX will be payable to cover the costs of an emergency delivery.

7.7 Unless otherwise agreed in advance with the end user, deliveries shall be made between the hours of YY.00, or any other time agreed with the end user in advance between Monday and XXXday.

7.8 If a delivery cannot be made within the hours specified in the contract and the whole or part of the delivery is not possible due to obstructions on the end user's site that are beyond the control of the supplier, the supplier will be entitled to compensation to cover the cost of transport and payment of an additional surcharge of XX% of the value of the biomass ordered, unless the end user informs the supplier of said obstruction within the notice period specified in Clause 7.4 above.

7.9 Upon delivery of the biomass to the end user, visual checks shall be made by the end user to ensure conformity to the agreed specification.

7.10 If checks reveal that the biomass does not conform to the agreed specification as per Clause 2, the end user reserves the right to reject the load in full. In the event that it is not possible to visually check the fuel load until it is in the fuel silo, but the pellet is subsequently found to not conform to the agreed specification within 24 hours of delivery, then the end user reserves the right to reject the fuel. Rejected fuel will be removed by, and at the expense of, the supplier. Any such dispute over the specification of the biomass will be resolved as per Clause 11.

7.11 The supplier shall be responsible for immediately clearing up any biomass spilt during offloading and shall provide suitable tools for this job.

7.12 The biomass shall remain at the risk of the supplier until delivery to the company is complete (i.e. the biomass is offloaded into the end user's silo, when ownership of the biomass shall pass to the end user.

7.13 The biomass supplier shall advise of mechanical fitting required to be fitted to the silo fill pipe.

8. Sampling

8.1 The end user may at any time send representative samples of biomass for evaluation, analysis, testing and approval. All samples must meet the specification. Such tests are to be at the end user's expense.

8.2 The strategy for maintaining the original quality of the biomass once the supplier has delivered it on site is the responsibility of the end user.

9. Terms of payment

9.1 The supplier will invoice the end user for each delivery.

9.2 Terms are monthly payment at XX days from date of invoice.

9.3 In the event that any payments are overdue the supplier has the right to refuse to make further supplies until all outstanding overdue invoices have been settled.

10. Other terms and conditions

10.1 Boiler outage or operational problems that are a direct result of sub-standard maintenance, boiler misuse/neglect or boiler defects are not the responsibility of the supplier. In this instance, any cost that is incurred by the supplier as a result of not being able to deliver fuel will be charged to the end user.

10.2 The supplier will indemnify the end user against the cost of repair to fuel handling and combustion equipment caused by the supplier or supply of biomass not in accordance with the specification set out in clause 2.1, 2.2 and 2.3.

10.3 The supplier will have public liability insurance of $ _____.

10.4 The supplier's liability under this Agreement (including under any indemnity) shall be limited to $ _____.

11. In the event of a dispute

11.1 Both parties shall attempt in good faith to negotiate a settlement to any dispute between them arising out of or in connection with the contract within thirty days of either party notifying the other of the dispute. Initially the party who wishes to bring the dispute to the notice of the other will do so in writing. The other party will respond to this in writing within 5 working days of receiving the notification of a potential dispute. Where the potential dispute relates to on-site issues at either the end-user or supplier sites, a joint site meeting will normally take place within 8 working days of the potential dispute being brought to the other party's attention.

11.2 Where a resolution has been agreed after one or more meetings, including a site meeting (if appropriate), this shall be communicated in writing and noted by both parties.

11.3 Where a resolution cannot be agreed after several attempts, the parties will attempt to settle it by mediation.

12. Force Majeure

12.1 A party, provided that it has complied with the provisions of clause 12.3, shall not be in breach of this agreement, nor liable for any failure or delay in performance of any obligations under this agreement (and, subject to clause 12.4, the time for performance of the obligations shall be extended accordingly) arising from or attributable to acts, events, omissions or accidents beyond its reasonable control (**Force Majeure Event**), including but not limited to any of the following:

(a) Acts of God, including but not limited to fire, flood, earthquake, windstorm or other natural disaster;

(b) war, threat of or preparation for war, armed conflict, imposition of sanctions, embargo, breaking off of diplomatic relations or similar actions;

(e) compliance with any law;

(f) fire, explosion or accidental damage;

(h) extreme adverse weather conditions;

(i) collapse of building structures, failure of plant machinery, machinery, computers or vehicles;

(j) any labour dispute, including but not limited to strikes, industrial action or lockouts;

(k) non-performance by suppliers or subcontractors (other than by companies in the same group as the party seeking to rely on this clause); and

(l) interruption or failure of utility service, including but not limited to electric power, gas or water.

12.2 The corresponding obligations of the other party will be suspended to the same extent as those of the party first affected by the Force Majeure Event.

12.3 Any party that is subject to a Force Majeure Event shall not be in breach of this agreement provided that:

(a) it promptly notifies the other parties in writing of the nature and extent of the Force Majeure Event causing its failure or delay in performance; and

(b) it could not have avoided the effect of the Force Majeure Event by taking precautions which, having regard to all the matters known to it before the Force Majeure Event, it ought reasonably to have taken, but did not; and

(c) it has used all reasonable endeavours to mitigate the effect of the Force Majeure Event to carry out its obligations under this agreement in any way that is reasonably practicable and to resume the performance of its obligations as soon as reasonably possible.

12.4 If the Force Majeure Event prevails for a continuous period of more than six months, any party may terminate this agreement by giving 14 days' written notice to all the other parties. On the expiry of this notice period, this agreement will terminate. Such termination shall be without prejudice to the rights of the parties in respect of any breach of this agreement occurring prior to such termination.

13. Third party rights

13.1 A person who is not a party to this agreement shall not have any rights under or in connection with it.

14. Governing law and jurisdiction

14.1 This agreement and any dispute or claim arising out of or in connection with it or its subject matter shall be governed by and construed in accordance with the laws of the Province of Nova Scotia.

14.2 The parties irrevocably agree that the courts of the Province of Nova Scotia shall have exclusive jurisdiction to settle any dispute or claim that arises out of or in connection with this agreement or its subject matter.

Agreed this *<DATE>*

Name……. Position ……
On behalf of *HALIFAX REGIONAL SCHOOL BOARD*

Name…… Position……. (On behalf of *<SUPPLIER>*)

APPENDIX B – CONTRACTOR INFORMATION SHEET

RFP #3702
BIOMASS HEATING FUEL STANDING OFFER/
Millwood 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 ***#3702 BIOMASS HEATING FUEL STANDING OFFER – Millwood 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 ***#3702 BIOMASS HEATING FUEL STANDING OFFER –Millwood 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 Proposal. Only one Sub-Contractor shall be named for each part of the work to be sublet.

Subcontractor/Suppliers/Manufacturers	Service/Material

3.4 **PROJECT PERSONNEL:**

Provide the names, qualifications and previous experience of staff who will be directly involved with the project. The names shall, for example, include Project Manager, Truck Drivers, etc.

Name	Position	Qualification/Experience

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. Failure to comply with this requirement may result in immediate contract termination.

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

3.7 **PROPOSED ANNUAL PRICE PER BTU**

The PER BTU 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.

BIOMASS HEATING FUEL STANDING OFFER – MILLWOOD HIGH SCHOOL

	Cost/BTU ($/BTU)	Cost/kg ($/kg)
Year 1		
Year 2		
Year 3		
Option Year 1		
Option Year 2		

DO NOT INCLUDE HST IN BID PRICE

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)

APPENDIX C – INSTALLED EQUIPMENT SPECIFICATIONS

Transmittal

Date: May 7, 2014

7051 Bayers Road
Suite 102
Halifax, Nova Scotia
B3L 2C1

Phone (902) 876-3182
Fax (902) 876-2796
www.mcw.com

Delivery By
- ☐ *Courier*
- ☐ *Mail*
- ☒ *E-Mail*

Project Name:	HRSB Energy Project Design – Biomass **Millwood High**	***Project No.:***	10-13-007 **Pkg# 1-F05-01-097**
Client:	HRSB		
To:	Atlantica Mechanical	***# of Pages:***	1 of 1
Attention:	Ray Gallant, P. Eng., PMP Production Manager	***Office:***	Moncton, NB
Telephone no.:	(902) 468-2300	***From:***	Michael McCabe MIT
Address:	9 Ralston Ave Dartmouth, NS B3B 1H6		

Enclosed please find the following shop drawings:

1 Copy	Pellet Storage Silo – "**Reviewed**"
1 Copy	Biomass Boiler Layout – "**Reviewed**"

Michael J. McCabe, MIT.
e-mail: mmccabe@mcw.com
MCW Maricor

LETTER OF TRANSMITTAL

Atlantica Mechanical
CONTRACTORS INC.

9 Ralston Avenue
Dartmouth, Nova Scotia
B3B 1H5

T: 902.468.2300
F: 902.468.3289

Transmittal ID: Sub 11

Date 06-May-14

To:

Name	Ted Loucks
Company	MCW Energy Solutions Ltd
Address	7051 Bayers Road, Unit 102
City	Halifax Prov. NS Post B3L 2C1
Phone	902-876-3182

From:

Name	Raymond Gallant
Date	May 5th, 2014
Project #	A-14-0778
Project	HRSB Millwood Biomass

Items Sent:

☑ Attached ☑ Shop Drawings ☐ Plans ☐ Samples ☐ Disk

Delivery Via:

☐ Hand ☐ Pickup ☐ Courier ☑ E-Mail

Copies	Date	Description
1	09-Apr-14	**Silo (Includes 1 file(s) + cover sheet)**

Items Transmitted:

☑ For Approval ☐ Approved As Submitted
☐ For Your Use ☐ Approved As Noted
☐ As Requested ☐ Returned For Corrections

Required Action:

☐ Resubmit For Approval
☐ Submit Copies For Distribution
☐ Return Corrected Prints ☐ Return After Use

Comments:

Site Address: 141 Millwood Drive
Lower Sackville, NS

T:
F:
C:

THOMAS INDUSTRIAL SALES LTD.

Project: Millwood High School
Biomass Heating System Upgrade
Project #10-13-007 Pkg#1-FO5-097

Section 23 52 00 2.3 Pellet Storage Silo

Shop Drawings

Model: C45-01236 Industrial Silo

Description: 12ft x 6 rings with 45 degree hopper.
Tank has a 10 degree roof, Guard Rail and toe board, 22" center roof opening
With double latched lid, 12" discharge opening with 16" x 16" flange,
Black Non Rust Bolts, Access Plus hopper access, Industrial Sealant and
16gauge top ring.
Silos are leg supported.
12ft Diameter
Overall Height= 25.6'
1701 Max. Bu. Capacity-6% Compacted
1605 Max. Bu. Capacity- Non Compacted
Product 40 lbs/cuft
Seismic Zone 1
Wind: 90mph (145kph) wind
G90 (Z275) Galvanization Standard
Design Material: Grain @52 lbs/cuft compacted
Cubic Feet=1997
Usable Feet=1856

Accessory Options Included

(1) Ladder and Cage for C45-01236
(1) Ladder Lock Out Door Complete
(6) Corrugated Feed View Window Complete
(1) Feed View Window Complete
(4) Feed Bin Lifting Brackets
(1) 8" vent pipe extending to near ground level(
(1) 4" pneumatic fill kit with collar for blow pipe.
(1) Industrial slide gate valve

THE CONTRACTOR SHALL VERIFY
ALL DIMENSIONS ON SITE

MCW Maricor

May 07,2014

☑ REVIEWED ☐ REVISE AND RESUBMIT
☐ REVIEWED AS MODIFIED ☐ NOT REVIEWED
SIGNED MJM

This silo will be assembled on site and then lifted by crane to allow for installation of the legs.
There has to be enough room around cement pad to place 4 lifting jacks for assembly.
The cement pad is not included in price and is to be provided to Brock Specifications.
Crane rental is included in price for lifting of bin but if any extra charges are incurred because of holdups not caused by our installation crew, they will be billed extra at the time of installation.

Allow 8-10 week Lead time for delivery

BROCK

UNSKIRTED STORAGE SILOS

DIAMETER	MODEL NUMBER	APPROXIMATE CAPACITY MAXIMUM Cu. Ft.	MAXIMUM M³	USABLE W/30° ANGLE OF REPOSE Cu. Ft.	USABLE W/30° ANGLE OF REPOSE M³	HEIGHT TO LID FEET	HEIGHT TO LID METERS
6 FT. (1.8m) Diameter 60° Hopper	C45-00601	124	4	113	3	10.2	3.1
	C45-00602	199	6	188	5	12.8	3.9
	C45-00603	273	8	262	7	15.5	4.7
	C45-00604	348	10	337	10	18.2	5.5
	C45-00605	423	12	412	12	20.8	6.3
	C45-00606	497	14	486	14	23.5	7.2
9 Ft. (2.7m) Diameter 45° Hopper	C45-00932	439	12	385	11	13.0	4.0
	C45-00933	608	17	554	16	15.8	4.8
	C45-00934	777	22	723	20	18.5	5.6
	C45-00935	946	27	892	25	21.2	6.5
	C45-00936	1,115	32	1,061	30	23.8	7.3
	C45-00937	1,284	36	1,230	35	26.4	8.0
	C45-00938	1,453	41	1,399	40	29.0	8.8
	C45-00939	1,622	46	1,568	44	31.7	9.7
	C45-009310	1,791	51	1,737	49	34.3	10.5
	C45-009311	1,960	56	1,906	54	37.0	11.3
9 Ft. (2.7m) Diameter 60° Hopper	C45-00902	514	15	460	13	16.0	4.9
	C45-00903	684	19	630	18	18.6	5.7
	C45-00904	854	24	800	23	21.3	6.5
	C45-00905	1,019	29	965	27	24.0	7.3
	C45-00906	1,189	34	1,135	32	26.6	8.1
	C45-00907	1,359	38	1,305	37	29.3	8.9
	C45-00908	1,529	43	1,475	42	31.9	9.7
	C45-00909	1,699	48	1,645	47	34.6	10.5
	C45-009010	1,869	53	1,815	51	37.3	11.4
12 Ft. (3.7m) Diameter 45° Hopper	C45-01232	803	23	662	19	14.9	4.5
	C45-01233	1,102	31	961	27	17.6	5.4
	C45-01234	1,400	40	1,259	36	20.3	6.2
	C45-01235	1,698	48	1,557	44	22.9	7.0
	C45-01236	1,997	57	1,856	53	25.6	7.8
	C45-01237	2,295	65	2,154	61	28.3	8.6
	C45-01238	2,593	73	2,452	69	31.0	9.4
	C45-01239	2,892	82	2,751	78	33.6	10.2
	C45-012310	3,190	90	3,049	86	36.3	11.1
	C45-012311	3,489	99	3,348	95	39.0	11.9

