

RFP – 24 RLA 005

Portage la Prairie Regional Landfill Authority Inc.

is accepting proposals for the following:

Electrical, Mechanical, and Concrete Services for the Portage la Prairie Regional Landfill Buildings

Proposals will be received by the Manager until **12:00 p.m.** Central time on Friday, **July 26, 2024**:

Portage la Prairie Regional Landfill
26095 PR 227
Portage la Prairie, MB R1N 3B9

Envelope should be sealed and clearly marked:

**"24 RLA 005 – Electrical, Mechanical, and Concrete Services for the Portage la Prairie
Regional Landfill Buildings."**

General enquiries may be directed to:

Robert Pohl, Manager
Portage la Prairie Regional Landfill
26095 PR 227
Portage la Prairie, MB
204-871-4549
rpohl@city-plap.com

1.0 SCOPE

1.1 Project Scope

The Portage la Prairie Regional Landfill Authority Inc. is seeking proposals for the completion of the electrical, the Mechanical and the Concrete for the insulated and non-insulated buildings at the Landfill site.

2.0 SCHEDULE

2.1 Schedule of Work

The proposed schedule for the RFP is as follows:

| | |
|-----------------------------|---------------------------|
| Complete evaluation of bids | Monday, July 29, 2024 |
| Award of Contract | Tuesday, July 30, 2024 |
| Completion of the Works | Friday, November 29, 2024 |

If the Proponent is not able to deliver the electrical, the mechanical, and the concrete services within this time frame; or is able to complete within a shorter time frame, the Proponent should specify in its Proposal, the start and end date of its proposed delivery schedule.

3.0 TIME AND DATE FOR FINAL RECEIPT OF PROPOSALS

Proposals must be received by 12:00 PM on Friday, July 26, 2024, at the following address:

Portage la Prairie Regional Landfill
Attention: Robert Pohl, Manager
26095 PR 227, Box 626
Portage la Prairie, MB R1N 3B9

The time that proposals are received will be conclusively deemed to be the time shown on the clock used by the Portage la Prairie Regional Landfill for this purpose.

Except where extended by Addendum, Proposals received later than the time state above will not be accepted and will be returned unopened.

4.0 PROJECT BACKGROUND

The Portage la Prairie Regional Landfill has an insulated and non-insulated build which were completed in 2022.

The Electrical, the Mechanical and the Concrete Services Contract will be provided by the successful Proponent.

6.0 ELECTRICAL MECHANICAL AND CONCRETE SERVICES REQUIREMENTS

- 1) Implement and supervise the execution of the electrical, the Mechanical and the concrete as shown in the Engineering drawing. Implementation and execution must meet all Manitoba regulatory requirements and best practices. The main tasks for this work include:
 - a) Development of work plan that meets all the requirements of the Portage la Prairie Planning District and Manitoba Building codes.
 - b) Construction supervision for execution of the electrical, the Mechanical and the concrete.
 - c) Construction Administration Services/Collaboration.
 - d) All manuals must be provided to the Landfill Authority.
 - e) Preparation and Submission of Final Drawings to the Landfill Authority and The Portage la Prairie and District Planning.

7.0 PROJECT DELIVERABLES

The Regional Landfill is to receive the following upon completion and acceptance of the project as described.

1. Provide two hardcopies and one electronic copy of the findings as set out in Section 6.0.

8.0 PROPOSAL SUBMISSION

Consultants should submit three (3) copies of the Request for Proposal Submission, to include the Declaration Form as attached, which should be in a sealed envelope clearly marked "Electrical, Mechanical, and Concrete Services for the Portage la Prairie Regional Landfill Buildings.", and with the Bidder's name and address.

It is suggested the proposal contain an introduction, describing the background, purpose, and scope of the project; a section describing the approach to be taken; a personnel section describing the study team, with resumes provided; and a schedule of the work to be done, with appropriate milestones explicitly indicated.

The fee basis is anticipated to be hourly rate, plus disbursements to an upset limit. The fee submission shall be separate, in a sealed envelope, and clearly and similarly identified. It shall provide a detailed price breakdown, and a statement of estimated total costs. It shall include a list of the team members, their respective proposed hours, and their respective charge-out rates. Disbursements and other costs shall be specified. GST shall be specified separately.

Consultants are requested to provide, with the proposal submission, significant detail on the scope of the work for each task and the associated fee.

Samples or other submissions required to accompany the Proposal Submission may be packaged

separately, but shall be clearly marked with the Request for Proposal Number, the Bidder's name and address, and an indication that the contents are supplemental to his Proposal Submission.

Request for Proposal Submissions shall be submitted no later than the Time and Date Set for Final Receipt of Bids in clause 3.0.

9.0 INSURANCE

The Consultant agrees to maintain public liability and property damage insurance in respect of:

Public Liability: \$2,000,000.00 for death of or injury to one person from any one accident.

Property Damage: \$2,000,000.00 for damage to property arising from any one accident and the Consultant provide proof of such insurance to the Engineer.

The Consultant shall be required to provide proof of insurance coverage within ten (10) days of award of the Proposal and prior to the commencement of any work.

10.0 SIGNATURES

The Declaration Form shall be signed in accordance with the following requirements:

1. If the Proposal is submitted by a sole proprietor carrying on business in the person's own name, that person's name should be printed immediately above their signature; or
2. If the Proposal is submitted by a person carrying on business under a name other than that person's own, business name should be printed immediately above their signature; or
3. If the Proposal is submitted by a partnership, the full name of the firm or business should be printed immediately above the signature of the partner or partners who have authority to sign for the partnership; or
4. If the Proposal is submitted by a corporation, the full name of the corporation should be printed immediately above the signature of its duly authorized officers and the corporate seal affixed; or
5. The signatures of persons bidding must be in their respective handwriting.

Proposals submitted by agents proposing to represent principals must be accompanied by a Resolution of the principals or by an irrevocable Letter of Authority and Direction from the principals in a form satisfactory to the Regional Landfill's Solicitor showing that the agents are duly authorized to sign and submit the Proposal Submission on behalf of the principals and have full power to execute the Contract on behalf of the principals, which Contract, when so executed, will bind the principals and have the same effect as if it were duly signed by the principals.

11.0 DISCREPANCIES

Bidders who find discrepancies or omissions in the Request for Proposal Package or are unsure of the meaning or intent thereof shall notify the Manager of the Regional Landfill.

The Manager will, if deemed necessary, issue Addenda to all Bidders.

Addenda will be issued at least seventy-two (72) hours prior to the Time and Date Set for Final Receipt of Bids. Bidders are advised to direct all questions or comments to the Manager at least one hundred and twenty (120) hours prior to the Time and Date Set for Final Receipt of Bids to allow time for the preparation and distribution of necessary Addenda.

Notwithstanding the generality of the foregoing, the Manager may extend the Time and Date Set for the Final Receipt of Bids at any time for cause.

Oral interpretations made to any Proposer shall not affect a modification of any provision of the final Contract Documents.

12.0 WORKERS COMPENSATION ACT

The Consultant shall provide proof of coverage within one week of award of the Proposal and prior to the commencement of work and comply with all the provisions of the Worker's Compensation Act, with respect to all persons employed by the Bidder.

13.0 TERMINATION OF CONTRACT

The Regional Landfill reserves the right to terminate the contract by submitting thirty (30) days' notice in writing to the Engineer.

14.0 OPENING OF PROPOSAL SUBMISSIONS

Proposals will not be opened publicly.

15.0 WITHDRAWAL OF PROPOSAL SUBMISSIONS

Engineers may withdraw their Proposal Submission without penalty at any time prior to the Time and Date Set for Final Receipt of Proposal submissions.

16.0 REJECTION OF PROPOSAL SUBMISSIONS

The Regional Landfill may reject a Proposal Submission as informal, if the Proposal Submission is

incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities.

The Regional Landfill may reject Proposal Submissions that are submitted by consultants who, in the judgement of the Manager, are not responsible or are not qualified to conduct and complete the Work.

The Regional Landfill may reject all or any part of any Proposal Submission and/or waive technical requirements if, in the judgement of the Manager, the interests of the Regional Landfill so require. THE REGIONAL LANDFILL RESERVES THE RIGHT TO NOT AWARD A CONTRACT IF THE TENDER PRICE EXCEEDS THE REGIONAL LANDFILL'S BUDGET

17.0 PROPOSAL SUBMISSION EVALUATION

Upon receipt of the proposal submissions, the Evaluation Committee shall first review the proposal submissions for compliance with all Mandatory Requirements. Submissions that do not comply with all the Mandatory Requirements may be disqualified. "Mandatory Requirements" means all requirements of this proposal that are mandatory, which are preceded with the term "must" or "shall".

Once the proposal submissions have been reviewed for the Mandatory Requirements, all eligible proposal submissions will be evaluated by the Evaluation Committee on the basis of the Rated Criteria. The Rated Criteria for the proposal submissions are set out in Appendix "1" attached hereto.

The scores for each proposal submission will be calculated in accordance with the weightings indicated next to the Rated Criteria. The Evaluation Committee or its authorized representative(s) will submit an award recommendation to the Regional Landfill Board for its approval and authorization, for the Bidder with the top-ranked proposal submission.

THE LOWEST PROPOSAL, OR ANY PROPOSAL SUBMISSION, WILL NOT NECESSARILY BE ACCEPTED.

In addition to the Rated Criteria, the Evaluation Committee may conduct reference checks of the Bidders, the results of which may be used to adjust the evaluation of the Rated Criteria. The Manager may also consider the proponent's past performance or conduct on previous contracts with the Regional Landfill or other institutions.

When evaluating proposal submissions, the Manager may request further information from the Bidder or third parties in order to verify, clarify or supplement the information provided in the proposal submission. The Manager may revisit and re-evaluate the proposal submission or ranking on the basis of any such information.

The Regional Landfill will not return the proposal submission, or any accompanying documentation submitted by a Bidder.

18.0 METHOD OF PAYMENT

Payments shall be made monthly based on a percentage of actual hours worked and the initial estimated hours. Actual disbursement costs shall be paid on a cost plus 5% basis.

19.0 COMPLIANCE WITH LAWS

The Consultant shall comply with and the work shall be carried out in compliance with all laws of the Dominion of Canada, Province of Manitoba, and the By-Laws of the RM of Portage la Prairie.

20.0 AWARD OF CONTRACT

The Regional Landfill anticipates to award the Contract, or to announce that no award will be made, on or before the date shown in the timetable in Section 2.1.

The successful Bidder will be expected to enter into Contract Documents with the Regional Landfill.

21.0 DISQUALIFICATION FOR PROHIBITED CONDUCT, CONFLICT OF INTEREST

The Regional Landfill may disqualify a Bidder for any conduct, situation, or circumstances, determined by the Regional Landfill, in its sole and absolute discretion, to constitute a Conflict of Interest.

The Portage la Prairie Regional Landfill may disqualify a Bidder, rescind an invitation to negotiate or terminate a contract subsequently entered if the Regional Landfill determines that the Bidder has engaged in any conduct prohibited by this Proposal.

Bidders must not engage in any illegal business practices, including activities such as bid rigging, price-fixing, bribery, fraud, coercion, or collusion. Bidders must not engage in any unethical conduct, including lobbying, as described above, or other inappropriate communications; offering gifts to any employees, officers, agents, appointed officials or other representatives of the Regional Landfill; deceitfulness; submitting proposals containing misrepresentations or other misleading or inaccurate information; or any other conduct that compromises or may be seen to compromise the competitive process provided for in this Proposal.

22.0 PAST PERFORMANCE OR PAST CONDUCT

The Regional Landfill may prohibit a Bidder from participating in a procurement process based on past performance or based on inappropriate conduct in a prior procurement process, including but not limited to the following:

1. illegal or unethical conduct as described above;
2. the refusal of the Bidder to honour its submitted pricing or other commitments; or
3. any conduct, situation or circumstance determined by the Regional Landfill, in its sole and

absolute discretion, to have constituted an undisclosed Conflict of Interest.

23.0 NO CONTRACT AND CANCELLATION RIGHTS

This Proposal process is intended to identify prospective Consultants for the purposes of negotiating potential agreements. No legal relationship or obligation regarding the procurement of any good or service will be created between the Bidder and the Regional Landfill by this Proposal process until the successful negotiation and execution of a written agreement for the acquisition of such goods and/or services, as described in Section 20.0.

24.0 GOVERNING LAW AND INTERPRETATION

These Terms and Conditions of the Proposal process:

1. are intended to be interpreted broadly and independently (with no particular provision intended to limit the scope of any other provision);
2. are non-exhaustive and will not be construed as intending to limit the pre-existing rights of the parties to engage in pre-contractual discussions in accordance with the common law governing direct commercial negotiations; and
3. are to be governed by and construed in accordance with the laws of the Province of Manitoba and the federal laws of Canada applicable therein.

DECLARATION

I confirm that I have authority to bind the Bidder, and attest to the accuracy of the information provided in this Tender Submission.

| | |
|------------------------------------|-------------------------|
| | |
| Signature of Bidder Representative | Bidder Name, and Title |
| | |
| Dated: | Name of Bidder Company |
| | |
| Witness Signature | Witness Name, and Title |

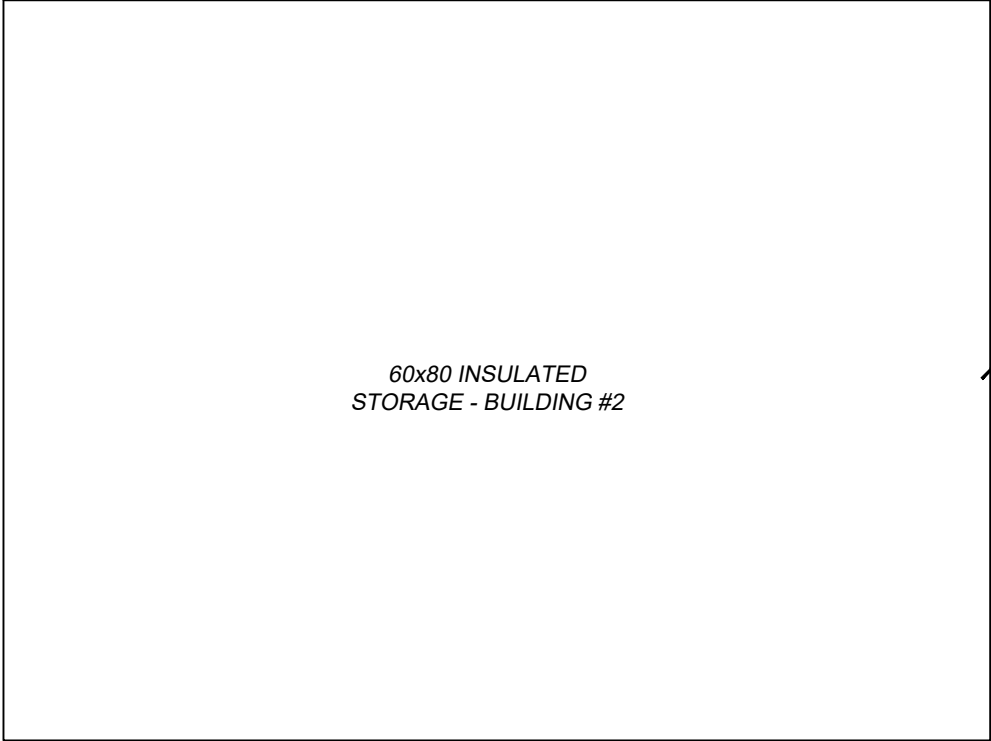
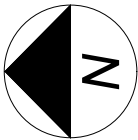
Executed under the seal shown below, with the intent that such execution take effect as a deed.

(affix seal here)

APPENDIX "1"

RATED CRITERIA

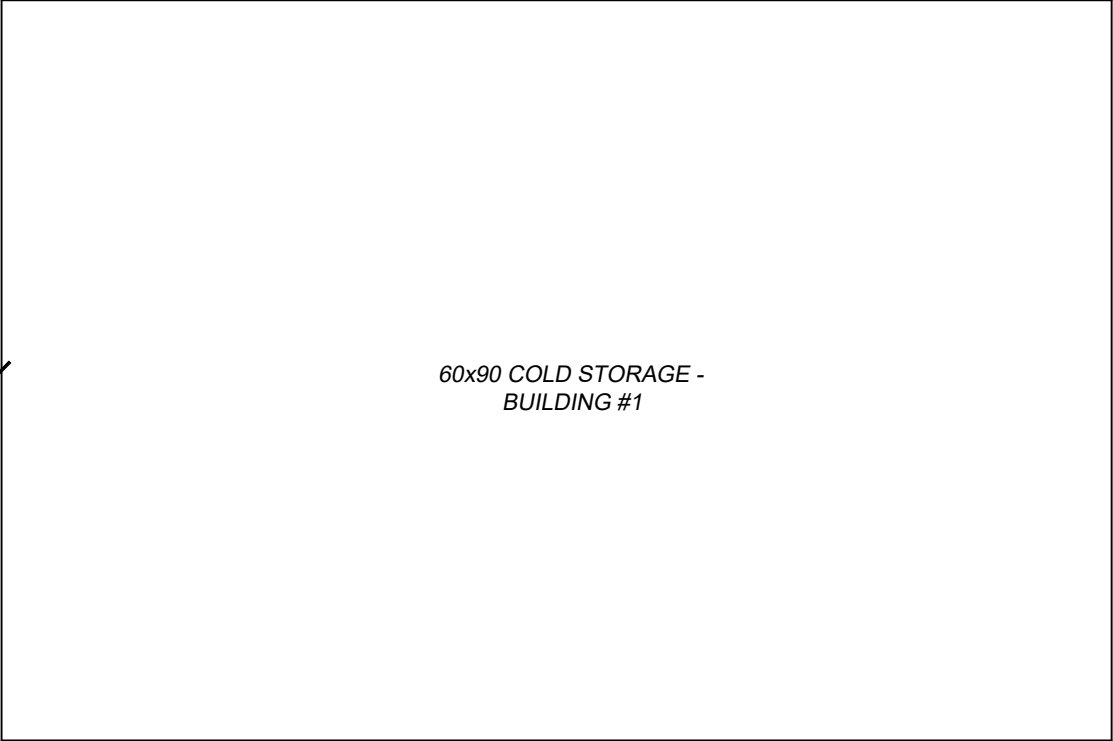
| Rated Criteria | Weighting (Points) |
|---|-------------------------------|
| Qualifications, experience and ability of the Bidder to provide the requested goods/services, understanding of the project, schedule, methodology | 40 |
| Personnel including project management, staff and specialists | 25 |
| Past relationship with the Regional Landfill Authority | 5 |
| Subtotal (minimum 50 points to qualify) | <u>70</u> |
| Pricing including detailed price breakdown and engineering costs | <u>30</u> |
| Total Points | 100 |



60x80 INSULATED
STORAGE - BUILDING #2




21.34 [70']

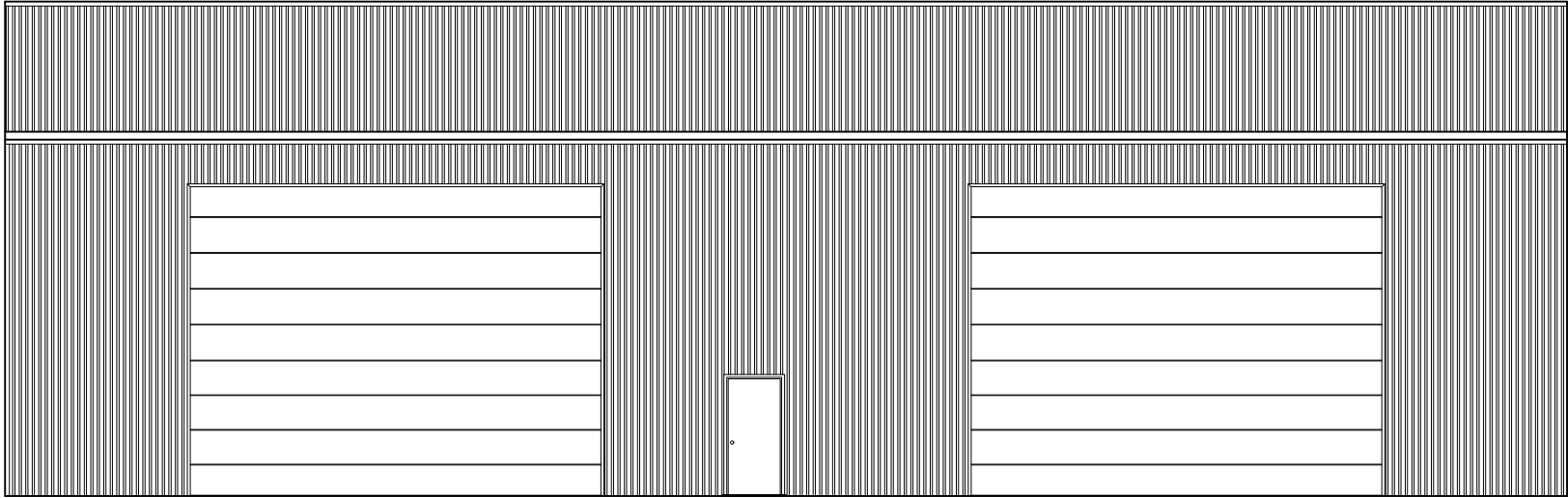


60x90 COLD STORAGE -
BUILDING #1

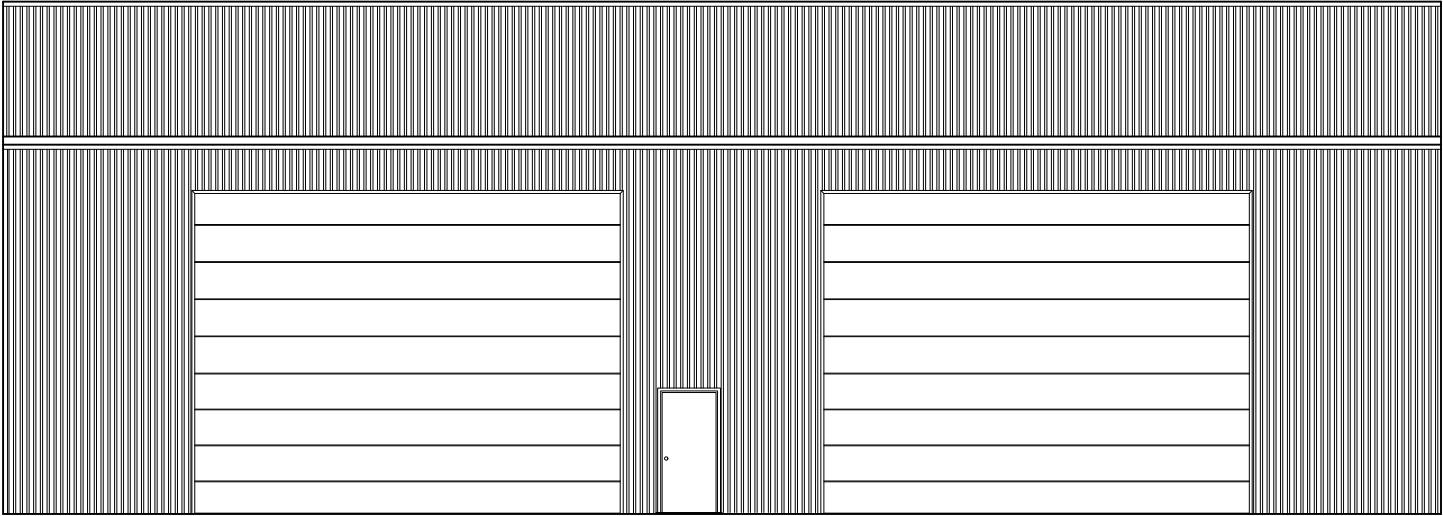


Landfill Site
26095 PR 227
RM of Portage La Prairie

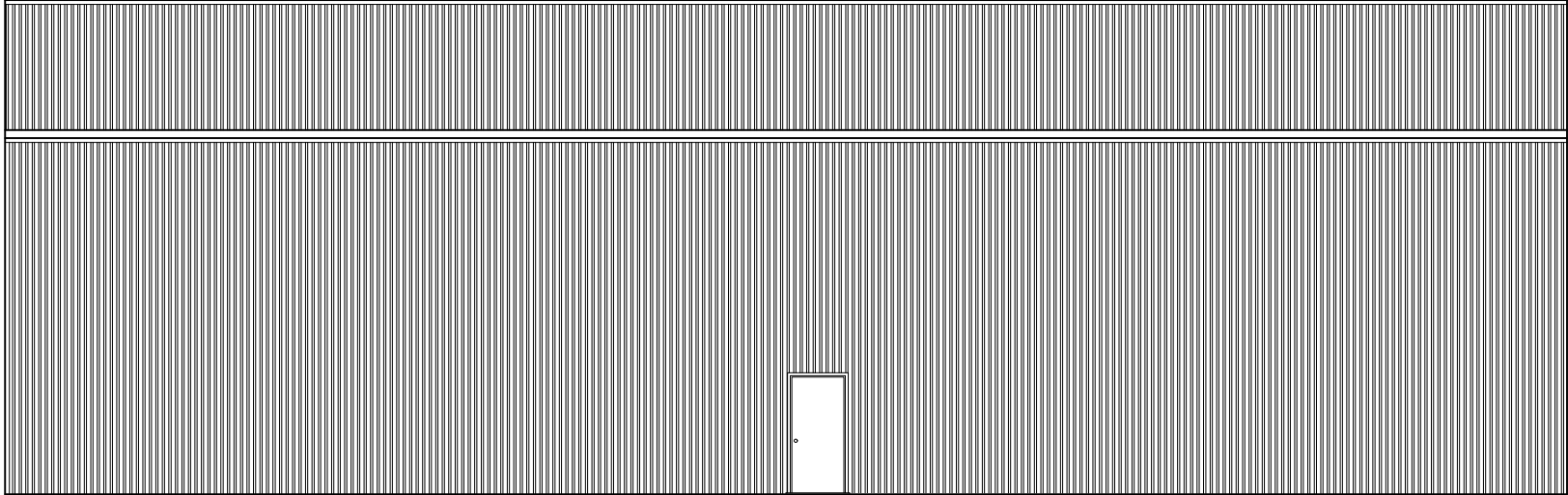
| | | | | | |
|-------|-----------|-----------|-----------------|---|-----------------|
| △ | KH | JUL-14-22 | Elev Direction |  | |
| △ | KH | AUG-10-22 | Slab Info added | | |
| △ | | | | | |
| REV. | BY | DATE | REMARKS | 60x80 & 60x90 Kristen John Pole Shed 26095 PR 227 Landfill Site RM of Portage la Prairie, MB | |
| DRAWN | DATE | CHECKED | DATE | | |
| KH | MAR-16-21 | | | ORDER NO. | SHEET 1 OF 5 |



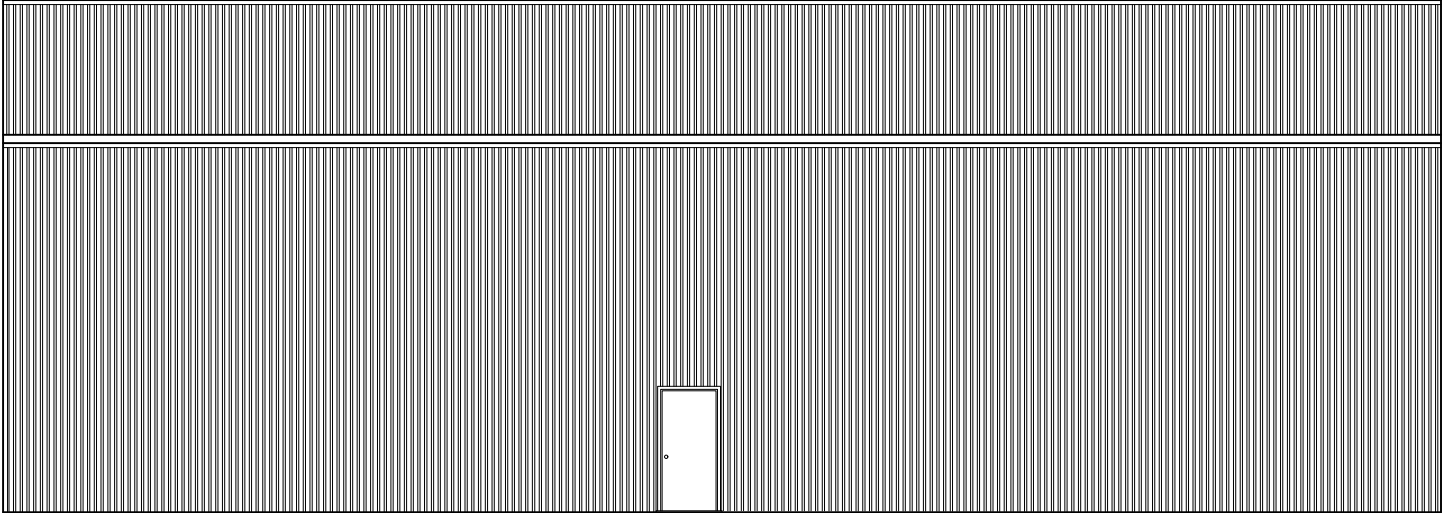
BUILDING #1 WEST ELEVATION



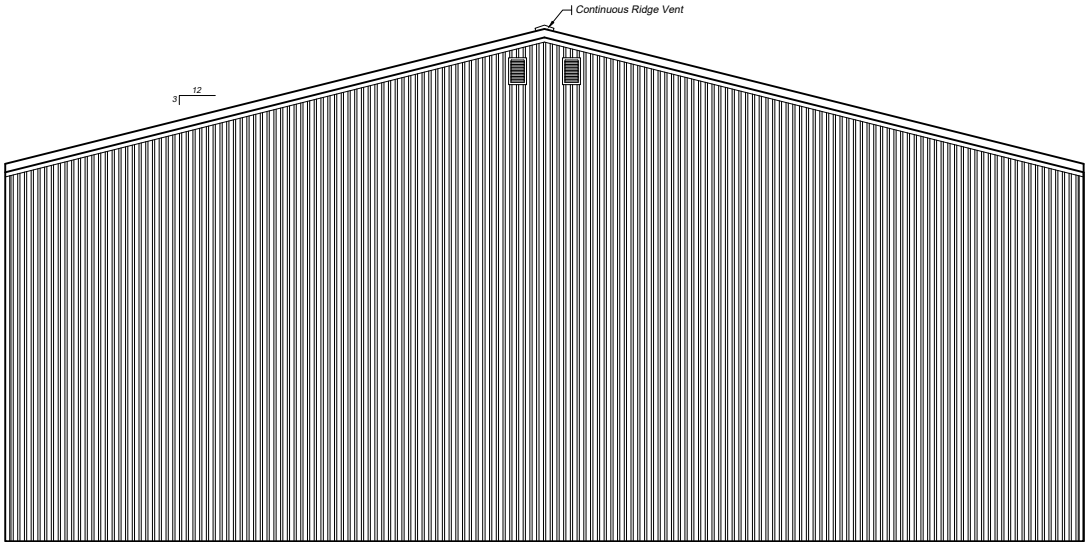
BUILDING #2 WEST ELEVATION



BUILDING #1 EAST ELEVATION



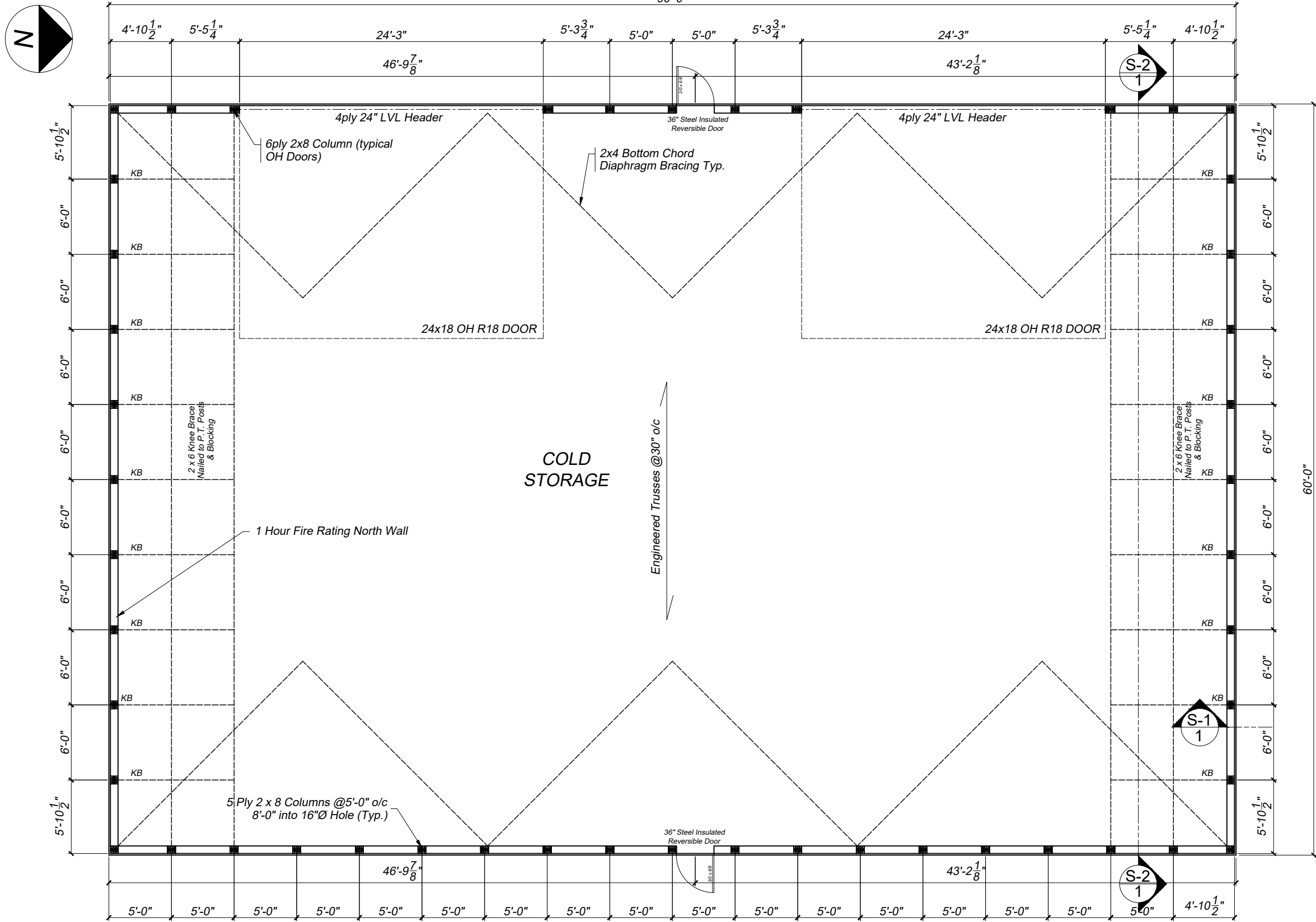
BUILDING #2 EAST ELEVATION



NORTH/SOUTH ELEVATION - BOTH BUILDINGS


| | | | |
|---|-----------|-----------|-----------------|
| △ | KH | JUL-14-22 | Elev Direction |
| △ | KH | AUG-10-22 | Slab Info added |
| △ | | | |
| REV. | BY | DATE | REMARKS |
| 60x80 & 60x90 Kristen John Pole Shed | | | |
| 26095 PR 227 Landfill Site RM of Portage la Prairie, MB | | | |
| DRAWN | DATE | CHECKED | DATE |
| KH | MAR-16-21 | | |
| ORDER NO. | | SHEET | |
| | | 2 OF 5 | |

