



PROCUREMENT SERVICES

CITY OF SURREY, SURREY CITY HALL
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ADDENDUM No. 1

REQUEST FOR QUOTATIONS No.: 1220-040-2022-020

TITLE: Coverdale Fairgrounds Shannon Hall Boiler Replacement

ADDENDUM ISSUE DATE: February 15, 2022

REVISED DATE: PREFER TO RECEIVE SUBMISSION ON OR BEFORE February 25, 2022.

INFORMATION FOR CONTRACTORS

Contractors are advised that Addendum No.1 to RFQ # 1220-040-2022-020 is hereby issued by the City. This addendum shall form part of the contract documents and is to be read, interpreted and coordinated with all other parts. The following information is provided to answer questions raised by Contractors for the above-named project, to the extent referenced and shall become a part thereof. No consideration will be allowed for extras due to the Contractors or any sub-contractor not being familiar with this addendum. This Addendum No.1 contains 38 (thirty-eight) pages in total.

INFORMATION ONLY

- 1. REVISED DATE**
The City would prefer to receive Quotations on or before **February 25, 2022** (the "Date").

QUESTIONS AND ANSWERS:

- Q1. Please clarify the frequency drive specs for the existing pumps P-1 and P-2?
- A1.** The pumps P1 and P2 will be specified in Addendum #1.
- Q2. We can't quote a 115V single phase VFD for these circ pumps. Either they need to change to 3 phase pumps or look at a 115V ECM style pump c/w built in speed control?
- A2.** The circulation pumps P1 and P2 to be replaced with ECM style pumps. Specifications to be included in Addendum #1.
- Q3. Please clarify if there is a specific model 2.5" air separator requested to be used in this project?
- A3.** Yes, the air separator will be specified in Addendum #1.

Q4. Ref. Pricing notes: M0.01 "Separate Pricing for Cascading operations". Can the scope be more defined with bill of materials?

A4. The components included in the clouded area in detail #2 of drawing M1.01 [Mechanical Renovation Schematic] represents the scope for cascading operations.

Q5. For selection of pumps, it needs to have Head & voltage?

A5. There were no new pumps in the design. As noted in item 2, new pumps will be specified as part of Addendum #1.

Q6. The existing DHW tank flue will require a chimney liner, will you be issuing an addendum for this?

A6. Thank you for the due diligence. The existing DHW is the Bradford White D80T1993N atmospheric vent natural gas commercial water heater. Our understanding is that an additional chimney liner is not required.

Q7. To avoid dealing with abatement on the proposed lead paint on the walls. Can we terminate the flue through a crafted box to match the exterior walls?

A7. Thank you for the proposed solution, however the flue pipe termination is noted on detail #3 of drawing M1.02 [Mechanical Room Wall Piping Penetrations] as terminating through the window, which to our understanding does not require any abatement.

Q8. Various alternate boilers have been submitted for equivalency?

A8. Contractor to provide a base quotation as per the specified boiler. The Riello or another model Viessmann boiler option could be considered as an alternate boiler option (not equal) for the project. The contractor might like to provide a separate quotation by using one of the alternate boiler options, in addition to their base quotation, which would be reviewed accordingly.

Alternate Materials and Equipment:

The price submitted for this contract shall be based on the use of materials and equipment as specified. The Contractor shall be fully responsible for any additional labour and materials required by any trades or other Contractors to accommodate the use of other than specified materials or equipment. The Contractor shall bear any and all costs for design/system modifications to accommodate the "alternate" equipment. Extras will not be approved to cover such work.

Q9. There doesn't seem to be enough room on the existing electrical panels. Are you able to allow for a cash allowance for this portion?

A9. City of Surrey to upgrade electrical panel to account for increased load.

Q10. Please provide a hazmat report for the room and the radiators?

A10. The hazmat report was added for the boiler room area. Base alternate price for radiators as containing lead paint.

Q11. Are you allowing an abatement cash allowance for hazardous material?

A11. No, hazardous material abatement around the existing Chimney and probability of radiators is responsibility of contractor. Lead paint report for radiators will be conducted after closing of RFQ. (Radiator work should be priced with probability of containing lead paint).

Q12. With the municipal installation of the new sump in the mechanical room, will there be a floor drain installed as well?

A12. Yes, this is the purpose of the sump pump.

Q13. Whether Bid Bond or Surety's consent is required.?

A13. Bid bond or Surety's consent is not required. Refer to Schedule C – Form of Quotation, section 10 for separate prices requested.

Q14. Whether third-party Balancing and Commission agent will be required.?

A14. The City of Surrey will hire a third-party commissioning agent.

Q15. Who is the contractor for Control & DDC?

A15. This is the responsibility of the contractor to hire a sub if needed and should be priced into your quote.

Q16. Whether X-Ray inspection will be required for welds 2-1/2" and over?

A16. If welding pipe and fittings, then yes.

Q17. Can the Victaulic Fittings be used if required?

A17. Yes.

Q18. Will a Hazardous Materials Report be getting released for the Shannon Hall BPU project??

A18. See attached.

All Addenda will become part of the Contract Documents.

- END OF ADDENDUM -



A Division of  MBC Group

SUBJECT:

Pre-Renovation Hazardous Materials Inspection Report

PROJECT SITE:

Shannon Hall
6050 176th Street,
Surrey, BC

PREPARED FOR:

Kevin Littlejohn
Project Coordinator
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PREPARED BY:

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PREPARED ON:

November 12th, 2021

MBC Group File #:

ENV-04382

1.0 INTRODUCTION

Sure Hazmat & Testing – A Division of MBC Group was retained by City of Surrey (the client) to conduct a site-specific hazardous material assessment within the Shannon Hall located at 6050 176th Street in Surrey, BC (referred to hereafter as the Subject Building). The assessment was conducted by **MBC Group**, Senior Environmental Manager, Ryan Verhelst on November 4, 2021.

This report outlines the scope of work, regulations, methodologies, findings of the assessment, and based on those findings, states conclusions and appropriate recommendations.

2.0 SCOPE OF WORK

The scope of our investigation was based on the client's renovation plans. The client has a planned boiler replacement project. The client's scope of work also includes installation of a security system equipment which will cause disturbance to drywall/plaster finishes in the entrance vestibule to the accessible washroom.

3.0 PURPOSE

The assessment was completed to identify the presence of hazardous building materials including asbestos-containing materials (ACMs), lead-based coatings (LBCs), ozone-depleting substances (ODSs), polychlorinated biphenyls (PCBs), elemental mercury, biological hazards, and crystalline silica and rock dust at the request of the Client in preparation for demolition work that is scheduled to take place. The purpose of the investigation was to be in compliance with WorkSafe BC section 20.112 for Hazardous Materials Demolition.

4.0 PREVIOUS REPORTS

An asbestos inventory report (AIM) from 2009 was provided to MBC Group. The AIM identified the following asbestos-containing materials within the boiler room:

- Parging cement on "some" fittings of mechanical piping system
- Firestop at chimney penetrations
- Firestop putty at telephone cabinet penetrations

The AIM concluded that no-asbestos containing materials were observed for the accessible washroom & vestibule area.

5.0 METHODOLOGY

The hazardous materials assessment was completed by **MBC Group** following AHERA sampling protocols in conjunction with **WorkSafe BC** recommended sampling procedures and the surveyor's knowledge of historical composition of building products.

The building was occupied at the time of the investigation. The assessment was semi-intrusive (semi-destructive, where practicable and pre-approved) for safety of the occupants. Walls, floors, and ceilings were inspected at existing access hatches and openings to determine the presence of concealed materials. Visual identification of materials suspected to contain asbestos or lead (in coatings) was supported by the analysis of representative samples.

Twenty (20) bulk samples of suspected ACMs were collected by **MBC Group** during the site investigation and were analyzed at the in-house laboratory of Sure Hazmat and Testing in accordance with the NIOSH 9002 PLM Bulk Sampling Analytical Method using polarized light microscopy and dispersion staining techniques. This is the current accepted method of analysis by WorkSafe BC. A copy of our Asbestos Bulk Results spreadsheet is attached to this report for your information and records. All records should be retained for a period of ten years as required by WorkSafe BC. All samples will be stored at our laboratory for two months before being disposed of. Should you wish to keep these samples beyond this, please notify us within this period.

Four (4) bulk samples of suspected LBCs were collected by **MBC Group** during this site investigation and were submitted to Sarcova Industries Inc. for analysis of lead content. All samples were analyzed using the EPA SW 846 3050B/700B method.

Suspected ozone-depleting substances (ODSs), elemental mercury, sources of polychlorinated biphenyls (PCBs), and crystalline silica and rock dust were visually identified based on appearance, age, and knowledge of historic applications/locations.

Equipment that may contain ODSs (e.g. air conditioning and refrigeration equipment) or PCBs (e.g. electrical transformers and fluorescent light ballasts) can often be identified by examining manufacturer's labels. For safety reasons, **MBC Group** personnel do not remove the ballast shields from fluorescent light fixtures to examine the ballast codes unless the electrical circuit for the lighting has been tagged and locked out by a qualified electrician.

The visual inspection for biological hazards was conducted in general accordance with Health Canada and Public Health Agency of Canada protocols for biological assessment and control.

Copies of the analytical laboratory reports for bulk samples collected are provided in **Appendix III**

6.0 SUMMARY OF FINDINGS

The following sections outline the findings of the hazardous building materials assessment.

6.1 Asbestos-Containing Materials (ACMs)

Suspect ACMs were identified within the accessible areas of the Project Area. Representative samples of each suspect ACM were collected and analyzed for asbestos content. **Please refer to Appendix III, bulk sample results & sample location drawings for specific sample locations.** Sample descriptions and analytical results for each of the suspect asbestos-containing materials are summarized in Table #1, below.

| Table #1: Analysis of Suspect ACMs Shannon Hall, Surrey, BC | | | | | | | |
|--|---|------------------------|----------------------------|------------|--------------------------------|----------------------------|---------------------------------------|
| Sample # | Sample Location | Material Description | Asbestos Percentage & Type | Friability | Current Condition ¹ | Accessibility ² | Current Risk of Exposure ³ |
| 1 | Boiler Room, North Wall | Skim Coat & Plaster | None Detected | N/A | N/A | N/A | N/A |
| 2 | Boiler Room, East Wall | Skim Coat & Plaster | None Detected | N/A | N/A | N/A | N/A |
| 3a | Boiler Room, Chimney | Brick Mortar | None Detected | N/A | N/A | N/A | N/A |
| 3b | Boiler Room, Chimney | Brick Mortar | None Detected | N/A | N/A | N/A | N/A |
| 3c | Boiler Room, Chimney | Brick Mortar | None Detected | N/A | N/A | N/A | N/A |
| 4 | Boiler Room, Chimney – Upper Penetration | Fire Stop | Chrysotile 5-10% | Yes | Good | Low | Low |
| 5 | Boiler Room, Chimney – Lower Penetration | Fire Stop | None Detected | N/A | N/A | N/A | N/A |
| 6 | Boiler Room – NW Water Line | Pipe Wrap & Insulation | None Detected | N/A | N/A | N/A | N/A |
| 7 | Boiler Room – Central Water Line | Pipe Wrap & Insulation | None Detected | N/A | N/A | N/A | N/A |
| 8 | Boiler Room – South Water Line | Pipe Wrap & Insulation | None Detected | N/A | N/A | N/A | N/A |

| | | | | | | | |
|-----|---|------------------------|--------------------------|------------|-------------|------------|---------------------------|
| 9 | Boiler Room – South Water Pipe Joint | Parging Cement | Chrysotile 20-25% | Yes | Good | Low | Low Hazard removed |
| 10a | Boiler Room – North Windows | Putty | None Detected | N/A | N/A | N/A | N/A |
| 10b | Boiler Room – North Windows | Putty | None Detected | N/A | N/A | N/A | N/A |
| 10c | Boiler Room – North Windows | Putty | None Detected | N/A | N/A | N/A | N/A |
| 11a | Accessible Washroom Vestibule | Drywall Joint Compound | None Detected | N/A | N/A | N/A | N/A |
| 11b | Accessible Washroom Vestibule | Drywall Joint Compound | None Detected | N/A | N/A | N/A | N/A |
| 11c | Accessible Washroom Vestibule | Drywall Joint Compound | None Detected | N/A | N/A | N/A | N/A |
| 12a | Accessible Washroom Vestibule | Skim Coat & Plaster | None Detected | N/A | N/A | N/A | N/A |
| 12b | Accessible Washroom Vestibule | Skim Coat & Plaster | None Detected | N/A | N/A | N/A | N/A |
| 12c | Accessible Washroom Vestibule | Skim Coat & Plaster | None Detected | N/A | N/A | N/A | N/A |

¹**Good** – Material has no visible damage or deterioration, or showing only very limited damage; **Damaged** – Surface is crumbling, blistered, water-stained, gouged, marred, or otherwise abraded on less than 10% of the surface evenly distributed (25% if localized); **Significantly Damaged** – Surface is crumbling or blistered over at least 10% of the surface if evenly distributed or 25% if localized; 10% (25% if localized) of material hanging from surface, deteriorated or showing adhesive failure; water stains, gouges, or marks over at least 10% of the surface (25% if localized).

² **High** – easily accessible; **Moderate** – not easily accessible but in view; **Low** – not easily accessible, enclosed or obscured.

³ **High** – Indicates that “High Risk” personal protective equipment and safe work procedures as outlined in the WorkSafe BC publication entitled “*Safe Work Practices for Handling Asbestos*”, latest edition must be followed in order to **access the subject building**; **Moderate** – Indicates that “Moderate Risk” personal protective equipment and safe work procedures must be followed in order to be **in proximity to the material**; **Low** – Indicates that no PPE is required to enter the building.

The **fire stop** present around the upper chimney penetration was determined to be asbestos-containing. Based on this result all fire stop is considered to be asbestos-containing.

Parging cement present on rigid pipe fittings was determined to be asbestos-containing. Parging cement was observed to have been removed from a majority of the pipe fittings within the Boiler Room.

The boiler was operational during our investigation and was not included in the scope of work. There are **potential asbestos-containing insulations and/or gaskets** concealed within the operating boiler.

There is **potential for asbestos-containing packing materials and gaskets** to be present within the valves/flanges of the mechanical piping system.

The boiler room **fire door** is presumed to be insulated with an asbestos-containing lining.

No other asbestos-containing materials were identified within the scope of work.

6.2 Lead-Based Coatings (LBCs)

| Table #2: Analysis of Suspect LBCs Shannon Hall, Surrey, BC | | | | | | | | |
|--|--------------------------|----------------------------------|-------------------------------|------------------------|-----------------------------|-------------------|---------------|--------------------------|
| Sample # | Area or Room | Material Description | Sample Location | Analytical Result ug/g | Lead-Based Coating (Yes/No) | Current Condition | Accessibility | Current Risk of Exposure |
| L1 | Accessible W/C Vestibule | Beige paint | Drywall Wall | <90 | No | N/A | N/A | N/A |
| L2 | Hallway Adj. Boiler Room | Beige paint | Plaster | 729 | Yes | Delaminating | High | Low |
| L3 | Boiler Room | White/Yellow Paint | Metal doorframe | 2,092 | Yes | Good | High | Low |
| L4 | Exterior wall | Grey Paint | Concrete | 867 | Yes | Good | High | Low |

Hazard removed

6.3 Ozone-Depleting Substances (ODSs)

Sources of ODSs were not identified within the Project Area.

