



JUNE 2025

MULTI-UNIT LOTS

District Energy Sharing
System Design Guide

Contents

1. Blatchford Renewable Energy	3
1.1 Blatchford Renewable Energy Overview	3
1.2 Purpose	3
2. Design Review and Approvals Process	4
2.1 Design Approval Authority	4
2.2 Submission and Review Process Overview	5
3. DESS Charges Overview	9
3.1 Thermal Energy Charges	9
3.2 Infrastructure Fee	9
3.3 Energy Transfer Station Equipment Charge	9
4. DESS Connection Requirements Overview	10
5. Building Design Requirements	12
5.1 Heating Requirements	13
5.2 Cooling Requirements	13
5.3 Future Tenant Improvement Work	13
5.4 ETS Room Requirement	13
5.5 Building HVAC and DHW Load Coordination	13
5.6 DESS Design Guide Compliance Confirmation	13
6. Building Design Guidelines	14
6.1 HVAC System Design Guidelines	14
6.1.1 HVAC System Options & ETS Options Matrix	15
6.1.2 Parkade Heating Options	22
6.1.3 HVAC System Piping Design	24
6.1.4 HVAC System Pumping	24
6.1.5 HVAC Fluid	25

6.2	Domestic Hot Water Systems	25
6.2.1	Centralized DHW Systems	25
6.2.2	Option B & C DHW Systems	26
6.3	Energy Transfer Stations	27
6.4	ETS Room Design	28
6.4.1	Location and Size	28
6.4.2	Fire and Noise Protection	30
6.4.3	Mechanical Requirements	30
6.4.4	Electrical Requirements	30
6.4.5	Security and IT Requirements	33
6.5	Thermal Metering	33
6.6	DESS Service Connections	33
6.6.1	DESS Supply/Return Piping	33
6.6.2	Metering Network Conduit	36
6.7	DESS Secondary Loop (Buried) – Builder Side of ETS	37
6.8	ETS Inspection and Administration	37
6.9	Record of Services	38
6.10	Approved City ETS Room Contractors	38
	APPENDIX A - INITIAL ENGAGEMENT AND FINAL DESIGN REQUIREMENTS	39
	APPENDIX B - DESS DESIGN DETAILS	47
	APPENDIX C - CONCEPTUAL BUILDING SCHEMATICS FOR MULTI-UNIT LOTS	54
	APPENDIX D - DPS SECONDARY LOOP (BURIED) - BUILDER SIDE OF ETS	57
	APPENDIX E - METER ANTENNA INSTALLATION INSTRUCTIONS	61
	APPENDIX F - TELUS MANAGED NETWORK PROCESS	63
	APPENDIX G - OPTION C KIT SCHEMATICS	66
	APPENDIX H - BLATCHFORD DESS AGREEMENT	68

1. Blatchford Renewable Energy

1.1 Blatchford Renewable Energy Overview

Blatchford Renewable Energy (BRE) plays a major role in helping to put Blatchford on the path to achieving the ambitious and exciting vision to be a 100% renewable, carbon-neutral community.

Blatchford Renewable Energy is a City of Edmonton utility that provides thermal energy services to the Blatchford community. The utility owns and operates the District Energy Sharing System.

All buildings in Blatchford must be designed and constructed to connect to the District Energy Sharing System (DESS) for all heating, cooling and domestic hot water needs. Certain buildings may be exempt from this requirement if they are designed, built and certified to a net-zero carbon standard, to the satisfaction of Blatchford Renewable Energy.

Since buildings will use renewable district energy, they will not need to be equipped with traditional systems related to the production of thermal energy, such as boilers, furnaces and hot water heaters.

1.2 Purpose

This guide provides the mechanical system requirements and design guidance for the following listed building types that are connecting to the Blatchford District Energy Sharing System. These building categories (collectively referred to as multi-unit lots) include:

- Townhouse Style Buildings
- Apartment style buildings
- Mixed-use buildings

The purpose of this design guide is to ensure the multi-unit lots within the development meet Blatchford Renewable Energy's design requirements for connecting to the DESS. The design guide presents the technical specifications for DESS compatible systems. Mechanical systems must be designed in accordance with these specifications. The guide also establishes a framework for Blatchford Renewable Energy to assess whether the buildings meet the outlined criteria.

BRE will supply, own and maintain the thermal energy meter(s) and the meter antenna(s) which is to be installed as per the approved ETS IFC Package. Installation and commissioning of the thermal energy meter(s) and meter antenna(s) will be the responsibility of the party constructing the ETS Room, either the Builder (as per [Figure 1A](#)), or BRE (as per [Figure 1B](#)). Builders must extend the DESS Metering Communications Conduit with pull string from the property line into the ETS Room as outlined in [Section 6.6](#) of this guide. Builders must also coordinate with TELUS to extend the TELUS communications conduit with pull string from the property line to the Demarcation point in the building mechanical room, this process is outlined in [Appendix F](#). Builders must then install a conduit with pull string from the Demarcation point to the ETS Room as specified in the BRE ETS IFC Package.

Only one (1) dedicated ETS Room is allowed and is to be constructed for each legal parcel. The Builder will select and confirm with BRE which ETS Option (1A or 1B) they plan on proceeding with. Any potential alternative ETS Equipment Design Option must be discussed with and approved by BRE. The operational mechanical and electrical systems inside of the ETS will be designed by BRE, the Builder is responsible for providing all required services including fire protection, drainage, electrical to the delineation point as stated in section 6.4.4, and domestic water lines to the ETS Room. The Builder is responsible for submitting the appropriate A, B, and C Schedules as required for permitting of the overall development and provide copies to BRE. BRE will provide C-3 Schedules for the ETS Mechanical and ETS Electrical scopes. Throughout this guide, ETS Design refers to the design by BRE of the operational mechanical and electrical systems inside the ETS Room. BRE personnel will, from time to time, access the ETS Room for inspection and maintenance of the utility-owned equipment. Installation, clearance and access requirements for the utility-owned equipment are also described in this guide.

Additional requirements and information on the District Energy Sharing System and Blatchford Renewable Energy can be found in the following documents found at [BlatchfordUtility.ca](https://blatchfordutility.ca):

- Customer Terms and Conditions
- Blatchford District Energy Utility Fiscal Policy
- Bylaw 17943 - Blatchford Renewable Energy

2. Design Review and Approvals Process

2.1 Design Approval Authority

Blatchford Renewable Energy will be the approving authority for adherence to the guideline. The enforcement, administration and interpretation of the guidelines will be at the sole discretion of Blatchford Renewable Energy. The design and construction of all buildings and site development must be in compliance with current Federal, Provincial and City of Edmonton codes, bylaws, standards and regulations. Approval of plans and specifications by Blatchford Renewable Energy does not constitute any warranty or representation that such plans and specifications comply with government regulations or requirements and/or good and prudent design, engineering and construction practices. Responsibility for obtaining appropriate approvals from Government Authorities and complying with their various regulations, policies and standards will at all times be that of the Builder. If a conflict arises between documents, the most stringent will govern.

2.2 Submission and Review Process Overview

Final Design

Prior to entering into the sale agreement, a Builder must provide Blatchford Renewable Energy with high level building information (see [Appendix A](#)).

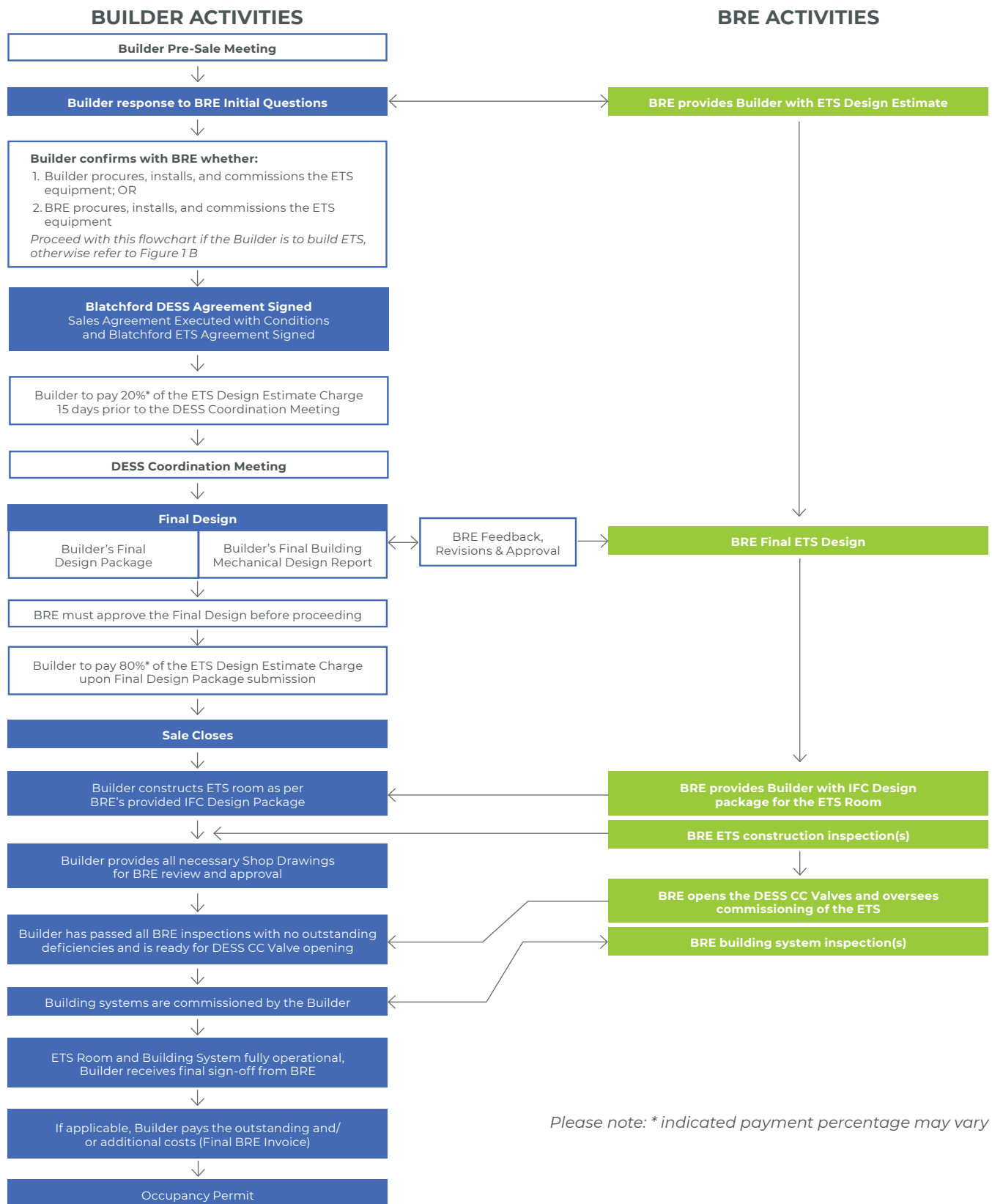
Final Design Submission Requirements

After entering into the sales agreement, Builders will be required to submit information for BRE's review and feedback at specific stages of the design and construction process to ensure the building's heating, ventilation, and air conditioning (HVAC) systems are compatible with the DESS.

BRE will review the design drawings for compliance with this guide. The City aims to finalize its design review and offer feedback within 10 business days (or as soon as reasonably feasible) after receiving a complete submission from the Builder. A list of the information that a Builder is required to submit as part of the initial engagement as well as the design submission can be found in [Appendix A](#). The Builder is responsible for the costs of any additional design reviews.

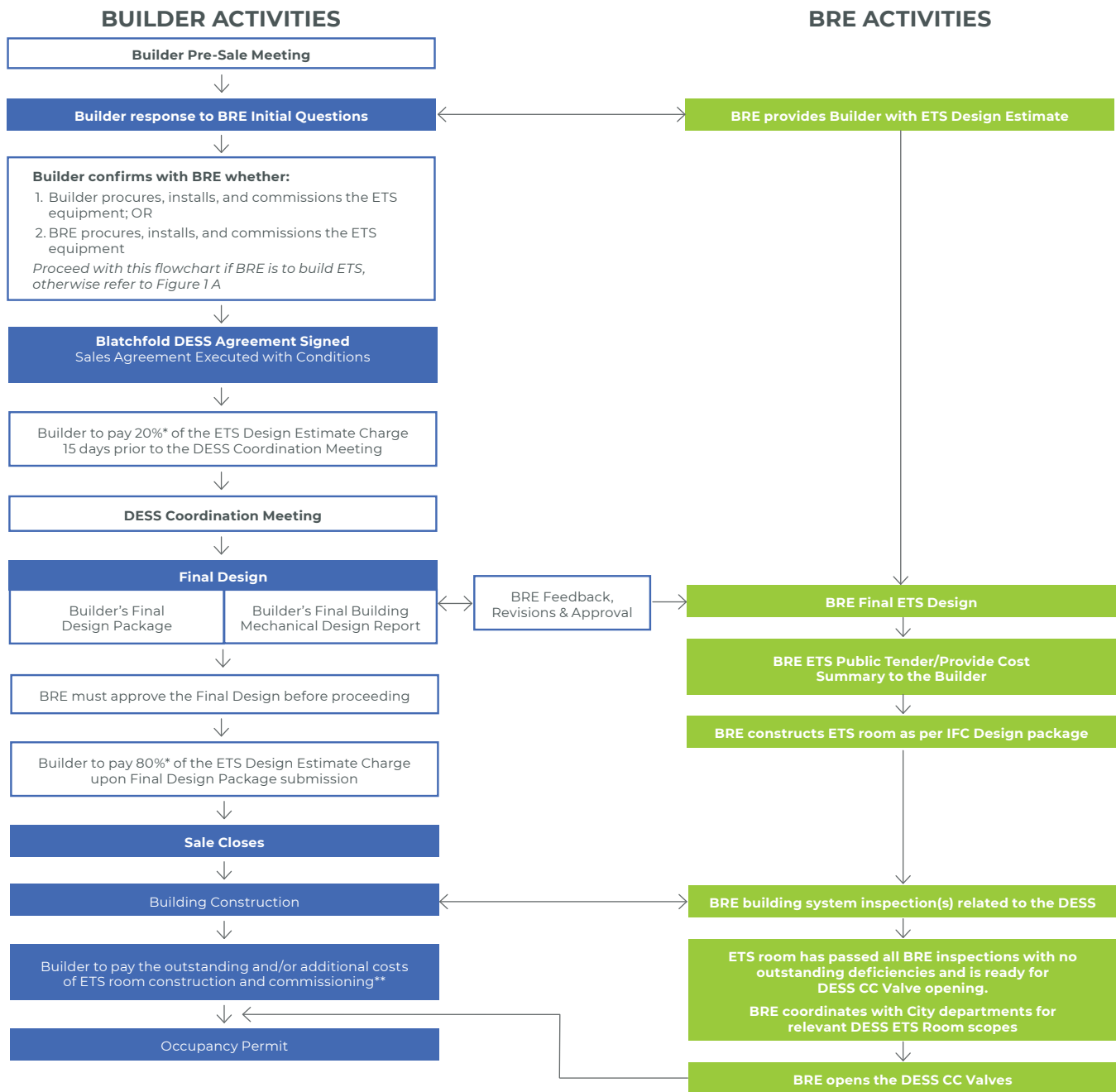
The Builder is to confirm with BRE which process they will be pursuing depicted in [Figure 1A](#) or [Figure 1B](#), showing the steps in the overall design review, coordination and approval process. Figure 1B.i. provides more information on the ETS Room construction process and outlines Builder and BRE activities and timelines given that the Builder is following Figure 1B. The steps labelled in Figure 1A, Figure 1B, and Figure 1B.i. in blue depict Builder responsibilities, whereas the steps marked in green outline BRE's process of design and construction of the central ETS. BRE will work in close collaboration with the builder throughout this process. The builder will sign the Blatchford DESS Agreement (see [Appendix H](#)) which outlines the terms and conditions for design and construction of the BRE infrastructure and ETS at the same time as the land sales agreement.

FIGURE 1A: Blatchford Building Design Review and Approval Process for Builder Building ETS Room – Multi-unit Lots



Please note: * indicated payment percentage may vary

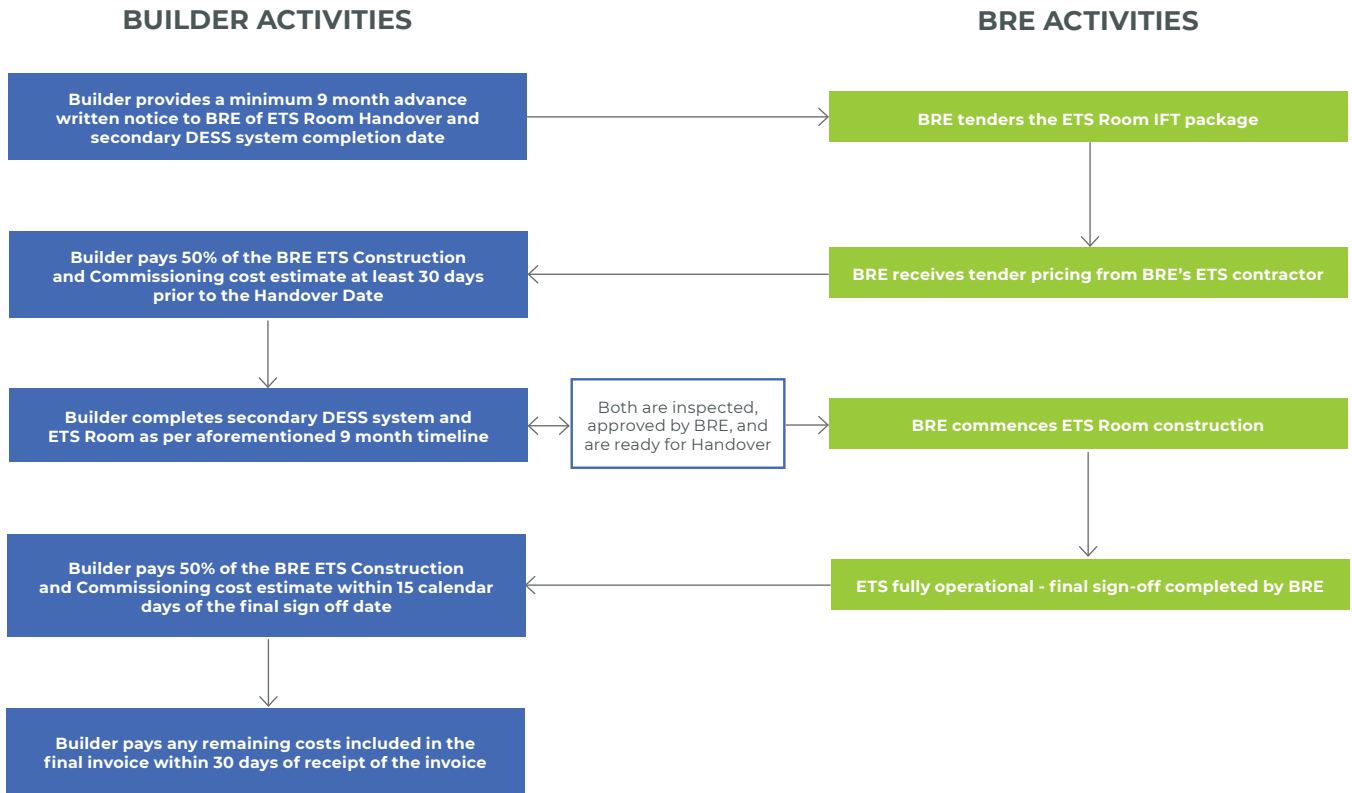
FIGURE 1B: Blatchford Building Design Review and Approval Process for BRE Building ETS Room – Multi-unit Lots



Please note: * indicated payment percentage may vary

**Please see Figure 1B.i. for a detailed process outlining Builder and BRE activities with timelines.

FIGURE 1B.i.: Blatchford Installing ETS Room Equipment Timelines and Cost Breakdown for BRE Building ETS Room – Multi Unit Lots



3. DESS Charges Overview

The key rates and development fees for the DESS include the following components. Details of the rates, fees and other charges are outlined in the Blatchford Renewable Energy Utility Bylaw.

