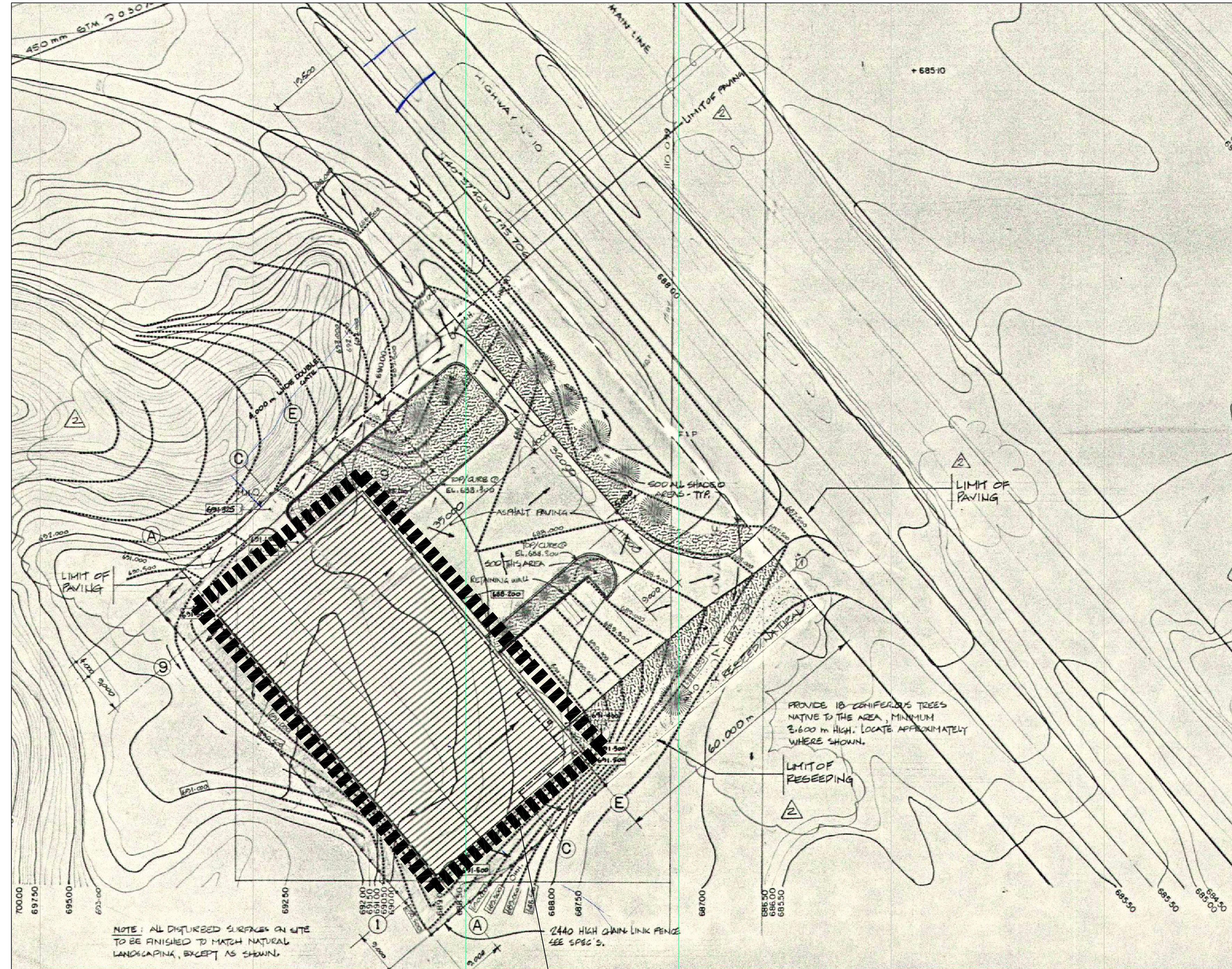


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1
M-01
SITE PLAN
SCALE: 1:100

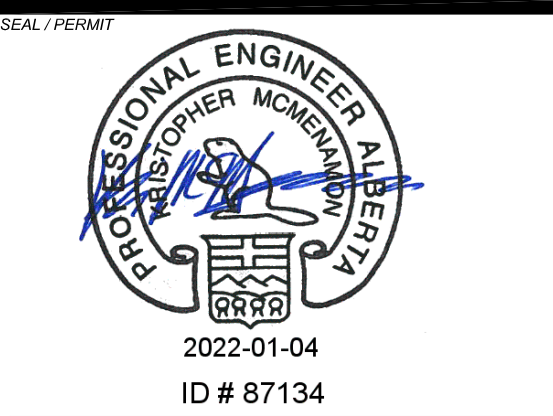
MECHANICAL LEGEND	
	NATURAL GAS LINE
	FLOOR DRAIN
	PIPE CAP
	PIPE CONTINUATION
	PIPE DROP
	PIPE RISER
	PIPE TEE
	GAS METER
	PIPE FLOW DIRECTION
	GATE VALVE
	PRESSURE REGULATING VALVE
	SUPPLY DUCTWORK (UP/DOWN)
	RETURN DUCTWORK (UP/DOWN)
	EXHAUST DUCTWORK (UP/DOWN)
	DIFFUSER (SQUARE CONE)
	RETURN GRILLE
	MOTORIZED DAMPER
	BALANCING DAMPER
	FIRE DAMPER
	EXISTING EQUIPMENT TO BE DEMOLISHED (SHOWN ON "DEMOLITION" PLAN)
	EXISTING EQUIPMENT TO REMAIN (SHOWN ON "NEW" PLAN)
	THERMOSTAT
	KEYNOTE
	DIFFUSER TYPE
	SIZE (mm)
	FLOW (L/s)
	EXHAUST DIFFUSER TYPE
	SIZE (mm)
	FLOW (L/s)
	EQUIPMENT TAG
	EQUIP. ABBREV.
	EQUIP. NUMBER
	YEAR/MON/DY
	NUMERICAL DATE FORMAT
	ABBREVIATIONS
E	EXISTING
EF	EXHAUST FAN
MAU	MAKEUP AIR UNIT