6.4 Polychlorinated Biphenyls (PCBs)

Fluorescent light fixtures with ballasts suspected to contain PCBs were not identified within the scope of the project.

6.5 Elemental Mercury

Sources of mercury in the form of fluorescent light tubes or thermostatic controls were not identified within the scope of the project.

6.6 Biological Hazards

Rodent/animal droppings were not identified in the project area.

6.7 Crystalline Silica and Rock Dust

Silica is one of the most common hazards on a construction site. Crystalline silica is present in concrete, mortar, brick, gypsum, plaster, masonry, ceramics, stucco, and asphalt.

6.8 Fungal contamination

Fungal contamination was not identified within the project area.

6.9 Hypodermic Needles

Hypodermic needles were not identified within the building.

7.0 CONCLUSIONS & RECOMMENDATIONS

7.1 Asbestos-Containing Materials (ACMs)

Asbestos-containing materials are present in the following locations:

- Parging cement on rigid pipe fittings within the Boiler Room
- Fire stop on chimney penetrations within the Boiler Room
- Fire door lining – Boiler Room

All asbestos-containing materials must be removed prior to demolition activities by a qualified hazardous materials contractor using appropriate work procedures as defined by WorkSafe BC.

The survey was based on the client's renovation scope of work. If the scope of the renovation changes to include any areas or materials not included in this investigation, MBC Group should be contacted to investigate prior to disturbance.

WorkSafe-BC Requirements

This section is intended to aid in compliance with WorkSafe BC regulations and is not intended to replace a Risk Assessment conducted on site by a qualified person prior to the start of asbestos abatement work. Prior to the performance of any work that impacts asbestos-containing materials, it is a regulatory requirement that a qualified person perform a Risk Assessment. This requirement is in compliance with the WorkSafe-BC Occupational Health & Safety (OH&S) Regulation *Part 6 "Substance Specific Requirements"*; specifically Section 6.6 subsections (1), (2), (3) and (4). The following recommendations are presented:

During the removal of asbestos-containing fire stop & parging cement, **Moderate Risk (Glovebag)** asbestos safe work procedures must be followed, including the following at a minimum:

- Supply appropriate notification to WorkSafe BC,
- Personal Protective Equipment must include tight-fitting half face piece respiratory protection fitted with P100 filters and approved disposable coveralls with head and foot covers,
- Application of amended water to the asbestos materials being disturbed,
- Use of asbestos barrier tape and warning signs around the perimeter of the work area,
- HEPA-equipped vacuum for local exhaust ventilation and to ensure removal of all asbestos materials,
- Hand and face wash station,
- Air monitoring.

To comply with Part 6 of the WorkSafe-BC OH&S Regulation, specifically Section 6.32 relating to documentation, the client should acquire copies of the asbestos abatement contractor's Notice of Project (NOP), abatement procedures, air monitoring results and any documentation issued to WorkSafe-BC. These documents are required to be stored and held for 10 years.

7.2 Lead-Based Coatings (LBCs)

Lead based finishes are present in the following locations:

- Interior plaster paints
- Interior metal doorframe paint
- Exterior concrete paint

The presence of lead based paint finishes does not pose an immediate hazard to building occupants when present in good condition and left undisturbed. During demolition safe work procedures should be followed when disturbing lead-based finishes. A Risk Assessment should be conducted on site by a qualified person prior to the start of lead abatement work.

As per the WorkSafe BC publication "Lead-Containing Paints and Coatings Preventing Exposure in the Construction Industry" lead-containing waste materials must be sampled and analyzed using the standard Toxicity Characteristic Leaching Procedure (TCLP). This procedure is designed to determine the leachability of lead in liquid and solid wastes.

7.3 Crystalline Silica and Rock Dust

Control measures must be implemented on all job sites where demolition or renovation activities are taking place. An exposure control plan (ECP) must be developed to reduce the risk of silica and nuisance dust exposure for workers. Engineering controls must be applied to avoid or modify operations which have the potential to generate significant quantities of hazardous dusts. Controlled work practices such as the use of water and ventilation equipment serve to reduce the amount of respirable dust in the work environment. Personal protective equipment such as respiratory protection provide protection for workers on the site.

8.0 DISCOVERY OF ADDITIONAL HAZARDOUS BUILDING MATERIALS

Due to the nature and variation of construction methods and materials and the restrictions imposed by the Client, it is impractical to assume that all areas either concealed or otherwise, were, or can be tested to ensure with absolute certainty the presence or absence of all hazardous materials. With this in mind, Part 20, Section 20.112 of the BC OHSR administered by **WorkSafe BC** states that, if "*after written confirmation is provided, a person discovers material that may be hazardous material on or in the machinery, equipment, building or structure or at the worksite, not previously determined to be hazardous material, all employers responsible for the demolition or salvage of the machinery, equipment, building or structure, or the renovation of the building or structure, and the owner, must ensure that a 'qualified person' repeats the inspection process*" outlined above, and detailed in Subsection 3 of Part 20, Section 20.112 of the BC OHSR.

9.0 LIMITATIONS

The conclusions presented in this report represent the judgement of the assessor based on current environmental and health and safety standards, and on-site conditions on the date(s) cited in this report. Due to the nature of the investigation and the limited data available, the assessor cannot warrant against undiscovered environmental liabilities.

This report is intended for client use only. Any use of this document by a third party, or any reliance on or decisions made based on the findings described in this report, are the sole responsibility of such third parties, and **MBC Group** accepts no responsibility for damages, suffered by any third party as a result of decisions made or actions conducted based on this report. No other warranties are implied or expressed.

The data, conclusions and recommendations which are presented in this report, and the quality thereof, are based on a scope of work authorized by the client. The bulk sampling program included asbestos bulk sampling and/or paint chip sampling in select representative areas for laboratory analysis. Note, however, that no scope of work, no matter how exhaustive, can guarantee to identify all contaminants. This report therefore cannot warrant that all building conditions are represented by those identified at specific locations.

Recommendations, when included, are made in good faith and are based on several successful experiences.

Note also that standards, guidelines and practices related to environmental investigations may change with time. Those which were applied at the time of this investigation may be obsolete or unacceptable at a later date.

Any comments given in this report on potential remediation problems and possible methods are intended only for the guidance of the designer. The scope of work may not be sufficient to determine all of the factors that may affect construction, clean-up methods and/or costs. Contractors bidding on this project or undertaking clean-ups should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the conditions may affect their work. Any results from an analytical laboratory or other subcontractor reported herein have been carried out by others, and MBC Group cannot warrant their accuracy. Similarly, MBC cannot warrant the accuracy of information supplied by the client.

10.0 CLOSURE

This report is based on observations and collected data from November 4, 2021. The conclusions made in this report are not a certification of the site's air quality. No warranty is expressed or implied as to final site condition. This report provides an analysis and assessment of materials tested and is based on information provided to **MBC Group**.

Please contact the writer with any questions or concerns.

Sincerely,



Ryan Verhelst
Senior Environmental Manager

APPENDIX I

Site Photos

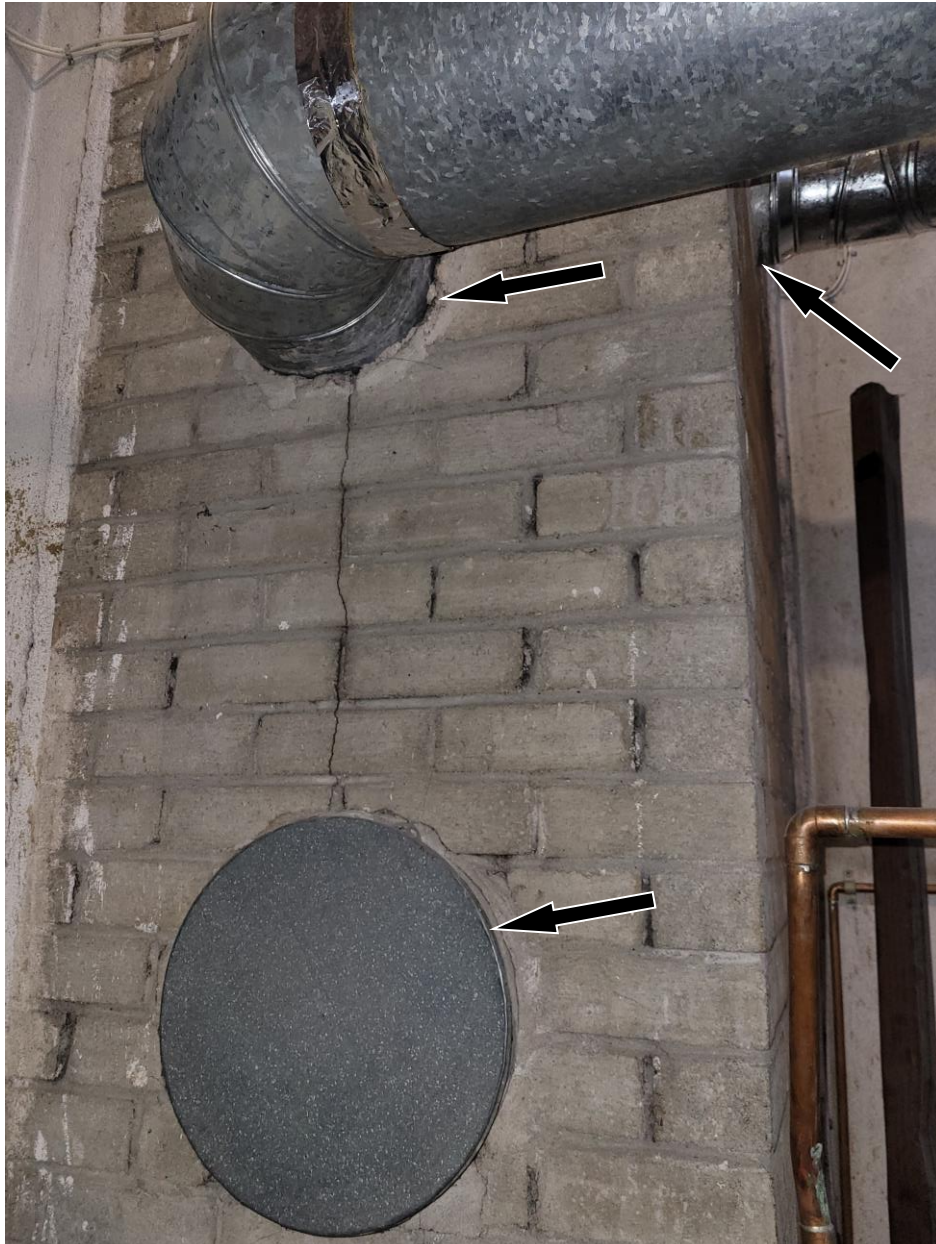


Photo # 1 – Asbestos-containing fire stop compound



Photo # 2 – Asbestos-containing parging cement

This hazard has been removed.



~~Photo # 3 – Fire door with presumed asbestos-containing lining & lead-based paint coatings. Lead-based paint on plaster is pictured on the Hallway wall~~

This hazard (Door and jam) has been removed

APPENDIX II

REGULATORY FRAMEWORK & APPLICABLE GUIDELINES

1.0 PROVINCIAL REGULATORY FRAMEWORK & APPLICABLE GUIDELINES

In British Columbia, the management of hazardous building materials in the workplace is regulated by WorkSafe BC under the Workers' Compensation Act (effective April 15, 1998), as amended by the Workers' Compensation (Occupational Health and Safety) Amendment Act (effective October 1, 1999). Specific requirements of the Occupational Health and Safety Amendment Act are prescribed in the British Columbia Occupational Health and Safety (BC OH&S) Regulation.

1.1 Hazardous Materials & Demolition/Renovations

Section 20.112 of the BC OH&S Regulation details the requirements that employers and owners are responsible for identifying, and managing the presence of potentially hazardous materials prior to, and during demolition, renovation or salvage of machinery, equipment, buildings, or structures. The employer or owner must:

- Ensure that a qualified person inspects the site to identify any asbestos, lead and/or other potentially hazardous materials that may be handled, disturbed, or removed;
- Have the inspection results available at the worksite; and,
- Ensure that the hazardous materials are safely contained or removed.

1.2 Provincial Hazardous Wastes Legislation & Regulations

In British Columbia, environmental matters pertaining to waste generally fall under the jurisdiction of the British Columbia Ministry of Environment (MoE), pursuant to the Environmental Management Act (EMA). The key waste regulation under the Environmental Management Act relating to hazardous building materials is the Hazardous Waste Regulation (HWR), as amended from time to time. The HWR provides the requirements for the proper handling, storage, transportation, treatment, recycling and disposal of hazardous wastes in the province. The regulation also outlines the materials and criteria to be used to characterize waste as hazardous.

1.3 Asbestos-Containing Materials (ACMs)

Asbestos, including ACMs are regulated under Part 6 (sections 6.1 to 6.32) of the BC OH&S Regulation.

Section 6.1 – Definitions

According to this section of the OH&S Regulation, an ACM is defined as any manufactured article or other material, other than vermiculite insulation, that would be determined to contain at least 0.5% asbestos through analytical testing. Materials other than vermiculite must be tested in accordance with one of the following methods:

“Asbestos, Chrysotile by XRD, Method 9000” (Issue 2, dated August 15, 1994) in the NIOSH Manual of Analytical Methods, published by the United States National Institute for Occupational Safety and Health, Centre for Disease Control;

“Asbestos (bulk) by PLM, Method 9002” (Issue 2, dated August 15, 1994) in the NIOSH Manual of Analytical Methods, published by the United States National Institute for Occupational Safety and Health, Centre for Disease Control; or,

“Test Method for the Determination of Asbestos in Bulk Building Materials” (EPA/600/R-93/116, dated July 1993) published by the United States Environmental Protection Agency.

WorkSafe BC Manual – “Safe Work Practices for Handling Asbestos”

This manual outlines basic information on asbestos and asbestos products, health hazard requirements for worker protection, safe work procedures and principles that should be followed in selecting the most suitable technique for the safe abatement of ACMs. This document provides a guide to current practices that are to be followed in the Province of British Columbia.

1.3.1 ALARA Principle

Asbestos is a substance that is governed by the ALARA principle, meaning all exposures must be kept as low as reasonably achievable. In effect, this means that although the BC OH&S Regulation provides explicit exposure limits, action levels and other significant criteria for asbestos, employers must also demonstrate further efforts (beyond those prescribed in the Regulation) to reduce, or eliminate worker exposure to asbestos, when it is considered reasonable to do so.

1.4 Lead-Based Coatings (LBCs)

Lead is regulated under Part 6 (sections 6.59 to 6.69) of the BC OH&S Regulation.

WorkSafe BC Manual – “Safe Work Practices for Handling Lead”

This manual outlines basic information on lead and lead-based products, health hazard requirements for worker protection, safe work procedures and principles that should be followed in selecting the most suitable technique for the safe abatement of lead containing paints and coatings. This document provides a guide to current practices that are to be followed in the Province of British Columbia.