3.1 Thermal Energy Charges

- Each multi-unit lot parcel will have the thermal energy meter(s) and meter antenna(s) to measure heating energy extracted from the DESS and cooling energy rejected to the DESS at the Energy Transfer Station (ETS).
- DESS thermal energy charges will be billed to the building owner or the condo corporation by the BRE based on a variable consumption rate for heating and cooling, plus a fixed monthly rate.
- All customer charges will be based upon cost of service and will be at most comparable to what consumers would pay elsewhere in the City of Edmonton in energy utility bills and annual maintenance costs.

3.2 Infrastructure Fee

- BRE will charge the Builder a one-time infrastructure fee for each unit. The fee will be charged on the sale closing date.
- Details on the Infrastructure Fee, including the amount, can be found in the Blatchford Renewable Energy Bylaw located on BlatchfordUtility.ca

3.3 Energy Transfer Station Equipment Charge

- The ETS Equipment Charge is comprised of the ETS Design and Inspection Costs and the ETS Construction and Commissioning Costs, as defined in the Blatchford DESS Agreement Definitions ([Appendix H](#)).
- As stated in Section 11 of the Blatchford DESS Agreement, the Builder will pay BRE the ETS Equipment Charge. ([Appendix H](#)).
- As stated in Section 12 of the Blatchford DESS Agreement, the Builder will pay BRE the ETS Construction and Commissioning cost in the case that the Builder is following the route depicted in Figure 1B. ([Appendix H](#)).
- If the route depicted in Figure 1A is chosen by the Builder, the Builder is solely responsible for all the ETS related costs, including the ETS Design and Inspection Costs.
- If the route depicted in Figure 1B is chosen by the Builder, for multi-unit lot buildings, the Builder will be assessed an ETS Equipment Charge including the ETS Design and Inspection Costs, and the ETS Construction and Commissioning Costs. This charge is intended to recover the cost of the ETS mechanical systems provided by the BRE and is in lieu of the Builder providing their own boilers, furnaces and chillers.

- The total ETS equipment charges and fees will be calculated based on the type and design capacity of ETS services requested by the Builder's engineer on the Blatchford Building Mechanical System Design Report ([Appendix A](#)).
- BRE will provide a cost summary based on the Builder's Final Building Mechanical System Design Report to the Builder.

4. DESS Connection Requirements Overview

Each multi-unit lot must be serviced by the DESS for all space heating, space cooling, domestic hot water and other process loads unless exempted from connection. Other process loads include heating loads such as snowmelt systems and cooling loads such as large, centralized refrigeration loads.

On each connected property, the BRE will design, own, operate and maintain an Energy Transfer Station (ETS) that will service the building's heating, cooling and DHW loads from the ambient-temperature DESS. Domestic hot water for the building will be provided from a DHW heating and storage system inside the ETS. The ETS replaces most of the equipment (such as boilers, pumps, hot water tanks, and chillers) commonly found in a building mechanical room. In addition, the DESS is designed to recover energy from building cooling. Heat rejection must be provided through the ETS and therefore cooling towers are not allowed.

The ETS will include high temperature heat pumps and storage tanks to provide domestic hot water for the building. The ETS will be capable of providing heating water, chilled water, and/or ambient heat pump loop water to the building mechanical system as required by the building mechanical design. The design loads for these services must be provided to the BRE by the Builder's engineer as part of the Blatchford Building Mechanical System Design Report ([see Appendix A](#)). Pumps and water treatment for the building's primary hydronic system will be provided as part of the ETS and sized based on the design basis provided by the Builder's mechanical engineer. Further ETS design options are provided in [section 6.1.1](#) of this guide.

Builder responsibilities for the ETS include:

- Providing a completed room exclusively for the use of the BRE to install and operate the ETS DESS equipment. The room must be located on the first level of the parkade or on the ground floor and designed in accordance with this guide.
- Extending the building hydronic and domestic water piping into the ETS Room for connection to the ETS DESS equipment by BRE. An example layout of the building ETS Room is provided in Detail 10 in [Appendix B](#).
- Extending the DESS service connection from the property line into the ETS Room.
- Designing and constructing all of the building's HVAC and DHW system(s) outside of the ETS Room in accordance with this guide.

Table 1 provides an overview of the major elements of a DESS-compatible building mechanical system for multi-unit lot buildings.

TABLE 1: Overview - Major Elements of a DESS-compatible Building Mechanical system for Multi-unit Lots

ITEM #	MULTI-UNIT LOTS	
	DESS Connection Requirement	<ul style="list-style-type: none"> • All buildings, except those identified as net-zero carbon and meet the DESS Exemption Guide requirements, must connect to the DESS; all heating, cooling, and domestic hot water thermal energy must come from the ETS. • Other heat loads such as parkade heat or snow-melt systems must be served by the DESS.
A	Building HVAC System	<ul style="list-style-type: none"> • The Builder must provide an HVAC system for all conditioned spaces that is compatible with the DESS as described in this guide.¹ • Compatible systems include water-air heat pump, water source variable refrigerant flow, in-floor radiant, low-temp hydronic radiators, or low-temp fan coils. • On-site heat generation systems such as boilers, gas furnaces, CHP's, or air-source heat pump are generally not permitted. • Electric resistance heat is only permitted as a backup heat source or in specific circumstances as described in the guide. • The building owner or condo corporation owns and maintains their HVAC system(s) outside of the ETS Room.
B	Building HVAC and DHW Piping	<ul style="list-style-type: none"> • The Builder must provide all piping between the ETS and the building HVAC systems or other loads. • The Builder must provide all DHW piping outside the ETS. • Building piping is owned and maintained by building owner or the condo corporation.
C	District Energy ETS	<ul style="list-style-type: none"> • BRE will coordinate and design an ETS to meet the design requirements of the building mechanical systems, as provided by the Builder's mechanical engineer. • BRE will own, operate, and maintain the ETS DESS equipment.
D	Building DHW Heating System	<ul style="list-style-type: none"> • BRE will design and install a DHW storage and heating system as part of the utility-owned ETS (if applicable).
E	Energy Metering	<ul style="list-style-type: none"> • Installation of the energy meter(s) and meter antenna(s) (at an agreed upon location with BRE) in the ETS Room to measure district energy use for the building heating and cooling will be installed by: <ul style="list-style-type: none"> • The Builder, if they are constructing the ETS Room (as per Figure 1A) • BRE, if they are constructing the ETS Room (as per Figure 1B) • The energy meter(s) and the meter antenna(s) will be owned and maintained by BRE.
F	Mechanical Room For ETS	<ul style="list-style-type: none"> • The Builder must provide a dedicated room for the ETS either at grade level or in the first level parkade. • The ETS Room will be for the exclusive use of the BRE to house BRE-owned ETS DESS equipment. • The ETS Room must be constructed as per this guide.

¹ A conditioned space as defined in 2019 NBC - AE means: any space within a building the temperature of which is controlled to limit variation in response to the exterior ambient temperature by the provision, either directly or indirectly, of heating or cooling over substantial portions of the year.

G	DESS Piping	<ul style="list-style-type: none"> • The Builder must extend the DESS service piping and the metering network communications conduit from the property line to the ETS Room as described in this guide. • The DESS piping and conduit from the property line to the ETS will be subject to acceptance testing. Upon acceptance, BRE will takeover ownership and maintenance of the DESS service piping and conduit.
H	DESS Service Connections	<ul style="list-style-type: none"> • BRE will provide each legal lot with a single DESS service connection installed into the property line.

5. Building Design Requirements

The Builder must meet the following requirements when designing a multi-unit lot or mixed-use building in Blatchford. For detailed design guidance to meet these requirements, refer to [section 6](#) of this document (Building Design Guidelines).

5.1 Heating Requirements

Requirement #1: All heating for conditioned spaces and semi-heated spaces must be provided by an HVAC system that receives all thermal energy from the building’s ETS as described in this guide. Note that parkade heating (where provided) will not be exempted from this requirement. [See Section 6.1.2](#) for parkade heating options.

Exception: Exceptions may be permitted on a case-by-case basis for use of electric resistance heaters in certain spaces where hydronic heating is not feasible AND the expected energy use of all electric resistance heating is less than 2% of the building’s annual space heating load as confirmed by a detailed energy model.

Requirement #1.1: Regardless of the ETS option (Options A, B, C, and D) the Builder must have a backup heating source. The Builder may either choose a backup boiler in the ETS Room, or equip all heat pumps with backup electric resistance heaters. If the Builder declines the ETS backup boiler option, then the Builder must install all heat pumps with backup electric resistance heaters internally or externally mounted, and controlled by the heat pump controller to provide backup heat only in the event of a heat pump fault and not as supplemental heating. The size of the backup is left to the Builder. Note that 100% redundancy is not outlined as a requirement. The objective is to provide a minimum level of comfort and freeze protection in the event of a service emergency.

Requirement #2: All heating for driveway or sidewalk snow-melt systems must be provided by a hydronic system that receives all thermal energy from the building’s ETS as described in this guide.

Requirement #3: All domestic hot water must be provided from the building’s ETS. DHW recirculation flow must be returned to the ETS for reheating (if applicable).

5.2 Cooling Requirements

Requirement #4: All mechanical cooling for conditioned spaces (when provided) must be provided by an HVAC system that rejects all thermal energy to the building's ETS as described in this guide.

Requirement #5: Non-HVAC refrigeration equipment with combined cooling capacity greater than 10 kW (3 nominal tons) must reject their condenser heat to a hydronic loop connected to the ETS.

5.3 Future Tenant Improvement Work

Requirement #6: Provision must be made to ensure that any future heating, cooling, DHW, and refrigeration loads as part of future tenant improvements can be made in compliance with this guide.

5.4 ETS Room Requirements

Requirement #7: The Builder must provide a dedicated room for the exclusive use of BRE to install and operate the ETS DESS equipment. The ETS Room is to be designed in accordance with the detailed requirements of this guide. Regardless of whether the Builder opts for Option 1A or 1B, obtaining all necessary Municipal, Provincial and Federal approvals and permits for the ETS Room (including but not limited to the Development and Building Permit) is the sole responsibility of the Builder. The Builder is also responsible for all associated fees and payments. In the instance that the City does pay for these charges, the Builder is to fully reimburse them to the City.

Requirement #7.1: The City of Edmonton has a contract with Telus to provide the Managed Network Services and requires this Telus connection to maintain and operate every ETS Room. For all multi-unit parcels with an ETS Room in Blatchford, the Builders must ensure they clearly state and label the ETS Room on their parcel as "*UTIL1, Parcel's Civic Address*" on all submissions to the City. The complete process to implement the TELUS Managed Network is located in [Appendix F](#).

5.5 Building HVAC and DHW Load Coordination

Requirement #8: The Builder's design team is required to provide final design loads for space heating, space cooling, DHW, and any other uses of heating or cooling. This information must be provided by completing and submitting to BRE the Blatchford Building Mechanical System Design Report included in [Appendix A](#).

- Final design loads must be submitted by the Builder with the the final design package. The final design report must be signed and sealed by the engineer of record for the building systems and must be provided in advance of issuance of a building permit.

5.6 DESS Design Guide Compliance Confirmation

Requirement #9: Confirmation by the registered professional of record that the design of the building HVAC and DHW distribution systems comply with the requirements of this guide must be provided prior to issuance of a building permit. Confirmation must be provided by completing and signing the applicable section of the Blatchford Building Mechanical Design Report included in [Appendix A](#).

6. Building Design Guidelines

Disclaimer: The following sections provide technical information for the design of DESS compatible mechanical systems (space heating, cooling, and DHW) for new construction and/or retrofits. The design information provided in this guide should be regarded as general guidance only and used for the purposes of improving energy efficiency, enhancing performance, and ensuring reliability when designing building mechanical systems for DESS connected buildings.

All design guidance in this document should be applied (where applicable) to the detailed building mechanical design by the Builder's engineering team. The Builder's Mechanical Engineer shall be responsible for ensuring the final building HVAC and DHW distribution system design (excluding the ETS) is in compliance with all applicable aspects of the Alberta Building Code, National Energy Code for Buildings, Alberta Plumbing Code, applicable ASHRAE standards, and good engineering practice.

6.1 HVAC System Design Guidelines

Efficient operation of the DESS and building ETS requires that high-efficiency, hydronic building HVAC systems are used to provide space heating and cooling. All heating systems must be designed to operate with low-temperature heating water or low-temperature heat pump water loop (in the case of a water source heat pump or water source variable refrigerant flow HVAC system).

The hydronic system must be designed by the Builder for variable flow operation with 2-way zone-level control valves to shut off flow when the zone is not calling for heating or cooling. Three-way zone valves that allow flow to bypass the heating or cooling elements are not permitted².

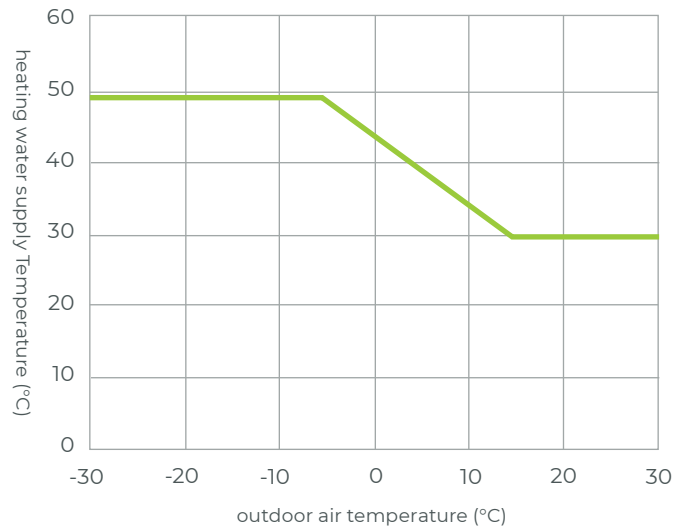
Heating water systems must be designed by the Builder to operate with a maximum heating water supply temperature of 49°C (120°F) at design condition.

Hydronic heating systems must be designed by the Builder to operate with reduced heating water supply temperatures during milder weather. The temperature of heating water supplied by the ETS to the HVAC system will be reset from 49°C to 30°C based on the reset curve shown in [Figure 2](#).

Under this example reset schedule, the heating water supply will be at design temperature (49°C) when outdoor air temperature is below -5°C. As outdoor air temperature rises from -5°C to 15°C, heating water supply temperature is reset down from 49°C to 30°C. Above 15°C outdoor air temperature, heating water supply temperature is maintained at 30°C.

² An exception may be granted for a limited number of three-way zone valves to be used as a low-flow bypass where required.

FIGURE 2: Example Outdoor Air Reset Schedule



The outdoor air reset schedule shown in Figure 2 is the maximum heating water supply temperature permitted at various outdoor air temperatures. Designs that accommodate a more aggressive reset schedule with lower supply water temperatures are encouraged.

Chilled water systems (where provided) must be designed to operate with a chilled water supply temperature setpoint no lower than 7°C which may be reset up to 12°C during low cooling load conditions. The chilled water supply reset may be based on outdoor air temperature or chilled water valve position (if available).

Minimizing heating water return temperature to the ETS is critical for ensuring system efficiency and minimizing operating cost. As such, heating water and chilled water systems must be designed to operate, at design conditions, with a large temperature differential (delta-T) between supply and return water as follows:

- Heating water (HWS/Heating Water Return) minimum design delta-T: 11°C
- Chilled water (Chilled Water Supply/Chilled Water Return) minimum design delta-T: 6°C
- Heat pump water loop (Heat Pump Supply Water/Heat Pump Return Water) design delta-T: 5°C

6.1.1 HVAC SYSTEM OPTIONS & ETS OPTIONS MATRIX

The Builder's design team may choose one or more allowable, hydronic-based HVAC system(s) to meet the design requirements of the building, in accordance with the ETS matrix outlined in [Tables 2-5](#) below. The tables below provide a high-level overview of each of the ETS design options, however, exact details are to be confirmed with BRE. The Builder's choice of ETS options A to D, as described below, must be reviewed and approved by BRE.

TABLE 2: Option A: Heat Pump Loop Water ETS Design

BRE Design Scope	BRE Designs the operational mechanical and electrical components inside the ETS Room utilizing the information provided by the Builder in Appendix A .
Builder Design Scope	<ol style="list-style-type: none"> 1) Builder selects space conditioning heat pump in each unit as per Section 6.1.1, Table 5 in this design guide. 2) All piping/instrumentation/manifolds outside of ETS Room including the DHW loop, Heat Pump loop water. 3) Builder to submit final design package and all associated details as per Appendix A in this design guide. 4) Builder's EOR to design the following for the ETS Room: <ul style="list-style-type: none"> • Fire protection systems (i.e. sprinklers) • Drainage • Domestic Water lines to the ETS Room • Electrical to the delineation point as specified in section 6.4.4
ETS Room Equipment	<ol style="list-style-type: none"> 1) DHW Heat Pump 2) DHW Tanks 3) Primary Building Pumps for the Heat Pump Loop 4) Heat Exchanger 5) Backup Boiler in ETS or backup electric resistance heaters in each space heating heat pump (Builder to confirm in Appendix A). 6) One (1) Energy Meter, Meter antenna (at an agreed upon location with BRE), and the specified size conduit w/ pull string from section 6.6.2 is to be installed from the energy meter to the agreed upon antenna mounting location. 7) BRE communications conduit w/ pull string from the property line for metering, alarms, and future City network. 8) A conduit w/ pull string as specified in section 6.6.2 must be installed from the Demarcation Point to the ETS Room unless otherwise specified.
Builder supplied equipment & infrastructure in each residential unit	<ol style="list-style-type: none"> 1) Heat Pump for space heating & cooling as per Section 6.1.1, Table 6 in this design guide. If the Builder does not choose to install a backup boiler in the ETS Room, they must install backup electric resistance heaters in each heat pump as outlined in Section 5.1, Requirement #1.1 and confirm the selected option in Appendix A. 2) DHW infrastructure (incl. appropriate piping) as detailed in Section 6.2 in this design guide. 3) If applicable, the Builder chooses one of the options from Section 6.1.2 as well for parkade heating. 4) Builder to provide DHW recirculation equipment including pumps and all associated piping will be located outside of the ETS Room (Section 6.1.4 in this design guide).
ETS Construction Scope	The party responsible for installing the ETS DESS equipment (either the Builder or BRE as per Figure 1A or 1B) procures, installs and commissions all the equipment inside the ETS Room as per the information provided by the Builder in Appendix A of this design guide and the approved design submission. In either case, BRE designs the operational mechanical and electrical components inside the ETS Room.
Builder Construction Scope	<ol style="list-style-type: none"> 1) Builder follows Section 6.4 in this design guide for constructing the ETS Room. 2) Builder follows Section 6.1 of the design guide for constructing the building's HVAC system(s) outside of the ETS Room. 3) Builder follows Section 6.6 in this design guide for constructing the DESS Service Connections.
BRE Inspection Requirements	<ol style="list-style-type: none"> 1) BRE is responsible for inspection of the operational mechanical and electrical systems inside the ETS Room. 2) BRE is responsible for witnessing pressure testing of DESS supply and return lines and communications conduit as per Section 6.6 in this design guide.

Inspection Costs	Builder to reimburse BRE for inspections in the ETS Room.
Common Space Energy Needs	Common spaces must be conditioned by an HVAC system that derives its thermal energy from the DESS via the ETS.
Conceptual Building Schematic	Refer to Figure 3 in Appendix C .