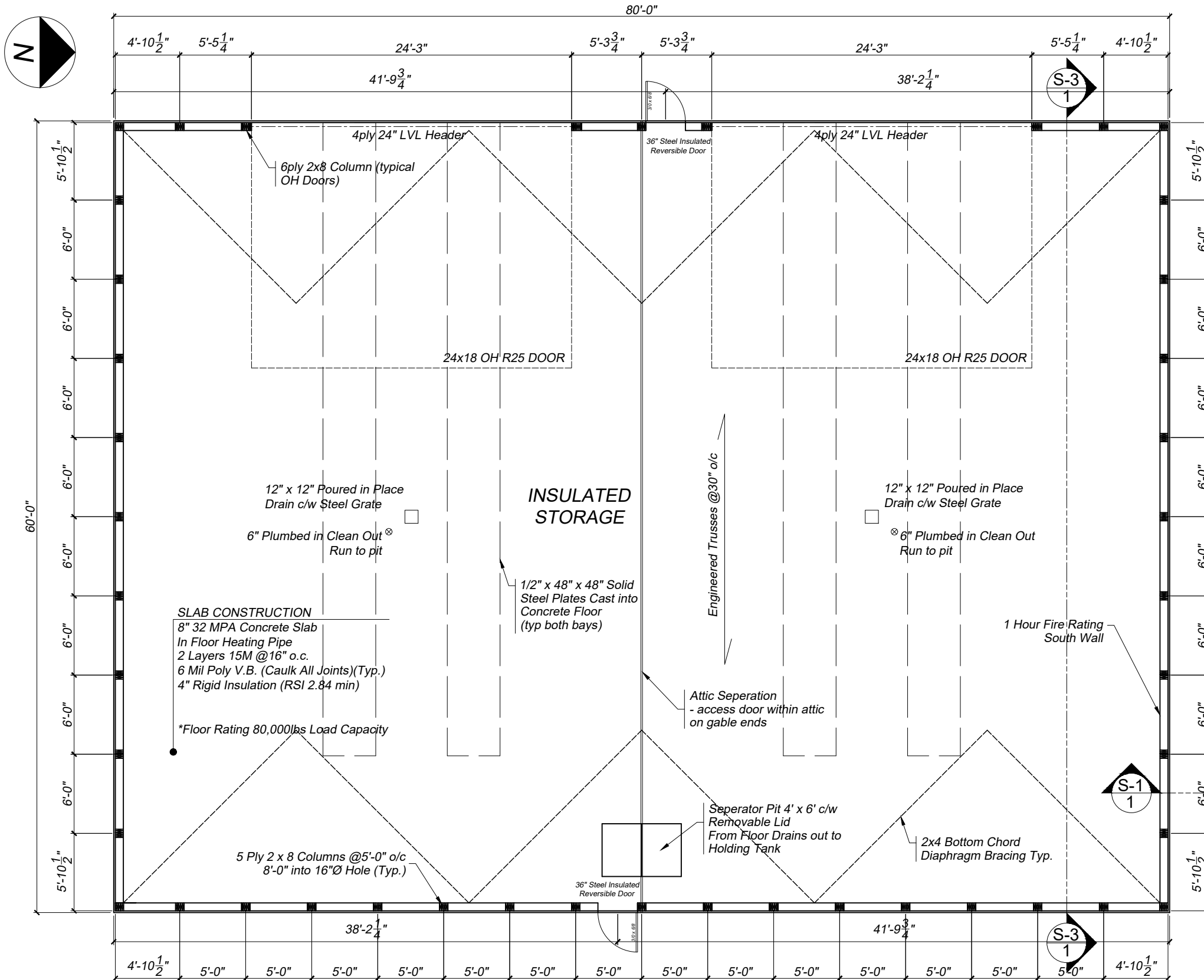




ALL DIMENSIONS ARE TO CENTER OF POLES
EXCLUDING CORNER POSTS AND DOOR POSTS

COLD STORAGE - BUILDING #1

| | | | | |
|---|-----------|-----------|-----------------|---|
| △ | KH | JUL-14-22 | Elev Direction |  |
| △ | KH | AUG-10-22 | Slab Info added | |
| △ | | | | |
| REV. | BY | DATE | REMARKS | |
| 60x80 & 60x90 Kristen John Pole Shed | | | | |
| 26095 PR 227 Landfill Site RM of Portage la Prairie, MB | | | | |
| DRAWN | DATE | CHECKED | DATE | ORDER NO. |
| KH | MAR-16-21 | | | |
| | | | | SHEET |
| | | | | 3 OF 5 |



NOTE:

CONCRETE CONTRACTOR TO GET ALL DRAIN PIPES TO EXTERIOR WALL ONLY

OWNER RESPONSIBLE FOR HOLDING TANK AND PLUMBING REQUIRED TO HOOK UP

ALL DIMENSIONS ARE TO CENTER OF POLES
EXCLUDING CORNER POSTS AND DOOR POSTS

INSULATED STORAGE - BUILDING #2

| | | | |
|---|-----------|-----------|-----------------|
| △ | KH | JUL-14-22 | Elev Direction |
| △ | KH | AUG-10-22 | Slab Info added |
| △ | | | |
| REV. | BY | DATE | REMARKS |
| <div> <div> </div> <div> McMunn & Yates Building Supplies </div> </div> | | | |
| 60x80 & 60x90 Kristen John Pole Shed | | | |
| 26095 PR 227 Landfill Site RM of Portage la Prairie, MB | | | |
| DRAWN | DATE | CHECKED | DATE |
| KH | MAR-16-21 | | |
| ORDER NO. | | | SHEET |
| | | | 4 OF 5 |

DESIGN SPECIFICATIONS

- 1. THIS STRUCTURE IS DESIGNED IN ACCORDANCE WITH AND SHALL BE CONSTRUCTED IN COMPLIANCE WITH THE NATIONAL BUILDING CODE OF CANADA (2010).
- 2. PRINCIPAL APPLIED DESIGN LOADS ARE INDICATED ON APPROPRIATE PLANS.
- 3. THIS STRUCTURE IS DESIGNED FOR LOW OCCUPANCY USAGE ONLY.

CAUTION

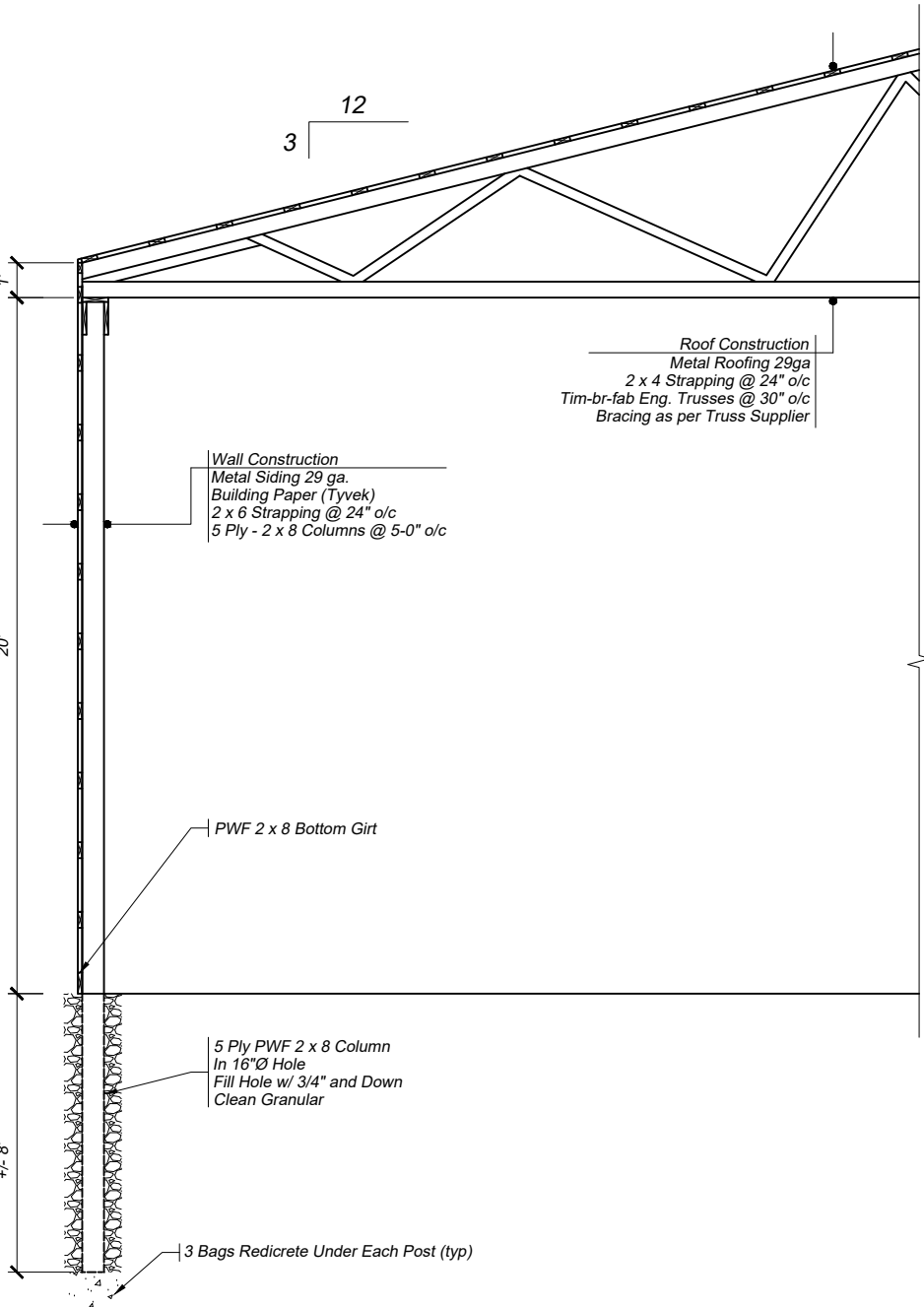
BECAUSE OF THE TYPE OF CONSTRUCTION, THE POLE TYPE, AND THE SIZE OF THE BUILDING FOUNDATION USED, THIS BUILDING WILL BE SUBJECTED TO MOVEMENTS RESULTING FROM VARIATION IN SOIL MOISTURE LEVEL, SEASONAL CHANGES AND TEMPERATURE CHANGES.

WOOD FRAMING

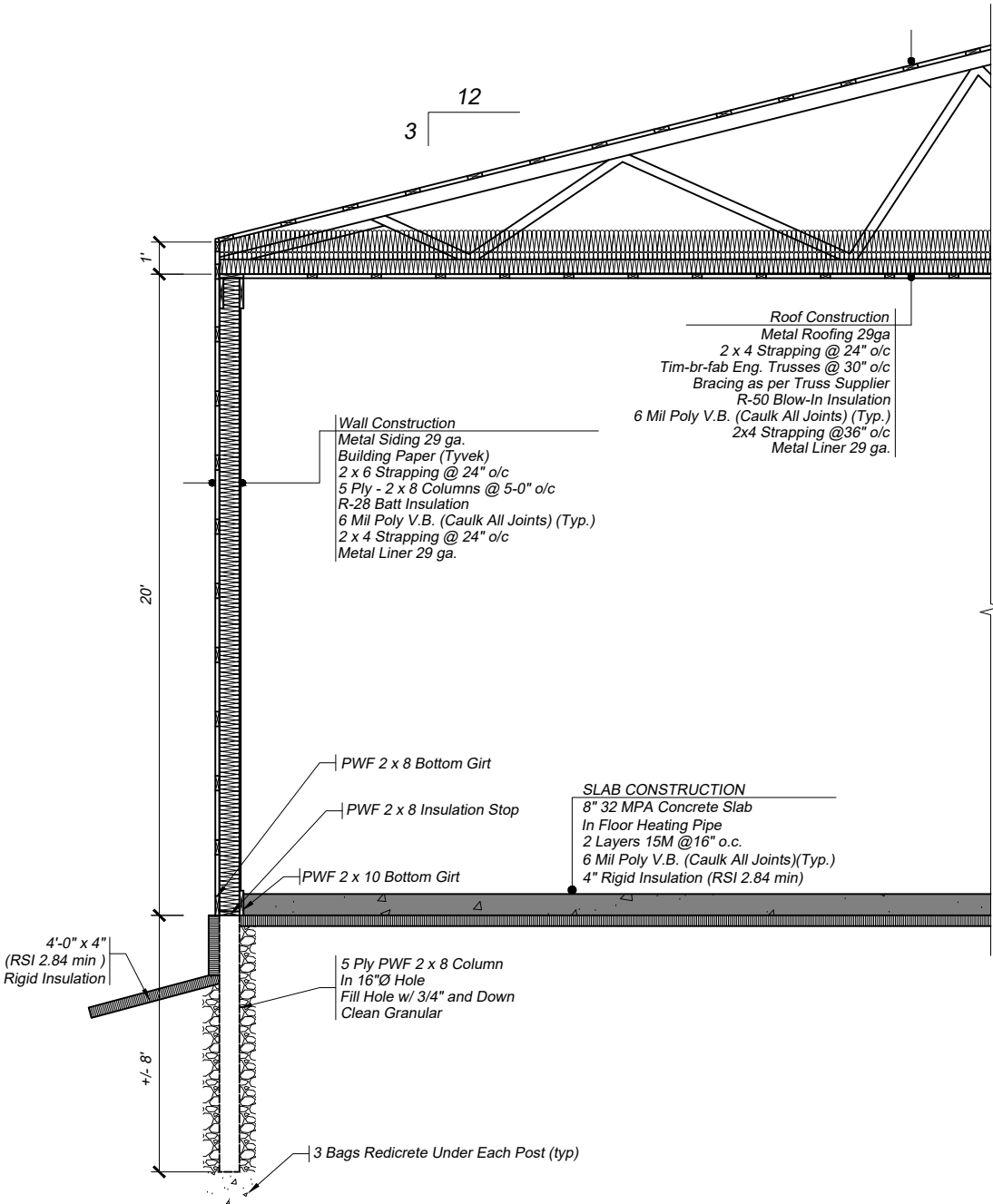
- 1. ROOF PURLINS, EXTERIOR GIRTS, HEADERS AND LINTELS SHALL BE NO. 2 GRADE SPF OR BETTER.
- 2. PRESSURE TREATED POSTS SHALL BE NO. 2 GRADE SPRUCE OR BETTER.
- 3. WHERE LUMBER IS IN CONTACT WITH SOIL, IT SHALL BE PRESURE TREATED WITH PRESERVATIVE TO CSA 0322-1976 "PROCEDURE FOR CERTIFICATION OF PRESURE-TREATED WOOD MATERIALS FOR USE IN PRESERVED WOOD FOUNDATIONS" AND CSA 080-M1983 "WOOD PRESERVATION". ALL PRESERVATIVE TREATED WOOD PRODUCTS SHALL BEAR A CERTIFICATION STAMP INDICATING CONFORMANCE WITH CSA 0322.
- 4. WHERE PRESERVED WOOD LUMBER IS CROSS CUT BELOW GRADE, PROTECT WITH SUITABLE FIELD CUT PRESERVATIVE.
- 5. ALL NAILS USED BELOW GRADE SHALL BE HOT DIPPED GALVANIZED.
- 6. STEEL ROOF DECK AND SIDING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

PREFABRICATED TRUSSES

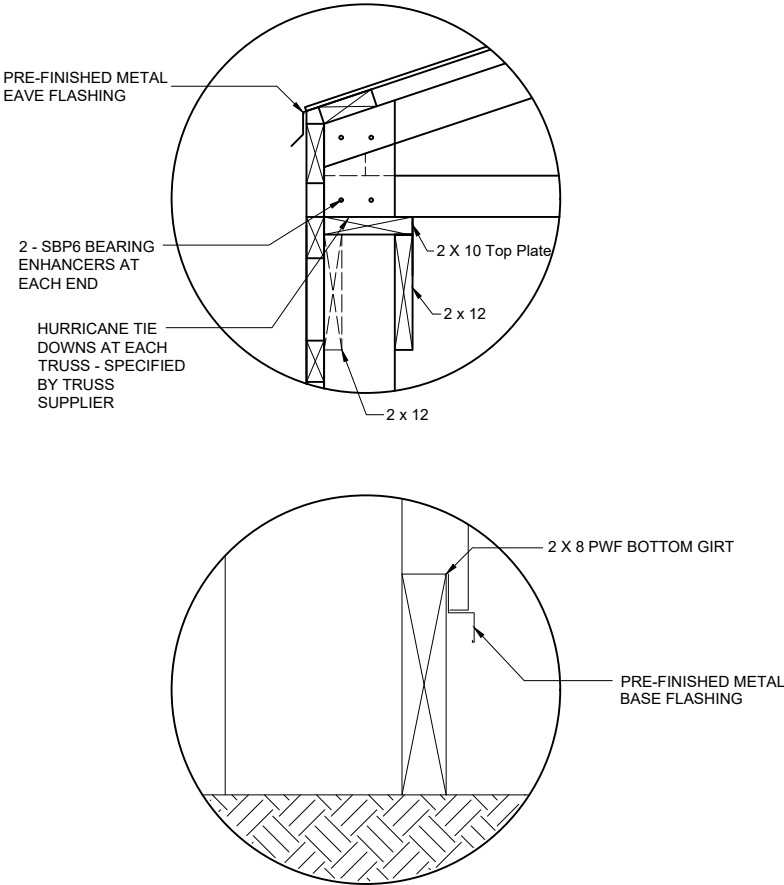
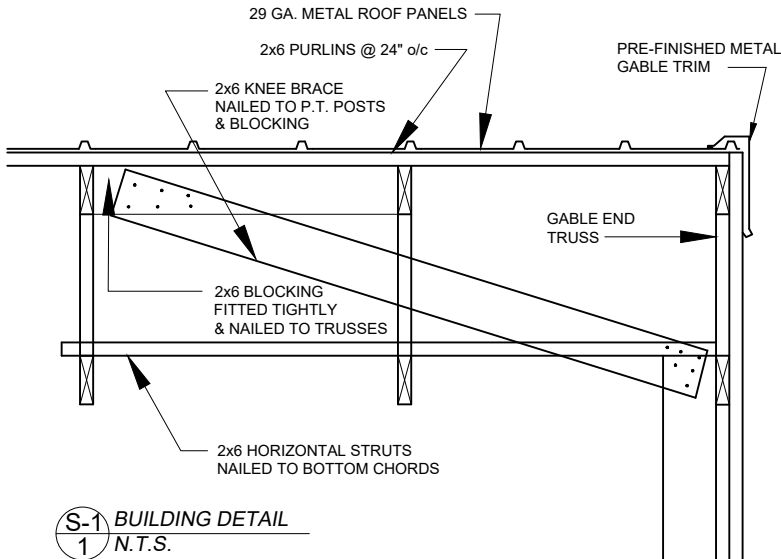
- 1. TRUSSES, COMPLETE WITH BRIDGING SYSTEM, TO BE DESIGNED IN ACCORDANCE WITH PART 4 OF THE NATIONAL BUILDING CODE OF CANADA (2010) FOR THE LOADS SHOWN ON THE DRAWINGS.











































S-2 BUILDING SECTION
1 N.T.S.



S-3 BUILDING SECTION
1 N.T.S.



| | | | |
|---|-----------|-----------|-----------------|
| △ | KH | JUL-14-22 | Elev Direction |
| △ | KH | AUG-10-22 | Slab Info added |
| △ | | | |
| REV. | BY | DATE | REMARKS |
| | | | |
| 60x80 & 60x90 Kristen John Pole Shed | | | |
| 26095 PR 227 Landfill Site RM of Portage la Prairie, MB | | | |
| DRAWN | DATE | CHECKED | DATE |
| KH | MAR-16-21 | | |
| ORDER NO. | | | SHEET |
| | | | 5 OF 5 |




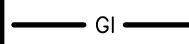
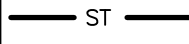
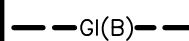
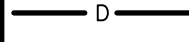
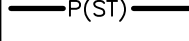
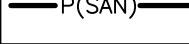
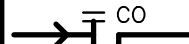
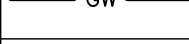

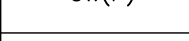
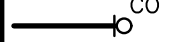
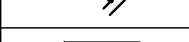
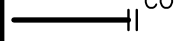
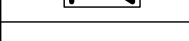
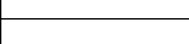
| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION |
|---|---|---|------------------------------|
|  | GATE OR ISOLATION VALVE (REFER TO SPECIFICATION) |  | PIPE GUIDE |
|  | GLOBE VALVE |  | PIPE SLEEVE |
|  | BALL VALVE |  | ANCHOR |
|  | LOCKSHIELD VALVE |  | STRAINER |
|  | FLOW BALANCING VALVE |  | UNION |
|  | PRESSURE INDEPENDENT FLOW BALANCING VALVE |  | FLANGE FITTING |
|  | PLUG VALVE |  | ECCENTRIC FITTING |
|  | PRESSURE REDUCING VALVE |  | CONCENTRIC FITTING |
|  | CHECK VALVE |  | PRESSURE GAUGE |
|  | SOLENOID VALVE |  | THERMOMETER |
|  | SAFETY RELIEF VALVE |  | PRESSURE GAUGE COCK ASSEMBLY |
|  | FLOW METERING STATION |  | THERMOMETER WELL |
|  | BACKFLOW PREVENTOR |  | EXPANSION JOINT |
|  | ANGLE VALVE |  | MANUAL AIR VENT |
|  | BUTTERFLY VALVE |  | AUTOMATIC AIR VENT |
|  | 2-WAY BUTTERFLY VALVE |  | AIR SEPARATOR |
|  | TEMPERED MIXING VALVE |  | SIGHT GLASS |
|  | FLEXIBLE JOINT |  | PUMP |
|  | VACUUM BREAKER |  | P.R.V. C/W SHUT-OFF VALVE |
|  | BACK WATER VALVE |  | WATER HAMMER ARRESTOR |

NOTE: NOT ALL SYMBOLS APPLY, REFER TO FLOOR PLANS AND DRAWINGS

| 4 VALVES AND APPURTENANCES (MSD-012.06) | | | |
|---|--|--|--|
| SYMBOL | | DESCRIPTION | |
| | SUPPLY DUCT UP OR FROM ABOVE | | ACOUSTICALLY LINED TRANSFER AIR DUCT |
| | SUPPLY DUCT DOWN OR FROM BELOW | | SILENCER |
| | RETURN OR EXHAUST DUCT UP OR FROM ABOVE | | CROSSTALK SILENCER |
| | RETURN OR EXHAUST DUCT DOWN OR FROM BELOW | | DUCT WITH MINIMUM CLEARANCE FIRE RATED ENCLOSURE |
| | ROUND DUCT UP OR FROM ABOVE | | DUCT WITH SLEEVE, INSULATION AND DAMPER |
| | ROUND DUCT DOWN OR FROM BELOW | | CAPPED CONNECTION |
| | ACOUSTIC LINED DUCT | | INSULATION DUCT |
| | FLEXIBLE CONNECTION | | RISE IN DUCT |
| | SQUARE ELBOW DUCT WITH TURNING VANE | | DROP IN DUCT |
| | RADIUS ELBOW WITH TURNING VANES | | SOUND BAFFLE |
| | AXIAL FAN/INLINE FAN MIXED FLOW OR CENTRIFUG | | PROPELLER FAN WITH PROTECTIVE SCREEN |
| | | | CENTRIFUGAL FAN (ONLY IN SCHEMATIC) |
| <p>DIFFUSER GRILLE OR REGISTER TYPE</p> <p>IMPERIAL: CFM,[INS.] METRIC: L/s,[mm]</p> <p>NECK OR FACE SIZE (MM)</p> <p>AIR FLOW (L/S)</p> <p>Diagram showing a diffuser grille with dimensions: P4, 150ø, 300.</p> | | <p>LINEAR SLOT DIFFUSER</p> <p>IMPERIAL: CFM,[INS.] METRIC: L/s,[mm]</p> <p>AIR FLOW (L/S)</p> <p>Diagram showing a linear slot diffuser with dimensions: S4, 150øx1200mm, 300.</p> <p>NECK SIZE AND LINEAR DIFFUSER LENGTH (MM)</p> | |
| | ROUND SUPPLY DIFFUSER | | LINEAR SUPPLY AIR DIFFUSER C/W FLEXIBLE DUCT |
| | DUCTED RETURN OR EXHAUST REGISTER OR GRILLE | | LIGHT TROFFER DIFFUSER TOP INLET C/W FLEXIBLE DUCT |
| | SQUARE OR RECTANGULAR DIFFUSER | | LIGHT TROFFER DIFFUSER SIDE INLET C/W FLEXIBLE DUCT |
| | NON DUCTED RETURN OR EXHAUST GRILLE | | DUCT MOUNTED SUPPLY OR RETURN GRILLE |
| | NON DUCTED ROUND RETURN OR EXHAUST GRILLE | | LINEAR SUPPLY OR RETURN GRILLE |
| | SQUARE PLAQUE DIFFUSER | | SPIN-IN CONNECTION C/W BALANCING DAMPER AND FLEX DUCT |
| | DIFFUSERS WITH BLANK-OFF PORTION (QTY SHOWN) | | SPIN-IN CONNECTION C/W BALANCING DAMPER AND RIGID DUCT |
| NOTE: NOT ALL SYMBOLS APPLY, REFER TO FLOOR PLANS AND DRAWINGS | | | |

5 AIR HANDLING SYMBOLS (MSD-012.10)

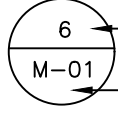
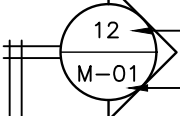


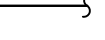
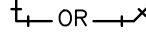

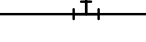
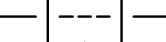
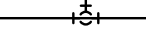
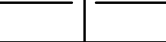
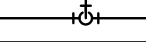
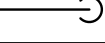
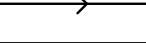




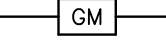
[illegible]

| <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-right: 10px;"> 2 MSD </div> <div> SANITARY AND STORM SYMBOLS AND ABBREVIATIONS (MSD-012.02) </div> </div> | | | |
|---|-------------------|---|-----------------------------------|
| SYMBOL | | SYMBOL DESCRIPTION | |
| - - - V - - - | |  | HORIZONTAL CLEANOUT ABOVE GRADE |
|  | |  | HORIZONTAL CLEANOUT BELOW GRADE |
| - - - SAN(B) - - - | |  | GREASE INTERCEPTOR ABOVE GRADE |
|  | |  | GREASE INTERCEPTOR BELOW GRADE |
| - - - ST(B) - - - | |  | INDIRECT DRAIN (CONDENSATE, ETC.) |
|  | | | |
|  | |  | RUNNING TRAP ABOVE GRADE OR FLOOR |
|  | |  | RUNNING TRAP BELOW GRADE OR FLOOR |
|  | |  | UPTURNED CLEANOUT |
|  | |  | HORIZONTAL CLEANOUT |
|  | | | |
|  | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| STV | STACK VENT | VST | VENT STACK |
| RWL | RAIN WATER LEADER | WST | WASTE STACK |
| SST | SANITARY STACK | SS | STAINLESS STEEL |
| BWV | BACKWATER VALVE | | |
| | | | |

NOTE: NOT ALL SYMBOLS APPLY, REFER TO FLOOR PLANS AND DRAWINGS

3 SANITARY AND STORM SYMBOLS AND ABBREVIATIONS
MO (MSD-012.03)

| Sheet List Table | | |
|------------------------------|---------------------------------------|-------------|
| Sheet Number | Sheet Title | Scale |
| GENERAL | | |
| M0 | DRAWING LIST & LEGENDS | N.T.S. |
| M1 | STANDARD DETAILS | N.T.S. |
| M2 | STANDARD DETAILS | N.T.S. |
| SITE PLAN | | |
| M3 | MECHANICAL SITE PLAN | 3/32"=1'-0" |
| MECHANICAL | | |
| M4 | MECHANICAL FLOOR PLAN | 1/8"=1'-0" |
| SCHEDULES AND SPECIFICATIONS | | |
| M5 | MECHANICAL SCHEDULES & SPECIFICATIONS | N.T.S. |
| M6 | MECHANICAL SPECIFICATIONS | N.T.S. |
| M7 | MECHANICAL SPECIFICATIONS | N.T.S. |

| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION |
|---|--|---|----------------------------------|
|  | DETAIL NUMBER DRAWING NUMBER |  | SECTION NUMBER DRAWING NUMBER |
|  | REVISION NUMBER |  | REVISION BUBBLE |
| | | | |
| R.I.O. | ROUGH IN ONLY | N.O. | NORMALLY OPEN |
| R.I.C. | ROUGH IN AND CONNECT | N.C. | NORMALLY CLOSED |
| A/D | ACCESS DOOR | S.S. | STAINLESS STEEL |
| | | | |
|  | PIPING SERVICE CONTINUES |  | ELBOWS |
|  | REFER TO STANDARD DETAIL DRAWINGS FOR ADDITIONAL REQUIREMENTS OF EQUIPMENT NOTED |  | TEE |
|  | EQUIPMENT/PIPING/DUCTWORK SHOWN DASHED BELOW |  | BRANCH OFF BOTTOM OF MAIN |
|  | PIPING INTERSECTS PIPING BELOW |  | BRANCH OFF TOP OF MAIN |
|  | PIPE DROP OR FROM BELOW |  | DIRECTION OF FLOW |
|  | PIPE UP OR FROM ABOVE | CTE | CONNECT TO EXISTING |
|  | CAPPED CONNECTION | EX.  NEW | CONNECT TO EXISTING |
| | | | |
| | | | |
|  | THRUST BLOCK | | |
|  | GAS METER | | |
| | | | |

NOTE: NOT ALL SYMBOLS APPLY, REFER TO FLOOR PLANS AND DRAWINGS

| | |
|--|--|
|  | Smith + Andersen |
| 2031 Portage Avenue 2nd Floor Winnipeg Manitoba R3J 0K6 204 985 9568 smithandandersen.com | |
| ENGINEER'S SEAL: | |
|  Certificate of Authorization SMITH + ANDERSEN No. 5990 |  |

6137262 MANITOBA LTD.
ARTHUR CONSULTING
PROJECT MANAGEMENT-ENGINEERING DESIGN
JOHN W. ARTHUR, P.ENG.
1-1660 KENASTON BLVD. PO BOX 70050
WINNIPEG MANITOBA R3P 0X6
CELL #1: 204-998-9898 CELL #2: 204 296-3499
FAX NO: 204 736-2380
EMAIL: arthur_consulting@mymts.net

GENERAL NOTES:

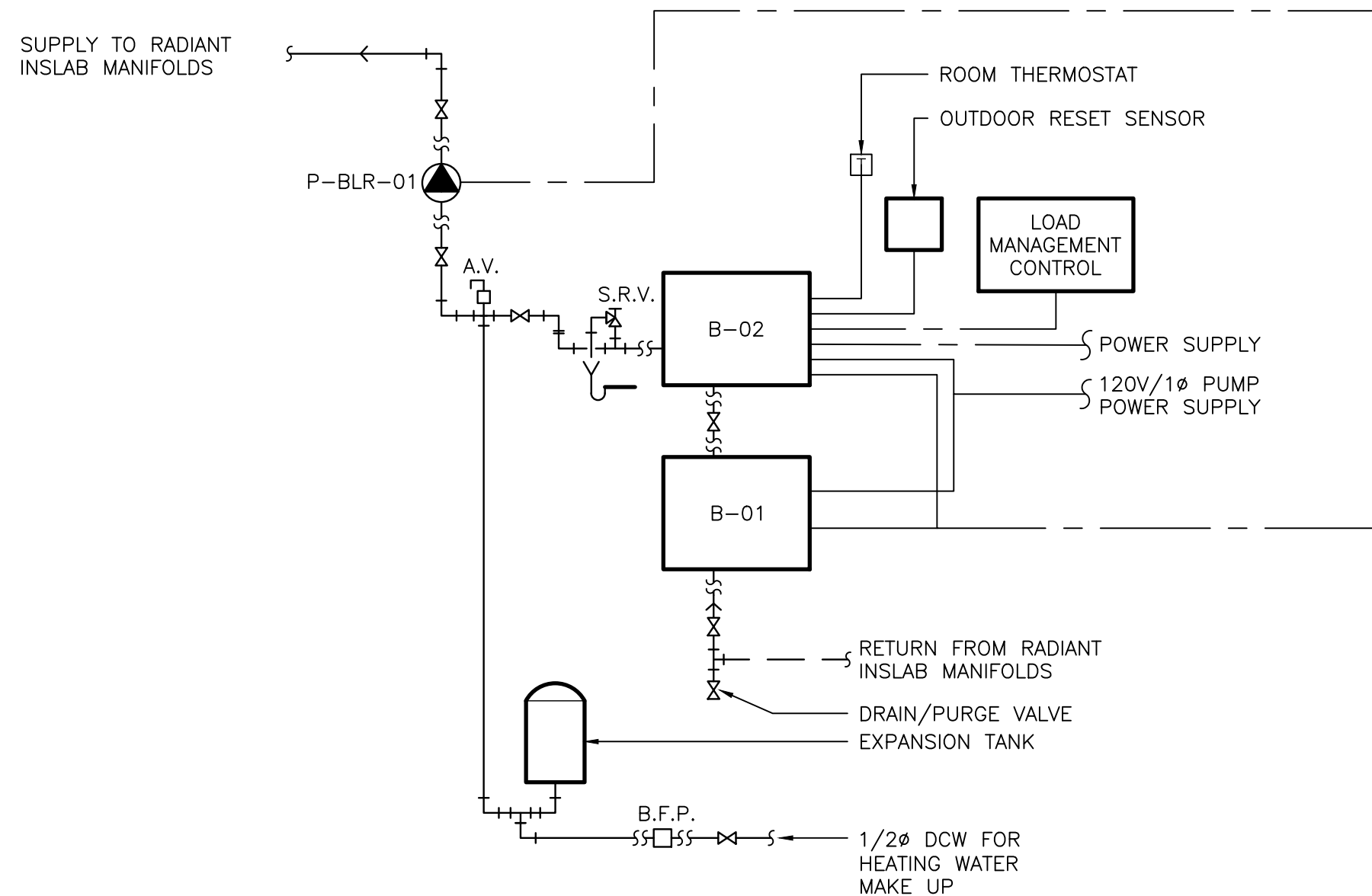
ALL DRAWINGS ARE THE EXCLUSIVE PROPERTY OF JOHN ARTHUR CONSULTING (6137262 MANITOBA LTD.) AND SHALL NOT BE REPRODUCED OR DISTRIBUTED WITHOUT WRITTEN PERMISSION OF JOHN ARTHUR CONSULTING.

NO MODIFICATIONS SHALL BE CARRIED OUT WITHOUT PRIOR WRITTEN APPROVAL OF JOHN ARTHUR CONSULTING.