UNSKIRTED STORAGE SILOS

DIAMETER	MODEL NUMBER	APPROXIMATE CAPACITY MAXIMUM Cu. Ft.	MAXIMUM M³	USABLE W/30° ANGLE OF REPOSE Cu. Ft.	USABLE W/30° ANGLE OF REPOSE M³	HEIGHT TO LID FEET	HEIGHT TO LID METERS
12 FT. (3.7m) Diameter 60° Hopper	C45-01202	966	27	825	23	18.3	5.7
	C45-01203	1,265	36	1,124	32	21.5	6.6
	C45-01204	1,563	44	1,422	40	24.1	7.3
	C45-01205	1,861	53	1,720	49	26.8	8.2
	C45-01206	2,160	61	2,019	57	29.5	9.0
	C45-01207	2,459	70	2,318	66	32.2	9.8
	C45-01208	2,758	78	2,617	74	34.8	10.6
	C45-01209	3,057	87	2,916	83	37.5	11.4
	C45-012010	3,356	95	3,215	91	40.2	12.3
	C45-012011	3,655	103	3,514	100	42.9	13.1
15 FT. (4.6m) Diameter 45° Hopper	C45-01532	1,386	39	1,096	31	16.7	5.1
	C45-01533	1,854	52	1,564	44	19.3	5.9
	C45-01534	2,323	66	2,033	58	22.0	6.7
	C45-01535	2,792	79	2,502	71	24.7	7.5
	C45-01536	3,261	92	2,971	84	27.3	8.3
	C45-01537	3,730	106	3,440	97	30.0	9.1
	C45-01538	4,199	119	3,909	111	32.7	10.0
	C45-01539	4,668	132	4,378	124	35.4	10.8
15 FT. (4.6m) Diameter 60° Hopper	C45-01502	1,734	49	1,444	41	21.6	6.6
	C45-01503	2,200	62	1,910	54	24.3	7.4
	C45-01504	2,666	75	2,376	67	26.9	8.2
	C45-01505	3,132	89	2,842	80	29.6	9.0
	C45-01506	3,599	102	3,309	94	32.3	9.8
	C45-01507	4,065	115	3,775	107	34.9	10.6
	C45-01508	4,531	128	4,241	120	37.6	11.5
18 FT. (5.5m) Diameter 45° Hopper	C45-01832	2,120	60	1,600	45	19.0	5.8
	C45-01833	2,791	79	2,271	64	21.7	6.6
	C45-01834	3,463	98	2,943	83	24.3	7.4
	C45-01835	4,134	117	3,614	102	27.0	8.2
	C45-01836	4,805	136	4,285	121	29.7	9.1
	C45-01837	5,476	155	4,956	140	32.4	9.9
	C45-01838	6,148	174	5,628	159	35.0	10.7
	C45-01839	6,820	193	6,300	178	37.3	11.4

Brock Industrial Systems • Milford, Indiana 46542-2000 U.S.A.
Phone +1 574-658-4191 • Internet: www.brockindustrial.com • E-Mail industrial@brockindustrial.com

Ladder Assembly Overview

Ladder and Cage Sections are installed approximately every two or three rings as the Silo is raised.

All BROCK Ladders, Cages and Platforms, when properly installed, are designed to meet or exceed specifications required by ASAE Standard S412.1.

The Side Ladder connects to the Silo sidewall during Silo assembly with pairs of Top Ladder Brackets at the eave, Ladder Standoff Brackets at **every other** horizontal seam and the Body-to-Hopper seam (always), and with Standoff Brackets on the Standoff Rail as shown in **Figures 47** and **Details A - E.**

The top ends of the Ladder Side Rail and Ladder Extension Rails are finished with a pair of Ladder Caps.

IMPORTANT! ***Ladder and Cage installations MUST USE all specified connecting Brackets and hardware for Operator safety and prevention of possible structural failure.***

Ladder Sections are bolted together using Ladder Rail Splicers, 5/16 x 3/4" Gr. 8.2 Hex Head Bin Seal Bolts and Flange Nuts. See **Detail 47E.**

The Lower Ladder attaches to a Ladder Standoff Rail (type determined by Silo diameter) at the Hopper Bin Leg. See **Figure 56.**

Refer also to the Ladder and Cage **PARTS CHARTS** on Pages 53-55 of this Manual for Part Numbers and quantities.

Cages are required on all outside Ladders where eave height is 20' *[6 096]* or higher. The bottom of Cages must be 7' *[2 134]* to 8' *[2 438]* above the foundation or Platform level.

Rest Platforms are required with Outside Ladder installations when eave height is over 30' *[9 144]*. If **there are Rest Platforms** or if there is a **Manhole Platform** (optional), refer to diagrams in your *Platform Installation Manual*, MCB1352.

CAUTION! ***The Ladder Section with the DANGER Decal shown in Figure 46 is the BOTTOM Section. Attach this section so the Decal reads right-side-up.***

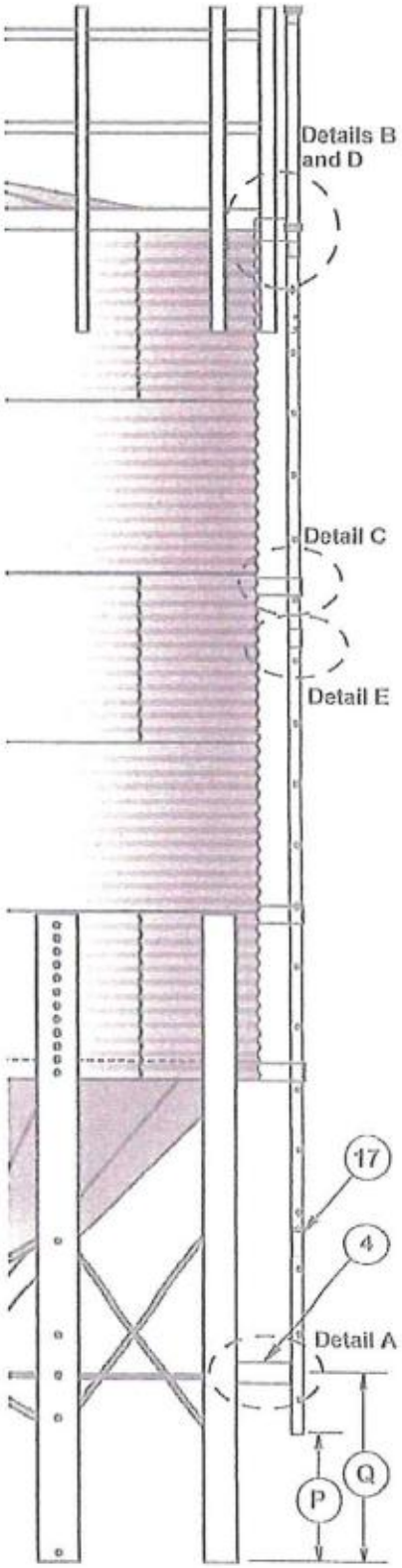
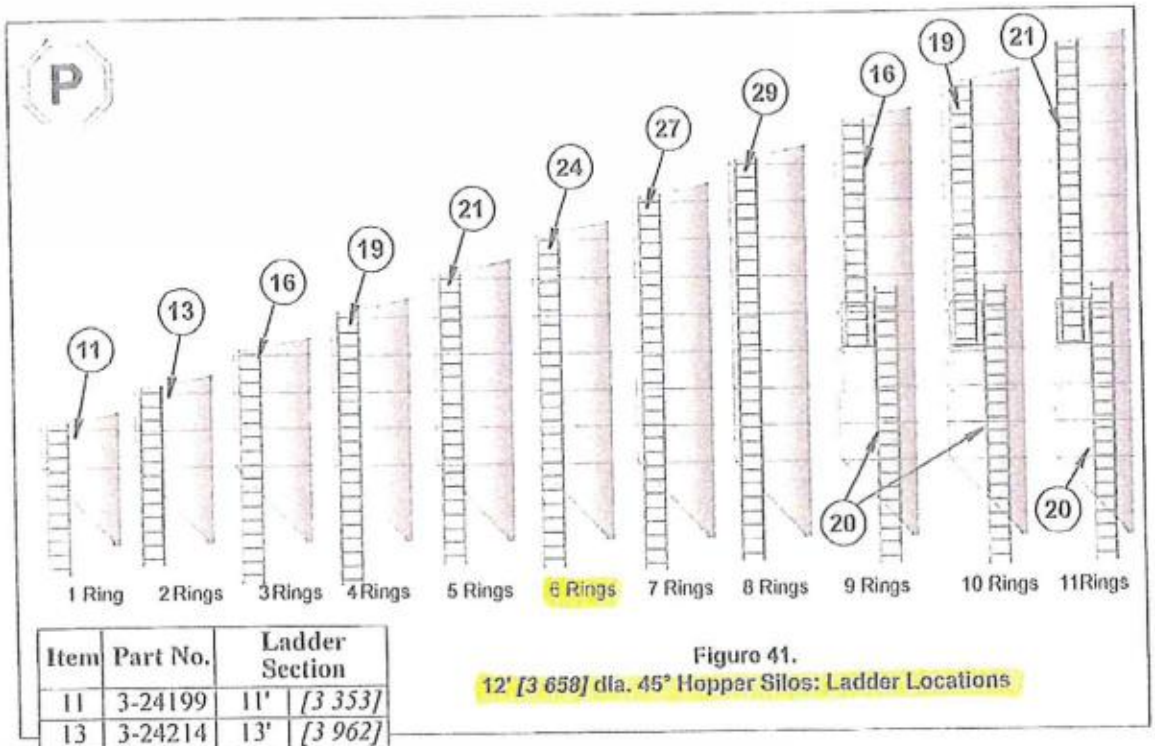


Figure 47.
Side Ladder



Item	Part No.	Ladder Section	
11	3-24199	11'	*[3 353]*
13	3-24214	13'	*[3 962]*
16	3-24201	16'	*[4 877]*
19	3-24213	19'	*[5 791]*
20	3-24222	20'	*[6 096]*
21	3-24207	21'	*[6 401]*
22	3-24211	22'	*[6 706]*
24	3-24212	24'	*[7 315]*
25	3-24218	25'	*[7 620]*
27	3-24220	27'	*[8 230]*
28	3-24223	28'	*[8 534]*
29	3-24214+ 3-24201	13'+16' (see above)	

Figure 41.
12' *[3 658]* dia. 45° Hopper Silos: Ladder Locations

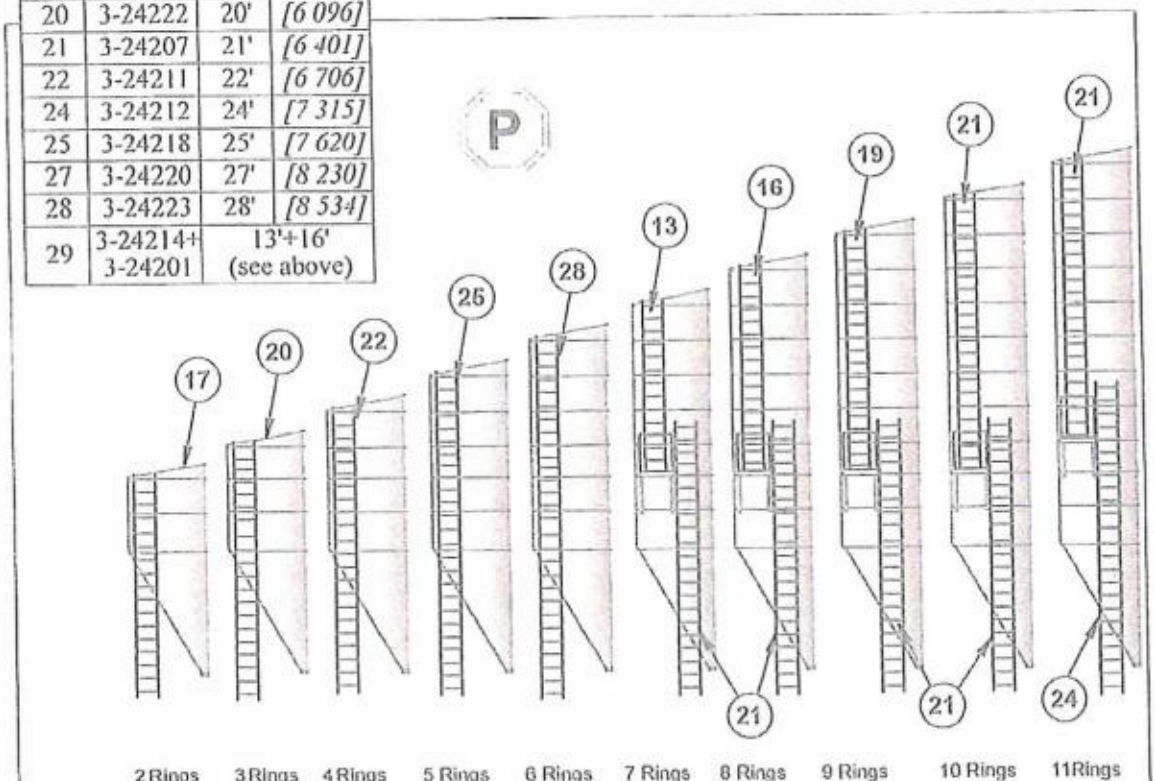


Figure 42.
12' *[3 658]* dia. 60° Hopper Silos: Ladder Locations

Guard Rail Assembly

Assemble Guard Rail Post Mounting Brackets (three per Body Sheet) to top Body Sheet sections (see **Figure 32**), with 5/16 x 1" Plastic Head Gr. 8.2 Bolts, heads **outside**, Flange Nuts and Weatherseal Washers inside.

Assemble Guard Rail Posts to Guard Rail Post Mounting Brackets (see **Figure 32**).

Assemble Guard Rail Tubes and Toe Board Sections to Guard Rail Posts (none at the Ladder), using the same hardware, with the Bolt heads **inside**.

The Toe Board mounting hole is punched **below** center. Make sure the Toe Board is mounted with drainage space—1/4" *[6.3]* clearance—between it and the Roof Panel.

