Township of Muskoka Lakes

Request for Tender

Contract # T-2024-12

Milford Bay Community Center Mechanical System Upgrades

TOWNSHIP OF MUSKOKA LAKES

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SECTION A

TENDER

TOWNSHIP OF MUSKOKA LAKES

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TOWNSHIP OF MUSKOKA LAKES

TENDER

PART I TENDER CALL

The Corporation of the Township of Muskoka Lakes (after this called the "Owner") invites Tenders for:

Contract Number: Contract # T-2024-12

Described as Milford Bay Community Center

Mechanical System Upgrades

Tenders shall be addressed and delivered to: **Township of Muskoka Lakes**
P.O. Box 129
1 Bailey Street
Port Carling, Ontario
P0B 1J0

Tenders shall be received until: **2:00 p.m. December 12, 2024**

Tenders received by the time and date specified above shall be opened and read in public as soon as possible after that time. Public reading of a Tender does not imply any decision by the Owner as to whether a Tender is or is not irregular.

PART II TENDER CONDITIONS

TC-1 Completion and Submissions of Tenders

1.1 The Tenderer shall complete all documents pertaining to this Contract in ink or in type.

1.2 If the Tenderer is a corporation, an authorized officer of the corporation shall sign and seal the Form of Tender.

1.3 If the Tenderer is a partnership, a minimum of two partners shall sign the Form of Tender and signatures shall be witnessed.

1.4 If the Tenderer is a sole proprietorship, the sole proprietor shall sign the Form of Tender and the signature shall be witnessed.

1.5 The Tenderer shall submit its Tender by the date and time specified in Part I of the Tender.

1.6 The Tenderer shall submit to the Owner:
a) Part III – Form of Tender;
b) the tender deposit;

1.7 The Tenderer shall submit the Tender in a sealed and opaque envelope properly identified with the contract number, contract description, name of Tenderer, due date and time.

1.8 Tender irregularities will be dealt with in accordance with the Township of Muskoka Lakes Purchasing By-Law 2004-161, as amended.

1.9 All inquiries/questions regarding this Tender are to be sent via email to Corey Moore, Manager of Parks, Recreation, and Facilities at cmoore@muskokalakes.ca. Inquiries must be received no later than five (5) Business Days prior to the tender submission deadline specified in Part I of the Tender or as amended by addendum. Unless otherwise addressed through an addendum, all responses to bid inquiries shall not be incorporated as part of the Contract or in any way change the Contract.

TC-2 Tender Deposit

2.1 At the time of tendering, the Tenderer shall submit a tender deposit with its Tender, in the form any one of the following:
a) Bid bond signed and sealed by the Tenderer's Surety
b) Irrevocable letter of credit
c) Certified cheque

2.2 The tender deposit must be an original and shall equal at least ten percent (10%) of the Total Tender Price.

2.3 Tender Deposits shall be made to the order of or in favour of "The Corporation of the Township of Muskoka Lakes".

2.4 The Owner shall not pay interest on Tender deposits.

2.5 The Owner shall retain the Tender deposit of the Tenderers with the first and second lowest acceptable bid until:

a) the successful Tenderer has executed the Form of Agreement in accordance with Section TC-14 and TC-19 of the Tender; and
b) the successful Tenderer has provided all securities and other documents in accordance with Sections TC-12 and TC-19 of the Tender.

2.6 The Owner shall return the deposits of all other Tenderers within five (5) Business Days of tender opening.

2.7 If bid bonds are used as a Tender deposit, bonds must be from a Surety Company authorized by law to carry on business in the Province of Ontario.

TC-3 Basis of Award

3.1 The Township intends to award a contract to the Tenderer who submits the lowest acceptable bid (in accordance with the Township Procurement Policy By-law 2004-161, as amended) by Total Tender Price. Upon formal notification of award the Tenderer shall thereafter be known as the Contractor.

TC-4 Addenda

4.1 Addenda will be posted on the Township website (www.muskokalakes.ca) for viewing and shall be located in the same area of the webpage that the Tender documents are downloaded from.

4.2 The Township will not notify Tenderers of addendums and it is the responsibility of the Tenderer to monitor the webpage and retrieve posted addendums prior to submitting their bid.

4.3 The Tenderer shall ensure that all addenda that are issued are acknowledged and listed under Section FT-1 of the Tender.

4.4 The deadline for the posting of addenda is no later than three (3) Business Days prior to tender submission deadline as specified in Part I of the Tender or as amended by addendum.

TC-5 Irregular Tenders

5.1 The Owner shall be the sole judge of whether or not a Tender is irregular.

TC-6 Unbalanced Tenders

6.1 The Tenderer shall not submit an unbalanced Tender.

6.2 The Owner shall have the right to:
a) deem a Tender to be unbalanced; and
b) reject a Tender which it deems to be unbalanced.

TC-7 Collusion

7.1 The Tenderer shall not engage in collusion of any sort and, in particular, shall:
a) ensure that no person or other legal entity, other than the Tenderer, has any undisclosed interest in the Tenderer's Tender; and
b) prepare its Tender without any knowledge of, comparison of figures with or arrangement with any other person or firm preparing a Tender for the same work.

TC-8 Right to Accept or Reject Tenders

8.1 Notwithstanding any other provision in this Contract, the Owner shall have the right to:
a) accept any Tender;
b) reject any Tender; and
c) reject all Tenders.

8.2 Without limiting the generality of Section TC-8.1, the Owner shall have the right to:
a) accept an irregular Tender;
b) accept a Tender which is not the lowest Tender; and
c) reject a Tender even if it is the only Tender received by the Owner.

8.3 Acceptance of the Tender shall occur at the time the Owner awards the Tender and not necessarily at the time the award is communicated to the successful Tenderer.

TC-9 Contract Documents

9.1 The Tenderer shall obtain and review all Contract Documents as listed in the Form of Tender including all Addenda issued by the Owner pertaining to this Contract.

TC-10 Errors, Omissions and Discrepancies in the Contract Documents

10.1 If the Tenderer finds any errors or omissions in or discrepancies among the Contract Documents, it shall immediately notify the Owner at the address specified in Part I of the Tender.

10.2 No oral explanation or interpretation by any person shall modify any of the Contract Documents.

TC-11 Mandatory Site Meeting

11.1 The Tenderer shall be present for mandatory site meeting at 1020 Beaumaris Rd, Milford Bay, ON P1L 1W8 on November 27, 2024, at 11am to walk the facility and understand the installation requirements.

TC-12 Irrevocability of Offer

12.1 The Tenderer shall not revoke its offer until after the expiration of sixty (60) days after the opening of Tenders by the Owner.

12.2 If the Tenderer revokes its offer prior to the expiration of sixty (60) days after the Tender opening, the Tenderer shall forfeit its Tender deposit but this shall not prohibit the Owner from pursuing any other legal remedy which it may have.

TC-13 Successful Tenderer - Securities

13.1 The successful Tenderer shall provide each in the amount of at least five percent (5%) of the Total Tender price:

a) a performance security or bond signed and sealed by the Tenderer's Surety; and
b) a labour and material payment bond signed and sealed by the Tenderer's Surety.

OR

The successful Tenderer may request the Owner to retain the 10% Tender Deposit from Section TC-2 in lieu of this bonding, provided that the Tender Deposit from Section TC-2 was not in the form of a Bid Bond.

13.2 The Surety of the successful Tenderer and the bonds referred to in Section TC-12.1(a) and TC-12.1(b) must be originals and shall be to the satisfaction of the Owner if this option is exercised.

TC-14 Successful Tenderer - WSIB Certificate of Clearance

14.1 The successful Tenderer shall provide the Owner with a valid Workplace Safety & Insurance Board Certificate of Clearance to the satisfaction of the Owner and in accordance with GC6.05 OPS General Conditions.

TC-15 Successful Tenderer - Execution of Form of Agreement

15.1 The successful Tenderer shall execute in accordance with TC-1, in triplicate, the Form of Agreement provided in the Contract Documents.

15.2 The successful Tenderer shall forward the executed Form of Agreement to the Owner.

TC-16 Successful Tenderer - Insurance

16.1 The successful Tenderer shall provide the Owner with an original Certificate of Insurance for each type of insurance coverage required by Section GC6.03 of the OPS General Conditions.

16.2 The successful Tenderer shall carry insurance, pursuant to Section GC6.03.02 of the OPS General Conditions in the amount of at least FIVE MILLION DOLLARS ($5,000,000.00).

16.3 The successful Tenderer shall carry insurance, pursuant to Sections GC6.03 of the OPS General Conditions which names the following as additional insured:

The Corporation of the Township of Muskoka Lakes
P.O. Box 129, 1 Bailey Street
Port Carling, ON, P0B 1J0

TC-17 Successful Tenderer - Contractor's Responsibilities Sign-Off Form

17.1 The successful Tenderer shall provide the Owner a completed and signed *Contractor's Responsibilities Sign-Off Form* as per the Township of Muskoka Lakes Health and Safety Policy HS-007-PRO-B. A copy of the policy is available during bidding upon request to the Township contact identified in TC-1. The policy shall be provided to the successful Tenderer upon notification of award.

TC-18 Successful Tenderer - Time for Completion

18.1 The successful Tenderer shall complete the Work as defined in GC1.06 by October 1, 2025, and this shall be the date used for the calculation of Liquidated Damages as per TC-18.1.

18.2 The successful Tenderer acknowledges that time shall be deemed to be of the essence of the Contract. For the Tenderer's purpose of establishing a schedule for the Work, it is anticipated that contract award will be complete within 30 calendar days after the opening of tenders by the Owner. Upon notice of award, the successful Tenderer will be required to complete submissions to the Owner as per TC-19.1. Upon receipt of all required submissions from the successful Tenderer, the Owner will return an executed Form of Agreement and a Purchase Order to the Tenderer within 10 Business Days. Authorization to commence work shall be provided by the Owner as detailed in the Special Provisions of this contract.

18.3 Milestone dates associated with the Contract will be adjusted, when possible, due to any delays to the anticipated award schedule caused by the Owner during the contract award and/or issuance of the authorization to commence work.

TC-19 Successful Tenderer - Liquidated Damages

19.1 Pursuant to Section GC 8.02.09 of the OPS General Conditions, the liquidated damages shall be in the amount of:

Five Hundred DOLLARS ($ 500) per calendar day beyond the dates outlined for Completion, as determined in TC-17.

19.2 When applied, liquidated damages will be subtracted off the final submitted invoice prior to payment.

TC-20 Successful Tenderer - Submission of Documentation

20.1 The successful Tenderer shall submit the documentation required by Sections TC-12, TC-13, TC-14, TC-15 and TC-16 within seven (7) calendar days of the day the Owner notifies the successful Tenderer that the documentation should be sent to the Owner.

20.2 If the successful Tenderer fails to comply with Section TC-19.1 the Owner may, in its sole discretion, withdraw its acceptance of the Tender and the Tenderer shall have no recourse whatsoever against the Owner.

TC-21 Successful Tenderer - Commencement of the Work

21.1 The successful Tenderer shall not commence the Work until it has received authority to proceed with the work from the Owner as well as the fully executed Form of Agreement signed by both parties (Tenderer and Owner) and a Purchase Order issued by the Owner

TC-22 Successful Tenderer - Vendor Performance Management Notice

22.1 The contract resulting from this Tender may be subject to performance evaluation conducted by the Owner. The Owner reserves the right to consider the results of this performance evaluation in the award of future contracts and/or in the selection of vendors for future work. Performance evaluation will be managed in accordance with Township policy HS-007-POL, “Contractor Activities and Control Policy” and Township Procurement Policy By-law 2004-161, as amended.

TOWNSHIP OF MUSKOKA LAKES

PART III - FORM OF TENDER

Tender by:

_____
NAME OF TENDERER

_____

_____

_____
ADDRESS OF TENDERER TELEPHONE NUMBER

_____
FAX NUMBER

_____
E-MAIL

after this called the "Tenderer".

FT-1 Contract Documents

1.1 The Contract Documents for Contract Number T-2024-12 are:

a) Tender
   i) Part I - Tender Call
   ii) Part II - Tender Conditions
   iii) Part III - Form of Tender
b) Form of Agreement
c) OPS General Conditions
d) Special Provisions – General
e) Contract Drawings
f) All Addenda issued pertaining to the Contract as acknowledged below:
   Addendum No.___ dated _____, 2024, No. of Pages ___
   Addendum No.___ dated _____, 2024, No. of Pages ___
   Addendum No.___ dated _____, 2024, No. of Pages ___
   Addendum No.___ dated _____, 2024, No. of Pages ___
   Addendum No.___ dated _____, 2024, No. of Pages ___
   Addendum No.___ dated _____, 2024, No. of Pages ___
   Addendum No.___ dated _____, 2024, No. of Pages ___

FT-2 Tenderer's Declarations

2.1 The Tenderer declares that it has obtained and read the Contract Documents.

2.2 The Tenderer declares that it understands and agrees to be bound by the

Contract Documents.

2.3 Without limiting the generality of Section FT-2.2, the Tenderer declares that it has, at the time of tendering, fulfilled all of those obligations under the Contract which are required to be fulfilled by the time of tendering.

2.4 The Tenderer declares that all information which it has provided or will provide to the Owner is true.

FT-3 Tenderer's Offer

3.1 The Tenderer offers to do the work in accordance with the Contract Documents.

3.2 The Tenderer offers to do the work and to accept payment at the unit prices specified in the Schedule of Prices in Section FT-4 of the Tender, in accordance with the Contract Documents.

3.3 The Total Tender Price, based on the estimated quantities in the Schedule of Prices, is:

_____

_____ DOLLARS

($_____)

FT-4 Schedule of Prices

4.1 The Schedule of Prices attached is Section FT-4.2 of the Tender.

This offer is made this_____day of_____, 20_____

_____
Signature of Witness
(only if required by TC-1)

_____
Signature of Tenderer
(Corporate Seal if required by TC-1)

_____
Signature of Tenderer
(Second Signature if required by TC-1)

_____
Print Name of Tenderer(s)

FT-4.2 SCHEDULE OF PRICES

CONTRACT NUMBER Contract # T-2024-12 Milford Bay Community Centre Mechanical System Upgrades						
Item	Spec. Code	Item Description	Unit	Quantity	Unit Price	Total
1	P-1	Hydronic system including boilers, pumps, heaters, piping and controls	Lump Sum	1		
2	P-2	HVAC equipment including controls	Lump Sum	1		
4	P-3	Ductwork including hangers and supports, cleaning of existing duct section to remain	Lump Sum	1		
5	P-4	Grilles, diffusers, dampers, and louvers	Lump Sum	1		
6	P-5	TAB Testing, adjusting, and balancing	Lump Sum	1		
7	P-6	Electrical upgrades	Lump Sum	1		
8	P-7	Structural Upgrades	Lump Sum	1		
9	P-8	Miscellaneous	Lump Sum	1		
10	P-9	Demolition	Lump Sum	1		
Separate Pricing						

10	SP-1	WH-1, ET-1, RP-1, and associated piping for domestic hot water recirculation.	Lump Sum	1		
11	SP-2	Chimney removal and re-sealing	Lump Sum	1		
12	SP-3	Insulation added to attic.	Lump Sum	1		
					Total Tender Price (Transfer Amount to FT-3.3 of the Tender)	
Tenderer's HST Registration Number:						

4.3 All prices to be shown excluding HST.

4.4 It is understood that the estimated quantities in the foregoing schedule are solely for the purpose of facilitating the comparison of bids and the Tenderer's compensation will be computed upon the basis of the actual quantities in the completed work, whether they be more or less shown herein.

4.5 The quantities shown in this Tender are an estimate only and are not a guarantee of amount of material to be supplied under this contract. The Township of Muskoka Lakes reserves the right to adjust quantities without a change in the tendered unit price.

4.6 The unit price shall govern whenever the total amount bid for an item does not agree with the extension of the quantity and the unit price, and the total item amount from Section FT-4.2 and the Total Tender Price in Section FT-3.3 and FT-4.2 shall be corrected accordingly.

SECTION B

FORM OF AGREEMENT

TOWNSHIP OF MUSKOKA LAKES

FORM OF AGREEMENT

This Form of Agreement witnesses that a Contract was made as of the_____day of

_____ , 20____.

BETWEEN:

_____

_____

_____

_____

(after this called the "Contractor")

AND:

THE CORPORATION OF THE TOWNSHIP OF MUSKOKA LAKES

(after this called the "Owner")

AND WITNESSES that the Contractor and the Owner agree as follows:

FA-1 The Contractor shall perform the following work:

Contract Number T-2024-12

Described as Milford Bay Community Center

Mechanical System Upgrades

_____

_____

FA-2 The Contractor shall perform the work in accordance with the Contract Documents listed in the Tender.

FA-3 The Owner shall pay the Contractor in accordance with the unit prices in the Schedule of Prices in the Tender pursuant to the Contract Documents.

FA-4 The provisions of the Contract Documents shall endure to the benefit of and be binding upon the Contractor and the Owner and their respective heirs, legal representatives, successors and assigns.

IN WITNESS WHEREOF the Contractor and the Owner have executed, in the manner required by law, this Form of Agreement.

Signature	*Date*	*Signature*	*Date*
Contractor (Corporate Seal if required by TC-1)		Director of Public Works The Township of Muskoka Lakes	

Signature	*Date*
Contractor (Second Signature if required by TC-1)	

Signature	*Date*
Witness (Only if required by TC-1)	

SECTION C

OPS
GENERAL CONDITIONS OF CONTRACT

ONTARIO PROVINCIAL STANDARDS

GENERAL CONDITIONS OF CONTRACT

The Contractor acknowledges that the general conditions of this contract are the Ontario Provincial Standard "OPS General Conditions of Contract". It is the responsibility of the Contractor to ensure that they have the correct document.

For this contract the following version of the OPS General Conditions of Contract shall apply:

OPS General Conditions November 2019 (OPSS.MUNI 100).

SECTION D

SPECIAL PROVISIONS - GENERAL

TOWNSHIP OF MUSKOKA LAKES

SPECIAL PROVISIONS - GENERAL

Special Provisions - General are non-technical specifications, which can amend or extend the OPS General Conditions contained in Section C of the Tender documents. Special Provisions - General do not relate to any one specific tender item, but apply to either a number of tender items or the contract as a whole.

Special Provisions - General rank third (c) in the order of precedence, GC2.02.

The Contractor acknowledges that the Special Provisions - General as produced by the Township of Muskoka Lakes and listed herein are provisions of this Contract.

TOWNSHIP OF MUSKOKA LAKES

SPECIAL PROVISIONS – GENERAL

GENERAL WORK

SP-D 1. SCOPE OF WORK

The Contractor shall perform all the general work covered by the following specifications.

SP-D 2. LOCATION OF THE WORK

The location of the work is the Milford Bay Community Centre located at 1020 Beaumaris Rd, Milford Bay, ON P1L 1W8

SP-D 3. SCHEDULE OF WORK

Upon being awarded the Contract, the Contractor shall forthwith supply to the Owner for their approval a copy of their detailed planned Schedule of Work, showing clearly that the Work will be completed within the stipulated time. No work shall commence on the Contract until the Owner has approved the Schedule of Work.

The Schedule of Work shall indicate proposed progress in 1-week periods for at least the following work as applicable:

Basement ERV system.

Main floor ERV system.

Hydronic system including boilers.

Testing, adjusting, and balancing.

SP-D 4. AUTHORIZATION TO START WORK

The Work shall not begin prior to approval by the Township of Muskoka Lakes and shall be completed by October 1, 2024 as identified in Part II Tender Conditions as the date used for the calculation of liquidated damages.

SP-D 5. HOURS OF WORK

No work shall occur outside of 7:00 am to 5:00 pm, Monday to Friday or on any Provincial and/or Federal statutory holidays (including Easter Monday and Civic Holiday) without prior written approval from the Contract Administrator.

SP-D 6. AFTER HOURS CONTACT

The contractor shall ensure that an authorized representative is available which can be contacted 24 hours a day, 7 days a week for emergency purposes.

SP-D 7. NO INTERRUPTION OF SERVICE

The Contractor shall make every effort to facilitate the ongoing activities/rentals of the community centre during the renovation.

SP-D 8. PERFORMANCE BOND & LABOUR AND MATERIALS PAYMENT BOND

The Contractor shall provide bonds in accordance with Part II Tender Conditions.

SP-D 9. GENERAL LIABILITY & AUTOMOBILE LIABILITY INSURANCE

The Contractor shall provide insurance in accordance with Part II Tender Conditions. Proof of this insurance must be provided to the Owner, prior to commencing the Work.

SP-D 10. MATERIALS SUPPLIED BY THE CONTRACTOR

The Contractor shall base their Tender on the materials specified as to quality and price. The Contractor may, however, after acceptance of their Tender, request permission to substitute alternative material where "other approved" is allowed in the specification. Should the Owner not approve such alternative material, the Contractor shall have no claim whatsoever against the Owner. All material supplied by the Contractor shall be new, in no case remanufactured or factory reconditioned and in no case recycled from any site unless specifically approved and tested by the Owner.

SP-D 11. FENCING

Fencing shall be erected in areas where there exists, in the opinion of the Owner, a danger to pedestrians or vehicular traffic for the installation or removal of equipment to/from the site. No separate payment will be made for fencing but shall be part of the General Work of the Contract.

SP-D 12. SAFE WORKING PRACTICES AND CONTINGENCY PLANNING DURING COVID-19 PANDEMIC

Upon award of the Contract and prior to any work being undertaken, the Contractor shall provide the Contract Administrator with a detailed policy outlining the safe working practices to decrease potential hazards of exposure and/or contamination during the COVID-19 Pandemic. The policy may include, but is not limited to the following information:

- Responsibility of the Project Manager, Site Supervisors, Foreman, Operators and Labourers.

- Responsibility of all employees to be aware of all federal/provincial/municipal health authorities' policies, procedures and orders, as well as any relevant changes to the Occupational Health and Safety Act.
- Requirements for the use of applicable personal protective equipment, including a summary of the supplies and equipment that will be made available.
- Revisions to working protocol, as required to adhere with current federal or provincial guidelines, including, but not limited to separation requirements, disinfection of equipment, trailers, service vehicles, etc.
- Protocol for dealing with the public in the event it is required, such as the need for access to a home to confirm service locations.
- Changes to site or documentation protocol to protect the site in the event the site is shut down due to infection, government enforced shut down or other reasons associated with COVID-19.

The Contractor will be responsible for ensuring the protocol, expectations and requirements are strictly followed by all staff and visitors to the site.

The Contactor shall also provide a detailed contingency plan outlining how they will manage the site in the event that members of their project team or construction staff become infected with the COVID-19 virus or need to quarantine for any reason and/or in the event of a government or municipal enforced shut down. The contingency plan shall outline replacement staff and measures to be taken in the field to ensure the site is maintained and monitored in a safe condition.

The detailed COVID-19 safe working practices policy and contingency plan will be reviewed by the Contract Administrator and the Client and the Contractor shall update these documents to address comments and concerns throughout construction as required.

SP-D 13. MEASUREMENT & PAYMENT

No measurement of quantities will be made for the General Work. No direct payment will be made for any of this General Work. The Contractor shall allow in their bid for all labour, material and equipment necessary for the general work described herein or specified elsewhere in the Contract.

SECTION E

Contract Drawings

TOWNSHIP OF MUSKOKA LAKES

Contract Drawings

The Contract Drawings do not relate to any one specific tender item, but apply to either a number of tender items or the contract as a whole.

The Contract Drawings rank fourth (d) in the order of precedence, GC2.02.

The Contractor acknowledges that the Contract Drawings as produced by Tatham Engineering Ltd for the Township of Muskoka Lakes and listed herein are provisions of this Contract.

MILFORD BAY COMMUNITY CENTRE
HVAC AND PLUMBING UPGRADES

TOWNSHIP OF MUSKOKA LAKES
1020 BEAUMARIS ROAD, MILFORD BAY, ON

DRAWING INDEX

TATHAM ENGINEERING

PROJECT 123056
ISSUED FOR PERMIT
NOVEMBER, 2024

TOWNSHIP OF MUSKOKA Lakes

PROJECT 123056
ISSUED FOR PERMIT
NOVEMBER, 2024

TATHAM ENGINEERING

MECHANICAL LEGEND

- DOMESTIC COLD WATER PIPING
- DOMESTIC HOT WATER PIPING
- DOMESTIC HOT WATER RE-CIRCULATION PIPING
- PROPANE GAS PIPING PIPING
- SANITARY WASTE PIPING
- CONDENSATE DRAIN PIPING
- SANITARY VENT
- HYDRONIC HOT WATER RETURN PIPING (HWR)
- HYDRONIC HOT WATER SUPPLY PIPING (HWS)
- HYDRONIC HOT WATER RETURN PIPING (40% PG) (HWR)
- HYDRONIC HOT WATER SUPPLY PIPING (40% PG) (HWS)
- REFRIGERANT LIQUID PIPING (RL)
- REFRIGERANT SUCTION PIPING (RS)
- PIPE UP
- PIPED DOWN
- ISOLATION VALVE
- BACKFLOW PREVENTER
- PRESSURE RELIEF VALVE (PRV)
- WATER METER (W)
- NATURAL GAS METER (GM)
- AIR FLOW DIRECTION
- EXISTING SERVICES OR EQUIPMENT
- EXISTING SERVICES OR EQUIPMENT TO BE REMOVED
- FLOOR DRAIN C/W TRAP
- SUPPLY DUCT UP/DOWN
- RETURN DUCT UP/DOWN
- SPIRAL DUCT UP/DOWN
- FIRE DAMPER (FD)
- BALANCING DAMPER (BD)
- MOTORIZED DAMPER (M)
- THERMOSTAT (Th-1)
- DETAIL NUMBER — 3
- SHEET NUMBER/ DETAIL LOCATION — M8
- SIZE (INCHES)
- GRILLE/DIFFUSER TAG (SEE SCHEDULE) — S1 10"ø
- AIR FLOW- IMPERIAL: CFM, METRIC: L/S — 250

AIR HANDLING UNIT SCHEDULE

TAG	MAKE	MODEL	SUPPLY AIR FAN			COOLING		HEATING				ELECTRICAL				STRUCTURAL				ACCESSORIES/REMARKS
			MAX FLOW (CFM)		E.S.P. (IN WC)	CAPACITY (MBH)		HYDRONIC HEATING COIL				V/ø/Hz	FLA	MCA	MOCP	WEIGHT (LB)	DIMENSIONS (IN)			
			SA	OA		TOTAL	SENSIBLE	CAPACITY (MBH)	HOT WATER FLOW RATE (GPM)	HOT WATER TEMPERATURE (°F)							HEIGHT	WIDTH	LENGTH	
										SUPPLY	RETURN									
AHU-1	JOHNSON CONTROLS	AMI-H08	4,000	1,070	0.75	115.8	88.5	196.2	13.3	140	110	208/3/60	16.8	21.0	35.0	1,132	34"	48"	110"	C/W 4" BASE RAIL, DOUBLE WALL CASING, NON-FUSED DISCONNECT, LEFT HAND FAN ACCESS, SUPPLY AIR FAN ARRANGEMENT 1, VFD MOTOR CONTROL, SPRING ISOLATION, LEFT HAND FILTER ACCESS, 2" 30% PLEATED MERV 8 FILTER, LEFT HAND INLET ACCESS, MIXING BOX W/ 2 INLET DAMPERS: TOP AND REAR, LEFT HAND MOTOR, ODP PREMIUM MOTOR, DX COIL: GALVANIZED COIL CASING, GALVANIZED DRAIN PAN, LEFT HAND COIL HANDLING, 0.016" TUBE WALL, AND PROGRAMMABLE THERMOSTAT.
AHU-2	JOHNSON CONTROLS	FNP08	760	640	0.3	24.6	16.8	11.6	0.7	140	110	115/1/60	4.8	6.0	15.0	176	16-3/4"	39-7/8"	47-1/4"	C/W BC02 24V UNIT S/S RELAY/FAN OPERATION RELAY & TRANSFORMER, GALVANIZED COIL CASING, CONTROL ENCLOSURE: HANDING OPPOSITE OF COIL 1, ENCLOSURE MOUNT: UNIT MOUNTED, FILTER BOTTOM ACCESS, GALVANIZED DRAIN PAN, INLET OPTION: MIXING BOX WITH LINKAGE, MIXING BOX DAMPER LOCATION: TOP AND REAR INLET, MOTOR CONTROL: 3 SPEED FIXED, OC012 TOGGLE DISCONNECT SWITCH – 15 AMPS, REAR RETURN, STANDARD FIBERGLASS, PROGRAMMABLE THERMOSTAT, RIGHT HAND DX COIL, HOT WATER COIL: FIELD PROVIDED PIPING PACKAGE SIZE 1/2", MANUAL AIR VENT, 1/2" VALVE PACKAGE, AND RIGHT HAND ACCESS

CONDENSING UNIT SCHEDULE

TAG	MAKE	MODEL	COOLING CAPACITY (MBH)	REFRIGERANT TYPE	ELECTRICAL			STRUCTURAL				ACCESSORIES/REMARKS
					V/ø/Hz	MCA	MOCP	DIMENSIONS (IN)			WEIGHT (LB)	
								HEIGHT	WIDTH	LENGTH		
CU-1	JOHNSON CONTROLS	KC120C00A2GLB1	113.0	R-454B	208/3/60	38.7	50	50"	32"	59"	435	27.4 LBS REFRIGERANT CHARGE, 80 FT. ONE WAY, 7/8"ø LIQUID LINE, 1-3/8"ø SUCTION LINE
CU-2	FRASER-JOHNSTON	XC324E2S11	22.5	R-454B	208/1/60	12.7	20	37"	26"	26"	135	3.6 LBS REFRIGERANT CHARGE, 30 FT. ONE WAY, 3/8"ø LIQUID LINE, 3/4"ø SUCTION LINE

ERV SCHEDULE

TAG	MAKE	MODEL	AIRFLOW (CFM)		E.S.P. (IN. WC)		ELECTRICAL						STRUCTURAL		ACCESSORIES/REMARKS
							SUPPLY FAN			EXHAUST FAN					
			SUPPLY	EXHAUST	SUPPLY	EXHAUST	V/ø/Hz	FLA	HP	V/ø/Hz	FLA	HP	WEIGHT (LB)	DIMENSIONS (IN.) (HxWxD)	
ERV-1	RUSKIN	MV1500XE	1070	1070	1.0	0.5	208/1/60	7.4	0.75	208/1/60	7.4	0.75	278	22x55x36	C/W VIBRATION ISOLATION DAMPERS
ERV-2	RUSKIN	MV750XE	640	640	1.0	0.5	208/1/60	5.0	0.5	208/1/60	5.0	0.5	261	22x47x32	C/W VIBRATION ISOLATION DAMPERS

LOUVER SCHEDULE

TAG	MAKE	MODEL	WIDTH (IN)	HEIGHT (IN)	E.S.P. (IN WC)	VOLUME (CFM)	VELOCITY (FPM)	AIRFLOW DIRECTION	ACCESSORIES/ REMARKS
LV-1	GREENHECK	ESD-403	24	24	0.063	1,070	602	INTAKE	C/W BIRD SCREEN
LV-2	GREENHECK	ESD-403	24	24	0.063	1,070	602	EXHAUST	C/W BIRD SCREEN
LV-3	GREENHECK	ESD-403	20	20	0.054	640	556	INTAKE	C/W BIRD SCREEN

MOTORIZED DAMPER SCHEDULE

TAG	MAKE	MODEL	WIDTH (IN)	HEIGHT (IN)	ACCESSORIES/REMARKS
MD-1a	TAMCO	9000 ECT	24	24	C/W 24V BELIMO ACTUATOR
MD-1b	TAMCO	9000 ECT	24	24	C/W 24V BELIMO ACTUATOR
MD-2a	TAMCO	9000 ECT	20	20	C/W 24V BELIMO ACTUATOR
MD-2b	TAMCO	9000 ECT	15	7	C/W 24V BELIMO ACTUATOR

FAN SCHEDULE

TAG	MAKE	MODEL	ELECTRICAL			RPM	AIRFLOW (CFM)	E.S.P. (IN WC)	ACCESSORIES/REMARKS
			V/ø/Hz	HP	FLA				
EF-1,2,3,4	GREENHECK	SP-B150	120/1/60	1/5	1.8	1050	150	0.25	C/W INTEGRATED BACKDRAFT DAMPER
EF-5	GREENHECK	SP-A390-VG	120/1/60	1/20	1.5	1069	250	0.25	C/W INTEGRATED BACKDRAFT DAMPER
EF-6	GREENHECK	SP-A390-VG	120/1/60	1/20	1.5	1196	300	0.25	C/W INTEGRATED BACKDRAFT DAMPER

DIFFUSER & GRILLE SCHEDULE

TAG	MAKE	MODEL	SERVICE	ACCESSORIES/REMARKS
S1	E.H. PRICE	ARCD	SUPPLY AIR	ROUND CONE DIFFUSER, ALUMINUM, 4 CONES, FULLY ADJUSTABLE C/W BALANCING DAMPER.
S2	E.H. PRICE	610	SUPPLY AIR	DOUBLE DEFLECTION, SUPPLY REGISTER, ALUMINUM C/W BALANCING DAMPER, CONFIRM COLOUR WITH OWNER.
R1	E.H. PRICE	630	RETURN AIR	LOUVERED RETURN GRILLE W/ 45 DEG. DEFLECTION, 3/4" BLADE SPACING, ALUMINUM, CONFIRM COLOUR WITH OWNER.