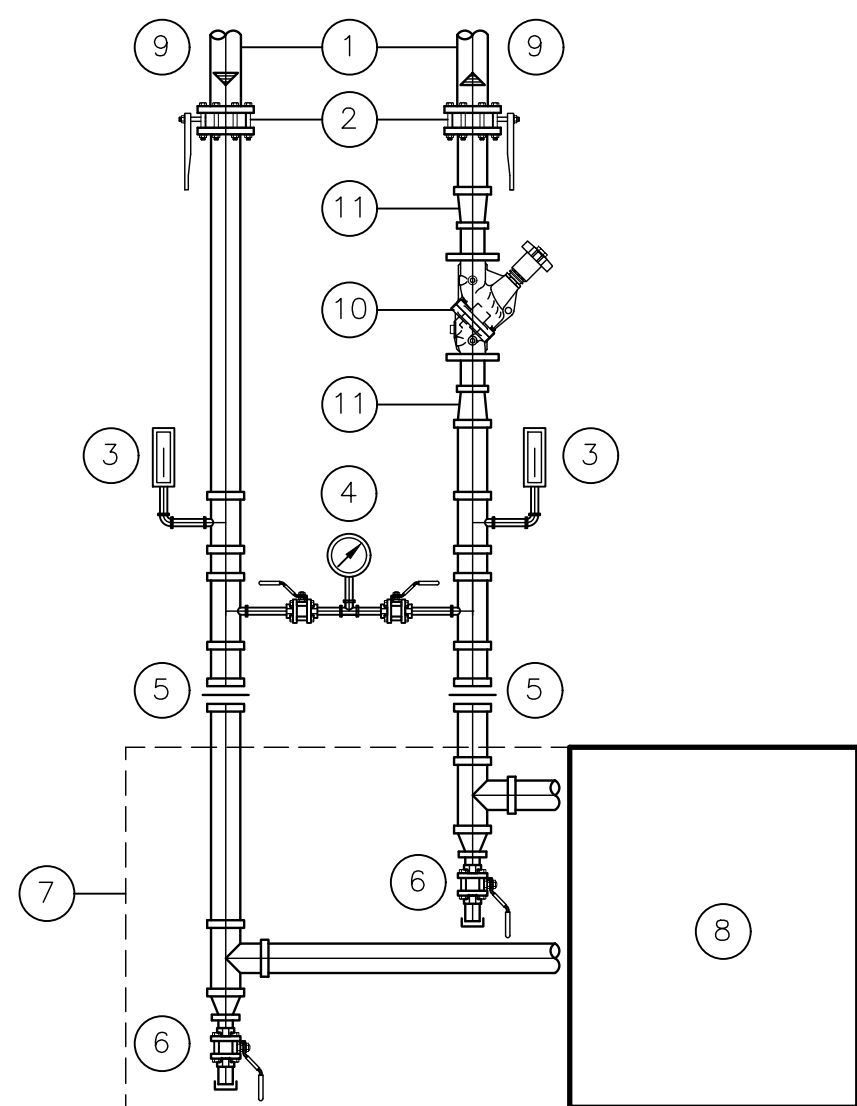
GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND PERTINENT INFORMATION ON SITE AND NOTIFY JOHN ARTHUR CONSULTING OF ANY DISCREPANCIES.

| | | | |
|---|---------------------|-------------------------|-----------|
| PROJECT TITLE & LOCATION: | | | |
| 26095 PR 227 Landfill Site, RM of Portage La Prairie, MB | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| 1 | 18JUN21 | ISSUED FOR CONSTRUCTION | M |
| NO. | DDMMYY | DESCRIPTION | BY |
| R E V I S I O N | | | |
| SHEET TITLE: | | | REV. NO.: |
| DRAWING LIST & LEGENDS | | | |
| DESIGN BY: MK | SCALE: N.T.S. | SHEET NO.: | |
| DRAWN BY: MM | DATE: Jun 2021 | MO | |
| CHECKED BY: KS | PROJ.NO.: 21246.001 | | |

| | |
|----------------|---------------------|
| CHECKED BY: KS | PROJ.NO.: 21246.001 |
|----------------|---------------------|

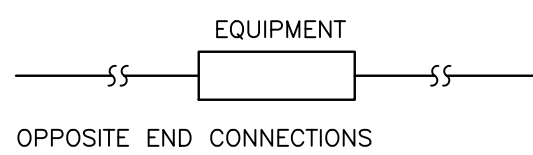
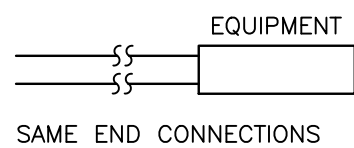


3 HEATING WATER SCHEMATIC



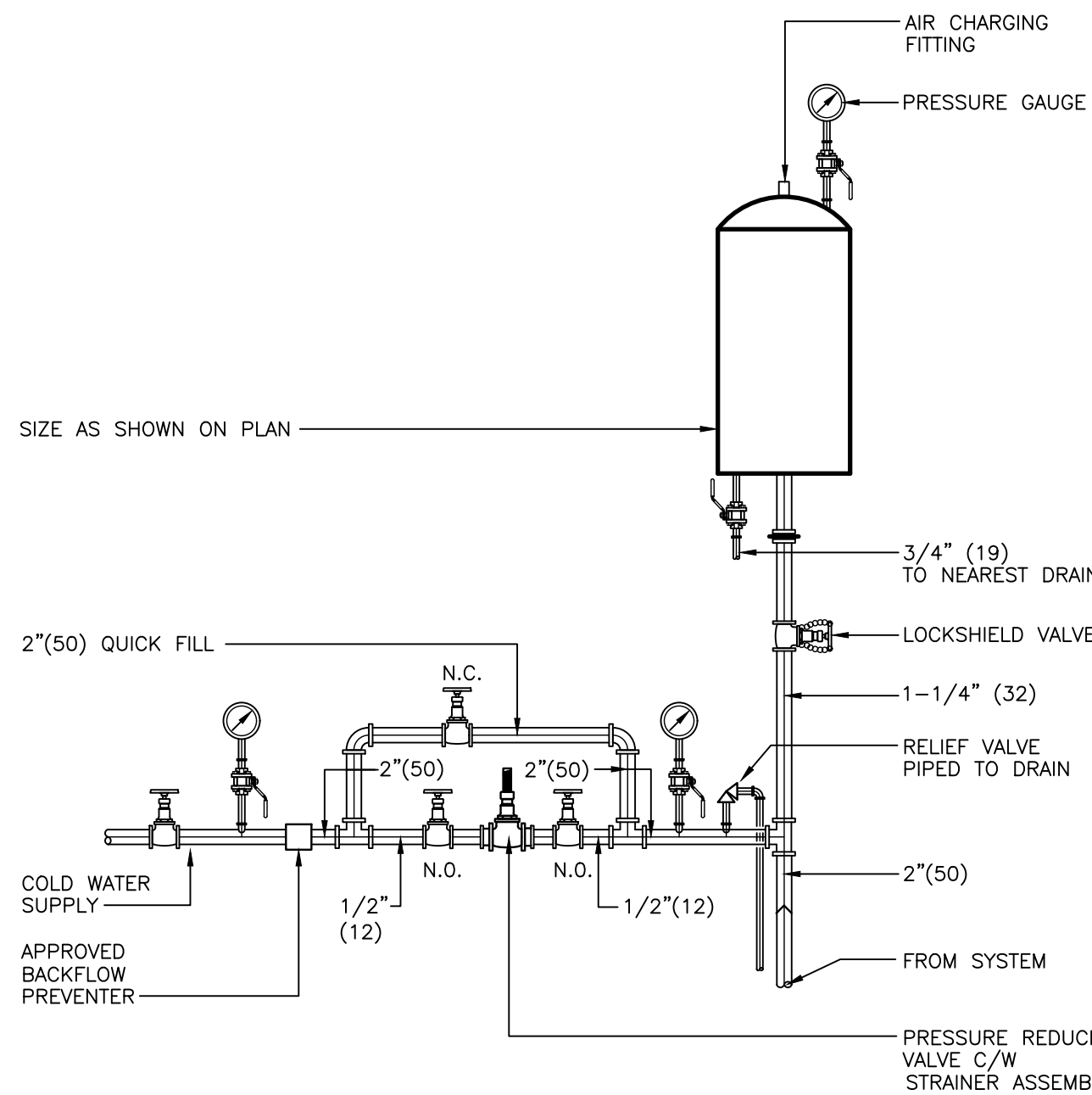
NOTES:

1. PIPE SIZES AS SHOWN ON PLANS.
2. SHUT-OFF VALVES.
3. THERMOMETER.
4. PRESSURE GAUGE.
5. UNIONS OR FLANGES LOCATED CLEAR OF SERVICE SPACE AND TUBE REMOVAL.
6. DRAIN LEG AND VALVE
7. TUBE REMOVAL AND SERVICE SPACE WHERE REQUIRED.
8. MECHANICAL EQUIPMENT REQUIRING SERVICE.
9. REFER TO SEPARATE MSD FOR CONTROL VALVE INSTALLATION DETAILS WHERE APPLICABLE.
10. FLOW BALANCING VALVE. REFER TO MSD- FOR INSTALLATION DETAILS.
11. CONCENTRIC FITTINGS.

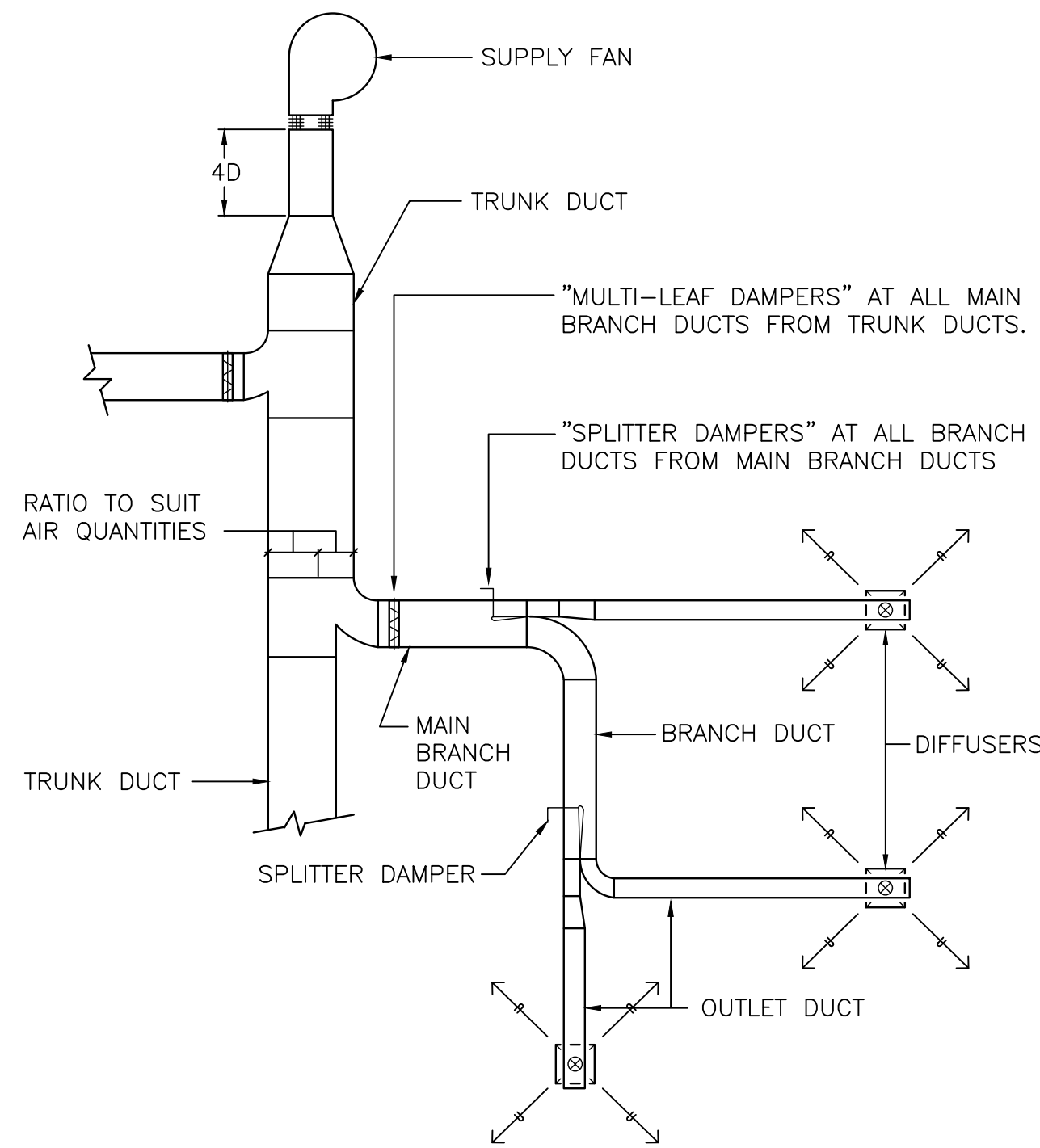


DRAWING SYMBOL

5 EQUIPMENT INSTALLATION



4 DIAPHRAM EXPANSION TANK PIPING SCHEMATIC

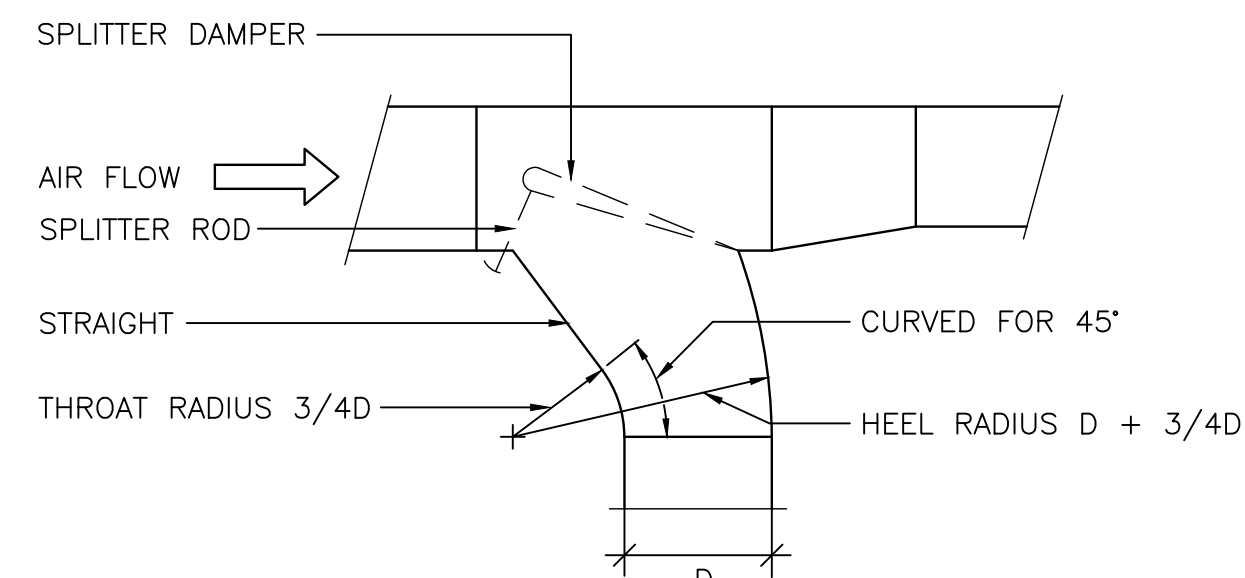


RETURN AND EXHAUST SYSTEMS TO BE AS SUPPLY SYSTEM SHOWN EXCEPT ALL SPLITTER DAMPERS TO BE REPLACED BY MULTI-LEAF VOLUME CONTROL DAMPERS IN BRANCH DUCTS

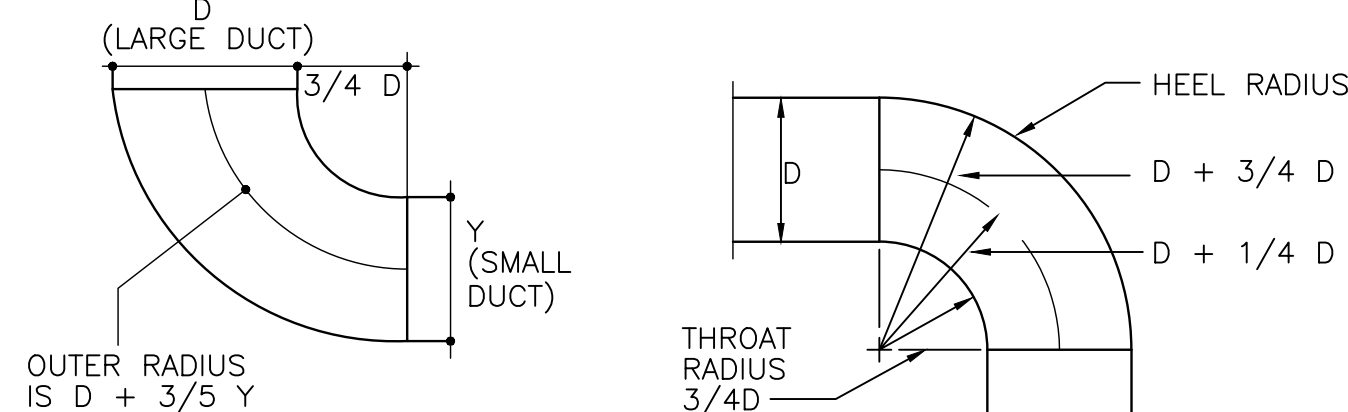
DEFINITIONS

- TRUNK DUCT:--SERVING TWO OR MORE MAIN BRANCH DUCTS
MAIN BRANCH DUCT:--SERVING TWO OR MORE BRANCH DUCTS
BRANCH DUCTS:--SERVING TWO OR MORE DIFFUSERS
OUTLET DUCTS:--SERVING ONE DIFFUSER

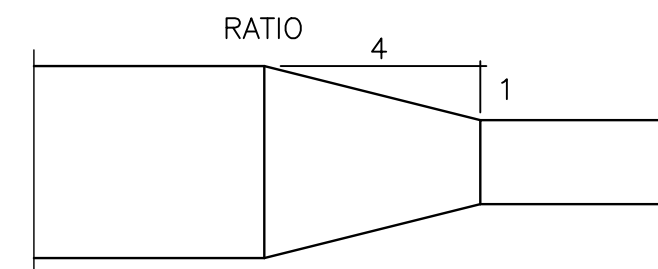
1 BALANCING DAMPERS



SINGLE TAKE - OFF



FULL RADIUS ELBOW
FOR HORIZONTAL



TRANSFORMATION

2 DUCT DETAILS



Smith + Andersen

2031 Portage Avenue 2nd Floor Winnipeg Manitoba R3J 0K6
204 885 6666 smithandanderson.com

ENGINEER'S SEAL:

APECM
Certificate of Authorization
SMITH + ANDERSEN
No. 5990



6137262 MANITOBA LTD.
ARTHUR CONSULTING
PROJECT MANAGEMENT-ENGINEERING DESIGN
JOHN W. ARTHUR, P.ENG.
1-1660 KENASTON BLVD. PO BOX 70050
WINNIPEG MANITOBA R3P 0X6
CELL #1: 204 998-9898 CELL #2: 204 296-3499
FAX NO: 204 736-2390
EMAIL: arthur_consulting@mymts.net

GENERAL NOTES:

ALL DRAWINGS ARE THE EXCLUSIVE PROPERTY OF JOHN ARTHUR CONSULTING (6137262 MANITOBA LTD.) AND SHALL NOT BE REPRODUCED OR DISTRIBUTED WITHOUT WRITTEN PERMISSION OF JOHN ARTHUR CONSULTING.
NO MODIFICATIONS SHALL BE CARRIED OUT WITHOUT PRIOR WRITTEN APPROVAL OF JOHN ARTHUR CONSULTING
GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND PERTINENT INFORMATION ON SITE AND NOTIFY JOHN ARTHUR CONSULTING OF ANY DISCREPANCIES.

PROJECT TITLE & LOCATION:

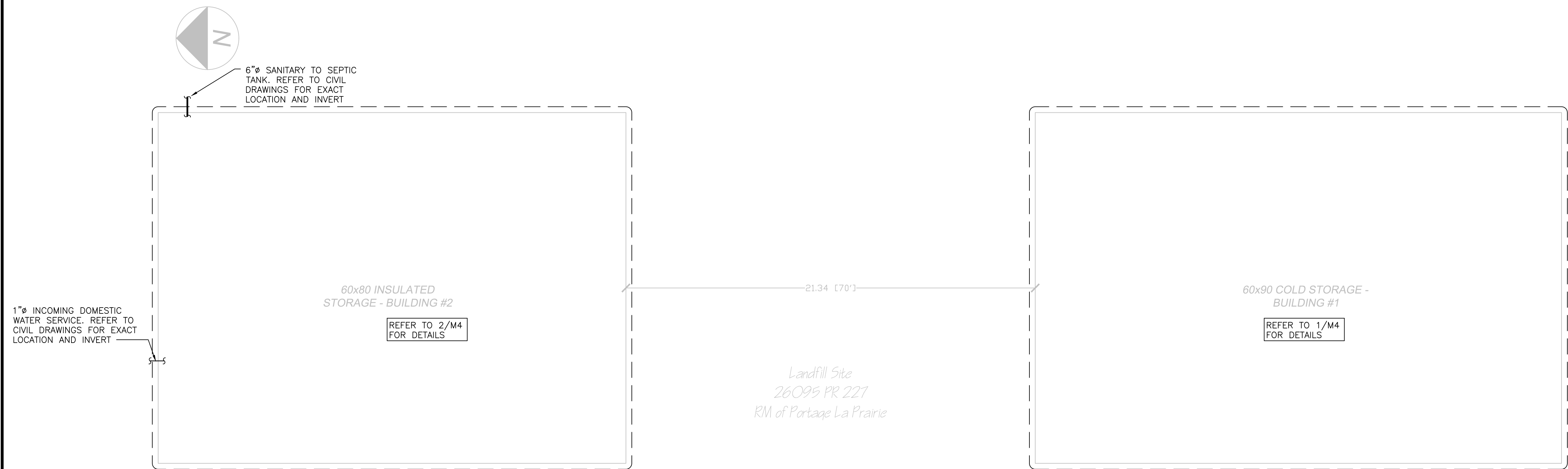
**26095 PR 227 Landfill Site, RM
of Portage La Prairie, MB**

| | | | |
|--|--|--|--|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| 1 | 18JUN21 | ISSUED FOR CONSTRUCTION | MK |
|-----|---------|-------------------------|----|
| NO. | DDMMYY | DESCRIPTION | BY |

REVISION

| | | |
|------------------|---------------------|------------|
| SHEET TITLE: | | REV. NO.: |
| STANDARD DETAILS | | |
| DESIGN BY: MK | SCALE: N.T.S. | SHEET NO.: |
| DRAWN BY: MM | DATE: Jun 2021 | M2 |
| CHECKED BY: KS | PROJ.NO.: 21246.001 | |



GENERAL NOTES:


- DO NOT SCALE DRAWINGS. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR SPECIFIED THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE. DETERMINE THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS BASED ON SITE CONDITIONS. REVIEW ALL REVISIONS WITH THE CONSULTANT.
- READ FLOOR PLANS IN CONJUNCTION WITH SCHEMATICS. ASSUME INFORMATION SHOWN ON FLOOR PLANS TO BE APPLICABLE TO THE RELATED SYSTEM SCHEMATIC AND VICE-VERSA TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
- VERIFY STRUCTURAL INTEGRITY OF ALL TEMPORARY AND PERMANENT OPENINGS. PROVIDE ADDITIONAL FRAMING TO ENSURE STRUCTURAL INTEGRITY AS REQUIRED.
- REFER TO THE STANDARD DETAILS AND DETAIL SHEETS FOR ADDITIONAL INFORMATION.

SITE PLAN NOTES:

- CONFIRM ALL INVERT ELEVATIONS AND REPORT ANY DISCREPANCIES PRIOR TO COMMENCING WITH THE WORK.
- DEMARCATION POINT BETWEEN ALL PLUMBING AND DRAINAGE SITE SERVICES CONTRACT AND THE MECHANICAL CONTRACT IS 1500MM (60 IN.) FROM THE BUILDING PERIMETER. PROVIDE ALL SERVICES WITHIN COURTYARDS AND SODDED OR PAVED AREAS WITHIN THE BUILDING FOUNDATION WALL. ALL FINAL CONNECTIONS SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.
- MAINTAIN A MINIMUM OF 1800MM (72 IN.) OF GROUND COVER OVER ALL EXTERIOR WATER SERVICES AND 1200MM (48 IN.) OVER EXTERIOR SEWERS.
- COORDINATE MECHANICAL SITE SERVICES, PIPING, AND EQUIPMENT WITH ALL OTHER DIVISIONS.


Smith + Andersen
2031 Portage Avenue 2nd Floor Winnipeg Manitoba R3J 0K6
204 885 6666 smithandanderson.com

ENGINEER'S SEAL:


Certificate of Authorization
SMITH + ANDERSEN
No. 5990



6137262 MANITOBA LTD.
ARTHUR CONSULTING
PROJECT MANAGEMENT-ENGINEERING DESIGN
JOHN W. ARTHUR, P.ENG.
1-1660 KENASTON BLVD. PO BOX 70050
WINNIPEG MANITOBA R3P 0X6
CELL #1: 204 998-9898 CELL #2: 204 296-3499
FAX NO: 204 736-2390
EMAIL: arthur_consulting@mymts.net

GENERAL NOTES:

ALL DRAWINGS ARE THE EXCLUSIVE PROPERTY OF JOHN ARTHUR CONSULTING (6137262 MANITOBA LTD.) AND SHALL NOT BE REPRODUCED OR DISTRIBUTED WITHOUT WRITTEN PERMISSION OF JOHN ARTHUR CONSULTING.
NO MODIFICATIONS SHALL BE CARRIED OUT WITHOUT PRIOR WRITTEN APPROVAL OF JOHN ARTHUR CONSULTING
GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND PERTINENT INFORMATION ON SITE AND NOTIFY JOHN ARTHUR CONSULTING OF ANY DISCREPANCIES.

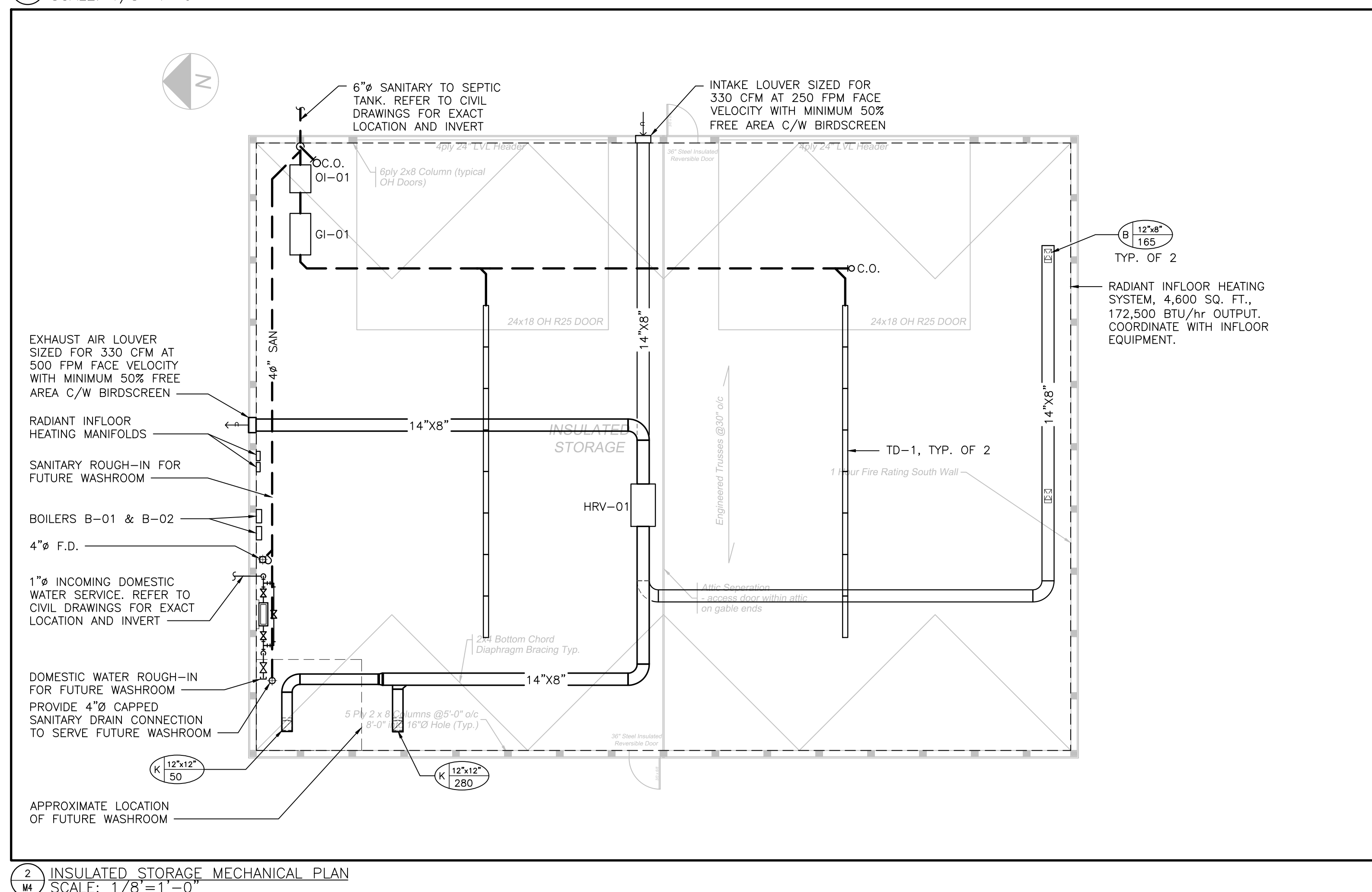
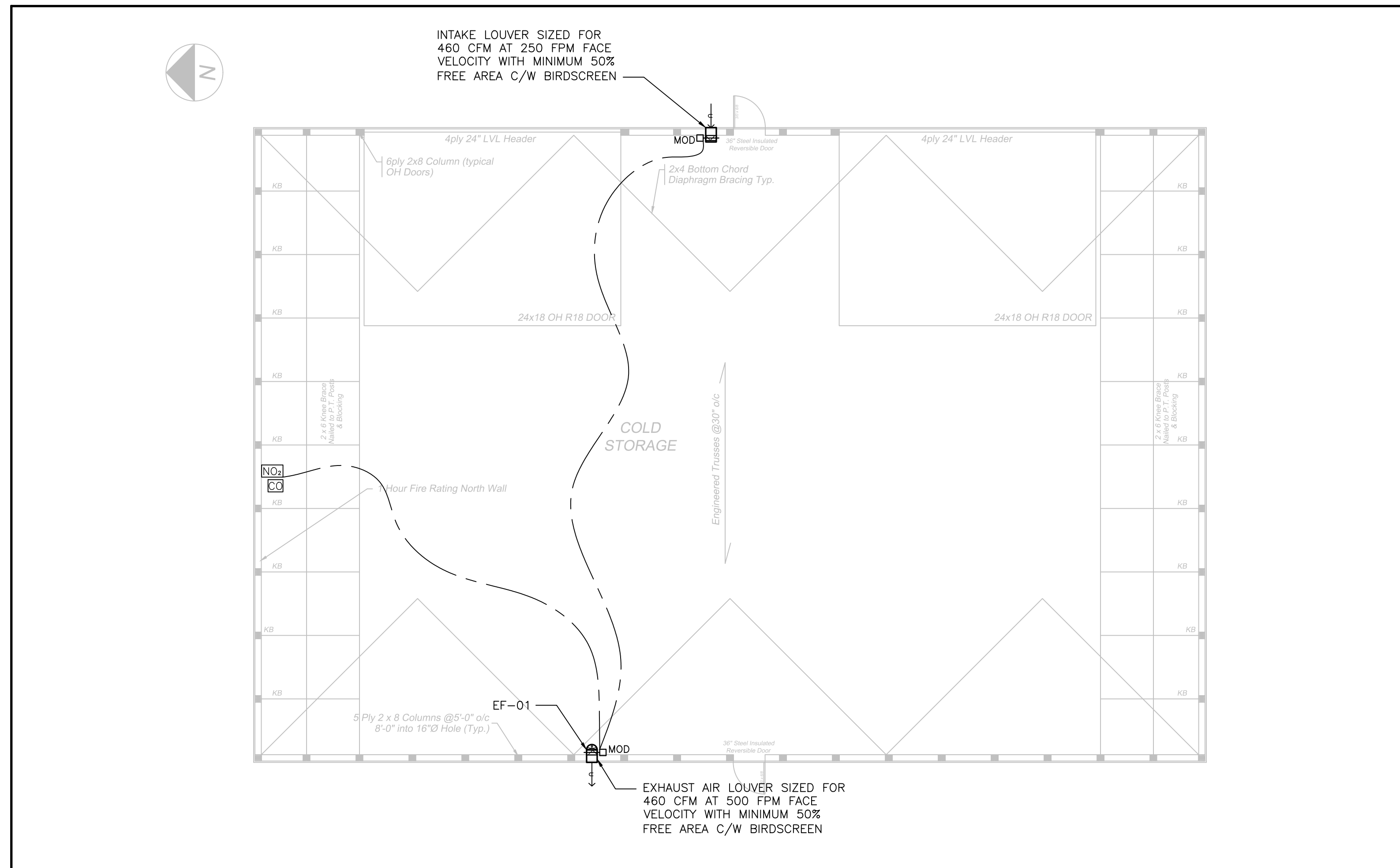
PROJECT TITLE & LOCATION:

**26095 PR 227 Landfill Site, RM
of Portage La Prairie, MB**

| | | | |
|-----|---------|-------------------------|----|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| 1 | 18JUN21 | ISSUED FOR CONSTRUCTION | MK |
| NO. | DDMMYY | DESCRIPTION | BY |

REVISION

| | | |
|---|---------------------|----------------------------|
| SHEET TITLE: MECHANICAL SITE PLAN | | REV. NO.: M3 |
| DESIGN BY: MK | SCALE: 3/32"=1'-0" | SHEET NO.: M3 |
| DRAWN BY: MM | DATE: Jun 2021 | |
| CHECKED BY: KS | PROJ.NO.: 21246.001 | |



GENERAL NOTES:

1. DO NOT SCALE DRAWINGS. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR SPECIFIED THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE. DETERMINE THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS BASED ON SITE CONDITIONS. REVIEW ALL REVISIONS WITH THE CONSULTANT.
2. READ FLOOR PLANS IN CONJUNCTION WITH SCHEMATICS. ASSUME INFORMATION SHOWN ON FLOOR PLANS TO BE APPLICABLE TO THE RELATED SYSTEM SCHEMATIC AND VICE-VERSA TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
3. VERIFY STRUCTURAL INTEGRITY OF ALL TEMPORARY AND PERMANENT OPENINGS. PROVIDE ADDITIONAL FRAMING TO ENSURE STRUCTURAL INTEGRITY AS REQUIRED.
4. REFER TO THE STANDARD DETAILS AND DETAIL SHEETS FOR ADDITIONAL INFORMATION.