1.4.1 ALARA Principle

Lead is a substance that is governed by the ALARA principle, meaning all exposures must be kept as low as reasonably achievable. In effect, this means that although the BC OH&S Regulation provides explicit exposure limits, action levels and other significant criteria for lead, employers must also demonstrate further efforts (beyond those prescribed in the Regulation) to reduce, or eliminate worker exposure to lead, when it is considered reasonable to do so.

1.4.2 Disposal of Lead-Containing Materials

In British Columbia, environmental matters pertaining to waste generally fall under the jurisdiction of the MoE, more specifically the HWR under the EMA. Per the HWR, paints identified to be lead-based paints will require sampling and laboratory analysis for Toxicity Characterization Leaching Procedure (TCLP) to characterize the lead-containing paints for disposal purposes. The TCLP test provides an indication of whether or not the lead paint will “leach” in a manner and amount greater than 5.0 mg/L. If the lead-based paint is found to have a leachable lead concentration greater than 5.0 mg/L, the lead-containing paint and its substrate (e.g., wood, drywall, or plaster) will be classified as leachable Hazardous Waste and must be properly disposed of as per the BC EMA.

1.5 Ozone-Depleting Substances (ODSs)

Provincial regulatory framework providing the requirements for the safe management, storage and disposal of ozone-depleting substances are provided in British Columbia Regulation (BC Reg.) 387/99, as amended from time to time – Ozone-Depleting Substances and Other Halocarbons Regulation respecting the appropriate management of ozone-depleting substances within the province of British Columbia.

1.6 Elemental Mercury

Mercury-containing equipment is regulated under Part 5, section 5.49 of the BC OH&S Regulation.

1.7 Biological Hazards

Biological hazards are regulated under Part 5 (section 5.1) and Part 6 (sections 6.33 to 6.40) of the BC OH&S Regulation. As described in the Regulation, the following biological agents are designated as hazardous substances:

- (a) A liquid or solid material that is contaminated with a prion, virus, bacterium, fungus or other biological agent that has a classification given by the Public Health Agency of Canada as a Risk Group 2, 3 or 4 human pathogen that causes an adverse health effect;
- (b) A biological toxin that causes an adverse health effect.

1.8 Crystalline Silica and Rock Dust

Respirable crystalline silica and rock dust are regulated under the Part 6, sections 6.110 to 6.115.1, of the BC OH&S Regulation.

2.0 FEDERAL REGULATORY FRAMEWORK & APPLICABLE GUIDELINES

2.1 Polychlorinated Biphenyls (PCBs)

The PCB Regulations SOR/2008-273 came into force on September 5, 2008. The purpose of the regulations is to improve the protection of Canada's environment and the health of Canadians by minimizing the risks posed by the use, storage and release of PCBs and by accelerating the elimination of these substances. The Regulations also set out end-of-use and end-of-storage dates for PCBs. These dates are listed in Environment Canada's fact sheet, "PCB Regulations: An Overview." Additionally, Environment Canada has published a report entitled, "Identification of Lamp Ballasts Containing PCBs", revised in August 1991. This report can be referenced to determine the PCB-content in fluorescent lamp ballast.

2.2 Elemental Mercury

The *Products Containing Mercury Regulations* SOR/2014-254 (the Regulations) came into force on November 8, 2015. The Regulations prohibit the manufacture and import of products containing mercury or any of its compounds, with some exemptions for essential products which have no technically or economically viable alternatives (e.g., certain medical and research applications, and dental amalgam). In the case of lamps, rather than introducing a prohibition, the Regulations limit the amount of mercury contained in fluorescent and other types of lamps.

2.3 Transportation of Dangerous Goods

The transportation of hazardous wastes is governed under the Transportation of Dangerous Goods (TDG) Act and Regulations which outline the requirements for storage, handling, and transportation of hazardous waste, amongst other products.

APPENDIX III

Laboratory Results & Sample Location Drawings

Bulk Asbestos Results

Client: ENV-04382 - City of Surrey

Sampled By/ Date: R.Verhelst - November 3, 2021

Reference: Shannon Hall - 6050 176 Street, Surrey, BC

| Sample # | Date Analyzed | Analyst | Sample Location | Material Type | Other Materials | | Asbestos Type & Amount |
|----------|---------------|---------|---|---------------|------------------------------|-------------------|-------------------------|
| | | | | | glass, synthetics, cellulose | | |
| 1 | 10-Nov-21 | IW | Boiler Room North Wall, West End | Skim Coat | Non-Fibrous 95% | Other Fibres <5% | Non-Detected |
| | | | | Plaster | Non-Fibrous 95% | Other Fibres <5% | Non-Detected |
| 2 | 10-Nov-21 | IW | Boiler Room East Wall, North End | Skim Coat | Non-Fibrous 95% | Other Fibres <5% | Non-Detected |
| | | | | Plaster | Non-Fibrous 95% | Other Fibres <5% | Non-Detected |
| 3a | 10-Nov-21 | IW | Boiler Room Chimney | Brick Mortar | Non-Fibrous 95% | Other Fibres <5% | Non-Detected |
| 3b | 10-Nov-21 | IW | Boiler Room Chimney | Brick Mortar | Non-Fibrous 95% | Other Fibres <5% | Non-Detected |
| 3c | 10-Nov-21 | IW | Boiler Room Chimney | Brick Mortar | Non-Fibrous 95% | Other Fibres <5% | Non-Detected |
| 4 | 10-Nov-21 | IW | Boiler Room Chimney, Upper Penetration | Fire Stop | Non-Fibrous 85% | Other Fibres >1% | Chrysotile 5-10% |
| 5 | 10-Nov-21 | IW | Boiler Room Chimney, Lower Penetration | Fire Stop | Non-Fibrous 95% | Other Fibres <5% | Non-Detected |
| 6 | 10-Nov-21 | IW | Boiler Room - NW Water Line | Pipe Wrap | Non-Fibrous 10% | Other Fibres <90% | Non-Detected |
| | | | | Insulation | Non-Fibrous 10% | Other Fibres <90% | Non-Detected |
| 7 | 10-Nov-21 | IW | Boiler Room - Central Water Line | Pipe Wrap | Non-Fibrous 10% | Other Fibres <90% | Non-Detected |
| | | | | Insulation | Non-Fibrous 10% | Other Fibres <90% | Non-Detected |
| 8 | 10-Nov-21 | IW | Boiler Room - South Water Line | Pipe Wrap | Non-Fibrous 10% | Other Fibres <90% | Non-Detected |
| | | | | Insulation | Non-Fibrous 10% | Other Fibres <90% | Non-Detected |

Note* Chrysotile is part of the Serpentine Asbestos Mineral Group

Bulk Asbestos Results

Client: ENV-04382 - City of Surrey

Sampled By/ Date: R.Verhelst - November 3, 2021

Reference: Shannon Hall - 6050 176 Street, Surrey, BC

| Sample # | Date Analyzed | Analyst | Sample Location | Material Type | Other Materials glass, synthetics, cellulose | Asbestos Type & Amount |
|----------|---------------|---------|--|------------------------|--|------------------------------|
| 9 | 10-Nov-21 | IW | Boiler Room - South Water Pipe Joint | Parging | Non-Fibrous 70% Other Fibres >1% | Chrysotile 20-25% |
| 10a | 10-Nov-21 | IW | Boiler Room - North Windows | Putty | Non-Fibrous 95% Other Fibres <5% | Non-Detected |
| 10b | 10-Nov-21 | IW | Boiler Room - North Windows | Putty | Non-Fibrous 95% Other Fibres <5% | Non-Detected |
| 10c | 10-Nov-21 | IW | Boiler Room - North Windows | Putty | Non-Fibrous 95% Other Fibres <5% | Non-Detected |
| 11a | 10-Nov-21 | IW | Hall @ Entrance To Accessible Washroom Wall | Drywall Joint Compound | Non-Fibrous 95% Other Fibres <5% | Non-Detected |
| 11b | 10-Nov-21 | IW | Hall @ Entrance To Accessible Washroom Wall | Drywall Joint Compound | Non-Fibrous 95% Other Fibres <5% | Non-Detected |
| 11c | 10-Nov-21 | IW | Hall @ Entrance To Accessible Washroom Wall | Drywall Joint Compound | Non-Fibrous 95% Other Fibres <5% | Non-Detected |
| 12a | 10-Nov-21 | IW | Hall @ Entrance To Accessible Washroom Ceiling | Skim Coat Plaster | Non-Fibrous 95% Other Fibres <5% Non-Fibrous 95% Other Fibres <5% | Non-Detected Non-Detected |
| 12b | 10-Nov-21 | IW | Hall @ Entrance To Accessible Washroom Ceiling | Skim Coat Plaster | Non-Fibrous 95% Other Fibres <5% Non-Fibrous 95% Other Fibres <5% | Non-Detected Non-Detected |
| 12c | 10-Nov-21 | IW | Hall @ Entrance To Accessible Washroom Ceiling | Skim Coat Plaster | Non-Fibrous 95% Other Fibres <5% Non-Fibrous 95% Other Fibres <5% | Non-Detected Non-Detected |

Note* Chrysotile is part of the Serpentine Asbestos Mineral Group

2021-11-12



Please find attached the analysis results for the samples submitted for Lead content determination to Sarcova Industries Inc.

All samples were analyzed using EPA SW 846 3050B/7000B method. Samples where less than 0.2g dry weight of matrix material was submitted will be marked as potentially biased due to insufficient material for analysis. Sample numbers are generated first chronologically by the submission date, followed by sequentially based on the order they appear on the completed COC. Unless otherwise stated all quality control and assurance samples analyzed were within acceptable limits. Samples whose lead concentration is below the Reporting Limit will be marked as "<0.009%".

Materials containing greater than 90 ppm or 0.009% lead are considered to be lead containing, and a qualified person should be consulted on the regional regulations concerning removal and disposal.

The results presented in this report are strictly valid for the samples received by the laboratory personnel and as such are subject to error generated during sampling. These results may not be reproduced, except in full, without the expressed permission of Sarcova Industries Inc. management.

Reasonable excess quantities of samples are archived for four weeks after analysis. Samples that are not retrieved by the client will be disposed of in accordance with local regulations.

Sincerely,

A handwritten signature in blue ink, appearing to read "Patrick O'Donnell".

Patrick O'Donnell M.Sc ,
Quality Assurance Officer

Sarcova PID: LS1880
 Analyst: CL
 Analysis Method: SW846-3050B/7000B

Project Location: Shannon Hall, Surrey BC

Client: Sure Hazmat & Testing – A Division of the MBC Group
 Contact: ryan.verhelst@mbc-group.ca
 Client Project Number: ENV-04382

CLIENT SAMPLES

LAB ID: LS1880-01

| Client ID: L1 | Sample Weight (g) | Concentration (µg/g) | Lead By Weight (%) |
|---|-------------------|----------------------|--------------------|
| Location: Hall Washroom Entry Beige Drywall Paint | 0.2022 | <90 | <0.009 |

LAB ID: LS1880-02

| Client ID: L2 | Sample Weight (g) | Concentration (µg/g) | Lead By Weight (%) |
|---|-------------------|----------------------|--------------------|
| Location: Hall at Boiler Room Beige Plaster Paint | 0.2523 | 729 | 0.073 |

LAB ID: LS1880-03

| Client ID: L3 | Sample Weight (g) | Concentration (µg/g) | Lead By Weight (%) |
|--|-------------------|----------------------|--------------------|
| Location: Boiler Room Door Frame White/Yellow Paint | 0.2423 | 2092 | 0.209 |

LAB ID: LS1880-04

| Client ID: L4 | Sample Weight (g) | Concentration (µg/g) | Lead By Weight (%) |
|---|-------------------|----------------------|--------------------|
| Location: Exterior Concrete Foundation Grey Paint | 0.2375 | 867 | 0.087 |

Sarcova PID: LS1880
 Analyst: CL
 Analysis Method: SW846-3050B/7000B

Project Location: Shannon Hall, Surrey BC

Client: Sure Hazmat & Testing – A Division of the MBC Group
 Contact: ryan.verhelst@mbc-group.ca
 Client Project Number: ENV-04382