FIRE DAMPER SCHEDULE

TAG	MAKE	MODEL	TYPE	FIRE RATING (HRS)	ORIENTATION	ACCESSORIES/REMARKS
FD	NAILOR	D0120	B	1-1/2	VERTICAL	CAN/ULC-S112 CLASSIFIED DYNAMIC FIRE DAMPER, REFER TO DRAWINGS FOR SIZING

BENCHMARKS

NOTES

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR PERMIT AND TENDER	NOV/24

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER — N.M.WILLIAMS — 100101606 — 13NOV2024 — PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER — J.C.THOMPSON — 100215043 — 13NOV2024 — PROVINCE OF ONTARIO

MILFORD BAY COMMUNITY CENTRE
MILFORD BAY, ON

LEGEND & SCHEDULES

TATHAM ENGINEERING

DESIGN: JT	FILE: 123056	DWG:	M.1
DRAWN: ML	DATE: NOV 2024		
CHECK: NW	SCALE: AS SHOWN		

HOT WATER TANK SCHEDULE

TAG	MAKE	MODEL	FUEL	INPUT CAPACITY (BTUH)	NOM. STORAGE CAPACITY (GAL)	SET POINT (°F)	RECOVERY CAPACITY @ 100°F TEMP RISE (GAL)	EFFICIENCY (%)	CONNECTIONS (IN.)							DIMENSIONS (IN.)		WEIGHT (LBS)	ACCESSORIES/REMARKS
									INLET	OUTLET	RECIRC	DRAIN	GAS	VENT	INTAKE AIR	HEIGHT	WIDTH		
WH-1	AO SMITH	BTH-120	PROPANE	120,000	60	140	138	95	1-1/2"	1-1/2"	3/4"	3/4"	3/4"	3"	3"	55-1/2"	27-3/4"	490	ASME CONSTRUCTION, CONDENSATE NEUTRALIZATION KIT, T&P RELIEF VALVE

HYDRONIC ERV PRE-HEAT COIL SCHEDULE

TAG	MAKE	MODEL	TOTAL CAPACITY (MBH)	HYDRONIC HOT WATER				PRESSURE DROP (IWG)	DIMENSIONS (IN.)		ACCESSORIES/REMARKS
				FLUID	EWT (°F)	LWT (°F)	GPM		HEIGHT	WIDTH	
PHC-1	JOHNSON CONTROLS	MA0061112.0012G02 C02003501F500SS	31.6	40% PG	130	100	2.3	0.29"	12"	12"	-
PHC-2	JOHNSON CONTROLS	MA0100912.0015G02 C02003501F500SS	53.7	40% PG	130	100	3.9	0.44"	12"	15"	-

HEAT EXCHANGER SCHEDULE

TAG	MAKE	MODEL	TOTAL HEAT EXCHANGED (BTUH)	WATER SIDE				GLYCOL SIDE				ELECTRICAL			DIMENSION (IN.)			ACCESSORIES/REMARKS
				FLUID TYPE	FLOW (GPM)	INLET TEMP. (°F)	OUTLET TEMP. (°F)	FLUID TYPE	FLOW (GPM)	INLET TEMP. (°F)	OUTLET TEMP. (°F)	V/ø/Hz	MCA	MOCP	HEIGHT	WIDTH	LENGTH	
HX-1	TRANTER	AC-016-H-5-NR-14	92,569	100% WATER	6.25	140	110	40% PG	6.70	100	130	-	-	-	36	13	22-1/4	-

BOILER SCHEDULE

TAG	MAKE	MODEL	ELECTRICAL		CAPACITY (MBH)				WATER TEMP (°F)		GLYCOL (%)	EFFICIENCY (%)	FUEL TYPE	BOILER CONNECTION SIZES (IN)						ACCESSORIES/REMARKS
			V/ø/Hz	AMPS	MAX		MIN		EWT	LWT				HWS	HWR	DRAIN	GAS	COMBUSTION	FLUE	
					INPUT	OUTPUT	INPUT	OUTPUT												
B-1,2	NAVIEN	NFB-399C	120/1/60	12	399	338	20	-	110	140	0	97.5	PROPANE	1-1/2"	1-1/2"	3/4"	3/4"	3"	3"	C/W PRV, CONDENSATE NEUTRALIZER, ZONE PUMP CONTROLLER AND PROPANE FIELD CONVERSION KIT

EXPANSION TANK SCHEDULE

TAG	MAKE	MODEL	SERVICE	VOLUME (USG)		TEMPERATURE (°F)		PRESSURE (PSI)		ORIENTATION	TYPE	ACCESSORIES/REMARKS
				TANK	ACCEPTANCE	FILL	MAX	FILL	MAX			
ET-1	BELL & GOSSET	D-20V	HYDRONIC WATER LOOP	10.9	2.4	70	140	40	50	VERTICAL	DIAPHRAGM	ASME CONSTRUCTION
ET-2	BELL & GOSSET	D-15V	HYDRONIC GLYCOL LOOP	8.0	2.4	70	130	40	50	VERTICAL	DIAPHRAGM	ASME CONSTRUCTION
ET-3	BELL & GOSSET	PTA-20V	DOMESTIC HOT WATER	8.0	3.2	70	140	40	80	VERTICAL	DIAPHRAGM	ASME CONSTRUCTION

PUMP SCHEDULE

TAG	MAKE	MODEL	DESCRIPTION	ELECTRICAL		RPM	FLOW (GPM)	HEAD (FT)	ACCESSORIES/REMARKS
				V/ø/Hz	HP				
BP-1,2	BELL & GOSSET	NRF-45	BOILER PUMP	-	0.36	3300	23.0	15.0	POWER FEED FROM B-1
P-1	BELL & GOSSET	ECOCIRC 20-18	HEAT EXCHANGER PUMP	120/1/60	0.024	3481	6.2	10.5	-
P-2	BELL & GOSSET	ECOCIRC 20-18	GLYCOL LOOP PUMP	120/1/60	0.056	4824	6.2	21.0	-
P-3	BELL & GOSSET	ECOCIRC XL 70-145	WATER LOOP PUMP	120/1/60	0.846	2620	54.3	30.0	-
RP-1	BELL & GOSSET	e^3-4V/BTPRC	DOMESTIC HOT WATER RECIRCULATION PUMP	120/1/60	-	-	4.0	2.2	-

HYDRONIC FORCE FLOW HEATER SCHEDULE

TAG	MAKE	MODEL	ELECTRICAL			CAPACITY (MBH)	FLOW (GPM)	PRESSURE DROP (FT.)	WATER (°F)		ACCESSORIES/REMARKS
			V/ø/Hz	AMPS	HP				EWT	LWT	
FFH-1,11	ROSEMEX	F-400-C	120/1/60	1.2	1/15	18.9	2.5	0.5	140	110	C/W BUILT-IN THERMOSTAT
FFH-2	ROSEMEX	F-300-C	120/1/60	1.2	1/15	15.0	1.9	0.3	140	110	C/W BUILT-IN THERMOSTAT
FFH-3	ROSEMEX	F-400-B	120/1/60	1.0	1/15	16.5	2.2	0.4	140	110	C/W BUILT-IN THERMOSTAT
FFH-4,5,13,14,16	ROSEMEX	F-600-B	120/1/60	2.2	1/4	25.1	3.2	1.1	140	110	C/W BUILT-IN THERMOSTAT
FFH-6,15	ROSEMEX	F-300-B	120/1/60	1.0	1/15	12.8	1.6	0.3	140	110	C/W BUILT-IN THERMOSTAT
FFH-7,8,9,10,12,17	ROSEMEX	F-300-A	120/1/60	0.8	1/15	10.6	1.4	0.2	140	110	C/W BUILT-IN THERMOSTAT

HYDRONIC BASEBOARD SCHEDULE

TAG	MAKE	ENCLOSURE MODEL	HEATING MODEL	ROWS	LENGTH (FT)	CAPACITY (MBH)	FLOW (GPM)	WATER (°F)		ACCESSORIES/REMARKS
								EWT	LWT	
BB-1	ROSEMEX	RVS-G	44C3	2	12.7	10.5	1.0	140	110	ENCLOSURE LENGTH TO BE VERIFIED BY CONTRACTOR BEFORE PURCHASE
BB-2	ROSEMEX	RVS-G	44C3	2	46.6	38.6	2.6	140	110	ENCLOSURE LENGTH TO BE VERIFIED BY CONTRACTOR BEFORE PURCHASE
BB-3,4,5	ROSEMEX	RVS-A	44C3	1	1.1	0.3	1.0	140	110	ENCLOSURE LENGTH TO BE VERIFIED BY CONTRACTOR BEFORE PURCHASE

HVAC SEQUENCE OF OPERATION:

1.1. B-1, B-2 AND P-1, BP-2:

1.1.1. BOILERS B-1 AND B-2 WILL BE WIRED TOGETHER IN A CASCADE SEQUENCE TO FIRE THE BOILERS IN A WAY THAT IS THE MOST EFFICIENT ALLOWING FOR BOTH BOILERS TO FIRE AT ONE TIME AT A LOWER RATE.

1.1.2. TO EQUALIZE THE RUN TIME OF EACH BOILER, THE FIRING SEQUENCE WILL AUTOMATICALLY BE CHANGED AT SET INTERVALS OF 24 HOURS.

1.1.3. B-1 WILL BE DESIGNATED AS THE LEADER CONTROL AND B-2 WILL BE DESIGNATED AS A MEMBER CONTROL.

1.1.4. THE OUTDOOR AIR RESET SENSOR WILL BE CONNECTED TO B-1 AND THE SET POINT WILL BE CALCULATED BASED ON THE PROGRAMMED RESET CURVE PARAMETERS.

1.1.5. UPON A CALL FOR HEAT, THE BOILER CONTROL TURNS ON BP-1 AND BP-2 AND MODULATES OUTPUT TO MAINTAIN MAIN CIRCULATION LOOP TEMPERATURE SET POINT.

1.2. P-1, P-2 AND P-3

1.2.1. UPON A CALL FOR HEAT, PUMPS P-1, P-2 AND P-3 OPERATE CONTINUOUSLY.

1.2.2. PUMPS P-2 AND P-3 MODULATE FLOW TO MAINTAIN CONSTANT DISCHARGE PRESSURE.

1.3. FFH-1 THRU FFH-17

1.3.1. FORCE FLOW HEATER FANS SHALL TURN ON TO MAINTAIN BUILT-IN THERMOSTAT SET POINT.

1.4. BB-1 THRU BB-5:

1.4.1. BASEBOARD HEATER HYDRONIC CONTROL VALVES SHALL MODULATE TO MAINTAIN WALL MOUNTED THERMOSTAT SET POINT.

1.5. AHU-1 AND ERV-1:

1.5.1. THE SYSTEM SHALL BE ENABLED BASED ON A TIME OF DAY SCHEDULE.

1.5.2. WHEN THE SYSTEM IS DISABLED, THE COOLING STAGES SHALL BE COMMANDED OFF, THE AHU SUPPLY FAN SHALL BE COMMANDED OFF, THE ERV SHALL BE COMMANDED OFF, AND THE HEATING COIL CONTROL VALVE SHALL BE COMMANDED 100% OPEN. THE ERV PREHEAT COIL CONTROL VALVE SHALL BE MODULATED TO MAINTAIN THE PLENUM TEMPERATURE AT 10 DEG C.

1.5.3. WHEN THE SYSTEM IS ENABLED, THE AHU AND ERV UNIT SHALL BE COMMANDED ON. THE AHU FAN SHALL RUN AT MINIMUM SPEED THROUGH THE VFD (EQUAL TO STAGE 1 COOLING FAN SPEED). THE ERV OUTDOOR AND EXHAUST AIR DAMPERS SHALL OPEN TO PROVIDE THE MINIMUM FRESH AIR VOLUME. THE ERV FANS SHALL START WHEN THE END-SWITCH ON THE OUTDOOR AND EXHAUST AIR DAMPERS INDICATES THE DAMPERS ARE OPEN. THE ERV PREHEAT COIL CONTROL VALVE SHALL BE MODULATED TO MAINTAIN A LEAVING COIL AIR TEMPERATURE OF 12 DEG C.

1.5.4. WHEN THE STATUS FOR THE AHU SUPPLY FAN IS PROVEN ON FROM THE VFD, THE HEATING AND COOLING SHALL BE CONTROLLED IN SEQUENCE, WITHOUT OVERLAP, TO MAINTAIN THE SPACE TEMPERATURE AT SETPOINT.

1.5.5. WHEN THE CO2 SENSOR IN THE RETURN AIR STREAM SENSES A CONCENTRATION OF CO2 GREATER THAN 1000 PPM THE ERV SHALL BE COMMANDED ON UNTIL THE CONCENTRATION FALLS BACK BELOW 1000 PPM.

1.5.6. COOLING MODE:

1.5.6.1. WHEN THE SPACE TEMPERATURE INCREASES ABOVE THE COOLING SETPOINT, THE FIRST STAGE OF COOLING SHALL BE COMMANDED ON AT THE CONDENSING UNIT. THE FAN SHALL CONTINUE TO RUN AT THE MINIMUM SPEED SETTING.

1.5.6.2. AFTER A 10 MINUTE TIME DELAY, IF THE SPACE TEMPERATURE IS STILL ABOVE SETPOINT, THE FAN SPEED SHALL BE COMMANDED TO 100% AND THE SECOND STAGE OF COOLING SHALL BE COMMANDED ON AT THE CONDENSING UNIT.

1.5.6.3. AS THE SPACE TEMPERATURE DROPS BELOW THE COOLING SETPOINT, THE STAGES OF COOLING SHALL BE COMMANDED OFF AND THE FAN SPEED REDUCED, WITH APPROPRIATE TIME DELAYS BETWEEN STAGES.

1.5.7. HEATING MODE:

1.5.7.1. THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE SET RESET BETWEEN 18 DEG C TO 32 DEG C BASED ON THE SPACE TEMPERATURE DEVIATION BELOW THE SPACE HEATING SETPOINT. AS THE SPACE TEMPERATURE DROPS BELOW OR REMAINS BELOW THE SPACE HEATING SETPOINT, THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE INCREASED TO A MAXIMUM OF 32 DEG C.

1.5.7.2. WHEN IN HEATING MODE, THE FAN VFD SPEED SHALL BE COMMANDED TO THE MINIMUM FAN SPEED SETTING.

1.5.7.3. THE HEATING COIL CONTROL VALVE SHALL BE MODULATED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT SETPOINT.

1.5.8. THE RETURN AIR TEMPERATURE SHALL BE MONITORED THROUGH A DUCT MOUNTED TEMPERATURE SENSOR.

1.5.9. THE CONTROLLER SHALL BE PROVIDED WITH AN ALPHA-NUMERIC DISPLAY FOR MONITORING AND ADJUSTMENT OF THE SYSTEM FUNCTIONS.

1.6. AHU-2 AND ERV-2:

1.6.1. THE SYSTEM SHALL BE ENABLED BASED ON A TIME OF DAY SCHEDULE.

1.6.2. WHEN THE SYSTEM IS DISABLED, THE COOLING STAGES SHALL BE COMMANDED OFF, THE AHU SUPPLY FAN SHALL BE COMMANDED OFF, THE ERV SHALL BE COMMANDED OFF, AND THE HEATING COIL CONTROL VALVE SHALL BE COMMANDED 100% OPEN. THE ERV PREHEAT COIL CONTROL VALVE SHALL BE MODULATED TO MAINTAIN THE PLENUM TEMPERATURE AT 10 DEG C.

1.6.3. WHEN THE SYSTEM IS ENABLED, THE AHU AND ERV UNIT SHALL BE COMMANDED ON. THE ERV OUTDOOR AND EXHAUST AIR DAMPERS SHALL OPEN TO PROVIDE THE MINIMUM FRESH AIR VOLUME. THE ERV FANS SHALL START WHEN THE END-SWITCH ON THE OUTDOOR AND EXHAUST AIR DAMPERS INDICATES THE DAMPERS ARE OPEN. THE ERV PREHEAT COIL CONTROL VALVE SHALL BE MODULATED TO MAINTAIN A LEAVING COIL AIR TEMPERATURE OF 12 DEG C.

1.6.4. WHEN THE STATUS FOR THE SUPPLY FAN IS PROVEN ON THROUGH A CURRENT SWITCH, THE HEATING AND COOLING SHALL BE CONTROLLED IN SEQUENCE, WITHOUT OVERLAP, TO MAINTAIN THE SPACE TEMPERATURE AT SETPOINT.

1.6.5. WHEN THE CO2 SENSOR IN THE RETURN AIR STREAM SENSES A CONCENTRATION OF CO2 GREATER THAN 1000 PPM THE ERV SHALL BE COMMANDED ON UNTIL THE CONCENTRATION FALLS BACK BELOW 1000 PPM.

1.6.6. COOLING MODE:

1.6.6.1. WHEN THE SPACE TEMPERATURE INCREASES ABOVE THE COOLING SETPOINT, THE FIRST STAGE OF COOLING SHALL BE COMMANDED ON AT THE CONDENSING UNIT.

1.6.6.2. AFTER A 10 MINUTE TIME DELAY, IF THE SPACE TEMPERATURE IS STILL ABOVE SETPOINT, THE SECOND STAGE OF COOLING SHALL BE COMMANDED ON AT THE CONDENSING UNIT.

1.6.6.3. AS THE SPACE TEMPERATURE DROPS BELOW THE COOLING SETPOINT, THE STAGES OF COOLING SHALL BE COMMANDED OFF, WITH APPROPRIATE TIME DELAYS BETWEEN STAGES.

1.6.7. HEATING MODE:

1.6.7.1. THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE SET TO 22.2 DEG C.

1.6.7.2. WHEN IN HEATING MODE, THE FAN VFD SPEED SHALL BE COMMANDED TO THE MINIMUM FAN SPEED SETTING.

1.6.7.3. THE HEATING COIL CONTROL VALVE SHALL BE MODULATED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT SETPOINT.

1.6.8. THE RETURN AIR TEMPERATURE SHALL BE MONITORED THROUGH A DUCT MOUNTED TEMPERATURE SENSOR.

1.6.9. THE CONTROLLER SHALL BE PROVIDED WITH AN ALPHA-NUMERIC DISPLAY FOR MONITORING AND ADJUSTMENT OF THE SYSTEM FUNCTIONS.

1.7. EF-1, EF-3, EF-4, AND EF-5:

1.7.1. FANS TO OPERATE USING A WALL MOUNTED TIMER WITH 5,10,15,30 MINUTE COUNTDOWN PRESETS.

1.8. EF-2:

1.8.1. FAN TO OPERATE CONTINUOUSLY.

BENCHMARKS

NOTES

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR PERMIT AND TENDER	NOV/24

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
N.M.WILLIAMS
100101606
13NOV2024
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
J.C.THOMPSON
100215043
13NOV2024
PROVINCE OF ONTARIO

MILFORD BAY COMMUNITY CENTRE
MILFORD BAY, ON

SCHEDULES

TATHAM ENGINEERING

DESIGN: JT	FILE: 123056	DWG: M.2
DRAWN: ML	DATE: NOV 2024	
CHECK: NW	SCALE: AS SHOWN	

GENERAL SPECIFICATIONS:

1. REVIEW WORK AREA AND READ DRAWINGS IN CONJUNCTION WITH ALL DISCIPLINES BEFORE COMMENCING WORK. NOTIFY ENGINEER OF ANY DISCREPANCIES BETWEEN PLANS AND POTENTIAL ISSUES ON WORK–SITE. NO ADDITIONAL PAYMENTS WILL BE MADE RELATED TO CLAIMS FOR ITEMS THAT WOULD HAVE BEEN APPARENT IF THE WORK AREA AND ALL PLANS WERE REVIEWED PRIOR TO PRICING THE WORKS.
2. THE GENERAL CONTRACTOR SHALL OBTAIN AND PAY FOR NECESSARY PERMITS PERTAINING TO THE INSTALLATION OF THEIR WORK AND PROVIDE ANY CERTIFICATES AND SIGN–OFFS AS CIRCUMSTANCES REQUIRE.
3. THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS IS TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM TO THE OWNER SUPPLIED AND INSTALLED BY THE GENERAL CONTRACTOR AND SUB–CONTRACTORS.
4. WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE ONTARIO BUILDING CODE, ONTARIO FIRE CODE, OCCUPATIONAL HEALTH AND SAFETY ACT, AND AUTHORITIES HAVING JURISDICTION. MATERIALS SHALL CONFORM TO THE LATEST EDITION OF THE CANADIAN STANDARDS ASSOCIATION, AND AUTHORITIES HAVING JURISDICTION. STANDARDS SET OUT IN DESIGN DRAWINGS SHALL NOT BE REDUCED BY CONFORMANCE TO APPLICABLE CODES AND STANDARDS. MAKE ALL MINOR MODIFICATIONS AS REQUIRED BY AUTHORITIES HAVING JURISDICTION AT NO COST TO THE OWNER.
5. SUBMIT ELECTRONIC SHOP DRAWINGS FOR EQUIPMENT LISTED ON THE SCHEDULES FOR REVIEW PRIOR TO ORDERING. REVIEW OF SHOP DRAWINGS DOES NOT RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITIES TO PROVIDE A COMPLETE WORKING SYSTEM CONSISTENT WITH THE INTENT OF THE DESIGN DRAWINGS. CONTRACTOR SHALL REVIEW DESIGN DRAWINGS, EQUIPMENT SCHEDULES AND SHOP DRAWINGS FOR ERRORS AND OMISSIONS AND ELEMENTS RELATING TO WORKS/ASSEMBLY ON–SITE.
6. AT THE COMPLETION OF THE PROJECT THE CONTRACTOR SHALL PROVIDE OPERATION AND MAINTENANCE MANUALS. THE FIRST PAGE OF THE OPERATION AND MAINTENANCE MANUAL SHALL HAVE A COVER PAGE EXPLAINING THE DETAILED MAINTENANCE REQUIREMENTS AND SCHEDULE FOR THE SYSTEM AND ANY OTHER INFORMATION THAT IS SPECIFIC TO THIS PROJECT. GENERIC OPERATIONS AND MAINTENANCE MANUALS WITH NO PROJECT SPECIFIC INFORMATION WILL NOT BE ACCEPTED.
7. KEEP ONE SET OF ALL APPLICABLE CONTRACT (INCLUDING UPDATES) AND SHOP DRAWINGS AT THE SITE.
8. THE LATEST ISSUED DRAWINGS SHALL BE KEPT ONSITE INCLUDING CONTRACTOR RED LINES TO REFLECT THE WORK AS INSTALLED AND BE MADE AVAILABLE TO THE AUTHORITIES HAVING JURISDICTION, OWNER AND ENGINEER.
9. UPON COMPLETION OF THE WORK, TRANSFER ALL CONTRACTOR RED LINES TO A CLEAN SET OF PRINTS AND SUBMIT TO ENGINEER FOR "AS–BUILT" RECORD AS PART OF THE FINAL JOB DOCUMENTATION.
10. PROVIDE TRAINING FOR THE OPERATOR OR OWNER'S REPRESENTATIVE. PROVIDE COMMISSIONING SERVICES AS REQUIRED.
11. LABEL ALL EQUIPMENT, PIPING, CONDUIT ETC.
12. THE CONTRACTOR IS RESPONSIBLE FOR STORAGE AND SECURITY OF MATERIALS AND EQUIPMENT ON THE JOB SITE.
13. THE OWNER'S PROPERTY MUST BE KEPT IN TIDY CONDITION. PROMPTLY REMOVE GARBAGE FROM THE SITE. CLEAN WORK AREA PRIOR TO ALL INSPECTIONS AND KEEP SITE IN A SAFE CONDITION.
14. DESIGN DRAWINGS ILLUSTRATE THE GENERAL LAYOUT OF THE WORK ONLY. COORDINATE THE INSTALLATION OF WORK WITH OTHER TRADES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER LAYOUT OF EQUIPMENT AND MATERIALS AND ENSURING THERE ARE NO INTERFERENCES WITH OTHER SYSTEMS.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING AND PATCHING REQUIRED FOR THE INSTALLATION OF THEIR WORK.
16. EQUIPMENT SHALL BE INSTALLED, STARTED, TESTED, AND ADJUSTED AS PER THE MANUFACTURERS' INSTRUCTIONS, AND AS NECESSARY TO ENSURE OPTIMUM PERFORMANCE. EQUIPMENT SHALL BE INSTALLED TO ALLOW FOR EASY ACCESS AND MAINTENANCE.
17. THE CONTRACTOR SHALL GUARANTEE WORK PERFORMED UNDER THIS CONTRACT FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION. ENSURE THAT ALL EQUIPMENT IS WARRANTED BY THE MANUFACTURER FOR A MINIMUM OF ONE (1) YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION.
18. MATERIALS AND EQUIPMENT SHALL BE NEW, TOP QUALITY AND SPECIFICATION GRADE, EXCEPT WHERE NOTED OTHERWISE.
19. THIS SPECIFICATION SHALL BE CONSIDERED TO BE THE BASE BID SPECIFICATION AND CONTRACTORS MUST CARRY THE BASE BID MANUFACTURERS IN THEIR QUOTATION. ALTERNATE MANUFACTURERS OF EQUIPMENT CAN ONLY BE OFFERED AS PROPOSED ALTERNATES WITH THE CORRESPONDING PRICE REDUCTIONS PASSED ALONG TO OWNER.
20. THE CONTRACTOR SHALL NOT WELD TO OR MAKE A HOLE IN A STRUCTURAL MEMBER WITHOUT REVIEW FROM THE STRUCTURAL ENGINEER. ATTACHMENTS TO STRUCTURAL MEMBERS SHALL BE MADE WITH SUITABLE CLAMPS OR CLIPS.
21. THE GENERAL CONTRACTOR SHALL PROVIDE ALL OPENINGS AND REINFORCEMENT FRAMING AS REQUIRED.
22. ALL MATERIALS IN CEILING SPACE USED FOR RETURN AIR PLENUM MUST BE PLENUM RATED.
23. CONFIRM FIRE SEPARATIONS WITH ARCHITECTURAL DRAWINGS AND GENERAL CONTRACTOR. EXCEPT FOR HVAC DUCTING SYSTEMS, ALL PENETRATIONS THROUGH FIRE SEPARATIONS SHALL BE FITTED WITH EXPANSION SLEEVES AND ULC CERTIFIED FIRE STOPPING. ACCEPTABLE MATERIAL: HILTI OR APPROVED EQUIVALENT.
24. THE OWNER RESERVES THE RIGHT TO MAKE MINOR ALTERATIONS TO THE LOCATION OF EQUIPMENT ETC AT NO ADDITION TO THE CONTRACT AMOUNT.
25. THESE DRAWINGS ARE SCHEMATIC IN NATURE AND INTENDED TO SERVE AS A GUIDE SHOWING QUANTITIES AND GENERAL ARRANGEMENTS AND ARE NOT NECESSARILY WORKING DRAWINGS FROM WHICH MEASUREMENTS CAN BE TAKEN, EXCEPT WHERE DIMENSION FIGURES ARE SPECIFICALLY SHOWN. INFORMATION INVOLVING ACCURATE MEASUREMENTS OF BUILDING SHALL BE TAKEN FROM ARCHITECTURAL BUILDING DRAWINGS OR FROM THE SITE.
26. MAINTAIN ADEQUATE LIABILITY INSURANCE TO PROTECT OWNER AND ALL CONTRACTORS.
27. TEMPORARY LIGHTING AND POWER FOR CONSTRUCTION BY GENERAL CONTRACTOR.
28. ALL EQUIPMENT, PIPING, CONDUIT, WIRING, JUNCTION BOXES, HARDWARE, ETC. INSTALLED IN OPEN CEILING SPACES SHALL BE INSTALLED IN AN INCONSPICUOUS AND AESTHETICALLY PLEASING MANNER UP TO THE SOLE DISCRETION OF THE OWNER AND ENGINEER. ALL EQUIPMENT, PIPING, CONDUIT, WIRING, JUNCTION BOXES, HARDWARE SHALL BE INSTALLED IN CHASES, ABOVE ADJACENT CEILINGS WHERE POSSIBLE.
29. PAINT ALL EXPOSED DUCTWORK, PIPING, CONDUIT, CABLE TRAYS, JUNCTION BOXES, HANGERS, HARDWARE ETC. REFER TO ARCHITECT OR INTERIOR DESIGNER'S DRAWINGS.
30. SUITABLE ACCESS DOORS MUST BE PROVIDED WHERE NECESSARY TO ACCESS VALVES, JUNCTION BOXES, CLEAN OUTS, FIRE DAMPERS, AND OTHER EQUIPMENT AND APPURTENANCES. ALL ITEMS REQUIRING ACCESS PANELS ARE NOT NECESSARILY SHOWN, CARRY A REASONABLE COST ALLOWANCE. COORDINATE EXACT LOCATION OF COMPONENTS REQUIRING ACCESS AND SELECT SIZES WHICH ARE SUITABLE FOR MAINTENANCE.
    - 30.1. FOR GYPSUM WALLS AND CEILINGS IN OCCUPIED AREAS, PROVIDE CONCEALED DOORS WITH 5/8" RECESS TO RECEIVE DRYWALL, ACCEPTABLE MATERIAL: FOR STANDARD CEILINGS AND WALLS ACUDOR DW–5015 OR EQUIVALENT, FOR 90 MINUTE FIRE RATING ACUDOR FW(C)–5015 OR EQUIVALENT, FOR GREATER RATING, CONTACT ENGINEER AND ARCHITECT.
    - 30.2. FOR GYPSUM, PLASTER, MASONRY OR TILE WALLS AND CEILINGS IN UTILITY AND STORAGE AREAS, PROVIDE UNIVERSAL FLUSH ACCESS DOOR, ACCEPTABLE MATERIAL: FOR STANDARD CEILINGS AND WALLS ACUDOR UF–5000 OR EQUIVALENT, FOR 90 MINUTE FIRE RATING ACUDOR FW–5050, FOR GREATER RATING, CONTACT ENGINEER AND ARCHITECT.
31. PAY FOR AND COORDINATE ALL UTILITY LOCATES AS REQUIRED.
32. PROVIDE WATER–PROOFING OF BUILDING OPENINGS RELATED TO THE WORK OF ALL TRADES.