TABLE 3: Option B: Row-Style ETS Design with Heat Exchanger With One Meter

BRE Design Scope	BRE Designs the operational mechanical and electrical components inside the ETS Room utilizing the information provided by the Builder in Appendix A .
Builder Design Scope	<ol style="list-style-type: none"> 1) Builder selects space conditioning heat pump in each unit as per Section 6.1.1 Table 5 in this design guide. 2) Builder selects DHW heat pumps in each unit as per Section 6.2.2 of this design guide (Garage Suite references not applicable). 3) All piping/instrumentation/manifolds outside of the ETS Room. 4) Builder to submit final design package and all associated details as per Appendix A in this design guide.
ETS Room Equipment	<ol style="list-style-type: none"> 1) Primary Building Pumps for the Heat Pump Loop 2) Heat Exchanger 3) Backup Boiler in ETS or backup electric resistance heaters in each space heating heat pump (Builder to confirm in Appendix A). 4) One (1) Energy Meter, Meter antenna (at an agreed upon location with BRE), and the specified size conduit w/ pull string from Section 6.6.2 is to be installed from the energy meter to the agreed upon antenna mounting location. 5) BRE communications conduit w/ pull string from the property line for metering, alarms, and future City network 6) A conduit w/ pull string as specified in Section 6.6.2 must be installed from the Demarcation Point to the ETS Room unless otherwise specified.
Builder supplied equipment & infrastructure in each residential unit	<ol style="list-style-type: none"> 1) Heat pump for space conditioning as per Section 6.1.1, Table 5 in this design guide. If the Builder does not choose to install a backup boiler in the ETS Room, they must install backup electric resistance heaters in each heat pump as outlined in Section 5.1, Requirement #1.1 and confirm the selected option in Appendix A. 2) DHW heat pumps in each unit as outlined in Section 6.2.2 of this design guide (Garage Suite references not applicable). 3) Space conditioning heat pump & DHW heat pump infrastructure (incl. appropriate piping) as detailed in Section 6.1 & 6.2 of this design guide. 4) Either ASHP or Water-to-water Heat Pump for DHW - BRE to review and approve. 5) Builder to provide DHW recirculation equipment including pumps and all associated piping and will be located outside of the ETS Room (Section 6.1.4 of Design Guide).
ETS Construction Scope	The party responsible for installing the ETS DESS equipment (either the Builder or BRE as per Figure 1A or 1B) procures, installs and commissions all the equipment inside the ETS Room as per the information provided by the Builder in Appendix A of this design guide and the approved design submissions. In either case, BRE designs the operational mechanical and electrical components inside the ETS Room.
Builder Construction Scope	<ol style="list-style-type: none"> 1) Builder follows Section 6.4 of this design guide for constructing the ETS Room. 2) Builder follows Section 6.2 of this design guide for constructing the DHW system(s) outside of the ETS Room. 3) Builder follows Section 6.6 of this design guide for constructing the DESS service connections.

BRE Inspection Requirements	<ol style="list-style-type: none"> 1) BRE is responsible for inspection of the operational mechanical and electrical systems inside the ETS Room. 2) BRE is responsible for witnessing pressure testing of DESS supply and return lines and communications conduit as per Section 6.6 in this design guide.
Inspection Costs	Builder to reimburse BRE for inspections in the ETS Room.
Common Space Energy Needs	Common spaces must be conditioned by an HVAC system that derives its thermal energy from the DESS via the ETS.
Conceptual Building Schematic	Refer to Figure 4 in Appendix C .

TABLE 4: Option C: Row Style With Heat Exchanger and Individual Meters

BRE Design Scope	BRE Designs the operational mechanical and electrical components inside the ETS Room utilizing the information provided by the Builder in Appendix A .
Builder Design Scope	<ol style="list-style-type: none"> 1) Builder selects space conditioning heat pump in each unit as per Section 6.1.1 Table 6 in this design guide. 2) Builder selects DHW heat pumps in each unit as per Section 6.2.2 of this design guide (garage Suite references not applicable). 3) All piping/instrumentation/manifolds outside of the ETS Room. 4) Builder to submit final design package and all associated details as per Appendix A in this design guide.
ETS Room Equipment	<ol style="list-style-type: none"> 1) Primary Building Pumps for the Heat Pump Loop 2) Heat Exchanger 3) Backup Boiler in ETS or backup electric resistance heaters in each space heat pump (Builder to confirm in Appendix A) 4) BRE communications conduit w/ pull string from the property line for metering, alarms, and future City network 5) A conduit w/ pull string as specified in Section 6.6.2 must be installed from the Demarcation Point to the ETS Room unless otherwise specified
Builder supplied equipment & infrastructure in each residential unit	<ol style="list-style-type: none"> 1) Heat pump for space conditioning as per Section 6.1.1, Table 6 in this design guide. If the Builder does not choose to install a backup boiler in the ETS Room, they must install backup electric resistance heaters in each heat pump as outlined in Section 5.1, Requirement #1.1 and confirm the selected option in Appendix A. 2) DHW heat pumps in each unit as outlined in Section 6.2.2 of this design guide (Garage Suite references not applicable). 3) Space conditioning heat pump & DHW heat pump infrastructure (incl. Appropriate piping) as detailed in Section 6.1 & 6.2 of this design guide. 4) Either ASHP or Water-to-water Heat Pump for DHW - BRE to review and approve. 5) Builder to provide DHW recirculation equipment including pumps and all associated piping and will be located outside of the ETS Room (Section 6.1.4 of Design Guide). 6) Builder to supply and install the specified size conduit w/ pull string from Section 6.6.2 energy meter to the agreed upon location.

BRE supplied equipment & infrastructure in each residential unit	1) One (1) Energy Meter and Meter antenna (installed at an agreed upon location with BRE).
ETS Construction Scope	The party responsible for installing the ETS DESS equipment (either the Builder or BRE as per Figure 1A or 1B) procures, installs and commissions all the equipment inside the ETS Room as per the information provided by the Builder in Appendix A of this design guide and the approved design submissions. In either case, BRE designs the operational mechanical and electrical components inside the ETS Room.
Builder Construction Scope	1) BRE is responsible for inspection of the operational mechanical and electrical systems inside the ETS Room. 2) BRE is responsible for witnessing pressure testing of DESS supply and return lines and communications conduit as per Section 6.6 in this design guide.
Inspection Costs	Builder to reimburse BRE for inspections in the ETS Room.
Common Space Energy Needs	Common spaces must be conditioned by an HVAC system that derives its thermal energy from the DESS via the ETS.
Conceptual Building Schematic	Refer to Figure 5 in Appendix C .

TABLE 5: Option D: Heating Water Loop ETS Design

BRE Design Scope	BRE Designs the operational mechanical and electrical systems inside the ETS Room utilizing the information provided by the Builder in Appendix A .
Builder Design Scope	1) Builder selects HVAC system option (fan coils, hydronic radiators, or convectors) as per Section 6.1.1, Table 5 in this design guide. 2) All piping/instrumentation/manifolds outside of ETS Room including the DHW loop, heating loop, and cooling loop. 3) Builder to submit final design package and all associated details as per Appendix A in this design guide.
ETS Room Equipment	1) DHW Heat Pump 2) DHW Tanks 3) Primary Building Pumps for Heat Pump Loop 4) Heat Pump for Heating Water Loop and Cooling Loop 5) Heat Exchanger 6) Backup Boiler 7) One (1) Energy Meter, Meter antenna (at an agreed upon location with BRE), and the specified size conduit w/ pull string from Section 6.6.2 is to be installed from the energy meter to the agreed upon antenna mounting location. 8) BRE communications conduit w/ pull string from the property line for metering, alarms, and future City network. 9) A conduit w/ pull string as specified in Section 6.6.2 must be installed from the Demarcation Point to the ETS Room unless otherwise specified.

<p>Builder supplied equipment & infrastructure in each residential unit</p>	<ol style="list-style-type: none"> 1) Builder supplies HVAC system option (fan coils, hydronic radiators, or convectors) as per Section 6.1.1, Table 5 in this design guide. 2) DHW infrastructure (incl. appropriate piping) as detailed in Section 6.2 in this design guide. 3) If applicable, the Builder is to choose one of the options from Section 6.1.2 for parkade heating. 4) Builder to provide DHW recirculation equipment including pumps and all associated piping and will be located outside of the ETS Room (Section 6.1.4 of this design guide).
<p>BRE Construction Scope</p>	<p>The party responsible for installing the ETS DESS equipment (either the Builder or BRE as per Figure 1A or 1B) procures, installs and commissions all the equipment inside the ETS Room as per the information provided by the Builder in Appendix A of this design guide and the approved design submissions. In either case, BRE designs the operational mechanical and electrical systems inside the ETS Room.</p>
<p>Builder Construction Scope</p>	<ol style="list-style-type: none"> 1) Builder follows Section 6.4 of this design guide for constructing the ETS Room. 2) Builder follows Section 6.6 of this design guide for constructing the DESS service connections.
<p>BRE Inspection Requirements</p>	<ol style="list-style-type: none"> 1) BRE is responsible for inspection of the operational mechanical and electrical systems inside the ETS Room. 2) BRE is responsible for witnessing pressure testing of DESS supply and return lines and communications conduit as per Section 6.6 in this design guide.
<p>Inspection Costs</p>	<p>Builder to reimburse BRE for inspections in the ETS Room.</p>
<p>Common Space Energy Needs</p>	<p>Common spaces must be conditioned by an HVAC system that derives its thermal energy from the DESS via the ETS.</p>
<p>Conceptual Building Schematic</p>	<p>Refer to Figure 6 in Appendix C.</p>

The HVAC system(s) selected must be designed by the Builder to use thermal energy from the ETS to meet all space heating, ventilation air heating, and space cooling loads. Gas-fired or electric resistance heating equipment (such as electric baseboards or gas/electric rooftop units) or the use of air-source heat pumps for heating or cooling are not permitted. Exceptions may be permitted on a case-by-case basis for use of electric resistance heaters in certain spaces³ where hydronic heating is not feasible and the expected energy use of all electric resistance heating is less than 2% of the building’s annual space heating load. Table 6 lists the various HVAC System types that are permitted for use on the multi-unit lots and their design requirements.

Table 6: HVAC System Efficiency and Design Requirements

HVAC SYSTEM TYPE	REQUIREMENTS
Water-air Heat Pump	<ul style="list-style-type: none"> • Must have a minimum rated coefficient of performance (COP) of 4.0 in heating mode when operating at “ground water heat pump” conditions (10°C entering water temperature and 20°C entering air temperature) in accordance with Air-Conditioning, Heating, and Refrigeration Institute/ISO 12356-1. • Must have a minimum rated energy efficiency ratio of 17.0 in cooling mode when operating at “ground loop heat pump” conditions (25°C entering water temperature and 27°C/19°C dry bulb temperature/wet bulb temperature entering air temperature) in accordance with Air-Conditioning, Heating, and Refrigeration Institute/ISO 12356-1. • Must be capable of continuous operation with a source loop entering temperature ranging for 8°C (winter) to 32°C (summer). • The heat pump loop (source) water must be sized for a minimum flow of 0.016 L/s per nominal kW (2.5 gpm per ton) of capacity.
Water-source Variable Refrigerant Flow	<ul style="list-style-type: none"> • The variable refrigerant flow system must operate with a minimum coefficient of performance (COP) of 4.0 in heating mode when rated in accordance with AHRI 1230 groundwater source conditions (10°C entering water temperature and 20°C entering air temperature). • The variable refrigerant flow system must operate with a minimum IEER of 20 in cooling mode with 21°C entering water temperature and 27°C/19°C dry bulb temperature/wet bulb temperature entering air temperature. • Must be capable of continuous operation with an entering source water temperature of 10°C in heating mode and 30°C in cooling mode. • The variable refrigerant flow source flow must be selected for 5°C delta-T at heating design and provided with a modulating source water control valve. • Variable refrigerant flow heat pump units must be centrally located adjacent to the ETS Room for direct connection to the DESS source water through the ETS.
In-floor radiant heat	<ul style="list-style-type: none"> • Should be designed to maximize delta-T at all operating conditions. • Heating water return temperatures at design condition must not exceed 38°C (design delta-T of 11°C).
Hydronic radiators, convectors, or fan coils	<ul style="list-style-type: none"> • Should be designed to maximize delta-T at all operating conditions. • Heating water return temperatures at design condition must not exceed 38°C (design Temperature Differential (delta T) of 11°C). • Chilled water return temperature at design condition must not be less than 13°C (design Temperature Differential (delta T) of 6°C).
Other	<ul style="list-style-type: none"> • Alternate solutions may be acceptable provided they meet similar efficiency and return water requirements to those listed above. Alternate solutions will be reviewed on a case-by-case basis by BRE.

Different HVAC systems may be used for different types of spaces. For example, a hot water loop may be used for parkade and vestibule heating, water-source variable refrigerant flow system may be used for residential space heating and cooling, and a heat pump water loop with water source heat pump system may be used for ground level commercial or retail spaces.

The proposed HVAC system type(s) must be identified on the project drawings as part of the Builder’s Final Design submission for review and approval by the utility.

³ Permissible spaces for electric baseboard heaters may include elevator machine rooms, electrical rooms, emergency generator rooms, or similar spaces where hydronic piping is prohibited or should be avoided at the discretion of the City.

6.1.2 PARKADE HEATING OPTIONS

The Builder’s design team may choose one of the allowable parkade heating systems with respect to the make-up air heating. The primary parkade heat loads must be served by the DESS. Table 7 describes three parkade HVAC strategies that are acceptable to BRE.

TABLE 7: Parkade Heating Options

	Option 1 – No Parkade Heat	Option 2 – Limited Make-up Air Heat	Option 3 – Natural Gas Make-up Air Heat
Envelope	<ul style="list-style-type: none"> Perimeter insulation and heat recovery recommended but not required. Insulate the parkade ceiling below the suites as per code requirements. Insulate walls between the parkade and heated spaces such as elevator lobbies or stairwells per code requirements. 	<ul style="list-style-type: none"> Insulate parkade envelope (e.g. below grade walls require R20 insulation as per the Blatchford green building codes). Parkade overhead door(s) should be tight fitting and insulated to reduce heat losses. Insulate the parkade ceiling below the suites to limit thermal losses from the building and occupant discomfort. All the above requirements must be in compliance with current National Building Codes (Alberta Edition) and BGBC requirements 	
Primary Ventilation	<ul style="list-style-type: none"> Design a primary system sized to provide baseline ventilation to the parkade with 80% efficient heat recovery ventilators (HRV) and good air distribution around the garage. Size the system for a portion of the ASHRAE 62.1 recommended ventilation rate for storage garages. Operate the system with demand control based on CO/NO₂ sensor levels to limit the accumulation of CO/NO₂ to well below the limits prescribed in the Alberta Building Code. A suggested sizing of one air change per hour for the primary system should achieve good results for a strategically laid out system. A larger primary system has a higher cost, but reduces the frequency of the secondary system running and causing cooler parkade temperatures. 		
Primary Heating Design	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Provide any or all of the following for heating the parkade and primary ventilation air: heating water coils in the primary HRV system air supply, hot water unit heaters, radiant heaters, or water-air heat pumps. The heating system for the parkade should be designed to maintain the space at only 10°C (50°F) (or a temperature deemed acceptable to the building engineer and owner) when the secondary ventilation system is not running. Lower temperatures are recommended to conserve energy, reduce heating system capacity, and reduce cost. Heating system should be designed to operate with outdoor air reset and heating water supply temperature under 49°C (120°F) in order to maintain a reasonable efficiency for the ETS heat pumps. 	
Secondary Ventilation	<ul style="list-style-type: none"> Provide a secondary ventilation system as per the ‘typical’ parkade ventilation approach that is sized to deliver the remaining ventilation capacity needed to meet the design ventilation rate for the parkade. Design rate should be an airflow that the engineer has determined to be sufficient to limit CO/NO₂ levels as required by code. Operate this system with variable speed control and only as required to limit CO/NO₂ levels to below the limits prescribed in the building code. Provide zonal control where possible to prevent over-ventilation of spaces. 		

<p>Secondary Ventilation Heating</p>	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Do not heat, or provide only limited heat, for the secondary ventilation system air. • Design for freezing parkade temperatures during periods when the secondary ventilation system is running and outdoor air is very cold. • Heat recovery (any type) for the secondary ventilation is optional. 	<ul style="list-style-type: none"> • Provide gas heat for secondary ventilation system. Gas heat must be designed to operate only to provide Make-up Air tempering when the ventilation system is running. • Provide heat only to temper the ventilation air to a level required to not affect the space temperature. • Heat recovery (any type) for the secondary ventilation is optional.
<p>Freeze Protection</p>	<ul style="list-style-type: none"> • Insulate and heat trace plumbing lines in the parkade susceptible to freezing. • Provide a dry-type sprinkler system for the parkade or insulate and heat trace the sprinkler system. • Insulate between the parkade and any occupied spaces to reduce thermal discomfort and potential condensation problems as required by the Blatchford Green Building Codes and Alberta Building Code. 	<ul style="list-style-type: none"> • Parkade may be subject to freezing when secondary ventilation is running. • Insulate and heat trace plumbing lines in the parkade susceptible to freezing. • Provide a dry-type sprinkler system for the parkade or insulate and heat trace the sprinkler system. • Use glycol in hydronic loops serving the parkade heating system. • Insulate between the parkade and any occupied spaces to reduce thermal discomfort and potential condensation problems as required by the Blatchford Green Building Codes and Alberta Building Code. 	<ul style="list-style-type: none"> • Parkade is heated at all times. Freeze protection is not generally required.

Note: When a design presents such that it does not prescriptively meet the requirements of code, under the *Safety Codes Act*, a variance must be submitted to show the intent of the submitted design will meet or exceed the intent of the code article varied from. Thus if choosing not to preheat the makeup air a variance would be required.

Other conditions resulting from not heating the makeup air will need resolution shown in the variance. The variance will be reviewed during the Plan Examination process. The Builder’s engineer will need to ensure adverse conditions are not created by the design chosen.

6.1.3 HVAC SYSTEM PIPING DESIGN

Hydronic piping inside the building (excluding the ETS) must be designed by the Builder's mechanical engineer and provided by the Builder. Piping shall be extended, by the Builder, into the ETS Room. The Builder must terminate the piping with isolation valves immediately inside the ETS Room wall. Coordination of the piping location(s) and size(s) will be required with the BRE design team during the final design submission and building permit reviews.

Hydronic piping inside the building must be designed by the Builder for a max head loss of not more than 24 kPa/100 m of piping (2.5 ftH₂O/100 ft) at design condition. Piping should be insulated as per current NECB and supported as per code requirements.

Each terminal unit (heat pump, fan coil, radiant manifold, etc) must be provided with a flow control device to limit flow during operation and a two-way control valve to stop flow when the zone is not calling for heating or cooling. A strainer and isolation valves are encouraged at each terminal unit.

Flushing, pressure testing, and commissioning of piping outside the ETS Room is the responsibility of the Builder, BRE may be required to witness.

If multiple condo corporations will exist within a single development parcel, then to facilitate metering of each condo corporation as a separate utility customer, separate hydronic systems must be provided for each separate condo corporation in the building (i.e. separation of commercial and residential piping loops). Each separate hydronic system must be independently piped from the ETS. If separate heated parkades are provided for residential and commercial condo corporation then separate hot water loops should service these two spaces from the ETS.

6.1.4 HVAC SYSTEM PUMPING

Variable speed pumping for primary building hydronic heating water, chilled water, and/or heat pump loop water will be provided by the utility as part of the ETS. The Builder's engineer is to provide design flow rates and design system head loss for each hydronic system from the wall of the ETS Room. This design basis information is to be submitted to BRE for each hydronic service on the Blatchford Building Mechanical System Design Report included in [Appendix A](#).