MECHANICAL DRAWING LIST		
SHEET NUMBER	SHEET TITLE	SCALE
M-01	SITE PLAN AND LEGEND	1:100
M-02	DEMOLITION PLAN-UPPER	1:100
M-02.1	DEMOLITION PLAN-LOWER	1:100
M-03	CONSTRUCTION PLAN - UPPER	1:100
M-03.1	CONSTRUCTION PLAN-LOWER	1:100
M-04	SCHEMATIC & SCHEDULE	1:100
M-05	SPECIFICATIONS	1:100



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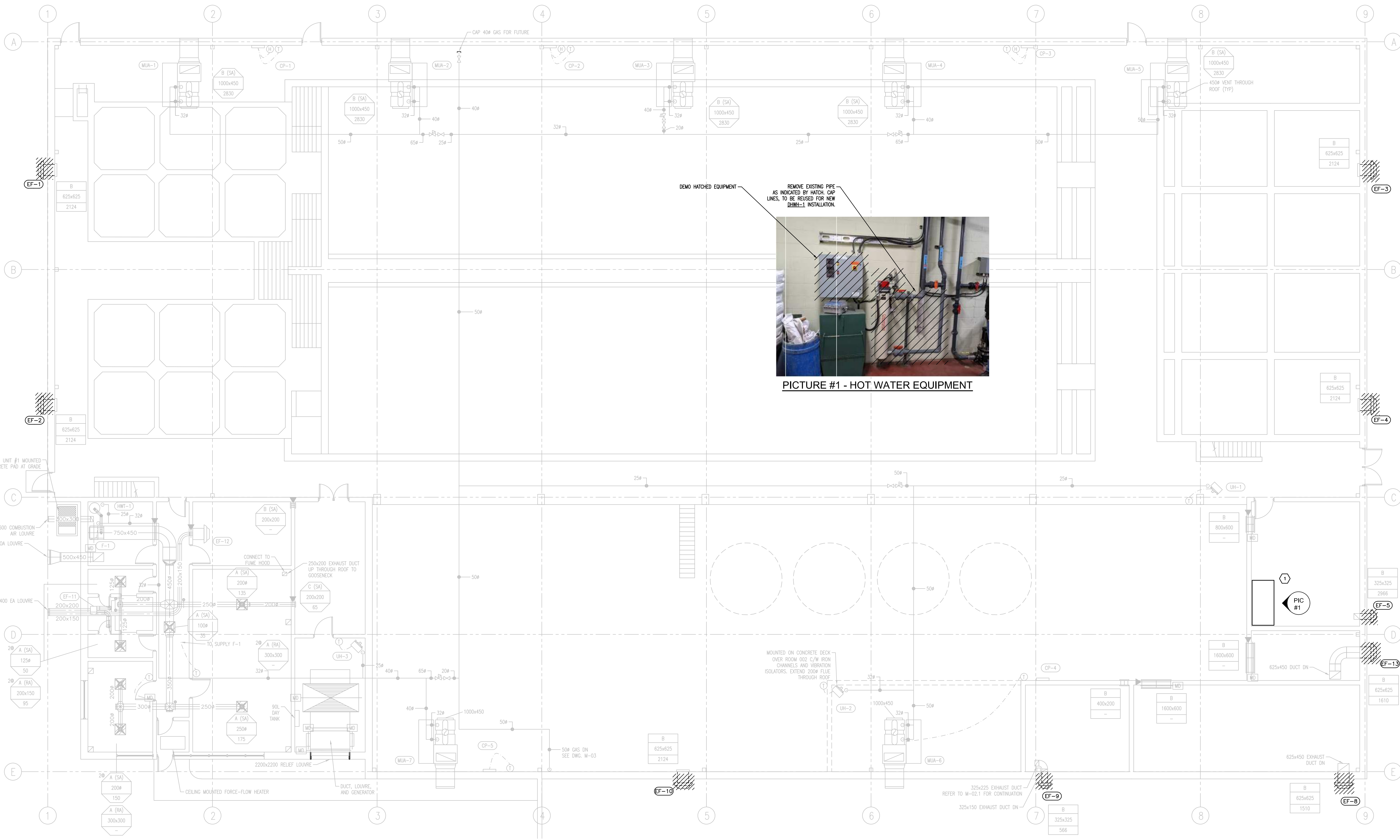
DRUMHELLER WATER TREATMENT PLANT
DRUMHELLER, ALBERTA

EXHAUST FAN REPLACEMENT

SITE PLAN

PROJECT # C21-3224
DRAWING NUMBER **M-01**

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REMOVE EXISTING PIPE AS INDICATED BY HATCH. CAP LINES, TO BE REUSED FOR NEW CHMT-1 INSTALLATION.



PICTURE #1 - HOT WATER EQUIPMENT

MOUNTED ON CONCRETE DECK OVER ROOM 022 C/W IRON CHANNELS AND VIBRATION ISOLATORS. EXTEND 200# FLUE THROUGH ROOF

1
M-02
DEMOLITION PLAN - UPPER
SCALE: 1:100

GENERAL NOTES:
1. ALL (EXCEPT EF-12) EXISTING, WALL MOUNTED EXHAUST FANS AND ASSOCIATED DAMPERS TO BE REMOVED AND REPLACED. INTERIOR GRILLES TO REMAIN.

KEYNOTES:
1 DEMOLISH EXISTING ON DEMAND ELECTRIC HOT WATER SYSTEM. SEE PIC #1. CAP EXISTING WATER LINE FOR RE-USE WITH NEW GAS FIRED WATER HEATER.



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PROJECT TITLE
DRUMHELLER WATER TREATMENT PLANT
DRUMHELLER, ALBERTA

EXHAUST FAN REPLACEMENT

DRAWING TITLE
DEMOLITION PLAN - UPPER PLAN


PROJECT #	DRAWING NUMBER
C21-3224	M-02

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TO BE REMOVED,
TYPICAL WHERE
INDICATED BY HATCH.

PICTURE #6
DEMOLITION PLAN - LOWER


 **1**
M-02.1 **DEMOLITION PLAN - LOWER**
SCALE: 1:100

GENERAL NOTES:
1. ALL (EXCEPT EF-12) EXISTING WALL MOUNTED EXHAUST FANS AND ASSOCIATED DAMPERS TO BE REMOVED AND REPLACED. INTERIOR GRILLES TO REMAIN.