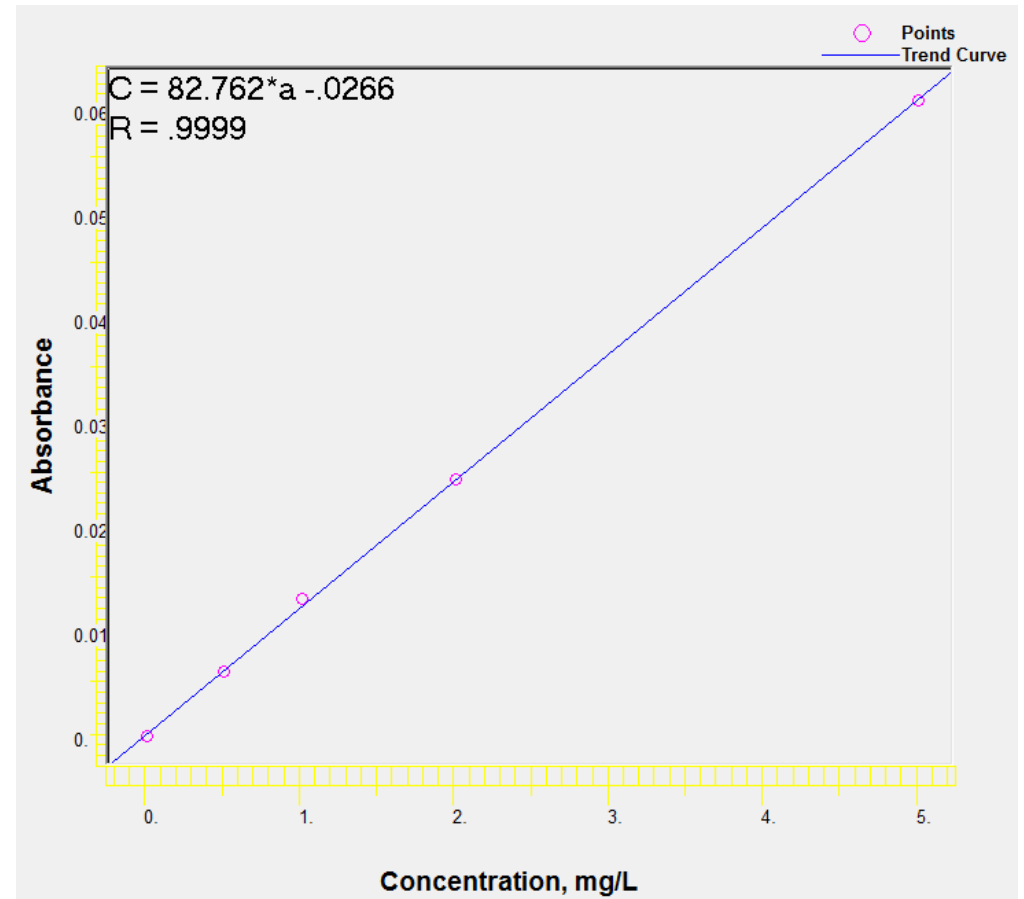
STANDARD ABSORBANCES

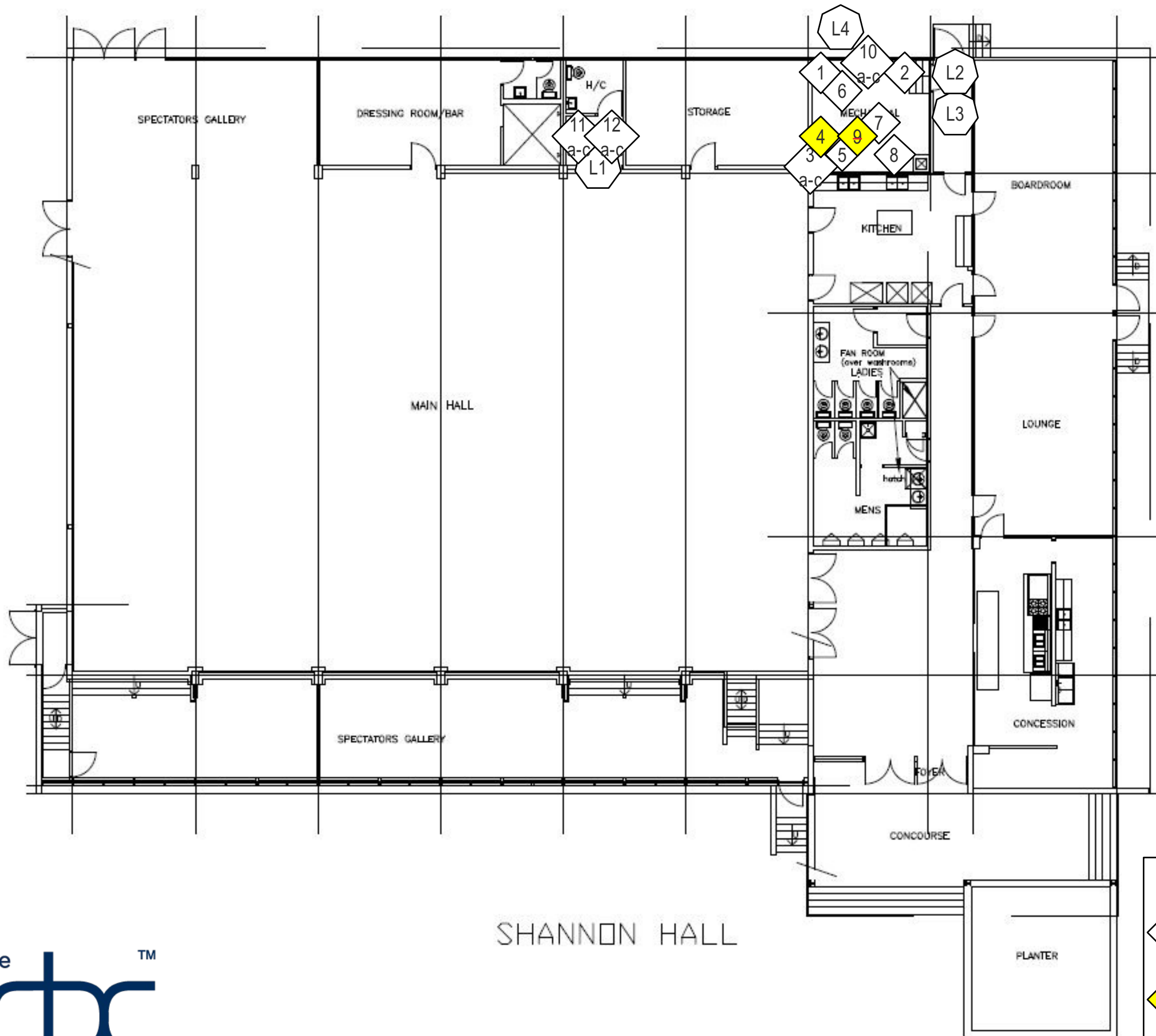
| | |
|--------|-------|
| BLANK | 0.000 |
| 0.5ppm | 0.006 |
| 1.0ppm | 0.013 |
| 2.0ppm | 0.024 |
| 5.0ppm | 0.061 |

QA/QC SAMPLES

| SAMPLE | EXPECTED RANGE | | ACTUAL | PASS? |
|--------|----------------|-------|--------|-------|
| MSD | 75% | 125% | 106% | Y |
| LCS | 1580 | 2350 | 2060 | Y |
| MB | - | 0.005 | 0.003 | Y |
| ICV | 1.60 | 2.40 | 1.97 | Y |
| ICB | - | 0.005 | 0.001 | Y |
| CCV | 1.60 | 2.40 | 2.25 | Y |
| CCB | - | 0.005 | 0.001 | Y |

CALIBRATION CURVE





| Legend | |
|--------|----------------------------|
| | Non-Asbestos Sample |
| | Asbestos-Containing Sample |
| | Lead Sample |

The following addendum supersedes information contained in drawings and specifications issued for the project to the extent referenced. This Addendum forms part of the Tender Documents and is subject to all of the conditions set out in the contract conditions.

1. DRAWINGS – MECHANICAL

1.1 Drawing No.: M0.01 – Cover Page

- .1 Add:
 - .1 Air Separator Schedule added; refer to drawings for details.
 - .2 Pump Schedule added; refer to drawings for details.
- .2 Delete:
 - .1 Variable Frequency Drive (VFD) Schedule deleted.
- .3 Revise:
 - .1 Motorlist Schedule: Pumps P-1,2 updated and moved from existing equipment to new. Refer to drawings for details.

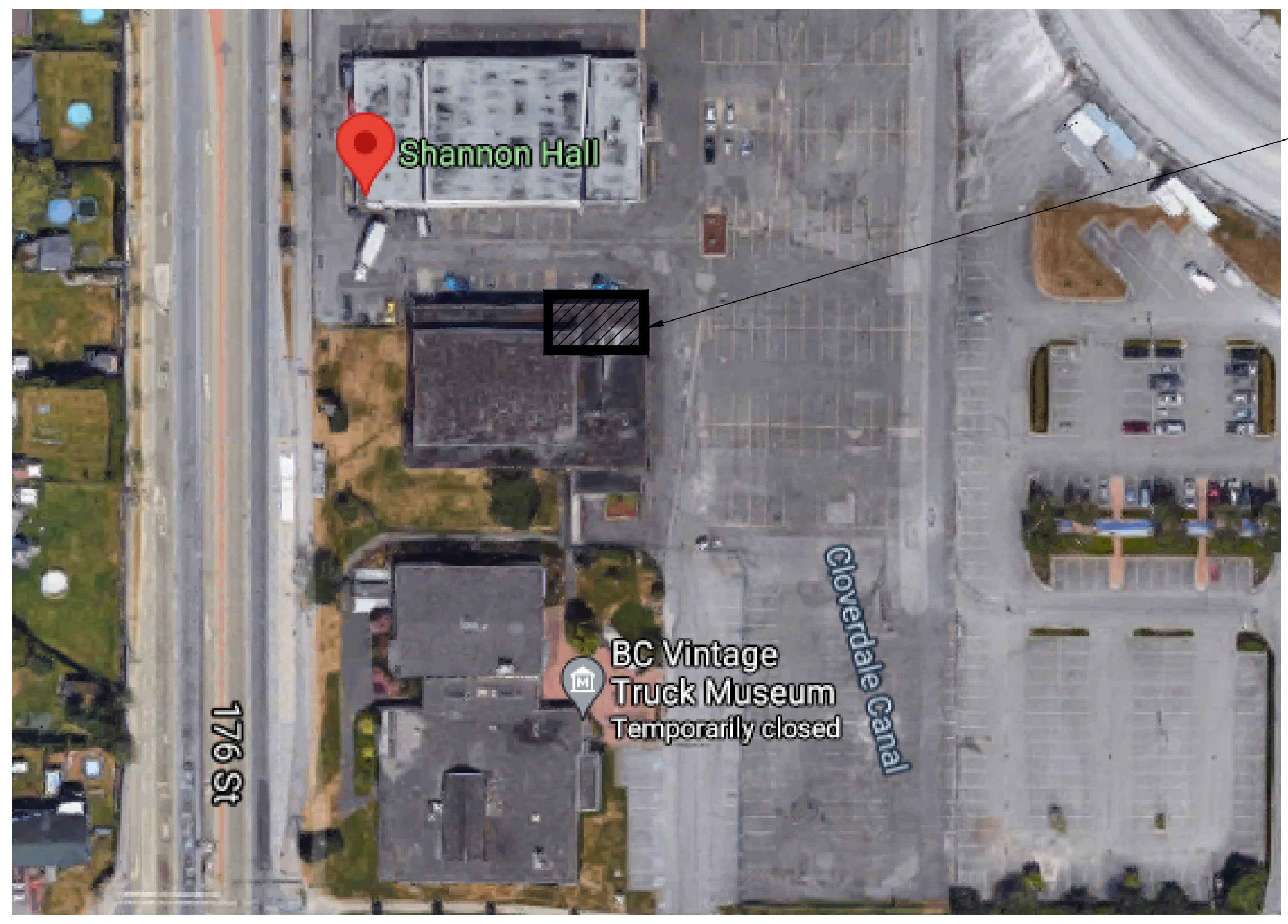
1.2 Drawing No.: M1.01 – Mechanical Room Schematics

- .1 Add:
 - .1 Tag AS-1 for Air Separator added to 2/M1.01
- .2 Delete:
 - .1 Note: “Existing Pumps” from P-1,2 deleted from 2/M1.01.
 - .2 Tags V-1,2 on VSD deleted from 1/M1.03 and 2/M1.03
- .3 Revise:
 - .1 “VSD” on circulation pumps P-1,2 changed to “ECM”

1.3 Drawing No.: M1.03 – Cascading Operation Schematics

- .1 Add:
 - .1 Tag AS-1 for Air Separator added to 2/M1.01
- .2 Delete:
 - .1 Note: “Existing Pumps” on P-1,2 deleted from 1/M1.03 and 2/M1.03.
 - .2 Tags V-1,2 on VSD deleted from 1/M1.03 and 2/M1.03
- .3 Revise:
 - .1 “VSD” on circulation pumps P-1,2 changed to “ECM”