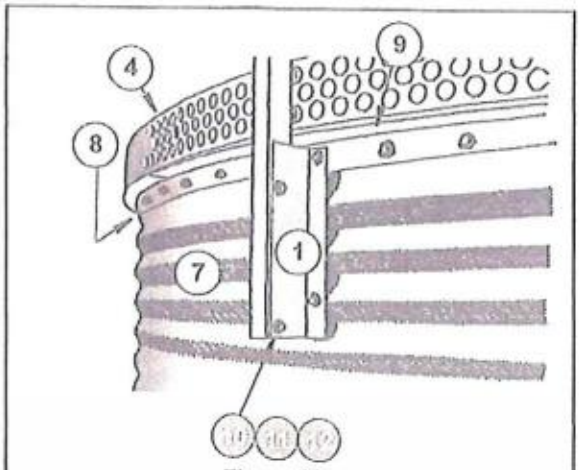
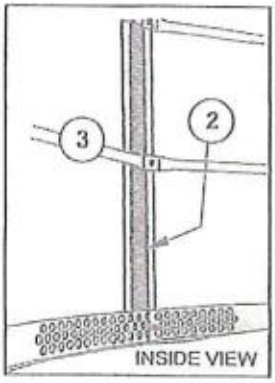


Figure 32.
Post, Post Mounting Bracket and Toe Board



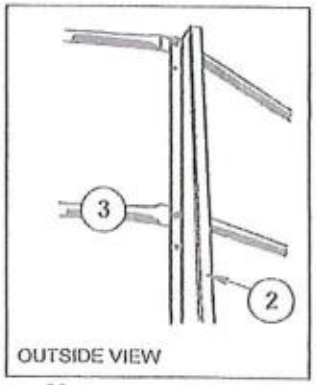
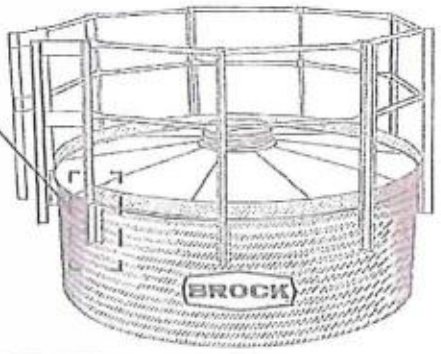
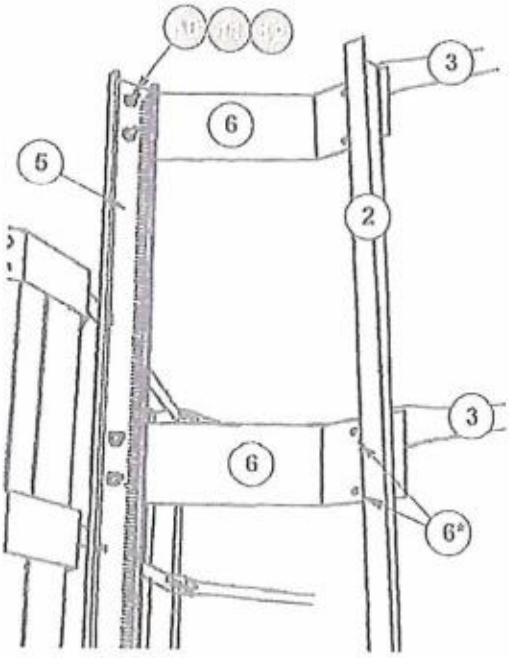


Figure 33.
Post and Tubes





Item	Part No.	Description
1	4-25099	Guard Rail Post Mounting Bracket
2	4-24297	Guard Rail Post
3	4-25073	Guard Rail Tube
4	4-25081	Toe Board Section
5	U-24299	Ladder Extension Rail
6	U-25078	Rail to Post Mounting Bracket
6*		This set of holes is used on the left side of the Ladder.
7	varies	Top Body Sheet Ring
8	varies	Roof Angle Ring
9		Leave 1/4" *[6.3]* clearance between the Toe Board and the Roof.
10	39-20157	5/16-18 x 1" Plastic Head Bolt
11	39-20155	5/16" Weatherseal Washer
12	39-20152	5/16"-18 Flange Nut

Figure 34.
Mounting Ladder to Guard Rail

SQUARE Foundation Footer Concrete Specifications:

Silos Designed for 45 lb/ft³ Material

ENGLISH

Model (Foundation Size)	6' dia. 8' x 8'		9' dia. 11' x 11'		12' Dia. Bin 14' X 14'	
Rings	Thick-ness (inches)	Vol. (cu. yds.)	Thick-ness (inches)	Vol. (cu. yds.)	Thick-ness (inches)	Vol. (cu. yds.)
1	8"	1.6	8"	3.0	9"	5.4
2	8"	1.6	9"	3.4	9"	5.4
3	8"	1.6	9"	3.4	10"	6.0
4	9"	1.8	10"	3.7	11"	6.7
5	10"	2.0	10"	3.7	11"	6.7
6	13"	2.6	11"	4.1	12"	7.3
7	15"	3.0	12"	4.5	12"	7.3
8	18"	3.6	14"	5.2	13"	7.9
9			16"	6.0	14"	8.5
10			18"	6.7	14"	8.5
11			17"	6.3	16"	9.7

Silos Designed for *721 kg/m³* Material

METRIC

Model (Foundation Size)	*1 829* dia. *2 438 x 2 438*		*2 743* dia. *3 353 x 3 353*		12' Dia. Bin *4 267 x 4 267mm*	
Rings	Thickness *[mm]*	Volume *[cu. m.]*	Thickness *[mm]*	Volume *[cu. m.]*	Thickness *[mm]*	Volume *[cu. m.]*
1	203	1.2	203	2.3	229	4.2
2	203	1.2	229	2.6	229	4.2
3	203	1.2	229	2.6	254	4.6
4	229	1.4	254	2.8	279	5.1
5	254	1.5	254	2.8	279	5.1
6	330	2.0	279	3.1	305	5.6
7	381	2.3	305	3.4	305	5.6
8	457	2.8	356	4.0	330	6.0
9			406	4.6	356	6.5
10			457	5.1	356	6.5
11			432	4.8	406	7.4

ROUND Foundation Footer Concrete Specifications:

Silos Designed for 45 lb/ft³ Material

ENGLISH

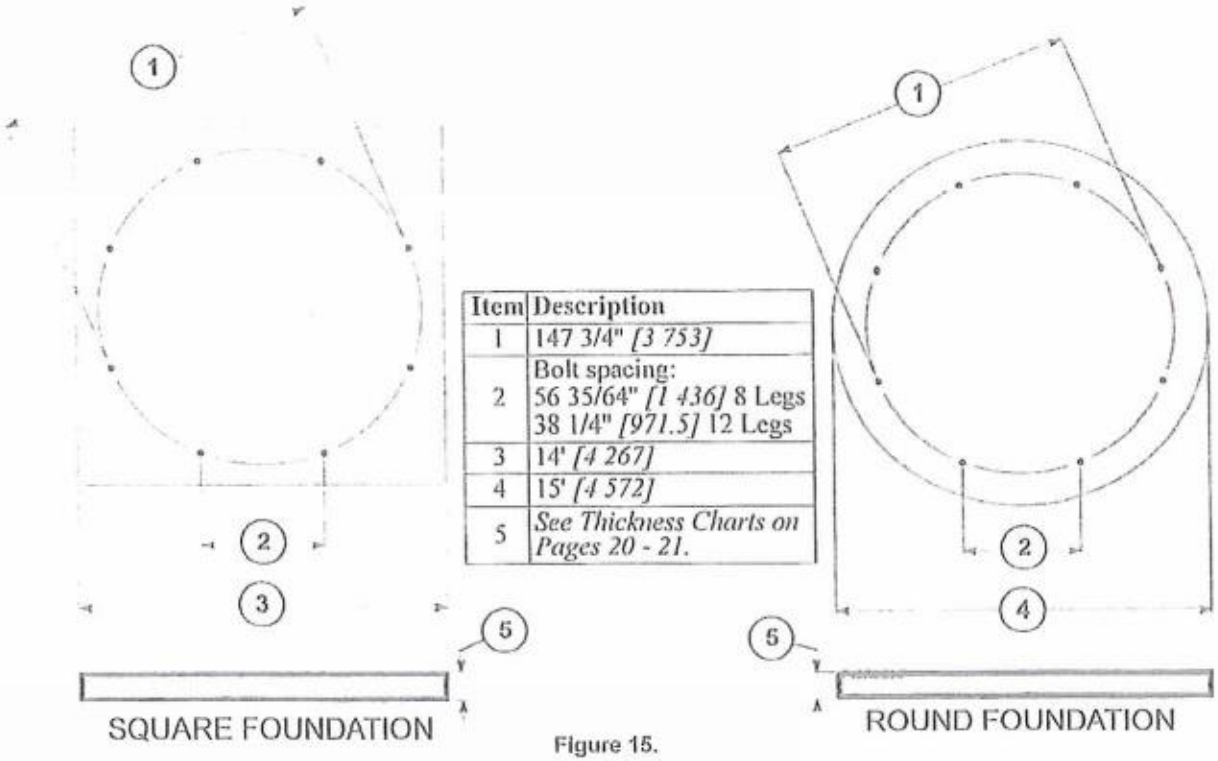
Model (Foundation Size)	6' Dia. (9' Dia.)		9' Dia. (12' Dia.)		12' Dia. Bin (14' X 14')		15' Dia. Bin		18' Dia. Bin (21' Outside Dia. 15' Inside Dia.)		
Rings	Thickness (inches)	Volume (cu. yds.)	Thickness (inches)	Volume (cu. yds.)	Thickness (inches)	Volume (cu. yds.)	Thickness (inches)	Volume (cu. yds.)	Outside Thickness (inches)	Inside Thickness (inches)	Volume (cu. yds.)
1	8"	1.6	8"	2.8	9"	4.9					
2	8"	1.6	9"	3.1	10"	5.5	10"	7.9	10"	4"	7.4
3	8"	1.6	10"	3.5	11"	6.0	10"	7.9	11"	4"	7.9
4	9"	1.8	10"	3.5	12"	6.5	11"	8.6	11"	4"	7.9
5	10"	2.0	11"	3.8	12"	6.5	11"	8.6	12"	4"	8.5
6	12"	2.4	12"	4.2	13"	7.1	12"	9.4	12"	4"	8.5
7	14"	2.7	12"	4.2	14"	7.6	12"	9.4	13"	4"	9.0
8	16"	3.1	13"	4.5	14"	7.6	13"	10.2	14"	4"	9.5
9			15"	5.2	14"	7.6	13"	10.2	14"	4"	9.5
10			17"	5.9	14"	7.6	13"	10.2			
11			17"	5.9	16"	8.7					

Silos Designed for *721 kg/m³* Material

METRIC

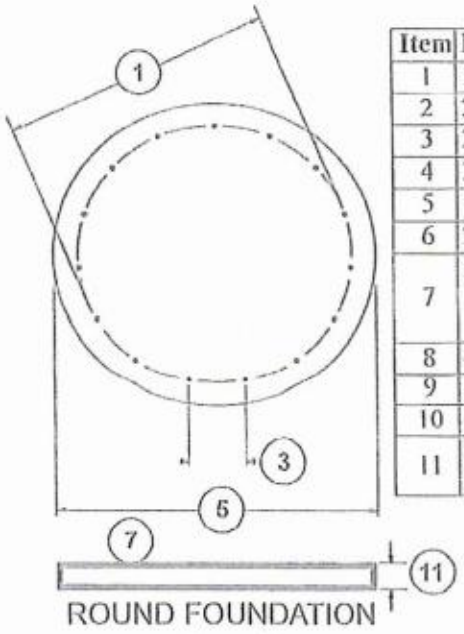
Model (Foundation Size)	*1 829* dia. *2 438 x 2 438*		*2 743* dia. *3 353 x 3 353*		*3 658 Dia. Bin 4 572 Dia.*		*4 572 Dia. Bin 5 486 Dia.*		*5 486 Dia. Bin 6 401 Outside Dia. 4 572 Inside Dia.*		
Rings	Thickness *[mm]*	Volume *[cu. m.]*	Thickness *[mm]*	Volume *[cu. m.]*	Thickness *[mm]*	Volume *[cu. m.]*	Thickness *[mm]*	Volume *[cu. m.]*	Outside Thickness *[mm]*	Inside Thickness *[mm]*	Volume *[cu. m]*
1	203	1.2	203	2.1	229	3.8					
2	203	1.2	229	2.4	254	4.2	254	6.0	254	102	5.7
3	203	1.2	254	2.7	279	4.6	254	6.0	279	102	6.1
4	229	1.4	254	2.7	305	5.0	279	6.6	279	102	6.1
5	254	1.5	279	2.9	305	5.0	279	6.6	305	102	6.5
6	305	1.8	305	3.2	330	5.4	305	7.2	305	102	6.5
7	356	2.1	305	3.2	356	5.8	305	7.2	330	102	6.9
8	406	2.4	330	3.4	356	5.8	330	7.2	356	102	7.3
9			381	4.0	356	5.8	330	7.8	356	102	7.3
10			432	4.5	356	5.8	330	7.8			
11			432	4.5	406	6.7					

12' *[3 658]*, 15' *[4 572]* and 18' *[5 486]* Dia. Foundations: Anchor Bolt and Concrete Specifications



Item	Description
1	147 3/4" *[3 753]*
2	Bolt spacing: 56 35/64" *[1 436]* 8 Legs 38 1/4" *[971.5]* 12 Legs
3	14' *[4 267]*
4	15' *[4 572]*
5	*See Thickness Charts on Pages 20 - 21.*

Figure 15.
12' *[3 658]* Diameter Bin



Item	Description
1	183 9/16" *[4 462]*
2	219 3/8" *[5 572]*
3	38 11/64" *[970]*
4	38 7/64" *[968]*
5	18' *[5 486]*
6	21' *[6 401]*
7	5 Bolt Chord 15' Bin: 13' 3" *[4 039]* 18' Bin: 14' 1/16" *[4 269]*
8	4" *[102]*
9	3' *[914]*
10	15' *[4 572]*
11	*See Thickness Charts on Pages 20 - 21.*

Figure 16.
15' *[4 572]* Diameter Bin

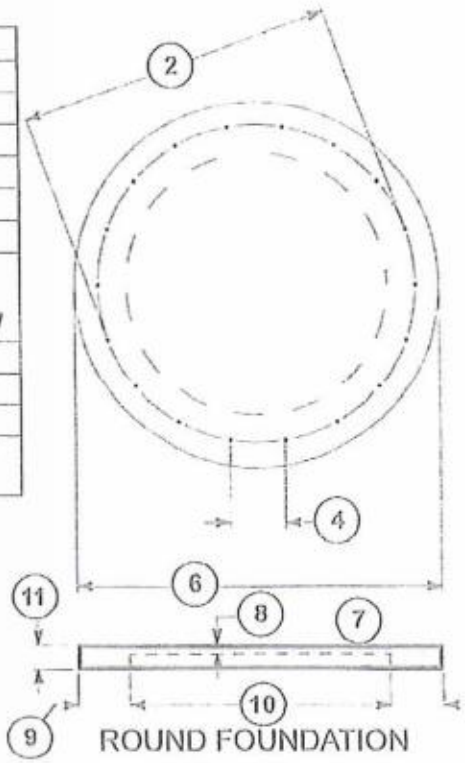


Figure 17.
18' *[5 486]* Diameter Bin

Pneumatic Mounting

This Silo is limited to a maximum of 1/2 oz/in² vacuum and 2 oz/in² of pressure. Pneumatic Mounting Brackets are designed to mount on a vertical Body Sheet seam. The **top** Bracket is mounted below the Roof Angle Ring on a vertical Body Sheet seam. The **bottom** Bracket is mounted as close as possible to the end of the pipe. The **intermediate** Bracket should be as evenly spaced as possible on vertical seams with a maximum spacing of three and one-half rings. See **Figure 35.**