PROPANE PIPING SPECIFICATIONS:

1. CONTRACTOR SHALL COORDINATE PIPING INSTALLATION WITH PROPANE UTILITY PROVIDER.
2. PROPANE PIPING SYSTEMS SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH CSA B149.1.
3. ABOVE GROUND PIPING:
    - 3.1. PIPING: SCHEDULE 40, ASTM A53 OR A106, GRADE B
    - 3.2. FITTINGS: ASME B16.3
    - 3.3. FLANGES AND FLANGED FITTINGS: ASME B16.5
    - 3.4. UNIONS: MALLEABLE IRON
    - 3.5. NIPPLES: SCHEDULE 40, ASTM A53 OR A106, GRADE B
    - 3.6. VALVES: CSA APPROVED FOR PROPANE SERVICE
4. UNDERGROUND PIPING:
    - 4.1. COPPER SEAMLESS TUBING FOR UNDERGROUND USE SHALL BE EITHER TYPE L OR G, EXTERNALLY COATED WITH EXTRUDED POLYETHYLENE OR PVC RESIN AT THE TIME OF MANUFACTURE, OR TYPE K, AND ANY PORTION OF THE COPPER TUBING THAT EXTENDS ABOVE GROUND SHALL BE PROTECTED AGAINST PHYSICAL DAMAGE.
    - 4.2. UNDERGROUND TUBING SYSTEMS SHALL BE JOINED OR CONNECTED BY BRAZING, APPROVED MECHANICAL COMPRESSION, OR APPROVED FLARED OR PRESS–CONNECTED FITTINGS.
    - 4.3. PIPING AND TUBING SHALL BE LOCATED IN A TRENCH THAT IS PROPERLY GRADED TO PREVENT A SAG IN THE PIPING OR TUBING.
    - 4.4. BACKFILL MATERIAL SHALL BE FREE OF SHARP OBJECTS, LARGE STONE, OR ANY OTHER MATERIAL THAT CAN DAMAGE THE PIPING OR TUBING.
5. PIPING OR TUBING SHALL NOT BE SUPPORTED BY OTHER PIPING OR TUBING, AND SHALL BE INSTALLED WITH INDIVIDUAL SUPPORTS OF SUFFICIENT STRENGTH AND QUALITY. SUPPORTS SHALL BE SPACED IN ACCORDANCE WITH CSA B149.1, TABLE 6.2.
6. IDENTIFICATION OF PIPING OR TUBING: YELLOW COATING WITH MARKINGS SPECIFYING "PROPANE" SHALL BE USED. WHERE THE PIPING OR TUBING PRESSURE IS IN EXCESS OF 14" W.C., BOTH THE PIPING OR TUBING AND THE PRESSURE SHALL BE IDENTIFIED AT SHUT–OFF VALVES.
7. TESTING OF PIPING SYSTEM SHALL BE COMPLETED IN ACCORDANCE WITH CSA B149.1, SECTION 6.22 TESTING OF PIPING, TUBING, HOSE AND FITTINGS.

PROPANE STORAGE TANK SPECIFICATIONS:

1. CONTRACTOR SHALL COORDINATE PIPING INSTALLATION WITH PROPANE UTILITY PROVIDER.
2. PROPANE STORAGE TANK SHALL BE DESIGNED, FABRICATED AND INSTALLED IN ACCORDANCE WITH CSA B149.2.
3. PROPANE STORAGE TANK SIZING AND SELECTION SHALL BE VERIFIED BY PROPANE UTILITY PROVIDER.
4. THE LOCATION OF THE ABOVE–GROUND PROPANE STORAGE TANK SHALL COMPLY WITH THE MINIMUM SEPARATION DISTANCES IN CSA B149.2, TABLE 7.4.

HVAC SPECIFICATIONS:

1. DUCTS SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE ONTARIO BUILDING CODE, ONTARIO FIRE CODE, ASHRAE, AND SMACNA STANDARDS.
2. AIR DISTRIBUTION SYSTEMS MUST BE BALANCED TO WITHIN 5% OF THE SPECIFIED VALUES SHOWN ON THE DRAWINGS. BALANCE AIR HANDLING UNITS PROVIDING VENTILATION TO THE VENTILATION LEVELS SHOWN. THE BALANCING MUST BE PERFORMED BY AN INDEPENDENT, NEBB CERTIFIED FIRM, SPECIALIZING IN THIS WORK. THE MECHANICAL CONTRACTOR SHALL TURN OVER THE BALANCING REPORT PRIOR TO SUBSTANTIAL COMPLETION BEING AWARDED.
3. BALANCING DAMPERS MUST BE INSTALLED IN THE AIR DISTRIBUTION SYSTEMS AS SHOWN ON THE DRAWINGS AND AS NECESSARY TO ALLOW PROPER BALANCING.
4. DUCTS MUST BE SEALED TO PREVENT AIR LEAKAGE. SEAL TO SMACNA AND ASHRAE 90.1 STANDARDS. FOR UNPAINTED DUCTS INSTALLED IN VISIBLE SPACES, THE DUCT MASTIC IS TO BE APPLIED TO THE INTERIOR OF DUCT JOINTS AND PENETRATIONS AND SHALL NOT BE VISIBLE FROM THE EXTERIOR. MASTIC MAY BE APPLIED TO THE EXTERIOR OF DUCTS ONLY IN AREAS WHERE IT IS NOT VISIBLE TO OCCUPANTS. EXPOSED MASTIC SHALL BE PAINTABLE AND IS TO BE APPLIED NEATLY WITH THE EXCESS REMOVED. REFER TO ARCHITECT'S DRAWINGS TO CONFIRM WHETHER OR NOT DUCTS ARE TO BE PAINTED.
5. FLEXIBLE DUCT CONNECTIONS SHALL BE USED TO CONNECT FANS OR AIR HANDLERS TO RIGID DUCT TO REDUCE THE TRANSFER OF NOISE VIBRATION.
6. FINAL CONNECTIONS TO DIFFUSERS SHALL BE MADE USING HARD ELBOWS CONNECTED TO FLEXIBLE ALUMINUM DUCTS TO MINIMIZE NOISE VIBRATION WHERE SHOWN. MAXIMUM 5' OF FLEXIBLE DUCT.
7. FIRE DAMPERS MUST HAVE A FIRE PROTECTION RATING IN ACCORDANCE WITH THE NFPA AND MUST BEAR THE ULC LABEL. USE DYNAMIC AND TYPE 'B' FIRE DAMPERS ONLY.
8. INSULATE THE FIRST TEN FEET OF SUPPLY AND RETURN DUCTS INTERNALLY WITH 1/2" RIGID ACOUSTIC DUCT LINER.
9. INSTALL FOIL BACKED VAPOUR RETARDANT FIBERGLASS INSULATION WITH JOINTS AND SEAMS SEALED WITH 3" FOIL TAPE ON DUCTS ACCORDING TO THE INSTALLED LOCATION:
    - 9.1. AHU–1, AHU–2: NO THERMAL INSULATION REQUIRED. PROVIDE ACOUSTIC DUCT LINER ON FIRST TEN FEET OF SUPPLY DUCTING.
    - 9.2. ERV–1, ERV–2: FULL LENGTH OF OUTDOOR AIR INTAKE AND EXHAUST DUCTING WITH MINIMUM R6.
    - 9.3. EF–5: FULL LENGTH OF EXHAUST DUCTING WITH MINIMUM R6.
10. INSTALL MINIMUM R12 RIGID FIBERGLASS BOARD INSULATION WITH ALUMAGARD CONTINUOUS VAPOUR BARRIER AND WEATHER PROOF COVERING ON EXTERIOR OF DUCTS EXPOSED TO THE OUTDOORS.
11. PROVIDE TWO (2) SETS OF FILTERS FOR EQUIPMENT. ONE (1) SET FOR USE DURING CONSTRUCTION, AND ONE (1) SET TO BE INSTALLED IMMEDIATELY PRIOR TO BALANCING.
12. INSTALLATION OF AIR CONDITIONING EQUIPMENT SHALL BE DONE BY A LICENSED CONTRACTOR IN ACCORDANCE WITH THE MANUFACTURERS' RECOMMENDATIONS.
13. DUCT SIZES ARE SHOWN IN INCHES AND DO NOT INCLUDE FOR INTERNAL INSULATION.
14. PIPES AND EQUIPMENT MUST BE INSTALLED SO AS TO MINIMIZE THE TRANSFER OF VIBRATION TO THE BUILDING AND ALSO TO ALLOW FOR EXPANSION AND CONTRACTION AS NECESSARY.
15. EQUIPMENT SHALL BE ASHRAE 90.1 COMPLIANT.
16. LINE VOLTAGE STARTERS, CONTROLS AND EQUIPMENT SAFETY SWITCHES SHALL BE SUPPLIED BY MECHANICAL CONTRACTOR AND INSTALLED BY ELECTRICAL CONTRACTOR UNLESS OTHERWISE NOTED ON DESIGN DRAWINGS. LOW VOLTAGE STARTERS AND CONTROLS SHALL BE SUPPLIED AND INSTALLED BY MECHANICAL CONTRACTOR.
17. ELECTRICAL WIRING, CONDUIT, JUNCTION BOXES, BACK BOXES, MOUNTING HARDWARE ETC. ABOVE 24V TO BE SUPPLIED AND INSTALLED BY ELECTRICAL CONTRACTOR. CONTROLS WIRING, CONDUIT, JUNCTION BOXES, BACK BOXES, MOUNTING HARDWARE ETC. 24V AND BELOW TO BE INSTALLED BY MECHANICAL CONTRACTOR (MECHANICAL CONTRACTOR MAY SUB–CONTRACT THIS WORK TO ELECTRICAL CONTRACTOR).
18. THE MECHANICAL CONTRACTOR SHALL INSTALL PIPE WITH SLEEVES IN ORDER TO PREVENT CONTACT WITH CONCRETE, MASONRY OR SIMILAR MATERIALS.
19. ROOF CURBS AND FLASHINGS ARE TO BE SUPPLIED BY THE MECHANICAL CONTRACTOR, INSTALLED BY THE GENERAL CONTRACTOR/ROOFER.
20. ALL EQUIPMENT SHALL BE INSTALLED IN SUCH A MANNER THAT MANUFACTURER'S RECOMMENDED CLEARANCES ARE MAINTAINED. THE CONTRACTOR SHALL LAY OUT THE WORK BASED ON THE MANUFACTURER'S RECOMMENDED CLEARANCES AND ADVISE ENGINEER IMMEDIATELY IF ANY SITE CONDITIONS NEGATIVELY AFFECT THE PROPER INSTALLATION OF ALL EQUIPMENT.
21. ALL DOOR UNDERCUTS INDICATED SHALL BE MIN 3/4". COORDINATE WITH GENERAL CONTRACTOR.
22. THIS CONTRACTOR SHALL REVIEW AND CONFIRM ALL EXISTING INDOOR METALLIC PIPING SYSTEMS ARE BONDED. PROVIDE BONDING FOR ALL NEW INDOOR METALLIC PIPING SYSTEMS AND EXISTING SYSTEMS WITHOUT PROPER BOND. BONDING SHALL BE INSTALLED TO THE REQUIREMENTS OF OESC 10–406. THE GENERAL CONTRACTOR SHALL DETERMINE IF BONDING IS BY MECHANICAL OR ELECTRICAL.
23. CLEAN ALL EXISTING GRILLES AND DIFFUSERS WHICH ARE SHOWN TO REMAIN.

PLUMBING SPECIFICATIONS:

1. DRAIN LINES ARE TO BE SUBJECT TO A WATER TEST AND WATER LINES ARE TO BE TESTED TO THE SATISFACTION OF THE LOCAL PLUMBING INSPECTOR.
2. PROVIDE TRAP SEAL PRIMER FOR ALL FLOOR DRAINS AND HUB DRAINS TO THE SATISFACTION OF THE AHJ.
3. ALL CLEANOUTS ARE NOT SHOWN. CLEANOUTS ARE TO BE PROVIDED IN ACCORDANCE WITH THE ONTARIO PLUMBING CODE AND REQUIREMENTS INCLUDING AT THE BOTTOM OF STACKS AND ALONG HORIZONTAL RUNS. ENSURE THAT CLEANOUTS ARE INCLUDED AT INTERVALS NECESSARY.
4. WATER HAMMER ARRESTORS ARE TO BE INSTALLED WHERE NECESSARY TO PREVENT WATER HAMMER IN WATER LINES.
5. CONNECT WATER LINES AT POINTS OF DISTRIBUTION TO NEARBY EQUIPMENT. SIZE WATER LINES TO EACH PIECE OF EQUIPMENT AS SHOWN BY THE PLUMBING EQUIPMENT SCHEDULE.
6. GRADE HORIZONTAL WATER LINES TO ENSURE PROPER DRAINAGE. INSTALL DRAIN VALVES IN ACCESSIBLE LOCATIONS AT LOW POINTS.
7. GRADE HORIZONTAL SANITARY PIPING AS SHOWN ON DESIGN DRAWINGS AND PER OBC. GRADE HORIZONTAL VENT PIPING TO DRAIN BACK TO SANITARY PIPES BY GRAVITY.
8. DOMESTIC COLD WATER LINES SHALL BE INSULATED WITH 1" THICK PREFORMED FIBERGLASS INSULATION AND DOMESTIC HOT WATER LINES SHALL BE INSULATED WITH 1.5" THICK PREFORMED FIBERGLASS INSULATION WITH AN ASJ VAPOUR BARRIER. JOINTS AND SEAMS MUST BE SEALED. WHEREVER EXPOSED TO VIEW THIS INSULATION SHALL HAVE A BRUSH COAT OF FIRE RETARDANT MASTIC WITH A LAYER OF 6 OUNCE CANVAS WRAP OR PVC JACKET. JACKET TO BE PAINTED AS PER ARCHITECTURAL DRAWINGS.
9. HANGERS FOR HORIZONTAL PIPING SHALL BE BLACK OR COPPER, AS APPROPRIATE, CLEVIS HANGERS MANUFACTURED BY ANVIL OR MYATT.
10. HANGERS FOR VERTICAL PIPING SHALL BE BLACK OR COPPER, AS APPROPRIATE, RISER CLAMPS MANUFACTURED BY ANVIL OR MYATT.
11. BALL VALVES SHALL BE FULL PORT AND SOLID BALL.
12. SET FIXTURES LEVEL, SQUARE, AND CENTERED WITH RELATION TO FLOORS, WALLS, AND PARTITIONS.
13. SET FIXTURES AT STANDARD HEIGHT FROM FLOOR TO RIM UNLESS DIRECTED OTHERWISE.
14. INSTALL SHUT OFF VALVES ON EACH WATER SUPPLY TO EQUIPMENT.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EXCAVATION AND BACK FILL REQUIRED FOR THE INSTALLATION OF UNDERGROUND WORK. BACK FILL MATERIAL MUST BE CLEAN AND PROPERLY COMPACTED.
16. PIPES AND EQUIPMENT MUST BE INSTALLED SO AS TO MINIMIZE THE TRANSFER OF VIBRATION TO THE BUILDING AND ALSO TO ALLOW FOR EXPANSION AND CONTRACTION AS NECESSARY.
17. EQUIPMENT SHALL BE ASHRAE 90.1 COMPLIANT.
18. THE MECHANICAL CONTRACTOR SHALL INSTALL PIPE WITH SLEEVES IN ORDER TO PREVENT CONTACT WITH CONCRETE, MASONRY OR SIMILAR MATERIALS.
19. ROOF CONES AND FLASHINGS ARE TO BE SUPPLIED BY THE MECHANICAL CONTRACTOR, INSTALLED BY THE GENERAL CONTRACTOR/ROOFER.
20. THE MECHANICAL CONTRACTOR SHALL PROVIDE RESTRAINT SYSTEMS FOR MECHANICAL EQUIPMENT AND PIPING AS REQUIRED BY APPLICABLE LOCAL BUILDING CODES.
21. ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE COPPER OR CROSS–LINKED POLYETHYLENE. ACCEPTABLE MATERIAL:
    - 21.1. HARD DRAWN 'L' COPPER CERTIFIED TO ASTM 88 WITH SOLDER JOINT PRESSURE FITTING AND LEAD FREE SOLDER;
    - 21.2. CROSS–LINKED POLYETHYLENE PIPING AND ASSOCIATED FITTINGS CERTIFIED TO CAN/CSA B137.5 AND CAN/ULC–S102.2 FOR FLAME SPREAD AND SMOKE DEVELOPMENT.
22. ALL SANITARY, STORM AND VENT PIPING ABOVE GRADE SHALL BE TO CSA B181.2. ACCEPTABLE MATERIAL:
    - 22.1. IPEX SYSTEM 15 PVC OR APPROVED EQUIVALENT.
    - 22.2. IPEX SYSTEM XFR OR APPROVED EQUIVALENT SHALL BE USED IN PLENUMS AS REQUIRED.
23. ALL SANITARY, STORM AND VENT PIPING BELOW GRADE SHALL BE TO CSA B181.1. ACCEPTABLE MATERIAL:
    - 23.1. IPEX SCH 40 PVC OR SDR35 OR APPROVED EQUIVALENT.
24. COORDINATE REQUIREMENTS FOR CHASES WITH GENERAL CONTRACTOR.
20. THE MECHANICAL CONTRACTOR SHALL PROVIDE SEISMIC BRACING AND RESTRAINT SYSTEMS FOR MECHANICAL EQUIPMENT AND PIPING AS REQUIRED BY APPLICABLE LOCAL BUILDING CODES. PROVIDE ENGINEERED, SEALED SHOP DRAWINGS FOR ANY REQUIRED AND INSTALLED SEISMIC BRACING. PROVIDE A SEALED LETTER OF CONFORMANCE UPON COMPLETION.
21. NEW SANITARY BRANCHES SHALL BE TIED DIRECTLY INTO MAINS. IF TYING INTO LOCATIONS OTHER THAN MAIN BUILDING MAINS, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONDUCT DUE DILIGENCE OF THE ADEQUACY OF THE PIPING NETWORK BEING TIED INTO.
22. PROVIDE TRAPS/DRAINS AND VENTS FROM INDIVIDUAL FIXTURES SIZED PER OBC. PROVIDE TRAPS/DRAINS AND VENTS FOR MULTIPLE FIXTURES PER DESIGN DRAWINGS. DO NOT REDUCE THE STANDARDS SET BY THE OBC IN ANY CASE.
23. THIS CONTRACTOR SHALL REVIEW AND CONFIRM ALL EXISTING INDOOR METALLIC PIPING SYSTEMS ARE BONDED. PROVIDE BONDING FOR ALL NEW INDOOR METALLIC PIPING SYSTEMS AND EXISTING SYSTEMS WITHOUT PROPER BOND. BONDING SHALL BE INSTALLED TO THE REQUIREMENTS OF OESC 10–406. GC SHALL DETERMINE IF BONDING IS BY MECHANICAL OR ELECTRICAL.
24. NO EXPOSED PIPING SHALL BE PERMITTED ON WALLS/PARTITIONS UNLESS OTHERWISE NOTED.
25. BACKFLOW PREVENTER AND METER ASSEMBLIES SHALL BE INSTALLED ACCORDING TO LOCAL CODES. THE FOLLOWING TYPICAL CLEARANCES HAVE BEEN PROVIDED, HOWEVER, LOCAL CODES TAKE PRECEDENT.
    - 25.1. BACKFLOW PREVENTER CLEARANCES:
        - 25.1.1. CENTRELINE HEIGHT ABOVE FLOOR – MIN 750mm, MAX 1500mm
        - 25.1.2. BEHIND – MIN 20mm
        - 25.1.3. IN FRONT – 750mm
        - 25.1.4. ABOVE – 300mm

HYDRONIC SPECIFICATIONS:

1. HYDRONIC HEATING PIPING
    - 1.1. PIPING SHALL BE ELECTRIC RESISTANCE OR SEAMLESS, SCHEDULE 40, CONFORMING TO ASTM DESIGNATION A53 OR A106 GRADE B.
    - 1.2. PIPING AND FITTINGS UP TO AND INCLUDING 2" (50MM) SHALL HAVE SCREWED ENDS WITH COUPLING.
    - 1.3. PIPING AND FITTINGS 2–1/2" (65MM) AND LARGER SHALL HAVE WELDED JOINTS AND SHALL BE SUPPLIED WITH ENDS BEVELED AT AN ANGLE.
    - 1.4. PIPING AND FITTINGS ANY SIZE: VICTAULIC STYLE 107N RIGID COUPLINGS. CONTRACTOR TO SELECT GASKET TYPE FOR GLYCOL USE.
2. VALVES SHALL BE INSTALLED WHERE SHOWN ON THE DRAWINGS OR WHERE REQUIRED TO ENSURE SPECIFIED ISOLATION, CONTROL, BALANCING, DRAINING OF THE SYSTEM AND PERFECT WORKING OF THE SYSTEM.
3. BALL VALVES FOR LINES 2" AND UNDER SHALL BE FULL PORT SOLID BALL BRONZE BODY 150 LB W.O.G. CRANE NO. 9302 OR EQUAL.
4. SUPPLY AND INSTALL AUTOMATIC AIR VENTS AT ALL HIGH POINTS OF THE SYSTEM WHERE AIR MAY ACCUMULATE.
5. INSTALL AUTOMATIC AIR VENTS IN EXPOSED AREAS WHERE THEY CAN BE SEEN. INSTALL MANUAL AIR VENTS IN AREAS THAT ARE CONCEALED. INSTALL ACCESS DOOR WHERE REQUIRED.
6. INSTALL FLOAT OPERATED TYPE AUTOMATIC AIR VENTS ON PIPING 3" AND LARGER. ACCEPTABLE PRODUCT: SARCO NO. 13W WITH OPERATING PRESSURE OF 150 PSIG AND OPERATING TEMPERATURE OF 350°F COMPLETE WITH ISOLATING BALL VALVE BETWEEN MAIN AND VENT TO ALLOW SERVICING OF VENT WITHOUT EMPTYING SYSTEM.
7. VENT DRAINS SHALL BE PIPED WITH RIGID COPPER TO 6" ABOVE FINISHED FLOOR (AFF).
8. RADIATION, FAN COIL UNITS, AND UNIT HEATERS SHALL INCLUDE AUTOMATIC AIR VENTS INSTALLED AT EACH HIGH POINT ON PIPING 2–1/2" AND SMALLER. ACCEPTABLE PRODUCT: HONEYWELL BRAUKMAN EA122A AUTOMATIC AIR VENT WITH MAXIMUM OPERATING PRESSURE OF 150 PSI, MAXIMUM OPERATING TEMPERATURE OF 230°F COMPLETE WITH REMOVABLE FLOAT/VALVE AND MATERIALS FOR USE WITH WATER, GLYCOL, MINERAL OIL OR PETROLEUM OILS.
9. THOROUGHLY REAM ALL CUT PIPE ENDS. ANY PIPING WHICH IS FOUND TO BE INSTALLED WITHOUT BEING FULLY REAMED SHALL BE SUFFICIENT REASON FOR COMPLETE REMOVAL OF ALL JOINTS FOR INSPECTION AT THE SUBCONTRACTOR'S EXPENSE.
10. TAKE OFF UP FEED RUN OUTS OFF THE TOP OF THE MAIN AT AN ANGLE OF 90° OR 45° TO THE HORIZONTAL; DOWN FEEDS SHALL BE TAKEN OFF THE SIDE IN A SIMILAR MANNER.
11. INSTALL ECCENTRIC REDUCERS AT CHANGES IN PIPE DIAMETER SO THAT AIR CANNOT COLLECT AT HIGH POCKETS IN THE PIPING.
12. SPECIALTY FITTINGS, EQUIPMENT, SIMILAR ITEMS AND INTERNAL PARTS THEREOF WHICH ARE COMPONENTS OF THE LINE OR LINES TO BE TESTED AND WHICH ARE NOT DESIGNED TO WITHSTAND THE SPECIFIED TEST PRESSURE SHALL BE REMOVED, DISCONNECTED OR BYPASSED AS APPLICABLE DURING THE TEST. DURING THE TEST PERIOD THE WATER PRESSURE PUMP OR OTHER SOURCE OF TEST PRESSURE SHALL BE DISCONNECTED FROM THE PIPING SYSTEM.
13. PRESSURE TESTS SHALL BE MADE WITH COLD WATER, AND, IN ADDITION TO THE FOREGOING, SHALL BE MADE IN ACCORDANCE WITH THE FOLLOWING INSTRUCTIONS:
    - 13.1. WHERE IT IS NOT PRACTICAL TO TEST EACH SYSTEM AS A WHOLE, IT MAY BE TESTED IN SECTIONS.
    - 13.2. PIPING SYSTEMS SHALL BE TESTED AT 125 PSIG FOR 10 MINS. IF LEAKS ARE FOUND, THEY SHALL BE ELIMINATED BY TIGHTENING, REPAIR, OR REPLACEMENT, AS APPROPRIATE, AND THE HYDROSTATIC TEST REPEATED UNTIL NO LEAKAGE IS FOUND.
    - 13.3. BOILER PRESSURE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION MANUAL RECOMMENDATIONS.
14. INSTALL PIPING SO AS TO BE FREE FROM STRAIN AND DISTORTION DUE TO EXPANSION AND CONTRACTION.
15. HANGERS FOR HORIZONTAL PIPING SHALL BE BLACK OR COPPER, AS APPROPRIATE, CLEVIS HANGERS MANUFACTURED BY ANVIL OR MYATT.
16. HANGERS FOR VERTICAL PIPING SHALL BE BLACK OR COPPER, AS APPROPRIATE, RISER CLAMPS MANUFACTURED BY ANVIL OR MYATT.
17. THE MAXIMUM SPACING BETWEEN HANGERS AND SUPPORTS SHALL BE IN ACCORDANCE WITH ASME B31.1 AND VICTAULIC'S SUGGESTED PIPE SUPPORT SPACING.
18. INSULATE HYDRONIC PIPING AND FITTINGS WITH THICK PREFORMED FIBERGLASS INSULATION WITH AN ASJ VAPOUR BARRIER. JOINTS AND SEAMS MUST BE SEALED. COVER INSULATION WITH 6 OZ. CANVAS WRAP AND FIRE RETARDANT MASTIC OR WITH PREFORMED PVC JACKET. INSULATON SHALL BE BANDED WITH 1/2" ALUMINUM STRAPS. INSULATE VALVES, STRAINERS, ETC ON ALL PIPING LARGER THAN 1".
    - 18.1. 105°F to 140°F
        - 18.1.1. <1" PIPE = 1" INSULATION
        - 18.1.2. 1" TO 1–1/2" = 1" INSULATION
        - 18.1.3. 1–1/2" TO 4" = 1.5" INSULATION
    - 18.2. 141°F to 200°F
        - 18.2.1. <1" PIPE = 1.5" INSULATION
        - 18.2.2. 1" TO 1–1/2" = 1.5" INSULATION
        - 18.2.3. 1–1/2" TO 4" = 2" INSULATION
19. HYDRONIC HEATING SYSTEMS MUST BE BALANCED BY AN INDEPENDENT, NEBB CERTIFIED FIRM, SPECIALIZING IN THIS WORK. THE MECHANICAL CONTRACTOR SHALL TURN OVER THE BALANCING REPORT PRIOR TO SUBSTANTIAL COMPLETION BEING AWARDED.
20. PROVIDE INHIBITOR LEVEL TEST REPORT AT COMPLETION OF WORK.
21. ELECTRICAL WIRING ABOVE 24V AND STARTERS TO BE SUPPLIED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. CONTROLS WIRING 24V AND BELOW BY THE MECHANICAL CONTRACTOR.
22. THIS CONTRACTOR SHALL REVIEW AND CONFIRM ALL EXISTING INDOOR METALLIC PIPING SYSTEMS ARE BONDED. PROVIDE BONDING FOR ALL NEW INDOOR METALLIC PIPING SYSTEMS AND EXISTING SYSTEMS WITHOUT PROPER BOND. BONDING SHALL BE INSTALLED TO THE REQUIREMENTS OF OESC 10–406. GC SHALL DETERMINE IF BONDING IS BY MECHANICAL OR ELECTRICAL.