END OF MECHANICAL ADDENDUM NO. 1



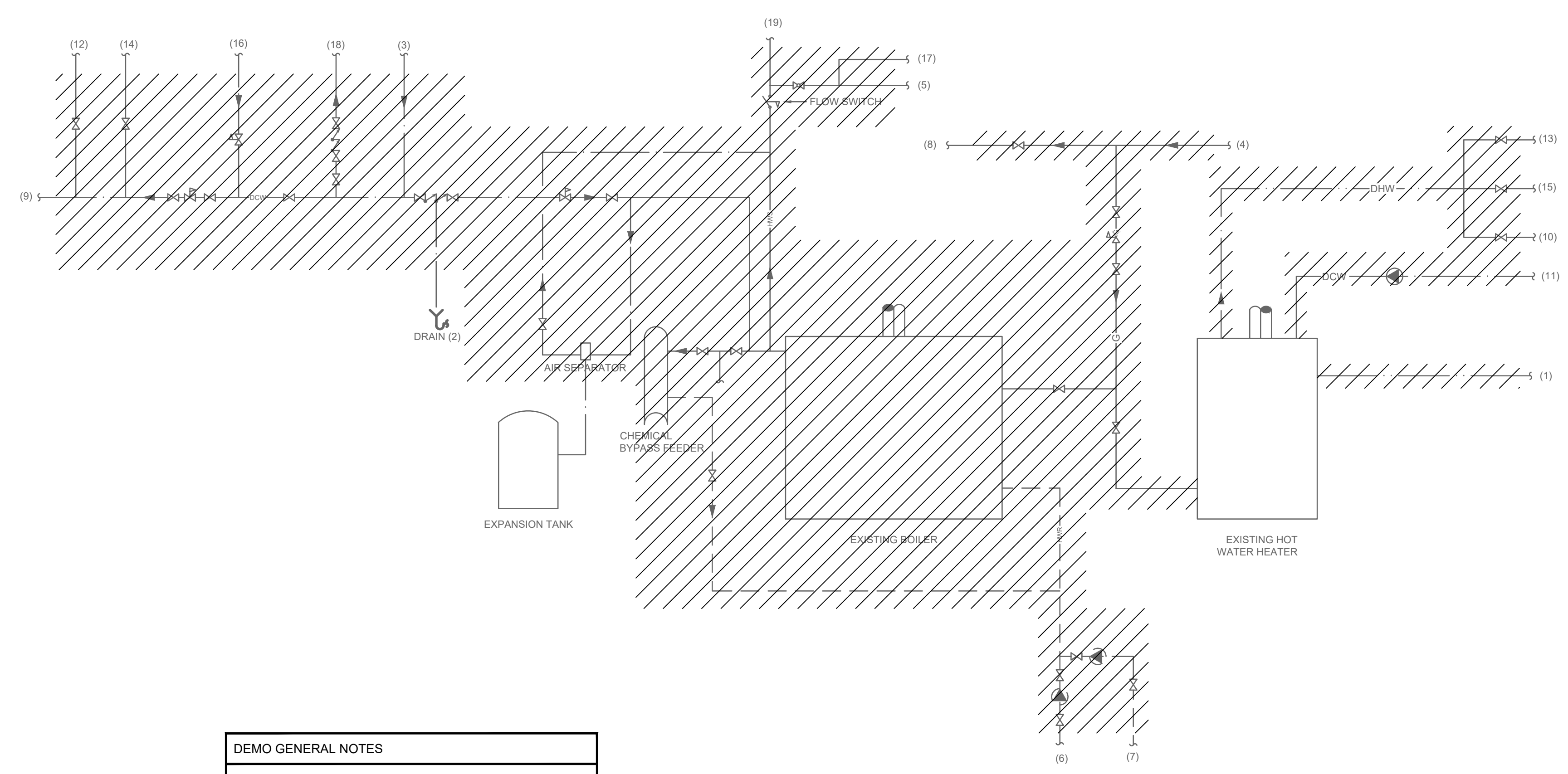
SITE PLAN
SCALE: NTS

| MECHANICAL ABBREVIATIONS | |
|--------------------------|----------------------------------|
| AD | AREA DRAIN |
| AFF | ABOVE FINISHED FLOOR |
| AHU | AIR HANDLING UNIT |
| ARCH | ARCHITECTURAL |
| BB | BASEBOARD HEATER |
| BOD | BACKDRAFT DAMPER |
| BF | BOTTLE FILLER |
| BFP | BACKFLOW PREVENTER |
| BHP | BREAK HORSEPOWER |
| BTM | BRITISH THERMAL UNIT / HOUR |
| CD | CONTROL DAMPER |
| CB | CATCH BASIN |
| CFM | CUBIC FEET PER MINUTE |
| CLG | CEILING |
| CO | CLEANOUT |
| CONN | CONNECTION |
| CW | COMPLETE WITH |
| CONT | CONTINUATION |
| DB | DRY BULB |
| CTE | CONNECT TO EXISTING |
| DCW | DOMESTIC COLD WATER |
| DDC | DIRECT DIGITAL CONTROL |
| DEG | DEGREE |
| DF | DRINKING FOUNTAIN |
| DHW | DOMESTIC HOT WATER |
| DIA | DIAMETER |
| DN | DOWN |
| DW | DISH WASHER |
| DWG | DRAWING |
| DWHR | DOMESTIC HOT WATER RECIRCULATION |
| E | ENTERING AIR TEMPERATURE |
| EAT | ENTERING AIR TEMPERATURE |
| EA | EXHAUST AIR |
| EF | EFFICIENCY |
| EFF | EFFICIENCY |
| ELEC | ELECTRICAL |
| ENT | ENTERING |
| ESP | EXTERNAL STATIC PRESSURE |
| EWT | ENTERING WATER TEMPERATURE |
| EZH | EXHAUST |
| F | FIRE MAIN |
| FD | FLOOR DRAIN |
| FE | FIRE EXTINGUISHER |
| FLA | FULL LOAD AMPS |
| FLR | FLOOR |
| FFM | FEET PER MINUTE |
| FT | FEET/FOOT |
| GAL | GALLONS |
| GPM | GALLONS PER MINUTE |
| GWB | GYPSONUM WALL BOARD |
| HD | HUB DRAIN |
| HB | HOSE BIBB |
| HP | HORSEPOWER |
| HCR | HEATING COIL RETURN |
| HCS | HEATING COIL SUPPLY |
| HRR | HEAT RECOVERY RETURN |
| HRS | HEAT RECOVERY SUPPLY |
| HWR | HEATING WATER RETURN |
| HWS | HEATING WATER SUPPLY |
| I | INSIDE DIAMETER |
| IE | INVERT ELEVATION |
| IN | INCH |
| INV | INVERT |
| JS | JANITOR SINK |
| KW | KILOWATT |
| KS | KITCHEN SINK |
| L | LAVATORY |
| LAV | LEAVING AIR TEMPERATURE |
| LBS | POUNDS |
| LWT | LEAVING WATER TEMPERATURE |
| MAU | MAKE-UP AIR UNIT |
| MAX | MAXIMUM |
| MH | MANHOLE |
| MH | 1000 BRITISH THERMAL UNIT/HOUR |
| MD | MOTORIZED DAMPER |
| MECH | MECHANICAL |
| MIN | MINIMUM |
| MU | MAKE-UP MECHANICAL WATER |
| NHFB | NON FREEZE WALL HYDRANT |
| NO | NOT IN CONTRACT |
| NO | NOISE CRITERION/NORMALLY CLOSED |
| NO | NORMALLY OPEN |
| NTS | NOT TO SCALE |
| OA | OUTDOOR AIR |
| ORB | OPPOSED BLADE DAMPER |
| OED | OPEN ENDED DUCT |
| OD | OUTSIDE DIAMETER |
| PDI | PLUMBING AND DRAINAGE INSTITUTE |
| PC | POINT OF CONNECTION |
| PRV | PRESSURE REDUCING VALVE |
| PSI | POUNDS PER SQUARE INCH |
| RA | RETURN AIR |
| RF | RETURN FAN |
| RM | ROOM |
| RM | REVOLUTIONS PER MINUTE |
| RWL | RAIN WATER LEADER |
| SA | SUPPLY AIR |
| SA | SUPPLY FAN |
| SH | SHOWER |
| SK | SINK DRAIN ABOVE |
| SS | STAINLESS STEEL |
| SP | STATIC PRESSURE |
| SPEC | SPECIFICATION |
| SR | SANITARY RISER |
| ST | STORM MAIN |
| TA | TRANSFER AIR |
| TAD | TRANSFER AIR DUCT |
| TBC | TO BE CONFIRMED |
| TBD | TO BE DETERMINED |
| TD | TRENCH DRAIN |
| THRU | THROUGH |
| TS | TAMPER SWITCH |
| TSP | TOTAL STATIC PRESSURE |
| TYP | TYPICAL |
| UR | URINAL |
| V | VENT |
| VFD | VARIABLE FREQUENCY DRIVE |
| VTR | VENT THROUGH ROOF |
| W | WATER MAIN |
| WC | WET BULL |
| WC | WATER CLOSET |
| WCO | WALL CLEANOUT |
| WG | WATER GAUGE |

| PIPING | | | FITTINGS AND VALVES | | |
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| DEMOLITION | EXISTING | NEW | DEMOLITION | EXISTING | NEW |
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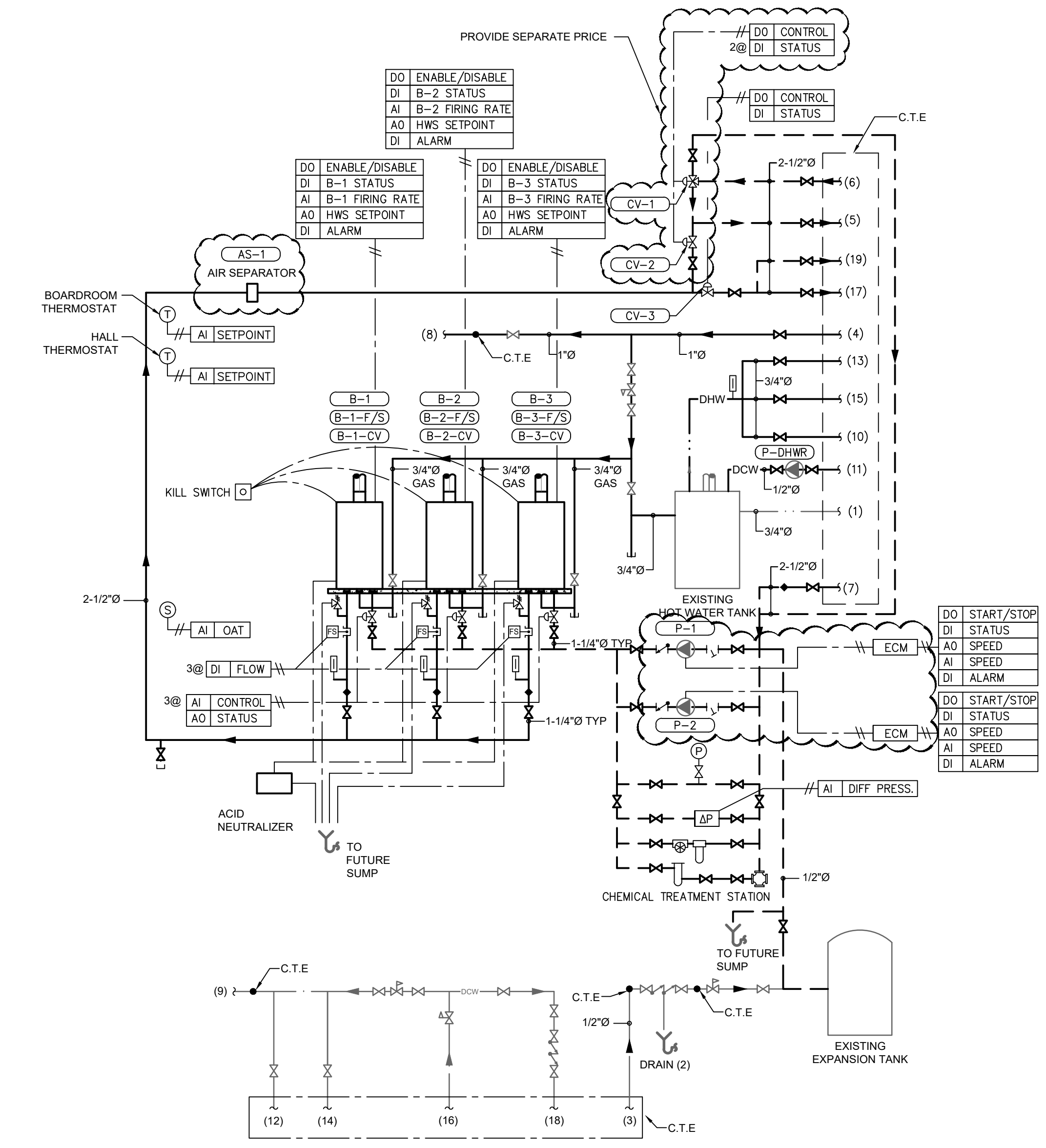
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| REV. | DATE | DESCRIPTION |
|------|------------|-----------------------------|
| 1. | 2021.05.28 | ISSUED FOR 80% PROGRESS SET |
| 2. | 2021.04.24 | ISSUED FOR REVIEW |
| 3. | 2021.07.05 | ISSUED FOR REVIEW |
| 4. | 2021.07.05 | ISSUED FOR REVIEW |
| 5. | 2021.09.03 | ISSUED FOR RFQ REVIEW |
| 6. | 2021.10.26 | ISSUED FOR RFQ |
| 7. | 2022.02.13 | ISSUED FOR ADDENDUM 01 |



- DEMO GENERAL NOTES**
- DEMO ALL PIPING. MAINTAIN CURRENT WALL CONNECTIONS. SEE WALL DRAWINGS FOR CONNECTION LOCATIONS.
 - DEMO EXISTING BOILER AND CAP OFF FLUE CONNECTION WITH EXISTING CHIMNEY. EXISTING MECHANICAL EQUIPMENT TO BE MOVED AND RECONNECTED.

1 MECHANICAL DEMOLITION SCHEMATIC
SCALE: NTS



2 MECHANICAL RENOVATION SCHEMATIC
SCALE: NTS

| CONNECTION TAG | LOCATION | SERVICE | DESCRIPTION | SIZE (IN) |
|----------------|------------|---------|---|-----------|
| 1 | NORTH WALL | DHW | HOT WATER TANK RELIEF LINE | 0.75 |
| 2 | NORTH WALL | MHWR | BOILER FEED WATER BACKFLOW PREVENTION DRAIN | 2 |
| 3 | NORTH WALL | MHWR | BOILER FEED WATER IN | 0.5 |
| 4 | NORTH WALL | PG | NATURAL GAS IN | 1 |
| 5 | SOUTH WALL | MHWS | HEATING WATER SUPPLY OUT | 2.5 |
| 6 | SOUTH WALL | MHWR | HEATING WATER RETURN IN | 2.5 |
| 7 | SOUTH WALL | MHWR | HEATING WATER RETURN IN | 2.5 |
| 8 | SOUTH WALL | PG | NATURAL GAS OUT | 1 |
| 9 | SOUTH WALL | DCW | DOMESTIC COLD WATER OUT | 1.5 |
| 10 | SOUTH WALL | DHW | DOMESTIC HOT WATER OUT | 0.75 |
| 11 | SOUTH WALL | DCW | DOMESTIC COLD WATER IN (FOR HOT WATER HEATER) | 0.5 |
| 12 | SOUTH WALL | DCW | DOMESTIC COLD WATER OUT | 0.75 |
| 13 | WEST WALL | DHW | DOMESTIC HOT WATER OUT | 0.75 |
| 14 | WEST WALL | DCW | DOMESTIC COLD WATER OUT | 0.75 |
| 15 | WEST WALL | DHW | DOMESTIC HOT WATER OUT | 0.5 |
| 16 | WEST WALL | DCW | DOMESTIC COLD WATER IN | 1.5 |
| 17 | WEST WALL | MHWS | HEATING WATER SUPPLY OUT | 2.5 |
| 18 | EAST WALL | DCW | YARD HYDRANTS OUT | 1.5 |
| 19 | EAST WALL | MHWS | HEATING WATER SUPPLY OUT | 2.5 |

| TAG | SERVICE | TYPE | LINE SIZE | VALVE SIZE | CONTROL MODE | CONTROL POINT | FAIL POSITION |
|------|---------|---------------|-----------|------------|--------------|---------------|---------------|
| CV-1 | MHWR | 3-WAY CONTROL | 2-1/2 | 2-1/2 | ON/OFF | DO | A CLOSED |
| CV-2 | MHWR | 2-WAY CONTROL | 2-1/2 | 2-1/2 | ON/OFF | DO | OPEN |
| CV-3 | MHWR | 2-WAY CONTROL | 2-1/2 | 2-1/2 | ON/OFF | DO | OPEN |

CONSULTANT:

SEAL:

PROJECT TITLE:

CLOVERDALE FAIRGROUNDS BOILER REPLACEMENT

PROJECT ADDRESS:

SHANNON HALL
6050 176 ST, SURREY, BC

DRAWN BY:

AC

CHECKED BY:

AO

SCALE:

AS NOTED

DATE:

JUNE 10, 2021

DRAWING TITLE:

MECHANICAL ROOM SCHEMATICS

PROJECT NO.