MAXIMUM LENGTH OF (1)				
Silo dia.	**9'**	**12'**	**15'**	**18'**
4" *[102]* 10° Stub	31.50" *[800]*	32.25" *[819]*	47.25" *[1 200]*	49.25" *[1 251]*
6" *[152]* 10° Stub	26.75" *[689]*	25.25" *[641]*	37.75" *[959]*	37.00" *[940]*

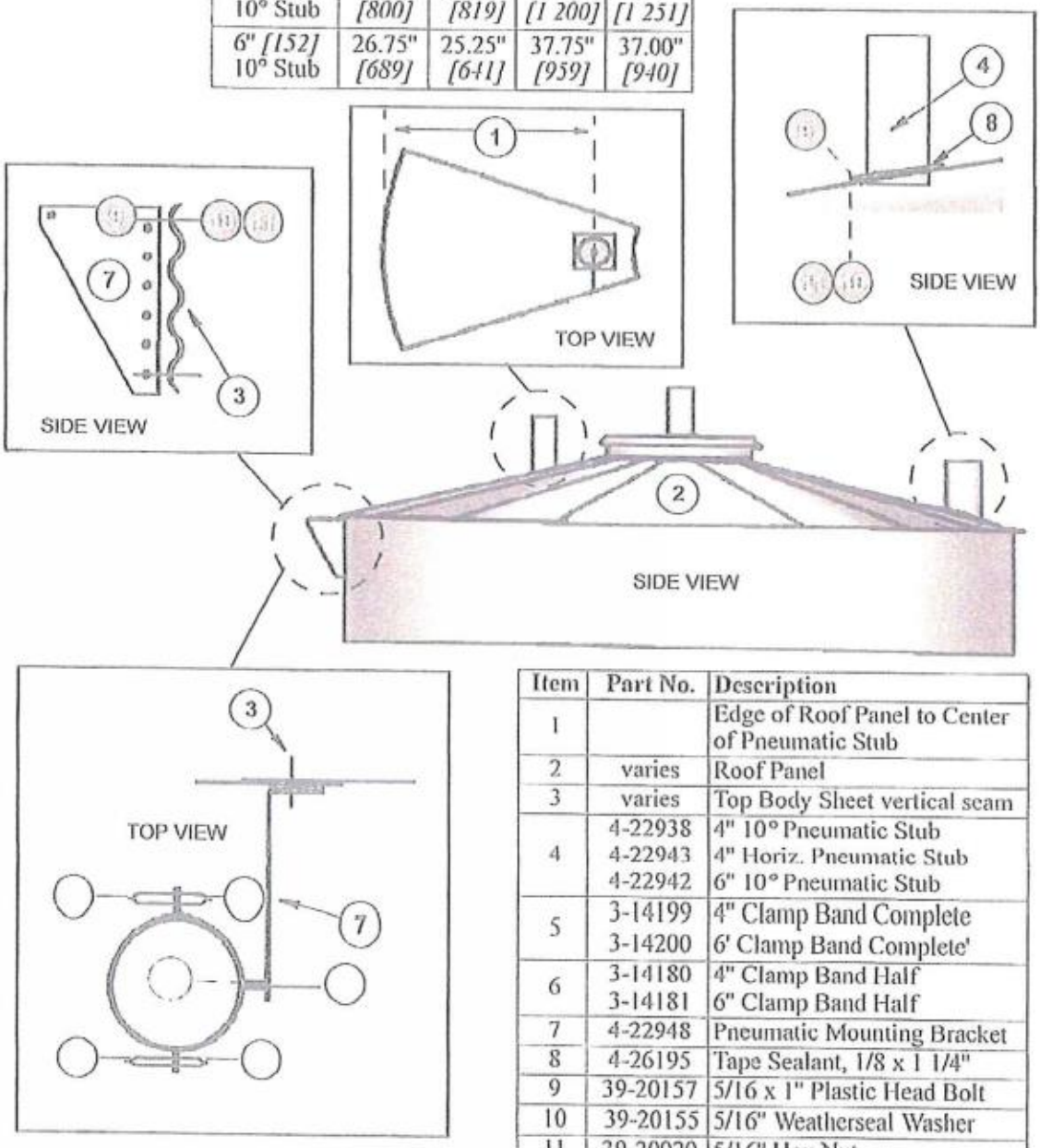
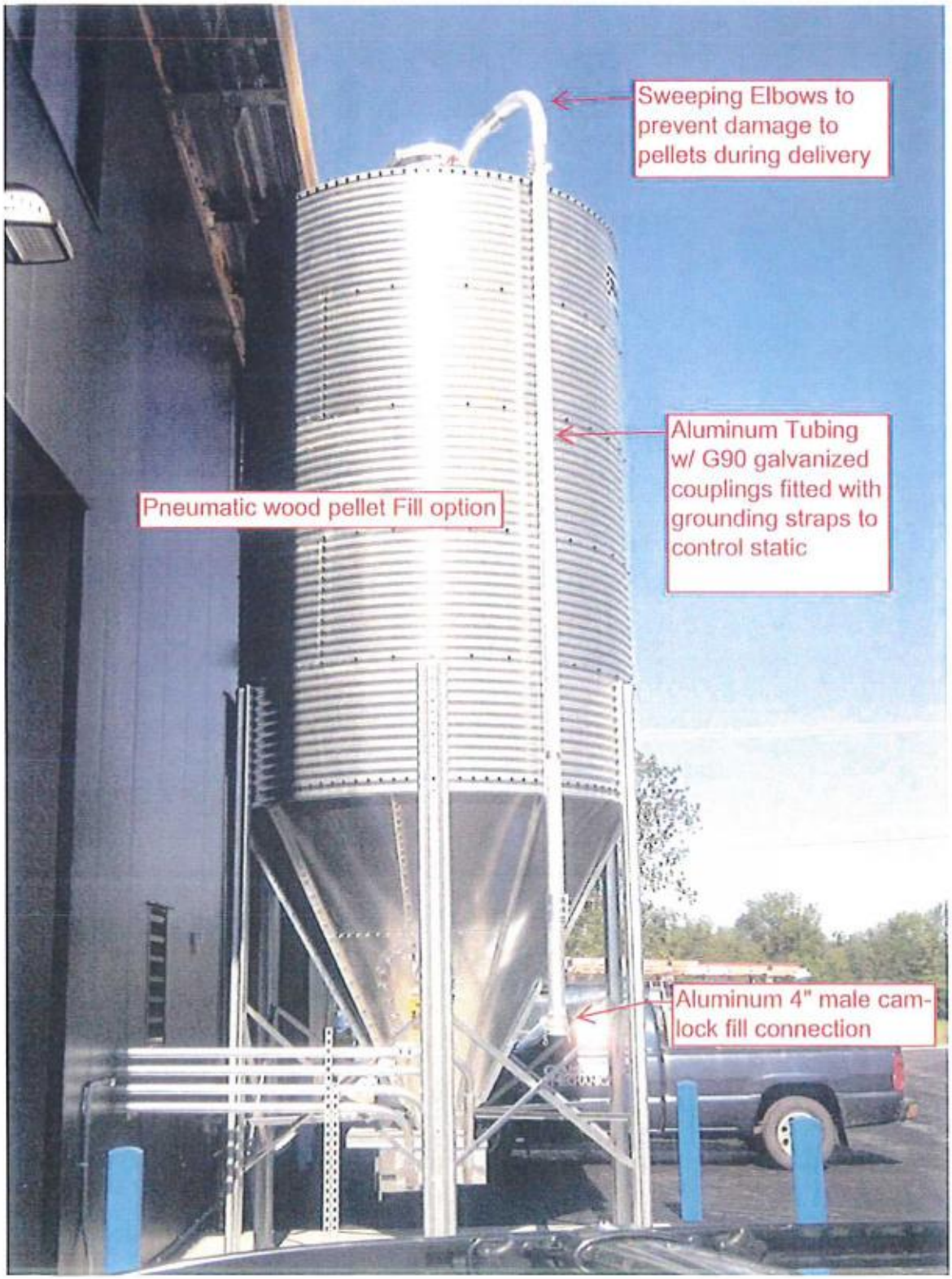
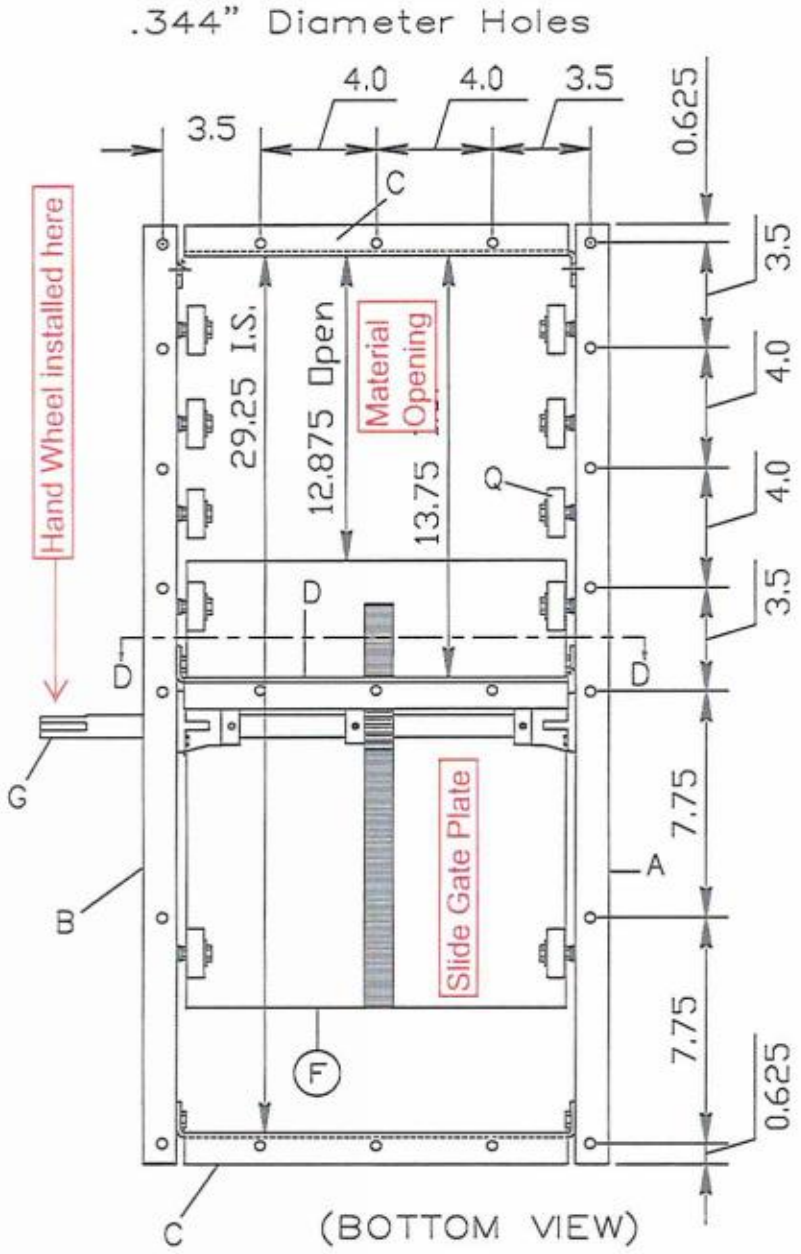


Figure 35.
Pneumatic Mounting

Item	Part No.	Description
1		Edge of Roof Panel to Center of Pneumatic Stub
2	varies	Roof Panel
3	varies	Top Body Sheet vertical seam
4	4-22938 4-22943 4-22942	4" 10° Pneumatic Stub 4" Horiz. Pneumatic Stub 6" 10° Pneumatic Stub
5	3-14199 3-14200	4" Clamp Band Complete 6' Clamp Band Complete'
6	3-14180 3-14181	4" Clamp Band Half 6" Clamp Band Half
7	4-22948	Pneumatic Mounting Bracket
8	4-26195	Tape Sealant, 1/8 x 1 1/4"
9	39-20157	5/16 x 1" Plastic Head Bolt
10	39-20155	5/16" Weatherseal Washer
11	39-20020	5/16" Hex Nut
12	39-20008	5/16 x 1" Hex Head Bolt
13	39-20118	5/16 x 1" Carriage Bolt
	3-23529	Clamp Band Hardware

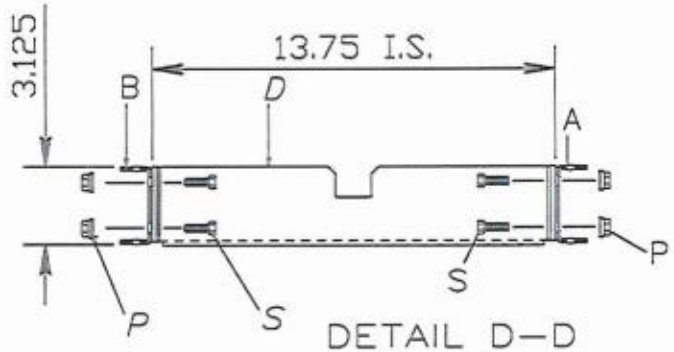

Sweeping Elbows to prevent damage to pellets during delivery
Aluminum Tubing w/ G90 galvanized couplings fitted with grounding straps to control static
Pneumatic wood pellet Fill option
Aluminum 4" male cam-lock fill connection


Brock Industrial Slide Gate
w/ Hand Wheel (3.25 inch thick)



9–29886 RACK AND PINION 12" COMPLETE

KEY	PART #	DESCRIPTION	QTY.
A	9–29877	CHANNEL, LEFT 12" R. & P.	1
B	9–29878	CHANNEL, RIGHT 12" R. & P.	1
C	9–29879	CHANNEL, END 12" R. & P.	2
D	9–29880	ANGLE, 12" R. & P.	1
E	9–29881	PLATE, COVER 12" R. & P.	1
F	9–29884	WELDMENT, SLIDE PLATE 12" R. & P.	1
G	9–29885	SHAFT 12" R. & P.	1
H	3–21019	GEAR, PINION R. & P.	1
I	39–20194	PIN, ROLL .25" X 1.25"	1
J	3–21020	COLLAR, SET R. & P.	2
K	3–21021	BEARING, NYLON .750 BORE	2
L	39–20004	BOLT, HEX HEAD 1/4–20	6
M	39–20019	NUT, JAM 1/4–20	6
P	39–20152	NUT, FLANGE 5/16–18	27
Q	3–24018	ASSEMBLY, ROLLER	10
R	39–20073	BOLT, 5/16–18 X 1" BIN SEAL	5
S	39–20008	BOLT, 5/16–18 X 1" HEX HEAD	12



DETAIL D–D
(Slide Plate "F" Not Shown)

LETTER OF TRANSMITTAL

Atlantica Mechanical
CONTRACTORS INC.