Primary building circulation pumps will be selected by the BRE engineer and installed, operated, and maintained as part of the building ETS by the utility. Chemical pot feeders, expansion tanks, and make up water pressure reducing valves for primary hydronic loops will be provided by BRE as part of the ETS. The Builder's design team shall coordinate with BRE and provide all relevant information for expansion tank sizing and system pressure setpoints.

Pumps, heat exchangers, and related mechanical assemblies for all secondary heating loops (such as circulators for make-up air units or snowmelt systems) and DHW recirculation are not provided or maintained by BRE and must not be located inside the ETS Room.

6.1.5 HVAC FLUID

To improve efficiency, the main hydronic piping loops for heating, cooling, or heat pump water should use water without antifreeze wherever possible. Hydronic loops for make-up air, snowmelt, or otherwise subject to freezing conditions may contain antifreeze and are provided as part of the Builder's design.

Make-up water, water treatment, and fluid quality for any hydronic loops passing through the ETS will be maintained by BRE.

Water treatment or make-up water for secondary loops (such as glycol loops for make-up air units or driveway snow melt) will not be part of the ETS and the maintenance of these systems are the responsibility of the building owner or the condo corporation. Routine water treatment services for hydronic system loops passing through the ETS will be provided by BRE. Routine services provided include: DESS fluid sampling, DESS fluid quality testing, top up of corrosion inhibitor, side stream filter changes, and make-up water additions. Any issues with the HVAC fluid (such as contamination of HVAC fluid by customer-owned systems, or loss of fluid due to leaks in the hydronic system) will be identified to the building owner to remediate. If the identified issues are not adequately remediated by the building owner, BRE may undertake repairs, as needed to protect operation of the ETS and DESS. All costs incurred by BRE for repairs or additional water treatment will be reimbursed by the building owner to the City.

6.2 Domestic Hot Water Systems

6.2.1 CENTRALIZED DHW SYSTEMS

All centralized domestic hot water must be provided by the ETS.

The ETS DHW system will store and supply DHW to the building DHW distribution system at 60°C. Mixing to prevent scalding should be provided as part of the DHW distribution system by the Builder in accordance with the National Plumbing Code.

A DHW supply system inside the building (excluding the ETS) must be designed by the Builder's mechanical engineer and provided by the Builder. The design scope for the Builder's engineer begins at the wall of the ETS Room where the building piping connects to the ETS for DHW, DHW recirculation (DHWR), and domestic cold water (DCW). Coordination of the piping locations, sizes, and design flow rates will be required with the BRE design team. Refer to Detail 10 - ETS Room Design and Piping Connections in [Appendix B](#).

If a DHW recirculation system is used, it must return recirculated DHW from the building to the ETS for reheating. DHW recirculation pumps, piping, and balancing are the responsibility of the Builder.

A separate DHW supply and recirculation system must be provided for each separate condo corporation that occupies a building.

Flushing and commissioning of DHW distribution systems through the building and ETS will be coordinated between the ETS commissioning agent and building commissioning agent.

6.2.2 OPTION B & C DHW SYSTEMS

Domestic hot water heating must be provided by a heat pump-based system that uses the DESS as described in this section.

WATER-TO-WATER DHW HEAT PUMP REQUIREMENTS

(Refer to DHW Heat Pump Detail A3 in [Appendix B](#)):

Builders proposing to use a water-to-water heat pump must meet the following requirements:

1. The heat pump must be a high-temperature water-to-water heat pump designed for operating with a DHW tank temperature setpoint of 55°C (130°F) or greater.
2. The heat pump must operate with at least a COP of 3.0 when operating at 10°C entering source temperature and 40°C entering load temperature.
3. The heat pump must include a vented, double-wall heat exchanger on the load side for direct potable water heating; or the designer must provide an intermediary double-wall heat exchanger for indirect potable water heating. Refer to Standata Plumbing Information Safety Bulletin P-08-01-NPC15 and the Alberta Building Code for details.
4. The DHW heat pump must heat potable water in a DHW storage tank sized appropriately for the DHW load and heat pump heating capacity to avoid short cycling. A minimum storage tank size of 227 L (60 gal) is required.
5. The DHW storage tank must have one or more electric element(s) for backup heating. The backup elements must be enabled through a relay on an alarm signal from the DHW heat pump, which will energize the electric element thermostat(s). Backup electric element thermostats must be set at no more than 60°C (140°F), must only be energized on alarm signal from the DHW heat pump and must not be designed for supplemental heating.
6. A thermostatic mixing valve must be provided as part of the building plumbing design to prevent scalding in accordance with local codes.

HYBRID ELECTRIC / AIR-SOURCE HEAT PUMP HOT WATER HEATER REQUIREMENTS

Builders may, at their option, propose the use of a hybrid electric heat pump hot water heater (“hybrid water heater”) for domestic hot water heating in townhouse lots.

Builders proposing to use a hybrid water heater must meet the following additional requirements:

1. The hybrid water heater must be ENERGY STAR® certified.
2. The hybrid water heater must be installed within a heated space. Garage installations are not permitted.
3. The hybrid water heater must have a minimum storage capacity of 60 gallons.
4. The hybrid water heater installation must comply with the manufacturer’s installation recommendations and applicable Alberta code requirements.
5. The hybrid water heater must be provided with a factory-approved ductwork adapter on the outlet. The hybrid water heater must be ducted so as to recirculate all cooled discharge air to the main floor living space. This may be completed through connection to the space

conditioning heat pump return air plenum or direct discharge of cooled air into a suitable location in the living space. Use rigid ductwork for hybrid water heater ducting.

6. The thermostat for the space conditioning heat pump must be located so as to be able to sense cool space temperature due to the operation of the hybrid water heater.
7. The room where the hybrid water heater is installed must be provided with a means to transfer supply air from the main living space. The room must be provided with an opening to the living space of 116 cm² (18 in²) free area or larger (a larger opening may be required by the manufacturer). This may be provided as an air transfer grille or ductwork system. Supply and return air connections for the hybrid water heater must be separated by a minimum of 5.0 meters.
8. Please see Detail 05 in [Appendix B](#) for more information regarding ducting requirements for hybrid water heaters. Note there are differing requirements whether or not a basement suite is built. All hybrid water heater ducting must be rigid. Any flexible ducting will not be accepted.

Final design packages for multi-unit lots which include hybrid water heaters must clearly indicate how all of these conditions are met.

6.3 Energy Transfer Stations

Figures 1A & 1B identify the responsibilities for the ETS design, construction and commissioning. Design of the final ETS option (see 6.1.1 of this guide) will be based upon the type(s) of HVAC system(s) selected by the Builder and the building heating and cooling design loads provided by the Builder's design team on the Blatchford Building Mechanical System Design Report.

All buildings must subscribe to one or more services from the ETS. For centralized DHW, buildings must subscribe to and provide design parameters for DHW service. Builders must also subscribe to low-temperature heat pump loop water service, heating water service, or both (as needed by the building HVAC system). Chilled water service from the ETS is an optional extra that can be provided for an additional charge.

A summary of the ETS services available, their design operating temperatures, and example building uses are presented in Table 8.

TABLE 8: ETS Energy Supply Options and Temperatures (Except for Options B and C - Builder to coordinate with BRE for details)

	Service	Design Supply Temperature	Design Return Temperature	Possible Building Uses
Required	Domestic Hot Water	60°C	n/a	<ul style="list-style-type: none"> Domestic hot water
Must select one or both of these services	Heat Pump Loop Water	Varying between min. 8°C (winter) max. 32°C (summer)	4°C (winter) (summer return temp may vary)	<ul style="list-style-type: none"> Water-air heat pump HVAC system Water source variable refrigerant flow system⁵ Condenser heat rejection for centralized, large refrigeration loads in tenant improvement spaces
	Heating Water	49°C (max) (include an outdoor air temperature (OAT) reset schedule like example shown in Figure 1)	38°C (at design)	<ul style="list-style-type: none"> In-floor radiant HVAC system Hot water radiators HVAC system Hot water fan coils HVAC system Hybrid heat pump HVAC system Heating secondary glycol loops for snow melt or make-up air systems. Other heating loads, pool heating, etc.
Optional	Chilled Water	7°C (min) (reset up to 12C based on OAT)	13°C (at design)	<ul style="list-style-type: none"> Radiant cooling HVAC systems Chilled water fan coil HVAC systems

Coordination will be required between the Builder’s design team and the BRE design team to accommodate the specific load and pumping requirements for each service.

The Builder’s engineer must provide the design thermal loads, design flow rates, and design pumping head loss for each requested service by providing the final version of the Blatchford Building Mechanical System Design Report with the Builder’s Final design review package.

6.4 ETS Room Design

The Builder is to provide an ETS Room for the exclusive use of the BRE to house the ETS DESS equipment. Procurement, Installation and commissioning of the ETS DESS equipment inside this room will be the responsibility of the party constructing the ETS Room, either the Builder (as per Section 2, Figure 1A), or BRE (as per Section 2, Figure 1B).

6.4.1 LOCATION AND SIZE

The ETS should be located on ground level or on the first below ground level of the parkade. The room should be on an exterior wall and as near as possible to the distribution piping system service connection location.

The room must have a minimum ceiling height of 2.44 m (8 feet) over at least 90% of the floor area.

For a standard ETS design consisting of DHW and heat pump loop water services, Table 9 provides a general size requirement that the ETS Room must have. If the Builder requests heating water or chilled water services, additional ETS floor area may be required. As Table 8 sizes are general requirements, the Builder is to coordinate with BRE for the final ETS Room size and all other requirements.

TABLE 9: ETS Room Minimum Size Requirements

BUILDING TYPE	# OF UNITS	MIN. FLOOR AREA REQUIREMENT ⁶	MIN. WALL LENGTH
Townhouse Style Buildings	<15	12 m ²	3.0 m
	16-30	17 m ²	3.0 m
	30-50	27 m ²	4.5 m
Apartment Style Buildings and Mixed-use Buildings	<30	27 m ²	4.5 m
	30-60	40 m ²	4.5 m
	61-90	55 m ²	4.5 m
	91+	Coordinate with the BRE	

A double access door with dimensions at least 1.83 m x 2.03 m (72"x80") (WxH) opening to the outside or parkade must be provided. For ETS Rooms 17 m² or smaller, a single access door with dimensions at least 0.91 m x 2.03 m (36" x 80") may be provided. For doors opening to the outside, a suitably sized landing and exterior light must be provided.

Again, the Builder will coordinate with BRE to determine the final ETS Room size and all other requirements.

⁶ Minimum floor area requirements are provided based on an ETS which provides heat pump condenser water and/or domestic hot water only. Requests for space heating water or chilled water service may require an increase in ETS floor area of +50% to +75% and should be coordinated with BRE during the final design submission.

6.4.2 FIRE AND NOISE PROTECTION

The ETS Room must have a 2-hour rated fire separation to the rest of the building. Sprinklers, fire dampers, and fire detection systems must be provided by the Builder in accordance with local codes.

Provision must be made by the Builder to prevent the transmission of mechanical noise and vibrations from the ETS Room compressors to adjacent occupied spaces.

6.4.3 MECHANICAL REQUIREMENTS

Ductwork will be designed by BRE and constructed by the party constructing the ETS Room. BRE will provide the ETS Room with a design for a source of make up air to be constructed by the party constructing the ETS Room. BRE will provide the design for exhaust and make up air ducts into the ETS Room as per the approved ETS Design. The ducts must have a minimum free area of 1.25 cm² per m² of ETS floor area (0.18 in² per ft²) and a minimum total free area of 0.02 m² (0.2 ft²).

Where ductwork passes through a fire rated wall, a fire damper must be provided by the Builder, as per approved ETS Design.

Heating and ventilation for the ETS Room will be provided by BRE as part of the ETS design. The room should be considered a semi-heated space.

The Builder is not permitted to use spray-on fibreglass or cellulose insulation in the ETS Room.

The Builder designs and constructs the floor drains connected to the sanitary sewer system in the ETS Room and must be provided with trap seal primers. Location of floor drain is to be coordinated with BRE during design of the ETS Room.

A domestic cold water source suitably sized for the building (pipe size to be coordinated with BRE during design of the ETS Room) DHW load and any hydronic system's make up water requirements must be provided by the Builder. All domestic cold water consumed by the ETS Room is to be paid for by the Builder/building owner(s)/condominium corporation.

A natural gas connection shall be extended to the ETS Room by the Builder unless otherwise determined and agreed upon through course of building design and ETS design coordination. All natural gas fees from the ETS Room is to be paid for by the Builder/building owner(s)/condominium corporation. Openings or shafts for boiler venting and combustion air, as well as any associated fire-rated shafts, may be required to be provided by the Builder for backup boiler(s) in the ETS and will be coordinated during ETS design.

6.4.4 ELECTRICAL REQUIREMENTS

The electrical systems within the ETS Room will be designed by BRE and constructed by the party constructing the ETS Room. Builder to indicate voltages available onsite as part of their response to the questions in [Appendix A](#). If the building has a large thermal demand necessitating large motor sizes in the ETS, BRE may request 600 V service. Maximum 400 A of ETS system load at 208V, or 600V should be pursued for systems that exceed this.

BRE will provide ETS DESS equipment load schedule to Builder prior to the Builder's Final Design submission. A revised load estimate will be provided by BRE following Builder final submission if changed. BRE will provide the electrical design for the ETS Rooms with the following concepts for determining demarcation points:

- Townhouse Style Building development with an electrical meter mounted to the exterior wall of the ETS Room:
 - The Builder is responsible for designing, procuring, and installing up to and including the electrical meter and communications;
 - » It is Builder's responsibility to coordinate the equipment specifics and DEMARC locations with BRE;
 - » Builder is to also procure and install the appropriate electrical and communications raceways and cables inside the ETS Room;
 - » All items related to the electrical metering and network connectivity; for example: coordination of workservice application, payment, energization, raceways, cable spec, testing requirements will be the responsibility of the Builder;
 - BRE will be responsible for the design of all electrical after the DEMARC (Electrical Meter) and Network (communications) scope after the DEMARC (network backboard within the ETS Room).
 - BRE will design, and the Builder will install the panelboard inside the ETS Room with a service rated main breaker;
 - BRE will share the electrical and network requirements of the ETS Room with the Builder per the latest version of the COE Facilities CMTG Vol 2.
- Townhouse Style Building with the ETS Room electrical meter mounted in bank on side of townhomes:
 - The Builder is responsible for designing, procuring and installing up to and including the electrical and communications DEMARC;
 - » It is Builders responsibility to coordinate the specifics and DEMARC locations with BRE;
 - » Builder is to also procure and install the appropriate electrical and communications raceways, cables, and service rated disconnect switch inside the ETS Room;
 - » All items related to the electrical metering and network connectivity; for example: coordination of work, service application, payment, energization, raceways, cable spec, testing requirements will be the responsibility of the Builder;
 - BRE will design the disconnect switch that will be procured and installed by the Builder in the ETS Room;
 - Ensure disconnect switch's rating matches the ETS Room panel bus rating;
 - Ensure the cables are within the maximum distance allowed by Electrical code requirements (Rule CEC 6-206).

- BRE will be responsible for the design of all electrical after the DEMARC (service rated disconnect switch with view port within the ETS Room) and Network (communications) scope after the DEMARC point (which is the backboard for the network within the ETS Room);
- BRE will share the electrical and network requirements of the ETS Room with the Builder per the latest version of the COE Facilities CMTG Vol2.
- ETS Room inside Multi-family Condo:
 - The Builder is responsible for procuring and installing up to and including the electrical and communications DEMARC;
 - » It is Builders responsibility to coordinate the specifics and DEMARC locations with BRE;
 - » Builder is to also procure and install cables and raceways to the DEMARC as per BRE's design;
 - » All items related to the electrical and network connectivity; for example: coordination of work, energization, raceways, cable spec, testing requirements will be the responsibility of the Builder;
 - » The Builder will procure and install cables and raceways to the DEMARC as per BRE's design;
 - BRE will be responsible for the design of all electrical after the DEMARC (service rated disconnect switch with view port within the ETS Room) and Network (communications) scope after the DEMARC point (which is the backboard for the Network within the ETS Room).
 - BRE will share the electrical and Network requirements of the ETS Room with the Builder per the latest version of the COE Facilities CMTG Vol 2.

The final concept and any site specific variations will be coordinated between the BRE and the Builder. BRE will also coordinate the ETS Room's Final electrical and network requirements with the Builder which the Builder will require to provide the appropriate electrical and network services. BRE will provide design drawings and specifications encompassing these scopes to the Builder.

Scope:

BRE design drawing and specifications to cover the operational electrical systems for the ETS Room, including power distribution systems, receptacles, lighting, emergency lighting and exit signage, and accommodations for the room's HVAC and ETS systems circuits. Builder is to construct in accordance with the latest version of the City of Edmonton Facility Consultant Manual - Volume 1 & 2. ETS feed will not be sub-metered; electricity will be measured on the main electricity meter and paid by the Builder/building owner(s)/condominium corporation.

BRE will provide equipment load schedule for the room and any motor starters or VFDs. Any required sealing for room conduit penetrations is the responsibility of the Builder and is to be followed as outlined in the approved ETS design.

6.4.5 Security and IT Requirements

A 53 mm conduit with pull string is to be provided by the Builder between building Telus demarcation point and ETS Room. Builder drawings must include this conduit, indicating where it enters ETS Room. The City of Edmonton has a contract with Telus to provide the Managed Network Services and requires this Telus connection to maintain and operate every ETS Room. For all multi-unit parcels with an ETS Room in Blatchford, the Builder is to clearly state and label the ETS Room on their parcel as "UTIL1, Parcels Civic Address" on all submissions to the City. The process to implement the TELUS Managed Network is located in [Appendix F](#). BRE will provide IT drawings for requirements within the ETS Room for the Builder to construct. A Metering Network conduit is also required to be brought to the ETS Room by the Builder. Builder drawings must include this conduit, indicating where it enters ETS Room. Refer to [Section 6.6.2](#) for more information.

BRE will provide security drawings for requirements within the ETS Room for the Builder to install. The Builder is to fully comply with all of the ETS Design requirements including Security and IT as provided by BRE. BRE will procure and install the City of Edmonton network switch for the ETS Room, the Builder will reimburse the City for this cost. The Builder is to install a flush mount card on the exterior of the ETS Room door and an electric strike will be required for the door. Builder architectural drawings to accommodate the access control system, including door hardware suitable for electric door strike and exterior card reader. Refer to requirements of the City of Edmonton Facility Consultant Manual - Volume 1 & 2.

6.5 Thermal Metering

For one parcel, BRE will supply only the Thermal Energy Meter(s) and meter antenna(s) depending on the ETS option chosen for the measurement of the heating, cooling, and DHW energy use for that one particular parcel. Sub-metering for individual units would be the responsibility of the Builder.

6.6 DESS Service Connections

6.6.1 DESS SUPPLY/RETURN PIPING

BRE will provide DESS supply and return piping connections and one communications conduit to the property line of each building lot. The Builder is responsible for extending these two DESS service lines and the communications conduit from the property line into the ETS Room (refer to Details 20 and 21 in [Appendix B](#)).

Upon completion, the services will be subject to final inspection and witness of pressure testing by a representative of BRE and then ownership of the services will be transferred to BRE.

BRE will provide the following:

1. HDPE DR17 DESS supply and return service connections are provided at the property line of each building and are isolated with curb cock shutoff valves on the City side of the property line and with an invert depth of approximately 2.75 m below finished grade.