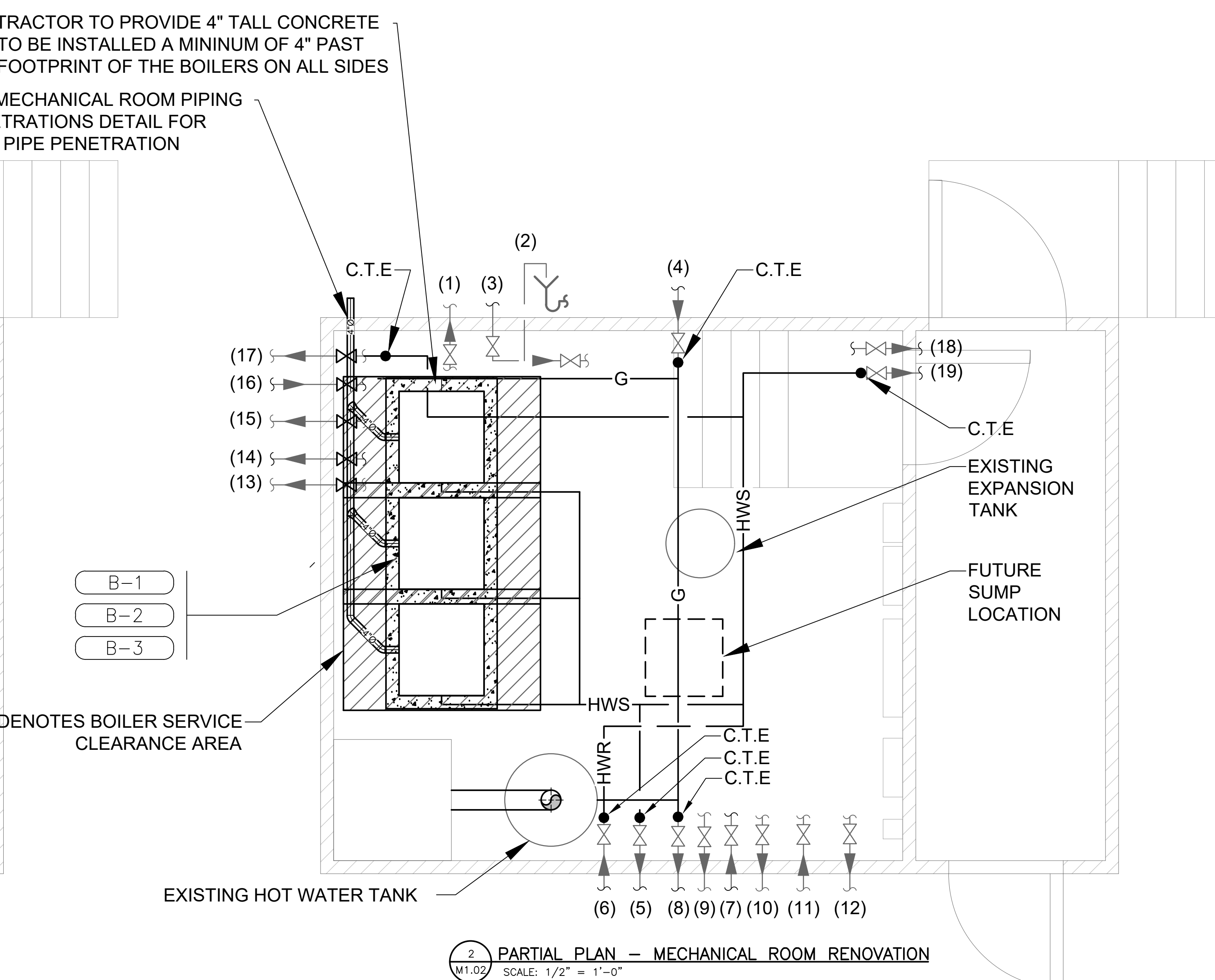
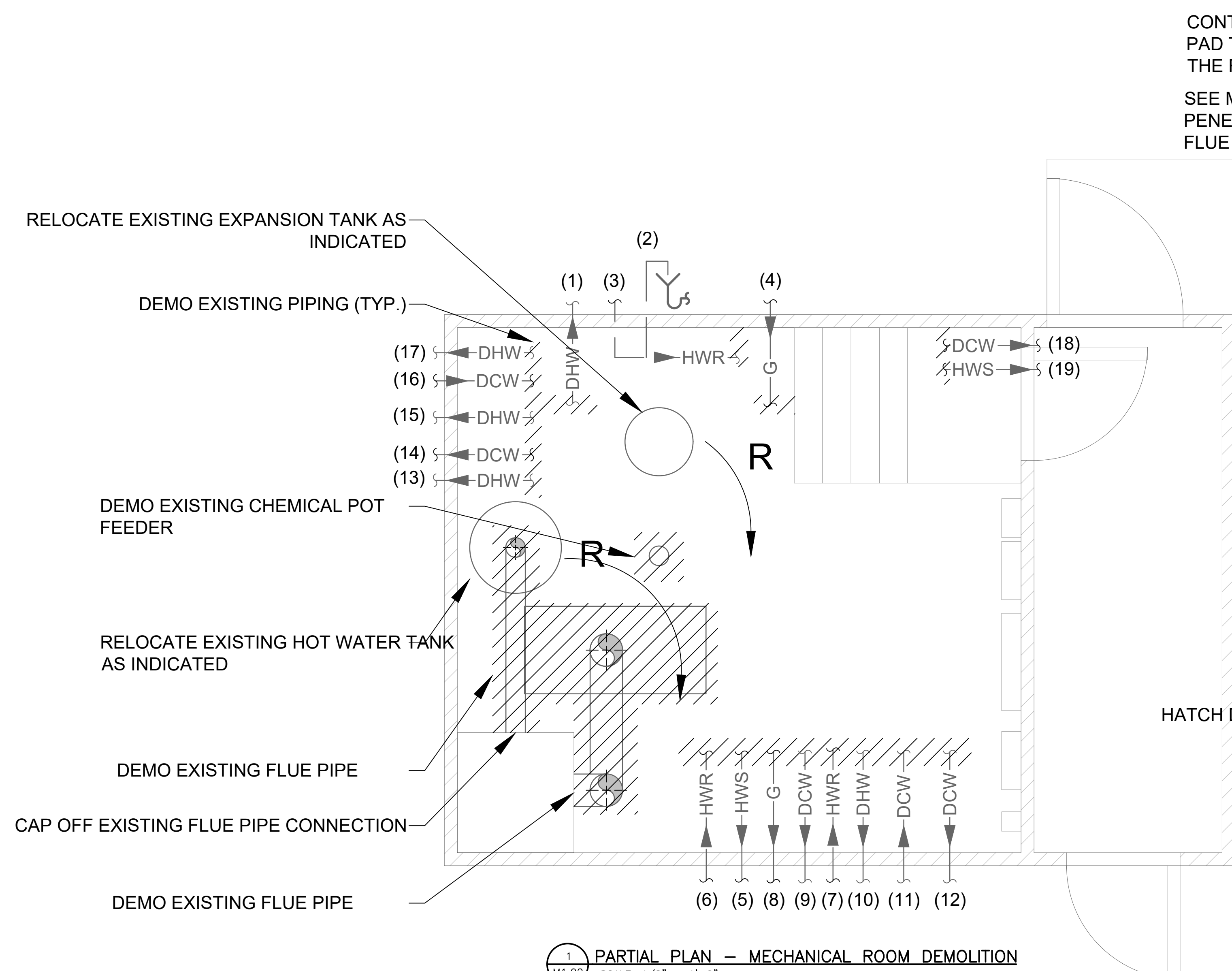
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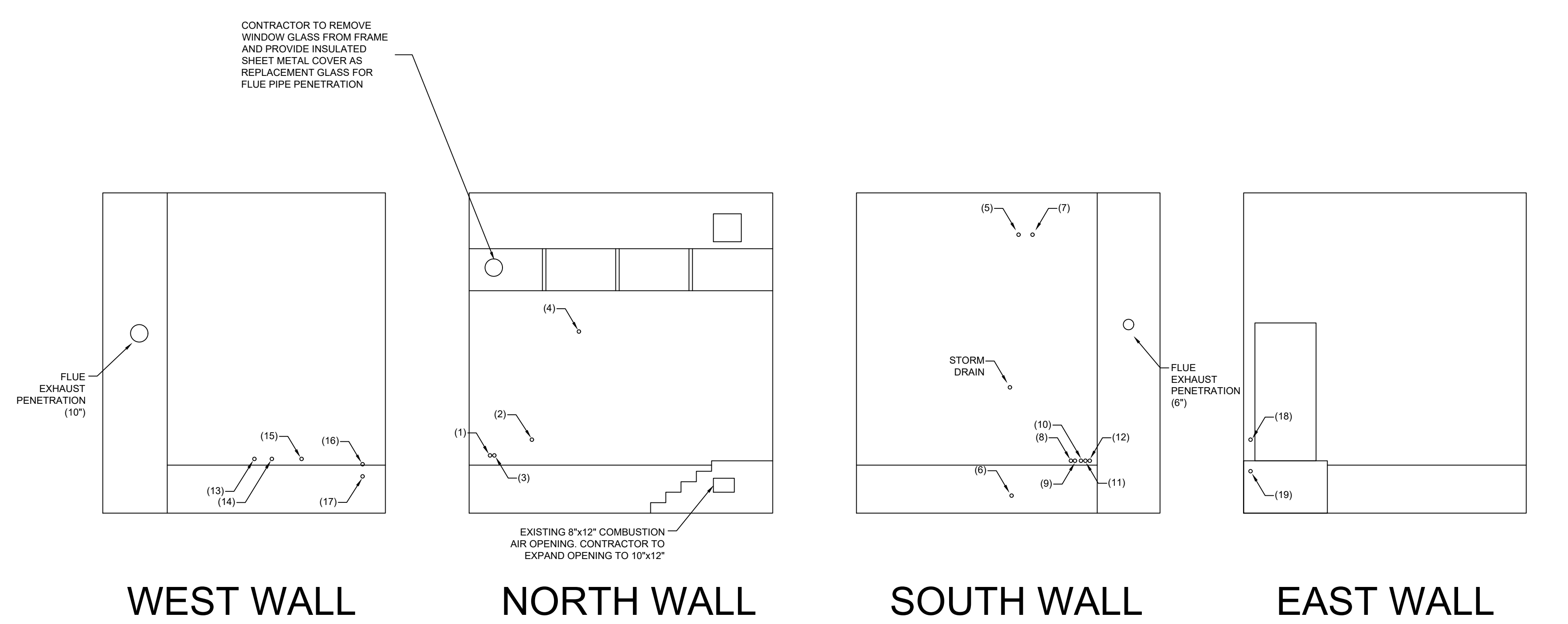
M1.01

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| REV. | DATE | DESCRIPTION |
|------|------------|-----------------------------|
| 1. | 2021.05.28 | ISSUED FOR 80% PROGRESS SET |
| 2. | 2021.04.24 | ISSUED FOR REVIEW |
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| 4. | 2021.07.05 | ISSUED FOR REVIEW |
| 5. | 2021.09.03 | ISSUED FOR RFQ REVIEW |
| 6. | 2021.10.26 | ISSUED FOR RFQ |
| 7. | 2022.02.13 | ISSUED FOR ADDENDUM 01 |



| CONNECTION TAG | LOCATION | SERVICE | DESCRIPTION | SIZE (IN) |
|----------------|------------|---------|---|-----------|
| 1 | NORTH WALL | DHW | HOT WATER TANK RELIEF LINE | 0.75 |
| 2 | NORTH WALL | MHWR | BOILER FEED WATER BACKFLOW PREVENTION DRAIN | 2 |
| 3 | NORTH WALL | MHWR | BOILER FEED WATER IN | 0.5 |
| 4 | NORTH WALL | PG | NATURAL GAS IN | 1 |
| 5 | SOUTH WALL | MHWS | HEATING WATER SUPPLY OUT | 2.5 |
| 6 | SOUTH WALL | MHWR | HEATING WATER RETURN IN | 2.5 |
| 7 | SOUTH WALL | MHWR | HEATING WATER RETURN IN | 2.5 |
| 8 | SOUTH WALL | PG | NATURAL GAS OUT | 1 |
| 9 | SOUTH WALL | DCW | DOMESTIC COLD WATER OUT | 1.5 |
| 10 | SOUTH WALL | DHW | DOMESTIC HOT WATER OUT | 0.75 |
| 11 | SOUTH WALL | DCW | DOMESTIC COLD WATER IN (FOR HOT WATER HEATER) | 0.5 |
| 12 | SOUTH WALL | DCW | DOMESTIC COLD WATER OUT | 0.75 |
| 13 | WEST WALL | DHW | DOMESTIC HOT WATER OUT | 0.75 |
| 14 | WEST WALL | DCW | DOMESTIC COLD WATER OUT | 0.75 |
| 15 | WEST WALL | DHW | DOMESTIC HOT WATER OUT | 0.5 |
| 16 | WEST WALL | DCW | DOMESTIC COLD WATER IN | 1.5 |
| 17 | WEST WALL | MHWS | HEATING WATER SUPPLY OUT | 2.5 |
| 18 | EAST WALL | DCW | YARD HYDRANTS OUT | 1.5 |
| 19 | EAST WALL | MHWS | HEATING WATER SUPPLY OUT | 2.5 |



CONSULTANT:

SEAL:

PROJECT TITLE:
CLOVERDALE FAIRGROUNDS BOILER REPLACEMENT

PROJECT ADDRESS:
SHANNON HALL
6050 176 ST. SURREY, BC

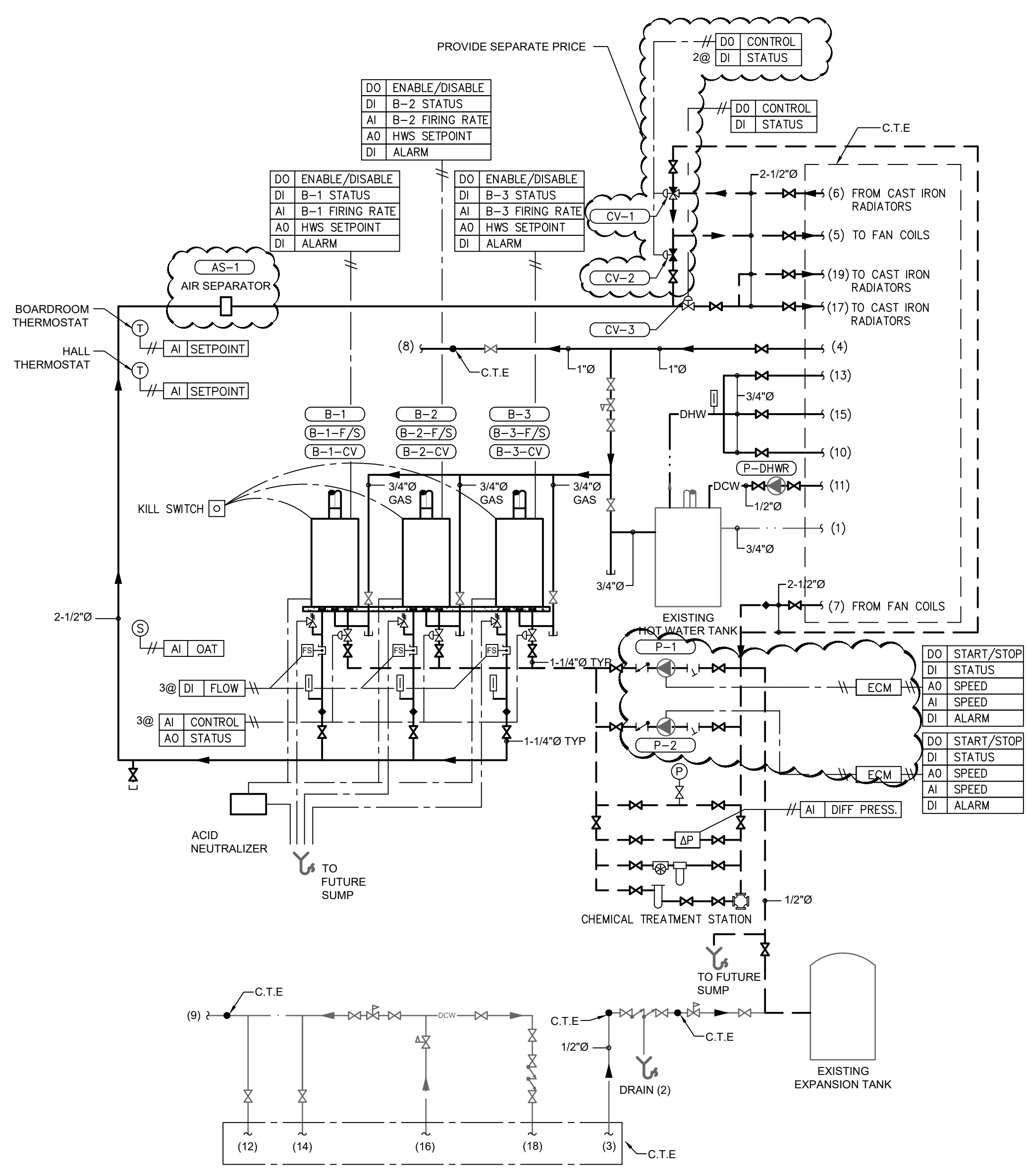
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SCALE: AS NOTED
DATE: JUNE 10, 2021