9 Ralston Avenue
Dartmouth, Nova Scotia
B3B 1H5

T: 902.468.2300
F: 902.468.3289

Transmittal ID: Sub 2-3

Date 06-May-14

To:

Name	Ted Loucks
Company	MCW Energy Solutions Ltd
Address	7051 Bayers Road, Unit 102
City	Halifax Prov. NS Post B3L 2C1
Phone	902-876-3182

From:

Name	Raymond Gallant
Date	March 31st, 2014
Project #	A-14-0778
Project	HRSB Millwood Biomass

Items Sent:

☑ Attached ☑ Shop Drawings ☐ Plans ☐ Samples ☐ Disk

Delivery Via:

☐ Hand ☐ Pickup ☐ Courier ☑ E-Mail

Copies	Date	Description
1	01-Apr-14	**Revised Drawing based on sub 2-2**

Items Transmitted:

☑ For Approval ☐ Approved As Submitted
☐ For Your Use ☐ Approved As Noted
☐ As Requested ☐ Returned For Corrections

Required Action:

☐ Resubmit For Approval
☐ Submit Copies For Distribution
☐ Return Corrected Prints ☐ Return After Use

Comments:

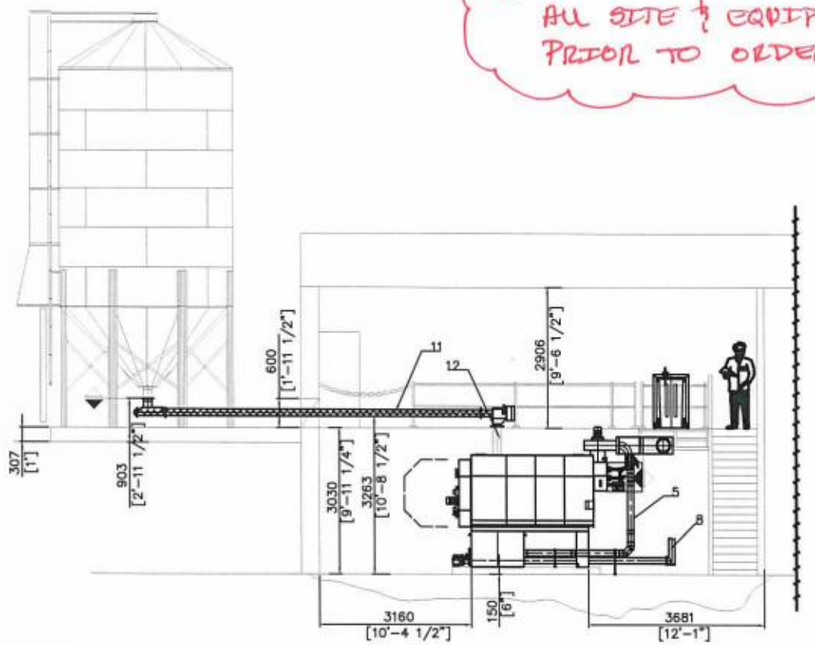
3rd revision includes the layout of the room and orientation of the doors on the boilers, the Silo will be issued as a separate submittal.

Site Address: 141 Millwood Drive
Lower Sackville, NS

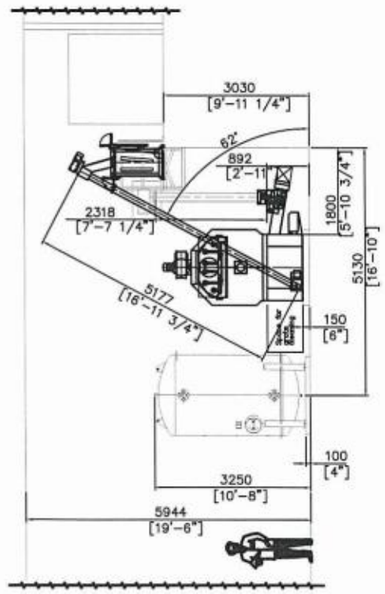
T:
F:
C:

provided by the customer
supply limit
provided by Viessmann

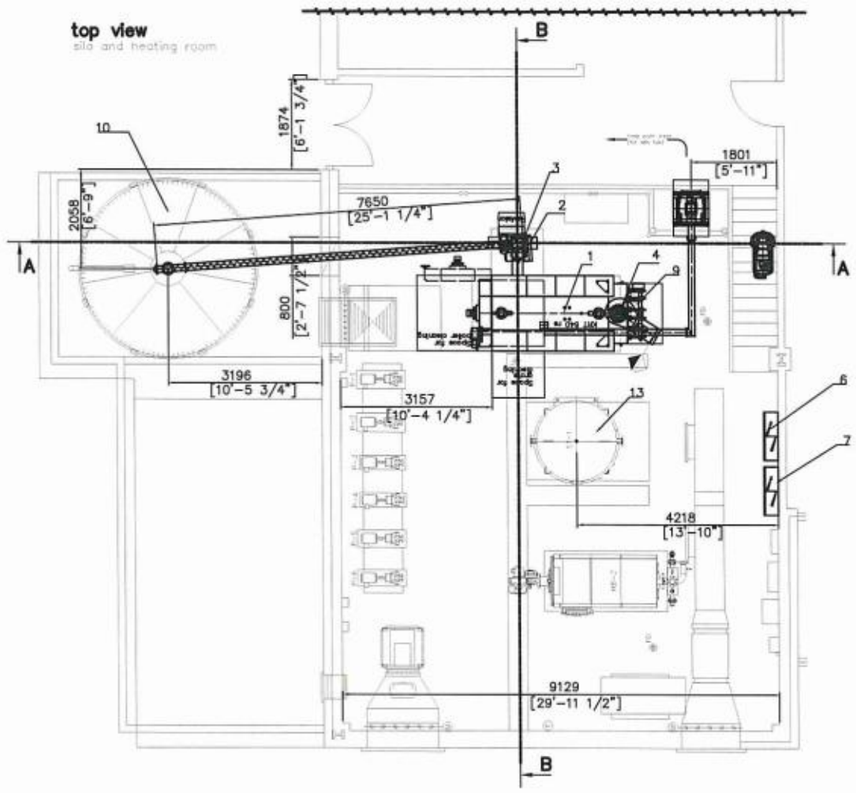
section drawing A–A
section through silo and heating room



section drawing B–B
section through heating room



top view
silo and heating room



* THIS CONTRACTOR IS TO VERIFY ALL SITE & EQUIPMENT DIMENSIONS PRIOR TO ORDERING EQUIPMENT

Additional instructions on how to execute the silo floor:
- The silo floor is not included in KÖB Holzheizsysteme GmbH scope of delivery.
- The floor should be designed such that the forces applied to it through the weight of the material to be burned (approx. 650 kg/m³) are not conducted via the pellet extraction auger but rather via the silo floor.
- The doors to the silo must be executed so as to be pressure- and dust-tight.

The following are all required for the heating system's delivery and installation to go off smoothly (provided by the customer):
- An opening to put in the boiler (as per project drawing)
  An opening in the wall (door): 1800x2500 mm
  An opening in the wall (door) for disassembled boiler: 1400x1700 mm
- Excavation or penetration of masonry (as per project drawing)
- A suitable chimney and connection
- A paved and clear access road for heavy lorries
- The removal of any heating boiler that may have been present
- The heating room and silo have to be accessible, dry and tidy
- Mains connection 208/3/60, min 40A
- Suitable openings for supply air and exhaust air, in accordance with local regulations

Performance to be provided by the customer:
- All penetrations has to be prepared by the customer.
- The penetration through the masonry has to be sealed by the customer after assembling KÖB, so as to be dust-tight and fire-resistant.
- The exhaust pipe and insulation has to be constructed by the customer (see Scope of Delivery)
- The raised floor for the silo has to be constructed by the customer
- Refill lines for pellets have to be constructed by the customer
- enough ventilation in the Silo and Heatingroom has to be constructed by the customer

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON SITE
MCW Maricor
MAY 07 2014
☒ REVIEWED ☐ REVISE AND RESUBMIT
☐ REVIEWED AS MODIFIED ☐ NOT REVIEWED
SIGNED

1. Heating boiler KRT540
2. Pellet auger
3. Rotary valve
4. Exhaust fan and exhaust pipe
5. Flue gas re-circulation system
6. Biomass boiler control panel
7. Main control panel
8. Pellet storage container with 240-l container
9. Suction system with compressor
10. Pellet storage container (provided by customer)
11. Pipe conveyor auger Ø120 mm (L = 7670 mm)
12. Downpipe
13. Thermal storage tank 5700L (1500 USG)

!!! IMPORTANT !!!
This drawing contains no information on building statics. The static examination of the building in this drawing must be carried out by the customer. The loads that develop as a result of operating the facility can be taken from the enclosed spec sheets (KÖB Chart of Dimensions 8300).
KÖB Holzheizsysteme GmbH shall not assume the liability for any damage that might arise due to incorrect examination of the building's statics or the absence of such an examination altogether.

Revision	Date	Name	Modification	Scale
Rev1	04/04/14	ZmB	Corrections as per MCW Maricor revisions from April 1st, 2014	–

KÖB
VIESMANN Group

Millwood High School

	Date	Name
Drawn	31/03/14	ZmB
Checked		

Drawing number
Final drawing

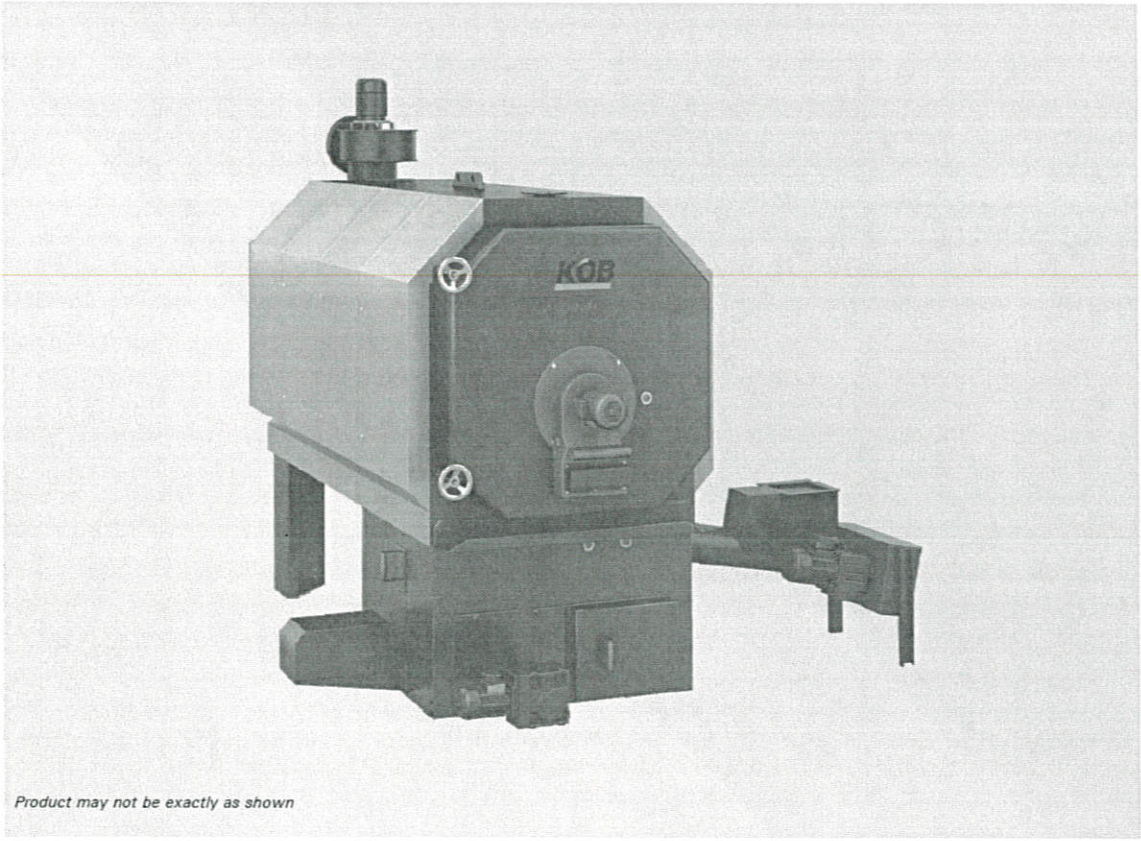
Sheet
01

Submittal package for

Millwood High School

Pyrot

Wood-fired Boiler
KRT 540



Product may not be exactly as shown

Pyrot with its patented swirling combustion chamber design, features the industry's most advanced combustion technology. A feed auger continuously moves the wood fuel onto a moving grate where gasification takes place. The combustible gases blend with precisely controlled secondary air, resulting in a complete combustion with ultra low emissions.

Max. output: 540 kW (1843 MBH)
Min. output: 140 kW (478 MBH)

THE CONTRACTOR SHALL VERIFY
ALL DIMENSIONS ON SITE
MCW-Maricor

MAR 3 1 2014

☑ REVIEWED ☐ REVISE AND RESUBMIT
☐ REVIEWED AS MODIFIED ☐ NOT REVIEWED
SIGNED

*Ensure proper orientation is maintained as per contract drawings. Ensure all accessories are coordinated accordingly.

Description

The PYROT Rotating Combustion System (patent no: EP 0 905 442 B1) was developed for automatic combustion of all dry to moist wood fuels (remnant wood, pellets and forest wood chips to max. W35). The PYROT Rotating Combustion System is characterized by high efficiencies and perfect combustion at all load levels. The PYROT Boiler Plant has been built to ASME Sec. IV and has CRN for Canada. It is tested and approved to the applicable CSA / UL safety standards.