- 1.1 Service connections are colored red for DESS supply and blue for DESS return. Supply is on the right when looking at the property from the street and should be maintained on the right as it is routed into the ETS Room.

The Builder will be responsible for the following:

1. Provide a trench from the property line to the DESS service building entry location. Trench bedding and backfill as per City of Edmonton Design and Construction Standards – Volume 4.
 - 1.1 DESS Service entries are to be run below the slab for slab on grade ETS Rooms or through the foundation wall or under the floor slab for below grade ETS Rooms.
 - 1.2 The invert of the service pipe must be a minimum of 2.75 m below finished grade at all points.
2. Extend the HDPE pipe of the DESS service connections from the property line to the building entry location as follows. [NOTE: It is preferable for the DESS service connections to enter the building directly into the ETS Room. Where required, DESS services may be routed through the parkade and into the ETS Room.]
 - 2.1 Underground DESS service lines to be DR17 PE4710 HDPE pipe manufactured with coloured stripes co-extruded in the pipe outside surface (red for supply and blue for return).
 - 2.2 The pipe diameter must match the service connection stub diameter. (NOTE: Smaller pipe sizes may be approved by the BRE during design review based on expected building loads. Larger pipe sizes may be required where the length of the service pipe, the potential demand, or the supply pressure warrant a mandate increase.)
 - 2.3 Confirm curb stop valves are closed. Cut and remove temporary U-bend from existing service connections. Do not cut pipe within 300mm of the curb stop valve.
 - 2.4 Use an electrofusion coupling or butt fusion machine to fuse new HDPE service to existing services. Follow all manufacturer installation instructions.
 - 2.5 Use a single continuous length of pipe where possible to extend the service from the property line to approximately 1m inside the building at the service entry location. Pipe penetrations through the foundation wall and ETS Room wall are the responsibility of the Builder.
 - 2.5.1 Observe minimum bending radius for HDPE pipe or use long radius elbows where needed.
 - 2.5.2 Securely cover exposed ends of pipe at the end of every workday. Do not stow or store materials, tools, or accessories inside pipe.
 - 2.6 Flush, sweep, swab, or pig the service connection to ensure dirt, debris, and other materials are removed prior to backfilling. All construction must be carried out in clean and sanitary conditions.
 - 2.6.1 Do not backfill trench until final inspection and sign off by BRE.
 - 2.7 Inside the building, provide shutoff valves for isolating the Distribution Piping System service connection.

- 2.7.1 Isolation valves to be lug-style, resilient seat butterfly type with stainless steel shaft; bronze or ductile iron chrome plated disc; level lock handle operator for valves up to 150mm, heavy duty hand wheel operator for valves 200 mm and over. Use DeZURIK model BOS or equivalent approved by BRE.
- 2.8 Arrange for final inspection by BRE once flushing is complete and ready for pressure test.
 - 2.8.1 Notify BRE with 72 hours advance notice to arrange for inspection of DESS service pipes once flushing is complete and prior to final pressure test and backfill.

HOLD POINT: BRE to witness pressure test and inspect service pipe prior to backfill; notify BRE minimum 72 hours in advance of pressure testing.

- 2.9 Conduct a pressure test of HDPE service piping as follows:
 - 2.9.1 With the curb cocks closed, pressurize pipe with water to 724 kPa (105 psi) and bleed off trapped air.
 - 2.9.2 Initial Expansion: Maintain 724 kPa (105 psi) for at least 4 hours and add water as needed. Do not measure this volume. Hydrostatic pressure expands pipe.
 - 2.9.3 Begin Test: Reduce pressure to 655 kPa (95 psi). Monitor pressure over 4 hours.
 - 2.9.4 The pipe installation is acceptable if there is no pressure drop over 4 hours.

HOLD POINT: Final acceptance of below grade DESS service piping by BRE is required.

- 3. If required and approved by BRE, extend the DESS services from the building entry location into the ETS Room through the parkade.
 - 3.1 DESS service pipe extensions in the parkade or building must be schedule 40 black steel pipe (ASTM A106 Grade B) with flanged, threaded, grooved, or welded joints. Joints and fittings to be designed for operation at a pressure and temperature rating of minimum 1034 kPa at 50°C.
 - 3.2 Avoid creating high points in the pipe routing which may trap air.
 - 3.2.1 Where a high point is required and approved by BRE, provide air vents with isolation ball valves.
 - 3.2.2 Air vents must be 20mm (3/4") threaded with 1034 kPa (150psi) pressure rating and piped to drain. Use APCO Willamette 50 series or equivalent approved by BRE.
 - 3.3 All non-buried DESS pipe must be supported in accordance with local codes.
 - 3.4 All non-buried DESS pipe must be insulated and provided with vapour barrier designed to prevent condensation at a DESS operating temperature of 4°C.
 - 3.5 All non-buried DESS pipe passing through unconditioned spaces must be heat traced to prevent freezing.
 - 3.6 Provide isolation valves immediately inside the ETS Room. Services must be extended into the ETS Room by the Builder.
 - 3.6.1 Isolation valves to be lug-style, resilient seat butterfly type with stainless steel shaft; bronze or ductile iron chrome plated disc; lever lock handle

operator for valves up to 150mm, heavy duty hand wheel operator for valves 200 mm and over. Use DeZURIK model BOS or equivalent approved by BRE.

- 3.7 Slope DESS services at minimum 0.4% towards the street main or ETS Room. Where a low point is created and approved by BRE, provide a 40mm (1-1/2") blow off drain valve.
- 3.8 Flush and clean each parkade DESS service pipe extension prior to connection to the DESS service.
- 3.9 Arrange for final inspection of parkade DESS service pipe extension by BRE once flushing is complete and pipe is ready for pressure test.
 - 3.9.1 Notify the BRE with 72 hours advance notice to arrange for inspection of parkade DESS service pipes once flushing is complete and prior to final pressure test.

HOLD POINT: BRE must inspect and witness pressure test for parkade DESS service pipe; provide BRE a minimum of 3 days (72 hours) advance notice to arrange for inspection.

- 3.10 Pressure test the completed DESS service pipes and parkade extension from the curb cock to the ETS Room. Pressure testing of HDPE/steel service piping to be completed as follows:
 - 3.10.1 With the curb cocks closed, pressurize pipe with water to 724 kPa (105 psi) and bleed off trapped air.
 - 3.10.2 Initial Expansion: Maintain 724 kPa (105) psi for at least 4 hours and add water as needed. Do not measure this volume. Hydrostatic pressure expands HDPE pipe.
 - 3.10.3 Begin Test: Reduce pressure to 655 kPa (95psi). Monitor pressure over 4 hours.
 - 3.10.4 The pipe is acceptable if there is no pressure drop over 4 hours.

HOLD POINT: Final acceptance of complete DESS service piping by BRE is required.

- 4. The Builder is responsible for any temporary connections to facilitate flushing and pressure testing.
- 5. Provide means to prevent water freezing and damaging DESS service lines during construction.

6.6.2 METERING NETWORK CONDUIT

The goal of the metering network conduit is to provide a continuous communication pathway from the Energy Centre to the ETS Room in each building. The Builder will extend the metering network conduit from the property line into the ETS Room with a pull string as shown in Detail 20 in [Appendix B](#). Network cables will be installed in the future by BRE.

Upon completion, the conduit will be subject to final inspection by a representative of BRE and then ownership of the conduit will be transferred to BRE.

BRE will provide the following:

1. Schedule 40 RPVC conduit(s) to the property line of each block adjacent to the DESS service connections, matching the size and quantity detailed in the following table:

Table 10: Conduit Quantity and Size by Stage

Stage 1	1 x 103mm schedule 40 RPVC conduit
Stage 2	1 x 103mm schedule 40 RPVC conduit
All Other Stages	2 x 53 mm schedule 40 RPVC conduits

The Builder will be responsible for the following:

1. Providing a trench from property line to the DESS service building entry location.
 - 1.1 Where other services may occupy the same trench, Canadian Electrical Code rule 60-602 must be followed.
2. For Stage 1 or Stage 2, the builder is to supply, splice, and install the one 103mm schedule 40 RPVC conduit from the service at the property line into the ETS Room with a pull string. For all other stages, the builder is to supply, splice, and install two 53mm schedule 40 RPVC conduits from the property line to the ETS Room with a pull string.
 - 2.1 The Builder shall provide conduit(s) matching the size and quantity listed in Table 9.
 - 2.2 Conduit(s) depth to be a minimum of 450 mm in non-vehicular areas and 600 mm in vehicular areas.
 - 2.3 Contact BRE with a minimum of 3 days (72 hours) advance notice to arrange for inspection of below grade network conduit(s) prior to backfill.

HOLD POINT: BRE must inspect network conduit(s) prior to backfill; provide BRE a minimum of 3 days (72 hours) advance notice to arrange for inspection.

3. Provide a 200 mm x 150 mm x 100 mm, NEMA 4X junction box mounted to the wall where the conduit(s) enters the building. Refer to Detail 20 in [Appendix B](#).
4. Extend non-metallic conduit(s) with pull string from the junction box to the ETS Room inside the building, sized in accordance with Table 9. This conduit(s) should have a maximum of four sweeping 90 degree bends or include pull boxes as required.

HOLD POINT: Final inspection of the complete meter network conduit(s) by BRE is required.

6.7 DESS Secondary Loop (Buried) – Builder Side of ETS

For multi-unit and condo developments proposing to service their site with direct buried supply and return distribution piping exterior to the buildings (laneways, boulevards, parking lots, etc.) it is recommended that the design and construction be completed in general conformance with the guidelines outlined in [Appendix D](#).

6.8 ETS Inspection and Administration

In the event that the Builder undertakes the construction of the ETS, the BRE will outline the required milestone inspection and administration requirements to the Builder through the ETS designs documents provided by the BRE.

6.9 Record of Services

The Builder is to provide record drawings for all BRE owned DESS services from the property line to the ETS Room including any other BRE owned services inside the Builder's parcel. Record drawing of DESS service to indicate pipe material and include as-built geodetic survey of the following items:

- Curb Stop/Gate Valve being connected to;
- Alignment of the service capturing any bends;
- Couplings;

Records must be submitted in PDF and digital CAD format to BlatchfordUtility@edmonton.ca and a printed copy must be stored in the ETS Room available for BRE's use, shall not be removed, and shall be updated by the Builder in the case of any changes.

6.10 Approved City ETS Room Vendors

BMS:

Johnathan Morton, Project Coordinator
T: (780) 484-6681 C: (780) 777-5636
Serv-All Mechanical Services
18120-107 Ave Edmonton, AB T5S 1K5

CCure:

Megan Leithoff, Account Executive,
Convergint M: (780) 242 7813,
megan.leithoff@convergint.com
3944-53 Avenue, Edmonton, AB T6B 3N7

LeRoy Wilkinson, Senior Account Executive,
Complex Security Solutions
Building Solutions North America,
Johnson Controls Canada LP
M: (780) 453 5280, leroy.wilkinson@jci.com
17402-116 Ave NW Edmonton, AB T5S 2X2

Leon Seiferman, Account Executive, Paladin
Technologies Inc. M: (780) 446 2033,
lseiferman@paladintechnologies.com
104-4103 97 Street, Edmonton, AB T6E 6E9

Vendor to perform the work to connect Telus Line and the Patch Panel:

Chermik:

Steve Juhasz, Field Manager – Fibre Optic
Services, Chermik Technical Services Ltd.
steven.juhasz@chermik.net
Phone: (780) 417-1487 ext. 213
Mobile: (780) 932-6907

Jason Kuziw, Operations Manager
Chermik Technical Services Ltd.
jason.kuziw@chermik.net
Phone: (780) 417-1487 ext. 202

*Note: If the Builder is unable to contact
the personnel listed above, Builder is to
reach out to BRE.*

Appendix A: Initial Questions and Final Design Requirements

Initial Questions

As a part of BRE's initial questions, the Builder must submit clear responses to the following questions for BRE's review.

1. Approximate building size (m²), # of residential units, # of bedrooms, and voltages available on-site.
2. For mixed-use sites; a description of the non-residential occupancies (offices, commercial, etc).
3. High level architectural drawings showing the site, parking garage, units layout, and ETS Room Location & Size.
4. Confirmation from the Builder regarding what ETS option they would like to pursue: Option A, B, C, or D.
5. Whether or not the Builder plans to have a natural gas connection to the ETS Room.
6. If a ramp snow melt, common spaces and/or parking garage heat will be required.

Final Design Submission

The final design package must include:

1. Complete building mechanical system design including final schematics, floor plans, equipment schedules, mechanical details and controls specifications. Ground floor or parkade floor plans to include the following:
 - a. The ETS Room size and location,
 - b. DESS service connection entry location and pipe routing within the building,
 - c. BRE communications conduit routing from the property line to the ETS Room,
 - d. TELUS services conduit routing from the junction box to the Demarcation Point,
 - e. TELUS Managed Network conduit routing from the Demarcation Point to the ETS Room,
 - f. Meter antenna conduit routing to the agreed upon location with BRE,
 - g. Include natural gas service drawings (if applicable).
2. Complete architectural drawings showing final size and location of ETS Room and access control door hardware accommodations.

3. Complete electrical drawings.
4. Complete drawings showing DESS service connection pipe from property line to ETS Room including plan view, section views, trenching and backfill details, building entry details, and details for valves, hangers, and air relief valves for the DESS service pipe.
 - a. DESS service connection routings from the curb stop to the DESS service connection entry location,
 - b. BRE communications conduit routing and building entry location.
5. All specifications and shop drawings as required by BRE.
6. Final Building Grading Plan.
7. Final Building Mechanical System Design Report.

Blatchford Building Mechanical System Design Report

Multi-unit Lot Buildings

Final	Rev. Date: _____
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Notes:

- i. This form must be submitted along with the final design package for all multi-unit lots.
- ii. This form must be signed by the registered professional of record who is a member in good standing of the Association of Professional Engineers and Geoscientists of Alberta.

Project: _____
(Name of project)

(Address of project)

(Legal description of project)

Part A: DESS Design Guide Requirements Checklist

The undersigned hereby gives assurance that the above listed project has been designed in accordance with this guide and meets the specific requirements as listed below.

(Initial next to each item to confirm compliance)

SPACE HEATING & HYDRONICS

- _____ 1.0 All heating for conditioned spaces and semi-heated spaces is provided by an HVAC system that receives all thermal energy from the building's Energy Transfer Station (ETS).
- _____ 1.1 Hydronic systems are designed to operate at the supply and return temperatures listed in Table 5 of this guide.
- _____ 1.2 HVAC system piping is designed for variable flow with 2-way control valves and flow regulating devices at each load.
- _____ 1.3 HVAC system piping is designed for a maximum head loss of 24 kPa/100m (2.5 ft/100 ft) of pipe.
- _____ 1.4 The hydronic systems for each separate condo corporation are not interconnected and are separately piped to the ETS.
- _____ 1.5 The Builder chooses to install each heat pump with a backup electric resistance heater in compliance with requirements in Table 2 & 3 and Section 5.1, Requirement #1.1. The Builder opts out of ETS Room backup boiler.

OTHER HEATING LOADS

- _____ 2.0 All heating for driveway or sidewalk snow-melting systems (where included) is provided by a hydronic system that receives all thermal energy from the building's ETS. and as outlined in section 6.2.2 of this guide.

DHW

- _____ 3.0 (Options A & D) All domestic hot water is provided from the building's ETS.
(Option B & C) All domestic hot water is provided by Builder's DHW HPs in each residential unit.
- _____ 3.1 (Options A & D) Domestic Hot Water Return, when provided, is returned to the ETS for reheating.
- _____ 3.2 (Options A & D) A separate DHW system and DHWR system is provided from the ETS to each separate condo corporation, if applicable.

SPACE COOLING

_____ 4.0 All mechanical cooling for conditioned spaces (where included) is provided by an HVAC system that rejects all thermal energy to the building's ETS.

REFRIGERATION LOADS

_____ 5.0 Centralized refrigeration equipment with capacity greater than 10 kW (3 nominal tons) (where included) rejects the condenser heat to a hydronic loop connected to the ETS.

FUTURE TI

_____ 6.0 Provision has been made for future heating, cooling, and DHW loads as part of future tenant improvements to be designed and installed in compliance with this guide.

ETS ROOM

_____ 7.0 An ETS Room for the exclusive use of BRE has been provided on the ground floor or first parkade level, with a floor area as per Table 8 and designed in accordance with this guide.

_____ 7.1 The ETS Room has a 2 hour fire separation.

_____ 7.2 Ductwork connections as required, domestic cold water, and floor drain(s) are provided in the ETS Room.

_____ 7.3 A dedicated electrical feed is provided for the ETS Room, sized as requested by the utility.

_____ 7.4 The Builder chooses to install a backup boiler in the ETS Room, and opts out of electric resistance heaters in each heat pump.

Part B: ETS Services Design Basis

In this section, the mechanical engineer of record for the building mechanical systems is to indicate the design sizing information for the ETS services (heat pump loop water, DHW, heating water, chilled water) that are required by the building's mechanical design.

Design thermal loads, design flow rates, and head loss at design condition are to be provided for each required service in order for BRE to design and size the ETS DESS equipment.

Refer to this guide for details of each service.

DOMESTIC HOT WATER (REQUIRED)

Provide the following data for the sizing of the DHW heating and storage system which will be provided by the utility as a part of the ETS.

Residential Spaces:

Number of Bedrooms: _____

Number of Residential Units: _____

Number of Clothes Washers: _____

Number of Dishwashers: _____

Total Residential Fixture Units: _____

Average Shower head Flow Rate: _____

Non-residential Spaces:

Provide the following expected peak DHW usage for all non-residential spaces including future tenant improvements.

Peak 120-minute DHW usage: _____ L at 60°C

Peak 24-hour DHW usage: _____ L at 60°C

Total Non-Residential Fixture Units: _____ Fixture Units

HEAT PUMP LOOP WATER (OPTIONAL)

Required

Not Required

Provide the design heat extraction and heat rejection loads at design conditions for the building heat pump water loop. Include the effects of system diversity and a sufficient safety factor.

Design Heat Pump Water Loop Heating: _____ kW

Design Heat Pump Water Loop Cooling: _____ kW

Provide the design flow rate and system head loss (from the wall of the ETS Room) for the heat pump loop water system.

Design Water Flow: _____ L/s

System head loss at design: _____ kPa

HEATING WATER (OPTIONAL)

Required

Not Required

Provide the heating design load for all spaces serviced by the building's hydronic heating system. Include the effects of system diversity and a sufficient safety factor.

Design Hydronic Heating Load: _____ kW

Provide the design flow rate and system head loss (from the wall of the ETS Room) for the hydronic heating system.

Design Heating Water Flow: _____ L/s

System head loss at design: _____ kPa

CHILLED WATER (OPTIONAL)

Required

Not Required

Provide the cooling design load for all spaces serviced by the building's chilled water system. Include the effects of system diversity and a sufficient safety factor.

Design Chilled Water Load: _____ kW

Provide the design flow rate and system head loss (from the wall of the ETS Room) for the chilled water system.

Design Chilled Water Flow: _____ L/s

System head loss at design: _____ kPa

Certification

I certify that the above mentioned project is designed in compliance with the requirements and details provided in this guide and that the design basis information provided in [Part B](#) above represents the design loads for this building.

I certify that I am a registered professional as defined in the Alberta Building Code.