PLUMBING AND DRAINAGE NOTES:

1. PROVIDE MINIMUM 75MM (3 IN.) FOR UNDER GROUND SANITARY DRAINAGE UNLESS INDICATED OTHERWISE.
2. PROVIDE APPROVED BACK FLOW PREVENTION FOR ALL TRAP PRIMER SYSTEMS.
3. PROVIDE MINIMUM 19MM (3/4 IN.) DOMESTIC COLD WATER AND DOMESTIC HOT WATER PIPES UNLESS INDICATED OTHERWISE.
4. INSTALL ALL PIPING OVERHEAD, TIGHT TO UNDERSIDE OF THE STRUCTURE WITH SUFFICIENT ROOM FOR INSULATION UNLESS INDICATED OTHERWISE. ROUTE PIPING WITHIN STRUCTURAL STEEL STRATA OR THROUGH CONCRETE BEAMS WHERE PRACTICAL.
5. HEAT TRACE THE ENTIRE SERVICE TO BE PROTECTED FROM FREEZING IN ALL AREAS INDICATED ON THE DRAWINGS AND NOTED IN THE SPECIFICATIONS. PROVIDE HEAT TRACING TO ACCOMMODATE ALTERATIONS IN THE PIPE LAYOUT DUE TO INTERFERENCES OR OTHER INSTALLATION REQUIREMENTS. CONNECT HEAT TRACING CIRCUIT TO THE ELECTRICAL POWER LOCATIONS INDICATED ON THE DRAWINGS OR THE NEAREST CIRCUIT AVAILABLE. COORDINATE WITH ELECTRICAL DIVISION.
6. PROVIDE SHUT-OFF VALVES ON ALL MAIN RISERS AND AT EACH CONNECTION TO EQUIPMENT.
7. PROVIDE COMPLETE VENTING SYSTEMS IN ACCORDANCE WITH THE PLUMBING OR BUILDING CODE.
8. HEAT TRACE ALL PIPING WITHIN UNHEATED SPACES SUCH AS PARKING LEVELS, SOFFITS AND WITHIN WALLS WHERE FREEZING MAY OCCUR.

HVAC NOTES:

1. PROVIDE ALL DUCTWORK DOWNSTREAM OF TERMINAL EQUIPMENT (I.E. FAN COILS, HEAT PUMPS, V.A.V. BOXES AND FAN POWERED BOXES) EQUAL TO THE EQUIPMENT OUTLET SIZE (MINIMUM) OR LARGER AS INDICATED. WHERE OUTLET SIZES ARE ODD SIZES, INCREASE THE DUCT SIZE UP TO THE NEAREST EVEN SIZE ((I.E. PROVIDE 356mm (14 IN.) FOR 318mm (12.5 IN.) OR 330mm (13 IN.) OUTLET). PROVIDE TRANSITION DUCTS AS REQUIRED.
2. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF GRILLES AND DIFFUSERS. REQUEST CLARIFICATION FOR ANY DIFFUSER OR GRILLE WITH MORE THAN A 600mm (24 IN.) DISCREPANCY IN LOCATION.
3. TEMPERATURE SENSORS ARE LOCATED TO AID IN PRICING ONLY AND ALL REQUIRED SENSORS MAY NOT BE SHOWN (REFER TO SPECIFICATIONS). COORDINATE FINAL LOCATION WITH THE ARCHITECT WITHIN 1000MM (40 IN.) OF LOCATION SHOWN. REVIEW ALL RELOCATIONS OUTSIDE OF THIS RANGE WITH THE CONSULTANT.
4. INSTALL TEMPERATURE SENSORS AT NOMINALLY 1200MM (48 IN.) ABOVE THE FINISHED FLOOR UNLESS INDICATED OTHERWISE.
5. PROVIDE DIFFUSER DUCT RUN-OUTS THE SAME SIZE AS THE DIFFUSER INLETS UNLESS INDICATED OTHERWISE.
6. INSTALL ALL PIPING OVERHEAD, TIGHT TO UNDERSIDE OF THE STRUCTURE WITH SUFFICIENT ROOM FOR INSULATION UNLESS INDICATED OTHERWISE. ROUTE PIPING WITHIN STRUCTURAL STEEL STRATA OR THROUGH CONCRETE BEAMS WHERE PRACTICAL.
7. VERIFY STRUCTURAL INTEGRITY OF ALL TEMPORARY AND PERMANENT OPENINGS. PROVIDE ADDITIONAL FRAMING TO ENSURE STRUCTURAL INTEGRITY AS REQUIRED.
8. PROVIDE ALL OPEN ENDED DUCTWORK COMPLETE WITH WIRE MESH.
9. PROVIDE DISCHARGE DUCTWORK FOR EXHAUST FANS EQUAL TO THE DISCHARGE OF THE FAN AS A MINIMUM OR LARGER AS INDICATED. TRANSITION AS REQUIRED FOR LARGER DUCTS.

SPRINKLER NOTES:

1. PROVIDE FIRE EXTINGUISHERS THROUGHOUT THE SPACE IN ACCORDANCE WITH NFPA 10 REQUIREMENTS.



Smith + Andersen

2031 Portage Avenue 2nd Floor Winnipeg Manitoba R3J 0K6
204 885 6668 smithandandersen.com

ENGINEER'S SEAL:



Certificate of Authorization
SMITH + ANDERSEN
No. 5990



6137262 MANITOBA LTD.
ARTHUR CONSULTING
PROJECT MANAGEMENT-ENGINEERING DESIGN
JOHN W. ARTHUR, P.ENG.
1-1660 KENASTON BLVD, PO BOX 70050
WINNIPEG MANITOBA R3P 0X6
CELL #1: 204 998-9898 CELL #2: 204 296-3499
FAX NO: 204 736-2380
EMAIL: arthur_consulting@mymts.net

GENERAL NOTES:

ALL DRAWINGS ARE THE EXCLUSIVE PROPERTY OF JOHN ARTHUR CONSULTING (6137262 MANITOBA LTD.) AND SHALL NOT BE REPRODUCED OR DISTRIBUTED WITHOUT WRITTEN PERMISSION OF JOHN ARTHUR CONSULTING.

NO MODIFICATIONS SHALL BE CARRIED OUT WITHOUT PRIOR WRITTEN APPROVAL OF JOHN ARTHUR CONSULTING
GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND PERTINENT INFORMATION ON SITE AND NOTIFY JOHN ARTHUR CONSULTING OF ANY DISCREPANCIES.

PROJECT TITLE & LOCATION:

**26095 PR 227 Landfill Site, RM
of Portage La Prairie, MB**

| | | | |
|--|--|--|--|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| | | | |
|-----|---------|-------------------------|----|
| 1 | 18JUN21 | ISSUED FOR CONSTRUCTION | MK |
| NO. | DDMMYY | DESCRIPTION | BY |

R E V I S I O N

SHEET TITLE:

MECHANICAL FLOOR PLAN

REV. NO.:

DESIGN BY: MK

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

SHEET NO.:

DRAWN BY: MM

DATE: Jun 2021

M4

CHECKED BY: KS

PROJ.NO.: 21246.001

1. GENERAL

[illegible]

| ASHRAE 62.1-2010 OUTSIDE AIR CALCULATION | | | | | | |
|--|--------------|------------|------|----|-------|-------------------|
| ZONE # | CATEGORY | OCCUPANT # | AREA | Rp | Rz | OUTSIDE AIR (CFM) |
| COLD STORAGE | OCC. STORAGE | 9 | 4600 | 5 | 0.06 | 321 |
| INS. STORAGE | OCC. STORAGE | 9 | 4600 | 5 | 0.06 | 321 |
| | | | | | TOTAL | 642 |

1 ASHRAE 62.1 CALCULATION

| EQUIPMENT NO. | | HRV-01 | | |
|-------------------|---------------------|---|------|-------|
| System | | VENTILATION | | |
| Location | | INSULATED STORAGE | | |
| Service | | OUTSIDE AIR/EXHAUST | | |
| | | | | |
| Airflow Rate | cfm | L/s | 330 | 156 |
| Width | in | mm | | |
| Height | in | mm | | |
| Area | ft ² | m ² | | |
| Face velocity | fpm | m/s | | |
| | | | | |
| Air Pressure Drop | In H ₂ O | Pa | 0.50 | 124.4 |
| | | | | |
| Make | | LIFEBREATH | | |
| Model | | 350DCS | | |
| Remarks | | C/W CONTROLS, DUCT HEATER W/ ELECTRONIC SCR THERMOSTAT (10 kW, 8") | | |
| | | | | |
| | | | | |

5 HEAT RECOVERY VENTILATOR SCHEDULE

| EQUIPMENT NO. | | P-BLR-01 | |
|---------------------------|----------|----------------|-------------|
| System | | RADIANT FLOOR | |
| Location | | NEAR BOILERS | |
| Service | | HWS | |
| Fluid | | WATER | |
| Fluid Flow | USgpm | L/min | 18 68 |
| Head | ft H2O | kPa | 15.00 44.76 |
| Brake | hp | kW | -- |
| Motor | hp | kW | -- |
| RPM | | | |
| Make | | BELL & GOSSETT | |
| Model | | NRF-36 | |
| Variable Frequency Drives | Yes / No | NO | |
| Pump Efficiency | % | | |
| Remarks | | 120/1/60 | |

6 PUMP SCHEDULE

| | | | | | |
|--|--------------------------|--------|-----|-----------|------|
| | EQUIPMENT NO. | | | EF-01 | |
| | | | | | |
| | | | | | |
| | System | | | EXHAUST | |
| | Location | | | WAREHOUSE | |
| | Service | | | | |
| | | | | | |
| | | | | | |
| | Airflow Rate | cfm | L/s | 460 | 217 |
| | External Static Pressure | In H2O | Pa | 0.1 | 31 |
| | Total Static Pressure | In H2O | Pa | | -- |
| | Brake | hp | kW | | -- |
| | Motor | hp | kW | 1/20 | 0.04 |
| | | | | | |
| | Make | | | CANARM | |
| | Model | | | S10-B2 | |
| | Type | | | WALLMOUNT | |
| | Size | | | | |
| | RPM | | | 1300 | |
| | Variable Inlet Vanes | Yes/No | | NO | |
| | Variable Frequency Drive | Yes/No | | NO | |
| | Remarks | | | 115/1/60 | |

4 FAN SCHEDULE

| EQUIPMENT NO. | | B-01,02 | |
|----------------------------|------------------|----------------|------|
| Make | | THERMOLEC | |
| Model | | B-27 | |
| Output | MBH | 92 | 124 |
| Working Pressure | psig kPa | 60 | 414 |
| Entering Water Temperature | °F °C | 104.0 | 40.0 |
| Leaving Water Temperature | °F °C | 124.0 | 51.1 |
| FUEL | | | |
| Gas Pressure | psig kPa | | -- |
| No. 2 Oil | USgpm L/min | | -- |
| Motor | hp kW | | -- |
| Equipment Weight | Lbs kg | | -- |
| Remarks | | c/w PUMP | |
| | | EXPANSION TANK | |
| | | SCR TEMP | |
| | | CONTROLS, ETC. | |

BOILER SCHEDULE

| EQUIPMENT NO. | | DHW#-01 | |
|----------------------------|-------|--------------------|------------|
| Make | | AO SMITH | |
| Model | | DEL-6 | |
| Size | | | |
| | | | |
| Storage Capacity | USgal | L | 6 23 |
| Recovery @ 100°F Rise | GPH | L | 6.0 2 |
| | | | |
| Entering Water Temperature | °F | °C | 40.0 4.4 |
| Leaving Water Temperature | °F | °C | 140.0 60.0 |
| | | | |
| Gas Pressure | psig | kPa | -- |
| Steam Pressure | psig | kPa | -- |
| Steam Flow Rate | Lb/hr | Kg/hr | -- |
| | | | |
| ELECTRICAL DATA | | | |
| Number of Elements | | 1.0 | |
| Max kW per Element | KW | 1.5 | |
| Total kW | KW | 1.5 | |
| Volt/Phase/Cycle | | 115/1/60 | |
| Motor | hp | kW | -- |
| Remarks | | c/w EXPANSION TANK | |

DOMESTIC HOT WATER HEATER SCHEDULE

| EQUIPMENT NO. | | | EF-01 | |
|--------------------------|--------|-----|-----------|------|
| | | | | |
| System | | | EXHAUST | |
| Location | | | WAREHOUSE | |
| Service | | | | |
| | | | | |
| Airflow Rate | cfm | L/s | 460 | 217 |
| External Static Pressure | In H2O | Pa | 0.1 | 31 |
| Total Static Pressure | In H2O | Pa | | -- |
| Brake | hp | kW | | -- |
| Motor | hp | kW | 1/20 | 0.04 |
| | | | | |
| Make | | | CANARM | |
| Model | | | S10-B2 | |
| Type | | | WALLMOUNT | |
| Size | | | | |
| RPM | | | 1300 | |
| Variable Inlet Vanes | Yes/No | | NO | |
| Variable Frequency Drive | Yes/No | | NO | |
| Remarks | | | 115/160 | |

FAN SCHEDULE



Smith + Andersen

2031 Portage Avenue 2nd Floor Winnipeg Manitoba R3J 0K
204 885 6668 smithandandersen.com

ENGINEER'S SEAL



Certificate of Authorization
SMITH + ANDERSEN
No. 5990



6137262 MANITOBA LTD.
ARTHUR CONSULTING
 PROJECT MANAGEMENT-ENGINEERING DESIGN
JOHN W. ARTHUR, P.ENG.
 1-1660 KENASTON BLVD. PO BOX 70050
 WINNIPEG MANITOBA R3P 0X6
 CELL #1: 204 998-9898 CELL #2: 204 296-3499
 FAX NO: 204 736-2380
 EMAIL: arthur_consulting@mymts.net

GENERAL NOTES:

ALL DRAWINGS ARE THE EXCLUSIVE PROPERTY OF JOHN ARTHUR CONSULTING (6137262 MANITOBA LTD.) AND SHALL NOT BE REPRODUCED OR DISTRIBUTED WITHOUT WRITTEN PERMISSION OF JOHN ARTHUR CONSULTING.

GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND PERTINENT INFORMATION ON SITE AND NOTIFY JOHN ARTHUR CONSULTING OF ANY DISCREPANCIES.

PROJECT TITLE & LOCATION:

**26095 PR 227 Landfill Site, RM
of Portage La Prairie, MB**

[illegible]

REVISION

SHEET TITLE:
MECHANICAL SCHEDULES
& SPECIFICATIONS

| | |
|---------------|--------------|
| DESIGN BY: MK | SCALE: N T S |
|---------------|--------------|

| | | | |
|----------|----|------|--------|
| DRAWN BY | MM | DATE | 1 2004 |
|----------|----|------|--------|

| | |
|--------------|----------------|
| DRAWN BY: MM | DATE: Jan 2021 |
| | |

REV. NO.:

M5

MECHANICAL SPECIFICATION CONT'D

- 1.33. PROVIDE ALL RIGGING AS MAY BE REQUIRED FOR ALL SYSTEM MATERIALS AND EQUIPMENT. PROVIDE ALL REQUIRED SUPPLEMENTARY STEEL SUPPORTS NECESSARY FOR MOUNTING OR HANGING EQUIPMENT. EQUIPMENT BEING SUSPENDED FROM THE FLOOR, CEILING OR ON THE ROOF SHALL HAVE SUPPORTS REVIEWED BY A C.P. ENGINEER, ARCHITECT OR STRUCTURAL CONSULTANT. ALL REQUIRED STRUCTURAL SUPPORTS OR STRUCTURAL REINFORCING, AS RECOMMENDED BY THE CONSULTANT, SHALL BE INCLUDED IN THE TENDER.
- 1.34. ALL NEW AND RELOCATED EXISTING SERVICES AND EQUIPMENT MUST BE SUPPORTED FROM THE BUILDING STRUCTURE. ALL DRILLING, APPROVED TYPE INSERTS AND HANGERS SHALL BE INCLUDED:
- o AUXILIARY STRUCTURAL MEMBERS SHALL BE INCLUDED AND INSTALLED WHERE REQUIRED TO ACCOMMODATE HANGERS
 - o ALL SUPPORTS SHALL BE CONNECTED TO THE TOP OF JOISTS AND BEAMS WHERE APPLICABLE.
 - o SUSPENSION FROM METAL DECK IS NOT ALLOWED.
 - o SUSPENDING ONE HANGER FROM ANOTHER IS NOT PERMITTED.
- 1.35. PROVIDE A COMPLETE ITEMIZED COST BREAKDOWN OF ALL MATERIALS, EQUIPMENT AND LABOUR COSTS ASSOCIATED WITH EACH SUBMISSION FOR ADDITIONAL OR DELETED WORK.
- 1.36. EACH CONTRACTOR SHALL TAKE OUT ALL NECESSARY FIRE AND LIABILITY INSURANCE, FREE OF EXTRA CHARGE, AND SHALL AGREE TO INDEMNIFY AND HOLD HARMLESS THE LANDLORD, TENANT AND ENGINEER BECAUSE OF BODILY INJURIES (INCLUDING DEATH) OR DAMAGE TO PROPERTY IN CONSEQUENCE OF THE PERFORMANCE OF THIS CONTRACT.
- 1.37. REPAIR THE BUILDING, INCLUDING ANY FINISHED OR UNFINISHED WORK, WHERE DAMAGED AS A RESULT OF NEGLIGENCE, IMPROPERLY LOCATED HOLES, EQUIPMENT INSTALLATION, MATERIALS HANDLING, ETC., THE TRADE RESPONSIBLE FOR ANY DAMAGE SHALL BEAR THE COST OF REPAIR WORK, AND SHALL ENGAGE SPECIALIZED TRADES AS REQUIRED. THE REPAIR WORK SHALL BE DONE TO THE SATISFACTION OF THE LANDLORD, TENANT, AND THE ENGINEER'S REPRESENTATIVE.
- 1.38. PROTECT ALL MATERIALS STORED ON SITE, INCLUDING THE LANDLORDS MATERIAL, THE TENANTS MATERIAL AND OTHER TRADES MATERIAL. TAKE SPECIAL PRECAUTIONS TO PREVENT THE ENTRY OF DUST OR OTHER FOREIGN MATERIAL IN DUCTWORK, PIPING, ELECTRONIC COMPONENTS, OR THE INTERNAL MOVING PARTS OF EQUIPMENT. PROTECT ACOUSTIC INSULATION AT ALL TIMES FROM DUST AND DEBRIS. THE TRADE RESPONSIBLE FOR ANY DAMAGE OR CONTAMINATION SHALL BEAR THE COST OF REPLACEMENT, CLEANING OR REPAIR, WHICH SHALL BE DONE TO THE SATISFACTION OF THE LANDLORD, TENANT AND THE ENGINEER'S REPRESENTATIVE.
- 1.39. THOROUGHLY CLEAN EXISTING AND NEW PIPING, DUCTS AND EQUIPMENT LOCATED WITHIN THE WORK ZONE OF ANY CONSTRUCTION DUST, INCLUDING DUST CUTTINGS, ETC.
- 1.40. ALL SUB TRADES MUST BE DECLARED PRIOR TO AWARDED THE CONTRACT, AND ARE SUBJECT TO APPROVAL BY THE LANDLORD, TENANT AND ENGINEER.

2. SCOPE OF WORK

- 2.1. PROVIDE COMPLETE, FULLY TESTED AND OPERATIONAL MECHANICAL SYSTEMS TO MEET THE REQUIREMENTS DESCRIBED IN THE CONTRACT DOCUMENTS, WHICH INCLUDE BUT ARE NOT LIMITED TO THE PRESENT SPECIFICATION AND DRAWINGS, AND IN COMPLETE ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS.
- 2.2. THE SPECIFICATION IS DIVIDED INTO SECTIONS WHICH ARE NOT INTENDED TO IDENTIFY CONTRACTUAL LIMITS BETWEEN SUB-CONTRACTORS NOR BETWEEN THE CONTRACTOR AND HIS SUB-CONTRACTORS. THE REQUIREMENTS OF ANY ONE SECTION APPLY TO ALL SECTIONS. REFER TO OTHER DIVISIONS AND SECTIONS TO ENSURE A COMPLETE AND OPERATIONAL SYSTEM.
- 2.3. ALL DRAWINGS OF THIS DIVISION ARE DIAGRAMMATIC AND APPROXIMATELY TO SCALE. THEY ESTABLISH SCOPE, MATERIAL AND INSTALLATION QUALITY AND ARE NOT DETAILED INSTALLATION INSTRUCTIONS. THE PRESENT TRADE IS AT ALL TIMES RESPONSIBLE FOR COORDINATING WITH OTHER TRADES TO AVOID SPACE CONFLICTS.
- 2.4. PROVIDE MECHANICAL COMPONENTS AND ACCESSORIES WHICH MAY NOT BE SPECIFICALLY SHOWN ON THE DRAWINGS OR STIPULATED IN THE SPECIFICATIONS, BUT ARE REQUIRED TO ENSURE COMPLETE AND OPERATIONAL SYSTEMS.
- 2.5. FOLLOW THE MANUFACTURERS WRITTEN INSTALLATION INSTRUCTIONS FOR EQUIPMENT, SUPPLEMENTED BY THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
- 2.6. INSTALL EQUIPMENT GENERALLY IN LOCATIONS SHOWN CLOSE TO THE BUILDING STRUCTURE WITH MINIMUM INTERFERENCE WITH OTHER SERVICES OR FREE SPACE. ENSURE THAT ALL EQUIPMENT IS ACCESSIBLE AND THAT SERVICE CLEARANCES HAVE BEEN PROVIDED WITH THE MANUFACTURERS WRITTEN INSTALLATION INSTRUCTIONS.
- 2.7. REMOVE AND REPLACE IMPROPERLY INSTALLED EQUIPMENT TO THE SATISFACTION OF THE ENGINEERS REPRESENTATIVE AT NO COST TO THE TENANT OR LANDLORD.
- 2.7. PROVIDE FIRE STOPPING FOR ALL PIPE PENETRATIONS IN RATED FLOOR AND WALL OPENINGS. THE GENERAL CONTRACTOR SHALL IDENTIFY ALL RATED FLOORS AND WALLS BASED ON THE LATEST ARCHITECTURAL DOCUMENTS, AND SHALL BE RESPONSIBLE TO ENSURE THAT ALL RELEVANT TRADES HAVE PROVIDED THE NECESSARY FIRE STOPPING.
- 2.8. IDENTIFY ALL OPENINGS AND ACCESS REQUIRED FOR PASSAGE OF MECHANICAL SERVICES THROUGH STRUCTURES, FLOORS AND DIVIDING WALLS TO THE GENERAL CONTRACTOR, SUCH IDENTIFICATION SHALL BE VIA MARKS ON THE DRAWINGS SHOWING OPENING SIZES, LOCATIONS AND LEVELS. THE CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION FROM THE STRUCTURAL ENGINEER PRIOR TO CUTTING OR CORING. THE GENERAL CONTRACTOR SHALL X-RAY SLABS, BEAMS OR OTHER CONCRETE STRUCTURAL MEMBERS PRIOR TO CUTTING OR CORING.
- 2.9. ON COMPLETION OF THE WORK, ALL TOOLS AND SURPLUS WASTE MATERIALS SHALL BE REMOVED AND THE WORK LEFT IN A CLEAN AND PERFECT CONDITION.
- 2.10. SCOPE OF WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FURNISHING OF LABOUR, MATERIALS, TOOLS AND EQUIPMENT REQUIRED TO PROVIDE A COMPLETE INSTALLATION AND THE TESTING OF ALL SYSTEMS SHOWN ON THE DRAWING AND SPECIFIED HEREIN INCLUDING:
- o GENERAL REQUIREMENTS
 - o DEMOLITION
 - o TESTING AND BALANCING
 - o PLUMBING AND DRAINAGE
 - o FIRE PROTECTION
 - o VENTILATION
 - o HEATING AND AIR CONDITIONING
 - o INSULATION
 - o AUTOMATIC CONTROLS

3. TESTING AND BALANCING

- 3.1. TEST ALL PLUMBING SYSTEMS IN ACCORDANCE WITH APPLICABLE PLUMBING CODES.
- 3.2. TEST ALL FIRE PROTECTION SYSTEMS IN ACCORDANCE WITH APPLICABLE N.F.P.A CODES.
- 3.3. TEST ALL DUCT SYSTEMS IN ACCORDANCE WITH APPLICABLE SMACNA AND ASHRAE 90.1 STANDARDS.
- 3.4. TEST, BALANCE AND ADJUST ALL AIR SYSTEMS TO OBTAIN 4 - 5% OF THE DESIGN AIR QUANTITIES. CONFIRM THE APPROPRIATE OPERATION AND ALLOCATION OF ALL THERMOSTATS AND REPORT ALL DEFICIENCIES. MARK THE FINAL BALANCE POSITION ON ALL NOTED BALANCING DAMPERS AFTER FINAL ADJUSTMENT OF AIR TURNING AND BALANCING DEVICES. PROVIDE A DEFICIENCY REPORT TO THE CONTRACTOR PRIOR TO FINALIZING THE TESTING AND BALANCING REPORT TO THE CONSULTANT. PROVIDE THREE (3) COPIES OF THE BALANCING REPORT TO THE FINAL AIR SYSTEMS TEST AND BALANCE REPORT TO THE CONSULTANT. INDICATE ALL TEST RESULTS INCLUDING COIL ENTERING AND LEAVING AIR TEMPERATURE, CLOSEST AND FURTHEST OUTLET SUPPLY AIR TEMPERATURES, AND ROOM TEMPERATURES FOR ALL AIR SYSTEMS.
- 3.5. TEST PRESSURE FOR WATER SYSTEMS SHALL BE 1.5 TIMES WORKING PRESSURE, BUT NOT LESS THAN 150PSIG.
- 3.6. ADJUST ALL DEFLECTION BLADES ON SUPPLY AIR GRILLES AND DIFFUSERS, TO ENSURE THAT AIR PATTERN IS HORIZONTAL ACROSS THE ROOM.
- 3.7. ENSURE THAT ALL COIL DRAIN PANS DRAIN FREELY AND NO STANDING WATER REMAINS.
- 3.8. ENSURE ACCESS IS PROVIDED TO ALL VALVES AND EQUIPMENT REQUIRING SERVICING.
- 3.9. INCLUDE, FOR ONE ADDITIONAL DAY (8 HOURS) TUNING FOR THERMOSTAT TO ACCOMMODATE TENANT SPECIFIED REQUIREMENTS. THIS FINAL ADJUSTMENT MAY BE REQUIRED ANY TIME WITHIN THE FIRST SIX MONTHS OF OCCUPANCY.
- 3.10. SET ALL SYSTEMS TO MAXIMUM OUTDOOR AIR, CLOSE ALL EXTERIOR DOORS AND ADJUST OUTDOOR AIR QUANTITIES TO ENSURE THAT THE BUILDING INTERIOR PRESSURE IS +5 PA (+0.02 IN. W.C.) RELATIVE TO THE EXTERIOR. REPEAT AS REQUIRED UNDER ALL POSSIBLE BUILDING OPERATING CONDITIONS. INCLUDE RESULTS IN THE BALANCING REPORT.

4. MECHANICAL INSTALLATION

- 4.1. PROVIDE AND INSTALL MECHANICAL SERVICES INSTALLATION IN ACCORDANCE WITH THE MANUFACTURERS PRINTED INSTALLATION INSTRUCTIONS UNLESS NOTED OTHERWISE.
- 4.2. HOT SERVICES:
- o HEATING WATER SERVICES, HEATING GLYCOL PIPING SHALL HAVE GLASS FIBRE PREFORMED PIPE INSULATION. REFER TO TABLE 1 FOR REQUIRED INSULATION THICKNESSES.
 - o ON HOT SERVICES, INSULATE VALVES, FITTINGS, COUPLINGS, UNIONS, FLANGES AND ALL OTHER APPURTENANCES THROUGH WHICH WATER OR STEAM PASSES, USING MITRED SECTIONS OF PREFORMED INSULATION OF A THICKNESS EQUAL TO THE ADJOINING PIPE INSULATION, AND SECURELY WIRE IN PLACE. OVER MITRED SECTION, APPLY ONE COAT OF FIELD APPLIED MESH REINFORCED MASTIC. FINISH SERVICES WITH A VAPOUR BARRIER USING TWO FULL BRUSH COATS OF VAPOUR SEAL ADHESIVE. COVER WITH CANVAS OR PVC JACKET.
 - o APPLY GLASS FIBRE OR MINERAL FIBRE PREFORMED VAPOUR BARRIER JACKET PIPE INSULATION TO DOMESTIC HOT WATER PIPING. REFER TO TABLE 1 FOLLOWING FOR REQUIRED INSULATION THICKNESS. APPLY WITH ALL JOINTS BUTTED FIRMLY TOGETHER, AND BOND SECURELY, SEALING FLAPS BY PASTING DOWN TO GIVE A SMOOTH FINISH.
 - o COLD SERVICES:
 - o PROTECT INSULATION BY MEANS OF SHEET STEEL SHIELDS AT EACH HANGER OR SUPPORT ON THE FOLLOWING:
 - o ALL SIZES OF CHILLED WATER
 - o ALL SIZES OF CHILLED GLYCOL
 - o DOMESTIC COLD WATER PIPING 75 MM (3 IN.) AND LARGER
 - o PROVIDE FOAMGLASS, THERMO-12 OR CALCIUM SILICATE INSULATION INSERTS THE FULL LENGTH OF SHIELDS AT ALL HANGERS AND SUPPORTS.
 - o 4.5. FOR DOMESTIC COLD WATER PIPING LESS THAN 75 MM (3 IN.) WHERE HANGERS ON COLD WATER LINES PENETRATE VAPOUR BARRIER MAKE SURE THE PENETRATION IS PROPERLY SEALED WITH INSULATION AND VAPOUR BARRIER CONTINUED UP HANGER A FURTHER 75 MM (3 IN.).
 - o 4.6. APPLY 12 MM (1/2 IN.) THICK, PREFORMED GLASS FIBRE PIPE INSULATION WITH VAPOUR BARRIER JACKET OR 12 MM (1/2 IN.) THICK FLEXIBLE ELASTOMERIC INSULATION TO ALL DOMESTIC COLD WATER AND CHILLED DRINKING WATER PIPING 25 MM (1 IN.) AND SMALLER. PROVIDE 25 MM (1 IN.) INSULATION ON ALL OTHER PIPE SIZES. INSULATE THE FIRST 4500 MM (15 FT.) OF THE STANDPIPE AND/OR SPRINKLER.
 - o 4.7. ON COLD WATER SERVICE VALVES, WATER METERS, DRAIN VALVES, VENT CONNECTIONS, THERMOMETER WELLS, PRESSURE GAUGES AND OTHER IRREGULAR SHAPED OBJECTS, APPLY FLEXIBLE ELASTOMERIC SHEET INSULATION, THICKNESS TO SUIT SERVICE, CUT AND MITRE AS NECESSARY AND ATTACH WITH ADHESIVE AND STAINLESS STEEL BANDING OR CEMENT AND SEAL EDGES OF INSULATION TO THE ADJACENT SURFACES AND FINISH WITH FIELD APPLIED MESH REINFORCED MASTIC.
 - o 4.8. APPLY 50 MM (2 IN.) THICK RIGID GLASS FIBRE INSULATION TANK WRAP BY WIRING OR BANDING ON ALL CHILLED WATER STORAGE TANKS. APPLY VAPOUR BARRIER OF FOIL FACED FLAME RESISTANT KRAFT PAPER OR ALUMINIUM FOIL, AND COVER WITH CANVAS. APPLY INSULATION TO LEGS/SUPPORTS. PROVIDE REMOVABLE SECTIONS AT ACCESS DOORS/MANHOLE AND ALL COMPONENTS REQUIRING SERVICING. AS AN ALTERNATIVE TO THE ABOVE, PROVIDE 50 MM (2 IN.) THICK FLEXIBLE ELASTOMERIC INSULATION.
 - o REFER TO THE TABLE 1 FOR REQUIRED INSULATION THICKNESSES.
 - o 4.9. PIPING IN AIR HANDLING OR AIR CONDITIONING UNITS, INSULATE WITH 25 MM (1 IN.) THICK FLEXIBLE ELASTOMERIC INSULATION AND COVER WITH FIELD APPLIED MESH REINFORCED MASTIC.
 - o 4.10. INSULATE REFRIGERANT SUCTON LINES WITH 12 MM (1/2 IN.) FLEXIBLE ELASTOMERIC INSULATION. COVER EXTERIOR PIPING WITH FIELD APPLIED MESH REINFORCED MASTIC.
 - o 4.11. INSULATION THICKNESSES AND CONSIDER HEATING AND COOLING SYSTEMS SHALL MEET OR EXCEED THE MINIMUM STANDARDS SET OUT IN ASHRAE 90.1 (REFER TO TABLE 1 FOLLOWING) AND AS SPECIFIED HEREIN FOR THE SERVICES COVERED:

TABLE 1: MINIMUM PIPE INSULATION THICKNESS/PERFORMANCE (BASED ON ASHRAE 90.1 AND MODEL NATIONAL ENERGY CODE FOR BUILDINGS)

| MINIMUM PIPE INSULATION - MM (IN.) | FLUID A | INSULATION CONDUCTIVITY | MEAN RATING | NOMINAL PIPE DIAMETER - MM (IN.) | 25 (1) | 35-50 | 65-100 | 125- | 200 (8) |
|--|-----------------------|-------------------------|-----------------------|----------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| DESIGN OPERATING TEMP. RANGE (BTU-IN.) | TEMP. RANGE (BTU-IN.) | TEMP. RANGE (BTU-IN.) | TEMP. RANGE (BTU-IN.) | TEMP. RANGE (BTU-IN.) | TEMP. RANGE (BTU-IN.) | TEMP. RANGE (BTU-IN.) | TEMP. RANGE (BTU-IN.) | TEMP. RANGE (BTU-IN.) | TEMP. RANGE (BTU-IN.) |
| 61-93 (141-200) | 0.042 (0.29) | 52 (1.25) | 25 (1.0) | 25 (1.0) | 25 (1.0) | 38 (1.5) | 38 (1.5) | 38 (1.5) | 38 (1.5) |
| 41-60 (105-140) | 0.040 (0.28) | 38 (1.00) | 25 (1.0) | 25 (1.0) | 25 (1.0) | 38 (1.5) | 38 (1.5) | 38 (1.5) | 38 (1.5) |
| DOMESTIC AND SERVICE HOT WATER SYSTEMS c | 0.040 (0.28) | 38 (1.00) | 25 (1.0) | 25 (1.0) | 25 (1.0) | 38 (1.5) | 38 (1.5) | 38 (1.5) | 38 (1.5) |
| 41 AND GREATER | 0.040 (0.28) | 38 (1.00) | 25 (1.0) | 25 (1.0) | 25 (1.0) | 38 (1.5) | 38 (1.5) | 38 (1.5) | 38 (1.5) |
| COOLING SYSTEMS (CHILLED WATER, CHILLED GLYCOL, BRINE AND REFRIGERANT) | 5-13 (40-60) | 0.039 (0.27) | 24 (0.75) | 25 (1.0) | 25 (1.0) | 25 (1.0) | 25 (1.0) | 25 (1.0) | 25 (1.0) |

A PIPING INSTALLED EXTERIOR TO THE BUILDING SHALL MEET THE MINIMUM INSULATION REQUIREMENTS OF HEATING SYSTEMS WITH A FLUID DESIGN OPERATING TEMPERATURE ABOVE 177.355 C (350 DEG. F).