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2022-01-04
ID # 87134

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Signature: *Vital Engineering*
Date: 2022-01-04

PERMIT NUMBER: P 9441
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PROJECT TITLE
DRUMHELLER WATER TREATMENT PLANT
DRUMHELLER, ALBERTA

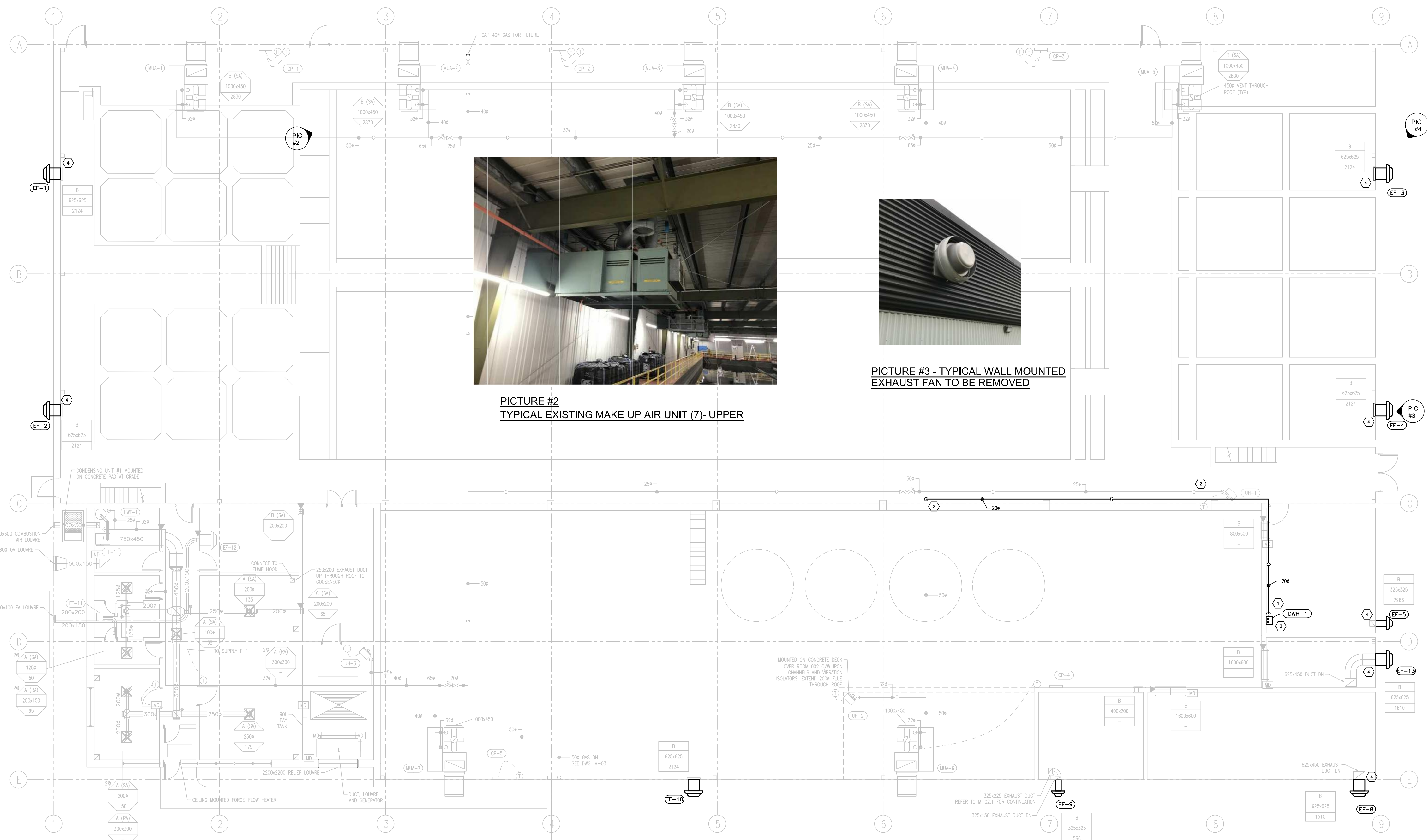
EXHAUST FAN REPLACEMENT

DRAWING TITLE
DEMOLITION PLAN - LOWER PLAN

PROJECT #	DRAWING NUMBER
C21-3224	M-02.1
DRAWN MB	
CHECKED KM	



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PICTURE #2
TYPICAL EXISTING MAKE UP AIR UNIT (7)- UPPER



PICTURE #3 - TYPICAL WALL MOUNTED EXHAUST FAN TO BE REMOVED

1
M-03
CONSTRUCTION PLAN - UPPER
SCALE: 1:100

GENERAL NOTES:
1. EXHAUST FANS AND ASSOCIATED DAMPERS TO CONNECT TO EXISTING DUCTWORK

KEYNOTES:
1. SEE DETAIL FOR DOMESTIC WATER HEATER ON DRAWING M-04.
2. TI-IN NEW 20" GAS LINE INTO EXISTING 50" GAS LINE.
3. CONCENTRIC VENTING & APPLIANCE VENTING AIR UP THROUGH ROOF.
4. TI-NEW EXHAUST FAN INTO EXISTING DUCT WORK AND GRILLE. TYP. CONTRACTOR TO RE-USE EXISTING WALL PENETRATIONS.