Registered Professional of Record's Name

Firm

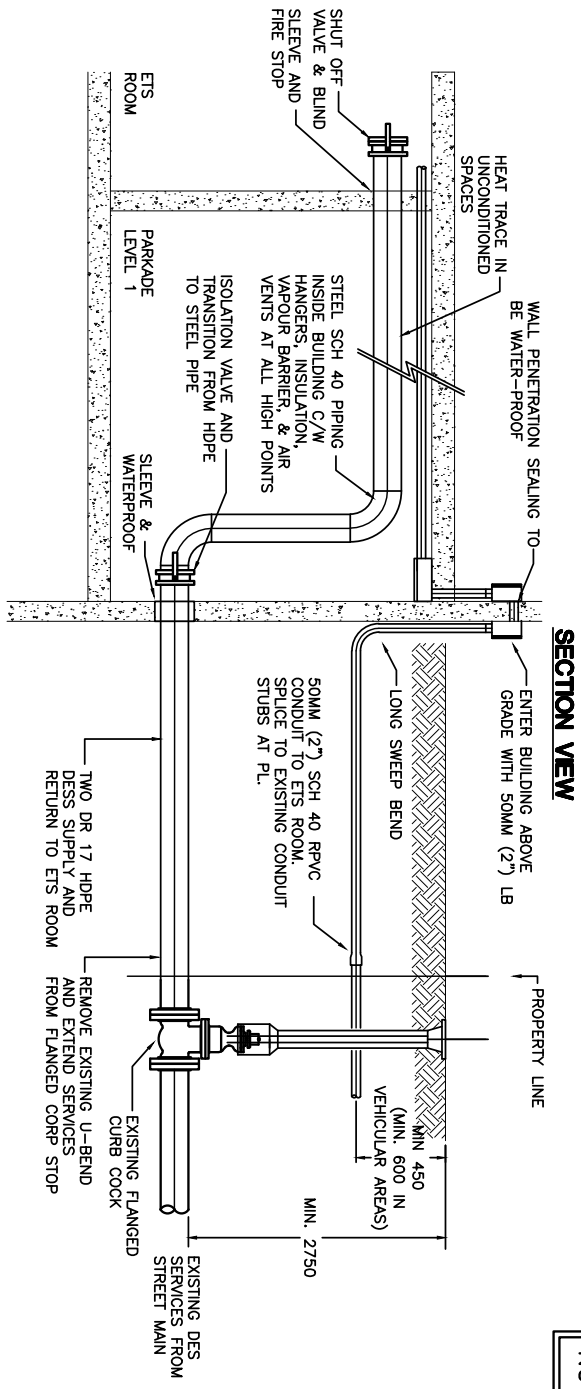
Address

Phone No.

Professional's Seal, Signature and Date

Appendix B – DESS Design Details

DRAWING NUMBER	DESCRIPTION	APPROVED
10	ETS Room Design and Piping Connections	
20	DES Service Connection Detail – Below Grade ETS	
21	DES Service Connection Detail – Slab on Grade ETS	
05A	Air-Source Hot Water Ducting Detail (Typical AO Smith Install)	
05R	Air-Source Hot Water Heater Ducting Detail (Typical RHEEM Install)	
A3	Fee Simple Townhouse Recommended Designs DHW Heat Pump	



FOR REFERENCE ONLY
NOT FOR CONSTRUCTION

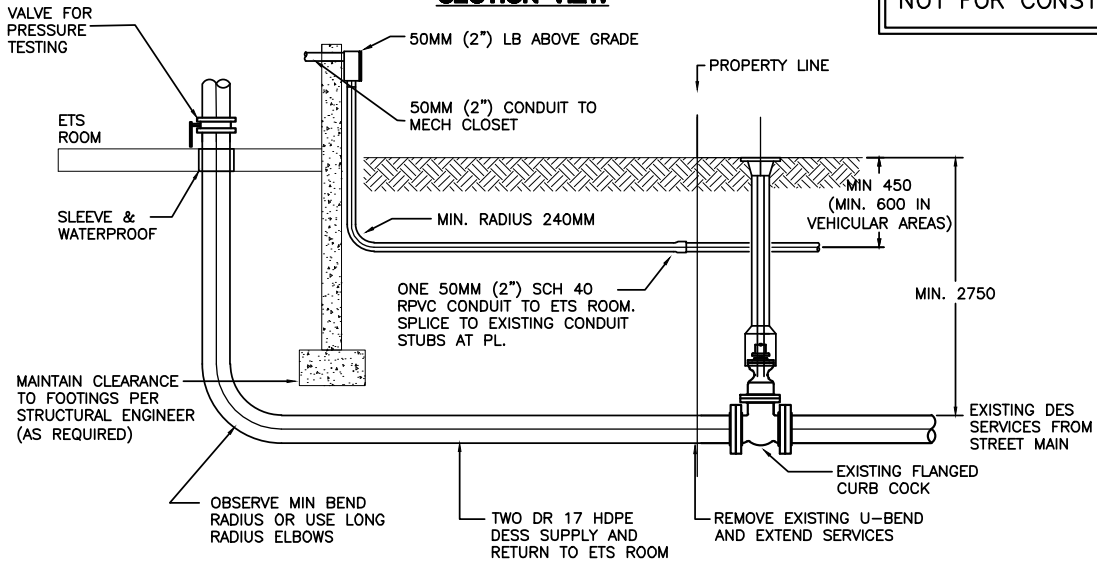
- NOTES:
1. PIPE INVERT TO BE MIN. 2750MM BELOW FINISHED GRADE.
 2. TRENCH BEDDING AND BACKFILL AS PER EDMONTON DESIGN AND CONSTRUCTION STANDARDS VOL. 2 AND VOL. 4
 3. ALL SERVICE CONNECTIONS TO BE PRESSURE TESTED AND INSPECTED BY BLATCHFORD RENEWABLE ENERGY PRIOR TO BACKFILL.
 4. ARRANGE WITH BLATCHFORD RENEWABLE ENERGY TO FLUSH DES SERVICES TO DRAIN PRIOR TO STARTUP.
 5. CURB STOPS TO BE OPERATED ONLY BY BLATCHFORD UTILITY.

PROJECT NAME: BLATCHFORD DESS	SCALE: NTS
DRAWING TITLE: DES SERVICE CONNECTION DETAIL BELOW GRADE ETS	DRAWN: SS
	CHECKED: AB
	DATE: SEP 25, 2023
	DRAWING NUMBER: DETAIL 20

PINCHIN LTD. APEGA PERMIT# P007802

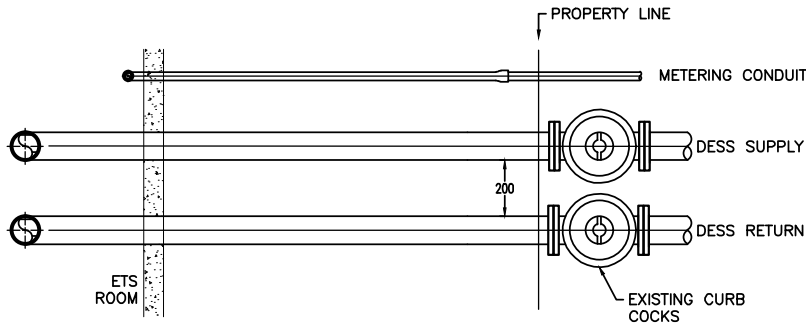
FOR REFERENCE ONLY
NOT FOR CONSTRUCTION

SECTION VIEW



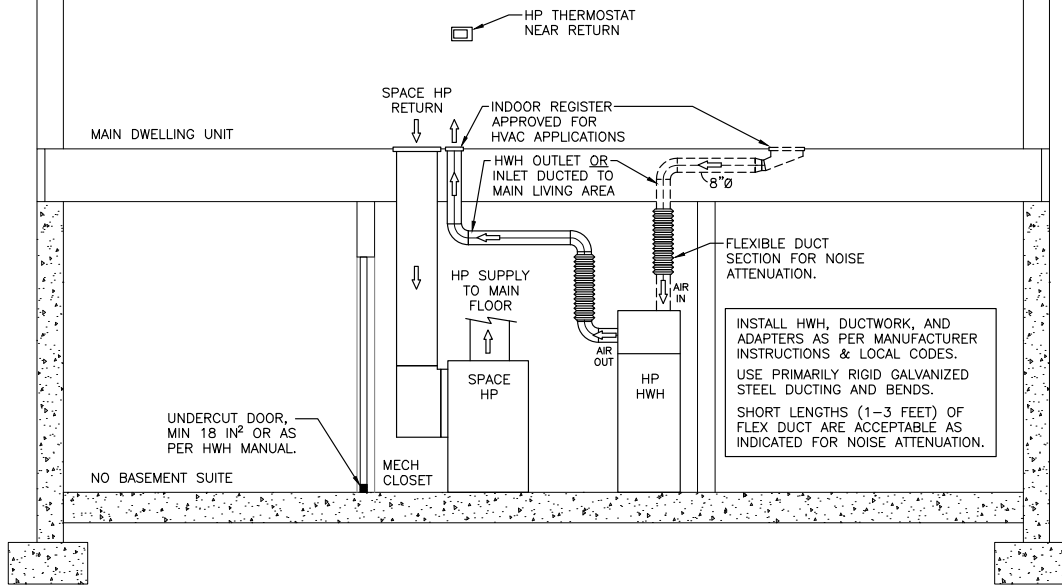
- NOTES:
1. PIPE INVERT TO BE MIN. 2750MM BELOW FINISHED GRADE.
 2. TRENCH BEDDING AND BACKFILL AS PER EDMONTON DESIGN AND CONSTRUCTION STANDARDS VOL. 2 AND VOL. 4
 3. ALL SERVICE CONNECTIONS TO BE PRESSURE TESTED AND INSPECTED BY BLATCHFORD RENEWABLE ENERGY PRIOR TO BACKFILL.
 4. ARRANGE WITH BLATCHFORD RENEWABLE ENERGY TO FLUSH DESS SERVICES TO DRAIN PRIOR TO STARTUP.
 5. CURB STOPS TO BE OPERATED ONLY BY BLATCHFORD UTILITY.

PLAN VIEW

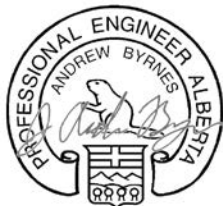
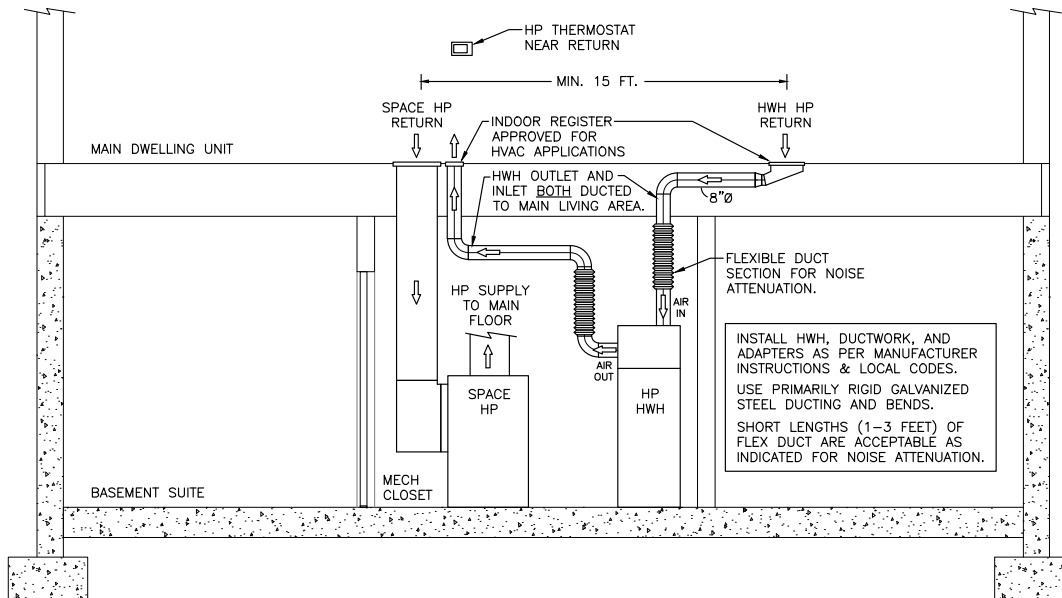


PROJECT NAME:	BLATCHFORD DESS	SCALE:	NTS
DRAWING TITLE:	DES SERVICE CONNECTION DETAIL SLAB ON GRADE ETS	DRAWN:	AB
		CHECKED:	GT
		DATE:	APR 11, 2024
		DRAWING NUMBER:	DETAIL 21

**WATER HEATER DUCTING WITHOUT BASEMENT SUITE
(RHEEM MODELS)**



**WATER HEATER DUCTING WITH BASEMENT SUITE (OR POSSIBLE FUTURE BASEMENT SUITE)
(RHEEM MODELS)**

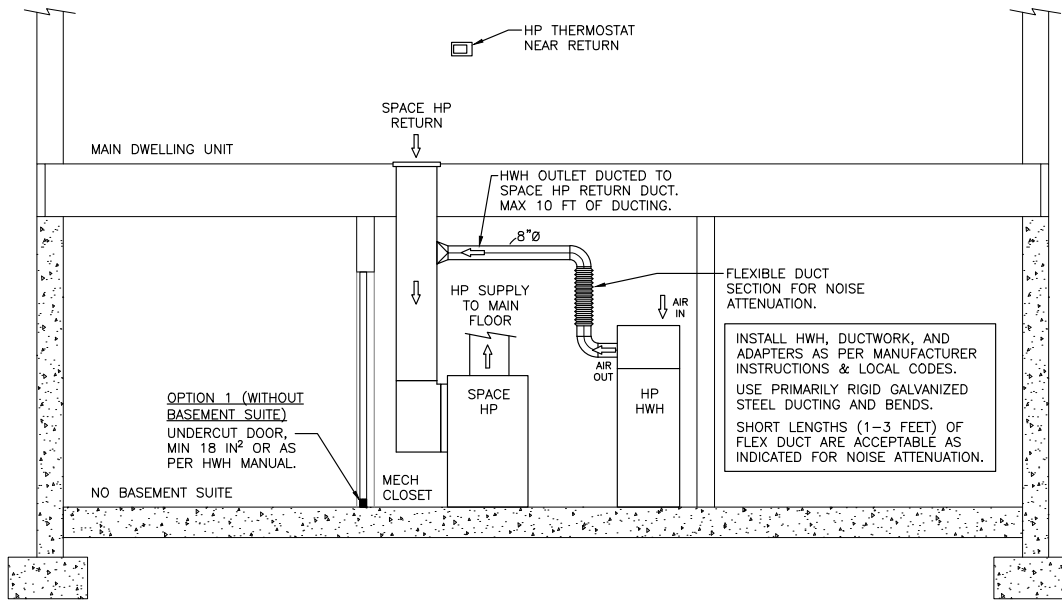


Andrew Byrnes
PINCHIN LTD. A. S. C.

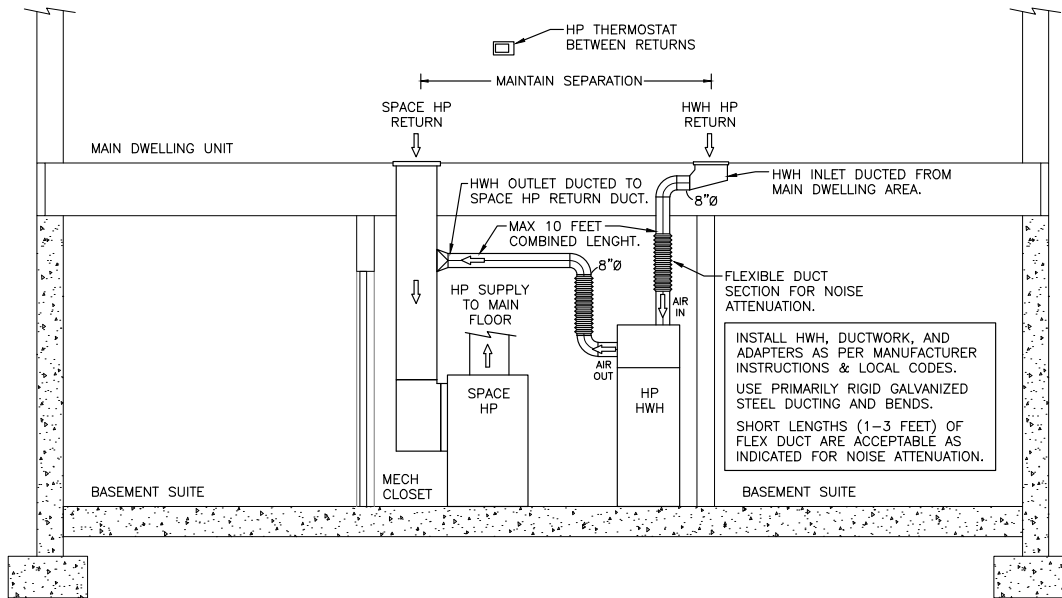
2024-Sep-13
ID 256735

PROJECT NAME: BLATCHFORD DESS	SCALE: N.T.S.
	DRAWN: SS
DRAWING TITLE: AIR-SOURCE HOT WATER HEATER DUCTING DETAIL (TYPICAL RHEEM INSTALL)	CHECKED: AB
	DATE: SEP 13, 2024
	DRAWING NUMBER: DETAIL 05R

**WATER HEATER DUCTING WITHOUT BASEMENT SUITE
(AO SMITH MODELS)**



**WATER HEATER DUCTING WITH BASEMENT SUITE (OR POSSIBLE FUTURE BASEMENT SUITE)
(AO SMITH MODELS)**



PINCHIN LTD. A.

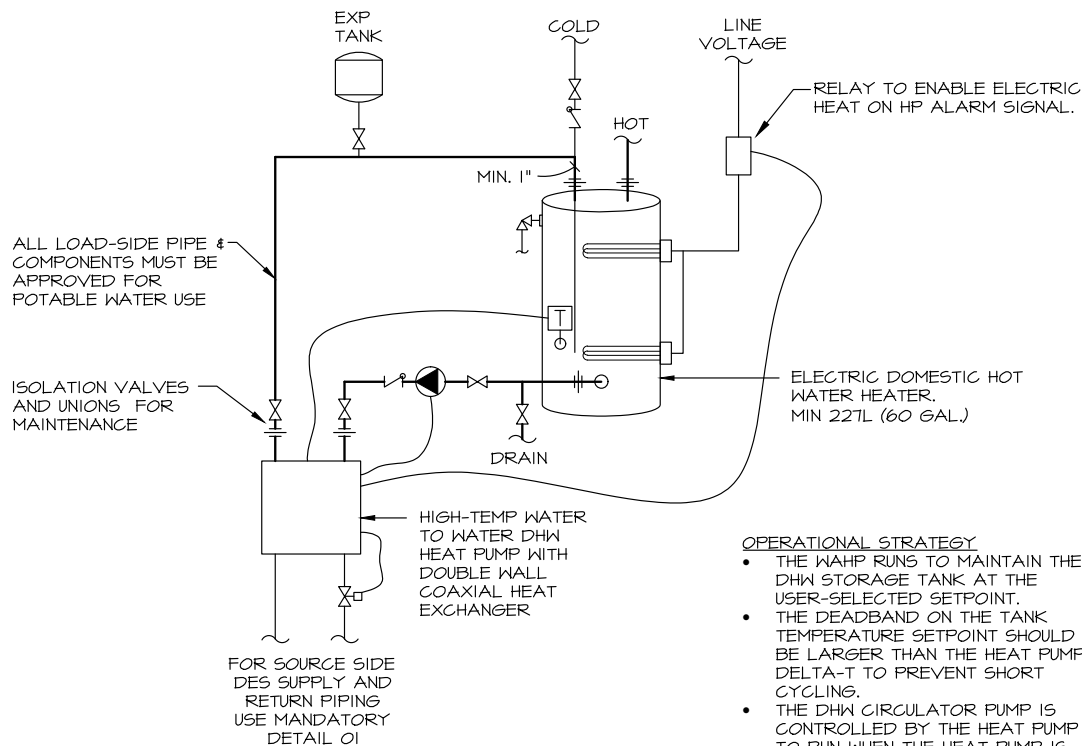
2024-Sep-13
ID 256735

PROJECT NAME: BLATCHFORD DESS	SCALE: N.T.S.
	DRAWN: SS
DRAWING TITLE: AIR-SOURCE HOT WATER HEATER DUCTING DETAIL (TYPICAL AO SMITH INSTALL)	CHECKED: AB
	DATE: SEP 13, 2024
	DRAWING NUMBER: DETAIL 05A

RECOMMENDED HEAT PUMP SYSTEMS FOR FSTH

1. A RECOMMENDED HEATING SYSTEM DESIGN IS PRESENTED BELOW, HOWEVER THE BUILDER MAY CHOOSE AN ALTERNATIVE DESIGN AS LONG AS THE PERFORMANCE AND OPERATIONAL REQUIREMENTS ARE MET AS DOCUMENTED IN THE DESS DESIGN GUIDE.
2. SOURCE (DESS) PIPING FOR ALL HEAT PUMPS MUST BE AS PER THE ARRANGEMENT AND SPECIFICATION SHOWN IN MANDATORY DETAIL 01.
3. THE BUILDER MAINTAINS ALL RESPONSIBILITY FOR ENSURING THE INSTALLED SYSTEM MEETS ALL APPLICABLE NATIONAL AND PROVINCIAL CODES.