Function:

- The in-feed auger conveys the wood fuel diagonally from below into the fire box. The holding devices for the back-burn sensor and the thermal extinguishing valve are situated on the in-feed auger. Above the in-feed auger, there is a metering container with a light barrier to ascertain the level of the fuel insulating layer required.
- The wood fuel is ignited automatically by an ignition blower, at the time of the boiler start. The gasification of the fuel is carried out on a feed grate moved by a worm-geared motor. The fire box is heavily insulated and lined with fire clay refractory elements.
- The combustion gases rising from the fire box are swept up by the rotating secondary airflow brought to bear from the rotation blower and burned out completely in the round combustion chamber. The thermal energy from the combustion gases is transmitted to the boiler water in horizontal heat exchanger tubes. The combustion chamber is heavily insulated and provided with excellent access through the boiler door in the front.
- A flue gas re-circulation system reduces the temperature in the fire box while maintaining the highest possible degree of efficiency. This increases the service life of the un-cooled refractory elements in the gasification zone. With the basic setting, the ratio of re-circulated gas to fresh air is precisely adjusted according to the amount of wood fuel that is burned. A mechanical adjustable damper provides a constant ratio of the quantity of re-circulated gas to fresh air over the entire output range.
- The flue gas blower is specially designed for wood heating operation and is very quiet. The motor has a solid, heat resistant design with a heat dissipation hub and is spring supported. The blower casing has a round intake port and a round blowout nozzle. Installation is possible on the top, side or rear of the flue gas collector within 360° rotation.

Supplied with:

- Boiler with rotating combustion chamber and tube heat exchanger including supply and return temperature sensors
- Fire box with moving grate and light barriers for ember monitoring
- Automatic ignition blower
- In-feed auger including insulating layer, safety end switch for maintenance lid, back-burn temperature sensor, extinguisher valve with strainer, extinguisher water container with mounting bracket
- Flue gas re-circulation system
- Flue gas blower including flue gas temperature sensor and oxygen sensor
- Draft damper for installation in the flue gas pipe
- Boiler cleaning tools for the fire box, combustion chamber and tube heat exchanger
- Installation fittings including pressure relief valve, drain valve, low water cut off, safety temperature limiter, temperature and pressure gauges
- Automatic de-ashing system in bin, 63 USG (240 L)
- Pneumatic cleaning system
- Insulation for flue gas re-circulation line
- Thermal safety flush valve
- Slide valve
- Boiler pump and boiler mixing valve
- Ecotronic control system

Boiler is delivered disassembled in two pieces, without casing and insulation, rotation blower uninstalled, firing block uninstalled, fireclay uninstalled, exhaust gas manifold mounted, boiler doors uninstalled, without exhaust gas blower mounted. On-site boiler assembly and bricking is the Mechanical contractor responsibility.

Codes

CSA B366.1-M91
Solid Fuel Fired Central Heating Appliances

CSA C.22.2#3-M88 (R2004)
Electrical Features of Fuel Burning Equipment

UL2523
Solid Fuel-Fired Hydronic Heating Appliances, Water Heaters and Boilers

CSA B365-01
Installation Code for Solid Fuel Burning Appliances and Equipment

Maximum allowable working pressure (water) 60 psi
Maximum water temperature 250° F (120° C) (closed loop)
Maximum boiler temperature 210° F (99° C) (open loop)
This boiler does not require a flow switch.
CRN number M7954.5C

Technical Data

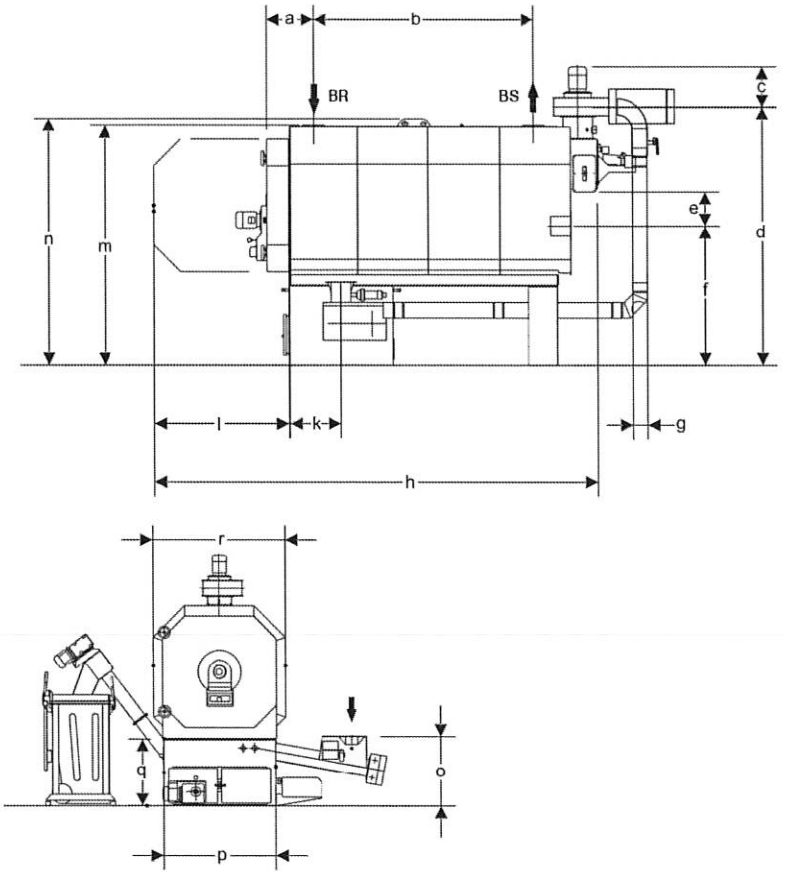
Boiler model KRT-		**540**
Maximum output	MBH (kW)	1843 (540)
Minimum output[1]	MBH (kW)	478 (140)
Efficiency		85%
Fuel Moisture content[2]	%	W 15
Flue gas figures		
Connection flue gas pipe Ø A	in. mm	137/8 (350)
Mass flow rate; W5; O_2 6%	lb/s (g/s)	0.64 (289.44)
Volume flow; W5; O_2 6%; 302°F (150°C)	ft^3/s (m^3/s)	12.4 (0.35)
Mass flow rate; W35; O2 8%;	lb/s (g/s)	0.85 (385.1)
Volume flow;W35; O_2 8%; 302°F (150°C)	ft^3/s (m^3/s)	16.2 (0.46)
Average flue gas temperature at full load[4]	°F (°C)	320 (160)
Average flue gas temperature at partial load[4]	°F (°C)	266 (130)
Chimney draft required	Pa	±0
Electrical connections		
Electrical connections, total	kW	3.63
Ignition device	kW	1.6
Flue gas blower	kW	1.1
Articulated head blower	kW	0.12
In-feed auger	kW	0.75
Grate drive unit	kW	0.06
Electric power consumption at full load	kW	1.753
Electric power consumption at partial load	kW	0.46

Heating		
Water side resistance (diff. 27° F / 15 K)	"wc (mbar)	22 (56)
Boiler water volume	USG (L)	399 (1510)
Heating surface	ft² (m²)	424.1 (39.4)
Volume on heating gas side	USG (L)	426 (1613)
Volume of ash container for grate ash	USG (L)	24 (91)
Volume of ash container for flue gas de-duster	USG (L)	24 (90)
Test pressure[5]	psi (bar)	90 (6)
Maximum allowable working pressure (water)[5]	psi (bar)	60 (4)
Maximum water temperature	°F (°C)	250 (120)
Minimum return temperature	°F (°C)	149 (65)
Weight		
Weight of fire box	lb (kg)	2061 (937)
Weight of pressure vessel (60psi)[6]	lb (kg)	11453 (5195)
Weight of displacement rods	lb (kg)	636 (289)
Weight of flue gas blower	lb (kg)	136 (62)
Weight of in-feed auger	lb (kg)	328 (149)
Total weight without water (60psi)[7]	lb (kg)	14621 (6632)
Total weight with water (60psi)[7]	lb (kg)	17950 (8142)

[1] *Minimum load:*	Operation with modulated control (Infinitely variable power control) Low load with ON Qmin / OFF (Stop-and-go mode)
[2] *Moist fuels:*	>W35 further limitations regarding output, degree of efficiency and control behaviour
[3] *Specification:*	See section on Wood Fuel Requirements
[4] *Flue gas temperature:*	An increase is possible by removing the displacement rods [Full load 86° F (30° C); Partial load 50° F (10° C)]
[5] *Pressure:*	Per ASME Sec. IV
[6] *Weight:*	Includes door and refractory concrete lining
[7] *Overall weight:*	Includes displacement rods
Other influences:	Fuel, water content, ash content, pneumatic cleaning system yes/no; track time (number of operating hours without cleaning) Specifications for the start of the track time [toward the end of the track time there is an increase in the flue gas temperature by approx. 68° F (20° C)]

Boiler Dimensions

BR Boiler Return
BS Boiler Supply

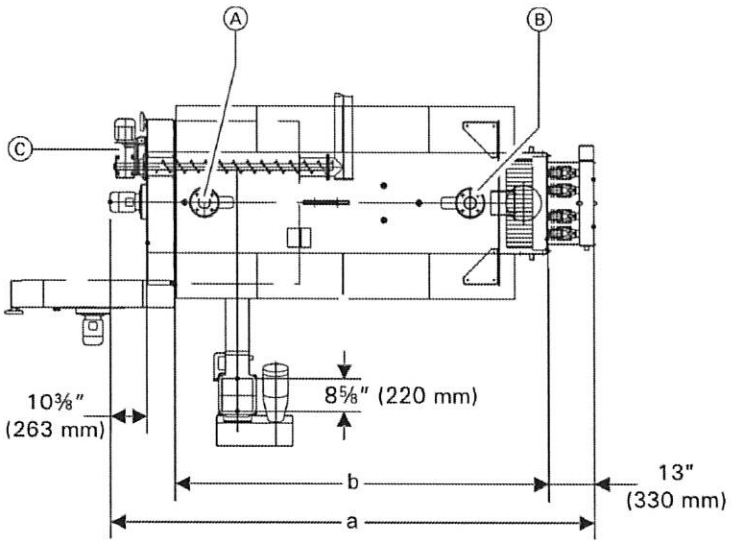


Dimensions

Boiler Model KRT-		540
a	in. (mm)	$18^{3}/_{8}$ (466)
b	in. (mm)	$79^{15}/_{16}$ (2030)
c	in. (mm)	$14^{3}/_{4}$ (375)
d	in. (mm)	$99^{1}/_{2}$ (2527)
e	in. (mm)	$12^{9}/_{16}$ (319)
f	in. (mm)	$50^{3}/_{8}$ (1279)
g	in. (mm)	5 (DN 125)
h	in. (mm)	$166^{5}/_{8}$ (4232)
k	in. (mm)	$24^{9}/_{16}$ (548)
l	in. (mm)	$54^{3}/_{4}$(1390)
m	in. (mm)	$91^{13}/_{16}$ (2332)
n	in. (mm)	$98^{1}/_{8}$ (2492)*1
o	in. (mm)	29 3/16 (742)
p	in. (mm)	$54^{3}/_{4}$ (1390)
q	in. (mm)	$29^{1}/_{2}$ (750)
r	in. (mm)	$61^{7}/_{8}$ (1570)

1 For Pyrot 540 - Suspension gear is detachable.

Boiler Dimensions *(continued)*



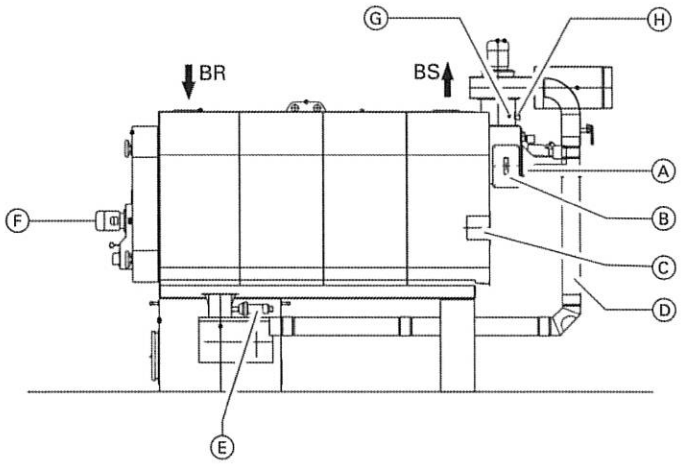
Legend

Ⓐ Boiler Return
Ⓑ Boiler Supply
Ⓒ Automatic de-ashing system

Dimensions

Boiler Model KRT-		540
a	in. (mm)	$145^{1}/_{16}$ (3685)
b	in. (mm)	$111^{7}/_{16}$ (2842)

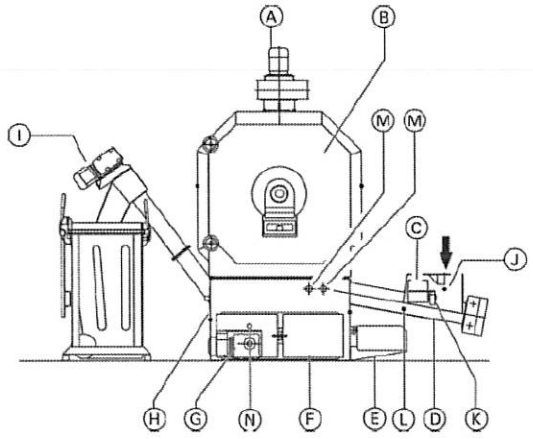
Boiler Components



Legend

- Ⓐ Pneumatic cleaning system
- Ⓑ Cleaning cover, flue gas collector, alternate port for the flue gas blower
- Ⓒ Cover with sight glass
- Ⓓ Recirculation gas line, line routing variable
- Ⓔ Automatic ignition unit
- Ⓔ Automatic ignition
- Ⓕ Articulated head blower
- Ⓖ Flue gas temperature sensor
- Ⓗ Oxygen sensor

BS Boiler Supply
BR Boiler Return



Legend

- Ⓐ Flue gas blower
- Ⓑ Boiler door with rotary blower
- Ⓒ Extinguishing water connection ¾ in.
- Ⓓ In-feed auger
- Ⓔ Grate motor
- Ⓕ Ash doors of the grate ash container (2 units)
- Ⓖ Motor for automatic de-ashing system
- Ⓗ Fire box
- Ⓘ Incline auger for automatic de-ashing system
- Ⓙ Light barrier for in-feed auger
- Ⓚ Limit switch for maintenance cover
- Ⓛ Temperature sensor for in-feed auger
- Ⓜ Light barrier for ember monitoring (2 locations)
- Ⓝ Light barrier for automatic de-ashing system

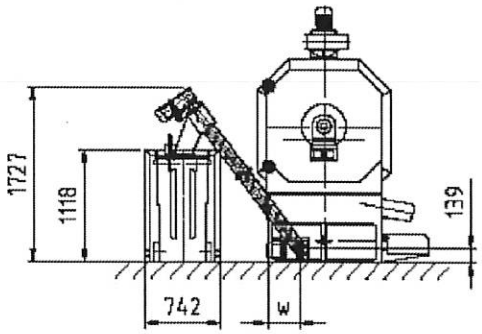
Automatic De-ashing System

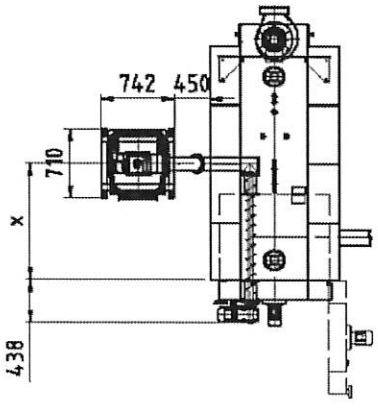
Description
De-ashing in Ash Bin, 63.5 USG (240 L)

Complete auger de-ashing from the ash chamber for the fire block into an externally situated movable galvanized ash bin. A light barrier control system keeps the level of the ashes constantly over the auger. As a result, the ash in the ash pan under the incineration system can burn out, and in normal operation only cool ash that has burned out is conveyed into the container.