8 RUNOUTS TO INDIVIDUAL TERMINAL UNITS NOT EXCEEDING 3.7 M (12 FT.) IN LENGTH

ADJUSTS TO RECIRCULATING SYSTEMS OF SERVICE OR DOMESTIC HOT WATER SYSTEMS AND FIRST 2.4 M (8 FT.) FROM STORAGE TANK FOR NON-RECIRCULATING SYSTEMS

- 4.12. DUCTWORK AND EQUIPMENT INTERNAL TO THE BUILDING WITHIN CONDITIONED SPACES SHALL HAVE 25 MM (1 IN.) THICK RIGID GLASS FIBRE DUCT INSULATION WITH VAPOUR BARRIER. IN CONCEALED SPACES AND ON ROUND DUCT SMALLER THAN 600 MM (24 IN.) INSULATION MAY BE 38MM (1-1/2 IN.) FLEXIBLE TYPE WITH VAPOUR BARRIER. FLEXIBLE DUCT CORRECTIONS DO NOT REQUIRE INSULATION EXCEPT WHERE A FACTORY APPLIED INSULATION HAS BEEN SPECIFIED WITH THE FLEXIBLE DUCT CONNECTION.
- 4.13. EXPOSED SUPPLY DUCTWORK WITHIN THE SPACE SERVED SHALL NOT BE INSULATED UNLESS OTHERWISE INDICATED.
- 4.14. BUTT JOINTS AND ATTACH PINS AND SPEED WASHERS, ONE PER 0.188 SO.M (2.50 FT.), BUT NOT MORE THAN 450 MM (18 IN.) APART IN ANY DIRECTION. APPLY FIRE RESISTIVE ADHESIVE IN 100 MM (4 IN.) WIDE STRIPS ON 300 MM (12 IN.) CENTRES. SEAL ALL JOINTS WITH ADHESIVE AND APPLY VAPOUR BARRIER TAPE. INSTALL PINS OF 3.2 LENGTH FOR THE THICKNESS OF INSULATION AND CLIP FLUSH AFTER FINAL INSTALLATION OF WASHERS. TACK WELD PINS TO SHEET METAL.
- 4.15. ON EXPOSED INSULATION IN MECHANICAL ROOMS, INCREASE THICKNESS AS NECESSARY TO GIVE 12 MM (1/2 IN.) THICKNESS OVER FLANGES AND ANGLES. PROVIDE CORNER BEADS TO PROTECT CORNERS TO A HEIGHT OF 2135 MM (84 IN.) ABOVE FLOOR AND PROVIDE CHANNELS AT FLOOR LINE TO FINISH OFF INSULATION ON APARTS.
- 4.16. INSULATION CONTRACTOR TO COORDINATE WITH SHEET METAL CONTRACTOR TO ENSURE DUCT INSULATION IS APPLIED PRIOR TO DUCTWORK BEING INSTALLED TO UNDERSIDE OF SLABS, BEAMS OR OTHER SERVICES OR BEHIND OTHER DUCT RISERS AND SHAFTS.
- 4.17. THE FOLLOWING DUCTWORK AND EQUIPMENT SHALL BE INSULATED:
1. APPARATUS CASINGS
 2. OUTSIDE AND MIXED AIR PLENUMS
 3. OUTSIDE AND MIXED AIR DUCTWORK, INCLUDING DUCTS TO AND FROM INDEPENDENT ERVS
 4. HEATING AND COOLING COIL SECTIONS OF DUCTWORK AND PLENUMS
 5. FLOORS OF SUPPLY TANKS IN EQUIPMENT ROOMS
 6. SUPPLY DUCTWORK IN EQUIPMENT ROOMS
 7. EXHAUST AND RELIEF AIR DUCTWORK. PLENUMS AND/OR CASINGS FROM 3000 MM (120 IN.) UPSTREAM OF SHUT-OFF DAMPERS TO CONNECTION TO EXTERIOR WALL OR ROOF
 8. EXHAUST, RELIEF AND SUPPLY AND RETURN AIR DUCTWORK, PLENUMS AND/OR CASINGS THROUGH NON-AIR CONDITIONED OR UNHEATED INTERNAL SPACE. USE 50 MM (2 IN.) THICKNESS.
 9. FOR NON-AIR DUCT PROJECTS, ALL SUPPLY DUCTWORK FROM FANS TO TAKE-OFF FOR VAV BOX FOR VARIABLE VOLUME SYSTEMS AND ALL SUPPLY DUCTWORK ON CONSTANT VOLUME SYSTEMS.
 10. FOR LEED PROJECTS, ALL SUPPLY AIR DUCTWORK (VARIABLE VOLUME OR CONSTANT VOLUME SYSTEMS) FROM FANS TO ANY TERMINAL UNIT OR DIFFUSER.
 11. SILENCERS AND FAN CAPACITY MONITORS. INSULATE TO SUIT THE SERVICE AND LOCATION.
 - 4.18. APPLY 2 LAYERS OF 50MM (2 IN.) FLEXIBLE ELASTOMERIC INSULATION ON ALL DUCTWORK WHICH IS EXTERNAL TO THE BUILDING. EXTERIOR INSULATION SHALL BE COATED WITH FACTORY APPLIED COATING.
 - 4.19. PROVIDE SLOPED EXTRUDED POLYSTYRENE INSULATION SUPPORT ON TOP OF DUCTWORK TO MAINTAIN SLOPE AT A MINIMUM OF 5% .ALL FLANGES SHALL BE COVERED BY A MINIMUM OF 12MM (1/2 IN.)
 - 4.20. ALL HORIZONTAL INDIRECT CONDENSATE DRAINAGE PIPING SHALL BE COVERED WITH 1/2 IN. (12 MM) FINISHED THICKNESS FIBREGLASS DUAL TENSILE INSULATION WITH FACTORY APPLIED FIRE RESISTIVE FIBREGLASS REINFORCED KRAFT PAPER AND ALUMINIUM FOIL VAPOUR BARRIER OR EQUAL. WHERE CONDENSATE LINES ROUTE INTO A DIRECT DRAIN, INSULATE THE TRAP AND FIRST 20 FEET OF DRAIN.
 - 4.21. MAKE GOOD ALL EXISTING INSULATION, WHEN CONNECTING TO EXISTING SERVICES. WHERE EXISTING INSULATION HAS BEEN PREVIOUSLY REMOVED, OR IS IN A STATE OF DISREPAIR, BRING THIS ITEM TO THE CONSULTANTS ATTENTION.
 - 4.22. WHERE INSULATED PIPING IS EXPOSED, PROVIDE PVC JACKETING CONFORMING WITH THE FLAME AND SMOKE SPREAD RATINGS REQUIRED BY CODE AND AS SUPPLIED BY ACWIL INSULATIONS LTD. AS AN ALTERNATIVE, PROVIDE CANVAS COVERING WITH TWO APPLICATIONS OF SIZING.
 - 4.23. REPAIR OR REPLACE ALL EXISTING AIR INTAKE PLENUMS AT LOUVRES OR HOODS. INSULATE ALL DUCTWORK FOR A MINIMUM LENGTH OF 10 FEET ON THE BUILDING SIDE OF THE ASSOCIATED MOTORIZED EXHAUST DAMPERS AND THE ENTIRE LENGTH OF THE OUTSIDE AIR INTAKE DUCT. USE 1 IN. (25 MM) FINISHED THICKNESS RIGID INSULATION BOARD ON THE OUTSIDE OF THE DUCT. PROVIDE 1/2 IN. (12 MM) FINISHED THICKNESS RIGID INSULATION BOARD ON THE INSIDE OF FLEXIBLE DUCTS.
 - 4.24. ALL PIPING, CARRYING FLUIDS SUBJECT TO FREEZING, ROUTING OUTSIDE THE BUILDING, OR IN SPACES SUBJECT TO FREEZING TEMPERATURES, SHALL BE ELECTRICALLY TRACED BY DIVISION 16 AND INSULATED WITH 2 IN. THICKNESS FIBREGLASS DUAL TENSILE INSULATION WITH FACTORY APPLIED FIRE RESISTIVE FIBREGLASS REINFORCED KRAFT PAPER AND ALUMINIUM FOIL VAPOUR BARRIER OR EQUAL.
 - 4.25. INSULATION JACKET FOR SERVICES AND DUCTWORK EXTERIOR TO THE BUILDING, AND FOR INDOOR COMPONENTS SUCH AS VALVES, PUMP, METERS, ETC., SHALL BE CHILDERS OR ARMACELL FIELD APPLIED U.V. PROTECTED MESH REINFORCED MASTIC.
 - o MASTIC SHALL BE EQUAL TO CHILDERS VI-CRYL CP-10/11 WEATHER BARRIER COATING. FINISH SHALL BE WHITE.
 - o SEALANT FOR AREAS WHERE MASTIC MEETS ADJOINING INSULATED OR UNINSULATED SERVICES OR DISSIMILAR WEATHER PROOFING MATERIALS SHALL BE EQUAL TO CHILDERS CP-76.
 - 4.26. TAPE ALL JOINTS AND SEAMS AND BAND AT 16 IN. (350MM) INTERVALS.
 - 4.27. STAPLES SHALL NOT BE USED FOR SECURING INSULATION.
 - 4.28. TEST ALL PIPING AND SEAL ALL DUCT JOINTS WITH DUCT SEALER BEFORE APPLYING INSULATION. (WHERE DUCTS ARE NOT 100% AIR TIGHT, INSULATION WILL PRESSURIZE, AND OPEN AT JOINTS AND SEPARATE FROM THE DUCT.)
 - 4.29. ALL INSULATION MATERIALS TO BE SUPPLIED BY OWENS-CORNING, CERTAINTED-MASON, KNAUF OR PARKET.

5. PLUMBING

- 5.1. ALL DOMESTIC WATER PIPING SHALL BE TYPE "L" COPPER WITH CAST BRASS OR WROUGHT COPPER FITTINGS.
- 5.2. ALL SANITARY DRAINS AND VENTS 2-1/2 IN. (65 MM) AND LARGER SHALL BE CAST IRON WITH MJ JOINTS. SANITARY DRAINS AND VENTS 1 1/2 IN. (38 MM) AND SMALLER SHALL BE COPPER DRAINAGE TUBE (DWV). PVC DWV PIPING AND FITTINGS ARE ALSO ACCEPTABLE AND SHALL BE CERTIFIED TO CSA B181.2. WHEN USED IN NON-COMBUSTIBLE CONSTRUCTION, THEY SHALL BE LISTED BY UL TO THE STANDARD CAN/ULC S102.2 AND CLEARLY MARKED WITH THE CERTIFICATION LOGO INDICATING A FLAME SPREAD RATING NOT EXCEEDING 25 AND A SMOKE DEVELOPMENT CLASSIFICATION NOT EXCEEDING 50. SOLAR EXPOSURE SHALL BE AVOIDED. THE PRIMER AND CEMENT SHALL BE CSA CERTIFIED. SHALL MEET THE REQUIREMENTS OF ASTM D2564. SHALL BE FROM THE SAME MANUFACTURER AS THE PVC PIPING AND FITTINGS AND SHALL BE APPLIED AS INDICATED IN THE MANUFACTURER'S WRITTEN INSTRUCTIONS. ADS PIPING IS NOT PERMITTED.
- 5.3. PROVIDE ISOLATING BALL VALVES ON MAIN AND/OR BRANCH LINES AND FOR ALL EQUIPMENT SERVED. ALL VALVES SHALL BE SUITABLE FOR THE OPERATING PRESSURE OF THE SYSTEM IN WHICH THEY ARE INSTALLED. ALL VALVES SHALL MATCH THE BASE BUILDING VALVES AND BE THE SAME MANUFACTURER, MODEL NUMBER AND RATING.
- 5.4. DISCONNECT AND CAP ALL EXISTING DRAIN, VENT, HOT AND COLD WATER PIPES NOT BEING REUSED AS PART OF THIS CONTRACT. CAP SERVICES BEHIND THE FINISHED SURFACES OF FLOORS AND WALLS AND AT THE MAINS OR BASE BUILDING VALVE LOCATIONS IN THE CEILING SPACE. DISCONNECT DOMESTIC WATER LINES AT MAINS TO ELIMINATE DEAD LEGS.
- 5.5. REUSE EXISTING PIPING WHEREVER POSSIBLE AND WHERE CONDITIONS PERMIT. PROVIDE NEW PIPING AS REQUIRED.
- 5.6. PROVIDE DIELECTRIC COUPLINGS/UNIONS WHERE COPPER PIPING CONNECTS TO FERROUS METAL EQUIPMENT OR FITTINGS.
- 5.7. ALL PIPING SHALL BE HUNG USING CLEVIS HANGERS AND THREADED ROD, WITH APPROVED INSERTS. USE COPPER ANGLE OR STAINLESS STEEL HANGERS OR BRANCH LINES SERVING FLUSH VALVES, SOLENOID VALVES, SELF CLOSING AND/OR QUICK CLOSING VALVES, GROUPS OF FIXTURES AND INDIVIDUAL FIXTURES. ARRESTORS SHALL BE EQUAL TO PRECISION PLUMBING PRODUCT SERIES "SC" SHOCK STOPS WITH STAINLESS STEEL CASING AND BELLOWSPRECHARGED WITH AIR. SIZE AND LENGTH SHALL BE DETERMINED IN THE PRESENCE WITH THE INDOOR PLUMBING CONTRACTOR.
- 5.10. RP BACK FLOW PREVENTERS SHALL BE PROVIDED WHEREVER DOMESTIC WATER IS CONNECTED TO A PIECE OF EQUIPMENT WHICH IS NOT A PLUMBING FIXTURE, OR WHERE BACK-FLOW OF CONTAMINATED WATER IS POSSIBLE. THE BACK FLOW PRESENTER SHALL BE A WATTS NO. 9 OR 909.
- 5.11. FLOW BALANCING VALVES ON DOMESTIC HOT WATER RECIRCULATION SYSTEMS SHALL BE NSF-61 COMPLIANT BELL AND GOSSET CB SERIES.

6. DOMESTIC HOT WATER HEATERS

- 6.1. STORAGE TANK WITH INTEGRAL HEATERS SHALL BE RHEEM, BRADFORD WHITE, JOHN WOOD, AO SMITH OR EQUAL, WITH 1/2" INSULATED STEEL LINING. IMMERSION HEATER TANK SHALL BE CSA APPROVED. TANK SHALL BE FACTORY INSULATED AND COVERED WITH AN ENAMELLED STEEL JACKET.
- 6.2. TANK SHALL BE RATED FOR 125 PSIG (860 KPA) WORKING PRESSURE. HEATER ELEMENT SHALL BE LOCATED AT THE BOTTOM AND CORD SHALL BE COMPLETE WITH THERMOSTAT. HIGH LIMIT THERMOSTAT SHALL PREVENT OVERHEATING. ACCESS PANELS IN JACKET SHALL PROVIDE ACCESS TO THERMOSTATS AND ELEMENT.
- 6.3. TANKS SHALL BE COMPLETE WITH A.S.M.E. TEMPERATURE PRESSURE RELIEF VALVE. RELIEF VALVE SHALL BE PIPED TO OUTSIDE FLOOR DRAIN, JANITOR'S SINK, OR 1-1/2 IN. DRAIN TAIL PIPE CONNECTED TO A SINK WASTE, THROUGH AN AIR GAP.
- 6.4. DWHW-01: REFER TO DOMESTIC HOT WATER HEATER SCHEDULE.

7. PLUMBING FIXTURES

- 7.1. PROVIDE NEW PLUMBING FIXTURES WHERE INDICATED ON PLANS OF MAKE AND MODEL AS SPECIFIED. ALL FIXTURES MUST BE FIRST QUALITY, BEST GRADE OBTAINABLE, CLEANED AND IN PERFECT CONDITION. FIXTURES SHALL BE PIPED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION FOR BEST PRACTICE.
- 7.2. FINAL LOCATION OF ALL NEW PLUMBING FIXTURES SHALL BE CO-ORDINATED, ON-SITE WITH ALL TRADES. REFER TO ARCHITECTURAL/INTERIOR DESIGN DRAWINGS AND DETAILS FOR EXACT LOCATION OF ALL PLUMBING FIXTURES.
- 7.3. FIXTURES SHALL BE AS MANUFACTURED BY AMERICAN STANDARD, TOTO OR KOHLER, EQUAL TO THE FIXTURES SPECIFIED. FIXTURES SHALL BE WHITE.
- 7.4. FITTINGS AND ALL UNMANUFACTURED BY AMERICAN STANDARD, DELTA FAUCETS EQUIVALENT TO THE TRIM SPECIFIED. ALL EXPOSED VALVES, FITTINGS, ESCUTCHEONS, TRIM, ETC., AT EACH FIXTURE SHALL BE POLISHED CHROME PLATED BRASS UNLESS SPECIFIED OTHERWISE.
- 7.5. ALL TANKS OF WATER CLOSETS SHALL BE INTERNALLY LINED WITH ANTI-SWEAT INSULATION.
- 7.6. PROVIDE CHROME PLATED BRASS, BRACKETS, CLEATS, SUPPORTS ETC., FOR RIGIDLY SECURING FIXTURES IN PLACE.
- 4.11. ALL ROUGHING IN SHALL BE ACCURATELY LAID OUT. NO OFFSET WILL BE ACCEPTED.
- 7.7. ALL FIXTURES SHALL BE FREE OF DEFECTS. ANY FIXTURE WHICH, IN THE OPINION OF THE CONSULTANT, IS DAMAGED SHALL BE REMOVED AND REPLACED. CLEAN AND POLISH ALL FIXTURES AND TRIM UPON COMPLETION.
- 7.8. WALL MOUNTED FIXTURES SHALL BE INSTALLED SYMMETRICAL WITH WALL TILE PATTERN.
- 7.9. W-1: AMERICAN STANDARD "CADET ELONGATED 16-1/2" (420MM) HIGH #2998.700 "LOW CONSUMPTION" TANK TOILET, FLOOR MOUNTED, VITREOUS CHINA, ELONGATED SYPHON JETTED BOWL, FULLY GLAZED 2" (50MM) BALL PASS INTERNAL TRAPWAY, 11" X 9" (279MM X 229MM) LARGE WATER SURFACE, AND "SPEED CONNECT" LINED BOLTED TANK COMPLETE WITH "PIVOT VALVE" WATER CONTROL (WITHOUT FLOAT) FOR QUIET REFILL, 1.3 GAL. (6L) FLUSH, WITH SANITARY BAR ON BOWL AND LARGE CAST RIB FOR CHINA TANK ASSEMBLY, AND BOLT CAPS. PROVIDE FLOOR FLANGE, FLANGE BOLTS AND GASKET. CENTOCO #500STSCC SEAT, ELONGATED HEAVY-DUTY SOLID PLASTIC OPEN FRONT, LESS COVER, WITH REINFORCED STAINLESS STEEL CHECK HINGE, POSTS, WASHERS AND NUTS. MCGUIRE #H172BV SUPPLY, C.P., POLISHED, RIGID HORIZONTAL INTEGRAL SWEAT TUBES WITH V.P. COMBINATION WHEEL HANDLE/LOOSE KEY BALL VALVE ANGLE STOP, ESCUTCHEON AND FLEXIBLE RISER.
- 7.10. L-1: AMERICAN STANDARD "MURRO" #0955.000 BASIN, CENTRE HOLE ONLY, 22" X 21" X 7-1/2" (559MM X 533MM X 191MM) ELONGATED DUAL TENSILE INSULATION WITH FACTORY APPLIED FIRE RESISTIVE FIBREGLASS REINFORCED KRAFT PAPER AND ALUMINIUM FOIL VAPOUR BARRIER OR EQUAL. USE 1 IN. (25 MM) FINISHED THICKNESS RIGID INSULATION BOARD ON THE OUTSIDE OF THE DUCT. PROVIDE 1/2 IN. (12 MM) FINISHED THICKNESS RIGID INSULATION BOARD ON THE INSIDE OF FLEXIBLE DUCTS.
- 7.11. FLOOR MOUNTED TOILET, FLOOR MOUNTED, VITREOUS CHINA, REAR OVERFLOW FOR CONCEALED ARM CARRIER, AMERICAN STANDARD "CERAMIC" #2000.160X.002 OR CHICAGO FAUCETS "MARATHON" #2200 FAUCET, C.P., SINGLE HOLE C.C., SOLID CAST BRASS LEAD-FREE BODY, WASH-RESIST, CERAMIC DROP-FREE DISC VALVE CARTRIDGE, MAXIMUM TEMPERATURE LIMIT STOP, WITH 1.84 GPM (6.8 L) MINIMUM FLOW RATE, LESS SUPPLY TUBES, MCGUIRE #155A DRAIN, C.P. OPEN GRID, MCGUIRE #H165LKM3RB SUPPLIES, C.P., POLISHED, SHIRT HORIZONTAL. WITH V.P. LOOSE KEY ANGLE STOPS, ESCUTCHEONS LESS BRAIDED FLEXIBLE RISERS, MCGUIRE #8872C "P" TRAP, C.P., CAST BRASS, 1-1/4" (32MM) WITH CLEANOUT AND ESCUTCHEON. SMITH SERIES #070-M ARRA, WITH STEEL PIPE, LEGS, BLOCK BASE FEET SUPPORT, CONCEALED ARMS AND PEDESTAL PLATE. (FOR NARROW WALL INSTALLATION PROVIDE 1/2 TYPE SLEEVE FOR ARMS.) AMERICAN STANDARD #0059.020 SEMI-CHINA PEDESTAL TO COVER EXPOSED PIPING AS PER LOCAL CODES.

8. FLOOR DRAINS

- 8.1. FLOOR DRAINS SHALL BE EQUAL TO J.R. SMITH MANUFACTURING CO. SPECIFICATION QUALITY. EQUIPMENT AS MANUFACTURED BY J.R. SMITH SHALL BE USED. THE EQUIPMENT MEETS THE SPECIFICATION.
- 8.2. FINISHED AREA FLOOR DRAINS SHALL BE CAST IRON BODY, DRAINAGE FLANGE, ADJUSTABLE 5 IN. (125 MM) DIA. NICKEL BRONZE STRAINER, CLAMP SHALL BE PROVIDED WHERE MOISTURE MEMBRANE IS INSTALLED. SMITH #2005A.
- 8.3. FLOOR DRAIN SHALL BE EQUAL TO J.R. SMITH MANUFACTURING CO. SPECIFICATION QUALITY. EQUIPMENT AS MANUFACTURED BY J.R. SMITH SHALL BE USED. THE EQUIPMENT MEETS THE SPECIFICATION.
- 8.4. HUB DRAINS SHALL BE SIMILAR TO ABOVE BUT WITH CAST IRON HUB. DRAIN SHALL BE SMITH #2005.2645.
- 8.5. FLOOR DRAIN SHALL BE EQUAL TO J.R. SMITH MANUFACTURING CO. SPECIFICATION QUALITY. EQUIPMENT AS MANUFACTURED BY J.R. SMITH SHALL BE USED. THE EQUIPMENT MEETS THE SPECIFICATION.
- 8.6. ADD WATER HAMMER ARRESTORS WHERE REQUIRED.

9. INTERCEPTORS

- 9.1. GRIT INTERCEPTOR GI-01: ZURN Z1187-S1-50 OR ACCEPTED EQUAL, C/W INTEGRATED EXTENSION ASSEMBLY WITH HEIGHT REQUIRED TO SUIT INSTALLED EXHAUST DUCT. HEAVY-DUTY REINFORCED SOLID COVER.
- 9.2. OIL INTERCEPTOR GI-02: ZURN ZS1186-800 OR ACCEPTED EQUAL, C/W DURA-CENTED INTERIOR AND EXTERIOR FABRICATED STEEL EXTENSION SECTION WITH HEIGHT REQUIRED TO SUIT INSTALLED PIPING INVERTS AND HEAVY DUTY REINFORCED COVER.
- 9.3. VENT INTERCEPTORS IN ACCORDANCE WITH LOCAL CODES AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.

10. PORTABLE FIRE EXTINGUISHERS

- 10.1. PORTABLE FIRE EXTINGUISHERS SHALL BE RATED AND IDENTIFIED IN ACCORDANCE WITH CAN/ULC-S508 "RATING AND FIRE TESTING OF FIRE EXTINGUISHERS". ALL RATINGS IDENTIFIED BELOW SHALL BE CONSIDERED AS A MINIMUM.
- 10.2. PORTABLE FIRE EXTINGUISHERS IN RESIDENTIAL AND ELECTRICAL ROOMS SHALL BE 6A80BC RATING, 4.53 KG (10 LBS.) MULTI-PURPOSE DRY CHEMICAL POWDER TYPE AND ULC LABELLED.
- 10.3. PORTABLE FIRE EXTINGUISHERS IN KITCHENS SHALL BE 1-A-K RATING, 6 L (1.59 USGAL) WET CHEMICAL TYPE, ULC LABELLED.
- 10.4. PORTABLE FIRE EXTINGUISHERS IN GENERAL AREAS SHALL BE MINIMUM 3A10BC RATING, 2.26 KG (5 LBS.) MULTI-PURPOSE DRY CHEMICAL POWDER TYPE AND ULC LABELLED (AMMONIUM PHOSPHATE).
- 10.5. PORTABLE FIRE EXTINGUISHERS IN GENERAL AREAS SHALL BE MINIMUM 3A10BC RATING, 2.26 KG (5 LBS.) MULTI-PURPOSE DRY CHEMICAL POWDER TYPE AND ULC LABELLED (AMMONIUM PHOSPHATE).
- 10.6. SPACING OF EXTINGUISHERS SHALL CONFORM TO THE AUTHORITY HAVING JURISDICTION, MAXIMUM SPACING FOR ORDINARY HAZARD SHALL BE 9 M (30 FT.) FOR 10 BC EXTINGUISHER AND 15 M (50 FT.) FOR 20 BC EXTINGUISHERS.
- 10.7. IN NO CASE SHALL THERE BE MORE THAN ONE EXTINGUISHER IN EACH ELECTRICAL ROOM, KITCHEN OR MECHANICAL ROOM. MAXIMUM SPACING FOR TYPE A EXTINGUISHERS IN GENERAL OFFICES SHALL BE 25 M (75 FT.).

11. DUCTWORK, FITTINGS AND EQUIPMENT

- 11.1. ALL DUCTWORK CONSTRUCTION, SUPPORT AND INSTALLATION SHALL BE IN ACCORDANCE WITH THE LATEST A.S.H.R.A.E. AND S.M.A.C.N.A. RECOMMENDATIONS AND THE BASE BUILDING STANDARDS.
- 11.2. FLEXIBLE DUCTS SHALL BE SPIRIT ALUMINIUM FLEXMASTER TYPE #7/L (#7/L-A ACOUSTIC DUCT) INSTALLED AS ONE CONTINUOUS PIECE. JOINING OF FLEXIBLE DUCTS IS NOT PERMITTED. MAXIMUM LENGTH SHALL NOT EXCEED 10 FT.-0 IN. (2500 MM). CONNECT TO DUCTWORK WITH DUCT SEALER IN THE JOINTS AND WITH SCREWS.
- 11.3. PROVIDE DUCT SEALER ON ALL NEW DUCT JOINTS.
- 11.4. DUCT SEALER TO BE EQUAL TO PROSEAL, FIBERSEAL, TO BE APPLIED WITH BRUSH OR FLOW GUN. DUCT SEALER SHALL BE NON-V.O.C., PERMANENTLY FLEXIBLE, LOW SHRINKAGE, AND ULC CLASSIFIED FOR SURFACE BURNING CHARACTERISTICS. APPLICATION TO BE MADE WHEN AIR SYSTEM(S) ARE OFF, TO ALLOW MATERIAL TO CURE 24-72 HOURS BEFORE PRESSURE IS APPLIED TO THE SYSTEM.
- 11.5. RIGID ROUND DUCTS SHALL BE OF SPIRAL CONSTRUCTION. DAMPERS WITH DURO-DYNE OR EQUAL 1/4 IN. DIAM. REGULATOR SET AND BEARINGS ARE REQUIRED AT ALL ROUND DUCT BRANCH TAKE-OFFS.
- 11.6. PROVIDE DUCT ACCESS DOORS WITH SASH LOCKS AT BOTH MAIN DUCTS, DAMPERS, SMOKE DAMPERS, CONTROL DAMPERS, COILS AND AS REQUIRED FOR SERVICING FOR ANY OTHER DEVICE. SIZE TO BE MINIMUM 16 IN. X 12 IN. (400 MM X 300 MM).
- 11.7. PROVIDE FLEXIBLE CONNECTIONS BETWEEN ALL FANS AND ADJACENT DUCTWORK WITH A MINIMUM 6 IN. (150 MM) SEPARATION BETWEEN FAN AND DUCTWORK. FLEXIBLE CONNECTIONS SHALL CONSIST OF A PREASSEMBLED UNIT OF FIRE RESISTANT P.V.C. WEAVE EQUAL TO DURO DYNE CANFLX.
- 11.8. PROVIDE 1 IN. (25 MM) FLEXIBLE SCRM FACED ACOUSTIC INSULATION EQUAL TO "KNAUF" DUCT LINER "M" FOR ALL SUPPLY, RETURN OR EXHAUST DUCTWORK UP TO A MINIMUM OF 10' FROM A FAN UNIT, UNLESS OTHERWISE INDICATED. ALL DIMENSIONS ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS, WHERE ACOUSTIC INSULATION IS INSTALLED, INCREASE DIMENSIONS ACCORDINGLY. LINING TO BE ATTACHED WITH COMPLETE COVERAGE OF ADHESIVE AND PINS ON MAXIMUM 18 IN. CENTRES. ALL RAW EDGES OF LINING TO BE BUTTERED DOWN WITH DUCT SEALER OR METAL EDGES TO AVOID EROSION OF FIBRES. SPRAY ADHESIVE IS NOT ACCEPTABLE.
- 11.9. PROVIDE BALANCING DAMPERS FOR ALL NEW DUCT BRANCHES. PROVIDE ALSO BALANCING DAMPERS AND SPLITTER DAMPERS IN ALL NEW DUCTWORK AS REQUESTED BY THE AIR BALANCING COMPANY.
- 11.10. WHERE BALANCING DAMPERS ARE PROVIDED IN DRYWALL CEILINGS, PROVIDE REMOTE CABLE ACTVATED BALANCING DAMPERS. SCREW ACTUATOR TO BE COORDINATED WITH EQUIPMENT ACCESS PANEL LOCATION.
- 11.11. PROVIDE FIRE DAMPERS ON ALL DUCTWORK PASSING THROUGH FIRE SEPARATION, WHERE SHOWN ON DRAWING AND WHERE REQUIRED BY LOCAL AUTHORITIES AND APPLICABLE CODES.
- 11.12. FIRE DAMPERS SHALL BE TYPE DBD, WITH BLADES OUTSIDE THE AIR STREAM, U.L.C. LABELLED, FABRICATED AND INSTALLED TO THE APPROVAL OF ALL AUTHORITIES HAVING JURISDICTION. INSTALL FIRE DAMPERS IN SLEEVES, SECURED WITH ANGLE SUPPORTS IN ACCORDANCE WITH NFPA 90A AND CUA 90-1.
- 11.13. WHERE INDICATED AND WHERE NECESSARY TO PROTECT BUILDING COMPONENTS, PROVIDE FIRE RESISTIVE INSULATION LISTED FOR INSTALLATION ON KITCHEN EXHAUST DUCTWORK, DUCT SUPPORTS, ACCESS DOORS, FITTINGS ETC. SHALL BE INSTALLED AND PROTECTED ACCORDING TO THE INSULATION MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.

12. DIFFUSERS, GRILLES AND REGISTERS

- 12.1. ALL DIFFUSERS, GRILLES AND REGISTERS SHALL BE MANUFACTURED BY PRICE, TITUS, NAILOR, KRUEGER OR CARNES EQUAL TO THE UNITS SPECIFIED.
- 12.2. ALL DIFFUSERS AND REGISTERS TO BE COMPLETE WITH VOLUME DAMPERS. ALL VOLUME AND AIR PATTERN DEVICES SHALL BE FULLY ADJUSTABLE FROM THE FACE OF THE DIFFUSER, REGISTER OR GRILLE. DIFFUSERS TO SUIT CEILING GRID.
- 12.3. PRIOR TO ORDERING, CONTRACTOR TO CONFIRM THE COLOUR OF ALL GRILLES AND DIFFUSERS WITH ARCHITECT.
- 12.4. NOISE GENERATED BY DIFFUSERS SHALL BE SUCH THAT ROOM SOUND PRESSURE LEVEL DOES NOT EXCEED NOISE TO SUIT SERVICE AND ATTACH WITH ADHESIVE AND STAINLESS STEEL BANDING OR CEMENT AND SEAL EDGES OF INSULATION TO THE ADJACENT SURFACES AND FINISH WITH FIELD APPLIED MESH REINFORCED MASTIC.
- 12.5. SQUARE DIFFUSERS SHOWN AS TYPE "P" SHALL BE SQUARE STEEL PLAQUE 600 MM X 600 MM (24 IN. X 24 IN.) FACE SIZE AND SHALL BE SQUARE, CONED METAL. DIFFUSERS SHALL CONSIST OF A PRECISION FORMED BACK CONE OF ALUMINIUM OR STAINLESS STEEL WITH A RIGID PLATE ATTACHED TO THE BACK OF THE CONE. THE PLATE SHALL BE 1/4" THICK. LENGTH FOR CONNECTING RIGID OR FLEXIBLE DUCT AS SHOWN. AN INNER PLATE ASSEMBLY SHALL BE INCORPORATED THAT DROPS NO MORE THAN 1/4" BELOW THE CEILING PLANE TO ASSURE PROPER AIR DISTRIBUTION PERFORMANCE. THE INNER PLATE SHALL BE OF ALUMINIUM OR STAINLESS STEEL. THE PLATE SHALL BE COM

12.2. RETURN REGISTERS SHOWN AS TYPE "K" SHALL BE STANDARD RETURN GRILLES WITH HORIZONTAL FINED BARS SET AT APPROXIMATELY 45 DEG. FOR WALL RETURNS AND SET STRAIGHT FOR CEILING RETURN. KEY OPERATED DAMPER SHALL BE PROVIDED ON ALL EXHAUSTS.

12.9. WHERE DIFFUSERS OR GRILLES ARE PROVIDED IN T-BAR CEILINGS, PROVIDE LAY-IN TYPE, AND WHERE LOCATED IN DRYWALL PROVIDE SURFACE MOUNTED. REVIEW CEILING TYPES WITH THE DESIGNER'S REFLECTED CEILING PLAN PRIOR TO CONSTRUCTION.

12.10. WHERE RIGID DUCT IS CONNECTED TO THE DIFFUSER, GRILLE OR REGISTER ALL DEVICES USED FOR FLOW PATTERN ADJUSTMENT AND FLOW BALANCING SHALL BE ACCESSIBLE FROM THE FACE OF THE DIFFUSER.

12.11. REFER TO THE ARCHITECTURAL DRAWINGS FOR ACTUAL LOCATIONS OF DIFFUSERS, GRILLES AND REGISTERS AND TO THE MECHANICAL DRAWINGS FOR ACTUAL SIZES AND NUMBER OF DIFFUSERS, GRILLES AND REGISTERS REQUIRED.

13.1. EXHAUST FANS SHALL BE AS SCHEDULED OR ACCEPTED EQUAL.
13.2. INSTALL THE FAN AND ALL COMPONENTS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.