DRAWING TITLE:
MECHANICAL ROOM PLAN

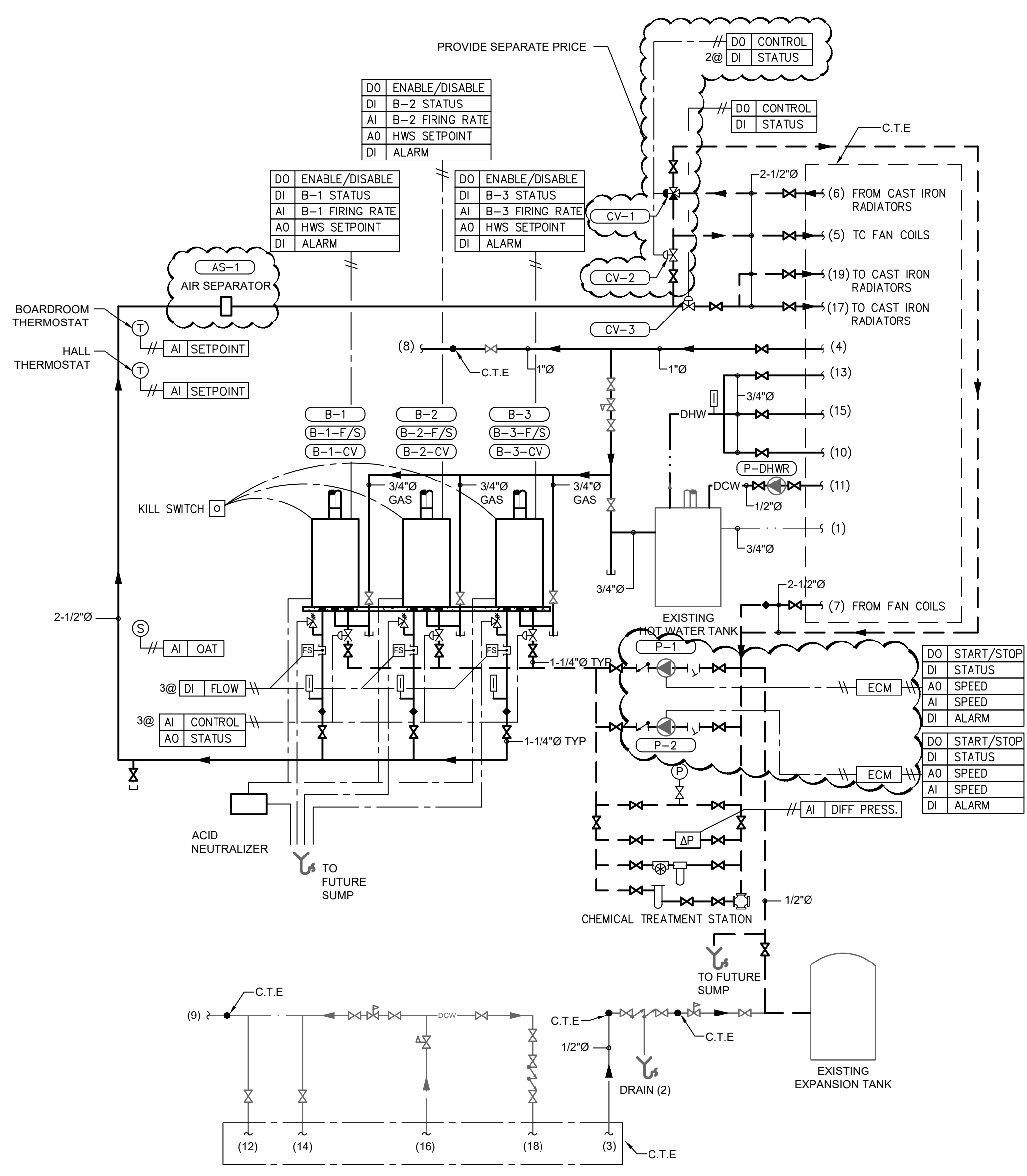
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085b-069-21 **M1.02**

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| 1. | 2021.05.28 | ISSUED FOR 80% PROGRESS SET |
| 2. | 2021.04.24 | ISSUED FOR REVIEW |
| 3. | 2021.07.05 | ISSUED FOR REVIEW |
| 4. | 2021.07.05 | ISSUED FOR REVIEW |
| 5. | 2021.09.03 | ISSUED FOR Rfq REVIEW |
| 6. | 2021.10.26 | ISSUED FOR Rfq |
| 7. | 2022.02.13 | ISSUED FOR ADDENDUM 01 |



1 CASCADING OPERATION VALVE POSITIONS
M1.03 SCALE: NTS



2 NON-CASCADING OPERATION VALVE POSITIONS
M1.03 SCALE: NTS

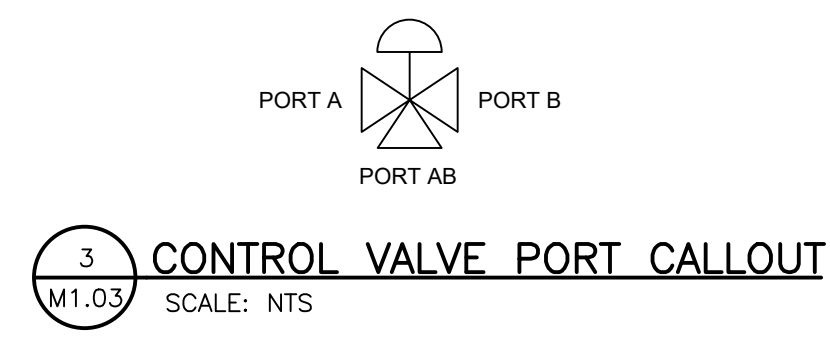
SEQUENCE OF OPERATION

INTENT OF THIS PROJECT IS TO ENSURE THAT CASCADING OF THE HEATING LOOP FLOW IS CONDUCTED SO THAT HIGHER TEMPERATURE DIFFERENTIALS ARE ACHIEVED IN ORDER TO INCREASE CONDENSING BOILER EFFICIENCY (BY HAVING RETURN WATER TEMPERATURE ON INLET SIDE OF BOILERS AS LOW AS POSSIBLE).

THIS SHALL BE ACHIEVED BY UTILIZING CASCADING WATER FLOWS. THE HOT WATER SUPPLY IS TO BE DIRECTED FIRST TO THE RADIATOR HEATING SYSTEM. THE HOT WATER RETURN FROM THE RADIATOR HEATING SYSTEM SHALL BE THE HOT WATER SUPPLY TO THE FAN COILS. PLEASE SEE DETAIL 1/M1.03 FOR CASCADING OPERATION VALVE POSITIONS.

IN CASCADING MODE CV-1 SHALL HAVE PORT "B" FULLY CLOSED, AND CV-2 SHALL BE FULLY CLOSED. HOT WATER PUMP P-1 OR P-2 SHALL BE RUNNING AT CASCADING MODE FLOW.

IN NON-CASCADING MODE CV-1 SHALL HAVE PORT "A" FULLY CLOSED, AND CV-2 SHALL BE FULLY OPEN. HOT WATER PUMP P-1 OR P-2 SHALL BE RUNNING AT NON-CASCADING MODE FLOW.



CONTROL VALVE SCHEDULE

| TAG | SERVICE | TYPE | LINE SIZE | VALVE SIZE | CONTROL MODE | CONTROL POINT | FAIL POSITION |
|------|---------|---------------|-----------|------------|--------------|---------------|---------------|
| CV-1 | MHWR | 3-WAY CONTROL | 2-1/2 | 2-1/2 | ON/OFF | DO | A CLOSED |
| CV-2 | MHWR | 2-WAY CONTROL | 2-1/2 | 2-1/2 | ON/OFF | DO | OPEN |
| CV-3 | MHWR | 2-WAY CONTROL | 2-1/2 | 2-1/2 | ON/OFF | DO | OPEN |

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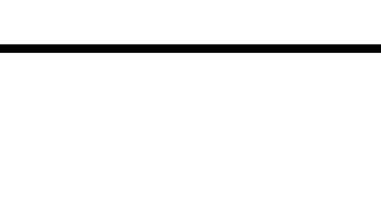
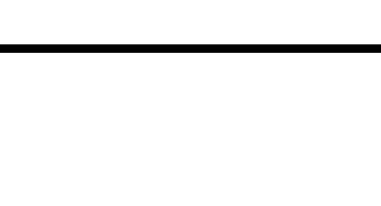
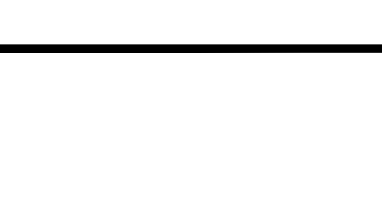
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CLOVERDALE FAIRGROUNDS BOILER REPLACEMENT

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6050 176 ST, SURREY, BC

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DRAWING TITLE:
CASCADING OPERATION SCHEMATICS

PROJECT NO. DRAWING NO.
085b-069-21 **M1.03**



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| 7. | 2022.02.13 | ISSUED FOR ADDENDUM 01 |



EXISTING AIR BLEEDER VALVE

EXISTING ANGLED ISOLATION VALVE

1 EXISTING BOARDROOM CAST IRON RADIATORS
M1.05 SCALE: NTS

- NOTES**
- PROVIDE SEPARATE PRICE FOR FLUSHING EXISTING CAST IRON RADIATORS AND DISTRIBUTION SYSTEM.
 - PROVIDE SEPARATE PRICE FOR REPLACING EXISTING ANGLED ISOLATION VALVES WITH THERMOSTATIC RADIATOR VALVES
 - PROVIDE SEPARATE PRICE FOR REPLACING RADIATOR AIR BLEEDER VALVES.

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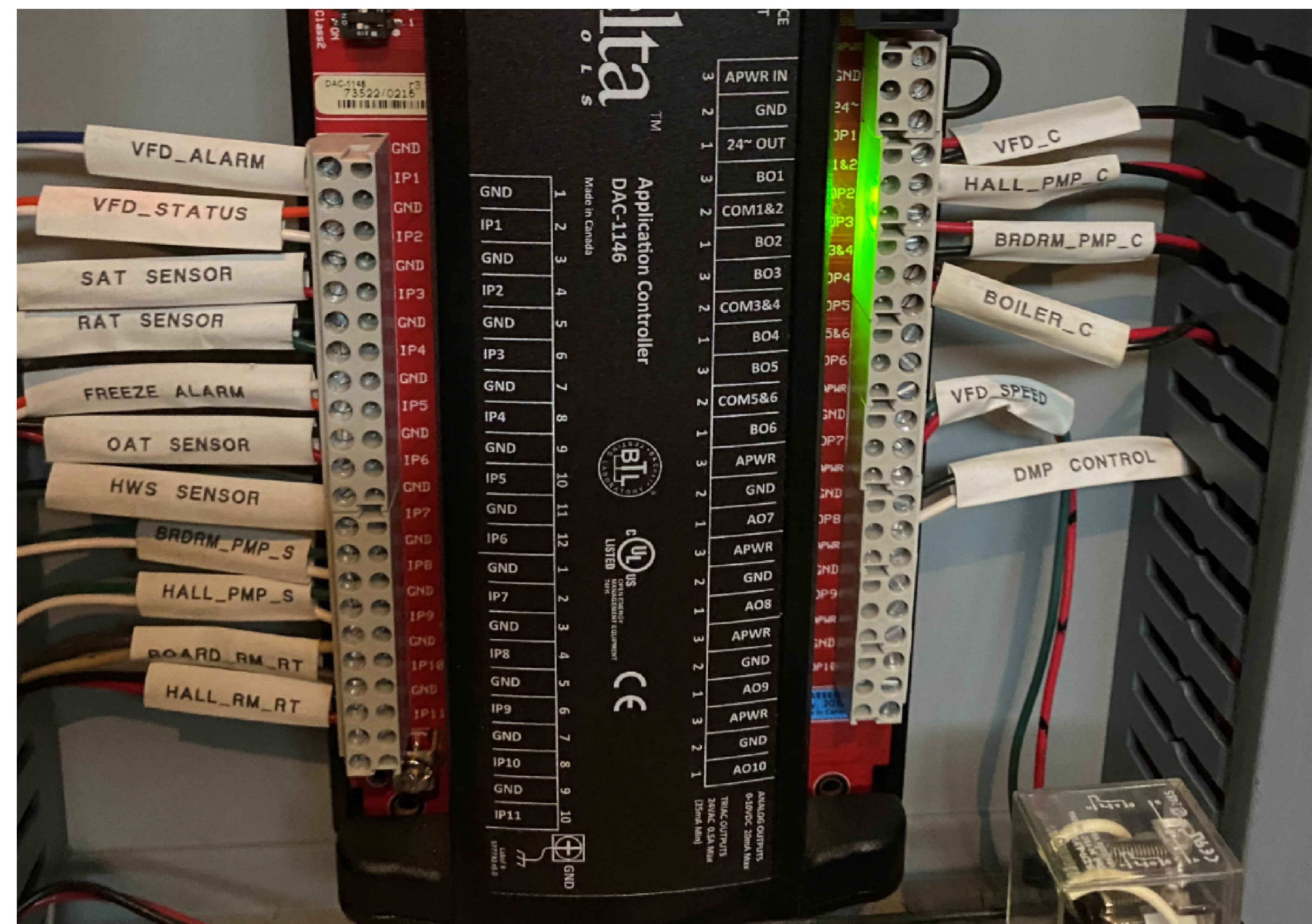
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|------------|---------------|
| DRAWN BY | AC |
| CHECKED BY | AO |
| SCALE | NTS |
| DATE | JUNE 10, 2021 |

DRAWING TITLE:
EXISTING EQUIPMENT I

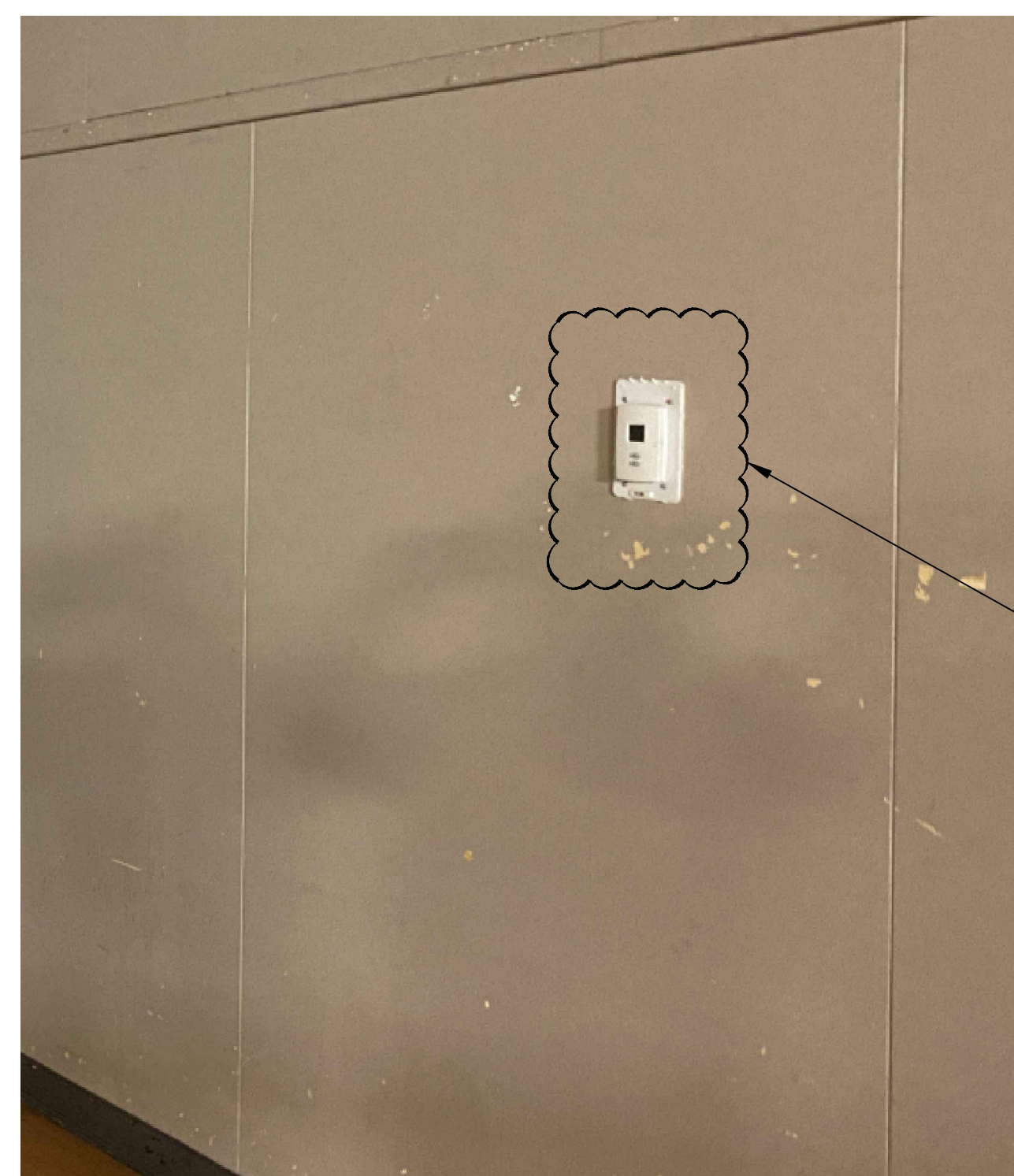
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| 085b-069-21 | M1.04 |