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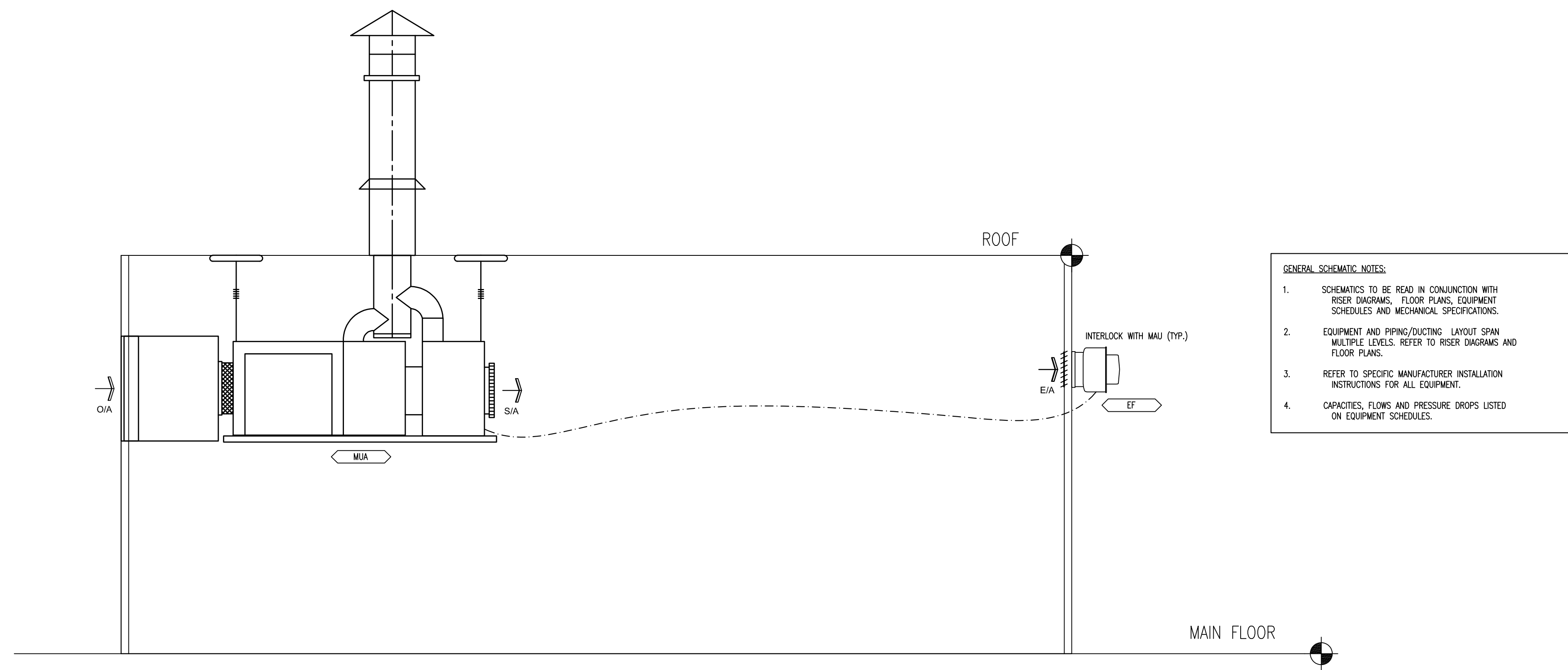
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PROJECT TITLE
DRUMHELLER WATER TREATMENT PLANT
DRUMHELLER, ALBERTA

EXHAUST FAN REPLACEMENT

CONSTRUCTION PLAN - UPPER PLAN

PROJECT # C21-3224
DRAWING NUMBER
DRAWN: MB
CHECKED: KM
M-03



- GENERAL SCHEMATIC NOTES:**
1. SCHEMATICS TO BE READ IN CONJUNCTION WITH RISER DIAGRAMS, FLOOR PLANS, EQUIPMENT SCHEDULES AND MECHANICAL SPECIFICATIONS.
 2. EQUIPMENT AND PIPING/DUCTING LAYOUT SPAN MULTIPLE LEVELS. REFER TO RISER DIAGRAMS AND FLOOR PLANS.
 3. REFER TO SPECIFIC MANUFACTURER INSTALLATION INSTRUCTIONS FOR ALL EQUIPMENT.
 4. CAPACITIES, FLOWS AND PRESSURE DROPS LISTED ON EQUIPMENT SCHEDULES.

1 MIXED AIR UNIT/EXHAUST FAN SCHEMATIC
M-04 SCALE: 1:100

EXHAUST FAN SCHEDULE

TAG	MODEL	MANUFACTURER	SERVICE	TYPE	MOUNTING	CAPACITY			ESP	DRIVE	MOTOR			NOTES
						CFM	L/s	in			RPM	HP	V-PH	
EF-1	CUBE-240-VGD-7	GREENHECK	UPPER	SIDE WALL DISCHARGE CENTRIFUGAL	WALL	4505	2124	79.6	BELT	1725	0.75	208-3	1.2	
EF-2	CUBE-240-VGD-7	GREENHECK	UPPER	SIDE WALL DISCHARGE CENTRIFUGAL	WALL	4505	2124	79.6	BELT	1725	0.75	208-3	1.2	
EF-3	CUBE-240-VGD-7	GREENHECK	UPPER	SIDE WALL DISCHARGE CENTRIFUGAL	WALL	4505	2124	79.6	BELT	1725	0.75	208-3	1.2	
EF-4	CUBE-240-VGD-7	GREENHECK	UPPER	SIDE WALL DISCHARGE CENTRIFUGAL	WALL	4505	2124	79.6	BELT	1725	0.75	208-3	1.2	
EF-5	CUBE-240-15	GREENHECK	UPPER	SIDE WALL DISCHARGE CENTRIFUGAL	WALL	6291	2966	93.3	BELT	1725	1.0-5	115-1	1.2	
EF-6	CUE-200-VG	GREENHECK	LOWER	SIDE WALL DISCHARGE CENTRIFUGAL	WALL	3203	1510	110.1	DIRECT	870	1	115-1	1.2	
EF-7	CUE-200-VG	GREENHECK	LOWER	SIDE WALL DISCHARGE CENTRIFUGAL	WALL	2121	1000	91.6	DIRECT	870	1	115-1	1.2	
EF-8	CUE-200-VG	GREENHECK	UPPER	SIDE WALL DISCHARGE CENTRIFUGAL	WALL	3203	1510	110.1	DIRECT	870	1	115-1	1	
EF-9	CUE-120-VG	GREENHECK	UPPER	SIDE WALL DISCHARGE CENTRIFUGAL	WALL	1200	566	118.8	DIRECT	1725	0.5	115-1	1	
EF-10	CUBE-240-7	GREENHECK	UPPER	SIDE WALL DISCHARGE CENTRIFUGAL	WALL	4505	2124	79.6	BELT	1725	0.75	115-1	1.2	
EF-13	CUBE-240-5	GREENHECK	UPPER	SIDE WALL DISCHARGE CENTRIFUGAL	WALL	3415	1610	74.7	BELT	1725	0.5	115-1	1	

NOTES:

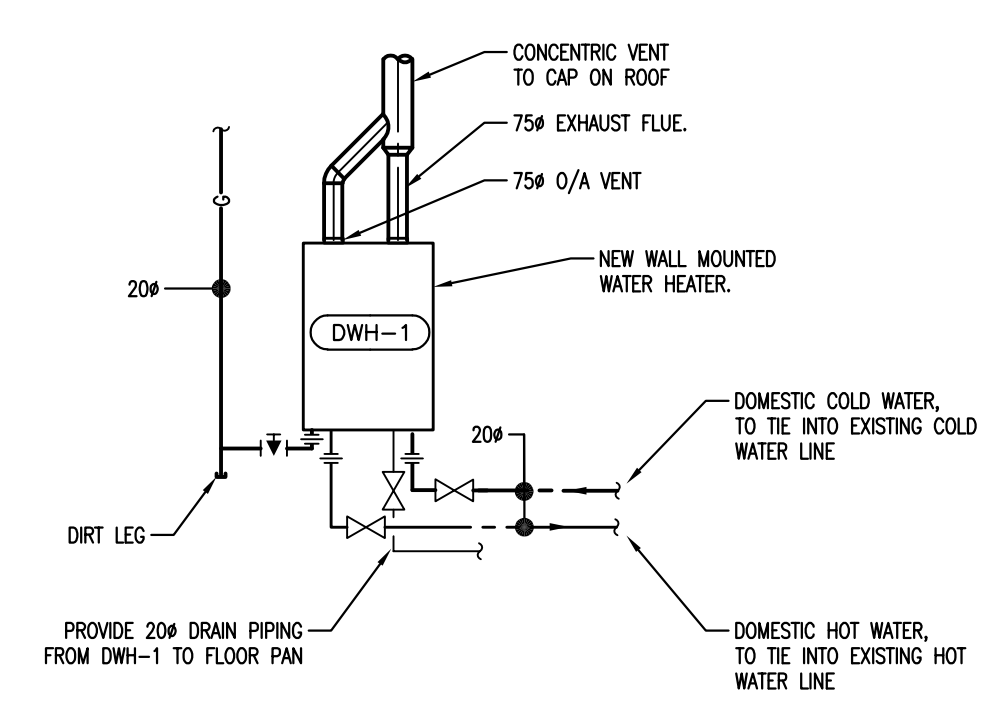
1. CW NEW DAMPER, DAMPER MOTOR SUPPLY AND INSTALL BY SERV-ALL CONTROLS CONTRACTOR
2. SPEED CONTROL PROVIDED BY SERV-ALL

GAS FIRED DOMESTIC WATER HEATER SCHEDULE

TAG	LOCATION	MANUFACTURER	MODEL	PHYSICAL DIMENSIONS				RECOVERY RATE @ 100' RISE		GAS INPUT (MBH)	WEIGHT (LBS)	NOTES
				HEIGHT		WIDTH/DIA.		GPH	L/hr.			
				in.	mm	in.	mm					
DWH-1	MECHANICAL ROOM	NAVEN	NPE-240A2	28	711	23	584	234.00	885.78	199.00	77	1

NOTES:

1. CW LIGHT COMMERCIAL NEUTRALIZER, PLUMB EASY VALVE SET, NAVEN CONDENSATE TRAP KIT, CONCENTRIC ROOF VENTING



2 DOMESTIC WATER HEATER DETAIL
M-04 SCALE: 1:100

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PROFESSIONAL ENGINEER
ALBERTA
REGISTERED MEMBER

2022-01-04
ID # 87134

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VITAL ENGINEERING CORPORATION
Signature: *[Signature]*
Date: 2022-01-04
PERMIT NUMBER: P 9441
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

PROJECT TITLE
DRUMHELLER WATER TREATMENT PLANT
DRUMHELLER, ALBERTA

EXHAUST FAN REPLACEMENT

SCHEMATIC & SCHEDULE

PROJECT #	DRAWING NUMBER
C21-3224	M-04

DRAWN: MB
CHECKED: KM

GENERAL

1.1 Intent

- 1 The intent of this specification and the drawings is to provide a complete and fully operating mechanical system in complete accord with applicable codes. The Mechanical Contractor shall make provisions for labor, material, and equipment necessary to complete the mechanical work.
2 Drawings and specifications are complementary to each other and what is called for in one is binding as if called for by both. Should any discrepancy appear between drawings and specifications which leaves doubt as to the true intent and meaning, obtain a ruling from the Consultant ten (10) days before submitting tender. Failing this, allow for most expensive alternative.
3 Contract documents are diagrammatic only. They are to establish scope, material and quality. They are not detailed installation drawings. Minor details usually not shown or specified and any incidental accessories required for proper installation of the system are to be included in the work.
4 Contractor is to ensure that all intended equipment will fit within given spaces. Make reference to the electrical, mechanical, architectural and structural drawings, when setting out work and before ordering equipment.
5 The Contractor shall visit the site prior to tender and verify existing conditions. New piping, ductwork and insulation standards shall at least match the existing installation or be higher if specified herein.
6 Consultant is defined as the Vital Engineering Corporation Representative administering the project.

1.2 Code Compliance

- 1 All work shall conform to current edition of National, Provincial and Municipal Codes, Standards and Acts, and will meet the requirements of authorities having jurisdiction.

1.3 Liability

- 1 Assume responsibility for layout of work, and for any damage caused to the Owner or other Tenants by improper execution of work.
2 Protect finished and unfinished work from damage.
3 Take responsibility for condition of materials and equipment supplied, and protect until work is completed and accepted. Coordinate deliveries with the general contractor.

1.4 Certificates

- 1 Give notices, obtain permits and approvals, and pay fees on work specified may be carried out. Furnish certificates if requested, as evidence that work conforms with laws and regulations of the authorities having jurisdiction.

1.5 Cutting and Patching

- 1 All work shall be coordinated with other trades especially that related to cutting and patching of required openings; and locations and installation of sleeves, insets, support, curbs, frames and access doors.
2 Obtain approval from structural and electrical engineers before drilling and coring of existing structure.
3 Provide X-ray of all required penetrations of the floor. X-ray use for locating in floor rebar and conduit to be done after normal working hours. Take necessary precautions to protect computer equipment when X-raying floors. Coordinate with Owner.

1.6 Compliance with Energy By-law

- 1 All equipment installed on this project shall comply with the performance recommendations of ASHRAE Standard 90.1 (latest edition) and the Model National Energy Code of Canada for Buildings, 2011 Edition.