REFRIGERANT PIPING:

1. REFRIGERANT SYSTEMS SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH THE CURRENT EDITIONS OF CSA B52 MECHANICAL REFRIGERATION CODE AND CSA B51 BOILER, PRESSURE VESSEL AND PRESSURE PIPING CODE.
2. ALL MATERIALS USED IN THE CONSTRUCTION AND INSTALLATION OF THE PIPING SYSTEMS SHALL BE SUITABLE FOR CONVEYING THE REFRIGERANT USED.
3. ALL PIPING AND FITTINGS SHALL BE REGISTERED IN ACCORDANCE WITH CSA B51 AND SHALL BE DESIGNED, CONSTRUCTED, AND TESTED IN ACCORDANCE WITH THE CURRENT EDITIONS OF ASME B31.5 REFRIGERATION PIPING AND HEAT TRANSFER COMPONENTS AND ASME BOILER AND PRESSURE VESSEL CODE, SECTION VIII, DIVISION 1.
4. COPPER TUBING SHALL BE JOINED BY BRAZING. SOLDERED JOINTS SHALL NOT BE USED.
5. EVERY REFRIGERANT CONTAINING PART OF THE SYSTEM THAT IS FABRICATED IN THE FIELD SHALL BE TESTED AND PROVED TIGHT AFTER COMPLETE INSTALLATION AND BEFORE OPERATION. THE HIGH AND LOW SIDES OF EACH SYSTEM SHALL BE TESTED AND PROVED TIGHT AT NOT LESS THAN THE LESSER OF THE DESIGN PRESSURE OR THE SETTING OF THE PRESSURE RELIEF DEVICE PROTECTING THE HIGH AND LOW SIDES OF THE SYSTEM. THE SYSTEM SHALL SUSTAIN THE TEST PRESSURE FOR A MINIMUM TEST PERIOD OF 2 HOURS OR AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION. PIPE JOINTS SHALL BE EXPOSED TO VIEW FOR VISUAL INSPECTION.
6. A DATED DECLARATION OF PRESSURE TEST SIGNED BY THE INSTALLER SHALL BE PROVIDED FOR ALL SYSTEMS CONTAINING 50 LB OR MORE OF REFRIGERANT. THE DECLARATION SHALL STATE THE NAME OF THE REFRIGERANT, THE FIELD TEST PRESSURES APPLIED TO THE HIGH SIDE AND THE LOW SIDE OF THE SYSTEM, AND THE DURATION OF THE TEST. WHEN REQUESTED, COPIES OF THE DECLARATION SHALL BE FURNISHED TO THE AUTHORITY HAVING JURISDICTION. THE TEST SHALL BE WITNESSED BY AN AUTHORIZED INSPECTOR WHEN REQUIRED BY THE AUTHORITY HAVING JURISDICTION.

COMBUSTION AIR AND FLUE VENTING SPECIFICATIONS:

1. ALL COMBUSTION AND FLUE GAS VENT PIPING SHALL BE SELECTED AND INSTALLED PER THE REQUIREMENTS OF B149 AND MANUFACTURER'S RECOMMENDATIONS.
2. ANY PIPING IN PLENUM SPACE SHALL BE PLENUM RATED (IPEX 636, ETC).
3. VENTS SHALL NOT TERMINATE:
    - 3.1. LESS THEN 7' ABOVE PUBLIC SIDEWALKS OR DRIVEWAYS;
    - 3.2. WITHIN 10' OF AIR INTAKES EXCLUDING THE COMBUSTION AIR INTAKE FOR THE SAME APPLIANCE;
    - 3.3. ABOVE A REGULATOR WITHIN 3' HORIZONTALLY OF THE REGULATOR VENT UNLESS GREATER THAN 15' ABOVE;
    - 3.4. LESS THAN 3' ABOVE GRADE LEVEL;
    - 3.5. WITHIN THE FOLLOWING DISTANCES OF WINDOWS/DOORS/OPENINGS AND COMBUSTION AIR INTAKES FOR OTHER APPLIANCES:
        - 3.5.1. 6" FOR UP TO 10MBH;
        - 3.5.2. 12" FOR UP TO 100MBH:
        - 3.5.3. 3' FOR ABOVE 100MBH;
    - 3.6. UNDERNEATH ANY OVERHANGS UNLESS FULLY OPEN ON TWO SIDES AND MINIMUM DISTANCE OF 1' BELOW OVERHANG.

BENCHMARKS

NOTES

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR PERMIT AND TENDER	NOV/24

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
N.M.WILLIAMS
100101606
13NOV2024
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
J.C.THOMPSON
100215043
13NOV2024
PROVINCE OF ONTARIO

MILFORD BAY COMMUNITY CENTRE

MILFORD BAY, ON

SPECIFICATIONS

TATHAM ENGINEERING

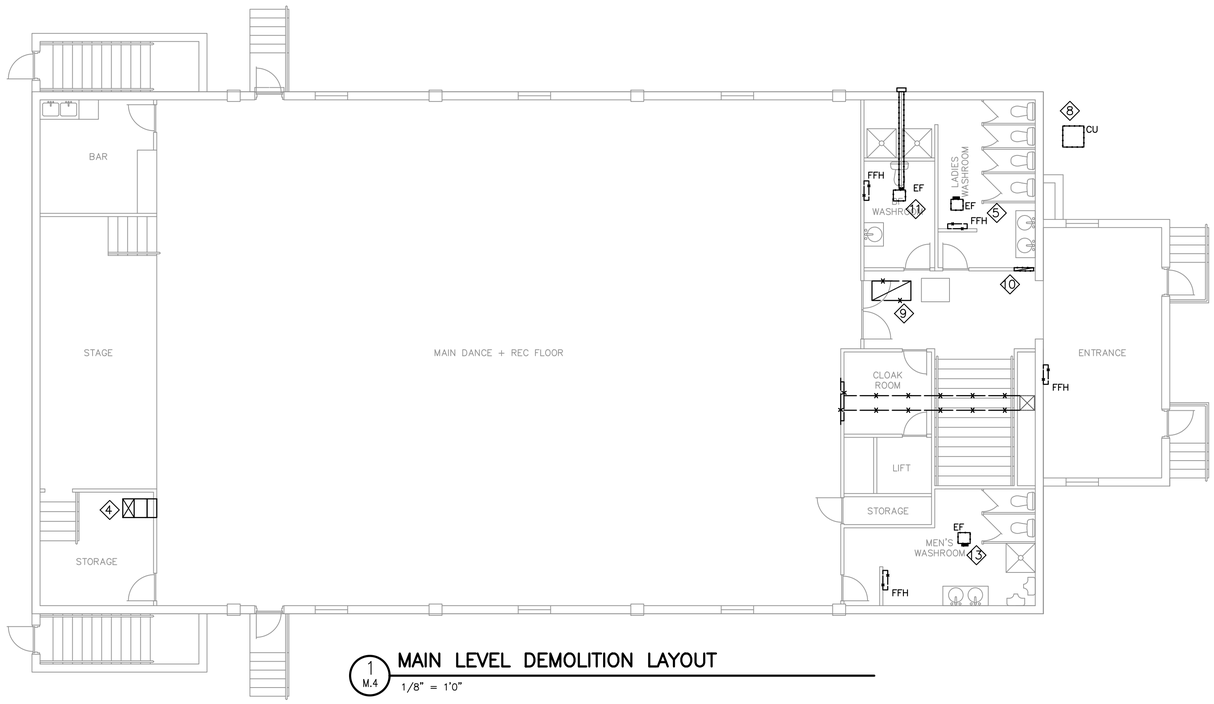
DESIGN: JT	FILE: 123056	DWG:
DRAWN: ML	DATE: NOV 2024	M.3
CHECK: NW	SCALE: AS SHOWN	

DRAWING NOTES

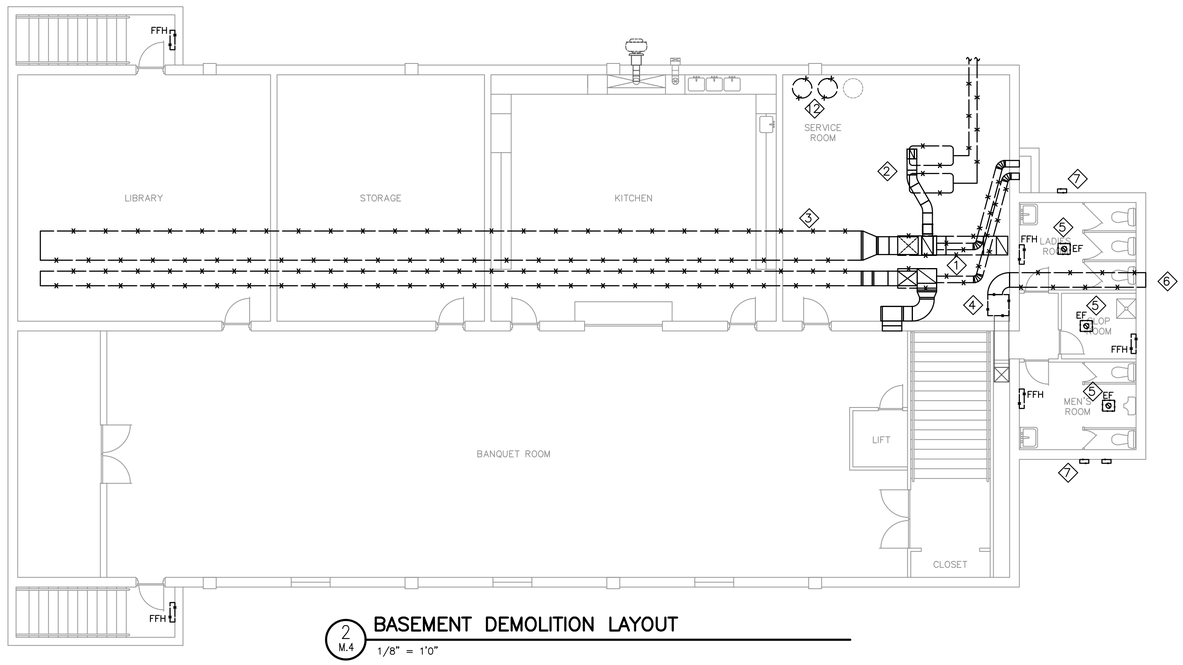
1. REMOVE EXISTING FURNACE UNITS INCLUDING DUCTING AND FLUE VENTING.
2. REMOVE EXISTING DIESEL FUEL STORAGE TANKS AND ASSOCIATED PIPING SYSTEMS.
3. REMOVE EXISTING SUPPLY AND RETURN DUCTING SYSTEMS IN THEIR ENTIRETY INCLUDING GRILLES AND FITTINGS.
4. REMOVE EXISTING EXHAUST FAN, OUTDOOR AIR INTAKE AND EXHAUST DUCTING WHERE INDICATED. KEEP EXHAUST FAN INLET DUCTING FOR REUSE AS INDICATED AND CLEAN DUCT BY APPROVED NADCA DUCT CLEANER. OUTDOOR AIR INTAKE DUCTING SHALL BE CAPPED WITH SHEET METAL AT CEILING LEVEL.
5. REMOVE EXISTING EXHAUST FAN AND LEAVE DUCTING IN PLACE.
6. INFILL AND PATCH EXISTING FAN LOUVER OPENING WITH CONCRETE MASONRY UNIT AND NON-SHRINK GROUT.
7. EXHAUST FAN OPENINGS IN HOLLOW CORE SLAB AND EXHAUST AIR WALL PENETRATIONS TO BE PATCHED AND SEALED WITH CONCRETE.
8. REMOVE EXISTING AIR CONDITIONING UNIT, CONDENSING UNIT AND ALL ASSOCIATED REFRIGERANT PIPING SYSTEMS.
9. REMOVE EXISTING 24"X48" R/A GRILLE AND PATCH DRYWALL CEILING OPENING.
10. REMOVE EXISTING 12"X24" R/A GRILLE AND PATCH DRYWALL OPENING.
11. REMOVE EXISTING EXHAUST FANS AND ASSOCIATED DUCTING.
12. REMOVE EXISTING DOMESTIC HOT WATER HEATERS.
13. CONTRACTOR SHALL CONFIRM EXISTING SIZE AND ROUTING OF EXHAUST FAN. FINDINGS SHALL BE PROVIDED TO ENGINEER AND OWNER.

GENERAL NOTES

EXISTING HOLLOW CORE SLAB PENETRATIONS TO BE PATCHED AND FILLED WITH CONCRETE, FLOOR OR CEILING FINISH TO MATCH SURROUNDINGS.



1 M.4 **MAIN LEVEL DEMOLITION LAYOUT**
1/8" = 1'0"



2 M.4 **BASEMENT DEMOLITION LAYOUT**
1/8" = 1'0"

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100215043
13NOV2024
PROVINCE OF ONTARIO

MILFORD BAY COMMUNITY CENTRE
MILFORD BAY, ON

DEMOLITION LAYOUT

TATHAM ENGINEERING

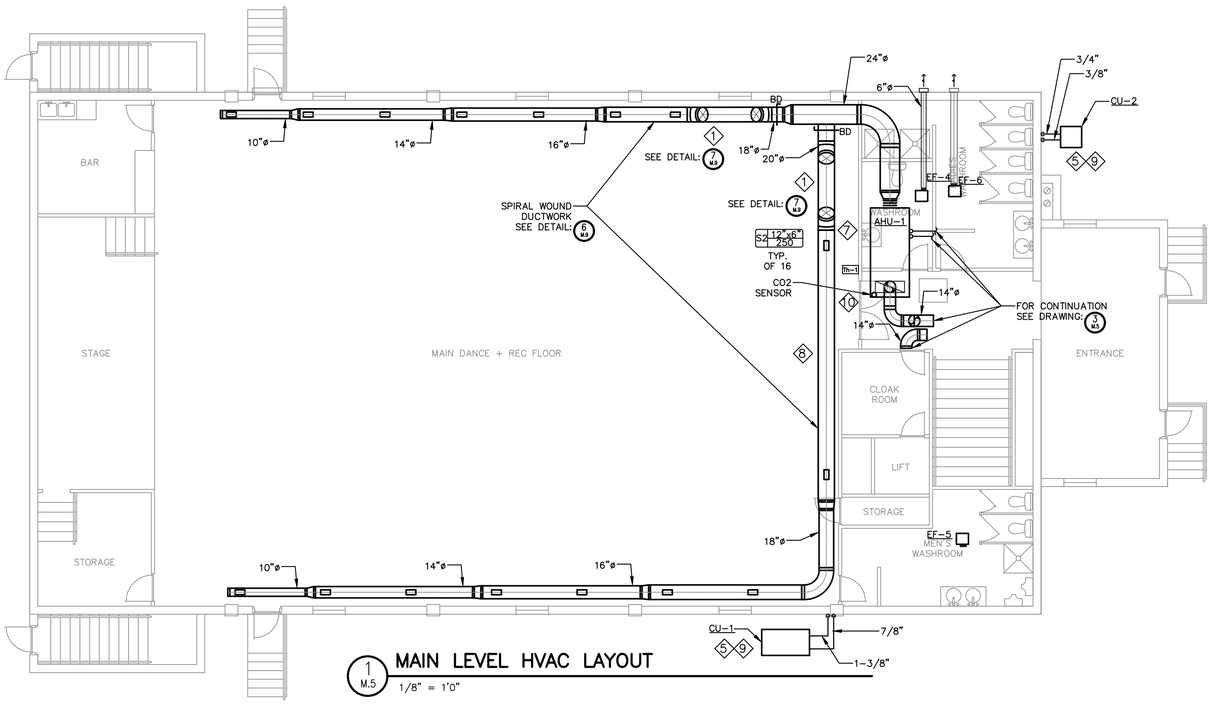
DESIGN: JT	FILE: 123056	DWG:	
DRAWN: ML	DATE: NOV 2024	**M.4**	
CHECK: NW	SCALE: AS SHOWN		

DRAWING NOTES

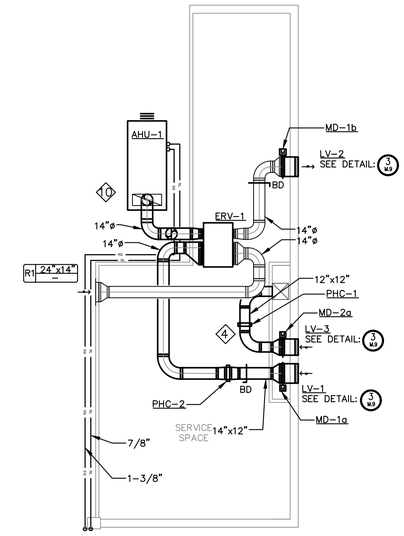
1. DUCT TO UNDERSIDE OF CEILING.
2. EXISTING OIL FURNACE EXHAUST DUCTS TO BE CAPPED WITH SHEET METAL AT EXTERIOR WALL.
3. ERV, HEATING COIL, AND COOLING COIL CEILING MOUNTED ON VIBRATION ISOLATORS.
4. INTAKE DUCT TO BE INSULATED UP TO PRE-HEATER.
5. MAINTAIN MANUFACTURERS RECOMMENDED CLEARANCES FROM BUILDING. PROVIDE LEVELED CONCRETE PAD WITH 6" OF LIMESTONE FILL TO PREVENT SETTLING
6. AHU-2 CONDENSATE DRAIN TO BE PIPED TO EXISTING FLOOR DRAIN.
7. AHU-1 CONDENSATE DRAIN TO BE PIPED TO NEW HUB DRAIN LOCATED UNDER BF WASHROOM LAVATORY. TIE NEW HUB DRAIN INTO LAVATORY DRAIN BEFORE TRAP.
8. COORDINATE HVAC DUCTWORK INSTALLATION TO AVOID EXISTING ACOUSTIC PANELING. REMOVE ACOUSTIC PANELING AS REQUIRED.
9. MAINTAIN PROPOSED CONDENSING UNIT LOCATIONS. IF ALTERNATE LOCATIONS ARE CONSIDERED, CONSULT ENGINEER FOR INFORMATION.
10. ERV SUPPLY AIR TO BE DUCTED DOWN TO TOP OF AHU-1 MIXING BOX FROM HIGH LEVEL.

H.V.A.C. DUCTWORK DISTRIBUTION NOTES

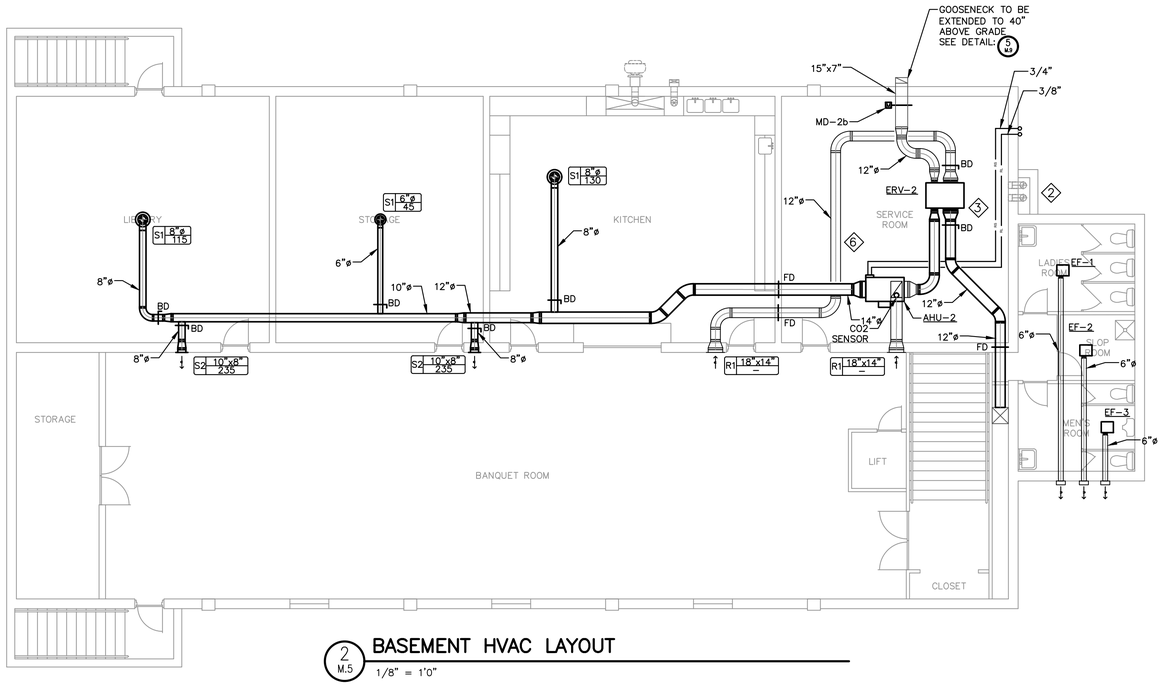
SPIRAL DUCT TO BE PROVIDED WHERE DUCTWORK WILL BE EXPOSED TO OCCUPIED SPACES



1 M.5 **MAIN LEVEL HVAC LAYOUT**
1/8" = 1'0"



3 M.5 **SERVICE SPACE HVAC LAYOUT**
1/8" = 1'0"



2 M.5 **BASEMENT HVAC LAYOUT**
1/8" = 1'0"

BENCHMARKS

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ENGINEER STAMP

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LICENSED PROFESSIONAL ENGINEER — J.C. THOMPSON — 100215043 — 13NOV2024 — PROVINCE OF ONTARIO

MILFORD BAY COMMUNITY CENTRE
MILFORD BAY, ON

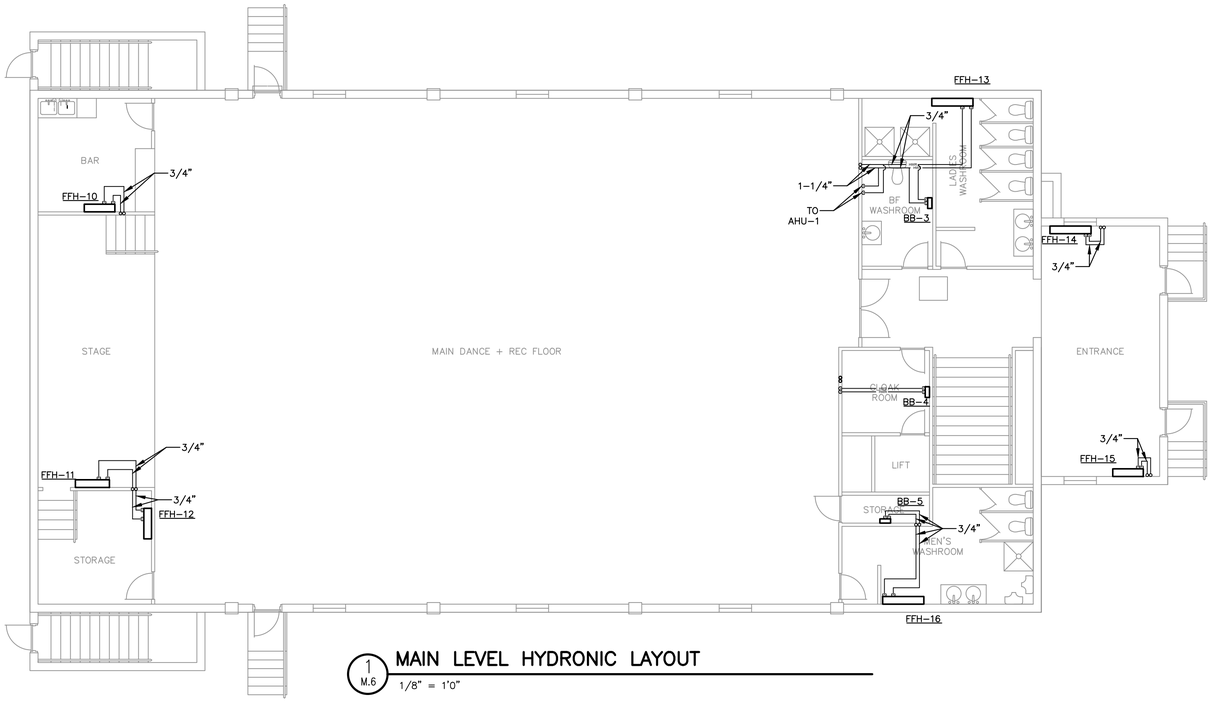
TATHAM ENGINEERING

HVAC LAYOUT

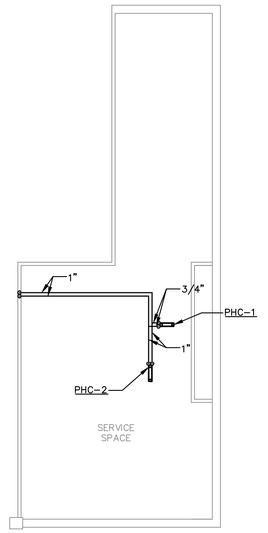
DESIGN: JT	FILE: 123056	DWG:	
DRAWN: ML	DATE: NOV 2024	**M.5**	
CHECK: NW	SCALE: AS SHOWN		

DRAWING NOTES

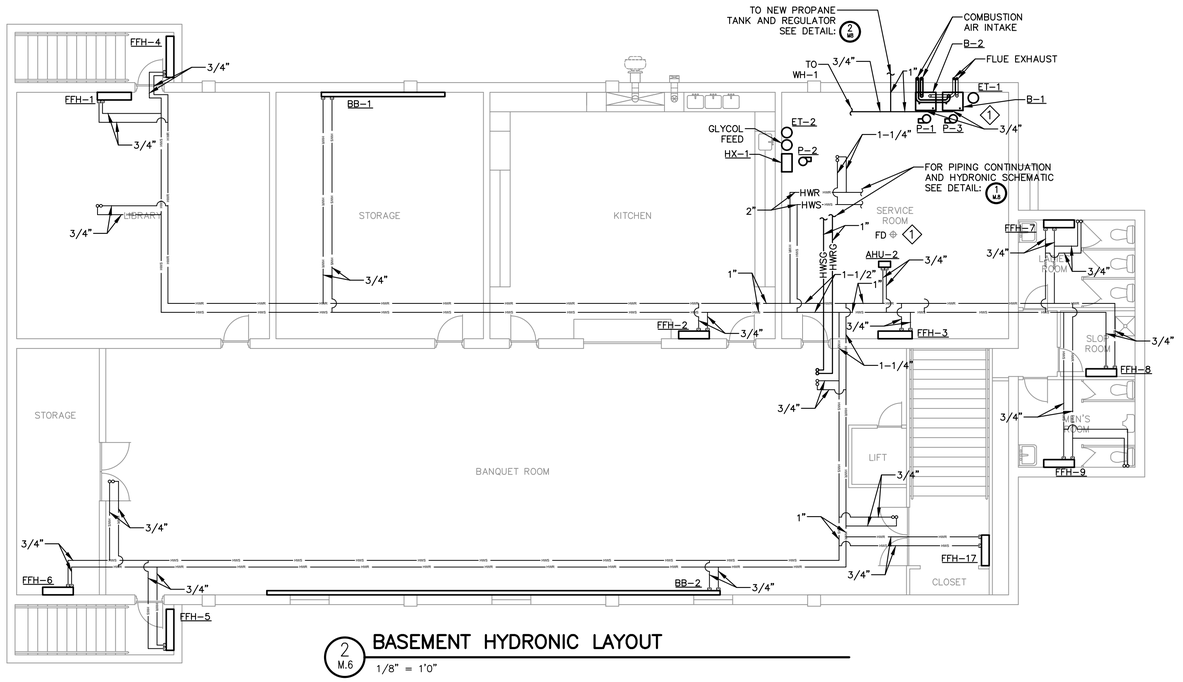
1. COLLECT BOILER AND DHW HEATER CONDENSATE DRAINS AS WELL AS PRESSURE RELIEF VALVE DISCHARGE PIPING INDIRECTLY TO FUNNEL WITH AIR GAP. ROUTE DRAIN LINE ALONG SERVICE ROOM FLOOR AND TERMINATE INDIRECTLY WITH AIR GAP INTO EXISTING FLOOR DRAIN. PROVIDE STEP OVER RAMP ALONG THE LENGTH OF DRAIN PIPING.