14.1. PACKAGED HRV UNIT SHALL BE AS SPECIFIED C/W ACCESSORIES AS NOTED.
14.2. MOUNT OR HANG THE UNIT AND INSTALL ALL COMPONENTS REQUIRED FOR A COMPLETE AND OPERATIONAL UNIT.
ENSURE MAINTENANCE ACCESS CLEARANCE IS PROVIDED.
14.3. REFER TO HEAT RECOVERY VENTILATOR SCHEDULE.

15.1. PROVIDE SUBMITTALS AND SHOP DRAWINGS IN ACCORDANCE WITH THE GENERAL REQUIREMENTS AND AS SPECIFIED HEREIN. SUBMIT SHOP DRAWINGS INDICATING SCHEMATIC LAYOUT OF SYSTEM, INCLUDING EQUIPMENT, CRITICAL DIMENSIONS AND TUBING/SLAB PENETRATION DETAILS AND DETAILS FOR PROTECTED EXPOSED PEX TUBING, SUBMIT MANUFACTURERS TECHNICAL INSTRUCTIONS, SUBMIT INSTALLERS CERTIFICATIONS OF TRAINING FOR INSTALLATION OF PEX FLOOR HEATING SYSTEMS, SUBMIT DATA INDICATING TUBE SIZING AND PANEL PERFORMANCE AT TUBE SPACING AND WARM WATER TEMPERATURE SELECTED. SUBMIT INDEPENDENT CERTIFICATION RESULTS FOR THE TUBING SYSTEMS FROM A RECOGNIZED TESTING LABORATORY. SUBMIT CATALOGUE DATA ON ALL SUPPORTS, TUBE GUIDES, SPACERS AND ASSOCIATED ACCESSORIES. SUBMIT DATA ON THE INSTALLATION OF THE TUBING AND MANIFOLDS. SUBMIT DESIGN CALCULATION RECORD FORMS INDICATING THE COMPLIANCE WITH THE REQUIREMENTS.

15.2. FURNISH AND INSTALL RADIANT FLOOR HEATING SYSTEM/TUBING, DISTRIBUTION MANIFOLDS WITH VENTING/AIR PURGE VALVE, MANIFOLD TO TUBING FITTINGS, EMBEDDABLE COMPRESSION SLEEVE TUBING REPAIR COUPLINGS, CIRCUIT ISOLATION VALVES, THERMOSTATS, CONTROLS AND INSTALLATION INSTRUCTIONS. SUPERVISION AND FIELD ENGINEERING REQUIRED FOR COMPLETE AND PROPER FUNCTION OF THE SYSTEMS. RADIANT FLOOR HEATING SYSTEM SHALL BE MANUFACTURED BY WIRSBO.

15.3. ALL RADIANT FLOOR HEATING TUBING SHALL BE HIGH DENSITY CROSSLINKED POLYETHYLENE REINFORCED IN ACCORDANCE WITH ASTM F897 AS CERTIFIED BY NSF OR THE CSA OR EQUIVALENT TESTING ORGANIZATION AND WITH AN EMBEDDED COMPRESSION SLEEVE TUBING REPAIR COUPLING. TUBING SHALL BE SHIPPED TO THE PROJECT SITE IN ACCORDANCE TO THE SPECIFIED STANDARD PRIOR TO SHIPMENT FROM THE MANUFACTURING FACILITY. TEMPERATURE AND PRESSURE RATING: TUBING SHALL BE RATED FOR NOT LESS THAN 82.2 DEG. C (180 DEG. F) WORKING TEMPERATURE AND 100 PSIG WORKING PRESSURE. TUBING SHALL HAVE A CO-EFFECTED OXYGEN DIFFUSION BARRIER CAPABLE OF LIMITING OXYGEN TRANSMISSION RATE TO NOT MORE THAN 0.10 CC/QUAD. INCHES (2.543 E-006 LB/CU. FT./DAY) AT 40 DEG. C (104 DEG. F) WATER TEMPERATURE. IN ACCORDANCE WITH DIN 4726, THE MINIMUM BEND RADIUS FOR COLD BENDING OF THE TUBE SHALL NOT BE LESS THAN FIVE (5) TIMES THE OUTSIDE DIAMETER. BENDS WITH A RADIUS LESS THAN FIVE (5) TIMES THE OUTSIDE DIAMETER SHALL BE APPROVED BY THE MANUFACTURER.

15.4. FITTINGS SHALL BE MANUFACTURED OF BRASS AND SHALL BE SUPPLIED BY THE TUBING MANUFACTURER AS PART OF A PROVEN CATALOGUED SYSTEM. TUBE COUPLINGS EMBEDDED WITHIN THE THERMAL MASS SHALL BE BRASS COMPRESSION TYPE WITH RIBBED INSERT AND COMPRESSION SLEEVE.

15.5. DISTRIBUTION MANIFOLDS SHALL BE SUPPLIED BY THE PART OF THE MANUFACTURER'S SYSTEMS. MANIFOLDS SHALL BE EQUIPPED WITH BALANCING AND ISOLATION VALVES FOR EACH CIRCUIT.

15.6. THE RADIANT FLOOR SYSTEM COMPONENT MANUFACTURER SHALL WARRANT THE CROSSLINKED POLYETHYLENE TUBING AND ALL RELATED WATER DISTRIBUTION COMPONENTS, EXCEPT CONTROLS, TO BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP FOR FIVE (5) YEARS. THE DESIGN SHALL BE SUBMITTED TO THE PROJECT ARCHITECT FOR REVIEW AND APPROVAL. THE PROJECT ARCHITECT SHALL DESIGN CALCULATION RECORD FORMS AND MANUFACTURER APPROVED SITE INSPECTION REPORTS. THE DESIGN SHALL BE APPROVED EITHER BY SUBMITTAL OR STAMPED BY A REGISTERED ENGINEER AS BEING COMPLETE AND ACCURATE.

15.7. DELIVER AND STORE TUBING AND SPECIALTIES IN SHIPPING CONTAINERS WITH LABELING IN PLACE. DO NOT EXPOSE TO ULTRA VIOLET LIGHT FOR MORE THAN 90 DAYS.

15.9. PROTECT TUBING AND SPECIALIES FROM ENTRY OF CONTAMINATING MATERIAL BY INSTALLING TAPE OR PLUGS IN ALL OPEN TUBE ENDS UNTIL INSTALLATION AND/OR MAINTAIN TUBING IN THE ORIGINAL SHIPPING BOXES OR PACKAGING UNTIL USAGE. UNPROTECTED TUBES SHALL NOT BE DRAGGED ACROSS THE GROUND OR CONCRETE SURFACES, AND SHALL BE STORED ON A FLAT SURFACE WITH NO SHARP EDGES. TUBE SHALL BE PROTECTED FROM OIL, GREASE, DIRECT SUNLIGHT AND OTHER ELEMENTS AS RECOMMENDED BY MANUFACTURER.

15.11. ROUTE TUBING IN ORDERLY MANNER, ACCORDING TO LAYOUT AND SPACING SHOWN IN APPROVED SUBMITTAL DRAWINGS. ALL NOTES ON DRAWINGS SHALL BE FOLLOWED.

15.12. AT JOINTS AND FITTINGS, SQUARE AND CLEAN END OF TUBE, USING A PLASTIC TUBE CUTTER AND JOIN IMMEDIATELY OR CAP WITH TAPE TO SEAL FROM CONTAMINANTS. WHERE FITTINGS ARE INSTALLED WITHIN THE THERMAL

15.13. REMOVE ALL TWISTS PRIOR TO SECURING TUBE. FASTEN TUBING AT NO MORE THAN 91.4 CM (3 FT.) INTERVALS, BEING CAREFUL NOT TO TWIST THE TUBE. IN THIN CONCRETE SLABS IT MAY BE NECESSARY TO SECURE TUBING EVERY

15.14. TUBING THAT MUST PASS THROUGH EXPANSION JOINTS SHALL BE SLEEVED 25.4 CM (10 IN.) ON EACH SIDE OF THE JOINT.

15.15. WHERE TUBING EXITS THE FLOOR, A SLEEVE SHALL BE PLACED AROUND THE TUBE, WITH THE SLEEVE EXTENDING A MINIMUM OF 25.4 CM (10 IN.) INTO THE FLOOR AND EXITING BY A MINIMUM OF 25.4 CM (10 IN.).

15.16. THE HEATING SYSTEM SHOULD BE PUT INTO OPERATION AFTER THE POURED CONCRETE THERMAL MASS HAS CURED A MINIMUM OF 28 DAYS. IF IT IS NECESSARY TO OPERATE THE HEATING SYSTEM TO PREVENT FREEZING, A MAXIMUM FLOW TEMPERATURE OF 15 DEG C (59 DEG F) MUST NOT BE EXCEEDED WHILE THE THERMAL MASS IS CURING GRADUALLY.

INCREASE THE FLOW TEMPERATURE BY -12.22 DEG. C. (10 DEG. F.) EACH DAY UNTIL IT REACHES THE MAXIMUM OPERATING TEMPERATURE.

15.17. FURNISH AND INSTALL ALL RADIANT HEATING SYSTEM COMPONENTS AS SHOWN IN SCHEMATICS, ON DRAWINGS AND AS SPECIFIED IN EQUIPMENT SCHEDULES FOR A COMPLETE AND OPERATIONAL SYSTEM, INCLUDING, BUT NOT LIMITED TO,

BOILER, PUMP, EXPANSION TANK, GLYCOL FILL TANK, AIR SEPARATOR, VALVES, MANIFOLD, PIPING, INSULATION, GAUGES AND APPURTENANCES.

16.3. SHOP DRAWINGS SHALL INCLUDE A CONTROL DIAGRAM INDICATING HOW CONTROLS ARE ELECTRICALLY CONNECTED FOR EACH SYSTEM AND EQUIPMENT LIST AND MANUFACTURERS, DATA SHEETS AND A DESCRIPTION OF THE CONTROL

16.4. THE OPERATING AND MAINTENANCE MANUAL SHALL CONTAIN AS BUILT SHOP DRAWINGS AND OPERATING AND MAINTENANCE PROCEDURES FOR EACH SYSTEM, AND EQUIPMENT LIST AND MANUFACTURERS DATA SHEETS AND A DESCRIPTION OF THE CONTROL SEQUENCE FOR EACH SYSTEM.

16.5. PROVIDE ALL NECESSARY CONDUIT AND WIRING TO FACILITATE AND ENSURE THE INSTALLATION OF A COMPLETE AND OPERATIONAL CONTROLLED HVAC SYSTEM.

16.6. ALL WIRING, EXCEPT IN THE CEILING PLENUMS, SHALL BE INSTALLED IN EMT CONDUIT. REFER TO THE ELECTRICAL DIVISION SPECIFICATION FOR THE CONDUIT REQUIREMENTS.

10.7. LOW VOLTAGE WIRING WITH THE CEILING FLENUM MAY BE FTS FLENUM RATED CABLE, WHERE ACCEPTED BY THE LOCAL AUTHORITIES. THE CABLE SHALL BE NEATLY TIE WRAPPED TO CONDUIT MOUNTED TO THE BUILDING STRUCTURE BUT MUST BE INSTALLED ON RIGHT ANGLES OR PARALLEL TO THE BUILDING WALLS. LOOSE WIRING SHALL ONLY BE

16.8. INSTALL THERMOSTATS AS INDICATED ON DRAWINGS, CONFIRM FINAL LOCATIONS WITH THE CONSULTANT BEFORE INSTALLATION

17. SEQUENCES OF OPERATION

17.1.2. SYSTEM START:
1.1 SYSTEM START SHALL BE INITIATED BY OPERATOR COMMAND OR THROUGH TIME SCHEDULE. UPON SIGNAL TO START THE SYSTEM, THE BOILERS, PUMP AND RADIANT HEATING VALVES SHALL BE ENABLED.

17.1.3. NORMAL OPERATION:
 .1 THE PUMP SHALL RUN CONTINUOUSLY TO MAINTAIN HEATING WATER SUPPLY TEMPERATURE.

3 WHEN IN UNOCCUPIED MODE THE VALVES SHALL MODULATE IF NECESSARY TO MAINTAIN THE NIGHT SET-BACK

17.1.4. SYSTEM STOP: 1. SYSTEM STOP IS INITIATED BY OPERATOR COMMAND OR THROUGH THE SCHEDULE. UPON SIGNAL TO STOP THE

17.1.5. SCHEDULE:

17.1.5. ALARMS:
1 BOILER GENERAL ALARM (BGAL) FROM BOILER PANEL

- .1 BOILER GENERAL ALARM (BOL) FROM BOILER PANEL.
- .2 SPACE TEMPERATURE OUT OF RANGE.
- .3 HEATING WATER SUPPLY TEMPERATURE OUT OF RANGE.

END OF SPECIFICATION



Certificate of Authorization
SMITH + ANDERSEN
No. 5990



6137262 MANITOBA LTD.
ARTHUR CONSULTING
 PROJECT MANAGEMENT-ENGINEERING DESIGN
JOHN W. ARTHUR, P.ENG.
 1-1660 KENASTON BLVD. PO BOX 70050
 WINNIPEG MANITOBA R3P 0X6
 CELL #1: 204 998-9898 CELL #2: 204 296-3499
 FAX NO: 204 736-2380
 EMAIL: arthur_consulting@mymts.net

GENERAL NOTES:

ALL DRAWINGS ARE THE EXCLUSIVE PROPERTY OF JOHN ARTHUR CONSULTING (6137262 MANITOBA LTD.) AND SHALL NOT BE REPRODUCED OR DISTRIBUTED WITHOUT WRITTEN PERMISSION OF JOHN ARTHUR CONSULTING.

NO MODIFICATIONS SHALL BE CARRIED OUT WITHOUT PRIOR WRITTEN APPROVAL OF JOHN ARTHUR CONSULTING
GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND PERTINENT INFORMATION ON SITE AND NOTIFY JOHN ARTHUR CONSULTING OF ANY DISCREPANCIES.

PROJECT TITLE & LOCATION:

**26095 PR 227 Landfill Site, RM
of Portage La Prairie, MB**

| | | | |
|-----|---------|-------------------------|----|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| 1 | 18JUN21 | ISSUED FOR CONSTRUCTION | MK |
| NO. | DDMMYY | DESCRIPTION | BY |

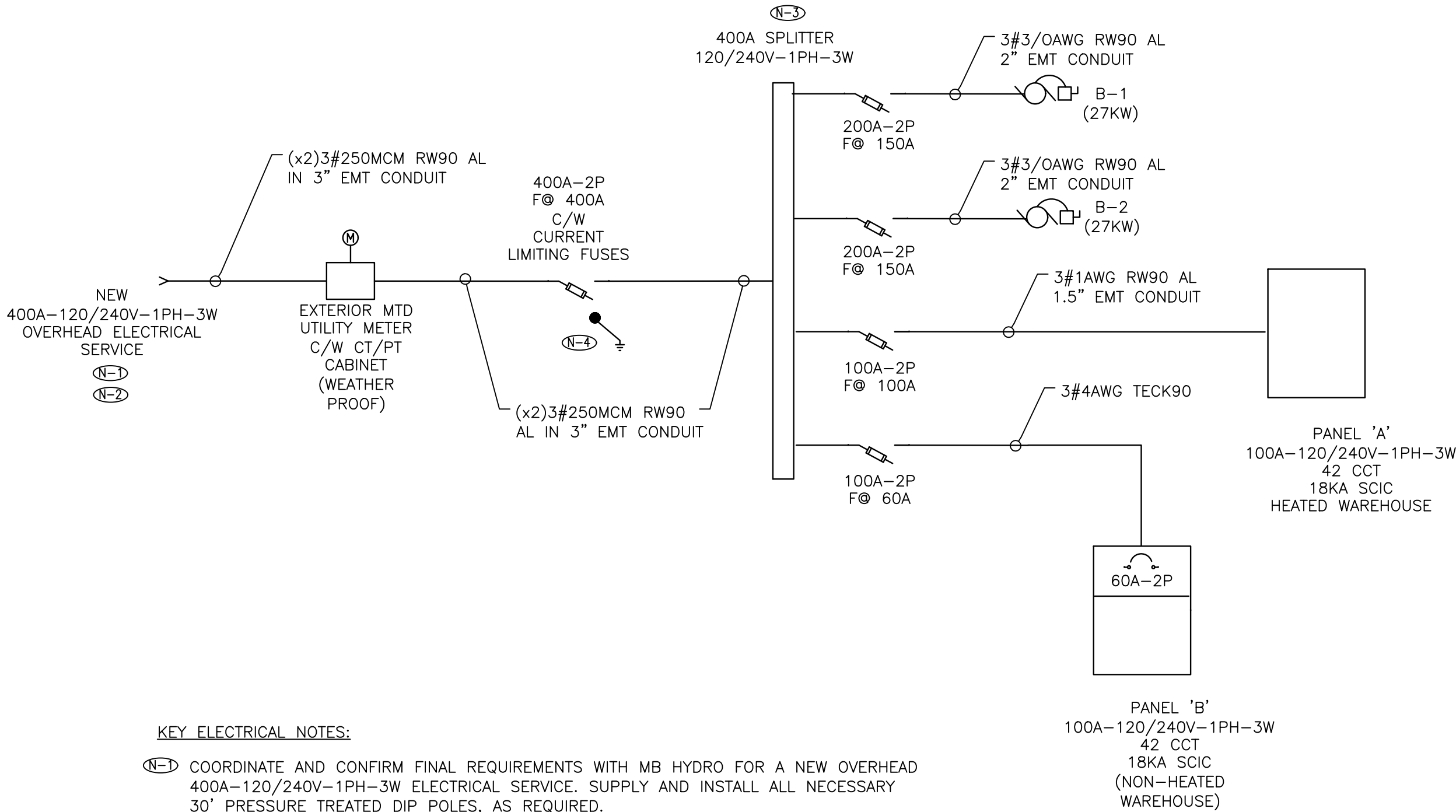
| | | |
|--|----------------------|--|
| SHEET TITLE: | | REV. NO.: |
| <h1>MECHANICAL SPECIFICATIONS</h1> | | |
| DESIGN BY: MK | SCALE: N.T.S. | SHEET NO.: <div style="font-size: 2em; font-weight: bold; text-align: center;">M7</div> |
| DRAWN BY: MM | DATE: Jun 2021 | |
| CHECKED BY: KS | PROJ. NO.: 21246.001 | |

| LUMINAIRE SCHEDULE | | | | | | |
|--------------------|--------------|--------------------------------|--------|---------|-------|-------|
| TYPE | MANUFACTURER | MODEL # | DRIVER | | | WATTS |
| | | | LUMENS | CCT (K) | VOLTS | |
| L1 | LITHONIA | JEBL 18L 40K 80CRI WH | 19783 | 4000 | 120 | 136 |
| L2 | LITHONIA | WPX2 LED 40K MVOLT PE DBLXD | 6000 | 4000 | 120 | 47 |
| L3 | LITHONIA | WPX1 LED P1 40K MVOLT PE DBLXD | 1500 | 4000 | 120 | 11 |
| | | | | | | |

- NOTES:**
- All luminaires need to be consistent on technology and must match reference standard description regardless of catalogue number. Where finishes are not indicated, allow for special finish. Manufacturer/Catalogue number not listed will not be considered.
 - The Electrical Contractor is responsible for the supply and installation of all fixed per unit cost luminaires as part of the base electrical contract. The Electrical Contractor is responsible for the installation of all cash allowance luminaires as part of the base electrical contract. Refer to specification 16505 or 26.51 13.00 for more details.
 - LED's are to be latest technology to proved maximum lumens, binned, best colour and longest life at time of purchase. Drivers are to be the latest technology at time of purchase.
 - Fluorescent luminaire dimensions listed are the maximum size allowed. Luminaires provided can be smaller than the dimension listed.
 - All luminaires diameter and depth listed are the maximum size allowed. Luminaires provided can be smaller than the dimension listed.
 - All LED luminaires that present signs of failure on site, within the warranty period, must be replaced at no cost to the owner. If temporary luminaires are required to replace any failed LED luminaires during the waiting time for parts (i.e. drivers, boards, heat sinks, etc.), the labour cost including installation, temporary luminaire supply, temporary luminaire removal, and reinstallation of the LED fixture must be provided at no cost of the owner. Additional electrical costs associated with higher Wattage temporary luminaires must be reimbursed with interest to the owner by the manufacturer.
 - In case of failure of an LED luminaire, complete or partial, an independent third party testing laboratory (approved by Smith + Andersen) shall be commissioned by the manufacturer or vendor to perform tests on samples taken from the failed luminaires. All reporting including the test results must be submitted to Smith + Andersen for evaluation and final approval.
 - Any additional time used by the Architect and/or the Engineer caused by luminaire manufacturing issues will be billed at our hourly rates to the manufacturer or vendor.
 - All LED parts and accessories must be replaceable on site without removal of the luminaire.

CONTROL:
ON/OFF
0-10V DIM
1%, 0-10V DIM DIMS TO 1%
0%, 0-10V DIM DIMS TO DARK
DALI
N-LIGHT
IS: INTEGRATED SENSOR

MOUNTING:
S: SURFACE
R: RECESSED
C: CEILING
W: WALL
V: VALENCE
P: PENDANT
TB: T-BAR
DW: DRYWALL
CH: CHAIN-HUNG
SUSP: SUSPENDED



- KEY ELECTRICAL NOTES:**
- COORDINATE AND CONFIRM FINAL REQUIREMENTS WITH MB HYDRO FOR A NEW OVERHEAD 400A-120/240V-1PH-3W ELECTRICAL SERVICE. SUPPLY AND INSTALL ALL NECESSARY 30' PRESSURE TREATED DIP POLES, AS REQUIRED.
 - ELECTRICAL CONTRACTOR TO PROVIDE ALL NECESSARY MOUNTING ATTACHMENTS, MASTING, AND SERVICE PROTECTION SHIELDS, RACKS AND 30' PRESSURE TREATED DIP POLES, AS REQUIRED.
 - ELECTRICAL EQUIPMENT TO BE SEALED TO UTILITY SATISFACTION.
 - SERVICE SYSTEM GROUND GRID. UTILIZE 2/0 Cu. CONNECT (x3) 10' x 0.75" Cu CLAD GROUND RODS MIN 10' APART.

| MOTOR EQUIPMENT SCHEDULE | | | | | | | | | | | | | | | | |
|--------------------------|---------------------------|-------------------|---------------|-----------|----------------|-----------|---------|-----|--------|----------|----------|---------|-----------|------------|----------|---------|
| TAG | DESCRIPTION / SERVICE | LOCATION | HP/KW/AMP/MCA | VOLTS/PH. | O/C PROTECTION | WIRE SIZE | STARTER | | | | | CONTROL | | | | Remarks |
| | | | | | | | HOA | VFD | Manual | Magnetic | PACKAGED | TYPE | SUPPLY BY | INSTALL BY | WIRED BY | |
| EF-1 | EXHAUST FAN | COLD STORAGE | FRAC | 120V-1PH | 15A-1P | #12 | | | | YES | | | | | | |
| HRV-01 | HEAT RECOVERY VENTILATOR | INSULATED STORAGE | 7.9 MCA | 120V-1PH | 15A-1P | #12 | - | - | - | - | YES | - | - | - | - | |
| HC-HRV-01 | ELEC PREHEAT COIL FOR HRV | INSULATED STORAGE | 10KWV | 240V-1PH | 60A-2P | #6 | - | - | - | - | | - | - | - | - | |
| BLR-01 | ELEC BOILER | INSULATED STORAGE | 27KWV | 240V-1PH | 150A-2P | #1/O | - | - | - | - | YES | - | - | - | - | |
| BLR-02 | ELEC BOILER | INSULATED STORAGE | 27KWV | 240V-1PH | 150A-2P | #1/O | - | - | - | - | YES | - | - | - | - | |
| P-BLR-01 | BOILER PUMP | INSULATED STORAGE | FRAC | 120V-1PH | 15A-1P | #12 | | | YES | | | | | | | |
| DHWH-01 | DOMESTIC HOT WATER TANK | WASHROOM | 1.5KW | 120-1PH | 20A-1P | #12 | - | - | - | - | | - | - | - | - | |
| | | | | | | | | | | | | | | | | |

- GENERAL NOTES:**
- A MANUAL MOTOR STARTER TO BE C/W PILOT LIGHT AND OVERCURRENT PROTECTION.
 - B ALL STARTERS TO BE SUPPLIED & INSTALLED BY THE ELECTRICAL CONTRACTOR (EC) UNLESS OTHERWISE NOTED.
 - C DISCONNECT SWITCHES TO BE SUPPLIED & INSTALLED BY THE ELECTRICAL CONTRACTOR (EC)
 - D ELECTRICAL CONTRACTOR TO PROVIDE CIRCUIT BREAKERS AND WIRING ACCORDING TO THE FINAL NAMEPLATES OF THE MECHANICAL EQUIPMENT AT NO COST.
 - E REFER TO PANELBOARD SCHEDULES AND SINGLE LINE DIAGRAM FOR MOTOR AND EQUIPMENT OVERLOAD PROTECTION.

- CONTROLS:**
- M.S MANUAL SWITCH
 - INT INTEGRAL
 - LO.T LOW VOLTAGE THERMOSTAT



APEGM
Certificate of Authorization
SMITH + ANDERSEN
No. 5990



Smith + Andersen
2031 Portage Avenue 2nd Floor Winnipeg Manitoba R3J 0K6
204 885 6666 smithandandersen.com

ENGINEER'S SEAL:

6137262 MANITOBA LTD.
ARTHUR CONSULTING
PROJECT MANAGEMENT-ENGINEERING DESIGN
JOHN W. ARTHUR, P.ENG.
1-1660 KENASTON BLVD. PO BOX 70050
WINNIPEG MANITOBA R3P 0X6
CELL #1: 204 998-9898 CELL #2: 204 296-3499
FAX NO: 204 736-2390
EMAIL: arthur_consulting@mymts.net

GENERAL NOTES:

ALL DRAWINGS ARE THE EXCLUSIVE PROPERTY OF JOHN ARTHUR CONSULTING (6137262 MANITOBA LTD.) AND SHALL NOT BE REPRODUCED OR DISTRIBUTED WITHOUT WRITTEN PERMISSION OF JOHN ARTHUR CONSULTING.

NO MODIFICATIONS SHALL BE CARRIED OUT WITHOUT PRIOR WRITTEN APPROVAL OF JOHN ARTHUR CONSULTING

GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND PERTINENT INFORMATION ON SITE AND NOTIFY JOHN ARTHUR CONSULTING OF ANY DISCREPANCIES.

PROJECT TITLE & LOCATION:

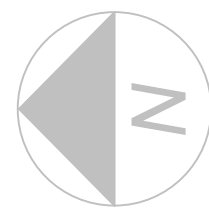
**26095 PR 227 Landfill Site, RM
of Portage La Prairie, MB**

| | | | |
|--|--|--|--|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| | | | |
|-----|------------|-------------------------|----|
| 1 | 2021.06.24 | ISSUED FOR CONSTRUCTION | MZ |
| NO. | DDMMYY | DESCRIPTION | BY |

REVISION

| | | | |
|--------------------|---------------------|------------|--|
| SHEET TITLE: | | REV. NO.: | |
| ELECTRICAL DETAILS | | | |
| DESIGN BY: AA | SCALE: NTS | SHEET NO.: | |
| DRAWN BY: AA | DATE: JUNE 2021 | | |
| CHECKED BY: MZ | PROJ.NO.: 21246.001 | | |



60x80 INSULATED
STORAGE - BUILDING #2

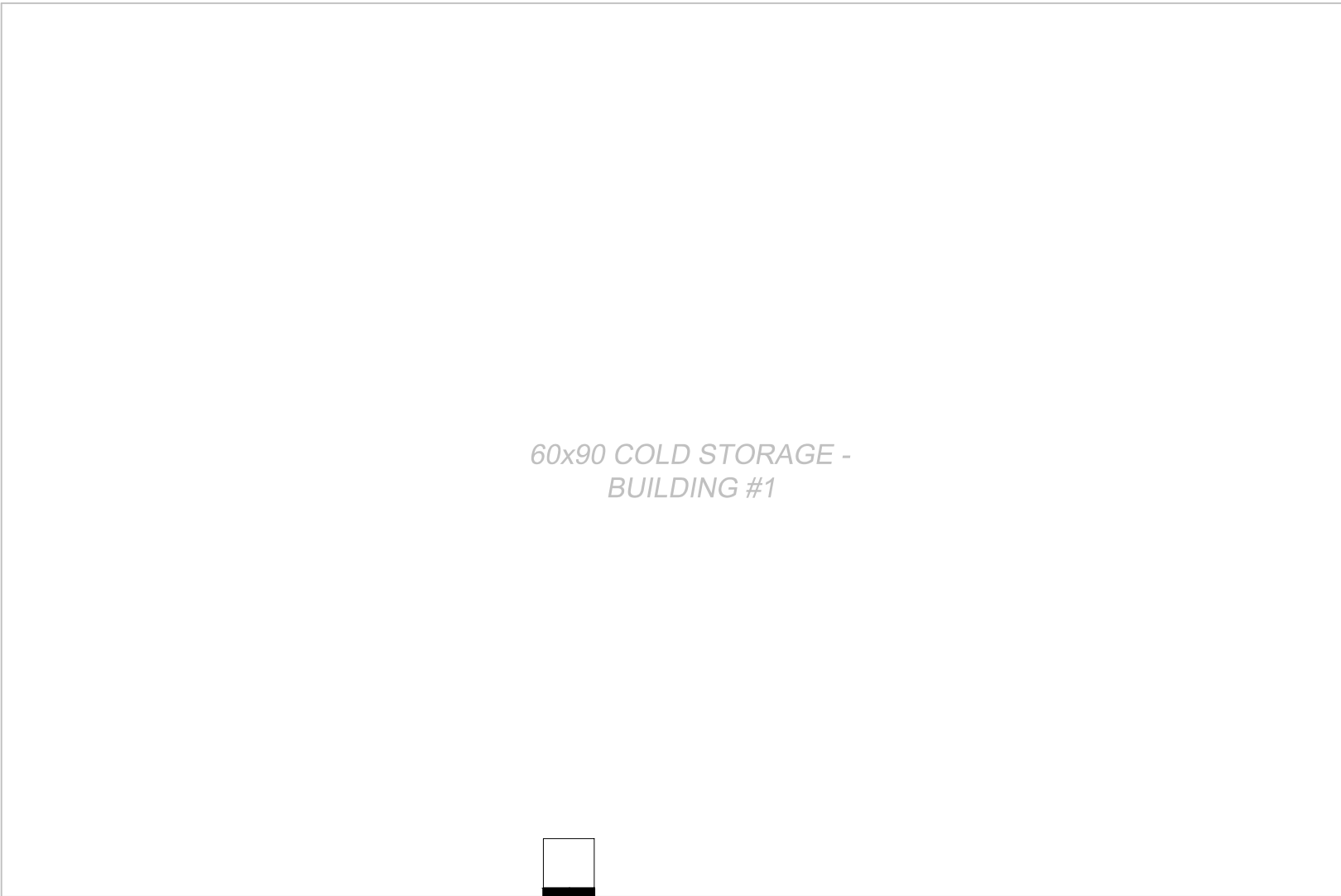
APPROXIMATE LOCATION OF
400A-120/240V-1PH-3W
MAIN ELECTRICAL
DISTRIBUTION

(N-1)

KEY ELECTRICAL NOTES:

- (N-1) APPROXIMATE LOCATION OF OVERHEAD ELECTRICAL SERVICE POINT TO BUILDING. COORDINATE AND CONFIRM FINAL REQUIREMENTS WITH MB HYDRO. SUPPLY AND INSTALL ALL NECESSARY 30' PRESSURE TREATED DIP POLES, AS REQUIRED. ELECTRICAL CONTRACTOR TO PROVIDE ALL NECESSARY MOUNTING ATTACHMENTS, MASTING, AND SERVICE PROTECTION SHIELDS AND RACKS, AS REQUIRED.

Landfill Site
26095 PR 227
RM of Portage La Prairie



60x90 COLD STORAGE -
BUILDING #1

APPROXIMATE LOCATION OF
SUB-PANEL 'B'
FED UNDERGROUND FROM
ADJACENT BUILDING



APEGM
Certificate of Authorization
SMITH + ANDERSEN
No. 5990



Smith + Andersen
2031 Portage Avenue 2nd Floor Winnipeg Manitoba R3J 0K6
204 885 6666 smithanderson.com

ENGINEER'S SEAL:

6137262 MANITOBA LTD.
ARTHUR CONSULTING
PROJECT MANAGEMENT-ENGINEERING DESIGN
JOHN W. ARTHUR, P.ENG.
1-1660 KENASTON BLVD. PO BOX 70050
WINNIPEG MANITOBA R3P 0X6
CELL #1: 204 998-9898 CELL #2: 204 296-3499
FAX NO: 204 736-2380
EMAIL: arthur_consulting@mymts.net

GENERAL NOTES:

ALL DRAWINGS ARE THE EXCLUSIVE PROPERTY OF JOHN ARTHUR CONSULTING (6137262 MANITOBA LTD.) AND SHALL NOT BE REPRODUCED OR DISTRIBUTED WITHOUT WRITTEN PERMISSION OF JOHN ARTHUR CONSULTING.
NO MODIFICATIONS SHALL BE CARRIED OUT WITHOUT PRIOR WRITTEN APPROVAL OF JOHN ARTHUR CONSULTING
GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND PERTINENT INFORMATION ON SITE AND NOTIFY JOHN ARTHUR CONSULTING OF ANY DISCREPANCIES.