1.7 Alternative Materials and Equipment

- 1 Contract price shall be based on materials and equipment specified. Approval by Consultant of equipment submitted by the mechanical trade as equal to that specified does not relieve the mechanical trade of any responsibility. Ensure that cost charges for all related trades are included when providing new values.
2 Revisions required to adapt accepted equal and alternatives shall be included in the contract price. No increase in the contract price will be considered to accommodate the use of equipment other than that specified.
3 Certain items of equipment and items of work (such as balancing, water treatment) may not have an approved equal due to the need to have a consistent type or source of maintenance. Refer to specific clauses in this specification.

1.8 Shop Drawings

- 1 Unless otherwise required all submittals shall be in electronic format.
2 Submit shop drawings to Consultant for all equipment specified in the specification or drawings for review. Do not order equipment or materials until Consultant has reviewed the shop drawings. Until submission has been reviewed, work involving relevant products may not proceed.
3 Shop drawings are to be complete along with the following information. Submissions that do not comply will not be reviewed.
- Dimensional data for roughing-in and installation;
- Equipment tags as related to project schedules;
- Technical data sufficient to ensure that equipment meets the requirements laid out in the Contract Documents;
- Wiring, piping, and service connection data;
- Motor sizes complete with voltage ratings; and
- Schedules as required.
4 Clearly mark all submittal material by flags, arrows, underlined text, or circling data that is relevant to the project. Cross out non-applicable materials and options. Specifically note specified features such as specialized tank fittings, pump seals, material, or finishes.
5 Shop drawings submitted for review shall be certified by the manufacturer and checked by the trade involved. Trade is to note all revisions required.
6 Where Electrical connections are required, electrical trade is to review shop drawings prior to submittal. Trade is to note all revisions required.
7 Drawings submitted for review shall bear the approval stamps and signatures of the trades involved.
8 Contractor is to accept responsibility for any equipment ordered where the proper procedure noted above has not been followed. No additional charges for cancellations, handling, reworking, etc. will be accepted.
9 A complete file containing all approved shop drawings is to be maintained and kept on site at all times. No shop drawings shall be used that do not bear the reviewed stamp of the consultant.
10 The submission of any shop drawing infers that it meets all specifications and drawings requirements. Discrepancies are to be noted on the submission for review by the Consultant. Failure to note these discrepancies and variations will not in any way relieve the Contractor from responsibility to correct the installation to the intent of the specification and the drawings.

1.9 Guarantee

- 1 Provide the Owner with a written guarantee that the equipment installed and work performed shall remain in serviceable condition for a period of one (1) year from the date of final acceptance by the Owner. The warranty shall cover material as well as labour.

1.10 Standard of Materials and Workmanship

- 1 Make and quality of materials used are subject to approval by the Consultant. Remove unacceptable materials and install suitable materials in their place.
2 Materials shall be new and of uniform pattern throughout, unless noted otherwise.
3 Employ only tradesmen properly licensed to perform the specific work. The Consultant may perform spot checks for trade tickets and accreditation.

1.11 Owner's Stock

- 1 The following items of mechanical equipment are available from the Owner's stock. Prior to submitting the tender price, review these items to ensure their suitability for the project. The tender price shall include the cost of despatch, servicing, moving in place, and installing to make these items completely operational.
2 Where equipment is removed and not reused it shall be handed over to the Owner, or disposed of if directed by the Owner as per the authorities having jurisdiction. Contractor to include all costs for disposal of all materials to be demolished and removed as indicated in these documents.

1.12 Temporary Heating

- 1 Contractor is to provide method for providing temporary heat as required by the project. The permanent systems of the building are not to be used for temporary heating purposes without the express written permission of the Consultant.
2 The use of permanent systems for temporary heat will not modify the terms of the warranty.
3 Where permanent systems are used, the Contractor is to provide adequate supervision to ensure that the heating system is operating in such a way as to cause no temporary or permanent damage. Closed systems are to be operated with proper treatment, filter changes, safety devices, and controls that are fully operational.
4 Where permanent systems are used, the Contractor is to provide an alarm indicating system failure.
5 Contractor is to replace all mechanical seals in pumps used for temporary heating purposes. New mechanical seals are to be provided regardless of the condition of the existing seals.
6 Where air systems are used during temporary heating, the Contractor is to provide filter media on all return and exhaust air inlets. The Contractor is to clean any ductwork that has become dirty during use.

1.13 Progress Claims

- 1 Prior to or with the first progress claim files, the Contractor is to submit a breakdown of the contract amount in a manner that is acceptable to the Consultant.
2 For each item requested, the labour, material, and equipment are to be listed separately.
3 Contractor is to ensure that the following items are included in each progress claim: contract item, breakdown, previous claim, present claim, claim to date, percentage complete.

4 The Contractor is to ensure that the claim provided is broken out into the following items:

- 1 Job startup and Administration Charges;

2 Plumbing;

3 Ventilation;

4 Sheet Metal;

5 Insulation;

6 Controls;

7 Startup and Commissioning; and

8 Documentation and Balancing.

1.14 Revised Drawings

- 1 Keep on site an extra set of white prints and specifications, recording changes and deviations daily. These drawings shall be made available on regular basis for review by the Consultant.
2 Upon completion of work, submit final record drawings to the Consultant. These must be submitted within two (2) weeks after acceptance of work. Failure to submit drawings may result in the work being done by the Owner and the cost deducted from the final payment.

- 3 The final record drawings shall be prepared by a qualified draughtsperson to the same drafting standards as the original drawings. Submittal shall include one set of prints and CD/USB containing full set of drawings in pdf format and AutoCAD format.
4 The contractor is to allow for the cost of updating AutoCAD drawing files. Contractor shall use current version of AutoCAD as used on the project drawings. If Contractor wishes to use Vital Engineering for this work, he should acquire separate quotation and enter into a separate contract with Vital Engineering.

1.15 Substantial Performance Inspection

- 1 Advise Consultant five (5) days prior to the date inspection is desired. All systems to be fully operational and any deficiencies should be noted to the Consultant.
2 All deficiencies shall be corrected within two (2) weeks after substantial performance and letter submitted to Consultant within that time advising that the work is complete. Failure to complete work may result in work being done by the Owner and the costs deducted from final payment.