HIGH TEMP DHW HEAT PUMP



OPERATIONAL STRATEGY

- THE WAHP RUNS TO MAINTAIN THE DHW STORAGE TANK AT THE USER-SELECTED SETPOINT.
- THE DEADBAND ON THE TANK TEMPERATURE SETPOINT SHOULD BE LARGER THAN THE HEAT PUMP DELTA-T TO PREVENT SHORT CYCLING.
- THE DHW CIRCULATOR PUMP IS CONTROLLED BY THE HEAT PUMP TO RUN WHEN THE HEAT PUMP IS RUNNING.
- ON A CALL FOR HEATING, THE HEAT PUMP OPENS THE DESS CONTROL VALVE AND AFTER A DELAY STARTS THE COMPRESSOR.
- THE BACKUP ELECTRIC ELEMENT IS ENABLED BY A RELAY ONLY ON HEAT PUMP ALARM SIGNAL.
- THE BACKUP ELEMENT THERMOSTAT IS SET FOR 60°C.

PROJECT NAME:	SCALE: N.T.S.
BLATCHFORD DESS	DRAWN: AB
	CHECKED: AB
DRAWING TITLE:	DATE: AUG 28, 2017
FEE SIMPLE TOWNHOUSE RECOMMENDED DESIGNS DHW HEAT PUMP	DRAWING NUMBER: DETAIL A3

PINCHIN LTD. APEGA PERMIT# P007802

Appendix C – Conceptual Building Schematics for Multi-Unit Lots

Conceptual Building Schematics for Multi-Unit Lots

Below is a conceptual building schematic for multi-unit lot buildings identifying key components of the DESS connection design and utility ownership demarcation. Refer to Table 1 in this guide for details.

The below schematic drawings are for reference only. Exact details to be finalized and approved by BRE based on Builders' chosen option.

FIGURE 3: Conceptual building schematic for Option A

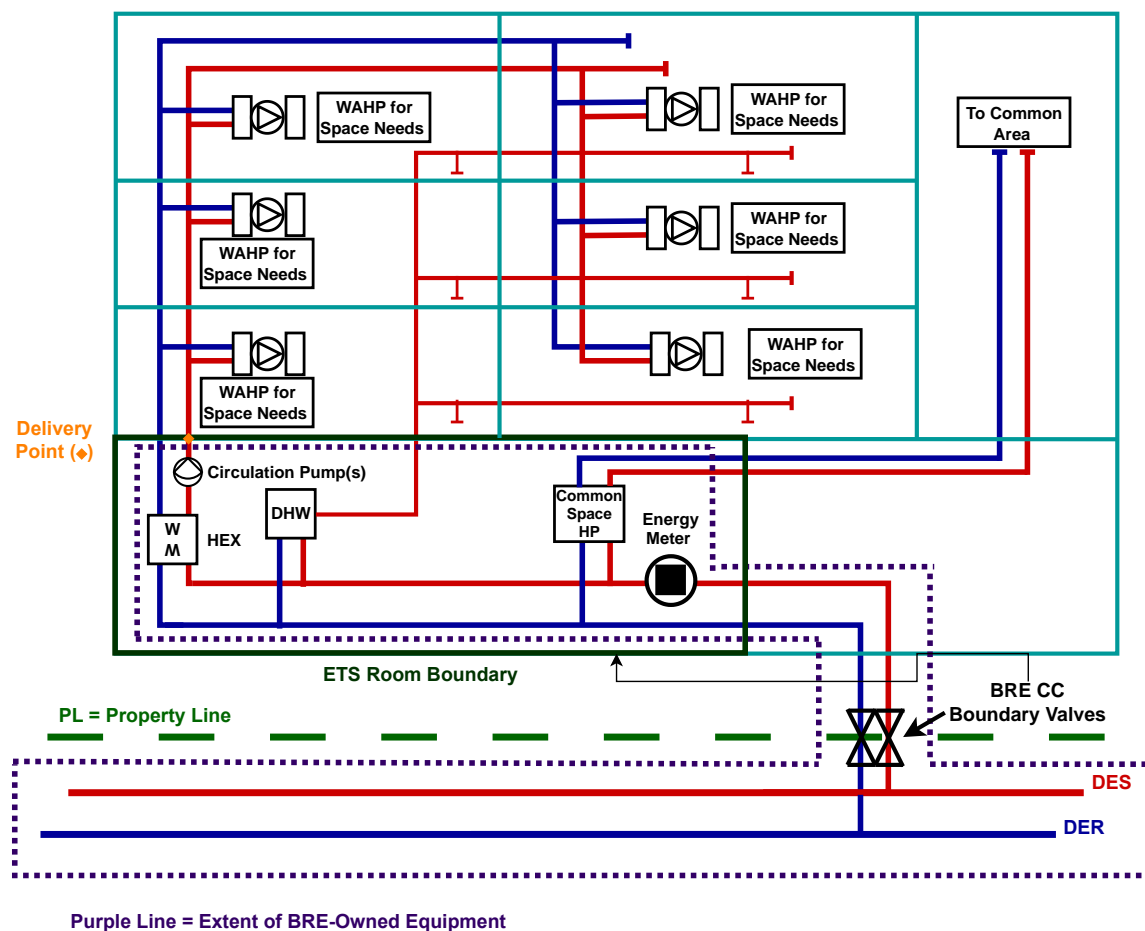


FIGURE 4: Conceptual building schematic for Option B

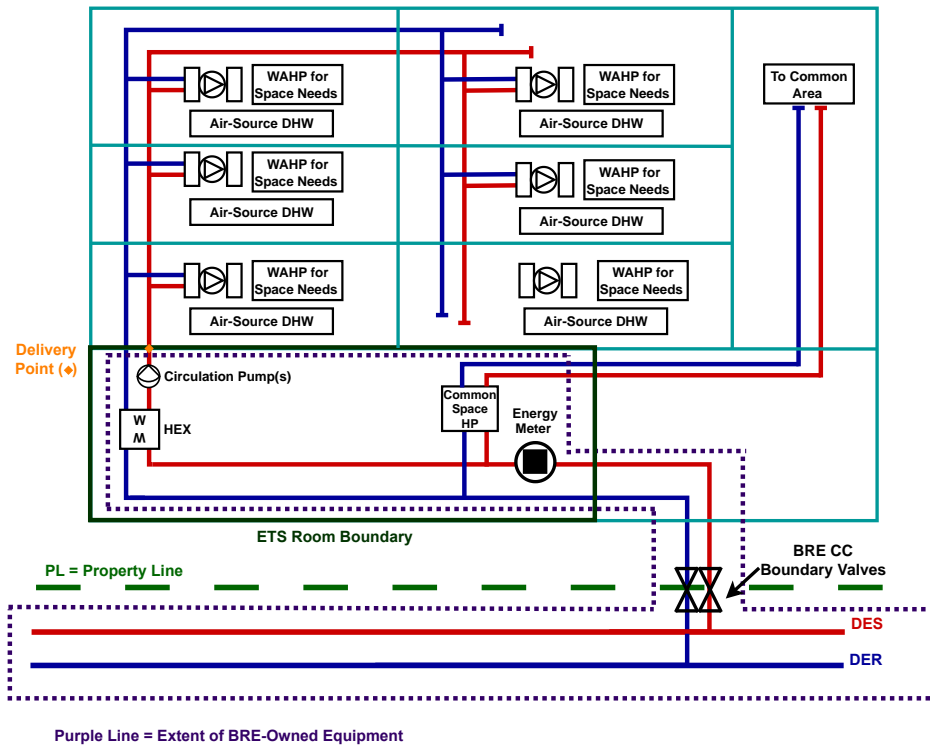


FIGURE 5: Conceptual building schematic for Option C

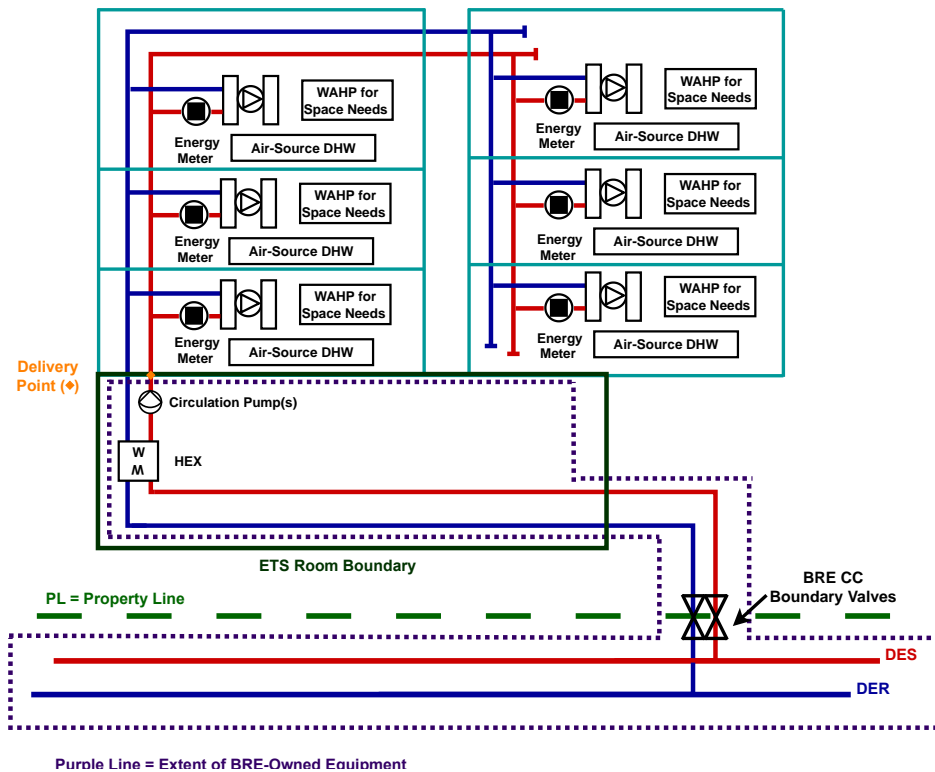
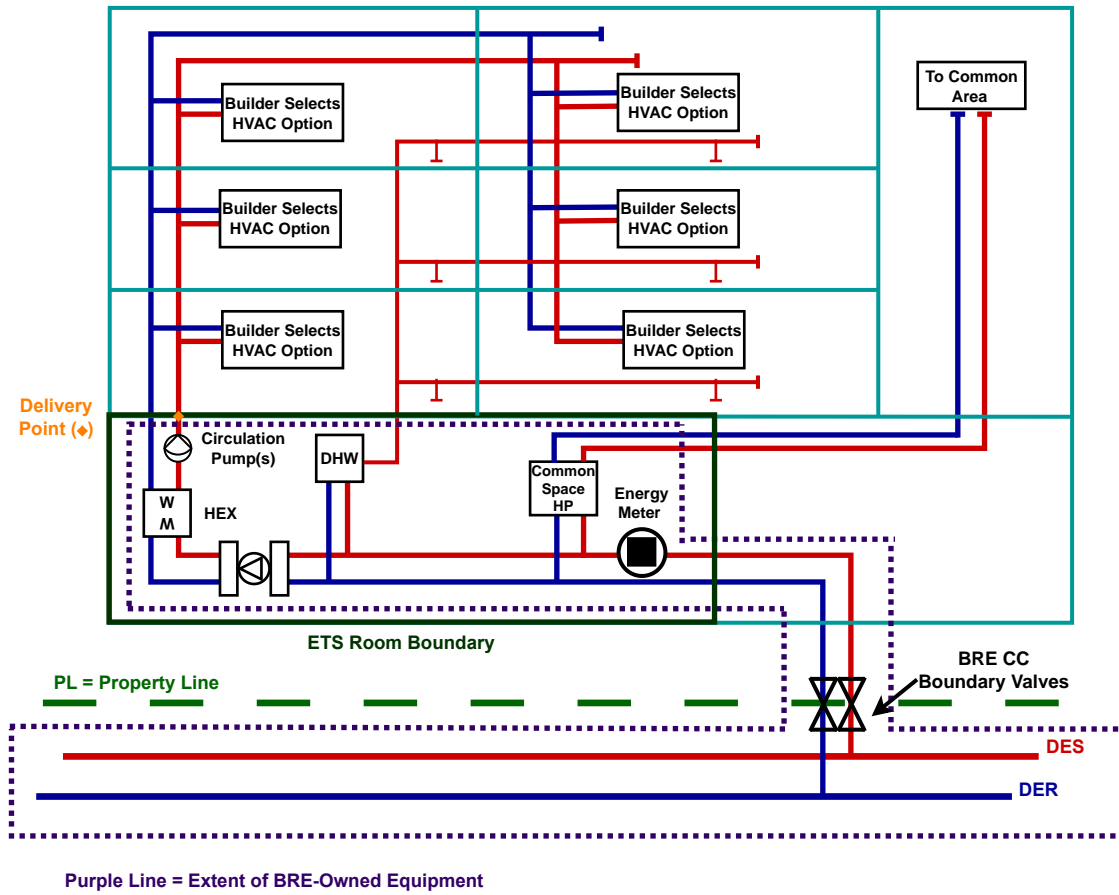


FIGURE 6: Conceptual building schematic for Option D



Appendix D – DESS Secondary Loop (Buried) – Builder Side of ETS

Scope

Intent of this Guideline

This guideline sets out the recommended requirements to be satisfied in the design and construction of the DPS Secondary Loop Piping component for multi-unit or condominium developments proposing to service the site with direct buried supply and return distribution piping exterior to the buildings (laneways, boulevards, parking lots etc.). This guideline is to be utilized as a reference document for designers and engineers engaged in the work, or preparation of engineered drawings and associated reports that will be subject to the review, as applicable, to the City.

Responsibilities of the Developer and Consultant

When using this guideline, the Developer and the Developers Consultant remain fully responsible for the design and construction of DPS Secondary Loop Piping according to good engineering standards that address the specific needs and site conditions of their project. Without limiting that broad and general obligation, this guideline is to be considered a minimum recommended requirement and further design and construction requirements may apply to specific projects depending on the circumstances. The Developers Consultant must be satisfied of the applicability of the design criteria in this guideline to the project at hand and apply more stringent criteria where appropriate. Notwithstanding the use of the terms Contractor or Developer, any obligations found within this guideline are ultimately the responsibility of the party or parties of the Developer. Further, the City expressly disclaims any responsibility for the suitability of the drawings or the designs to a particular site but requires the Developers Consultant to assume full responsibility in this regard.

References

The City of Edmonton has developed a standard outlining the design and construction requirements for the Distribution Piping System (DPS) component of a District Energy Sharing System (DESS) project within the City of Edmonton (COE) owned lands. Much of this standard is complementary for the design and construction of a DPS Secondary Loop Piping system on a condominium parcel with direct buried supply and return distribution piping exterior to the buildings (laneways, boulevards, parking lots etc.). Refer to the latest version of 'City of Edmonton Distribution Piping System Design & Construction Standard' for technical reference.

System Requirements and Design Guidelines

DPS Secondary Loop Piping

1. Definition:
 - DPS Secondary Loop Piping: those sections of the private DPS system that supply and return flow throughout the multi-units development or condo development parcel servicing each dwelling.
2. Location:
 - DPS Secondary Loop Piping shall be installed in a drive isle, laneway or boulevard and shall be unobstructed by surface features that may restrict open cut excavation.
3. Sizing:
 - DPS Secondary Loop Piping for the condo development to be designed and sized by the Builders engineering consultant. Sizing to be based on the design heating and design cooling loads required for the development.
 - The DPS must be sized to meet the larger of the seasonal design flow rates.
 - The minimum size of DPS Secondary Loop Piping is 100 mm.
4. Bury Depth:
 - DPS Secondary Loop Piping depth of bury to be below that of the depth of frost penetration. Recommended 2.75m minimum.
 - It is recommended that DPS Secondary Loop Piping be designed so that the depth of the valve operating nut is between 1.8 m and 2.5 m from finished grade.

Valves

1. Location and Spacing:
 - The location and spacing of valves in the DPS should be such that when in operation:
 - » No more than 10 units are taken out of service by shutdown of the DPS Secondary Loop Piping.
 - Valves shall be located at intersections of DPS Secondary Loop Piping.

Cathodic Protection

- All buried steel and non-steel metallic pipe, valves, and fittings require cathodic protection.
- All exterior bolts on valves and couplings shall be Stainless Steel type 304 or an approved equivalent.

Service Connections off DPS Secondary Loop Piping

1. Sizing:
 - Sizing to be provided by the Builders Consultant. Sizing to be based on the flow required to meet the design DES heating and design DES cooling load of each unit.
 - For DPS service connections off of the secondary loop piping, valves shall be of the same size as the DPS service connection.

- For reference only: Blatchford Renewable Energy Standard service connection size for a typical fee simple townhouse (BRH zoned lot) with an expected dwelling of up to 250 m² of conditioned floor area is 40 mm (1-1/2"). Larger lots or different zonings may require differently sized services.

2. Services:

- The invert of the DPS service shall be a minimum of 2.75 m below finished grade at foundation tie-in.
- The DPS service shall be aligned to service each lot in coordination and in conjunction with the water and drainage servicing.

Materials

1. Buried DPS Secondary Loop Piping:

- Buried DPS Secondary Loop pipe, fittings, and flanges shall be HDPE with a minimum cell classification of PE445474C or higher for PE 4710 materials in accordance with ASTM D3350 or CSA B137.1.
- Pipe and fittings 100 mm diameter and larger to be butt fused.
- Pipe and fittings 75 mm diameter and smaller to be butt fused and/or socket fused.
- Electrofusion coupling is acceptable where determined by the design engineer.
- DPS Secondary Loop Piping to be manufactured with coloured stripes co-extruded on the pipe outside surface.
- Refer to the latest version of 'City of Edmonton Distribution Piping System Design & Construction Standard Section 33 65 14 for further detail'.

Insulation:

- Buried DPS Secondary Loop Piping to be protected with insulation in the event that minimum cover cannot be achieved. Insulation design is the responsibility of the designer.

Bedding and Backfill:

- Refer to the latest version of 'City of Edmonton Design and Construction Standards, Volume 2: Roadways Design and Construction', Section 02318 – Trench and Backfill and 'Volume 4: Water'.
- For utility crossings or areas where compaction can't be achieved, use Fillcrete (non-shrink geo grout), piping to be wrapped in poly.