1 M.6 **MAIN LEVEL HYDRONIC LAYOUT**
1/8" = 1'0"



3 M.6 **SERVICE SPACE HYDRONIC LAYOUT**
1/8" = 1'0"



2 M.6 **BASEMENT HYDRONIC LAYOUT**
1/8" = 1'0"

BENCHMARKS

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MILFORD BAY COMMUNITY CENTRE
MILFORD BAY, ON

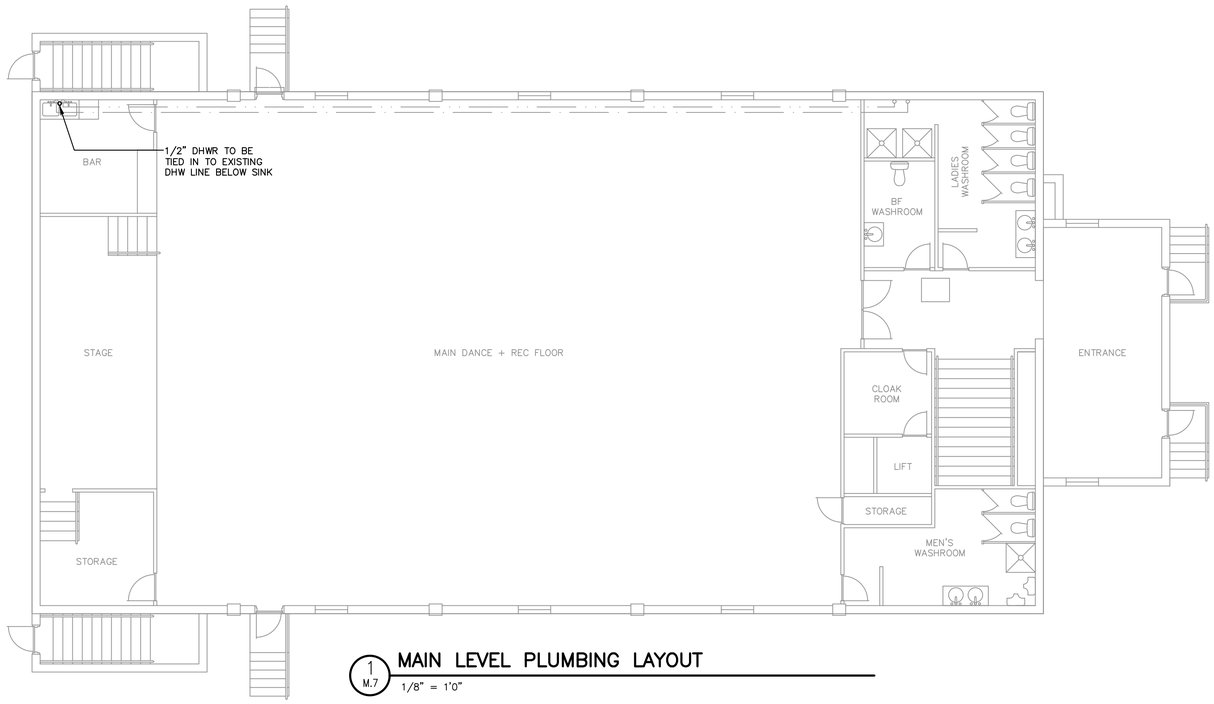
HYDRONIC LAYOUT

TATHAM ENGINEERING

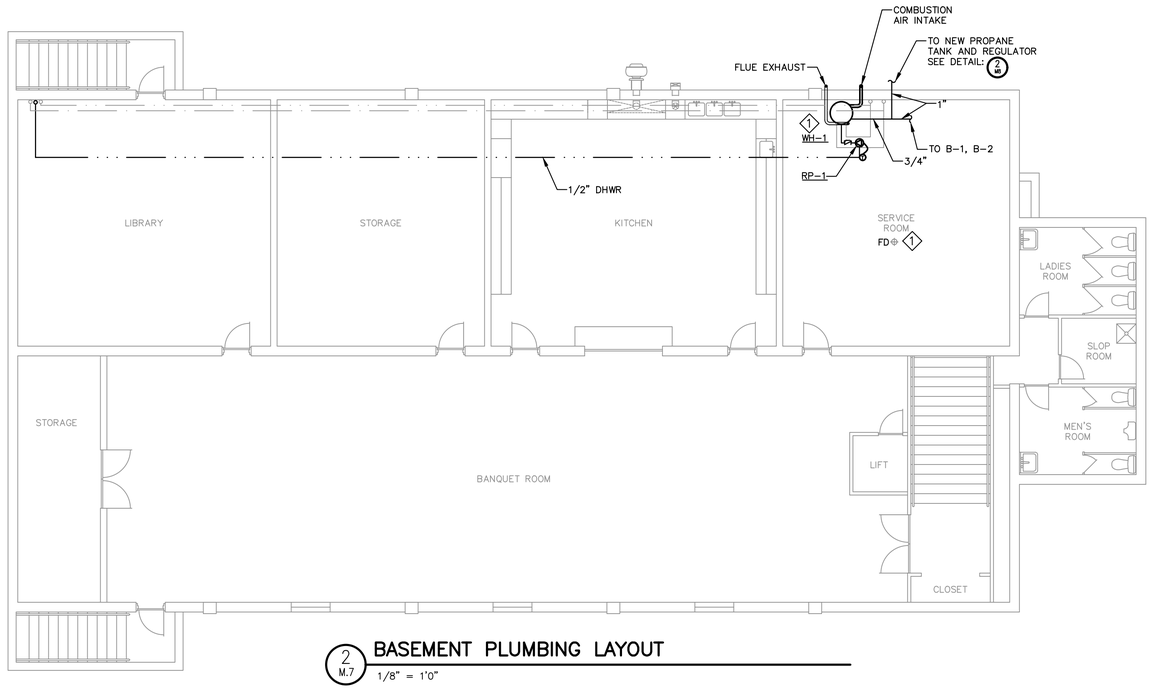
DESIGN: JT	FILE: 123056	DWG:	**M.6**
DRAWN: ML	DATE: NOV 2024		
CHECK: NW	SCALE: AS SHOWN		

DRAWING NOTES

1. COLLECT BOILER AND DHW HEATER CONDENSATE DRAINS AS WELL AS PRESSURE RELIEF VALVE DISCHARGE PIPING INDIRECTLY TO FUNNEL WITH AIR GAP. ROUTE DRAIN LINE ALONG SERVICE ROOM FLOOR AND TERMINATE INDIRECTLY WITH AIR GAP INTO EXISTING FLOOR DRAIN. PROVIDE STEP OVER RAMP ALONG THE LENGTH OF DRAIN PIPING.



1 M.7 **MAIN LEVEL PLUMBING LAYOUT**
1/8" = 1'0"



2 M.7 **BASEMENT PLUMBING LAYOUT**
1/8" = 1'0"

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100215043
13NOV2024
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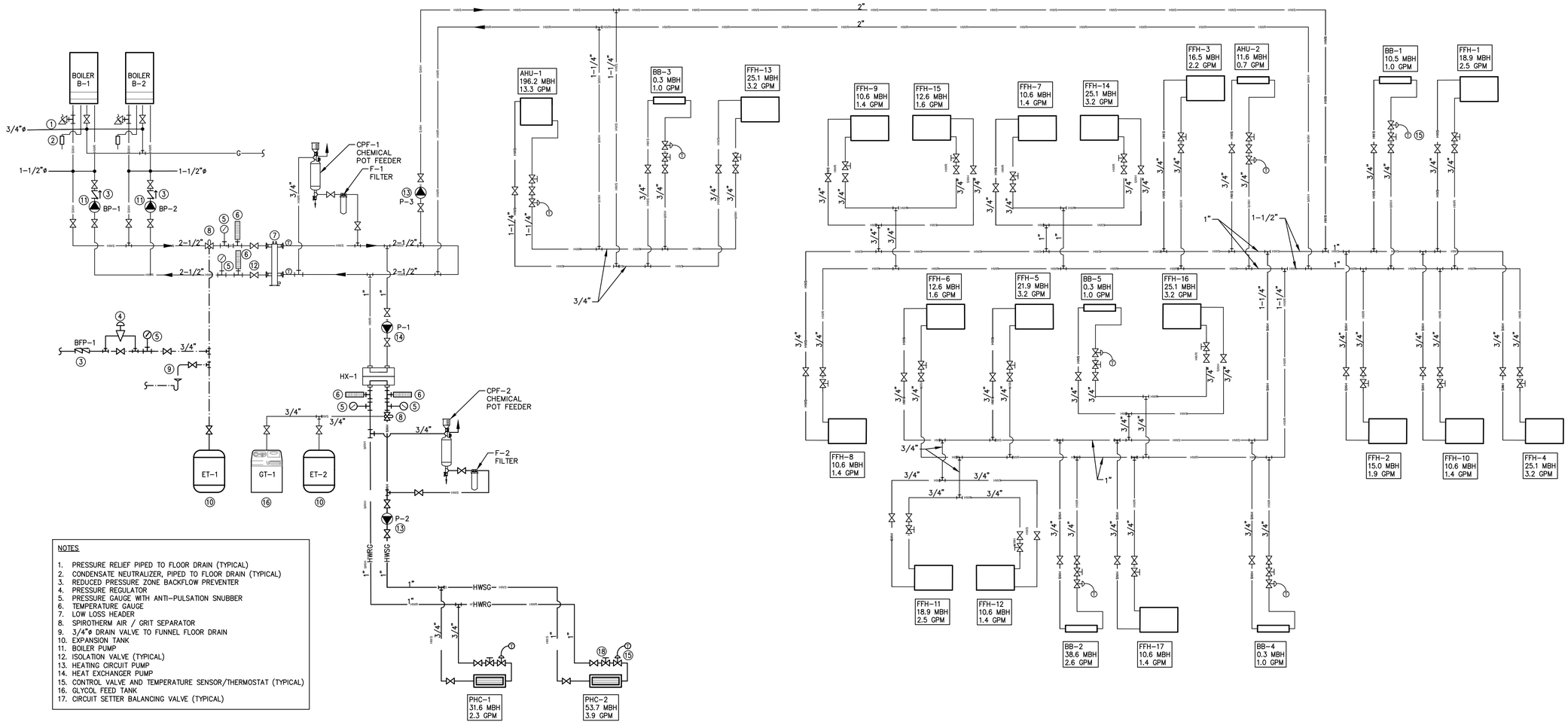
MILFORD BAY COMMUNITY CENTRE
MILFORD BAY, ON

PLUMBING LAYOUT

TATHAM ENGINEERING

DESIGN: JT	FILE: 123056	DWG:	
DRAWN: ML	DATE: NOV 2024	**M.7**	
CHECK: NW	SCALE: AS SHOWN		



NOTES

1. PRESSURE RELIEF PIPED TO FLOOR DRAIN (TYPICAL)
2. CONDENSATE NEUTRALIZER, PIPED TO FLOOR DRAIN (TYPICAL)
3. REDUCED PRESSURE ZONE BACKFLOW PREVENTER
4. PRESSURE REGULATOR
5. PRESSURE GAUGE WITH ANTI-PULSATION SNUBBER
6. TEMPERATURE GAUGE
7. LOW LOSS HEADER
8. SPIROTHERM AIR / GRIT SEPARATOR
9. 3/4"ø DRAIN VALVE TO FUNNEL FLOOR DRAIN
10. EXPANSION TANK
11. BOILER PUMP
12. ISOLATION VALVE (TYPICAL)
13. HEATING CIRCUIT PUMP
14. HEAT EXCHANGER PUMP
15. CONTROL VALVE AND TEMPERATURE SENSOR/THERMOSTAT (TYPICAL)
16. GLYCOL FEED TANK
17. CIRCUIT SETTER BALANCING VALVE (TYPICAL)

1 / M.8 MECHANICAL ROOM AND HYDRONIC PIPING SCHEMATIC

– N.T.S.

DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

BENCHMARKS

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MILFORD BAY COMMUNITY CENTRE

MILFORD BAY, ON

HYDRONIC PIPING SCHEMATIC

TATHAM ENGINEERING

DESIGN: JT	FILE: 123056	DWG:	**M.8**
DRAWN: ML	DATE: NOV 2024		
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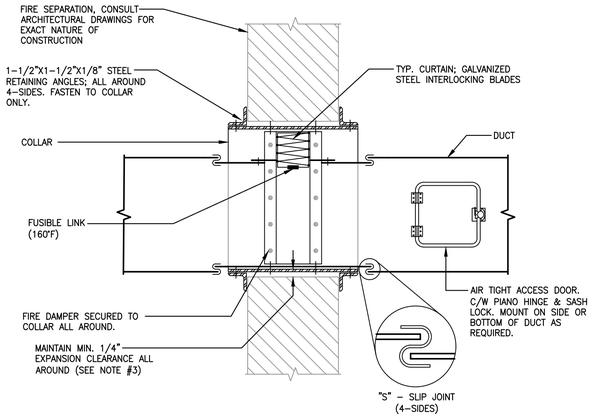
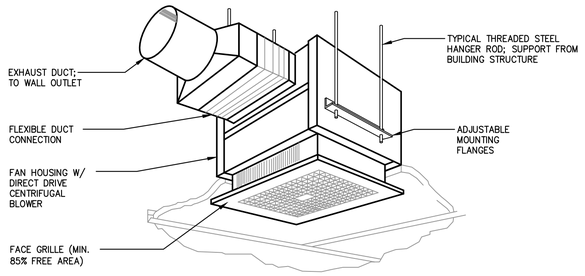


NOTES:

1. FRAME, BLADES, AND COLLAR SHALL BE GALVANIZED STEEL CONSTRUCTION. COLLAR SHALL BE MIN. 14 GA.
2. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR THE INSTALLATION OF TYPE-"B" EXTERNAL CURTAIN FIRE DAMPERS. STANDARD OF ACCEPTANCE CONTROLLED AIR MANUFACTURING LIMITED, RUSKIN MANUFACTURING, OR NAILOR INDUSTRIES INC.
3. DO NOT SEAL AROUND RETAINING ANGLES W FIRESTOP CAULKS AND/OR PUTTYS. DO NOT FILL ANNULAR SPACE (EXPANSION VOID) W FIRESTOP MATERIAL.
4. HORIZONTAL INSTALLATION SIMILAR, C/W STAINLESS STEEL CLOSURE SPRING.
5. SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR REVIEW PRIOR TO INSTALLATION.

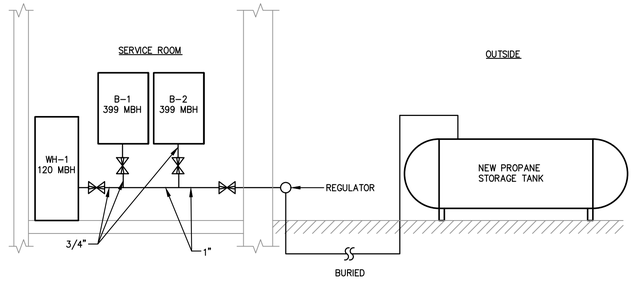
1 M.9 FIRE DAMPER DETAIL

- N.T.S.



4 M.9 CEILING MOUNTED EXHAUST FAN DETAIL

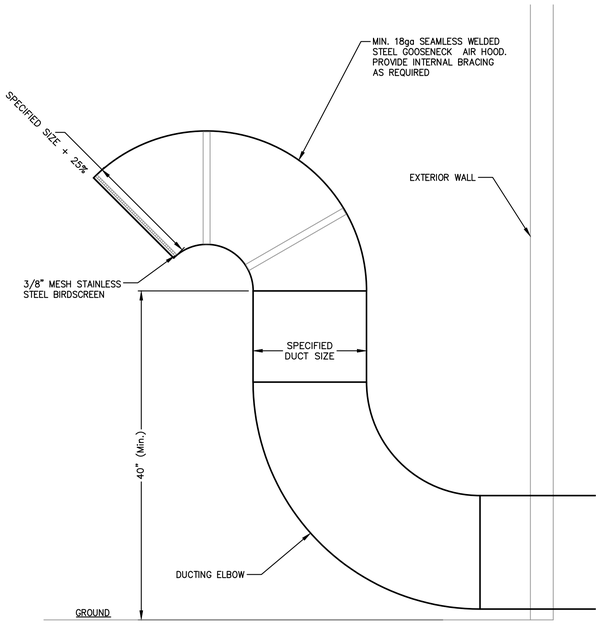
- N.T.S.



NOTES:
- PROPANE GAS STORAGE TANK, OUTSIDE SUPPLY PIPING AND REGULATOR TO BE ARRANGED WITH PROPANE SUPPLIER. CONTRACTOR RESPONSIBLE FOR SIZING GAS PIPING BASED ON SCHEDULE 40 FOR PRESSURES OF 11 IN W.C. AND PRESSURE DROP OF 1 IN W.C. FROM REGULATOR TO B-1, B-2, AND WH-1.
- CONTRACTOR SHALL CONFIRM RECOMMENDED STORAGE CAPACITY WITH PROPANE SUPPLIER AND DETERMINE WHETHER EXISTING STORAGE TANK IS TO BE REUSED. COST OF NEW CONCRETE PAD SHALL BE CARRIED BY THE CONTRACTOR OR PROPANE SUPPLIER.

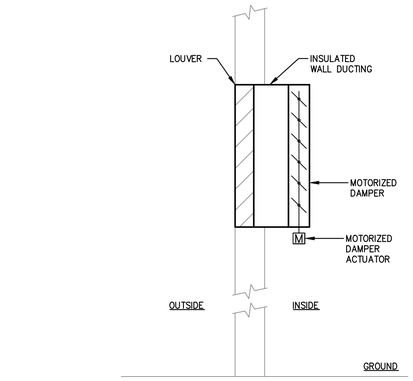
2 M.9 PROPANE GAS SCHEMATIC DETAIL

- N.T.S.



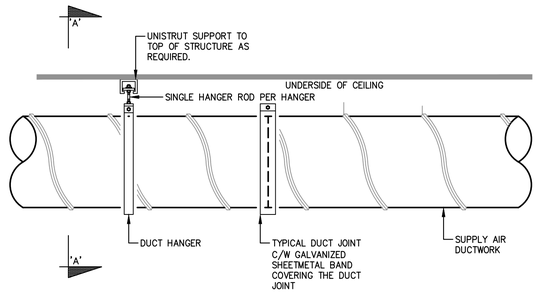
5 M.9 GROUND GOOSENECK DETAIL

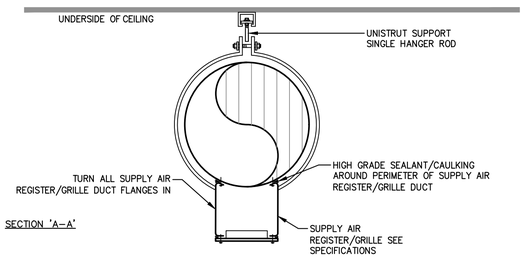
- N.T.S.



3 M.9 MOTORIZED DAMPER DETAIL

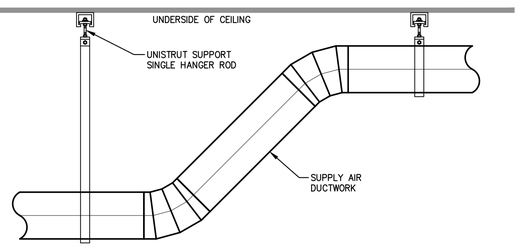
- N.T.S.





6 M.9 EXPOSED SPIRAL DUCTWORK DETAILS

- N.T.S.



7 M.9 VERTICAL DUCT OFFSET DETAIL

- N.T.S.

BENCHMARKS

NOTES

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MILFORD BAY COMMUNITY CENTRE
MILFORD BAY, ON

MECHANICAL DETAILS

TATHAM ENGINEERING

DESIGN: JT	FILE: 123056	DWG:	
DRAWN: ML	DATE: NOV 2024		M.9
CHECK: NW	SCALE: AS SHOWN		

GENERAL NOTES

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTS PREPARED BY ALL CONSULTANTS PRIOR TO CONSTRUCTION. REPORT DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.
2. ALL DIMENSIONS ARE IN FEET AND INCHES EXCEPT AS NOTED.
3. FOLLOW ALL SECTIONS, DETAILS, AND STATEMENTS NOTED AS "TYPICAL", UNLESS OTHERWISE NOTED ON DRAWINGS. TYPICAL DETAILS SHOW STRUCTURAL INTENT RATHER THAN ACTUAL CONDITIONS FOR THE PROJECT. TYPICAL DETAILS APPLY TO SIMILAR CONDITIONS THROUGHOUT THE PROJECT UNLESS OTHERWISE NOTED.
4. USE OF THESE DRAWINGS IS LIMITED TO THAT IDENTIFIED IN THE REVISIONS COLUMN. DO NOT CONSTRUCT FROM THESE DRAWINGS UNLESS MARKED "ISSUED FOR PERMIT AND/OR CONSTRUCTION"
5. DO NOT USE INFORMATION ON THESE DRAWINGS FOR ANY OTHER PROJECT OR WORKS.
6. THE CONTRACTOR SHALL REVIEW ALL DRAWINGS AND CONTRACT DOCUMENTS PRIOR TO AND DURING CONSTRUCTION TO ENSURE THAT THE ASSUMPTIONS MADE IN THE DRAWINGS REFLECT THE REQUIREMENTS OF CONSTRUCTION AND FIELD CONDITIONS ENCOUNTERED. WHERE DISCREPANCIES ARISE OR THE CONTRACTOR FINDS AN ERROR OR OMISSION RELATING TO THE CONTRACT, THE CONTRACTOR SHALL PROMPTLY REPORT IT TO THE STRUCTURAL CONSULTANT AND SHALL NOT PROCEED WITH THE ACTIVITY AFFECTED UNTIL RECEIVING DIRECTION FROM THE STRUCTURAL CONSULTANT.
7. THE DRAWINGS SHOW THE COMPLETED STRUCTURE. THE CONTRACTOR IS RESPONSIBLE FOR SAFETY ON THE JOB SITE AND FOR DESIGN, INSTALLATION AND SUPERVISION OF ALL TEMPORARY BRACING AND FALSEWORK TO SUIT THE CONSTRUCTION METHODS AND TO SUPPORT THE SUPERIMPOSED CONSTRUCTION LOADS. DESIGN AND FIELD REVIEW OF ALL TEMPORARY WORKS TO BE CARRIED OUT BY A PROFESSIONAL ENGINEER RETAINED BY THE CONTRACTOR, LICENSED AND INSURED IN THE PROVINCE OF ONTARIO.
8. ALL WORK AND MATERIALS SHALL CONFORM TO REQUIREMENTS SET OUT IN THE 2012 ONTARIO BUILDING CODE.
9. ALL CODES AND STANDARDS REFERENCED SHALL BE THE LATEST EDITION REFERENCED BY THE 2012 ONTARIO BUILDING CODE (DIV. B, 1.3.1.2).
10. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT OF ONTARIO.
11. ALL DESIGN LOADS NOTED ON DRAWINGS ARE SPECIFIED LOADS (UNFACTORED) TO BE USED FOR ULS (FACTORED) DESIGN, UNLESS OTHERWISE NOTED:
    - A) ROOF DEAD LOAD = 15 psf
    - B) ACCESSIBLE UPPER LEVEL DL = 15 psf
    - C) MAIN FLOOR DL = 56 psf
    - D) ACCESSIBLE UPPER LEVEL LL = 75 psf
    - E) MAIN FLOOR LL (WASHROOM) = 50 psf
    - F) MAIN FLOOR LL (LOBBY) = 100 psf

    CLIMATIC DATA (BRACEBRIDGE):
    SNOW:
    - SS = 65 psf
    - SR = 0.4 psf
12. IMPORTANCE CATEGORY FOR BUILDINGS: HIGH
13. DEAD LOAD (DL) IS THE SELF WEIGHT OF THE STRUCTURE PLUS THE SUPERIMPOSED DEAD LOAD (U.N.O.):
    SELF WEIGHT IS DUE TO THE WEIGHT OF THE STRUCTURE ITSELF. IT VARIES WITH THE STRUCTURAL SYSTEM AND INCLUDES CONCRETE TOPPINGS ON STEEL DECK. SUPERIMPOSED DEAD LOADS (SDL) ARE NON-STRUCTURAL DEAD LOADS DUE TO NON-STRUCTURAL TOPPINGS, FINISHES, PARTITIONS, ROOFING MATERIALS, SUSPENDED EQUIPMENT, PAVERS, SOIL, ETC.
14. ALL PROPRIETARY PRODUCTS SPECIFIED ON THESE DRAWINGS SHALL BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN SPECIFICATIONS. ALTERNATIVE PRODUCTS MAY ONLY BE USED WITH THE PRIOR APPROVAL OF THE STRUCTURAL CONSULTANT. CONTRACTOR IS RESPONSIBLE FOR PROVIDING WRITTEN DOCUMENTATION AND SPECIFICATIONS AS REQUIRED BY STRUCTURAL CONSULTANT FOR EVALUATION OF SUITABILITY OF ALTERNATE PRODUCTS.
15. THESE DRAWINGS INDICATE STRUCTURAL DESIGN FOR BUILDING ONLY. DESIGN INFO APPLIES WITHIN THE BUILDING FOOTPRINT ONLY. ALL STRUCTURAL DESIGN FOR STRUCTURES OUTSIDE THE BUILDING FOOTPRINT IS BY OTHERS UNLESS NOTED OTHERWISE IN THESE DRAWINGS.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING LOCATES FOR ALL UTILITIES AND UNDERGROUND SERVICES PRIOR TO COMMENCING WORK AND SHALL COORDINATE WORK WITH SERVICES AND UTILITIES ADJACENT TO OR WITHIN THE AREA OF WORK.
17. OPENINGS AND SLEEVES INDICATED ON THE STRUCTURAL DRAWINGS ARE FOR REFERENCE ONLY. COORDINATE ALL OPENING LOCATIONS AND DIMENSIONS WITH THE APPROPRIATE CONSULTANT AND THE SUB-CONTRACTOR PRIOR TO CONSTRUCTION.
18. DO NOT CUT OR DRILL ANY OPENINGS IN STRUCTURAL MEMBERS WITHOUT WRITTEN PERMISSION FROM THE STRUCTURAL CONSULTANT UNLESS SPECIFICALLY NOTED ON THE STRUCTURAL DRAWINGS.
19. REFER TO MECHANICAL, AND ELECTRICAL DRAWINGS FOR SMALL OPENINGS, SLEEVES, RECESSES, DEPRESSIONS, SUMPS, TRENCHES, CURBS, HOUSEKEEPING PADS, EQUIPMENT BASES,AND S SLOPES NOT INDICATED ON THE STRUCTURAL DRAWINGS.

STRUCTURAL STEEL

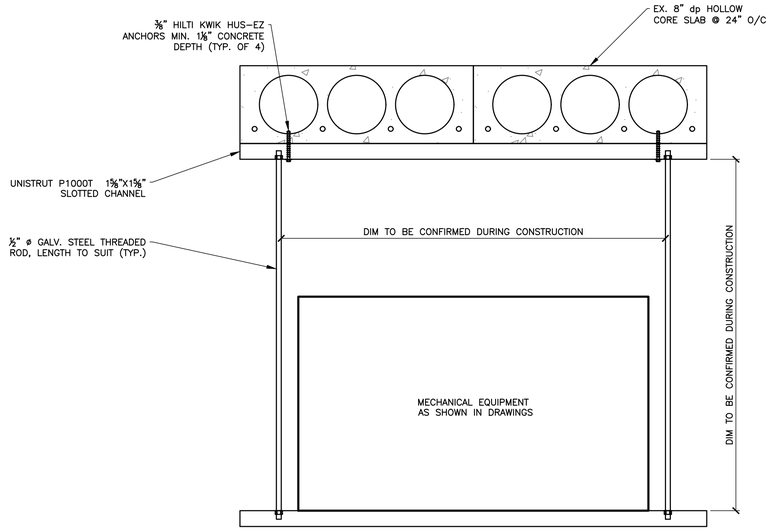
1. ALL STRUCTURAL STEEL SHALL BE NEW STOCK AND CONFORM TO THE FOLLOWING GRADES AND STANDARDS:
    A) ANGLES, AND CHANNELS: CAN/CSA G40.21 TYPE 350W
2. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH CAN/CSA S16.
3. NO HOLES SHALL BE CUT IN THE STRUCTURAL STEEL WITHOUT THE PRIOR APPROVAL OF THE STRUCTURAL CONSULTANT. NO STRUCTURAL STEEL SHALL BE CUT IN THE FIELD UNLESS REVIEWED AND APPROVED BY THE STRUCTURAL CONSULTANT.
4. SUBSTITUTIONS FOR STEEL SECTIONS SHOWN ON DRAWINGS SHALL NOT BE MADE WITHOUT THE WRITTEN APPROVAL OF THE STRUCTURAL CONSULTANT.
5. SPLICES IN STEEL MEMBERS OTHER THAN THOSE SHOWN ON THE DRAWINGS SHALL NOT BE PERMITTED.
6. ALL STEELWORK SHARP/ROUGH EDGES SHALL BE GROUND BACK TO A SMOOTH SURFACE.
7. CLEAN, PREPARE SURFACES AND SHOP PRIME STRUCTURAL STEEL IN ACCORDANCE WITH CAN/CSA-S16.1.
8. TOUCH UP SHOP PRIMER TO BOLTS, WELDS, AND BURNED AND SCRATCHED SURFACES AT COMPLETION OF ERECTION.
9. ALL EXTERIOR EXPOSED STEEL SHALL BE PROTECTED BY HOT DIP GALVANIZING OR TWO COATS OF GALVAFROID PAINT.