- 3 Excessive deficiencies will not be tolerated. Should an excessive number of the items outlined below not be completed due to Contractor delay, additional charges for the Consultant's time required to review the deficiencies may be levied against the Contractor.
4 The following shall be an outline checklist of the minimum requirements to be met by the contractor prior to the Consultants' Substantial Performance by the contractor.

Inspection:

- Complete Commissioning Checklists
Final Gas Inspection Certificate from local gas inspector
Controls Commissioning, Checklist and 15 day trend logs for all major equipment (AHUs, Chiller/Boiler Plants, selected special equipment)
Final As-Built Drawings ready for review
Maintenance and operation manuals, ready for review

1.16 Examination of Work

- 1 This project involves renovations to existing building, therefore, examine the site and local conditions to determine the difficulties in carrying out the work indicated and specified prior to submitting final price. Items will not be considered based on the grounds of differences on site.

1.17 Coordination of Services

- 1 Coordinate with proper utilities for services such as water, sewer, natural gas, and assume all charges.
2 Coordinate with the owner to shutdown, disconnect, reroute, or make connection to existing services. Provide 24-hour written notice for all service shutdowns.

1.18 Performance Tests

- 1 Operate each mechanical system after mechanical and electrical work has been completed, to demonstrate that each system fulfills the requirements of the contract and operates satisfactorily. These are performance tests and must be completed before work can be finally accepted. Coordinate with packaged equipment suppliers and the commissioning agent.

1.19 Operation and Maintenance Manuals

- 1 Provide four (4) copies of manuals prepared by qualified and experienced personnel for use by Owner. Manuals form part of the contract and must be delivered to the Consultant before work will be considered complete. Each manual shall provide the following:
- Layman's description of all mechanical systems including operating maintenance and lubrication instructions.
2 Certification of all equipment where required by local codes and authorities.
3 Shop drawings and maintenance bulletins.
4 List address and telephone numbers of all equipment suppliers and contractors.
5 Performance details for all equipment including curves for fans and pumps with actual operating points noted.

1.20 Balancing

- 1 Balance terminal boxes, exhaust fans, and air outlets to air quantities indicated on the drawings and in this specification. Where outlet quantities are not indicated, divide box capacity equally among all outlets.
2 Completely balance the hydronic system including pumps, terminal devices, boilers, heat exchangers, etc.
3 Submit two (2) copies of the report to Consultant within two (2) weeks after substantial completion. Failure to submit the report within the specified time will result in the work being done by the Owner and the costs deducted from final payment.

4 Balancing shall be performed to the following accuracies:

Table with 2 columns: Equipment Type and Accuracy. Includes Air-Terminal Outlets (±10%), Air-Central Equipment (±5%), Hydronic-Terminals (±10%), and Hydronic-Pumps and Central Equipment (±5%).

5 Provide a drop test of all fire dampers and a letter/certificate attesting to this work.

1.21 Painting and Identification

- 1 Paint all exposed ducts and pipes with colours to match interior finishes or in colours as directed by the Architect.
2 Identify piping with labels and flow arrows. Provide identification at 50 ft maximum intervals, before and after pipes passing through walls, at all sides of tees, behind access doors. Use brightly colored for non-insulated pipes and for insulated pipes.
3 Provide 3/4" diameter brass tags, secure to valve stems with key chain. Provide typed valve directories at all mechanical rooms in addition to computer copy as integrated into controls graphics software.
4 Identify electric starting switches, thermostats controlling motors and equipment supplied under this division with lamacod plates having 1/4" minimum letter size.

1.22 Fire-Stoppping

- 1 Fire-stop all pipe and duct penetrations through floors and walls, designated as fire and/or smoke separations.
2 Fire-stopping materials to meet ULC CAN 2S115. Acceptable Materials: by Tremco® or "National Firestopping", or HILTI CP80 Case-In-Place Fire-Stoppping System.
3 Preparation of surfaces and installation of fire-stopping materials shall be carried out as per manufacturer's instructions.

1.23 Flashing and Roof Curbs

- 1 Provide curbs, flashing and counter flashing where mechanical equipment passes through weather or waterproofed walls, floors and roofs. Install roof mounted equipment on factory supplied roof curbs. All roof work and materials must meet and exceed ARCA (Alberta Roofing Contractors Association) standards.
2 Installers to be ARCA certified.

1.24 Metric Conversion

- 1 All units in this division are expressed in SI units. Soft metric conversions are used throughout.
2 Equivalent Nominal Diameters of Pipes - Metric and Imperial.
- Where pipes are specified with metric dimensions and only Imperial sized pipes are available, provide equivalent nominal Imperial sized pipe as indicated in the table, and provide no extra cost adapters to ensure compatible connections to all metric sized fittings, equipment and piping.

- 2 When CSA approved SI Metric pipes are available and are provided, the contractor shall provide at no extra cost adapters to ensure compatible connections between the SI Metric pipes and all new and existing pipes, fittings and equipment.

EQUIVALENT NOMINAL DIAMETERS OF PIPE

Table with 4 columns: mm, Inches, mm, Inches, mm, Inches. Lists equivalent nominal diameters for various pipe sizes.

3 Metric Duct Sizes

- 1 The metric duct sizes are expressed as 25 mm = 1 inch.

2. DUCTWORK AND ACCESSORIES

2.1 General

- 1 Fabricate ductwork in accordance with SMACNA Duct Manual and ASHRAE Handbooks. Ductwork shall meet the requirements of NFPA 90A and 90B and conform to applicable codes. Kitchen exhaust ductwork shall conform to NFPA 96.
2 Prior to fabrication of ductwork, check all ceiling spaces and heights and conflicts with other trades.
3 Duct sizes indicated are inside clear dimensions. For acoustically lined or internally insulated ducts maintain size inside ducts.
4 Provide fire dampers where ducts cross fire separations. Fire dampers shall be ULC listed and constructed in accordance with ULC Standard S112 "Fire Dampers". Fusible links shall be constructed to ULC Standard S895.
5 Provide balancing dampers where indicated on drawings and at points on low pressure supply, return and exhaust ducts where branches are taken from larger ducts.
6 Provide adequately sized access panels for dampers, equipment, fire dampers, valves, radiation valves, and any other equipment requiring servicing.
7 Provide return air openings and/or insulated sound traps where indicated.
8 Provide acoustical seal around ducts and sound traps at penetration through sound barriers.
9 Modify ceiling system where required to accommodate grilles and diffusers.
10 Size round ducts, installed in place of rectangular ducts, from ASHRAE table of equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by permission from Consultants Engineer.
11 Exposed round ductwork to be spiral lock seam type only.
12 Provide duct hangers and supports in accordance with SMACNA manuals.
13 Identify ductwork as per the base building standards. Confirm these prior to submitting tender.