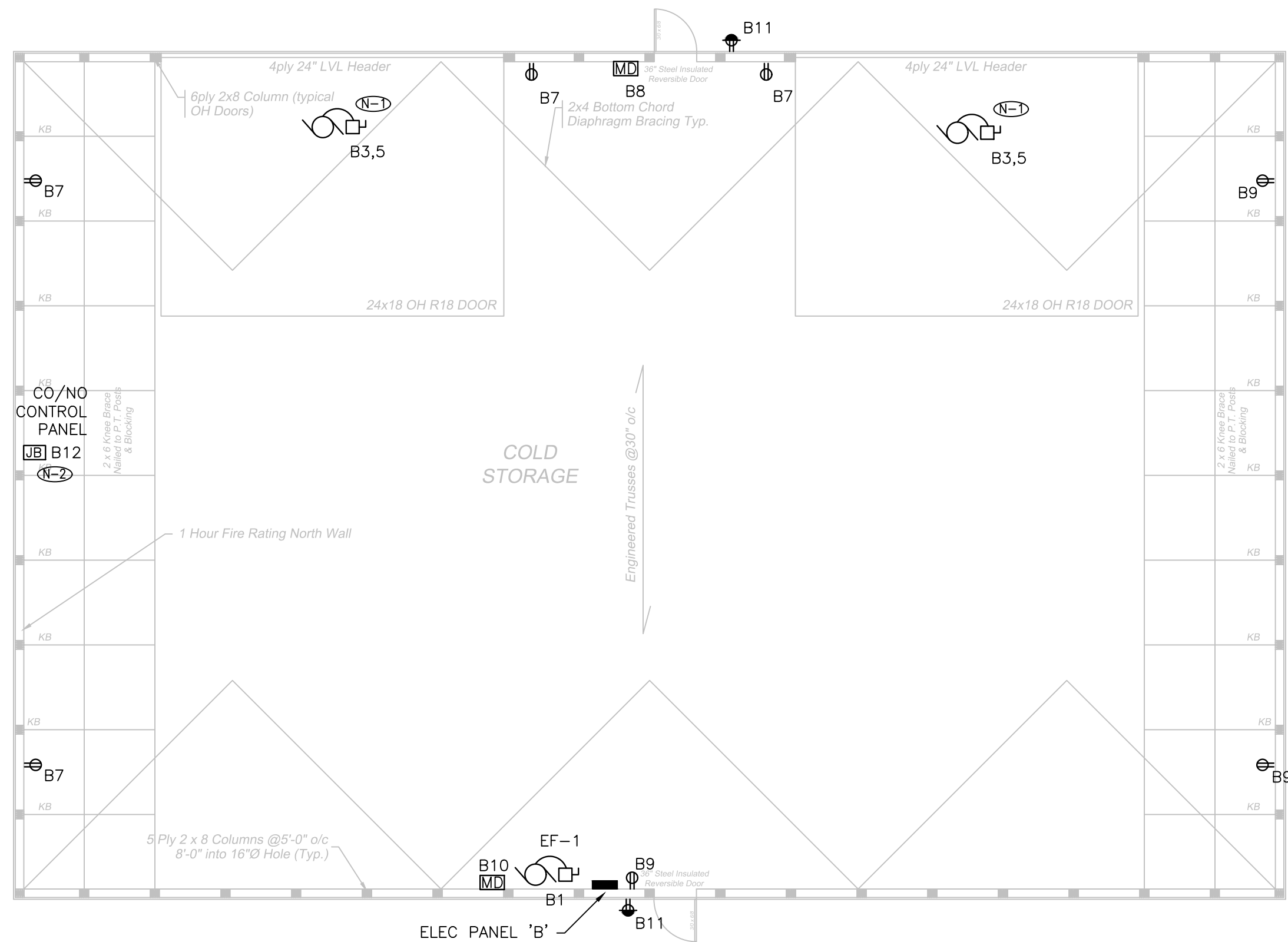
PROJECT TITLE & LOCATION:

**26095 PR 227 Landfill Site, RM
of Portage La Prairie, MB**

| | | | |
|-----|------------|-------------------------|----|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| 1 | 2021.06.24 | ISSUED FOR CONSTRUCTION | MZ |
| NO. | DDMMYY | DESCRIPTION | BY |

REVISION

| | | |
|-------------------------------|---------------------|----------------------|
| SHEET TITLE: SITE PLAN | | REV. NO.: |
| DESIGN BY: AA | SCALE: 3/32"=1'-0" | SHEET NO.: E2 |
| DRAWN BY: AA | DATE: JUNE 2021 | |
| CHECKED BY: MZ | PROJ.NO.: 21246.001 | |

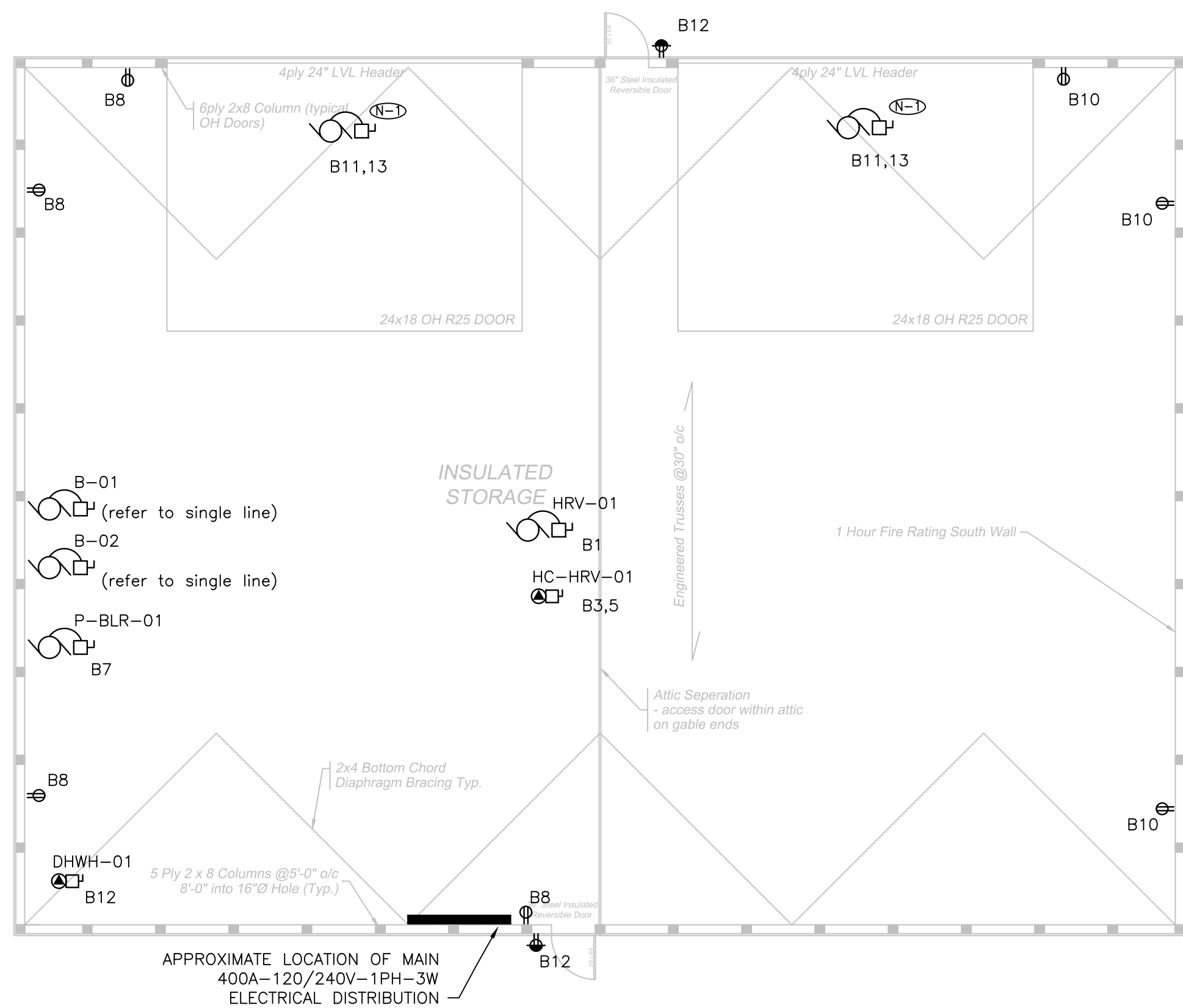


1 COLD STORAGE ELECTRICAL POWER AND SYSTEMS LAYOUT
SCALE: 1/8"=1'-0"

| PANEL: 'B' | | | | LOCATION: COLD BUILDING | | | | Smith + Andersen | | | | | | |
|---|----------------------------------|----------|----------------|-----------------------------|---------|---------|---|------------------|---------|-----------------|----------------|--------------------|-------------------|-----------|
| PROJECT NAME: Portage La Prairie Landfill PROJECT #: 21246.000.E | | | | FED FROM: MAIN DISTRIBUTION | | | | | | | | | | |
| TYPE/ INFO | DESCRIPTION | D.F. [%] | CONN. LOAD [W] | DEMAND LOAD [W] | BKR [A] | CCT NO. | Φ | CCT NO. | BKR [A] | DEMAND LOAD [W] | CONN. LOAD [W] | D.F. [%] | DESCRIPTION | TYPE INFO |
| | EXHAUST FAN | 100 | 100 | 100 | 15 | 1 | A | 2 | 15 | 700 | 700 | 100 | HIGH BAY LIGHTING | |
| | OVERHEAD DOOR | 50 | 1000 | 500 | 20 | 3 | B | 4 | 15 | 600 | 600 | 100 | HIGH BAY LIGHTING | |
| | COLD STORAGE RECEPTACLES | 50 | 1000 | 500 | 2P | 5 | A | 6 | 15 | 200 | 200 | 100 | OUTDOOR LIGHTING | |
| | COLD STORAGE RECEPTACLES | 100 | 800 | 800 | 15 | 7 | B | 8 | 15 | 100 | 100 | 100 | MOTORIZED DAMPER | |
| | COLD STORAGE RECEPTACLES | 100 | 600 | 600 | 15 | 9 | A | 10 | 15 | 100 | 100 | 100 | MOTORIZED DAMPER | |
| | OUTDOOR COLD STORAGE RECEPTACLES | 100 | 400 | 400 | 15 | 11 | B | 12 | 15 | 100 | 100 | 100 | CO/NO2 PANEL | |
| | | 100 | | | 15 | 13 | A | 14 | 15 | | | 100 | | |
| | | 100 | | | 15 | 15 | B | 16 | 15 | | | 100 | | |
| | | 100 | | | 15 | 17 | A | 18 | 15 | | | 100 | | |
| | | 100 | | | 15 | 19 | B | 20 | 15 | | | 100 | | |
| | | 100 | | | 15 | 21 | A | 22 | 15 | | | 100 | | |
| | | 100 | | | 15 | 23 | B | 24 | 15 | | | 100 | | |
| | | 100 | | | 15 | 25 | A | 26 | 15 | | | 100 | | |
| | | 100 | | | 15 | 27 | B | 28 | 15 | | | 100 | | |
| | | 100 | | | 15 | 29 | A | 30 | 15 | | | 100 | | |
| | | 100 | | | 15 | 31 | B | 32 | 15 | | | 100 | | |
| | | 100 | | | 15 | 33 | A | 34 | 15 | | | 100 | | |
| | | 100 | | | 15 | 35 | B | 36 | 15 | | | 100 | SPARE | |
| | | 100 | | | 15 | 37 | A | 38 | 15 | | | 100 | SPARE | |
| | | 100 | | | 15 | 39 | B | 40 | 15 | | | 100 | SPARE | |
| | | 100 | | | 15 | 41 | A | 42 | 15 | | | 100 | SPARE | |
| PANEL OPTIONS: | | | | | | | | | | LOAD A [KW]: | 2.2 | PHASE VOLTAGE [V]: | 120 | |
| 3R CSA ENCLOSURE RATING | | | | | | | | | | LOAD B [KW]: | 2.5 | LINE VOLTAGE [V]: | 240 | |
| <input type="checkbox"/> FEED THROUGH | | | | | | | | | | TOTAL [KW]: | 4.7 | PHASE: | 1P | |
| <input type="checkbox"/> SUB-FEED | | | | | | | | | | CURRENT A [A]: | | WIRE: | 3 | |
| <input type="checkbox"/> ISOLATED GROUND BUS | | | | | | | | | | CURRENT B [A]: | | MAINS [A]: | 100 | |
| <input type="checkbox"/> | | | | | | | | | | | | MAIN BREAKER [A]: | | |
| <input type="checkbox"/> | | | | | | | | | | | | I.C. [KA]: | 25 | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |
| <input type="checkbox"/> | | | | | | | | | | | | | | |

KEY ELECTRICAL NOTES:

- (N-1) WIRE AND CONNECT OVERHEAD DOOR OPERATOR AND ALL ASSOCIATED CONTROLS. CONFIRM FINAL ELECTRICAL REQUIREMENTS WITH MANUFACTURERS SPECIFICATIONS PRIOR TO ROUGH-IN.
- (N-2) APPROXIMATE LOCATION OF CO/NO CONTROL PANEL. COORDIANTE AND CONFIRM FINAL LOCATION WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.



1 INSULATED STORAGE ELECTRICAL POWER AND SYSTEMS LAYOUT
SCALE: 1/8"=1'-0"

| PANEL: 'A' | | | | | | | | | | LOCATION: INSULATED BUILDING | | | | Smith + Andersen | | | |
|---|--------------------------|--|-------------|----------------------|--------------------|------------|----------------------------|---|------------|---|--------------------|-------------------|-------------|------------------------|--------------|--|--|
| PROJECT NAME: Portage La Prairie Landfill PROJECT #: 21246.000.E | | | | | | | | | | FED FROM: MAIN DISTRIBUTION | | | | | | | |
| TYPE INFO | DESCRIPTION | | D.F. [%] | CONN. LOAD [W] | DEMAND LOAD [W] | BKR [A] | CCT NO. | Φ | CCT NO. | BKR [A] | DEMAND LOAD [W] | CONN. LOAD [W] | D.F. [%] | DESCRIPTION | TYPE INFO | | |
| | HEAT RECOVERY VENTILATOR | | 100 | 1000 | 1000 | 15 | 1 | A | 2 | 15 | 700 | 700 | 100 | HIGH-BAY LIGHTING | | | |
| | PREHEAT COIL HRV | | 100 | 5000 | 5000 | 60 | 3 | B | 4 | 15 | 600 | 600 | 100 | HIGH-BAY LIGHTING | | | |
| | | | 100 | 5000 | 5000 | 2P | 5 | A | 6 | 15 | 200 | 200 | 100 | OUTDOOR LIGHTING | | | |
| | BOILER PUMP | | 100 | 100 | 100 | 15 | 7 | B | 8 | 15 | 800 | 800 | 100 | INSULATED RECEPTACLES | | | |
| | DOMESTIC HOT WATER TANK | | 100 | 1500 | 1500 | 20 | 9 | A | 10 | 15 | 600 | 600 | 100 | INSULATED RECEPTACLES | | | |
| | OVERHEAD DOOR | | 50 | 1000 | 500 | 20 | 11 | B | 12 | 15 | 400 | 400 | 100 | OUTDOOR RECEPTACLES | | | |
| | | | 50 | 1000 | 500 | 2P | 13 | A | 14 | 15 | | | 100 | | | | |
| | | | 100 | | | 15 | 15 | B | 16 | 15 | | | 100 | | | | |
| | | | 100 | | | 15 | 17 | A | 18 | 15 | | | 100 | | | | |
| | | | 100 | | | 15 | 19 | B | 20 | 15 | | | 100 | | | | |
| | | | 100 | | | 15 | 21 | A | 22 | 15 | | | 100 | | | | |
| | | | 100 | | | 15 | 23 | B | 24 | 15 | | | 100 | | | | |
| | | | 100 | | | 15 | 25 | A | 26 | 15 | | | 100 | | | | |
| | | | 100 | | | 15 | 27 | B | 28 | 15 | | | 100 | | | | |
| | | | 100 | | | 15 | 29 | A | 30 | 15 | | | 100 | | | | |
| | | | 100 | | | 15 | 31 | B | 32 | 15 | | | 100 | | | | |
| | | | 100 | | | 15 | 33 | A | 34 | 15 | | | 100 | | | | |
| | | | 100 | | | 15 | 35 | B | 36 | 15 | | | 100 | SPARE | | | |
| | | | 100 | | | 15 | 37 | A | 38 | 15 | | | 100 | SPARE | | | |
| | | | 100 | | | 15 | 39 | B | 40 | 15 | | | 100 | SPARE | | | |
| | | | 100 | | | 15 | 41 | A | 42 | 15 | | | 100 | SPARE | | | |
| PANEL OPTIONS: | | | | | | | | | | LOAD A [KW]: 9.5 | | | | PHASE VOLTAGE [V]: 120 | | | |
| 1 CSA ENCLOSURE RATING | | | | | | | | | | LOAD B [KW]: 7.4 | | | | LINE VOLTAGE [V]: 240 | | | |
| <input type="checkbox"/> FEED THROUGH | | | | | | | | | | TOTAL [KW]: 17 | | | | PHASE: 1P | | | |
| <input type="checkbox"/> SUB-FEED | | | | | | | | | | CURRENT A [A]: 79 | | | | WIRE: 3 | | | |
| <input type="checkbox"/> ISOLATED GROUND BUS | | | | | | | | | | CURRENT B [A]: 62 | | | | MAINS [A]: 100 | | | |
| | | | | | | | | | | | | | | MAIN BREAKER [A]: | | | |
| | | | | | | | | | | | | | | I.C. [KA]: 25 | | | |
| LEGEND: | | | | | | | | | | NOTES: | | | | | | | |
| BAS-Building Automation System | | | | R.C-Relay Controlled | | | LTS-Lighting | | | 1. Panel Enclosure To Be Sprinklerproof. | | | | | | | |
| GFCI-Ground Fault Circuit Interrupter | | | | M-Motor | | | HI-High Intensity | | | 2. Panels greater than 66 circuits to be double tub. | | | | | | | |
| AFCI-Arc Fault Circuit Interrupter | | | | D.F-Demand Factor | | | Discharge Lighting Breaker | | | 3. Surge Protection Device (SPD) to be in a separate barriered enclosure with separate cover. | | | | | | | |
| SPD - Surge Protection Device | | | | REC-Receptacle | | | D.C-Direct Connection | | | | | | | | | | |
| BLO-Breaker Lock-On Device | | | | | | | | | | | | | | | | | |



APEGM
Certificate of Authorization
SMITH + ANDERSEN
No. 5990



Smith + Andersen

2031 Portage Avenue 2nd Floor Winnipeg Manitoba R3J 0K6
204 885 6666 smithandanderson.com

ENGINEER'S SEAL:

6137262 MANITOBA LTD.
ARTHUR CONSULTING
PROJECT MANAGEMENT-ENGINEERING DESIGN
JOHN W. ARTHUR, P.ENG.
1-1660 KENASTON BLVD. PO BOX 70050
WINNIPEG MANITOBA R3P 0X6
CELL #1: 204 998-9898 CELL #2: 204 296-3499
FAX NO: 204 736-2390
EMAIL: arthur_consulting@mymts.net

GENERAL NOTES:

ALL DRAWINGS ARE THE EXCLUSIVE PROPERTY OF JOHN ARTHUR CONSULTING (6137262 MANITOBA LTD.) AND SHALL NOT BE REPRODUCED OR DISTRIBUTED WITHOUT WRITTEN PERMISSION OF JOHN ARTHUR CONSULTING.
NO MODIFICATIONS SHALL BE CARRIED OUT WITHOUT PRIOR WRITTEN APPROVAL OF JOHN ARTHUR CONSULTING
GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND PERTINENT INFORMATION ON SITE AND NOTIFY JOHN ARTHUR CONSULTING OF ANY DISCREPANCIES.

PROJECT TITLE & LOCATION:

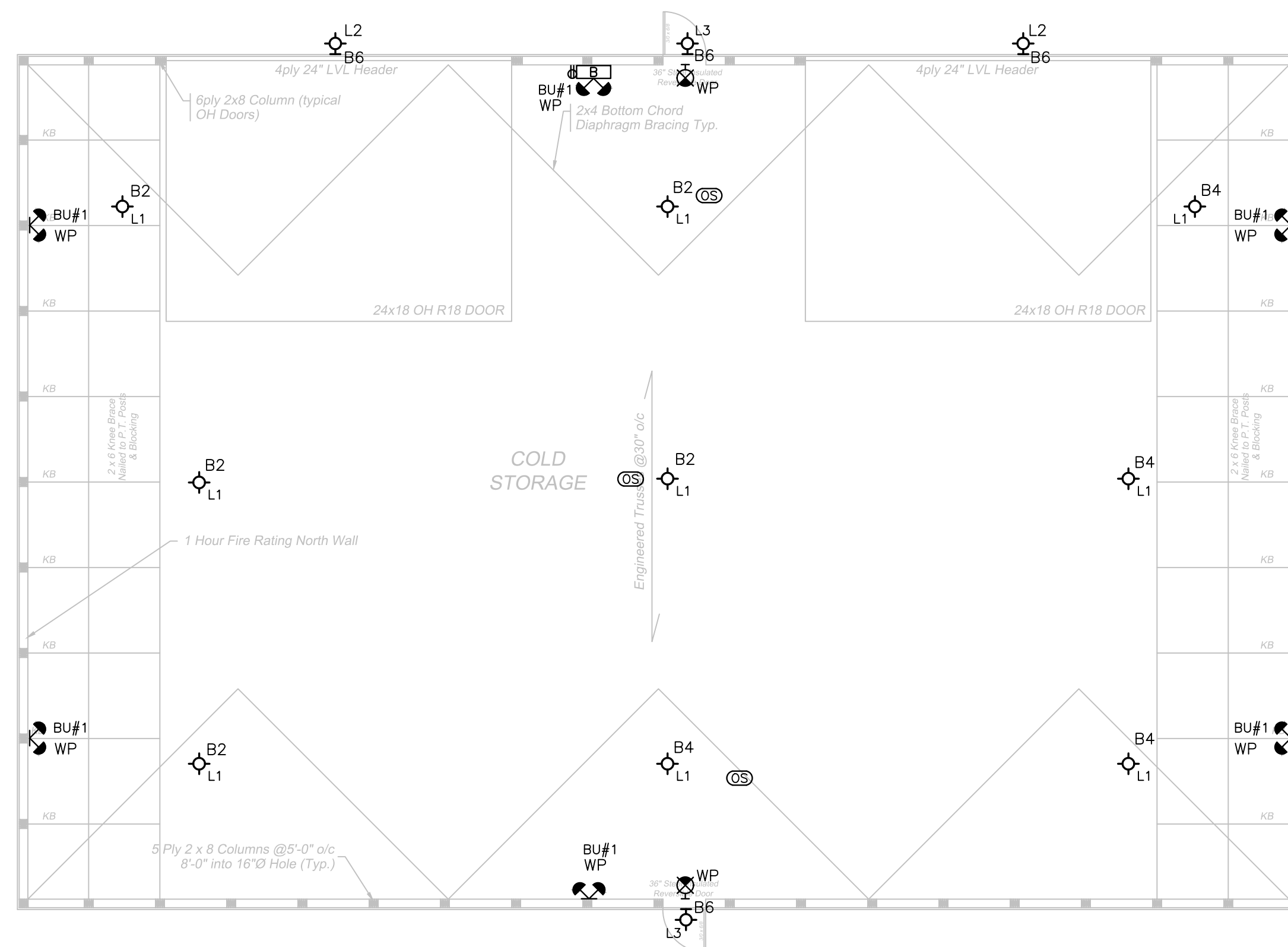
**26095 PR 227 Landfill Site, RM
of Portage La Prairie, MB**

| | | | |
|--|--|--|--|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| | | | |
|-----|------------|-------------------------|----|
| 1 | 2021.06.24 | ISSUED FOR CONSTRUCTION | MZ |
| NO. | DDMMYY | DESCRIPTION | BY |

REVISION

| | | | |
|---|---------------------|------------|--|
| SHEET TITLE: ELECTRICAL POWER AND SYSTEMS LAYOUTS | | REV. NO.: | |
| DESIGN BY: AA | SCALE: 1/8"=1'-0" | SHEET NO.: | |
| DRAWN BY: AA | DATE: JUNE 2021 | E3 | |
| CHECKED BY: MZ | PROJ.NO.: 21246.001 | | |



1. EXTERIOR BUILDING MOUNTED LUMINAIRES COMPLETE WITH INTEGRAL PHOTOCCELL CONTROLS.
2. INTERIOR BUILDING LUMINAIRES CONTROLLED BY OCCUPANCY SENSORS. SENSORS TO BE SENSOR SWITCH DUAL TECHNOLOGY - SUITABLE FOR 20' MOUNTING HEIGHT. SENSORS TO BE SET TO 30MIN AUTO ON. SUSPEND SENSORS FROM ROOF DECK WITH THREADED ROD AND J.B. TO SAME HEIGHT AS L1 LUMINAIRES.

Certificate of Authorization
SMITH + ANDERSEN
No. 5990

2031 Portage Avenue 2nd Floor Winnipeg Manitoba R3J 0K6
204 885 6668 smithandandersen.com

The floor plan shows a central rectangular area labeled "INSULATED STORAGE". Surrounding this central area are four rooms, each featuring a gabled roof structure. The rooms are separated from the central storage area by walls and doors.

Room Details and Annotations:

- Top Left Room:**
 - Header: 4ply 24" LVL Header
 - Column: 6ply 2x8 Column (typical OH Doors)
 - Door: 24x18 OH R25 DOOR
 - Structural: L2, A6, A2 L1, BU#1
- Top Right Room:**
 - Header: 4ply 24" LVL Header
 - Door: 24x18 OH R25 DOOR
 - Structural: L2, A6, A2 L1, A4 L1, BU#1
- Bottom Left Room:**
 - Bracing: 2x4 Bottom Chord Diaphragm Bracing Typ.
 - Columns: 5 Ply 2 x 8 Columns @5'-0" o/c 8'-0" into 16"Ø Hole (Typ.)
 - Door: 24x18 OH R25 DOOR
 - Structural: A2 L1, BU#1
- Bottom Right Room:**
 - Door: 24x18 OH R25 DOOR
 - Structural: A4 L1, BU#1

Central Area and Other Features:

- INSULATED STORAGE:** The central rectangular area.
- Engineered Trusses @30' o/c:** Indicated by a vertical line with arrows pointing up and down.
- Attic Separation - access door within attic on gable ends:** Indicated by a horizontal line with arrows pointing left and right.
- 1 Hour Fire Rating South Wall:** Indicated by a diagonal line.
- Other Labels:** L3, A6, A2 L1, A4 L1, BU#1, GS, and various door and window symbols.

**26095 PR 227 Landfill Site, RM
of Portage La Prairie, MB**

| | | |
|--|---------------------|-----------------------------|
| SHEET TITLE: ELECTRICAL LIGHTING LAYOUTS | | REV. NO.: |
| DESIGN BY: AA | SCALE: 1/8"=1'-0" | SHEET NO.: E4 |
| DRAWN BY: AA | DATE: JUNE 2021 | |
| CHECKED BY: MZ | PROJ.NO.: 21246.001 | |

1. GENERAL
- 1.1. SUPPLY ALL LABOUR, EQUIPMENT, AND MATERIALS NECESSARY TO INSTALL COMPLETE AND OPERATIONAL, THE ELECTRICAL SYSTEMS DESCRIBED HEREIN AND SHOWN ON THE DRAWINGS. THE REQUIREMENTS OF THIS SECTION ARE IN ADDITION TO THOSE CONTAINED IN THE GENERAL CONDITIONS AND OTHER PORTIONS OF THE CONTRACT DOCUMENTS.
- 1.2. REFER TO GENERAL REQUIREMENTS IN THE ARCHITECTURAL SPECIFICATION.
- 1.3. WHERE THE TERM "PROVIDE" IS USED IT SHALL BE UNDERSTOOD TO INCLUDE LABOUR, MATERIALS AND SERVICES NECESSARY TO SUPPLY AND INSTALL ITEMS OR WORK REFERRED TO.
2. DRAWINGS AND SPECIFICATIONS
- 2.1. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO PROVIDE FOR AN ELECTRICAL INSTALLATION COMPLETE AND IN OPERATING CONDITION. THE RESPONSIBILITY FOR SUPPLYING AND INSTALLING ALL MATERIAL NECESSARY TO ACCOMPLISH THIS, EXCEPT WHERE SPECIFICALLY NOTED THAT SUCH WORK OR MATERIALS IS NOT INCLUDED, SHALL BE PART OF THIS SECTION.
3. CODES, PERMITS AND FEES
- 3.1. THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE CANADIAN ELECTRICAL CODE (AS AMENDED BY THE AUTHORITY HAVING JURISDICTION), AND THE BYLAWS OF THE CITY OR MUNICIPAL ELECTRICAL ENERGY INSPECTION DEPARTMENT WHOSE AUTHORITY COVERS THE AREA IN WHICH THE WORK IS BEING DONE.
- 3.2. OBTAIN AND PAY FOR ALL PERMITS AND LICENSES REQUIRED TO EXECUTE THE WORK.
4. SUBSTITUTIONS
- 4.1. WHERE MATERIALS, EQUIPMENT AND APPARATUS OR OTHER PRODUCTS ARE SPECIFIED BY THE MANUFACTURER'S NAME, OTHER MANUFACTURERS MAY BE SUBSTITUTED UPON OBTAINING WRITTEN APPROVAL OF THE ENGINEER THREE DAYS PRIOR TO OPENING OF BIDS. SUBMIT LIST OF PROPOSED EQUIVALENT PRODUCTS IN DUPLICATE TO THE ENGINEER VIA EMAIL IN PDF FORMAT. SUBMITTALS BY FAX WILL NOT BE ACCEPTED.
- 4.2. WHERE MATERIALS, EQUIPMENT AND APPARATUS OR OTHER PRODUCTS ARE NOTED AS BEING "EQUAL TO" THE SPECIFIED MANUFACTURER, PRODUCTS OF EQUAL OR SUPERIOR QUALITY BY OTHER MANUFACTURERS MAY BE SUBSTITUTED WITHOUT APPROVAL OF THE ENGINEER.
5. MATERIALS
- 5.1. ALL MATERIALS SUPPLIED SHALL BE NEW AND OF THE QUALITY INDICATED IN THE SPECIFICATIONS AND SHALL CONFORM TO THE STANDARDS OF THE CSA AND THE ULC AND APPROVED BY THESE AGENCIES WHERE APPLICABLE.
- 5.2. IN THE EVENT THAT A MATERIAL SPECIFIED DOES NOT BEAR CSA AND ULC APPROVAL, OBTAIN THE APPROVAL OF THE LOCAL INSPECTION AUTHORITY, PAY ALL CHARGES LEVIED BY THE INSPECTION AUTHORITY AND MAKE ANY MODIFICATIONS REQUIRED, AT NO ADDITIONAL EXPENSE TO THE OWNER.
6. EQUIPMENT LOCATIONS
- 6.1. CONSULT WITH THE OWNER AND ALL OTHER SUBTRADES INVOLVED TO CONFIRM THE LOCATIONS OF THE VARIOUS OUTLETS AND EQUIPMENT AND COOPERATE FULLY TO ENSURE THAT NO CONFLICT ARISES DURING THE INSTALLATION.
- 6.2. SPECIAL CARE SHALL BE TAKEN THAT EQUIPMENT, OUTLETS, JUNCTION BOXES OR PULL BOXES WILL NOT BE OBSTRUCTED BY OTHER STRUCTURE, EQUIPMENT, PIPES OR DUCTS INSTALLED UNDER THIS GENERAL CONTRACT BY OTHER TRADES.
- 6.3. NO EXTRA CHARGE FOR MATERIALS AND LABOUR SHALL BE ADDED TO THE CONTRACT FOR OUTLETS MOVED WITHIN 10 FEET FROM THE LOCATION SHOWN ON THE PLANS PRIOR TO ROUGH-IN.
7. GUARANTEES
- 7.1. GUARANTEE ALL WORK FOR ONE YEAR, FOLLOWING FINAL ACCEPTANCE. THIS GUARANTEE SHALL INCLUDE ALL PROBLEMS CAUSED BY IMPROPER INSTALLATION OR EQUIPMENT FAILURE.
8. SITE EXAMINATION
- 8.1. EXAMINE THE SITE OF WORK AND BECOME FAMILIAR WITH ALL FEATURES AND CHARACTERISTICS AFFECTING THIS WORK.
- 8.2. NO ADDITIONAL COMPENSATION WILL BE GIVEN FOR EXTRA WORK DUE TO EXISTING CONDITIONS, WHICH SUCH EXAMINATION SHOULD HAVE DISCLOSED.
- 8.3. REPORT TO THE ENGINEER ANY UNSATISFACTORY CONDITIONS, WHICH MAY ADVERSELY AFFECT THE PROPER COMPLETION OF THIS WORK.
9. SHOP DRAWINGS
- 9.1. PRIOR TO DELIVERY OF ANY PRODUCTS TO THE JOB SITE AND SUFFICIENTLY IN ADVANCE TO ALLOW AMPLE TIME FOR CHECKING, SUBMIT SHOP DRAWINGS IN PDF FORMAT FOR REVIEW OF REQUIREMENTS AS SPECIFIED IN THIS DIVISION.
- 9.2. SHOW DETAILS, DIMENSIONS, CONSTRUCTION, SIZE, ARRANGEMENT, OPERATING CLEARANCES, PERFORMANCE CHARACTERISTICS AND CAPACITIES OF PRODUCTS AND PARTS OF THE WORK.
- 9.3. MANUFACTURE OF PRODUCTS SHALL CONFORM TO REVIEWED SHOP DRAWINGS.
- 9.4. WHERE APPLICABLE INCLUDE WIRING, SINGLE LINE AND SCHEMATIC DIAGRAMS.
- 9.5. INCLUDE WIRING DRAWINGS OR DIAGRAMS SHOWING INTERCONNECTION WITH WORK OF OTHER SECTIONS.
- 9.6. KEEP ONE COMPLETE SET OF SHOP DRAWINGS AT THE JOB SITE DURING CONSTRUCTION.
10. PROJECT RECORD DRAWINGS
- 10.1. BEFORE COMMENCING WORK, OBTAIN TWO SETS OF WHITE PRINTS OF ALL DRAWINGS PERTINENT TO THE WORK. KEEP DRAWINGS ON SITE AND, DAILY OR WEEKLY AS NECESSARY, RECORD IN COLORED PENCIL ALL CHANGES, ALTERATIONS, OR ADDITIONS IN RUNS OF CONDUIT, NUMBERS AND LOCATION OF PANELS, LUMINAIRES AND DEVICES THAT MAY OCCUR DURING PROGRESS OF THE WORK.
- 10.2. AT THE CONCLUSION OF THE JOB, FORWARD THE MARKED UP DRAWINGS TO THE ENGINEER FOR UPDATING THE ORIGINAL DOCUMENTS. ALLOW \$750, PLUS GST WHERE APPLICABLE, IN BID PRICE TO COVER THIS WORK. NOTE THAT CHANGES BY CHANGE ORDER ARE NOT INCLUDED IN THIS ALLOWANCE. INCLUDE ALLOWANCE IN CHANGE ORDER PRICING AS APPLICABLE TO COVER THIS WORK.
11. MAINTENANCE MANUALS
- 11.1. BEFORE REQUESTING FINAL CERTIFICATE, SUBMIT PDF FORMAT COPIES OF THE MAINTENANCE MANUAL AS SPECIFIED IN DIVISION 1 AND AS FURTHER CALLED FOR IN THIS DIVISION.