WOOD FRAMING

1. WOOD AND ENGINEERED LUMBER COMPONENTS SHALL BE DESIGNED, FABRICATED, AND INSTALLED IN ACCORDANCE WITH CAN/CSA-086 AND THE ONTARIO BUILDING CODE (OBC) PART 9.
2. ALL LUMBER SHALL BE NO. 1/2 GRADE SPF IN ACCORDANCE WITH CSA 086, UNLESS NOTED OTHERWISE.
3. ALL LVL LUMBER SHALL BE 2.0E, 2900 FB MATERIAL AND SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND REQUIREMENTS.
4. STEEL PLATES AND WASHERS SHALL BE IN ACCORDANCE WITH ASTM A36 (GRADE 250W).
5. FASTENERS AND HARDWARE USED IN EXTERIOR APPLICATIONS SHALL BE HOT-DIPPED GALVANIZED.
6. ALL LUMBER FASTENING SHALL BE IN ACCORDANCE WITH OBC PART 9 OR MANUFACTURER'S SPECIFICATIONS, UNLESS NOTED OTHERWISE. ALL NAILS, SPIKES, AND STAPLES SHALL BE IN ACCORDANCE WITH OBC 2012, 9.23.3.
7. ALL INDIVIDUAL PLIES IN SIDE-LOADED LVL MEMBERS SHALL BE FASTENED TO EACH ADJACENT PLY USING FOUR ROWS OF 10dx3" LONG COMMON WIRE NAILS SPACED AT 12" O/C, UNLESS NOTED OTHERWISE.
8. SPECIFIED CONNECTORS SHALL BE MANUFACTURED BY SIMPSON STRONG-TIE. SUBSTITUTIONS SHALL BE SUBMITTED FOR ENGINEERS APPROVAL PRIOR TO CONSTRUCTION.
9. ALL PROPRIETARY CONNECTORS AND FIXINGS ARE TO BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.
10. NON-TREATED WOOD IN CONTACT WITH CONCRETE OR STONE SHALL BE PROTECTED BY SILL GASKET OR 6 MIL POLY.
11. SOLID WOOD BLOCKING SHALL BE PROVIDED BENEATH ALL POINT LOADS.

LINTEL SCHEDULE

MARK	SIZE
L1	L 8 x 8 x ½" CONCRETE BLOCK SUPPORT WITH 8" MINIMUM BEARING EACH END ON SOLID GROUTED CORES (2 COURSES HIGH).
L2	L 10 x 10 x ⅝" CONCRETE BLOCK SUPPORT WITH 8" MINIMUM BEARING EACH END ON SOLID GROUTED CORES (2 COURSES HIGH).



NOTE:
-CONTRACTOR TO SCAN CONCRETE PRIOR TO DRILLING, LOCATE FASTENERS AWAY FROM EX. TENDONS AS SHOWN

-EQUIPMENT TO BE SUPPORTED FROM 2 HOLLOW CORE SLABS AS SHOWN

D1 BASEMENT SLAB MOUNTING DETAIL

SCALE: 1½" = 1'-0"

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR PERMIT AND TENDER	NOV/24

ENGINEER STAMP

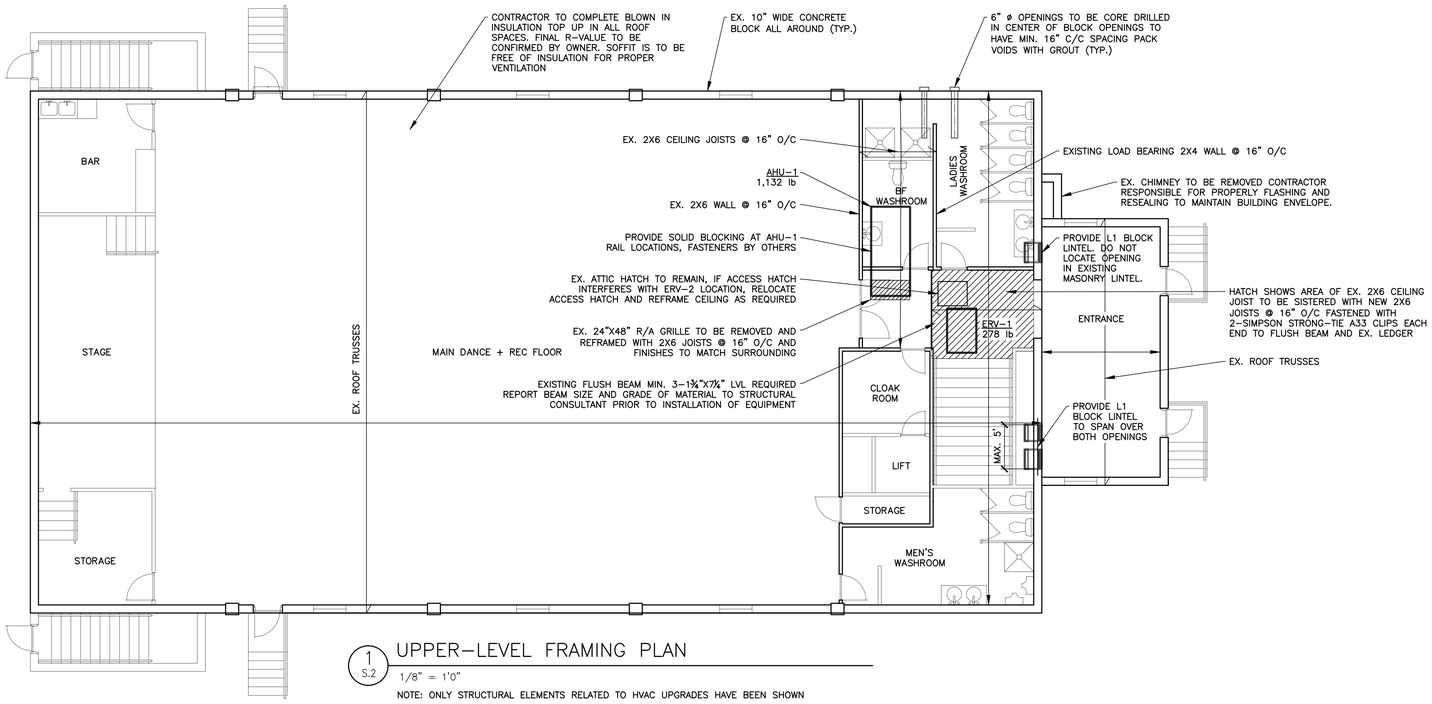
LICENSED PROFESSIONAL ENGINEER — NOV 13/24 — L.M. VINT 100540450 — PROVINCE OF ONTARIO

MILFORD BAY COMMUNITY CENTRE
MILFORD BAY, ON

GENERAL NOTES & DETAILS

TATHAM ENGINEERING

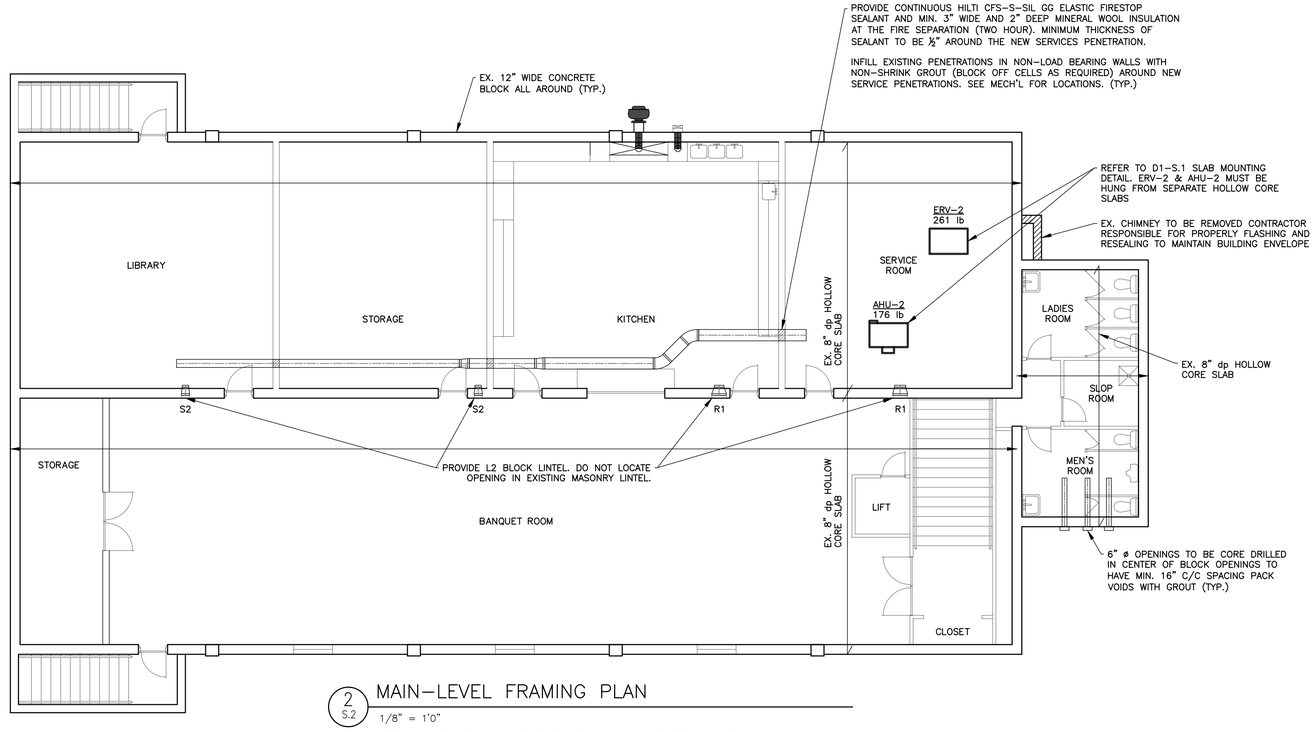
DESIGN: CG	FILE: 123056	DWG: S.1
DRAWN: CG	DATE: OCT 2024	
CHECK: LV	SCALE: AS NOTED	



1 S.2 UPPER-LEVEL FRAMING PLAN

1/8" = 1'0"

NOTE: ONLY STRUCTURAL ELEMENTS RELATED TO HVAC UPGRADES HAVE BEEN SHOWN



2 S.2 MAIN-LEVEL FRAMING PLAN

1/8" = 1'0"

NOTE: ONLY STRUCTURAL ELEMENTS RELATED TO HVAC UPGRADES HAVE BEEN SHOWN

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR PERMIT AND TENDER	NOV/24

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
NOV 13/24
L.M. VINT
100540450
PROVINCE OF ONTARIO

MILFORD BAY COMMUNITY CENTRE

MILFORD BAY, ON

TATHAM ENGINEERING

UPPER-LEVEL & MAIN-LEVEL FRAMING PLAN

DESIGN: CG	FILE: 123056	DWG: S.2
DRAWN: CG	DATE: OCT 2024	
CHECK: LV	SCALE: AS NOTED	

GENERAL SYMBOLS

X / YZ — DETAIL SYMBOL:
X = DETAIL NUMBER
YZ = DRAWING NUMBER

▲ EQUIPMENT SUPPLIED BY ANOTHER DIVISION, INSTALLATION, WIRING AND CONDUIT BY DIVISION 16

■ EQUIPMENT NOT SUPPLIED UNDER THIS CONTRACT, INSTALLATION, WIRE AND CONDUIT BY DIVISION 16

△# SYMBOL INDICATES A DEVICE LOCATION, SEE BELOW (# DENOTES LOCATION NUMBER)

◇# SYMBOL INDICATES MODIFICATION OR NEW WORK NOTE (# DENOTES NOTE NUMBER)

⬡# SYMBOL INDICATES REMOVAL NOTE (# DENOTES REMOVAL NOTE NUMBER)

DEVICE LOCATIONS

△1 DEVICE LOCATED IN SERVICE ROOM

△2 DEVICE LOCATED NEAR EQUIPMENT

SINGLE LINE SYMBOLS AND CONTROL DIAGRAMS

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER, MOULDED CASE WITH THERMAL & MAGNETIC TRIPS
	CURRENT TRANSFORMER
	CAPACITOR
	CONTROL POWER TRANSFORMER (CPT)
	FUSE
	FUSIBLE DISCONNECT SWITCH
	NON-FUSIBLE DISCONNECT SWITCH
	DRY-TYPE POWER TRANSFORMER (INDOOR)
	OIL-FILLED POWER TRANSFORMER (OUTDOOR)
TR	TIMER
C	CONTACTOR (C) COIL, WITH COIL SUPPRESSOR
	CONTACT, N.O. AND N.C.
	TERMINAL BLOCK
	TEMPERATURE SWITCH, N.O AND N.C.
	SINGLE PHASE MOTOR
S	LIGHT SWITCH C/W BACK BOX: – "S" INDICATES 2-WIRE SWITCH
#	DISCONNECT SWITCH, UN-FUSED, # DENOTES NUMBER OF POLES
TH	THERMOSTAT

ALL SYMBOLS/DEVICES/ABBREVIATIONS LISTED MAY NOT APPLY

REMOVAL NOTES

GENERAL NOTES FOR ALL REMOVAL WORKS:

- UNLESS OTHERWISE NOTED, "REMOVE" OR "REMOVED" INDICATES CONTRACTOR TO DISCONNECT, REMOVE AND DISPOSE OF ELECTRICAL EQUIPMENT AND/OR DEVICE INCLUDING POWER FEED CONDUCTORS, CONDUIT AND/OR CABLE(S).
- CONTRACTOR TO COORDINATE WITH THE TOWNSHIP ALL EQUIPMENT TO BE REMOVED AND EQUIPMENT TO BE SAVED. CONTRACTOR TO ASSIST THE TOWNSHIP WITH DELIVERY OF EQUIPMENT TO BE SAVED, WITHIN THE TOWN.
- ALL REMOVED EQUIPMENT TO BE DISPOSED BY THE CONTRACTOR.
- CONTRACTOR TO PREPARE AN ELECTRICAL REMOVAL SCHEDULE FOR REVIEW WITH ENGINEER AND OWNER PRIOR TO BEGINNING ANY SHUT DOWN WORK.
- ALL REMOVAL WORK SCHEDULES REQUIRED BY THE CONTRACTOR ARE TO BE APPROVED BY ENGINEER AND OWNER FIVE (5) WORKING DAYS PRIOR TO ANY POWER SHUTDOWN.
- THE REMOVAL WORK IS TO OCCUR AFTER BUSINESS HOURS. CONTRACTOR IS TO INCLUDE ALL NECESSARY PREMIUM LABOUR TIME TO PERFORM REMOVAL WORK ON WEEKENDS, EVENINGS OR OTHER "NON-REGULAR" TIMES AS DIRECTED BY THE TOWNSHIP

NOTES

1. CONTRACTOR TO PROVIDE HVAC UNIT TIMER CONTROL PANEL (NEMA 4X) FOR CONDENSING UNITS CU-1 AND CU-2 AND (NEMA 12) FOR AIR HANDLING UNIT AHU-1, ENERGY RECOVERY VENTILATORS ERV-1 AND ERV-2.

2. CONTRACTOR TO PROVIDE LOCAL DISCONNECT SWITCH (NEMA 4X) FOR CONDENSING UNITS CU-1 AND CU-2 AND (NEMA 12) FOR AIR HANDLING UNIT AHU-1.

ELECTRICAL EQUIPMENT LIST Summer Loads

Project Name: **Milford Bay Community Centre**
Project No.: **123056**
Original Date: **23-Sep-24**
Revised Date:

Total Connected Load (kW):	**76**	**System Voltage: 208**		**PF: 0.90**			**Phases: 3**		**Wires: 4**			**Service Size: 200AMPS, 120/208V, 3-Phase**				
Total Demand Load (kW):	**54**	**System Ampacity (based on *Normal* Demand):**					**168**		Check MCA: 0							

Rev. No.	Item or Tag No.	Description	Location	Motor HP	Connected Load			Demand Load		Power Supply				Starter Type	Controls Description
					kW	MCA	OCP	D.F.	kW	Volts	Phase	Hz	Amps		
		New Loads													
	ERV-1	Lower Level ERV	Lower Level Service Room		2.30			1	2.30	208	1	60			Delay Timer set at 120 seconds
	ERV-2	Upper Level ERV	Upper Level		3.46			1	3.46	208	1	60			Delay Timer set at 150 seconds
	AHU-1	Air Handling Unit	Upper Level		6.80			1	6.80	208	3	60			Delay Timer set at 90 seconds
	AHU-2	Air Handling Unit	Lower Level		0.70			1	0.70	120	1	60			
	HW-1	Hot Water Tank	Lower Level Service Room		0.60			1	0.60	120	1	60			
	B-1	Condensing Boiler	Lower Level Service Room		1.44			1	1.44	120	1	60			
	B-2	Condensing Boiler	Lower Level Service Room		1.80			1	1.80	120	1	60			
	EF-1	Bathroom Fan	Lower Level Ladies room		0.21			0.5	0.11	120	1	60			
	EF-2	Bathroom Fan	Lower Level Slop room		0.21			0.5	0.11	120	1	60			
	EF-3	Bathroom Fan	Lower Level Men's room		0.21			0.5	0.11	120	1	60			
	EF-4	Bathroom Fan	Upper Level Men's Washroom		0.18			0.5	0.09	120	1	60			
	EF-5	Bathroom Fan	Upper Level Ladies' Washroom		0.18			0.5	0.09	120	1	60			
	EF-6	Bathroom Fan	Upper Level Washroom		0.18			0.5	0.09	120	1	60			
	CU-1	Condensing Unit			12.50			1	12.50	208	3	60			Delay Timer set at 30 seconds
	CU-2	Condensing Unit			2.37			1	2.37	208	1	60			Delay Timer set at 60 seconds
	BP-1	Boiler Pump	Lower Level Service Room		0.27			0	0.00	120	1	60			Power feed from B-1
	BP-2	Boiler Pump	Lower Level Service Room		0.10			0	0.00	120	1	60			Power feed from B-2
	P-1	Heat Exchanger Pump	Lower Level Service Room		0.10			1	0.10	120	1	60			
	P-2	Heat Exchanger Pump	Lower Level Service Room		0.02			1	0.02	120	1	60			
	P-3	Secondary Hydronic System Pump	Lower Level Service Room		0.63			1	0.63	120	1	60			
	RP-1	Hot Water Recirculation Pump	Lower Level Service Room		0.02			1	0.02	120	1	60			
	FFH-1	Hydronic Forced Fan Heater	Lower Level		0.14			0	0.00	120	1	60			
	FFH-2	Hydronic Forced Fan Heater	Lower Level		0.14			0	0.00	120	1	60			
	FFH-3	Hydronic Forced Fan Heater	Lower Level		0.12			0	0.00	120	1	60			
	FFH-4	Hydronic Forced Fan Heater	Lower Level		0.26			0	0.00	120	1	60			
	FFH-5	Hydronic Forced Fan Heater	Lower Level		0.10			0	0.00	120	1	60			
	FFH-6	Hydronic Forced Fan Heater	Lower Level		0.12			0	0.00	120	1	60			
	FFH-7	Hydronic Forced Fan Heater	Lower Level		0.10			0	0.00	120	1	60			
	FFH-8	Hydronic Forced Fan Heater	Lower Level		0.10			0	0.00	120	1	60			
	FFH-9	Hydronic Forced Fan Heater	Lower Level		0.10			0	0.00	120	1	60			
	FFH-10	Hydronic Forced Fan Heater	Upper Level		0.10			0	0.00	120	1	60			
	FFH-11	Hydronic Forced Fan Heater	Upper Level		0.14			0	0.00	120	1	60			
	FFH-12	Hydronic Forced Fan Heater	Upper Level		0.10			0	0.00	120	1	60			
	FFH-13	Hydronic Forced Fan Heater	Upper Level		0.26			0	0.00	120	1	60			
	FFH-14	Hydronic Forced Fan Heater	Upper Level		0.26			0	0.00	120	1	60			
	FFH-15	Hydronic Forced Fan Heater	Upper Level		0.12			0	0.00	120	1	60			
	FFH-16	Hydronic Forced Fan Heater	Upper Level		0.26			0	0.00	120	1	60			
		Existing Loads													
	SP-1	Sewage Pump	Lower Level		3.30			0.25	0.825	208	1	60			Duty/Standby
	SP-2	Sewage Pump	Lower Level		3.30			0	0	208	1	60			Duty/Standby
		Lighting	Entire Building		11.35			0.75	8.5125	120	1	60			Recommendation - upgrade to LED
		Receptacles 100W/receptacle	50		5.00			1	5	120	1	60			
		Bar Fan 120V/0.8A	Lower Level		0.10			0.5	0.048	120	1	60			
		Bar Fridge 8A	Lower Level		0.96			0.5	0.48	120	1	60			
		Storage Audio equipment box 15A	Lower Level		1.00			1	1	120	1	60			
		BF Washroom, 1 fan	Lower Level		0.25			0.5	0.125	120	1	60			
		Service Room, Water filter, 230V/11.6A	Upper Level		2.78			0.5	1.39	208	1	60			
		Service Room, IT box 120V	Upper Level		0.20			1	0.2	120	1	60			
		Kitchen microwave 1pc, 120V	Upper Level		1.50			0.5	0.75	120	1	60			
		Kitchen freezer 1pc, 120V 4A	Upper Level		0.50			0.5	0.25	120	1	60			
		Kitchen fridge 1pc, 120V 4A	Upper Level		0.50			0.5	0.25	120	1	60			
		Kitchen range hood,	Upper Level		0.50			0.5	0.25	120	1	60			
		Kitchen dishwasher, 240V, 26A, 5.9kW	Upper Level		5.90			0.25	1.475	208	1	60			Install shunt trip breaker tied to generator
		Lift room Electrical panel and motor 240V/ 10A	Upper Level		2.00			0.25	0.5	208	1	60			
		Total Connected Load (kW):	**76**												
		Total Demand Load (kW):	**54**												
		System Ampacity (based on Normal Demand):	**168**												

1 E1.1 ELECTRICAL EQUIPMENT LIST – SUMMER LOADS

– NTS

ELECTRICAL EQUIPMENT LIST Winter Loads

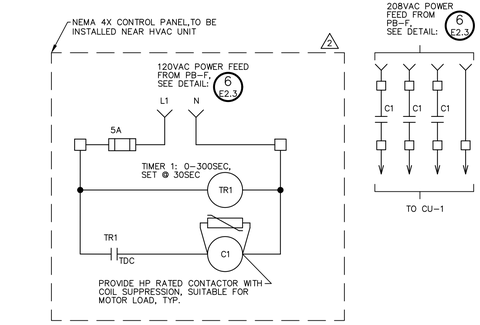
Project Name: **Milford Bay Community Centre**
Project No.: **123056**
Original Date: **23-Sep-24**
Revised Date:

Total Connected Load (kW):	**76**	**System Voltage: 208**		**PF: 0.90**			**Phases: 3**		**Wires: 4**			**Service Size: 200AMPS, 120/208V, 3-Phase**				
Total Demand Load (kW):	**42**	**System Ampacity (based on *Normal* Demand):**					**129**		Check MCA: 0							

Rev. No.	Item or Tag No.	Description	Location	Motor HP	Connected Load			Demand Load		Power Supply				Starter Type	Controls Description
					kW	MCA	OCP	D.F.	kW	Volts	Phase	Hz	Amps		
		New Loads													
	ERV-1	Lower Level ERV	Lower Level Service Room		2.30			1	2.30	208	1	60			Delay Timer set at 120 seconds
	ERV-2	Upper Level ERV	Upper Level		3.46			1	3.46	208	1	60			Delay Timer set at 150 seconds
	AHU-1	Air Handling Unit	Upper Level		6.80			1	6.80	208	3	60			Delay Timer set at 90 seconds
	AHU-2	Air Handling Unit	Lower Level		0.70			1	0.70	120	1	60			
	HW-1	Hot Water Tank	Lower Level Service Room		0.60			1	0.60	120	1	60			
	B-1	Condensing Boiler	Lower Level Service Room		1.44			1	1.44	120	1	60			
	B-2	Condensing Boiler	Lower Level Service Room		1.80			1	1.80	120	1	60			
	EF-1	Bathroom Fan	Lower Level Ladies room		0.21			0.5	0.11	120	1	60			
	EF-2	Bathroom Fan	Lower Level Slop room		0.21			0.5	0.11	120	1	60			
	EF-3	Bathroom Fan	Lower Level Men's room		0.21			0.5	0.11	120	1	60			
	EF-4	Bathroom Fan	Upper Level Men's Washroom		0.18			0.5	0.09	120	1	60			
	EF-5	Bathroom Fan	Upper Level Ladies' Washroom		0.18			0.5	0.09	120	1	60			
	EF-6	Bathroom Fan	Upper Level Washroom		0.18			0.5	0.09	120	1	60			
	CU-1	Condensing Unit			12.50			0	0.00	208	3	60			Delay Timer set at 30 seconds
	CU-2	Condensing Unit			2.37			0	0.00	208	1	60			Delay Timer set at 60 seconds
	BP-1	Boiler Pump	Lower Level Service Room		0.27			0	0.00	120	1	60			Power feed from B-1
	BP-2	Boiler Pump	Lower Level Service Room		0.10			0	0.00	120	1	60			Power feed from B-2
	P-1	Heat Exchanger Pump	Lower Level Service Room		0.02			1	0.02	120	1	60			
	P-2	Glycol Loop Pump	Lower Level Service Room		0.02			1	0.02	120	1	60			
	P-3	Water Loop Pump	Lower Level Service Room		0.63			1	0.63	120	1	60			
	RP-1	Hot Water Recirculation Pump	Lower Level Service Room		0.02			1	0.02	120	1	60			
	FFH-1	Hydronic Forced Fan Heater	Lower Level		0.14			1	0.14	120	1	60			
	FFH-2	Hydronic Forced Fan Heater	Lower Level		0.14			1	0.14	120	1	60			
	FFH-3	Hydronic Forced Fan Heater	Lower Level		0.12			1	0.12	120	1	60			
	FFH-4	Hydronic Forced Fan Heater	Lower Level		0.26			1	0.26	120	1	60			
	FFH-5	Hydronic Forced Fan Heater	Lower Level		0.20			1	0.20	120	1	60			
	FFH-6	Hydronic Forced Fan Heater	Lower Level		0.12			1	0.12	120	1	60			
	FFH-7	Hydronic Forced Fan Heater	Lower Level		0.10			1	0.10	120	1	60			
	FFH-8	Hydronic Forced Fan Heater	Lower Level		0.10			1	0.10	120	1	60			
	FFH-9	Hydronic Forced Fan Heater	Lower Level		0.10			1	0.10	120	1	60			
	FFH-10	Hydronic Forced Fan Heater	Upper Level		0.10			1	0.10	120	1	60			
	FFH-11	Hydronic Forced Fan Heater	Upper Level		0.14			1	0.14	120	1	60			
	FFH-12	Hydronic Forced Fan Heater	Upper Level		0.10			1	0.10	120	1	60			
	FFH-13	Hydronic Forced Fan Heater	Upper Level		0.26			1	0.26	120	1	60			
	FFH-14	Hydronic Forced Fan Heater	Upper Level		0.26			1	0.26	120	1	60			
	FFH-15	Hydronic Forced Fan Heater	Upper Level		0.12			1	0.12	120	1	60			
	FFH-16	Hydronic Forced Fan Heater	Upper Level		0.26			1	0.26	120	1	60			
		Existing Loads													
	SP-1	Sewage Pump	Lower Level		3.30			0.25	0.83	208	1	60			Duty/Standby
	SP-2	Sewage Pump	Lower Level		3.30			0	0.00	208	1	60			Duty/Standby
		Lighting	Entire Building		11.35			0.75	8.51	120	1	60			Recommendation - upgrade to LED
		Receptacles 100W/receptacle	50		5.00			1	5.00	120	1	60			
		Bar Fan 120V/0.8A	Lower Level		0.10			0.5	0.05	120	1	60			
		Bar Fridge 8A	Lower Level		0.96			0.5	0.48	120	1	60			
		Storage Audio equipment box 15A	Lower Level		1.00			1	1.00	120	1	60			
		BF Washroom, 1 fan	Lower Level		0.25			0.5	0.13	120	1	60			
		Service Room, Water filter, 230V/11.6A	Upper Level		2.78			0.5	1.39	208	1	60			
		Service Room, IT box 120V	Upper Level		0.20			1	0.20	120	1	60			
		Kitchen microwave 1pc, 120V	Upper Level		1.50			0.5	0.75	120	1	60			
		Kitchen freezer 1pc, 120V 4A	Upper Level		0.50			0.5	0.25	120	1	60			
		Kitchen fridge 1pc, 120V 4A	Upper Level		0.50			0.5	0.25	120	1	60			
		Kitchen range hood,	Upper Level		0.50			0.5	0.25	120	1	60			
		Kitchen dishwasher, 240V, 26A, 5.9kW	Upper Level		5.90			0.25	1.48	208	1	60			Install shunt trip breaker tied to generator
		Lift room Electrical panel and motor 240V/ 10A	Upper Level		2.00			0.25	0.50	208	1	60			
		Total Connected Load (kW):	**76**												
		Total Demand Load (kW):	**42**												
		System Ampacity (based on Normal Demand):	**129**												

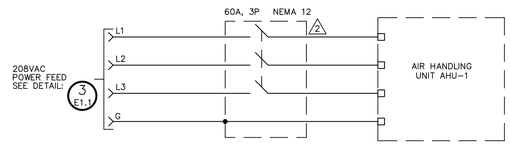
2 E1.1 ELECTRICAL EQUIPMENT LIST – WINTER LOADS

– NTS



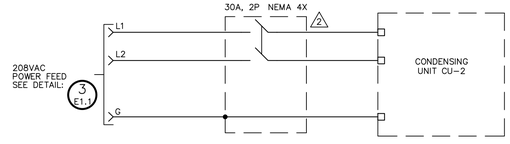
3 E1.1 HVAC UNIT TIMER CONTROL PANEL WIRING DIAGRAM ◇1

- DIAGRAM FOR CU-1, 208V-3 PHASE. SET TIMER TR1 FOR 30SEC. NEMA 4X PANEL.
- SIMILAR DIAGRAM FOR CU-2, 208V-1 PHASE. SET TIMER TR1 FOR 60SEC. NEMA 4X PANEL.
- SIMILAR DIAGRAM FOR AHU-1, 20V-3 PHASE. SET TIMER TR1 FOR 90SEC. NEMA 12 PANEL.
- SIMILAR DIAGRAM FOR ERV-1, 208V-1 PHASE. SET TIMER TR1 FOR 120SEC. NEMA 12 PANEL.
- SIMILAR DIAGRAM FOR ERV-2, 208V-1 PHASE. SET TIMER TR1 FOR 150SEC. NEMA 12 PANEL.