Supplied with:
- Boiler ash chamber with ash level control system and de-ashing auger made of high-temperature steel drive via worm-geared motor
- Connection station with moveable ash bin
- Triggering system for the drives
- Infrared light barrier for level monitoring of ash in the firebox

Standard





Data and dimensions for de-ashing into ashbin, 64 USG (240 L)

Boiler Model	**KRT-**	**540**
Dimensions		
w	in (mm)	$145^{1}/_{16}$ (3685)
x	in (mm)	$111^{7}/_{16}$ (2842)

Pneumatic Cleaning System

Pneumatic cleaning system (for Pyrot KRT-540)

The complete heat exchanger is cleaned off by periodic blasts of compressed air while the system is in regular operation. During the cleaning process the individual sections are blasted clean one after another. The ash on the heat exchanger tubes is detached by very short but strong blasts of air. The particles detached are conducted by the flow of gas to the de-duster, where most are filtered out and collected. The system is built into the rear side of the boiler. The compressor should preferably be installed in a cool spot in the heating room.

Function of the control system:
The number of cleaning cycles within one time unit (e.g. per hour) is adapted to the load of the boiler. One individual, complete cleaning cycle consists of a series of pressure impulses over all the sections of the heat exchanger.

Supplied with:
- Nozzle element integrated in the exhaust gas collector, incl. connection piece with heat dissipation plates
- Compressed air distributor with container and valve; with high-temperature hoses connected to the nozzle element
- Compressor with the following specs: Delivery capacity of 11.3 CFM (0.32 m3/min); tank: 60 USG (227 L); pressure: max. 135 psi; motor: 3 HP, 1200 RPM, two 120V lines, includes pressure controller, pressure switch and operating time limiter; plug and play; noise level of normal design: 75 dBA
- Compressed air hose to max. of 13 ft (4.0 m) in length and ¾" in diameter. All compressed air tubes to be copper type L
- Valves permanently wired on terminal strip
- Software component in the control system
- Wiring schematics

To be carried out by the customer:
- Provide a power supply, 120V /1/ 16A

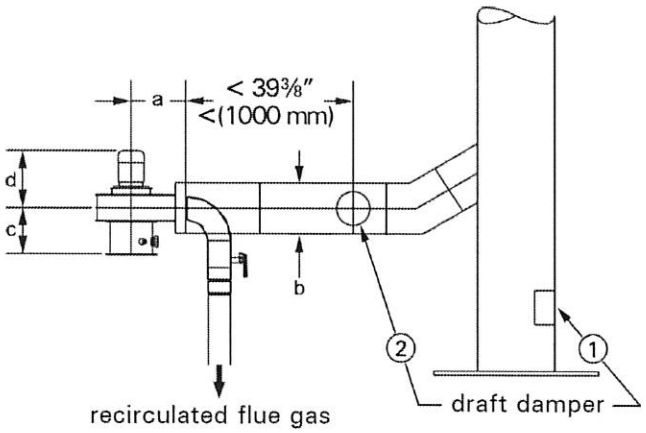
Technical data:

Boiler Model KRT-	**540**
Number of zones/valves	5
Size of valves	G 1 "
Max. air consumption, full load USG/h (L/h)	1189 (4500)

A customer supplied air compressor has to deliver at least the quantity and quality of air specified and have an adjustable pressure controller as well as a safeguard against hose rupture (e.g. operating time limiter).

Chimney Connection

It is recommended to install a draft damper in the chimney **1**. The draft damper is field supplied.
Optional, the Viessmann supplied draft damper can be installed in the flue gas pipe of the biomass boiler **2**. The draft damper should be installed in the flue gas pipe (not included) as close as possible to the chimney not closer than 39e In. (1000 mm) to the outlet of the flue gas blower. The final position has to be arranged with the chimney supplier. The draft damper must be installed in the heating room together with the biomass boiler.



Dimensions

Boiler Model KRT-		540
a	in. (mm)	17 3/8 (442)
b	in. (mm)	13 7/8 (350)
c	in. (mm)	14 (355)
d	in. (mm)	14 3/4 (375)
e	in. (mm)	13 3/4 (350)
f	in. (mm)	6 7/8 (175)

Flue gas recirculation system

Exhaust gas is mixed into the combustion air. This increases the proportion of gases not involved in the incineration (nitrogen N_2 and carbon dioxide CO_2), with the effect of lowering the fire box temperature. This in turn enables, on the one hand, maximum efficiencies with low amount of excess air with dry fuels and, on the other hand, the incineration of fuels that tend to form slag.

Supplied with:
- high temperature-resistant insulated venting recirculation line between flue gas blower and firing block including mechanical adjustable damper for regulating air/recirculated gas mixture
- software component in control system

Auto Ignition

Ignition blower safely ignites wood fuels with a moisture content of up to 40% m.c. Equipped with electronic protection of electric heating element.

Thermal run off safety valve

Boiler Model KRT-	Thermal run-off safety valve TS-2430 (Quantity)	Water throughput required at 36 psi (2.5 bar)		Supply line WSL	Drain pipe SDP[2]
		L/h	GPM		
540	1	2226	10	R ¾ in.	R 1 in.

Pressure relief valve

Boiler Model KRT-	Pressure relief valve Conbraco [1]	Drain pipe PDP [2]
	60 psi	60 psi
540	1 ¼ in.	1 ½ in.

[1] Threaded connection for supply line
[2] Length of the drain pipe up to 13 ft. (4.0 m)

Boiler Pump

Boiler Model KRT-	Pump	Frequency	Voltage and phase
540	TP 100-160/2	60 Hz	3 x 208-230 V

Mixing valve

Boiler Model KRT-	Nominal pipe size	Valve
540	4 in.	3-way mixing valve

Fire Protection

Power failure provision
The customer must ensure that there is a supply of water independent of the electrical supply. This design ensures that in case of a power failure, the boiler will be reliably cooled by the thermal run-off safety valve.

Protection against back-burn for the boiler plant
The following safeguards are part of the scope of supply for the PYROT Swirling Combustion System:

- Preventing overfilling of the fire box
A level monitor must be installed to prevent overfilling of the firebox. The PYROT Swirling Combustion System has a light barrier to monitor the embers.

- Preventing back-burn
With a temperature sensor directly on the in-feed auger, any danger of back-burn initiation will be detected and quickly counteracted at an early stage by increasing the fuel conveyance speed into the fire box.

- Back flash safeguard
The PYROT Swirling Combustion System is operated with continuous negative pressure and is equipped with a back flash prevention device. This device prevents backflashes caused by flying embers or combustible gases that may ignite the fuel system.

- Automatic in-feed auger extinguishing system
The supplied fire extinguishing system is necessary on the in-feed auger. This system should reliably prevent back- burn in case of a malfunction (such as a power failure). For safety reasons and to prevent damage by flooding, connecting the extinguishing system directly to the water network is not advisable. This extinguishing system must be equipped with a 6.6 USG (25 L) extinguishing water tank with a float-type switch and an adjustable Danfoss extinguisher valve. The tank for the extinguishing system must be equipped with a level monitoring system. If there is a shortage of water, the PYROT Swirling Combustion System will switch off automatically. In case of excess temperature, the in-feed auger will be flooded reliably but in a limited fashion.

Back-burn safeguard for the fuel supply system
The fire extinguishing system for the conveyor auger and the down pipe depends on specific requirements (location, size of the fuel storage site, material, pressure conditions and regulations), these being accessories to the scope of delivery ordered from Viessmann according to their descriptions.

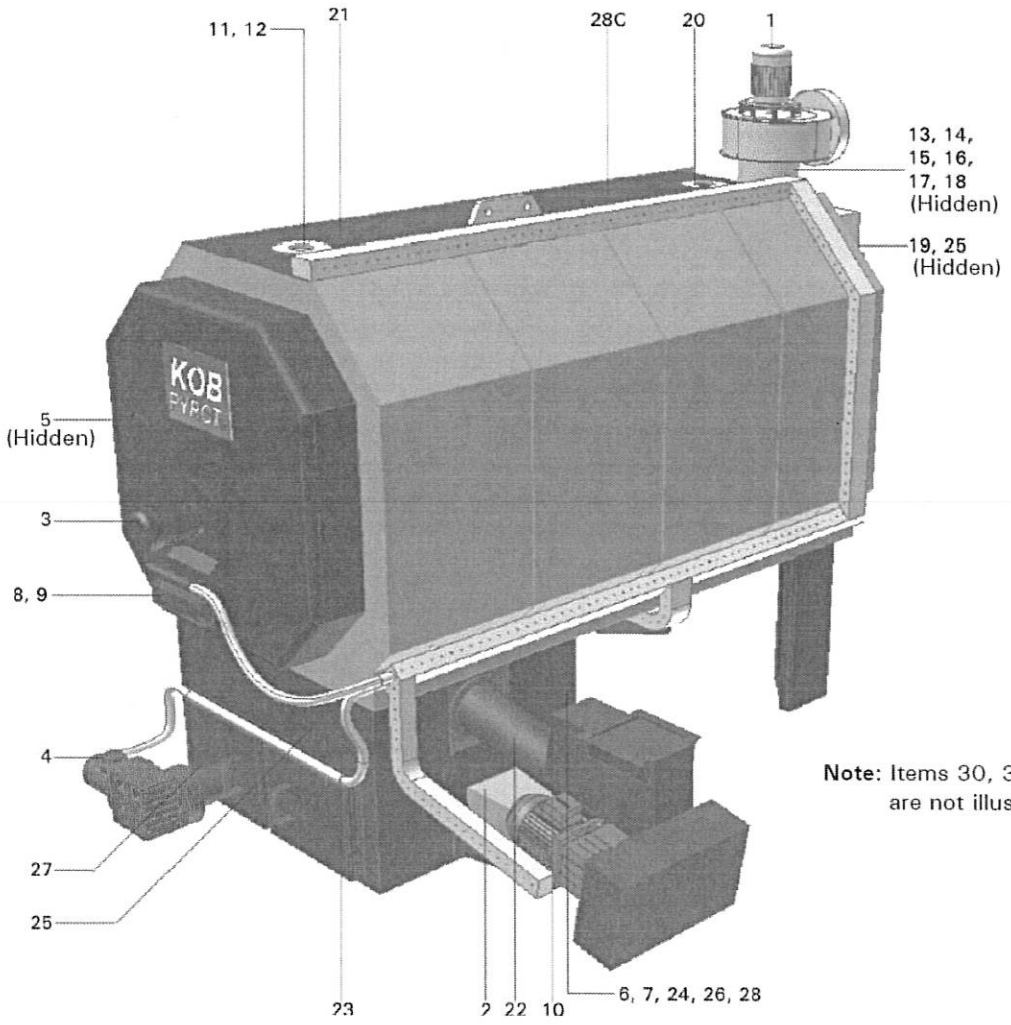
Automatic triggering system for the fuel supply system
Approved in part as a variation to the shut-off valve in pressure-less fuel storage units.

Slide valve
The slide valve is approved in pressure-less fuel storage units and is a suitable safeguard against back-burn. The slide valve is optional and closes in case of standstill, danger of back-burn, or power failure with the help of a spring return motor.

Control Panel

Mounting of the control panel
A certified electrician shall mount the control panel. Optimum positioning of the control panel will minimize the time and costs of the installation. The control panel should be in an area where the heat radiation (front side of boiler, rear side of boiler with flue gas de-duster and flue gas blower as well as recirculation line) and the exposure to dust during cleaning is at a minimum.
The ambient temperature for the control panel (approx. 4 in. (100 mm) away from the control cabinet) should not exceed 104° F (40° C) while the system is in operation. The minimum temperature must not be less than 50° F (10° C) In case of doubt, preference should be given to placing the control panel outside the mechanical room near the heating room door.

Electrical Components



Note: Items 30, 32 and 33 are not illustrated.