- 11.2. INCLUDE IN THE MANUALS INFORMATION BASED ON THE FOLLOWING REQUIREMENTS:
- 11.2.1. OPERATION AND MAINTENANCE INSTRUCTIONS TO BE SUFFICIENTLY DETAILED WITH RESPECT TO DESIGN ELEMENTS, CONSTRUCTION FEATURES AND COMPONENT FUNCTION AND MAINTENANCE REQUIREMENTS TO PERMIT EFFECTIVE OPERATION, MAINTENANCE, REPAIR, MODIFICATION, EXTENSION AND EXPANSION OF ANY PORTION OR FEATURE OF THE INSTALLATION.
- 11.2.2. TECHNICAL DATA TO BE IN FORM OF APPROVED SHOP DRAWINGS, SUPPLEMENTED BY BULLETINS, TECHNICAL DESCRIPTIONS OF ITEMS, AND PARTS LISTS. ADVERTISING OF SALES LITERATURE WILL NOT BE ACCEPTABLE.
- 11.2.3. PROVIDE WIRING AND SCHEMATIC DIAGRAMS AND PERFORMANCE CURVES WHERE NECESSARY.
- 11.2.4. NCLUDE NAMES AND ADDRESSES OF NEAREST SUPPLIER FOR ALL ITEMS INCLUDED IN THE MAINTENANCE MANUALS.
- 11.2.5. PROVIDE MANUAL AND SEMINAR WITH OWNER'S FORCES TO ENSURE PROPER OPERATION OF BUILDING PRIOR TO SUBSTANTIAL PERFORMANCE.
12. DISTRIBUTION
- 12.1. ALL ELECTRICAL DISTRIBUTION EQUIPMENT PANELBOARDS SHALL BE CUSTOM MADE BY ONE MANUFACTURER OF SIZE AND TYPE AS INDICATED ON ELECTRICAL DRAWINGS. ALL DISTRIBUTION EQUIPMENT TO BE SPRINKLER PROOF, C/W LOCKABLE DOORS AND LAMACOID NAMEPLATES.
- 12.2. ALL ELECTRICAL PANELBOARDS TO BE C/W TYPE WRITTEN PANEL DIRECTORY MOUNTED IN A PLASTIC SLEEVE ON INSIDE OF LOCKABLE PANEL DOOR.
- 12.3. CIRCUIT BREAKERS TO BE BOLT-IN, MOULDED CASE, THERMAL AND MAGNETIC TRIP. AMPERAGE RATING AS INDICATED ON ELECTRICAL DRAWINGS. FAULT CURRENT RATING TO BE 22KA UNLESS COMPLETE DISTRIBUTION SERIES RATED AS PER MANUFACTURER OF EQUIPMENT.
13. GROUNDING
- 13.1. PROVIDE BONDING TO ALL METAL EQUIPMENT, METALLIC WASTE WATER SYSTEM, GAS PIPING AND BUILDING STRUCTURE AS REQUIRED BY CODE.
14. DISCONNECT SWITCHES
- 14.1. SUPPLY AND INSTALL DISCONNECT SWITCHES AS INDICATED AND AS REQUIRED BY CODE. DISCONNECT SWITCHES SHALL BE EQUAL TO EATON TYPE DH1, OR TYPE DH3(WEATHERPROOF) WHERE NOTED. BRYANT 30000/40000/60000 SERIES MOTOR STARTERS WITHOUT OVERLOAD PROTECTION MAY BE USED FOR LOADS RATED 30/40/60A OR LESS.
15. MOTOR STARTERS
- 15.1. SUPPLY AND INSTALL MAGNETIC AND MANUAL MOTOR STARTERS WHERE INDICATED. STARTERS SHALL BE EQUAL TO EATON TYPE A200 MAGNETIC AND M5 OR B-COMLETE WITH 100 MANUAL COMPLETE WITH BUILT-IN HEATERS SIZED FOR MOTOR RATING.
- 15.2. PROVIDE CONTROL TRANSFORMERS AND AUXILIARY CONTACTS AS REQUIRED FOR CONTROL CONNECTIONS.
16. WIRING METHODS
- 16.1. ALL WIRING SHALL BE COPPER UNLESS INDICATED OTHERWISE.
- 16.2. FEEDER CONDUCTORS FROM SERVICE EQUIPMENT TO PANELBOARDS TO BE SIZED FOR MAXIMUM VOLTAGE DROP OF 2%.
- 16.3. BRANCH CIRCUIT WIRING SHALL BE MIN. #12 AWG 90C RATED IN EMT. AC-90 MAY BE USED WHERE PERMITTED BY CODE. ENT MAY BE USED FOR WIRING IN POURED CONCRETE WHERE PERMITTED BY CODE, WHERE WIRE SIZE IS NOT INDICATED, AMPACITY MUST MATCH OR EXCEED THAT OF PROTECTIVE DEVICE.
- 16.4. FEEDERS SHALL BE 90C RATED WIRE IN EMT. TECK 90, ACWU 90, AND AC-90 CABLES MAY BE USED FOR CONCEALED WIRING WHERE PERMITTED BY CODE, UNLESS SPECIFICALLY NOTED OTHERWISE.
- 16.5. BRANCH CIRCUIT WIRE SIZES INDICATED ON ANY EQUIPMENT SCHEDULES ARE RATED ON 90C. WHERE EQUIPMENT IS MARKED WITH A MAXIMUM CONDUCTOR TERMINATION TEMPERATURE THEN WIRE SIZE TO BE REVISED AS PER 4-006 OF CEC.
- 16.6. WIRING PENETRATING ANY HORIZONTAL OR VERTICAL ASSEMBLY REQUIRED TO HAVE A FIRE-RESISTANCE RATING SHALL BE IN ACCORDANCE WITH THE LOCAL BUILDING CODE. CONDUITS OR CABLES SHALL BE TIGHTLY FITTED AND FIRE STOPPED WHERE NECESSARY TO MAINTAIN FIRE RATING, AS FOLLOWS:
- 16.6.1. FOR PENETRATIONS THROUGH A FIRE SEPARATION WALL PROVIDE A FIRESTOP SYSTEM WITH A "F" RATING SHALL BE IN ACCORDANCE WITH CAN/ULC S524 AND AS INDICATED BELOW:
- | Fire Resistance Rating of Separation | Required ULC or cUL "F" Rating of Firestopping Assembly |
|--------------------------------------|---|
| 30 minutes | 20 minutes |
| 45 minutes | 45 minutes |
| 1 hour | 45 minutes |
| 1.5 hours | 1 hour |
| 2 hours | 1.5 hours |
| 3 hours | 2 hours |
| 4 hours | 3 hours |
- 16.6.2. FOR COMBUSTIBLE PENETRATIONS THROUGH A FIRE SEPARATION PROVIDE A FIRESTOP SYSTEM WITH AN "F" RATING AS DETERMINED BY ULC OR CUL WHICH IS EQUAL TO THE FIRE RESISTANCE RATING OF THE CONSTRUCTION BEING PENETRATED. COMBUSTIBLE CABLES AND RACEWAYS SHALL BE MAX. 25 MM DIAMETER.
- 16.6.3. FOR PENETRATIONS THROUGH A FIRE WALL OR HORIZONTAL FIRE SEPARATION PROVIDE A FIRESTOP SYSTEM WITH A "F" RATING AS DETERMINED BY ULC OR CUL WHICH IS EQUAL TO THE FIRE RESISTANCE RATING OF THE CONSTRUCTION BEING PENETRATED.
- 16.6.4. INSTALL FIRESTOP MATERIALS IN ACCORDANCE WITH ULC FIRE RESISTANCE DIRECTORY OR UL PRODUCTS CERTIFIED FOR CANADA (CUL) DIRECTORY.
- 16.6.5. COMPLY WITH MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION OF THROUGH-PENETRATION MATERIALS.
- 16.6.5.1. SEAL ALL HOLES OR VOIDS MADE BY PENETRATIONS TO ENSURE AN AIR AND WATER RESISTANT SEAL.
- 16.6.5.2. PROTECT MATERIALS FROM DAMAGE ON SURFACES SUBJECTED TO TRAFFIC.

- 16.7. PROVIDE GROUND WIRE IN ALL CONDUITS IN CONCRETE SLABS AND IN ALL BURIED CONDUITS AS REQUIRED BY CODE.
- 16.8. PROVIDE SUFFICIENT LENGTH OF FLEXIBLE CONDUIT OR CABLE COILED NEATLY IN CEILING SPACE TO ALLOW FOR 10'0" RELOCATION POTENTIAL FOR ALL RECESSED LUMINAIRES.
17. BASIC METHODS
- 17.1. INSTALL WIRING CONTINUOUSLY WITHIN RACEWAYS OR CABLES; SPLICES WILL BE PERMITTED ONLY AT OUTLETS AND JUNCTION BOXES. SUFFICIENT SLACK SHALL BE LEFT AT THESE POINTS TO PERMIT PROPER CONNECTION OF LUMINAIRES, DEVICES, EQUIPMENT, ETC.
- 17.2. ALL WIRING SHALL BE RUN CONCEALED IN CEILING, WALLS OR FLOOR WHEREVER POSSIBLE, ANY EXPOSED CONDUITS OR CABLES SHALL BE RUN PARALLEL TO OR AT RIGHT ANGLES TO BUILDING LINES AND IN A NEAT MANNER.
- 17.3. INSTALL PULL BOXES IN THE LOCATIONS SHOWN ON THE DRAWINGS AND AS FURTHER REQUIRED BY THE CANADIAN ELECTRICAL CODE. PULL BOXES SHALL BE LOCATED IN INCONSPICUOUS SPACES. WHERE DEVICES ARE SHOWN ABOVE FIXED MILLWORK, MOUNT OUTLETS 6" ABOVE COUNTER OR BACKSPLASH. COORDINATE WITH MILLWORK INSTALLER AND ENSURE THAT OUTLETS DO NOT CONFLICT WITH BACKSPLASH.
- 17.4.
18. WIRING DEVICES
- 18.1. LIGHT SWITCHES SHALL BE COMMERCIAL GRADE, 15A, PROVIDE 20A SWITCHES WHERE INDICATED. ALL SWITCHES SHALL BE WHITE, UNLESS OTHERWISE NOTED.
- 18.2. RECEPTACLES SHALL BE COMMERCIAL GRADE, 15A, WHITE FINISH.
- 18.3. WIRING DEVICES AND COVERPLATES SHALL BE OF ONE MANUFACTURER; BRYANT, G.E., HUBBELL, LEVITON OR P & S.
- 18.4. ALL COVER PLATES SHALL BE THERMOPLASTIC IN FINISHED AREAS. PROVIDE STAMPED METAL COVER PLATES IN OTHER AREAS. PROVIDE WEATHERPROOF "WHILE IN-USE" COVERS FOR EXTERIOR RECEPTACLES.
- 18.5. GROUND FAULT CIRCUIT INTERRUPTING (GFI) DUPLEX RECEPTACLES SHALL BE COMMERCIAL GRADE COMPLETE WITH LED INDICATOR
- 18.6. MULTI-SERVICE, RECESSED FLOOR BOXES SHALL BE WALKER RFB-4. PROVIDE RAKMIL RECESSED ACTIVATION COVER COMPLETE WITH CARPET TRIM PLATE AND DUPLEX RECEPTACLES AS INDICATED ON THE DRAWINGS. PROVIDE TWO DTB-2-ST TEL/DATA BRACKETS FOR MOUNTING OF RJ TYPE JACKS. PRE-APPROVED ALTERNATE - WELLMARK 400 SERIES.
- 18.7. LINE VOLTAGE DIMMER SWITCHES SHALL BE EQUAL TO LUTRON 'N' SERIES. PROVIDE WHITE FINISH.
- 18.8. TIMER SWITCHES SHALL BE EQUAL TO LEVITON 6260M (10-20-30-60 MINUTE ELECTRONIC), WHITE FINISH.
19. LIGHTING
- 19.1. EXCEPT AS NOTED, PROVIDE ALL LUMINAIRES AND LAMPS AS INDICATED ON THE LUMINAIRE SCHEDULE, AND ALL SUPPORTS AND WIRING AS REQUIRED TO MAKE OPERATIONAL THE LIGHTING SYSTEM AS INDICATED ON THE DRAWINGS.
20. LIGHTING CONTROLS
- 20.1. TIMECLOCK IN MAINTENANCE AREA SHALL BE EQUAL TO INTERMATIC ET70415CR FOUR CHANNEL PROGRAMMABLE
- 20.2. OCCUPANCY SENSORS TO BE SENSORSWITCH DUAL TECHNOLOGY - HIGH BAY - SUITABLE FOR APPLICATION
21. EXIT AND EMERGENCY LIGHTING
- 21.1. PROVIDE AN EXIT AND EMERGENCY LIGHTING SYSTEM CONSISTING OF INDIVIDUAL SOLID STATE BATTERY UNITS, REMOTE HEADS AND EXIT LIGHTS IN ACCORDANCE WITH THE LOCAL BUILDING CODE AND LOCAL REQUIREMENTS AND/OR BYLAWS.
- 21.2. BATTERY UNITS SHALL BE EQUAL TO AIMLITE EBST SERIES COMPLETE WITH LONG LIFE LEAD BATTERIES, TYPE 6W LED 12V INTEGRAL HEADS AND INTEGRAL 3 CIRCUIT ZONE SENSING RELAY. PROVIDE WHITE FINISH. CAPACITIES SHALL EXCEED LOADS LISTED ON THE DRAWINGS.
- 21.3. REMOTE HEADS SHALL BE EQUAL TO AIMLITE RMD DOUBLE COMPLETE WITH 6W 12V LED. PROVIDE WHITE FINISH.
- 21.4. LED GREEN PICTOGRAM EXIT SIGNS SHALL BE AIMLITE RPST SERIES, STEEL, WIRED FOR A/C 120/347V AND 12V D/C OPERATION.
- 21.5. INTERLOCK EMERGENCY UNIT EQUIPMENT WITH NORMAL LIGHTING CIRCUIT IN AREA TO ACTIVATE EMERGENCY LIGHTING UPON LOSS OF POWER.
- 21.6. WIRING TO REMOTE HEADS AND EXIT LIGHT DC SOCKETS SHALL BE SIZED TO PREVENT VOLTAGE DROP IN EXCESS OF 5%. CONNECT TO BATTERY UNITS AS INDICATED. PROVIDE SEPARATE CIRCUITS FOR ALL EXIT LIGHTING USING SEPARATE RACEWAYS FROM NON-EMERGENCY WIRING.
- 21.7. FOLLOWING COMPLETION OF THE EXIT AND EMERGENCY LIGHTING INSTALLATION, CONDUCT TESTS OF EACH SYSTEM COMPONENT. UPON COMPLETION OF THE TESTS, ISSUE TO THE ENGINEER A COPY OF THE TEST REPORT LISTING LOCATION OF EACH COMPONENT AND CONFIRMATION THAT IT WILL REMAIN OPERATIONAL FOR 30 MINUTES. APPROVED ALTERNATE MANUFACTURERS ARE BEGHELLI, AND LUMACELL.
- 21.8.
22. MECHANICAL AND OTHER EQUIPMENT
- 22.1. PROVIDE WIRING, CONNECTIONS, STARTERS, DISCONNECTS AND CONTROLS FOR MECHANICAL EQUIPMENT AND FOR OTHER EQUIPMENT SUPPLIED AND INSTALLED BY OTHERS.
- 22.2. PROVIDE FLEXIBLE CONNECTIONS TO MECHANICAL EQUIPMENT FOR VIBRATION ISOLATION. NMD-90 MAY BE USED FOR CONNECTIONS TO CEILING MOUNTED EXHAUST FANS WHERE PERMITTED BY CODE. CONNECTIONS TO EQUIPMENT ROOF MOUNTED OR IN OTHER DAMP OR WET LOCATIONS SHALL BE LIQUID-TIGHT.
- 22.3. IN GENERAL, ALL CONTROL WIRING WILL BE BY MECHANICAL CONTRACTOR UNLESS OTHERWISE NOTED. WHERE 120 VOLT POWER IS REQUIRED FOR MECHANICAL EQUIPMENT, WIRING TO THE EQUIPMENT TERMINALS IS THE WORK OF THE ELECTRICAL CONTRACTOR.
- 22.4. REFER TO THE MECHANICAL DRAWINGS AND SPECIFICATIONS TO CONFIRM ELECTRIC CHARACTERISTICS AND CONTROLS FOR ALL MECHANICAL EQUIPMENT AND SYSTEMS.
- 22.5. RECEPTACLES FOR MAINTENANCE OF EQUIPMENT LOCATED ON ROOF SHALL BE PROTECTED BY GFCI, SUPPLIED BY A CIRCUIT THAT DOES NOT SUPPLY AND OTHER OUTLETS OR EQUIPMENT, CSA 5-20R, LOCATED WITHIN 7.5M OF EQUIPMENT, LOCATED NOT LESS THAN 750MM ABOVE FINISHED ROOF AND PROTECTED FROM MECHANICAL DAMAGE AS PER LOCAL ELECTRIC CODE.
23. NAMEPLATES
- 23.1. PROVIDE AND INSTALL LAMINATED PLASTIC NAMEPLATES (BLACK)

- WITH ENGRAVED LETTERS (WHITE) TO IDENTIFY THE FOLLOWING:
- 23.1.1. ELECTRICAL DISTRIBUTION EQUIPMENT (CDP, PANELS, SPLITTERS)
- 23.1.2. DISCONNECT SWITCHES
- 23.1.3. LIGHTING CONTROLS
- 23.2. NAMEPLATES/LABELS SHALL GIVE EITHER THE DESIGNATED NAME OF THE EQUIPMENT (PANEL A) OR ITS FUNCTION (STARTER FOR FAN COIL UNIT FC-1, LIGHTING CONTROL, EXHAUST FAN SWITCH, ETC.).
- 23.3. PROVIDE ADHESIVE LABELS TO IDENTIFY THE FOLLOWING:
- 23.3.1. RECEPTACLE CIRCUIT NUMBERS, IN PUBLIC AREAS.
24. FIELD REVIEWS
- 24.1. CALL THE ENGINEER FOR FIELD REVIEW AT THE FOLLOWING STAGES OF CONSTRUCTION;
- 24.1.1. ROUGH-IN.
- 24.1.2. SUBSTANTIAL COMPLETION.
- 24.1.3. COMPLETION OF DEFICIENCIES (IF APPLICABLE).
- 24.2. PROVIDE TWO WORKING DAYS NOTICE FOR ALL REVIEWS.
- 24.3. FAILURE TO INFORM THE ENGINEER OF CONSTRUCTION PROGRESS AS DESCRIBED ABOVE MAY RESULT IN THE ENGINEER BEING UNABLE TO ISSUE AN ASSURANCE OF PROFESSIONAL FIELD REVIEW AND COMPLIANCE (SCHEDULE 'C') TO THE BUILDING AUTHORITY, WHICH IS REQUIRED PRIOR TO OCCUPANCY.
25. SUBSTANTIAL COMPLETION
- 25.1. PRIOR TO REQUESTING SUBSTANTIAL COMPLETION INSPECTION, THE FOLLOWING ITEMS MUST BE COMPLETE:
- 25.1.1. EMERGENCY LIGHTING SYSTEM MUST BE OPERATIONAL AND TESTED BY ELECTRICAL CONTRACTOR AND DEMONSTRATED TO THE ENGINEER.
- 25.1.2. ALL EXIT LIGHTS MUST BE INSTALLED AND OPERATIONAL.
- 25.1.3. PROVIDE CERTIFICATION THAT THE LIGHTING CONTROL DEVICES AND SYSTEMS HAVE BEEN APPROPRIATELY INSTALLED AND FUNCTIONALLY TESTED TO MEET THE PERFORMANCE REQUIREMENTS OF THE BUILDING SPACES AND BUILDING OCCUPANCY.
- 25.1.4. PROVIDE CERTIFICATE OF ACCEPTANCE FROM ELECTRICAL INSPECTION DEPARTMENT.
- 25.1.5. PROJECT RECORD DRAWINGS MUST BE SUBMITTED TO ENGINEER FOR UPDATING.
- 25.1.6. MAINTENANCE MANUALS MUST BE SUBMITTED TO ENGINEER FOR REVIEW.
- 25.1.7. ALL OUTLETS MUST HAVE COVERPLATES INSTALLED.
- 25.1.8. ALL ELECTRICAL EQUIPMENT NOT LOCATED IN SERVICE ROOMS MUST HAVE COVERS AND/OR DOORS INSTALLED COMPLETE.
- 25.1.9. ANY DEVICES NOT INSTALLED MUST HAVE THE WIRING MADE SAFE AND TERMINATED IN AN OUTLET BOX COMPLETE WITH COVER.
- 25.1.10. ALL HALLWAY AND STAIRWELL LIGHTING MUST BE FULLY OPERATIONAL.
- 25.1.11. CONTINUITY OF FIRE SEPARATIONS AT ELECTRICAL PENETRATIONS MUST BE COMPLETE.
- 25.1.12. IF ANY OF THE ABOVE ITEMS HAVE NOT BEEN COMPLETED AT THE TIME OF SUBSTANTIAL COMPLETION INSPECTION, AND THE LETTER OF "ASSURANCE OF PROFESSIONAL FIELD REVIEW AND COMPLIANCE" CANNOT BE ISSUED, ANY COSTS FOR SUBSEQUENT INSPECTIONS WILL BE CHARGED TO THE ELECTRICAL CONTRACTOR.



APEGM
Certificate of Authorization
SMITH + ANDERSEN
No. 5990



Smith + Andersen

2031 Portage Avenue 2nd Floor Winnipeg Manitoba R3J 0X6
204 985 6666 smithandanderson.com

ENGINEER'S SEAL:

6137262 MANITOBA LTD.
ARTHUR CONSULTING
PROJECT MANAGEMENT-ENGINEERING DESIGN
JOHN W. ARTHUR, P.ENG.
1-1660 KENASTON BLVD. PO BOX 70050
WINNIPEG MANITOBA R3P 0X6
CELL #1: 204 998-9898 CELL #2: 204 296-3499
FAX NO: 204 736-2390
EMAIL: arthur_consulting@mymts.net

GENERAL NOTES:

ALL DRAWINGS ARE THE EXCLUSIVE PROPERTY OF JOHN ARTHUR CONSULTING (6137262 MANITOBA LTD.) AND SHALL NOT BE REPRODUCED OR DISTRIBUTED WITHOUT WRITTEN PERMISSION OF JOHN ARTHUR CONSULTING.
NO MODIFICATIONS SHALL BE CARRIED OUT WITHOUT PRIOR WRITTEN APPROVAL OF JOHN ARTHUR CONSULTING
GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND PERTINENT INFORMATION ON SITE AND NOTIFY JOHN ARTHUR CONSULTING OF ANY DISCREPANCIES.

PROJECT TITLE & LOCATION:

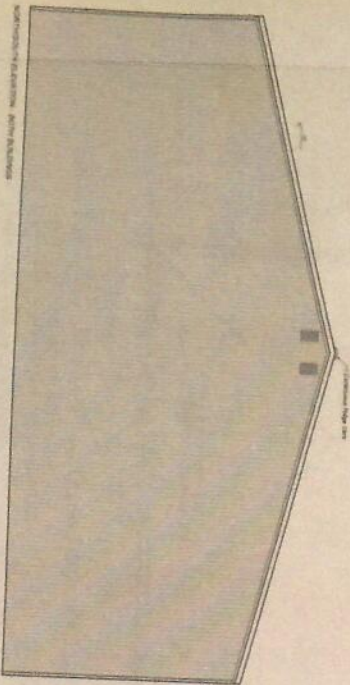
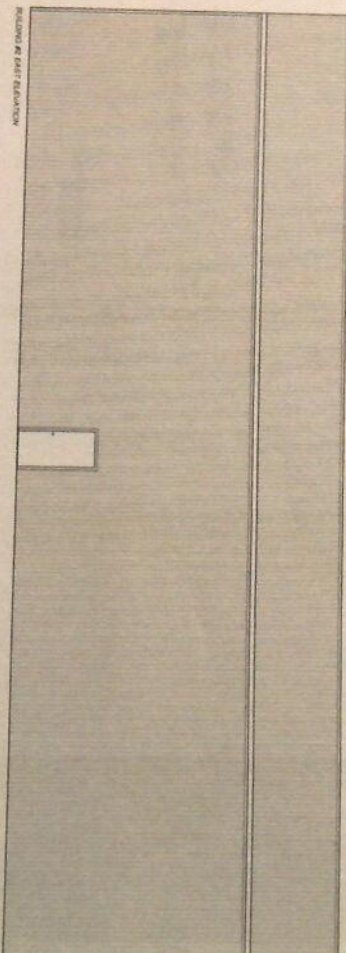
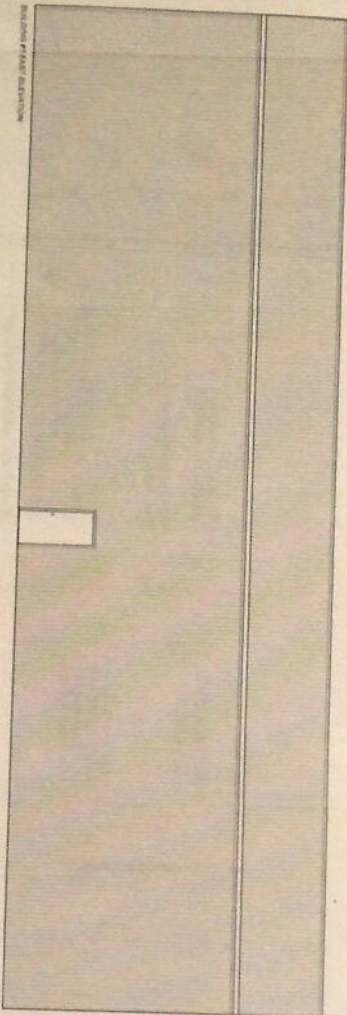
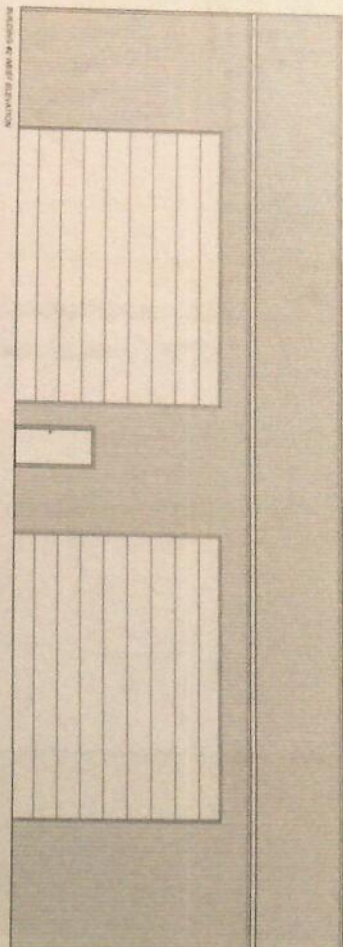
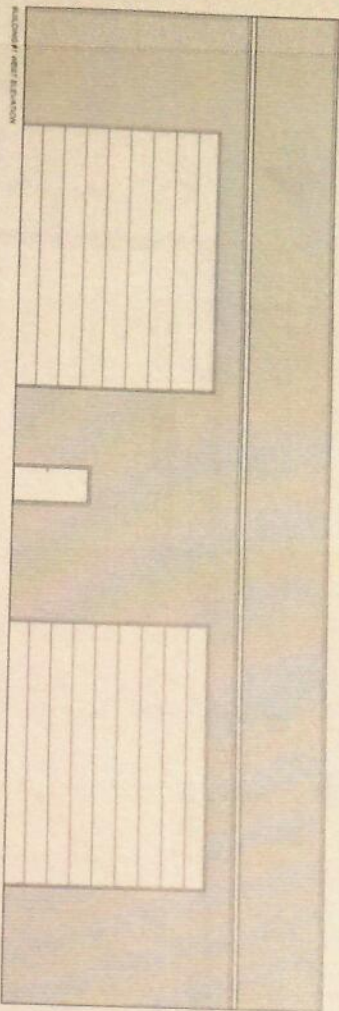
**26095 PR 227 Landfill Site, RM
of Portage La Prairie, MB**

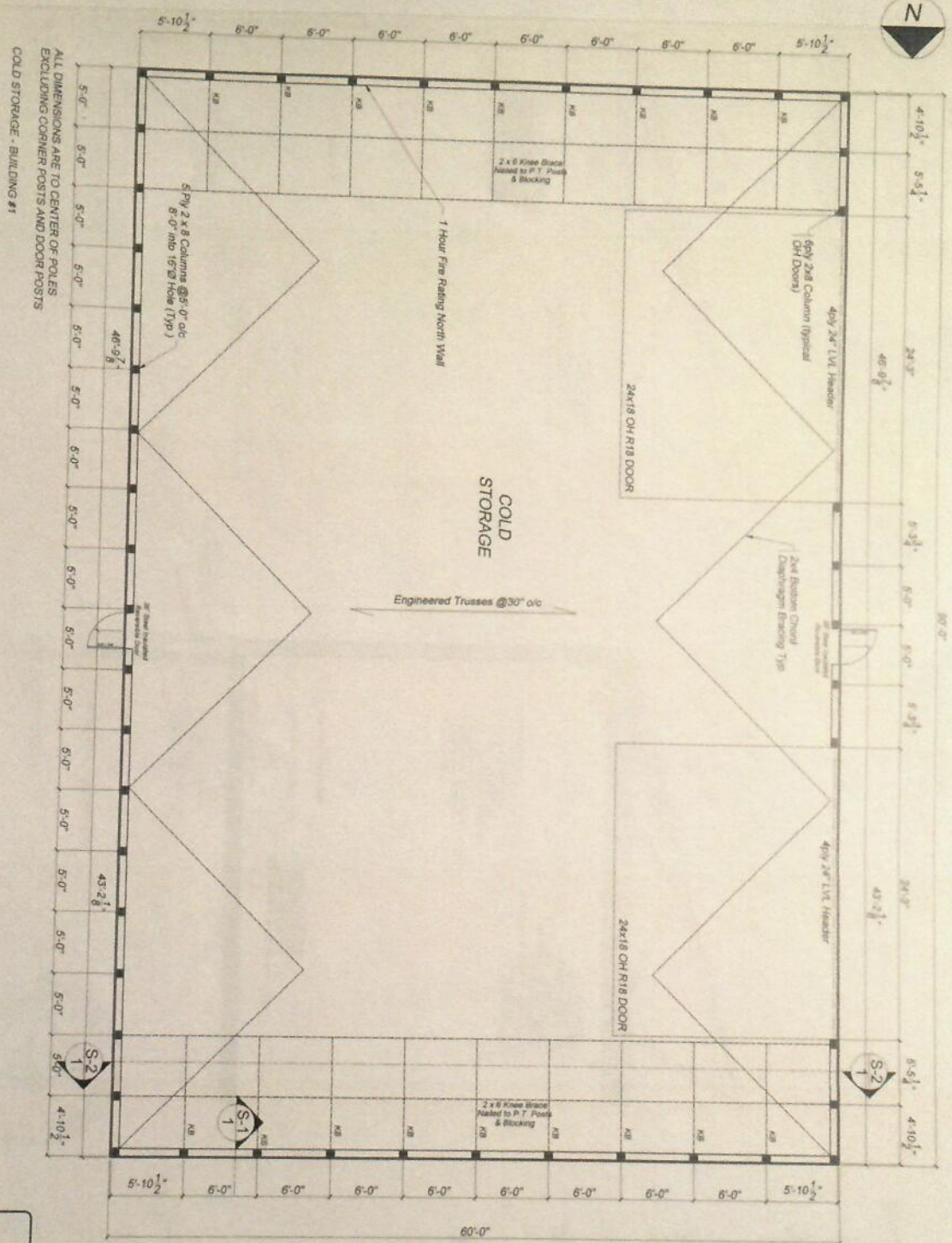
| | | | |
|--|--|--|--|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| | | | |
|-----|------------|-------------------------|----|
| 1 | 2021.06.24 | ISSUED FOR CONSTRUCTION | MZ |
| NO. | DDMMYY | DESCRIPTION | BY |

REVISION

| | | |
|---|---------------------|-------------------------|
| SHEET TITLE: ELECTRICAL SPECIFICATION | | REV. NO.: |
| DESIGN BY: AA | SCALE: NTS | SHEET NO.: E5 |
| DRAWN BY: AA | DATE: JUNE 2021 | |
| CHECKED BY: MZ | PROJ.NO.: 21246.001 | |

[illegible]



| | DATE | CHECKED | SIGNATURE | ORDER NO. | REMARKS |
|-----|------------|---------|---------------|-----------|----------------|
| DEL | 2006-14-80 | | John P. Shedd | | Item removed |
| RET | 409-16-80 | | | | Shed not added |

60x80 & 60x90 Kristen John Pale Shed
 20006 PR 227 Landfill site Rd of Portage in Trutwin, MD

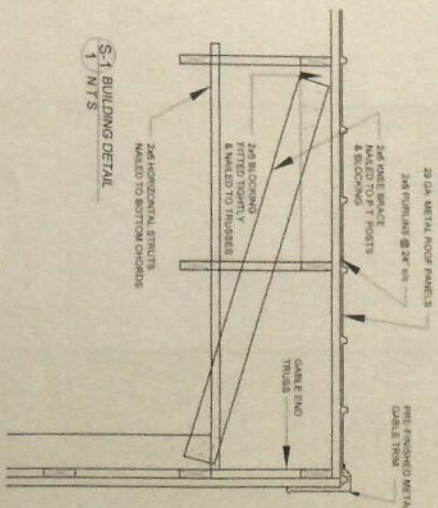
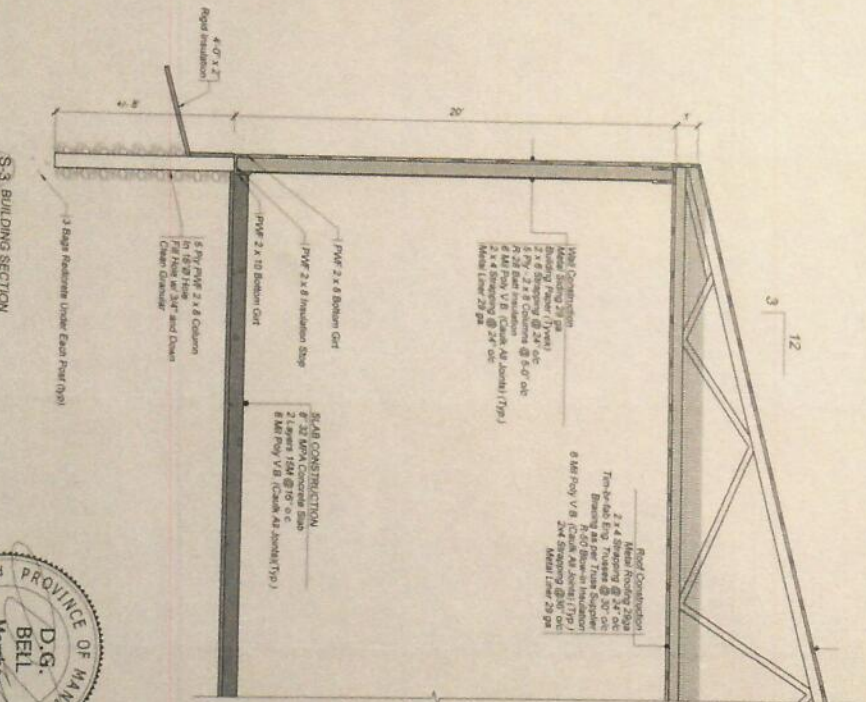
[illegible]

CAUTION

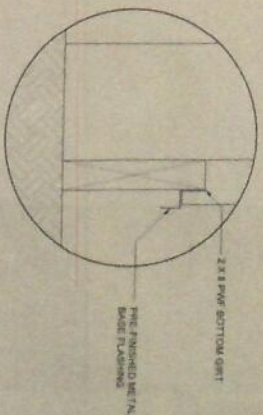
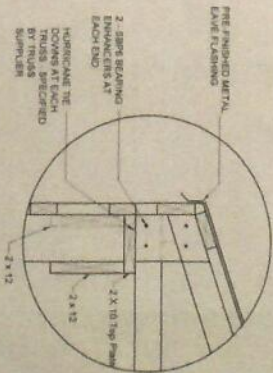
BECAUSE OF THE TYPE OF CONSTRUCTION, THE POLE TYPE, AND THE BUILDING FOUNDATION USED, THIS BUILDING WILL BE SUSCEPTIBLE TO SETTLING, CRACKING, AND THERMAL/STRESS CHANGES.

[illegible]

* The user's computer system should be designed to interface with part 4 of the network, including code or OpenData links with the local sections on the database.



S-1 BUILDING DETAIL
1 NYS

[illegible]