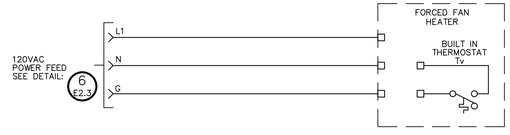
4 E1.1 TYPICAL HVAC UNIT ELEMENTARY WIRING DIAGRAM ◇2

- DIAGRAM FOR AIR HANDLING UNIT AHU-1
- SIMILAR DETAIL FOR CONDENSING UNIT CU-1, NEMA 4X DISCONNECT SWITCH



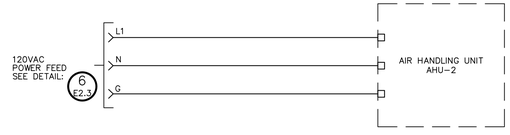
5 E1.1 TYPICAL HVAC UNIT ELEMENTARY WIRING DIAGRAM ◇2

– DETAIL FOR CONDENSING UNIT CU-2



6 E1.1 TYPICAL FORCED FAN HEATER ELEMENTARY WIRING DIAGRAM

– TYPICAL DETAIL FOR FORCED FAN HEATERS FFH-1-16



7 E1.1 TYPICAL AIR HANDLING UNIT ELEMENTARY WIRING DIAGRAM

– DIAGRAM FOR AIR HANDLING UNIT AHU-2

BENCHMARKS

NOTES

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR PERMIT AND TENDER	NOV/24

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
S. R. S. TAYLOR
100518503
13NOV'24
PROVINCE OF ONTARIO

MILFORD BAY COMMUNITY CENTRE
MILFORD BAY, ON

TATHAM ENGINEERING

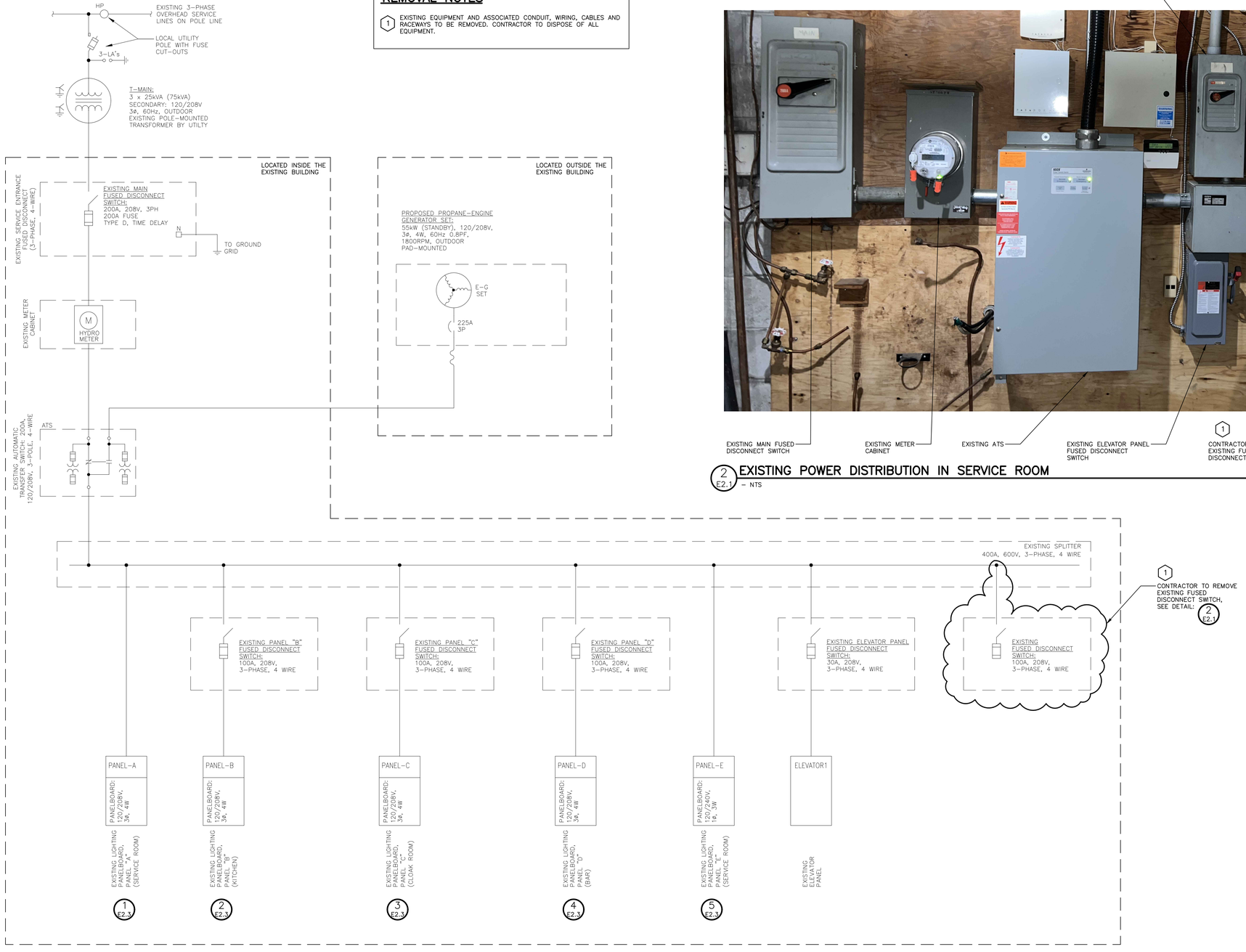
ELECTRICAL LEGEND AND EQUIPMENT LIST

DESIGN: JL	FILE: 123056	DWG: **E1.1**
DRAWN: JL	DATE: NOV 2024	
CHECK: SRT	SCALE: AS SHOWN	

REMOVAL NOTES

1. EXISTING EQUIPMENT AND ASSOCIATED CONDUIT, WIRING, CABLES AND RACEWAYS TO BE REMOVED. CONTRACTOR TO DISPOSE OF ALL EQUIPMENT.

2 E2.1 EXISTING POWER DISTRIBUTION IN SERVICE ROOM
– NTS



1 E2.1 SINGLE LINE DIAGRAM – EXISTING CONDITIONS AND MODIFICATIONS
– NTS

BENCHMARKS

NOTES

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR PERMIT AND TENDER	NOV/24

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MILFORD BAY, ON

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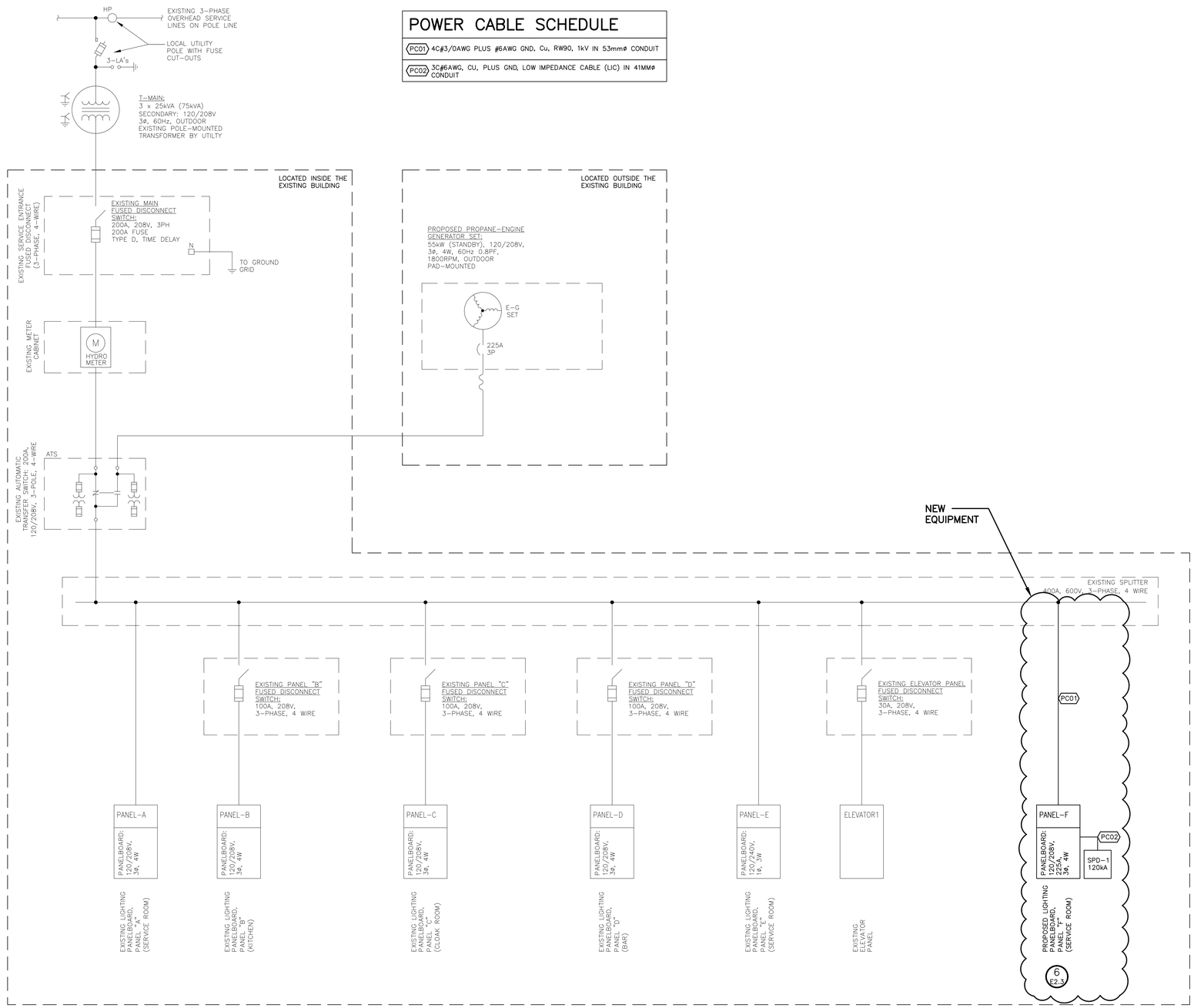
ELECTRICAL
EXISTING SINGLE LINE DIAGRAM

DESIGN: JL	FILE: 123056	DWG: **E2.1**
DRAWN: JL	DATE: NOV 2024	
CHECK: SRT	SCALE: AS SHOWN	

POWER CABLE SCHEDULE

PC01	4C#3/0AWG PLUS #6AWG GND, Cu, RW90, 1kV IN 53mmø CONDUIT
PC02	3C#6AWG, CU, PLUS GND, LOW IMPEDANCE CABLE (LIC) IN 41MMø CONDUIT



1 PROPOSED SINGLE LINE DIAGRAM
E2.2 – NTS

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BENCHMARKS

NOTES

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR PERMIT AND TENDER	NOV/24

ENGINEER STAMP

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MILFORD BAY COMMUNITY CENTRE
MILFORD BAY, ON

TATHAM ENGINEERING

ELECTRICAL
PROPOSED SINGLE LINE DIAGRAM

DESIGN: JL	FILE: 123056	DWG: **E2.2**
DRAWN: JL	DATE: NOV 2024	
CHECK: SRT	SCALE: AS SHOWN	

PANEL TAG NAME: 'PB–A'

120/208V, 3PH, 4W
MAINS: 200A, Cu
MOUNTING: WALL
LOCATION: SERVICE ROOM

LOAD–W	CIRCUIT DESCRIPTION	PROT.		CIRCUITS		PROT.	CIRCUIT DESCRIPTION	LOAD–W
	SPARE	15A	1	A	19	15A	SPARE	
	ELEVATOR CAB	15A	2	B	20	20A / 2P	WATER HEATER	
	FURNACE	15A	3	C	21			
	GENERATOR BLOCK HEATER	15A	4	A	22	20A / 2P	WATER HEATER	
		2P	5	B	23			
	UV LIGHT	15A	6	C	24	20A / 2P	MAIN ENTRANCE HEATER	
	UPSTAIRS DAMPER	15A	7	A	25			
	BASEMENT LIGHTS	15A	8	B	26	15A	BASEMENT LIGHTS & PLUGS	
	BASEMENT LIGHTS	15A	9	C	27	15A	FURNACE ROOM & HALLWAY LIGHTS	
	MENS & WOMENS WASHROOM HEATERS	30A / 2P	10	A	28	15A	LIBRARY & BOARD ROOM LIGHTS	
			11	B	29	15A	FIRE ALARM	
	LIBRARY LIGHTS & STAIR WELL	15A	12	C	30	20A / 2P	SEWAGE PUMP	
	DOWNSTAIRS WASHROOMS, JANITOR & ELEVATOR ROOMS	15A	13	A	31			
	WATER PUMP	30A / 2P	14	B	32	20A / 2P	NORTH ENTRANCE HEATER	
			15	C	33			
	EXHAUST FAN	30A / 2P	16	A	34	20A / 2P	LIBRARY ENTRANCE HEATER	
			17	B	35			
	SPACE		18	C	36		SPACE	

1 E2.3 LIGHTING PANEL PB–A – EXISTING CONDITIONS AND MODIFICATIONS

– NTS
– PANEL LOCATED IN SERVICE ROOM

PANEL TAG NAME: 'PB–B'

120/208V, 3PH, 4W
MAINS: 200A, Cu
MOUNTING: WALL
LOCATION: KITCHEN

LOAD–W	CIRCUIT DESCRIPTION	PROT.		CIRCUITS		PROT.	CIRCUIT DESCRIPTION	LOAD–W
	KITCHEN LIGHT	15A	1	A	13	15A	N/A	
	KITCHEN PLUG	20A / 2P	2	B	14	50A / 2P	DISHWASHER 3	
			3	C	15			
	KITCHEN PLUG	20A / 2P	4	A	16	20A	SPARE	
			5	B	17	15A	DOUBLE FRIDGE	
	FRIDGE	20A / 2P	6	C	18	20A / 2P	KITCHEN PLUG	
			7	A	19			
	KITCHEN EXHAUST FAN	15A	8	B	20	20A / 2P	KITCHEN PLUG	
	SPACE		9	C	21			
	NA	30A / 2P	10	A	22	20A / 2P	KITCHEN PLUG	
			11	B	23			
	SPACE		12	C	24	15A	EXHAUST FAN MEETING ROOM	

2 E2.3 LIGHTING PANEL PB–B – EXISTING CONDITIONS AND MODIFICATIONS

– NTS
– PANEL LOCATED IN KITCHEN

PANEL TAG NAME: 'PB–C'

120/208V, 3PH, 4W
MAINS: 200A, Cu
MOUNTING: WALL
LOCATION: CLOAK ROOM

LOAD–W	CIRCUIT DESCRIPTION	PROT.		CIRCUITS		PROT.	CIRCUIT DESCRIPTION	LOAD–W
	SPARE	15A	1	A	13	15A	WALL PLUG MAIN HALL RIGHT SIDE	
	LIGHTS MAIN HALL	20A / 2P	2	B	14	20A / 2P	OUTSIDE LIGHTS	
			3	C	15			
	POT LIGHTS LEFT SIDE	15A	4	A	16	15A	ENTRANCE HALL LIGHTS	
	MENS WASHROOM	15A	5	B	17	15A	POT LIGHTS RIGHT SIDE	
	WALL PLUG MAIN HALL	15A	6	C	18	15A	N/A	
	LADIES WASHROOM	15A	7	A	19	15A	COAT ROOM	
	WASHROOM	15A	8	B	20	15A	MAIN HALL LIGHTS LEFT	
	WASHROOM	15A	9	C	21	15A	MAIN HALL LIGHTS RIGHT	
	N/A	15A	10	A	22	15A	JANITOR CLOSET	
	N/A	15A	11	B	23	15A	EXIT LIGHTS	
	N/A	15A	12	C	24	15A	N/A	

3 E2.3 LIGHTING PANEL PB–C – EXISTING CONDITIONS AND MODIFICATIONS

– NTS
– PANEL LOCATED IN CLOAK ROOM

PANEL TAG NAME: 'PB–D'

120/208V, 1PH, 3W
MAINS: 125A, Cu
MOUNTING: WALL
LOCATION: BAR

LOAD–W	CIRCUIT DESCRIPTION	PROT.		CIRCUITS		PROT.	CIRCUIT DESCRIPTION	LOAD–W
	N/A	15A	1	A	13	15A	PLUG BY SINK	
	PLUG ON STAGE LEFT SIDE	15A	2	B	14	15A	FRIDGE AND LIGHTS	
	PLUG ON STAGE RIGHT SIDE	15A	3	C	15	15A	PLUGS ABOVE STAGE	
	STAIRWAY OFF STAGE	15A	4	A	16	15A	ABOVE STAGE POT LIGHTS	
	PLUG IN FRONT OF STAGE	15A	5	B	17	15A	LEFT & RIGHT STAGE BACK WALL PLUGS	
	DOWNSTAGE CHAIR STORAGE	15A	6	C	18	15A	N/A	
	SPACE	15A	7	A	19		SPACE	
	SPACE	15A	8	B	20		SPACE	
	SPACE	15A	9	C	21		SPACE	
	DAMPER MOTOR	15A	10	A	22		SPACE	
	EXHAUST FAN	15A	11	B	23		SPACE	
	N/A	15A	12	C	24		SPACE	

4 E2.3 LIGHTING PANEL PB–D – EXISTING CONDITIONS AND MODIFICATIONS

– NTS
– PANEL LOCATED IN BAR

NEW EQUIPMENT

PANEL TAG NAME: 'PB–F'

120/208V, 3PH, 4W
MAINS: 225A, Cu
MAIN BREAKER 200A
MOUNTING: WALL
LOCATION: SERVICE ROOM

LOAD–W	CIRCUIT DESCRIPTION	PROT.		CIRCUITS		PROT.	CIRCUIT DESCRIPTION	LOAD–W
	SPARE	15A	1	A	2	15A / 2P	ENERGY RECOVERY VENTILATOR ERV–1	2300
460	FORCED FAN HEATER FFH–1 & FFH–4	15A	3	B	4			
460	FORCED FAN HEATER FFH–2 & FFH–3	15A	5	C	6	20A / 2P	ENERGY RECOVERY VENTILATOR ERV–2	3500
460	FORCED FAN HEATER FFH–5 & FFH–6	15A	7	A	8			
690	FORCED FAN HEATER FFH–7, FFH–8 & FFH–9	15A	9	B	10	15A	HEATING BOILER B–1	1500
230	FORCED FAN HEATER FFH–10	15A	11	C	12	20A	HEATING BOILER B–2	1800
460	FORCED FAN HEATER FFH–11 & FFH–12	15A	13	A	14	15A	HOT WATER TANK HW–1	600
230	FORCED FAN HEATER FFH–13	15A	15	B	16	15A	HEAT EXCHANGER PUMP P–1	100
460	FORCED FAN HEATER FFH–14 & FFH–15	15A	17	C	18	15A	HEAT EXCHANGER PUMP P–2	100
230	FORCED FAN HEATER FFH–16	15A	19	A	20	15A	SECONDARY HYDRONIC SYSTEM PUMP P–3	600
100	CONTROL PANEL FOR CU–1	15A	21	B	22	15A	HOT WATER RE–CIRCULATION PUMP RP–1	100
100	CONTROL PANEL FOR CU–2	15A	23	C	24	15A	CONTROL PANEL FOR ERV–1	200
100	CONTROL PANEL FOR AHU–1	15A	25	A	26	15A	CONTROL PANEL FOR ERV–2	200
6800	AIR HANDLING UNIT AHU–1	35A / 3P	27	B	28	15A	AIR HANDLING UNIT AHU–2	700
			29	C	30	15A	SPARE	
			31	A	32	15A	SPARE	
12550	CONDENSING UNIT CU–1	50A / 3P	33	B	34	60A / 3P	SURGE PROTECTION DEVICE SPD–1 2	
			35	C	36			
			37	A	38			
2640	CONDENSING UNIT CU–2	20A / 2P	39	B	40	20A	SPARE	
			41	C	42	20A	SPARE	

6 E2.3 PROPOSED LIGHTING PANEL PB–D 1 4

– NTS
– PANEL LOCATED IN CLOAK ROOM

PANEL TAG NAME: 'PB–E'

120/240V, 1PH, 3W
MAINS: 125A, Cu
MAIN BREAKER 100A
MOUNTING: WALL
LOCATION: SERVICE ROOM

LOAD–W	CIRCUIT DESCRIPTION	PROT.		CIRCUITS		PROT.	CIRCUIT DESCRIPTION	LOAD–W
	SPARE		1	A	2		SPARE	
	A/C	40A / 2P	3	B	4	20A / 2P		
			5	A	6			
	AEC MACHINE	15A	7	B	8	15A	SECURITY ALARM PANEL	
	SPACE		9	A	10		SPACE	
	SPACE		11	B	12		SPACE	
	SPACE		13	A	14		SPACE	
	SPACE		15	B	16		SPACE	
	SPACE		17	A	18		SPACE	
	SPACE		19	B	20		SPACE	
	SPACE		21	A	22		SPACE	
	SPACE		23	B	24		SPACE	

5 E2.3 LIGHTING PANEL PB–E – EXISTING CONDITIONS AND MODIFICATIONS

– NTS
– PANEL LOCATED IN SERVICE ROOM

REMOVAL NOTES

1. EXISTING EQUIPMENT AND ASSOCIATED CONDUIT, WIRING, CABLES AND RACEWAYS TO BE REMOVED. CONTRACTOR TO DISPOSE OF ALL EQUIPMENT.

   CONTRACTOR TO TRACE EXISTING LIGHTING PANELS AND WIRING PRIOR TO PERFORMING WORK TO ENSURE PANELS LABELS MATCHES ACTUAL WIRING.

2. EXISTING DISHWASHER TO REMAIN. CONTRACTOR TO PROVIDE A SHUNT TRIP BREAKER.

NEW INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE NEW CONDUIT AND WIRING TO ALL FIELD DEVICES.
   PANELBOARD GENERAL NOTES:
   1. BREAKER SIZES LISTED ARE PROVIDED AS A GENERAL GUIDE. PRIOR TO INSTALLATION, CONTRACTOR TO CONFIRM ALL BREAKER SIZES WITH FINAL EQUIPMENT LOADS.
   2. CONTRACTOR TO SIZE ALL FEEDER CABLES, WIRING AND CONDUIT BASED ON ONTARIO ELECTRICAL SAFETY CODE – LATEST EDITION. INCLUDE INSULATED GROUND CONDUCTOR IN ALL CONDUIT RACEWAYS.
   3. CONTRACTOR TO VERIFY ALL PANEL CIRCUITS AND UPDATE PANEL SCHEDULE AS REQUIRED WITH TYPED DIRECTORY.
2. CONNECT POWER LEADS "AS SHORT AND STRAIGHT AS POSSIBLE" BETWEEN PANELBOARD PB–F AND SPD–1 SURGE SUPPRESSION PANEL. LOCATE SPD–1 TO THE LEFT OF THE PANELBOARD AND PROVIDE LOW IMPEDANCE CABLE AS SPECIFIED IN SPECIFICATION 16400.
   SPD–1 UNIT AND CABLE AS FOLLOWS:
   - 4C#6AWG, Cu PLUS GND. LOW IMPEDANCE CABLE (LIC) IN 41mm RPVC
   - SPD1: TK–120–3Y208–FL, FOR 120/208V 3ϕ WYE, 4W+G
3. DISHWASHER BREAKER TO BE SHUNT TRIPPED (S/T) BY LOAD SHED SIGNAL OF ATS WHEN LOSS OF NORMAL POWER IS DETECTED.
4. CONTRACTOR TO PROVIDE CONDUIT AND CABLE TO ALL NEW HVAC UNITS. CONTRACTOR IS RESPONSIBLE FOR SITE VERIFICATION OF ROUTING AND LENGTH PRIOR TO SUBMITTED TENDER BID OR QUOTE.

BENCHMARKS

NOTES

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR PERMIT AND TENDER	NOV/24

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
S. R. S. TAYLOR
100518503
13NOV'24
PROVINCE OF ONTARIO

MILFORD BAY COMMUNITY CENTRE
MILFORD BAY, ON

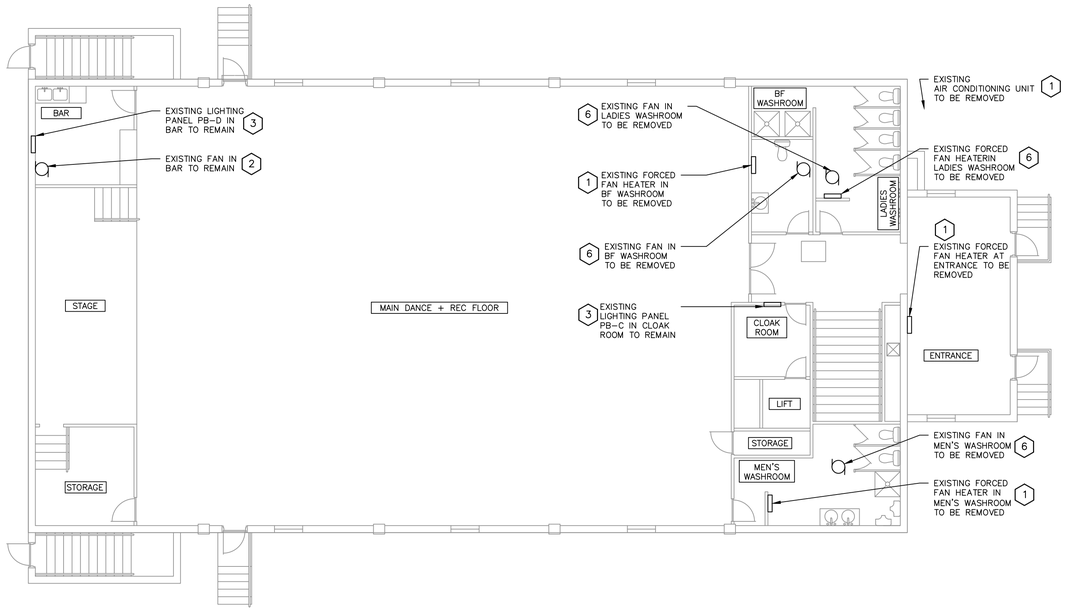
TATHAM ENGINEERING

ELECTRICAL
LIGHTING PANEL SCHEDULES

DESIGN: JL	FILE: 123056	DWG: E2.3
DRAWN: JL	DATE: NOV 2024	
CHECK: SRT	SCALE: AS SHOWN	

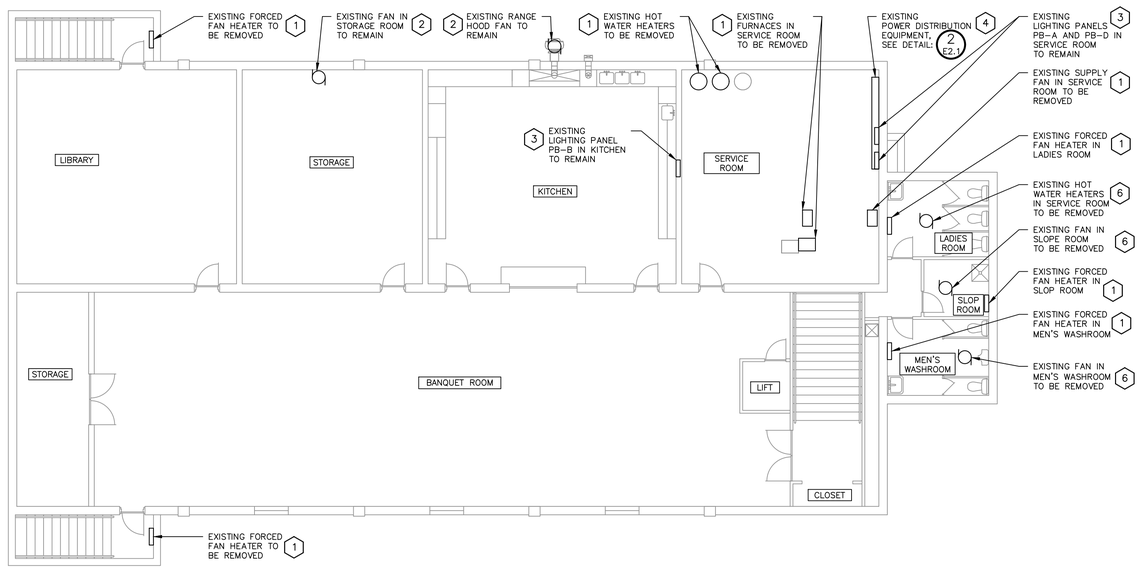
REMOVAL NOTES

1. EXISTING EQUIPMENT TO BE REMOVED. CONTRACTOR TO REMOVE ALL EXISTING EQUIPMENT, CONDUIT AND WIRING BACK TO ASSOCIATED PANEL(S).
2. EXISTING EQUIPMENT TO REMAIN.
3. EXISTING LIGHTING PANELS TO REMAIN. REFER TO CONTRACT DRAWINGS FOR REQUIRED REVISIONS TO THE EXISTING LIGHTING PANELS.
4. EXISTING POWER DISTRIBUTION EQUIPMENT TO REMAIN. REFER TO CONTRACT DRAWINGS FOR REQUIRED REVISIONS TO THE EXISTING POWER DISTRIBUTION EQUIPMENT.
5. REFER TO PANEL SCHEDULES ON DRAWING E2.3 FOR EQUIPMENT REMOVALS.
6. EXISTING FAN TO BE REMOVED. CONTRACTOR TO REMOVE CONDUIT AND WIRING BACK TO ASSOCIATED SWITCH.