1 EXISTING DDC CONTROLLER
SCALE: NTS



2 EXISTING THERMOSTAT (BOARD_RM_RT)
SCALE: NTS



3 EXISTING HALL TEMPERATURE SENSOR
SCALE: NTS

EXISTING SUPPLY AIR TEMPERATURE SENSOR (SAT SENSOR)

EXISTING THERMOSTAT (HALL_RM_RT)



EXISTING SUPPLY WATER TEMPERATURE SENSOR (HWS SENSOR)

4 EXISTING FAN COIL ROOM TEMPERATURE SENSORS
SCALE: NTS

EXISTING RETURN AIR TEMPERATURE SENSOR (RAT SENSOR)

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| 6. | 2021.10.26 | ISSUED FOR RFG |
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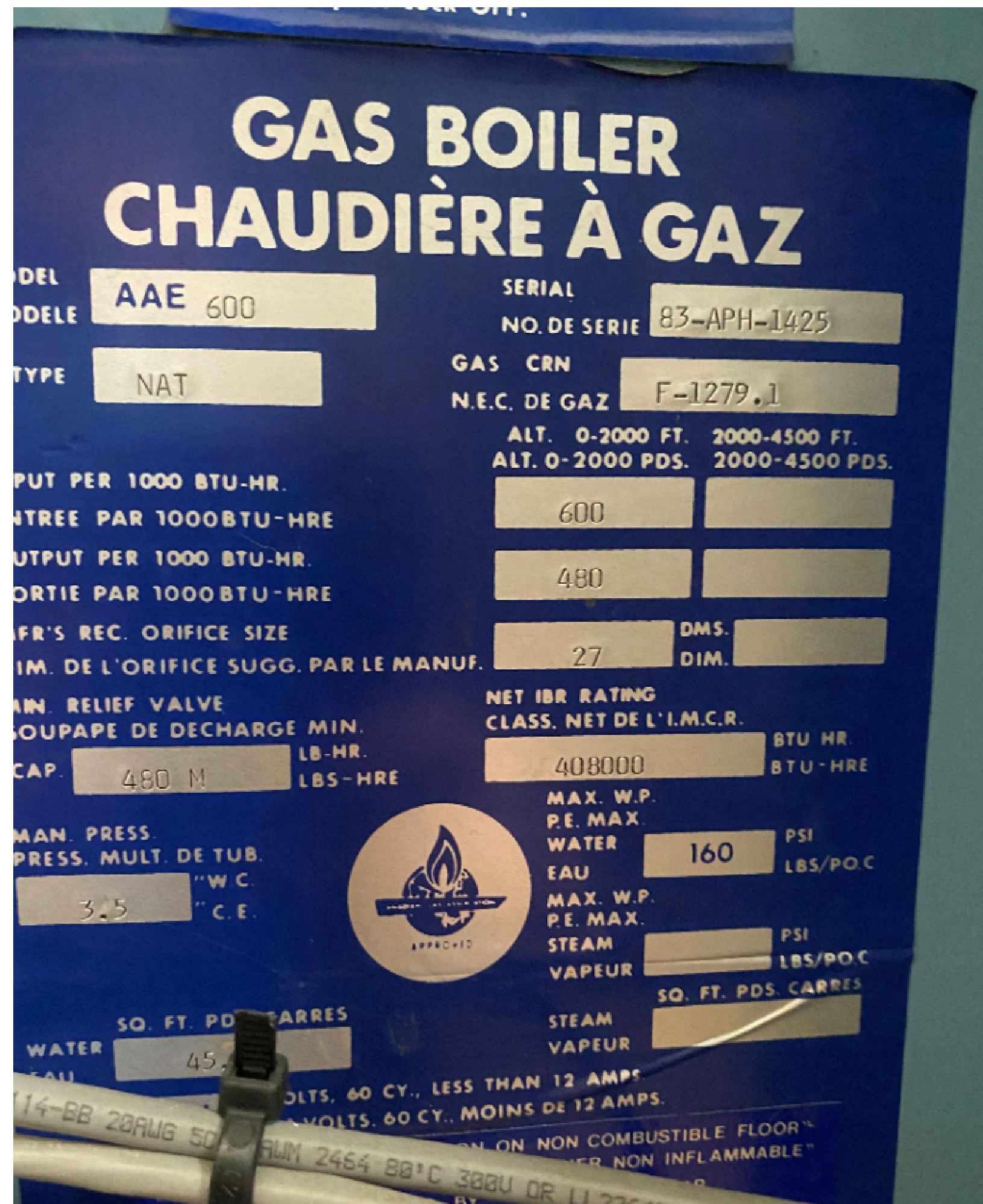
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CLOVERDALE FAIRGROUNDS BOILER REPLACEMENT

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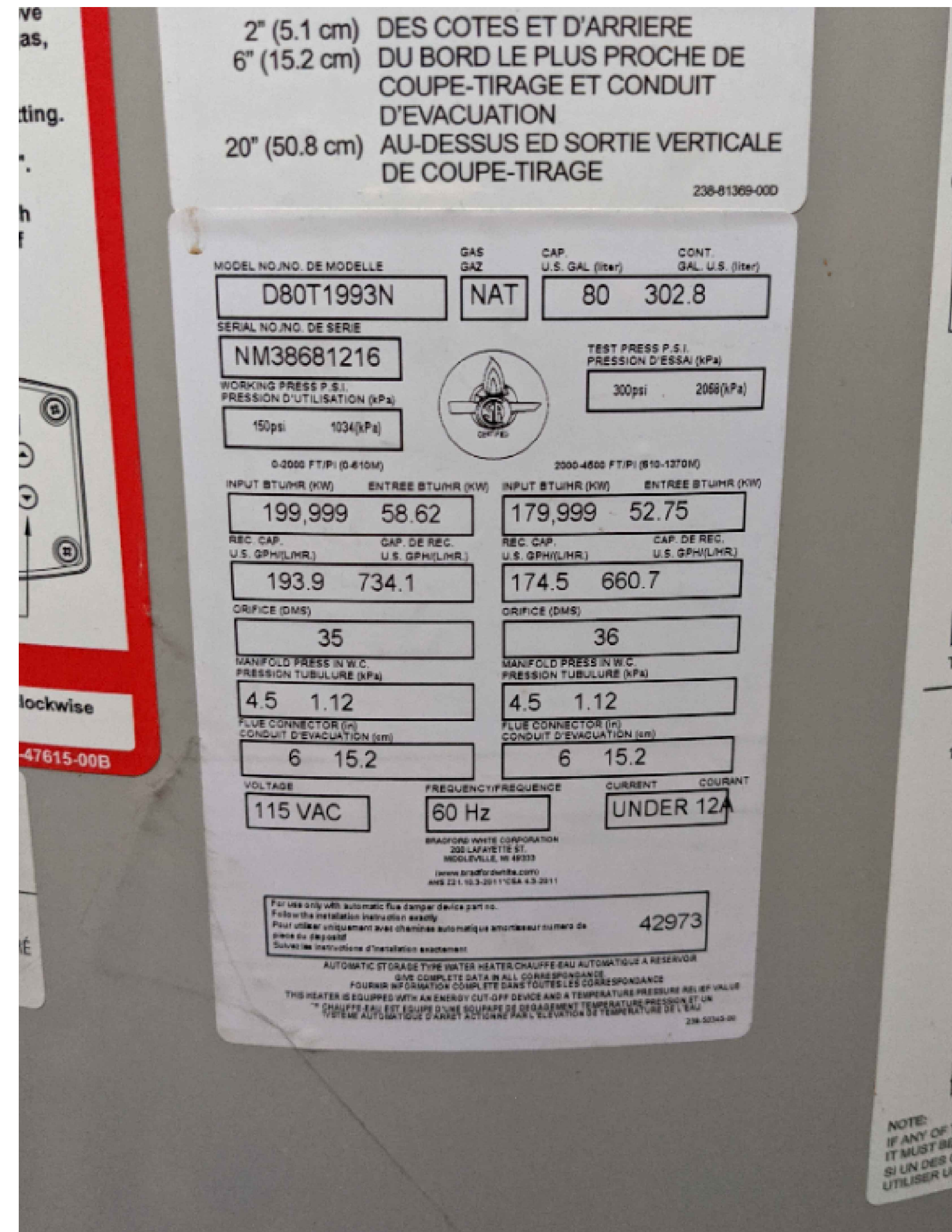
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| SCALE | NTS |
| DATE | JUNE 10, 2021 |

DRAWING TITLE:
EXISTING EQUIPMENT II

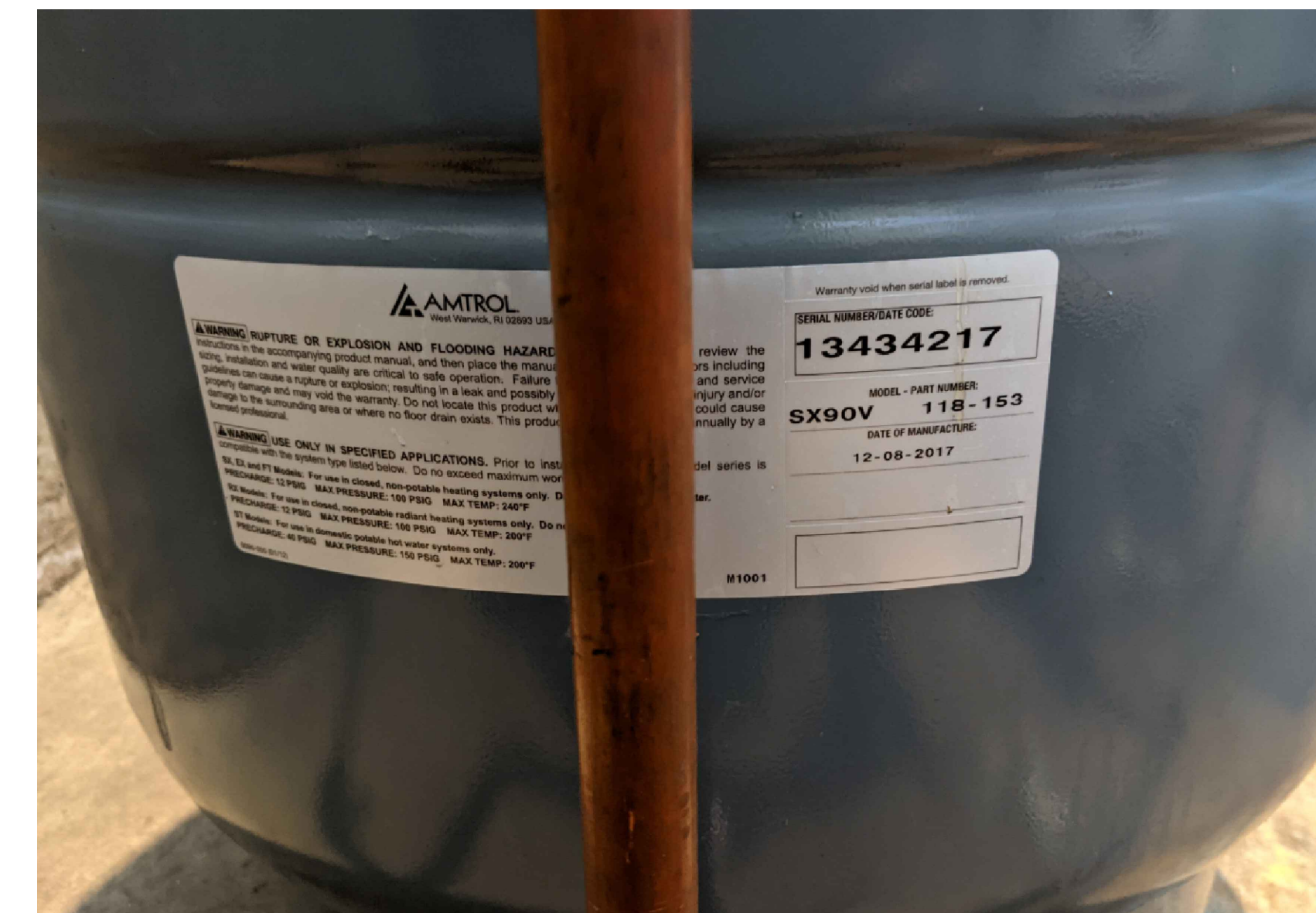
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| 085b-069-21 | M1.05 |



1 EXISTING BOILER
SCALE: NTS



2 EXISTING HOT WATER HEATER
SCALE: NTS



3 EXISTING EXPANSION TANK
SCALE: NTS



4 EXISTING BOILER CIRCULATION PUMP (P1/BRDRM_PMP & P2/HALL_PMP)
SCALE: NTS



5 EXISTING DHWR PUMP (P-DHWR)
SCALE: NTS



6 EXISTING O/A TEMPERATURE SENSOR (OAT SENSOR)
SCALE: NTS

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CONSULTANT:

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CLOVERDALE
FAIRGROUNDS
BOILER
REPLACEMENT

PROJECT ADDRESS:
SHANNON HALL
6050 176 ST, SURREY, BC

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CHECKED BY AO
SCALE NTS
DATE JUNE 10, 2021

DRAWING TITLE:
EXISTING
EQUIPMENT III

PROJECT NO. 085b-069-21
DRAWING NO. M1.06