M	High voltage
Y	Low voltage
B	Sensors
S	Switches
N	Sensors

High voltage

Number	Designation	Device tag	Description
1	M1	-14M1	Exhaust fan
2	M2	-27M2	Grate drive
3	M3	-28M3	Rotation blower
4	M4	-8M4	De-ashing auger
5	M5	-8M5	De-ashing ascending conveyor auger
10	M16	-24M16	Ignition blower
11	M20	-9M20	Boiler pump

Low voltage

Number	Designation	Device tag	Description
6	Y10	-21Y10	Primary air valve 1
7	Y11	-21Y11	Primary air valve 2
8	Y13	-20Y13	Secondary air valve 1
9	Y14	-20Y14	Secondary air valve 2
12	Y20	-26Y20	Mixing valve actuator
13	Y21	-29Y21	Solenoid valve 1
14	Y22	-29Y22	Solenoid valve 2
15	Y23	-29Y23	Solenoid valve 3
16	Y24	-29Y24	Solenoid valve 4
17	Y25	-29Y25	Solenoid valve 5
18	Y26	-29Y26	Solenoid valve 6

Temperature sensors

Number	Designation	Device tag	Description
19	B1	-22B1	Flue gas temperature sensor
20	B20	-22B20	Boiler supply temperature sensor
21	B20.1	-22B20.1	Boiler return temperature sensor
22	B27	-22B02	Infeed auger temperature sensor

Light barriers

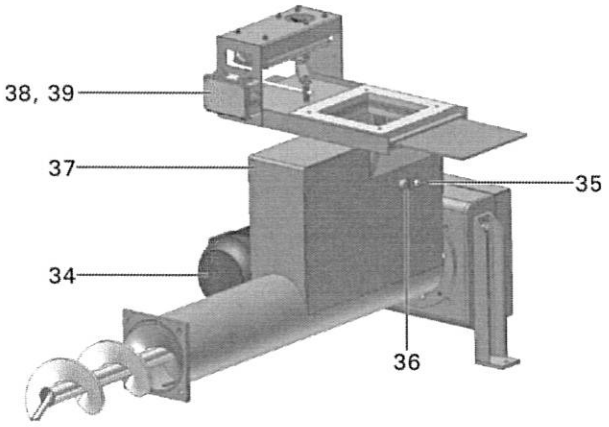
Number	Designation	Device tag	Description
23	B1.1	-16B1.1	Light barrier embers 1 (Transmitter)
24	B1.2	-16B1.2	Light barrier embers 1 (Receiver)
25	B2.1	-17B2.1	Light barrier embers 2 (Transmitter)
26	B2.2	-17B2.2	Light barrier embers 2 (Receiver)
27	B4.1	-18B4.1	Light barrier de-ashing system (Transmitter)
28	B4.2	-18B4.2	Light barrier de-ashing system (Receiver)

Sensors

Number	Designation	Device tag	Description
29	B26	-23B26	O_2 sensor
30	N1	-19N1	Floater switch for fire extinguishing water container
31	N21	-6N21	Safety temperature limiter STB
32	N22	-6N22	Low water cut-off

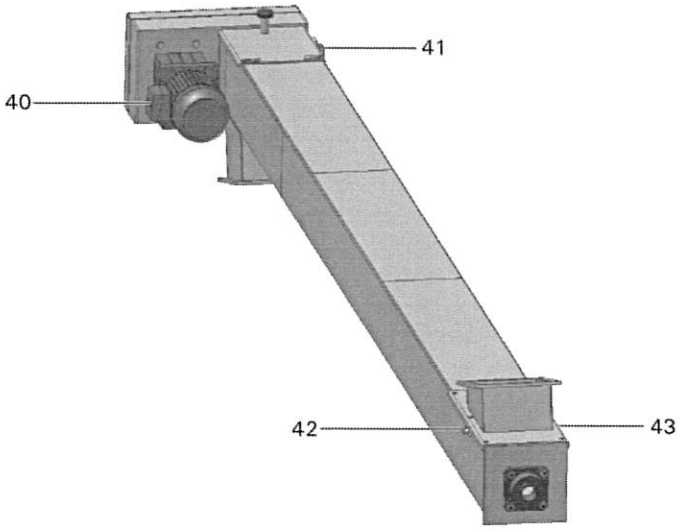
Fuel Transport and Extraction Systems

Infeed auger



Number	Designation	Device tag	Description
34	M31	-11M31	Motor for in-feed auger
35	S31.1	11S31.1	Limit switch for maintenance lid
36	B31.1	-11B31.1	Light barrier metering container (Transmitter)
37	B31.2	-11B31.2	Light barrier metering container (Receiver)
38	Y30.1	-23Y30.1	Slide valve T30
39	Y30.2	-23Y30.2	Slide valve T30

Pipe / trough conveyor auger



Number	Designation	Device tag	Description
40	M32	-12M32	Motor for pipe/trough conveyor auger
41	S32.1	-12S32.1	Limit switch for maintenance lid
42	B32.1	-12B32.1	Light barrier conveyor auger (Transmitter)
43	B32.2	-12B32.2	Light barrier conveyor auger (Receiver)

ECOTRONIC Control System

General information

The ECOTRONIC facility control system is a decentralised microprocessor system (CAN-BUS) developed by KOB with various modules that are connected by a data transmission line.

Its function: the ECOTRONIC records all the data relevant to operation and controls the supply of and demand for heat. Thus the boiler plant is continuously monitored during all the operating phases and kept within an optimum range in terms of emissions.

Factory settings (pre-settings): all the parameters in the ECOTRONIC, such as set point values and switching times, are pre-set and can be called back up at any time.

Standard Equipment:

- 208V, 3-phase, 60 Hz
- microprocessor-driven control (programming unit with backlit text display), CSA approved, battery back-up for time clock, and RS232 serial port for PC connection
- data cable from programming unit to control panel; length 33 ft./10 m
- control panel; 39x47x12" / 1000x1200x300 mm powder coated exterior. CSA-approved construction and completely prewired.
  Default configuration:
  - factory customized, updateable software
  - fuel transport system control with motor outputs, overload protection and soft start
  - boiler pump output with variable speed control
  - air flow valve output
  - gate valve output
  - ignition blower control
  - boiler mixing valve output, 24 VAC
  - rotary blower control with motor output and overload protection
  - solenoid valve outputs, 24 VDC
  - deashing system control with motor outputs with overload protection
- in the panel door:
  - Ecotronic control is door-mounted
  - 4-pole main switch
  - all documentation including complete wiring diagram and operation manual
- sensors and switches mounted on the feed auger:
  - infrared sensor to monitor fuel level
  - safety endswitch on inspection cover
  - strap-on sensor for the feed auger, PT-1000
- sensors and switches for fire box and flue gas pipe (field installed):
  - infrared monitoring of fuel in fire box
  - zirconiumdioxide sensor with measuring transducer (Lambda-Sonde)
  - flue gas sensor, PT-1000
- sensors and switches for boiler:
  - boiler supply temperature sensor, KTY
  - boiler return temperature sensor, KTY
  - fixed high limit
  - rotation blower temperature sensor

Boilers Control Panel

Standard Equipment:
• power supply 208V, 3-phase, 60 Hz
• Control Panel; grey (RAL 7035) powder coated exterior. CSA-approved construction and completely prewired.
Default configuration:
- pre programmed control system, CSA-approved, software and time clock are supported with battery back-up.
- PC-driven
- ethernet interface (network connection) on touch-panel
- alarm output via potential-free contact
- Communication over Bacnet to External BMS system
- staging of 1–4 Viessmann biomass boilers and additional 1 – 4 back up boilers over LON (Viessmann) or relays non Viessmann
- master staging of boiler system with BTU reading and buffer tank temperature control with outdoor reset or BMS temperature set point
-system to meet the required temperature calculated or manage temperature set point sent over external signal
• Panel Door:
- 10" touch screen display
- 3-pole main switch
- all documentation including complete wiring diagram and operation manual
- operational data archive of 14 days
- simplified operation of biomass boiler systems using Touch-Screen of Mastercontrol Illustrations on Touch-Screen: System overview with labelled components, overview of operational parameters in table form, history of faults.

Requirements:
Customer provides high speed internet connection to the Manufacturer at time of start up or one site visit from a Control Integration Specialist will be required at an additional charge

Notes:
Delivery of BTU meter included after information of piping is received. Installation of the BTU meter in system pipes at site is the responsibility of Mechanical contractor.
Flow meter should be installed after thermal storage tank (before branching) in a straight run of pipe, free of bends, tees, valves and obstructions, for a distance of 20 pipe diamaters upstream and 10 diameters downstream. One temperature sensor thermowell will need to be placed in the same pipe with the flow meter. It should be located on the downstream side of the flow meter. The downstream distance between the thermowell and flow meter should be at least 5 pipe diameters; leaving enough clearance to remove either sensor from the pipe without interference from the other sensor.

Recommendations: Avoid running wires beside or near high voltage 120/240VAC conductors. If proximity to high voltage conductors cannot be avoided, use stranded, twisted pair of shield design wire. Ensure that only one end of the shielding is grounded.

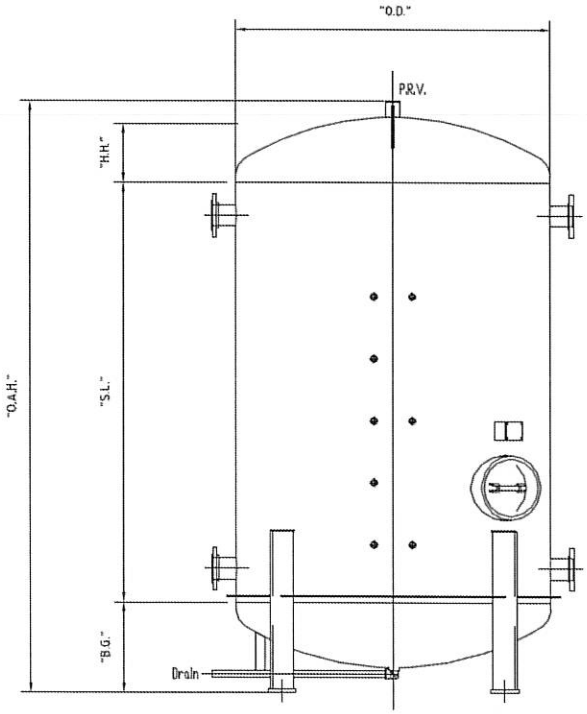
Storage Tank

Performance Criteria
The storage tank shall have a storage capacity of no less than 1500 USG (5700 L) and shall be designed for use on heating systems with the following operating conditions: maximum operating pressure 60 psig at 210°F (99°C). Tank is supplied with insulation.

Construction
Tank shall be made of SA-516-70

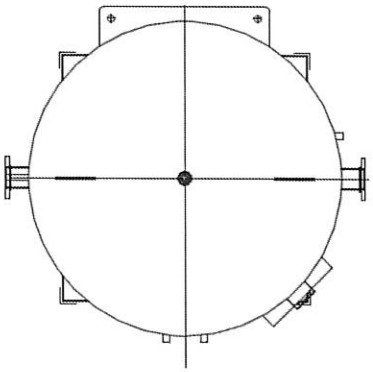
Certifications
The tank shall be designed in accordance with ASME Section VIII, Div. 1, 2010, CSA B51-09, with the CRN number.

Installation
All water connections shall be accessible once the tank is installed, for ease of service.
A pressure and temperature relief valve shall be factory supplied and field installed to meet local Canadian or U.S. codes (CSA ratings shall be followed).



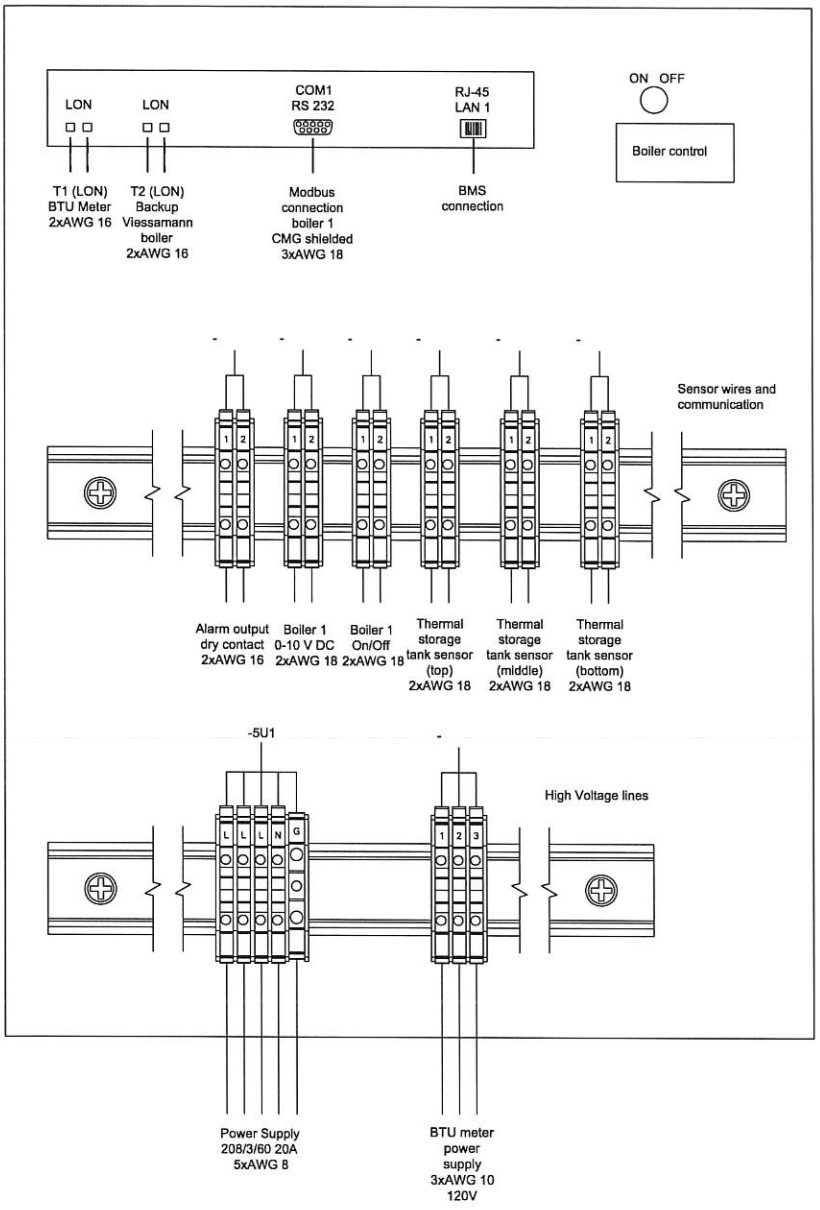
Elevation view

Dimensions
O.A.H.= 123" (3124 mm)
H.H.= 14" (356 mm)
O.D.= 66" (1676 mm)
S.L.= 88" (2235 mm)
B.G.= 19" (483 mm)

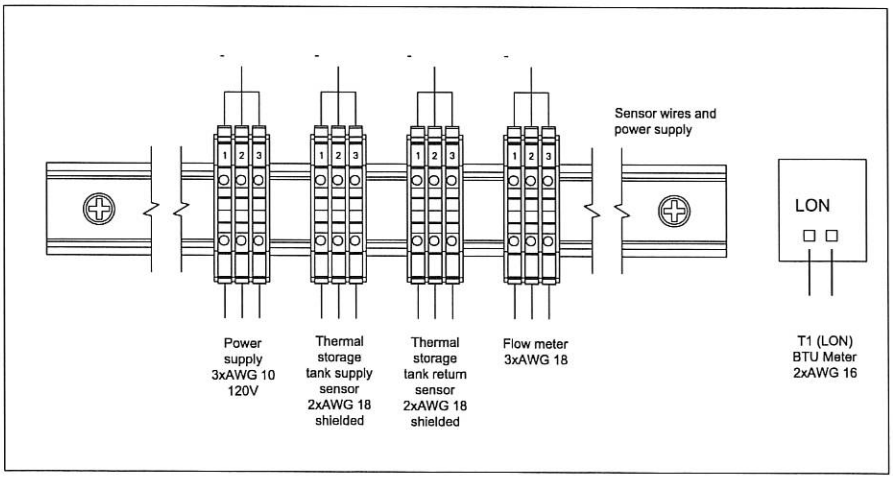


Top view
"Straight tank"

Boilers Control Panel



BTU Meter



Control Panel - ECOTRONIC