2.2 Low Velocity Ductwork

- 1 Ductwork shall be galvanized steel. The minimum sheet metal thickness for ducts including fittings, access doors, and other accessories shall be as per SMACNA duct manual for Low Velocity Ductwork.
2 Connect diffusers or trefoil boots to low pressure ducts with 36" maximum length of stretched flexible duct. Hold in place with caulking compound and strap or clamp. Do not use flexible duct to change directions.
3 Where low pressure ducts are connected to fan equipment, terminal boxes or any other apparatus, a screwed or bolted flexible gasketed joint shall be provided between the ductwork and the equipment, minimum 2" wide.
2.3 Duct Sealing
1 All supply, return and exhaust duct joints, longitudinal as well as transverse, shall be sealed as follows:
- Low Pressure Ductwork:
 - Slip Joints: Apply heavy brush-on high pressure duct sealant. Apply second application after the first application has completely dried out. Where metal clearance exceeds 1/16" use heavy mastic type sealant.
 - Flanged Joints: Soft elastomer baryl or extruded form of sealant between flanges followed by an application of heavy brush-on high pressure duct sealant.
 - Other Joints: Heavy mastic type sealant.
- Medium and High-Pressure Ductwork: Combination of woven fabrics and sealing compound followed by an application of high pressure duct sealant.
2 Duct tapes as sealing method are not permitted.
3 Surfaces to receive sealant should be free from oil, dust, dirt, moisture, rust and other substances that inhibit or prevent bonding.
4 Do not insulate any section of the ductwork until it has been inspected and approved of duct sealant application, by the Consultant.

3. PIPING

3.1 Pipe Material

- 1 Service: Natural Gas, Propane.
2 Material: Steel Schedule 40, A53 Grade B.

3.2 Pipe Connections

- 1 Screwed joint steel piping up to and including 1 1/2". Weld piping 2 1/2" and larger including branch connections. Screw 2" piping for liquid systems, weld 2" piping for air or gas systems. Use dielectric type couplings when joining dissimilar metal pipes.
2 Use lead free solder for soldering domestic water copper pipe.

3.3 Pipe Hangers And Supports

- 1 All piping shall be firmly supported and securely braced. Provide copper plated hangers and supports for copper piping and galvanized hangers and supports for galvanized piping.
2 Use of perforated straps is not permitted for pipe hangers.
3 Provide ring type hangers for piping up to 1 1/2" and clevis type hangers for piping over 1 1/2".

3.4 Pipe Support Spacing

Table with 3 columns: Pipe Size, Rod Diameter, Spacing. Lists support spacing requirements for various pipe sizes.

3.5 Expansion Compensation

- 1 Provide expansion compensators, guide and anchors where required and where indicated.

3.6 Gas Distribution Piping

- 1 Install gas piping in open or ventilated spaces. Pitch lines and provide drip legs at condensation collection points. Where gas piping is run in concealed space provide ventilation grilles as required.

4. INSULATION

4.1 Duct And Breeching Insulation

- 1 Exposed Rectangular Ducts: Rigid fibrous glass insulation, K' value at 75°F maximum 0.24 Btu.in/ft²h°F with factory applied reinforced aluminum foil vapour barrier.
2 Round Ducts and Concealed Rectangular Ducts: Flexible fibrous glass insulation, K' value 75°F maximum 0.24 Btu.in/ft²h°F with factory applied reinforced aluminum foil vapour barrier.
3 Acoustic Lining: Fibrous insulation with K' value at 75°F maximum 0.24 Btu.in/ft²h°F absolute roughness of exposed surface not to exceed 0.025 in coated to prevent fibre erosion at air velocities up to 5000 fpm, 1.5 lb/ft³ minimum density for ductwork and 4.7 lb/ft³ for plenums.
4 Breeching Insulation: Semi-rigid mineral fibre, insulation with glass mat, K' value 0.24 Btu.in/ft²h°F maximum at 75°F. Service temperature 180°F to 550°F.
5 Recovery Jackets: ULC Labelled thermocoaxes.
6 Ensure surface and insulation is clean and dry prior to and during installation.
7 Ensure insulation is continuous through inside partitions.
8 Finish and seal insulation neatly at hangers, supports, access doors, fire dampers and other protrusions.
9 Recover all insulation except in ceiling spaces, crawl spaces, and mechanical shafts.
10 Insulation Installation Thickness Schedule

4.2 Equipment Insulation Thicknesses

0.60/Outside Air Inlets, Combustion Air, and Relief Duct 2 Exhaust Ducts within 10 ft. of Exterior Walls or Openings 1 Supply Ducts 1 Acoustic Lining (where indicated) 1 Breeching for Boilers, Domestic Hot Water Heaters, Gas Furnaces, Unit Heaters (atmospheric gas burners) 1 Breeching for Boilers, Domestic Water Heaters, Gas Furnaces, Unit Heaters (forced air burners) 2.42 CONTROLS

4.3 Acceptable Contractors

- 1 All controls work is to be done by Serve-All and will be part of the contract as a PC SUM.

END OF SECTION



Revision table with columns: #, DATE, REVISION. Shows revisions from 2021-11-23 to 2021-08-10.

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REAL PERMIT



PERMIT TO PRACTICE VITAL ENGINEERING CORPORATION. Signature: Christopher Momeni. Date: 2022-01-04. PERMIT NUMBER: P 9441. The Association of Professional Engineers, Geologists and Geophysicists of Alberta.

PROJECT TITLE

DRUMHELLER WATER TREATMENT PLANT DRUMHELLER, ALBERTA

EXHAUST FAN REPLACEMENT

DRAWING TITLE

SPECIFICATIONS

Table with 2 columns: PROJECT # (C21-3224), DRAWING NUMBER (M-05).