1 E2.4 **UPPER-LEVEL LAYOUT – EXISTING CONDITIONS** 5

– SCALE: 1/8" = 1'0"



2 E2.4 **BASEMENT LAYOUT – EXISTING CONDITIONS** 5

– SCALE: 1/8" = 1'0"

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BENCHMARKS

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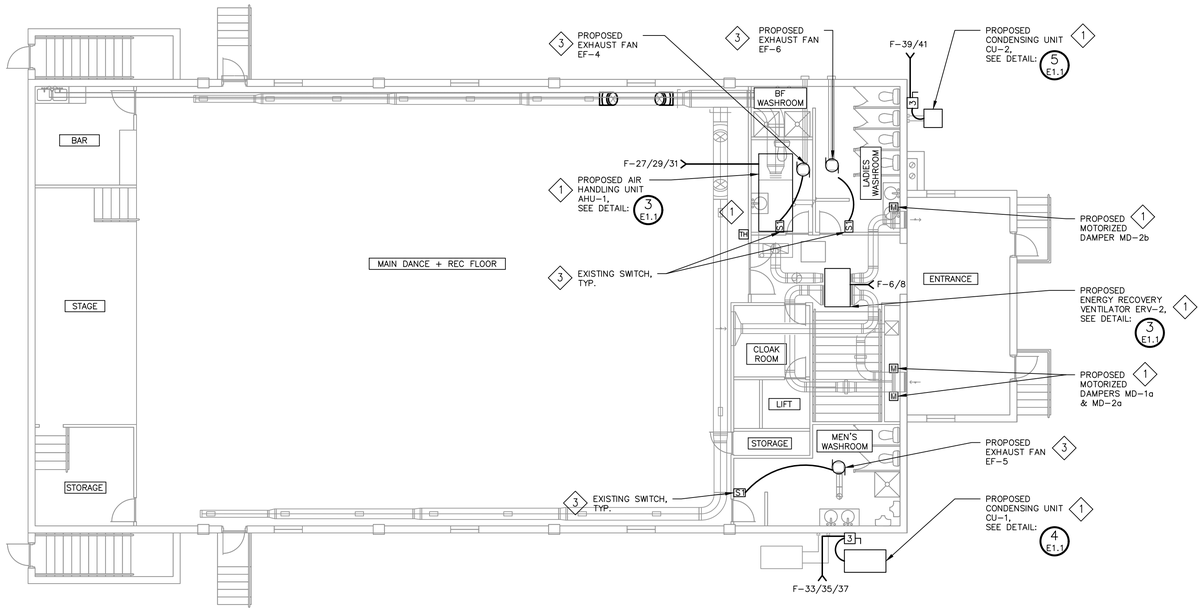
MILFORD BAY, ON

TATHAM ENGINEERING

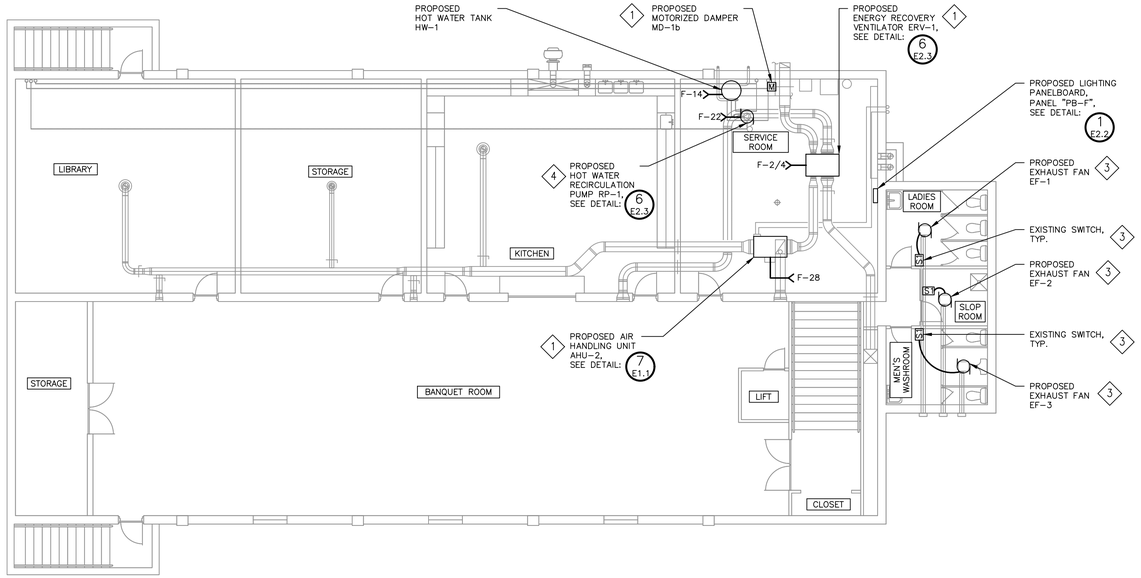
ELECTRICAL
BUILDING LAYOUT
EXISTING CONDITIONS

DESIGN: JL	FILE: 123056	DWG: **E2.4**
DRAWN: JL	DATE: NOV 2024	
CHECK: SRT	SCALE: AS SHOWN	



1 E2.5 UPPER-LEVEL HVAC LAYOUT – PROPOSED CONDITIONS ◇2

– SCALE: 1/8" = 1'0"



2 E2.5 BASEMENT HVAC LAYOUT – PROPOSED CONDITIONS ◇2

– SCALE: 1/8" = 1'0"

NOTES

1. EQUIPMENT INSTALLED BY DIVISION 15 WITH CONDUIT AND WIRING PROVIDED BY DIVISION 16. FINAL WIRING AND CONTROLS REQUIREMENT FOR EQUIPMENT TO BE CONFIRMED DURING CONSTRUCTION WITH EQUIPMENT SHOP DRAWING.
2. NOT ALL WIRING REQUIREMENTS BETWEEN HVAC UNITS ARE SHOWN. CONTRACTOR TO PROVIDE CONDUIT AND WIRING AS REQUIRED TO SUIT INSTALLATION AND TO CONNECT ALL UNITS AS REQUIRED. CONTRACTOR TO PROVIDE CONDUIT AND WIRING TO ALL NECESSARY CONTROLLERS AND THERMOSTATS. CONTRACTOR TO REFER TO EQUIPMENT SHOP DRAWINGS AND MANUFACTURERS INSTRUCTIONS FOR REQUIRED WIRING. PROVIDE BONDING CONNECTION OF ALL UNITS TO GROUND, PER MANUFACTURERS RECOMMENDATIONS.
3. CONTRACTOR TO PROVIDE THE FAN AND ASSOCIATED WIRING. CONTRACTOR IS RESPONSIBLE TO VERIFY THE FAN VOLTAGE. REUSE OF THE EXISTING FAN SWITCH TO POWER NEW FAN IS PERMITTED. CONTRACTOR TO INVESTIGATE EXISTING FAN SWITCH AND CIRCUIT FOR SUITABILITY OF REUSE AND PROVIDE A NEW CONDUIT AND WIRING AS NECESSARY.
4. CONTRACTOR TO PROVIDE A 15A RECEPTACLE FOR PROPOSED HOT WATER RECIRCULATION PUMP RP-1.

BENCHMARKS

NOTES

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PROVINCE OF ONTARIO

MILFORD BAY COMMUNITY CENTRE
MILFORD BAY, ON

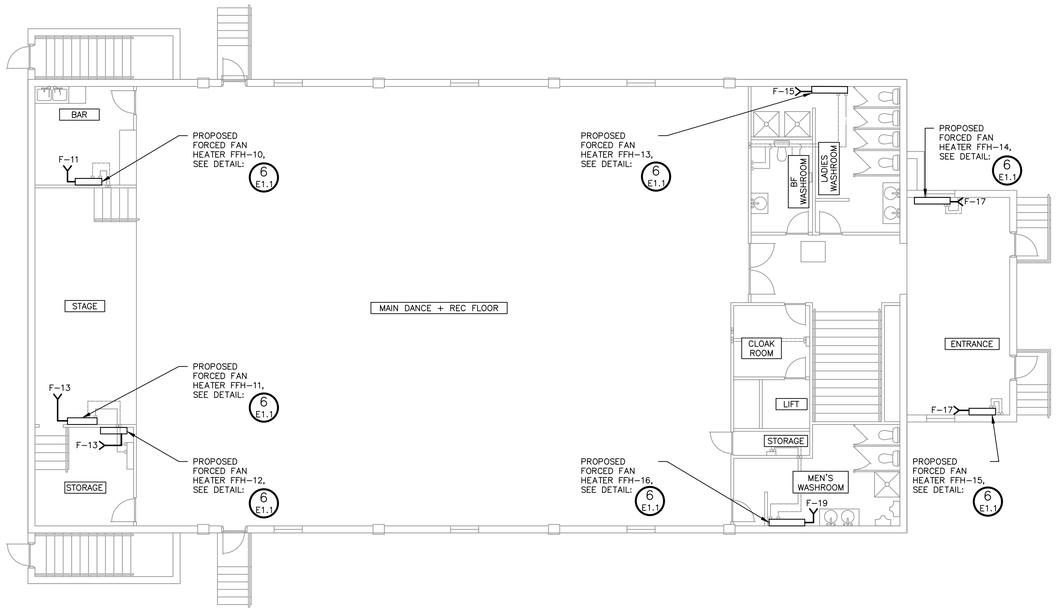
ELECTRICAL
HVAC BUILDING LAYOUT
PROPOSED CONDITIONS

TATHAM ENGINEERING

DESIGN: JL	FILE: 123056	DWG: **E2.5**
DRAWN: JL	DATE: NOV 2024	
CHECK: SRT	SCALE: AS SHOWN	

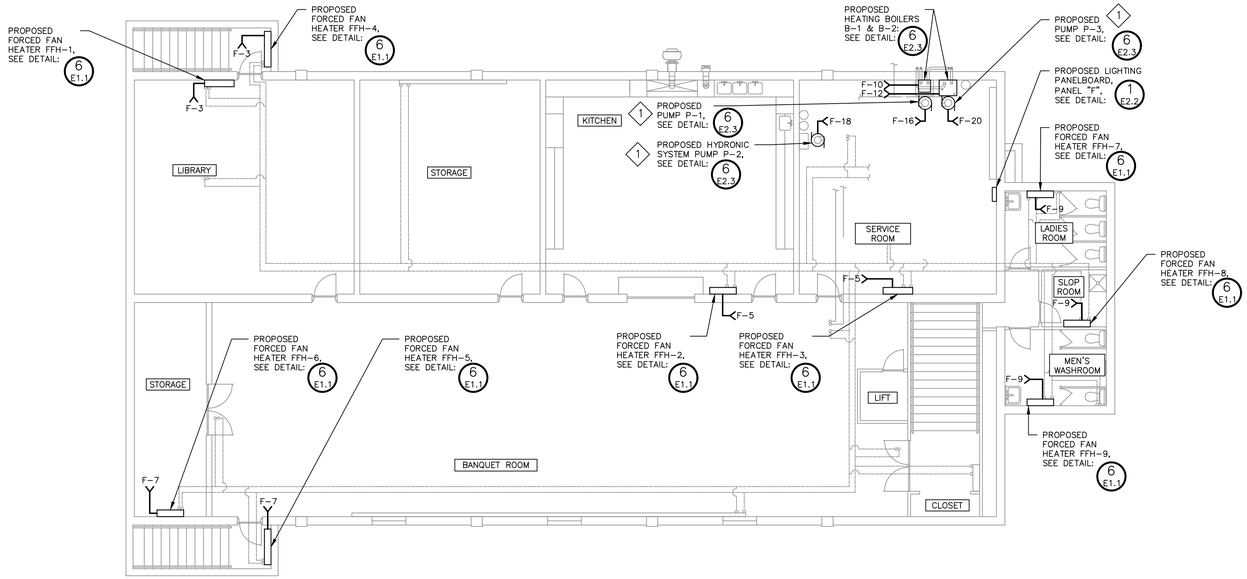
NOTES

1. EQUIPMENT INSTALLED BY DIVISION 15 WITH CONDUIT AND WIRING PROVIDED BY DIVISION 16. FINAL WIRING REQUIREMENT FOR EQUIPMENT TO BE CONFIRMED DURING CONSTRUCTION WITH EQUIPMENT SHOP DRAWING.
2. NOT ALL WIRING REQUIREMENTS BETWEEN UNITS ARE SHOWN. CONTRACTOR TO PROVIDE CONDUIT AND WIRING AS REQUIRED TO SUIT INSTALLATION AND TO CONNECT ALL UNITS AS REQUIRED. CONTRACTOR TO PROVIDE CONDUIT AND WIRING TO ALL NECESSARY CONTROLLERS, THERMOSTATS AND PUMPS. CONTRACTOR TO REFER TO EQUIPMENT SHOP DRAWINGS AND MANUFACTURERS INSTRUCTIONS FOR REQUIRED WIRING. PROVIDE BONDING CONNECTION OF ALL UNITS TO GROUND, PER MANUFACTURERS RECOMMENDATIONS.



1 E2.6 **UPPER-LEVEL HYDRONIC LAYOUT – PROPOSED CONDITIONS** 2

– SCALE: 1/8" = 1'0"



2 E2.6 **BASEMENT HYDRONIC LAYOUT – PROPOSED CONDITIONS** 2

– SCALE: 1/8" = 1'0"

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BENCHMARKS

NOTES

No.	REVISION DESCRIPTION	DATE
1.	ISSUED FOR PERMIT AND TENDER	NOV/24

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
S. R. S. TAYLOR
100518503
13NOV'24
PROVINCE OF ONTARIO

MILFORD BAY COMMUNITY CENTRE
MILFORD BAY, ON

ELECTRICAL
HYDRONIC BUILDING LAYOUT
PROPOSED CONDITIONS

TATHAM ENGINEERING

DESIGN: JL	FILE: 123056	DWG: **E2.6**
DRAWN: JL	DATE: NOV 2024	
CHECK: SRT	SCALE: AS SHOWN	

PART 1 – GENERAL

1.1 Scope of Work

.1 Provide all products and services mentioned or shown in the Contract Drawings with all incidentals necessary for the Milford Bay Community Centre site.

.2 Provide all removal work and services mentioned or shown in the the Contract Drawings.

.3 Contractor will be responsible for all repairs during the warranty period.

.4 Contractor is responsible to review all HVAC shop drawings and consult with supplier prior to installation.

.5 Contractor to provide an installation with all necessary wiring, connections and conduit for proposed lighting panel and modifications to an existing lighting panels. Contractor to verify all panel circuits and update panel schedule as required with typed directory.

.6 Provide dishwasher breaker to be shunt tripped by load shed signal of ATS when loss of normal power is detected.

.7 Provide HVAC unit timer control panels mentioned or shown in the Contract Drawings.

.8 Provide local disconnect switches for HVAC equipment mentioned or shown in the Contract Drawings. Disconnect Nema ratings to comply with latest edition of OESC based on environment of disconnect installation location.

.9 Provide and pay for all necessary permits and locates prior to beginning work.

.10 Submit shop drawings for approval of all equipment and components for review by Consultant prior to ordering.

.11 Provide and pay for all necessary ESA inspections, with a final certificate. Submit copy to Consultant for review.

.12 All fees for Electrical Safety Authority to be included in this contract.

.13 All distribution equipment as noted on drawings in provided under this contract.

.14 Provide all required equipment, verification, testing and third-party commissioning as required by this specification.

.15 As outlined in the tender form certain aspects of this contract will be performed in phases to allow other disciplines to complete their work. Contractor to allow for multiple phases of the site work, and all costs are to be included in this contract.

.16 Contractor is responsible for preparation of As-built drawings and submit ESA Certificate as part of Substantial Performance.

1.2 Standards

.1 Provide all products and services in accordance with the latest addition of the following codes and standards:
- .1 Ontario Electrical Safety Code, latest edition applicable.
- .2 Canadian Standards Association.
- .3 Ontario Building Code, Latest Edition.

1.3 Permits, Fees and Inspection

.1 Coordinate all requirements for electrical inspection with local hydro authority.

.2 Provide all licenses, permits and certificates required by the local authorities at no additional expense.

.3 Arrange and pay for inspection(s) of the Works by the authorities having jurisdiction.

.4 Upon completion of the Work, provide the Consultant with final, unconditional certificates of approval by the local inspection authorities.

1.4 Examination of the Site and Contract Documents

.1 Examine Drawings and Specifications of the complete Project and become familiar with all local site conditions.

.2 Submission of Tender confirms the Contractor accepts the Contract and site conditions without qualifications.

.3 Failure to determine the existing conditions or the nature of the construction shall not be a basis for granting compensation.

1.5 Construction Drawings

.1 The electrical drawings are diagrammatic, intended to convey the scope of work and indicate general arrangements of equipment. **Do not scale drawings unless a scale is identified.**

.2 Have the location of panels, conduits, luminaires, outlets and other equipment shown in the drawings reviewed by the Consultant before proceeding with the installation. Inform the Consultant of significant changes in location of equipment to meet field conditions and receive their authorization before proceeding. Obtain from the site Consultant the location of equipment not definitely located in the drawings.

.3 Locations of panels, outlets, luminaires and other equipment indicated in the drawings are approximate and may be subject to revision found necessary or desirable by the Consultant at the time the work is installed. The Consultant may at their discretion request the relocation of electrical equipment within three metres of that shown prior to roughing in. This relocation shall be at no additional cost.

.4 Drawings do not generally indicate the number of wires within conduits for outlets and fixtures. Provide the correct wire size and quantity as required by the indicated circuitry and control diagrams.

1.6 Shop Drawings

.1 Submit shop drawings in accordance with general Contract Conditions and include arrangement drawings, bill of materials, diagrams, nameplate drawings and product data as applicable for the following equipment:
- .1 Panelboard and breakers
- .2 Disconnect switches

.2 Shop drawings shall provide all necessary details and information:
- .1 to allow the Consultant to assess that the equipment is in accordance with the Contract requirements;
- .2 to be suitable for binding into the operations and maintenance manuals; and
- .3 to be stamped and signed by the Contractor, thereby indicating that they have checked that the equipment offered conforms to the requirements of the Contract Documents.

.3 Product data sheets shall include the name of the manufacturer and be clearly marked to show which items, features and options are offered.

.4 Shop drawings that are not presented as required will be returned for revision and resubmission.

.5 Shop drawings will be returned marked 'Non Conforming – Revise and Resubmit,' 'Conforms with Design Intent with Revisions Noted' or 'Conforms with Design Intent'. Do not procure or start manufacture before receipt of submitted drawings stamped as 'Conforms with Design Intent with Revisions Noted' or 'Conforms with Design Intent' by the Consultant.

.6 The review of shop drawings by the Consultant does not relieve the Contractor of their responsibilities for compliance with the Contract Documents.

1.7 Construction Record Drawings (As Builts)

.1 Keep one set of all applicable contract (including updates) and shop drawings at the site.

.2 Ensure that the latest issue drawings are marked up to reflect the work as installed and have these available for the Consultant's review at site.

.3 Upon completion of the work, transfer all revisions to a clean set of prints and submit them to the Consultant as part of the final job documentation.

1.8 Operating and Maintenance Manual

.1 Produce operating and maintenance manuals for all work and submit one complete preliminary PDF for the Consultant's review.

.2 Submit two final approved hard copies and one PDF of the operating and maintenance manuals at project completion.

.3 Coordinate installation of materials and equipment with work of other trades. Report any conflicts to the Consultant.

.4 Coordinate with local utilities (hydro and telephone) and obtain all necessary information to ensure proper functioning of all the installed equipment. Notify the Consultant in writing of any resultant changes.

.5 Relocate equipment and/or material installed, but not coordinated with the work of other trades as directed by the Consultant, at no extra cost.

.6 Confirm with the local utility all aspects of primary and secondary power supply, including trenching, cabling, grounding and metering.

1.9 Finishes

.1 Shop-finish metal enclosures by application of rust resistant primer inside and out, and at least two coats of finishing enamel.

.2 Clean and touch up any surfaces on shop-painted surfaces marred during shipment or installation with paint selected to match the original.

.3 Wire brush and prime using a zinc-rich coating on any non-coated steel hangers, racks and fasteners to prevent rusting.

1.10 Equipment Identification

.1 Provide nameplates for all electrical equipment listing equipment identifier and function.

.2 Nameplates:
- .1 Lamicoid 3 mm thick plastic engraving sheet, black face, white ore, mechanically attached with stainless steel screws or rivets.

  NAMEPLATES:

  Size 1: 1 line, 3 mm high letters
  Size 2: 1 line, 6 mm high letters
  Size 3: 2 lines, 6 mm high letters
  Size 4: 1 line, 12 mm high letters
  Size 5: 2 lines, 12 mm high letters
  Size 6: 1 line, 25 mm high letters
  Size 7: 2 lines, 25 mm high letters

.3 Wording on nameplates to be approved by Engineer prior to manufacture.

.4 Allow for average of twenty-five (25) letters per nameplate.

.5 Identification to be English.

.6 Disconnects, starters and contactors: Size 4, indicate equipment description and voltage.

.7 Terminal cabinets, pull and junction boxes: Size 2, indicate panelboard system and voltage.

.8 Transformers: Size 5 indicate tag number, kVA capacity, phases, system primary and secondary voltages.

.9 Provide a typewritten circuit directory with clear plastic cover for each panel board in a suitable holder on the inside of each panel door. Indicate breaker circuit number, rating, load description, and associated load data. On outside of panel board door, indicate tag number, capacity, phases and voltages.

.10 For all buried incoming ducts provide a "buried cable" marker on the building where the buried service enters.

1.11 Fireproofing

.1 Where sleeves or openings are installed in walls, floors, roof or partitions to accommodate raceways, cables or bus duct, provide all necessary seals, fittings, barriers and fire-resistant materials to restore the installation to its original fire rating to the satisfaction of the Building Code, governing authorities and the Owner's insurance underwriters. Work To be completed by authorized fire proofing contractor.

PART 2 – PRODUCTS

2.1 Basic Materials

.1 Grounding
- .1 Ground and bond metallic water pipes and electrical equipment in accordance with hydro requirements.
- .2 Ground secondary surge protection to 3mx20mm galvanized steel ground rod buried at position of protective device without damage to other services.
- .3 Install an AC ground grid system as per section 10 of the Electrical Code.

.2 Conduits and Fittings
- .1 Minimum conduit size: 21mm. Solvent weld (glue) all PVC joints.
- .2 All conduits to be CSA approved, complies with CSA C22.2 No. 211.2-06.
- .3 Use EMT conduit for all for all non-hazardous areas, indoor wiring. Use rigid PVC conduit for all underground or below grade installations, UV sunlight resistant.
- .4 Use rigid galvanized steel threaded conduit in all hazardous or classified areas, and as required by Ontario Electrical Safety Code.
- .5 Rigid PVC conduit for direct buried and concrete encased duct banks, as indicated on drawings.
- .6 Rigid PVC Type DB2 conduit for conduit sizes greater than 78mm diameter, for direct buried and concrete encased duct banks.
- .7 Include fittings as required.
- .8 Fish cord: 6mm stranded nylon cord, tensile strength 5kN.

.3 Wire and Cable
- .1 Power distribution and lighting circuits. Single conductor stranded copper conductors, minimum #12AWG minimum with 600V Rated RW90 insulation for installation in wire-ways or conduit.
- .2 Power wiring to mechanical equipment: single conductor, Class B stranded copper, minimum size #12AWG minimum, 600V rated, RW90 insulation for installations in conduit. Include an insulated green conductor for ground wire.
- .3 Power wiring to all equipment: #12AWG minimum, solid copper, RW90, XLPE, two ground wires (1-bare, 1-insulated green), c/w interlocking aluminium armour and insulated grommets when entering boxes. Wiring must be CSA approved and equal to AC90 ISO-BX.
- .4 Size wiring as per electrical code for all loads, with minimum #12AWG wire size.
- .5 Control circuits (120V): single conductor, Class B standard copper, minimum size #14AWG, 600V rated, RW90 insulation for installations in conduit. Include an insulated green conductor for ground wire.
- .6 Contractor to verify voltage drop per rating for each load from panel board.

2.2 Disconnect Switches

.1 Fusible and non-fusible disconnect switch: size as indicated, enclosure rated for applicable area (see Clause 2.1).

.2 Service entrance as noted on drawings.

.3 Provision for padlocking in "on" and "off" switch position.

.4 Mechanically interlocked door to prevent opening when handle in ON position.

.5 Fuses: size as indicated.

.6 Fuse holders: suitable without adaptors, for type and size of fuse indicated.

.7 Quick-make, quick-break action, non-teasible mechanism with visible blade – dead front construction.

.8 ON-OFF switch position indication on switch enclosure cover.

.9 Early break auxiliary contact (switch), as indicated on drawings.

.10 Acceptable manufacturers: Allen-Bradley, Cutler-Hammer, Siemens, GE and Square-D (Schneider).

2.3 Power Panelboards

.1 Panelboards: product of one manufacturer.

.2 Designed for service entrance (as indicated) c/w main breaker rated 22kAIC. Main and feeder breakers must be series rated for 22kAIC.

.3 Panelboard; bus and feeder breakers rated for 10,000 A (symmetrical) interrupting capacity or as indicated.

.4 Sequence phase bussing with odd numbered breakers on left and even on right, with each breaker identified by permanent number identification as to circuit number and phase.

.5 Panelboards: voltage mains, number of circuits, and number and size of branch circuit breakers as indicated.

.6 Two keys for each panelboard (and key alike).

.7 Copper buses with neutral of same ampere rating as mains.

.8 Copper ground bar.

.9 Mains: suitable for bolt on breakers.

.10 Trim and door finish in accordance with Section 16010 – Electrical General Requirements.

.11 Base panelboards on CSA C22.2 No. 29 – specification.

.12 Panelboard Breakers:
- .1 Breakers with thermal and magnetic tripping in panelboards except as indicated otherwise.
- .2 Main breaker: separately mounted on top or bottom of panel to suit service and cable entry. When mounted vertically, down position should open breaker.
- .3 Lock on devices as indicated.
- .4 Bolt-on moulded case circuit breaker; quick-make, quick-break type, for manual and automatic operation with temperature compensation for 40°C ambient.
- .5 Common-trip breakers: with single handle for multi-pole applications.
- .6 Ground fault protection circuit breakers: Class A type, 120V AC, complete with automatic shunt trip, zero sequence transformer and facilities for testing and reset pushbuttons.

PART 3 – EXECUTION

3.1 Disconnect Switches

.1 Install disconnect switches complete with fuses as indicated.

.2 Provide all necessary mounting hardware.

.3 Provide disconnect switches – surface mounted on brick, concrete or block walls with 3 mm thick lead washers between enclosure and wall face.

.4 Mounting height: 1500 mm above finish floor level to top of switch enclosure.

.5 Provide a Nameplate: Size 4.

3.2 Power Panelboards

.1 Locate panelboards as indicated and mount securely, plumb, true and square, to adjoining surfaces.

.2 Install surface mounted panelboards on melamine backboards. Where practical, group panelboards on a common backboard.

.3 Mount panelboards to height required by code or as indicated.

.4 Connect loads to circuits. Perform a "load balance" check after all loads are connected.

.5 Connect neutral conductors to common neutral bus with respective neutral identified.

.6 Breaker sizes listed in the panelboard schedule(s) are provided as a general guide. Prior to installation, contractor to confirm all breaker sizes with final equipment loads

.7 Contractor to size all panelboard feeder wiring and conduit based on Ontario Electrical Safety Code - latest edition. Include insulated ground conductor in all conduit raceways.

.8 Provide a Nameplate: Size 4.

3.3 Disconnect Switches

.1 Install disconnect switches complete with fuses as indicated.

.2 Provide all necessary mounting hardware.

.3 Provide disconnect switches – surface mounted on brick, concrete or block walls with 3 mm thick lead washers between enclosure and wall face.

.4 Mounting height: 1500 mm above finish floor level to top of switch enclosure.

.5 Provide a Nameplate: Size 4.

3.4 Grounding

.1 Provide a complete grounding system in accordance with the code and any service having jurisdiction.

.2 Ground all electrical equipment, including distribution panels, lighting fixtures, motors, conduits, receptacles, wiring and control devices. Ensure conduits make a good mechanical connection at all points to maintain a continuous metallic ground throughout the complete system.

.3 Ground all plumbing and mechanical services inside buildings to ensure that no item of equipment is left electrically isolated.

.4 Provide ground bushings to all stubbed-up metallic conduits under panels and interconnect to ground bus with grounding conductor.

.5 Provide grounding electrodes in accordance with the requirements of the code and any service authority having jurisdiction.

.6 Provide separate insulated ground wire in all metal or plastic conduits buried in earth or installed in or below concrete slabs.

.7 Provide separate ground conductor through all flexible conduit connections.

3.5 Inspections

.1 Advise Engineer so that he may inspect ducts prior to placing and be present during placement of concrete and clean out.

3.6 Cable Installation in Ducts

.1 Install cables as indicated in ducts.

.2 Do not pull spliced cables inside ducts.

.3 Install multiple cables in duct simultaneously.

.4 Use CSA approved lubricants of type compatible with cable jacket to reduce pulling tension.

.5 To facilitate matching of colour coded multiconductor control cables reel off in same direction during installation.

.6 Before pulling cable into ducts and until cables properly terminated, seal ends of lead covered cables with wiping solder; seal ends of non leaded cables with moisture seal tape.

3.7 Testing and Commissioning

.1 Provide testing and commissioning of all electrical work. Notify the Consultant at least three working days before the testing and commissioning is scheduled to start. The Consultant may request repetition of any test for which due notification was not received.

.2 Provide insulation test using 500V megger on the utility supply cables.

BENCHMARKS

NOTES

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1.	ISSUED FOR PERMIT AND TENDER	NOV/24

ENGINEER STAMP

LICENSED PROFESSIONAL ENGINEER
S. R. S. TAYLOR
100518503
13NOV'24
PROVINCE OF ONTARIO

MILFORD BAY COMMUNITY CENTRE
MILFORD BAY, ON

ELECTRICAL SPECIFICATIONS SHEET

TATHAM ENGINEERING

DESIGN: JL	FILE: 123056	DWG:
DRAWN: JL	DATE: NOV 2024	**E3.1**
CHECK: SRT	SCALE: AS SHOWN	