Execution

1. Manufacturer's Recommendation:
 - The manufacturer's recommended installation procedure is to be obtained and followed for all materials and equipment installed. In the case of discrepancy between the manufacturer's requirements and these specifications, advise the Engineer and request instruction before proceeding.
2. Quality Control:
 - The Engineer of Record shall be the primary authority responsible for monitoring the works for compliance with quality control standards.
 - The Engineer of Record shall conduct inspections at his/her discretion and report any noted deficiencies and/or quality workmanship concerns and issues to the Contractor.
 - All noted deficiencies, quality control concerns and workmanship issues must be addressed and resolved to the satisfaction of the Engineer of Record prior to system operations.
3. Flushing, Testing, Cleaning and Charging:
 - All works associated with flushing, testing, and cleaning of DPS Secondary Loop Piping to be performed by the Contractor.
 - After completion of flushing, testing, and cleaning, the Contractor will charge the system with water.
 - Refer to the latest version of 'City of Edmonton Distribution Piping System Design & Construction Standard Section 33 65 15 for further detail'.
4. Commissioning and Testing:
 - Commissioning and testing to be performed by the Contractor.
 - During commissioning, and when directed by the Engineer of Record, the contractor will be required to take the following steps with oversight by the Engineer of Record:
 - » Open and close each service connection or branch 75 mm or over to demonstrate flow capacity.
 - » Open and close select service connections under 75 mm.

Corrosion Inhibitor:

- Corrosion inhibitor is to be injected by the contractor via the energy transfer station or otherwise determined port of injection once the DPS Secondary Loop Piping has been commissioned. Contractor to coordinate with the Utility to understand location for point of injection in the Energy Transfer Station along with coordination for access requirements.
- Circulate inhibitor through the DPS Secondary Loop Piping for 72 hours and top up as required to maintain required levels.

Appendix E – Meter Antenna Installation Instructions

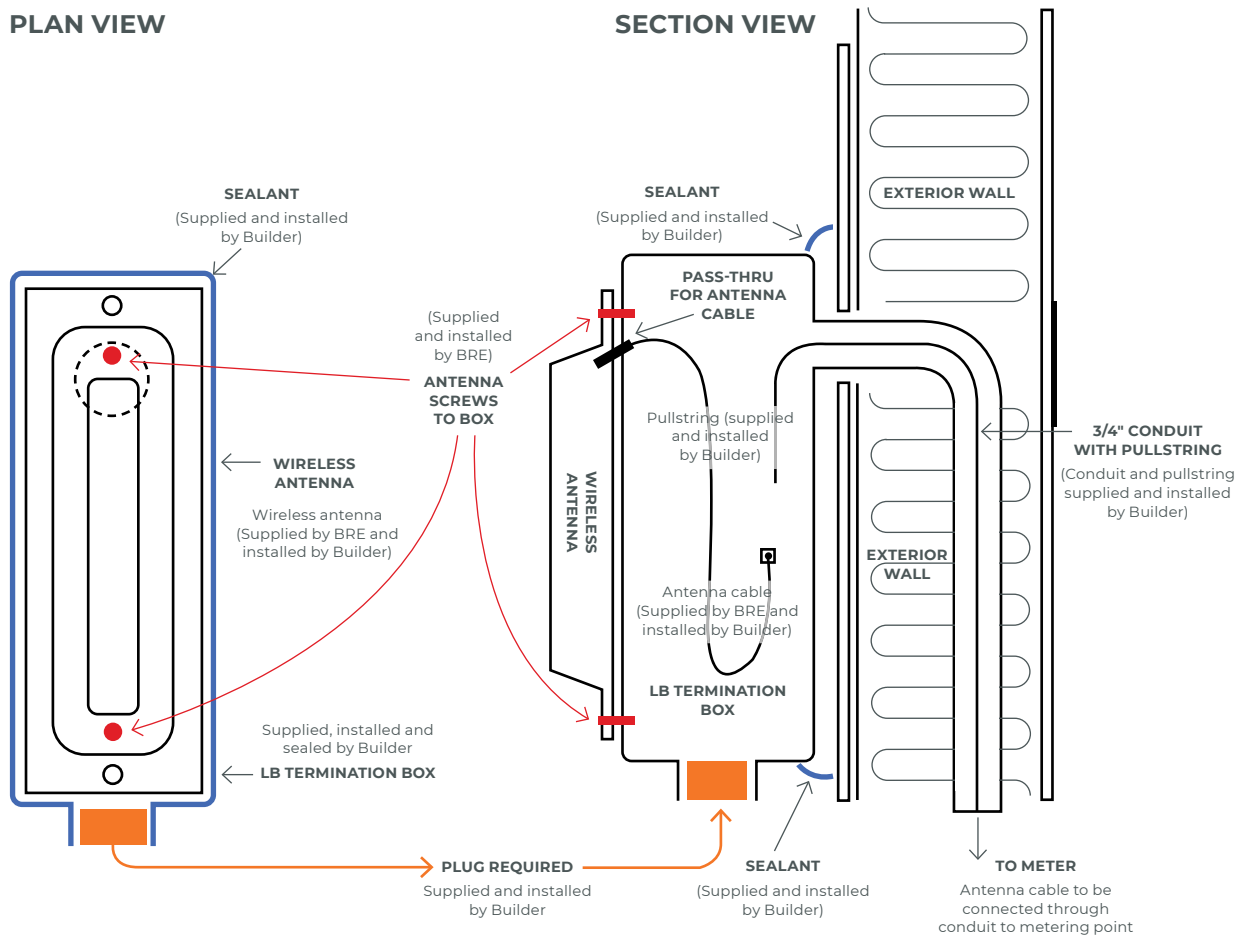
1. Wireless Meter Antenna Conduit

- 1.1 Extend a dedicated 20 mm (3/4") non-metallic conduit with an end-to-end pull-string from the metering point inside each building's mechanical space to the exterior of the building. This exterior location must face the main street/boulevard and must be located approximately 1m above the front door away from regular access to prevent damage.
- 1.2 Run the conduit to an exterior location where there are no pipes, drains or boxes within 0.5 meters. In addition, the antenna should not be close to another emitter, i.e., hydro antenna, city water antenna or any other signal that may cause an interference.
- 1.3 Builder to install a 1-1/4 size PVC LB conduit fitting with waterproof cover on the townhouse exterior wall facing the street. Builder to install a 3/4" rigid PVC conduit with pull string from the LB to the location of the energy meter in the unit's mechanical closet. Do not use metallic conduits. The Builder is to mechanically fasten the conduit and LB to the building. The Builder is also to seal all building penetrations using weatherproof sealant to ensure proper sealing against water entry. Complete sealing, weatherproofing and waterproofing of the conduit, LB termination box, and all of its associated connection points is the sole responsibility of the Builder. LB must have a minimum flat cover size of 6.75" x 2.5". Builder to mount the wireless antenna. An example LB fitting is shown below:

When using the LB style fitting, the Builder is to provide and install a suitable cap to seal the bottom conduit hole. (See image below: CARLON 1-1/4 LB Box Model# LBBODY-125).



See the schematic below for reference only. Actual installation may vary.



Please note:

- Complete sealing, weatherproofing and waterproofing of the conduit, LB termination box, and all of its associated connection points is the sole responsibility of the Builder.
- The Builder is to supply and install the following: LB Termination box, 3/4" conduit with pullstring LB Termination box plug (if required).
- BRE is to supply the following for Builder installation: Wireless antenna, antenna screws, antenna cable.
- **Please Note:** Builder must securely mount the meter antenna LB box to the building frame and not the soffit/flashing to ensure a sturdy connection.

- 1.1 The conduit routing and the proposed antenna install location must be clearly indicated on the design drawings submitted by the Builder prior to installation for BRE's review and approval.
- 1.2 The 20 mm (3/4") non-metallic rigid conduit installed inside the building must not have more than four (4) 90° bends. Use only long swept bends. From the metering point to the exterior antenna location, the length of the conduit must not be more than 20 meters.

Appendix F – TELUS Managed Network Process

Builder Responsibilities

1. Builder must clearly circle and label the location of the ETS room as “UTIL1, Parcel’s Civic Address” on all submissions to the City including but not limited to DP, BP, Architectural and DESS submissions.
2. Once the land sale closes, Builder must complete the [TELUS Intake Form](#).

If there will be commercial spaces in the building, the Builder selects “Mixed (Residential & Commercial)” from the drop down.

If there are no commercial spaces, the Builder selects “Multi Family” in the drop down.

In the Additional Details or Description section of the Telus Intake Form, the Builder must enter the exact statements below:

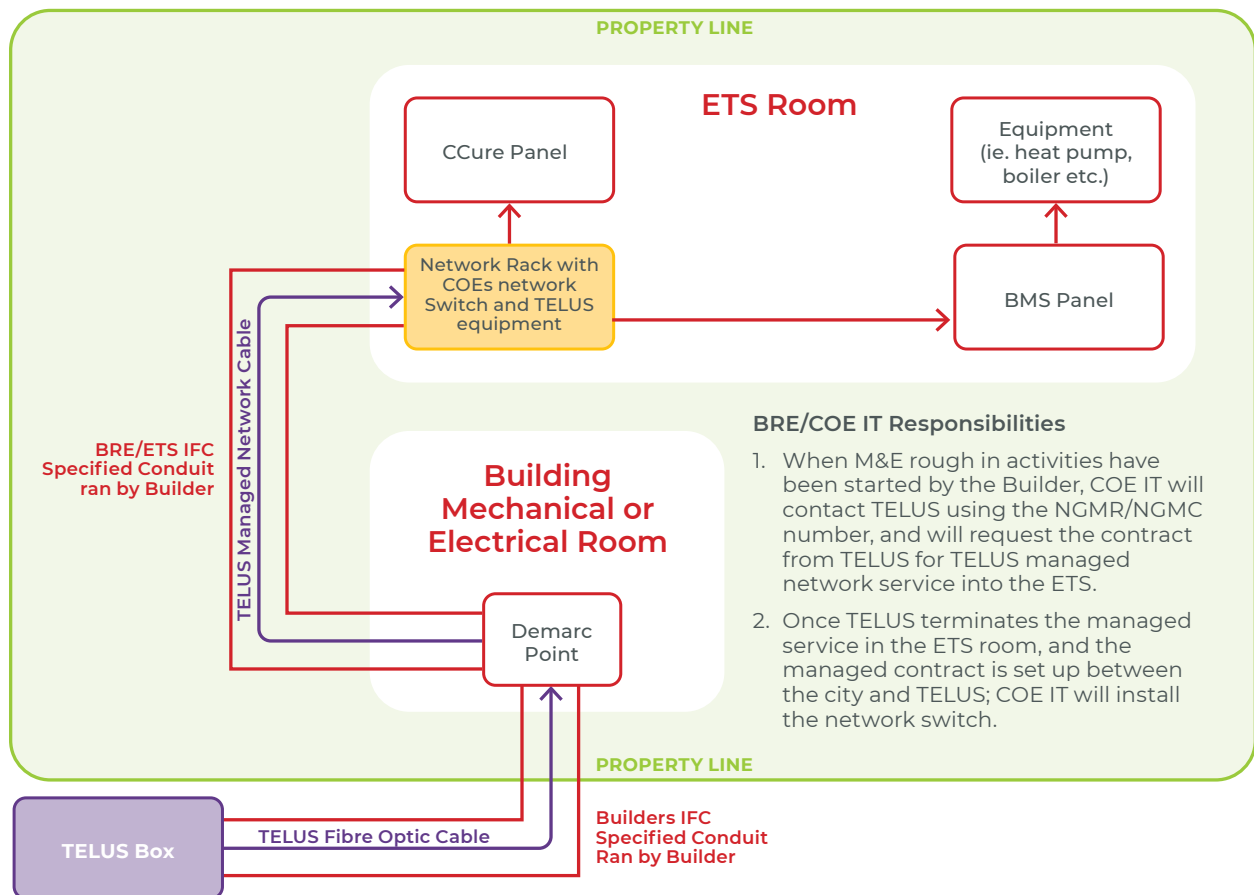
- a. This project will also have construction of a City of Edmonton - Energy Transfer Station on this Land Parcel.
 - b. The City of Edmonton - Energy Transfer Station will have the following civic address assigned: “UTIL1, Parcel’s Civic Address” (Please indicate the actual address for your lot in “Parcel’s Civic Address” Ex. UTIL1, 1234 Fane Road NW).
 - c. The Energy Transfer Station will require 12 Fibre strands delivered from TELUS (1 of which will be TELUS Managed Fibre)*.
 - d. The Energy Transfer Station is clearly shown on the provided site drawings. Please reference the site drawings for exact location.
3. Once the intake form is completed, it can take up to 2 weeks for the Builder to receive the NGMR/NGMC # from TELUS, depending on the completeness of the form.
 - a. As soon as the Builder receives the NGMR or NGMC number, the Builder must share this number with BRE immediately.
 4. Builder installs a 53mm conduit with a pull string (unless otherwise specified differently) in BRE ETS IFC/IFT package between TELUS demarc point and ETS room.
 5. Builder to notify BRE when M&E Rough In activities have started in the units planned first for their occupancy on the entire parcel.
 6. Builder to coordinate with TELUS to install the required TELUS services to the demarc point, and also extend the TELUS 12f strand cable (unless otherwise specified differently by TELUS) into the ETS room.
 7. Builder to complete the network rack installation and all associated scopes inside the ETS room as outlined in the approved BRE’s ETS IFC/IFT package.

8. Builder is to notify BRE once the above step is complete. Then, the City will sign a contract for the Managed Network Service between the City and TELUS for the ETS Room.
9. TELUS will then install the required TELUS equipment in the network rack and terminate the Managed Network cable in the ETS Room.
10. TELUS will advise the City once Step 9 is complete. City's IT will then install the network switch in the ETS Room.
11. Once City IT's scope is completed, the Builder will bring in one of the three approved City security contractors: Paladin Technologies, Convergent, or Johnson Controls to install the specified security equipment in the ETS Room from the BRE ETS IFC package. Servall will then be able to complete their scope of work for the BMS.

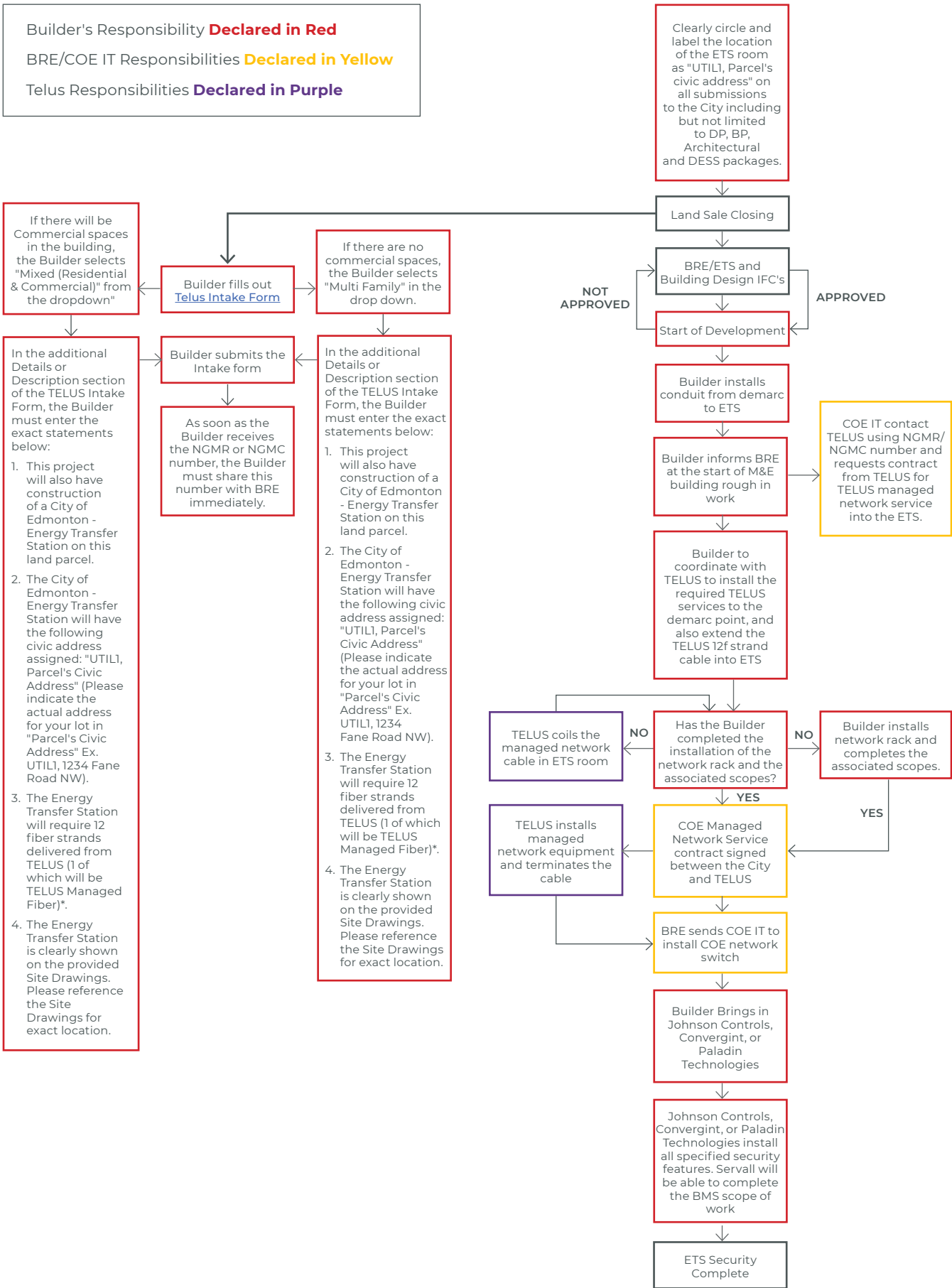
BRE Specifies

- Conduit type and size between the Demarc Point and the ETS room
- Size and location of BMS, CCure Panels and Network Switch

Builder's Responsibility **Declared in Red**
 BRE/COE IT Responsibilities **Declared in Yellow**
 Telus Responsibilities **Declared in Purple**





Builder's Responsibility **Declared in Red**
 BRE/COE IT Responsibilities **Declared in Yellow**
 Telus Responsibilities **Declared in Purple**




Appendix G – Option C Kit Schematics

DRAWING NUMBER	DESCRIPTION	APPROVED
M-1	Kit #1 - Energy Meter Spacer Kit	
M-2	Kit #2 - Kamstrup Energy Meter	

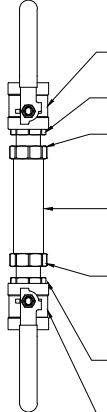




1-1/4" x 1/2" x 1-1/4"
NPT BRASS REDUCING TEE
FOR RETURN PIPE.
(TYPICAL OF 1)



TEMPORARY
1/2" NPT BLACK IRON PLUG.
(TYPICAL OF 1)



MAS B-3 1-1/4" FULL PORT, THREADED ISOLATION BALL VALVE.

1-1/4" MALE NPT x 1" FEMALE NPT BUSHING.

BSSP 1-1/4" NUT AND A 1" TAILPIECE (WITH AN NPT THREAD) AND ONE PAIR OF 1-1/4" FIBER GASKETS. SUPPLIED BY ENERGY METER SUPPLIER.

260 MM SPACER PIPE. PLACEHOLDER FOR FUTURE METER BODY WHICH WILL BE INSTALLED IN DESS MANIFOLD. (TYPICAL OF 1)

BSSP 1-1/4" NUT AND A 1" TAILPIECE (WITH AN NPT THREAD) AND ONE PAIR OF 1-1/4" FIBER GASKETS. SUPPLIED BY ENERGY METER SUPPLIER.


1-1/4" MALE NPT x 1" FEMALE NPT BUSHING.

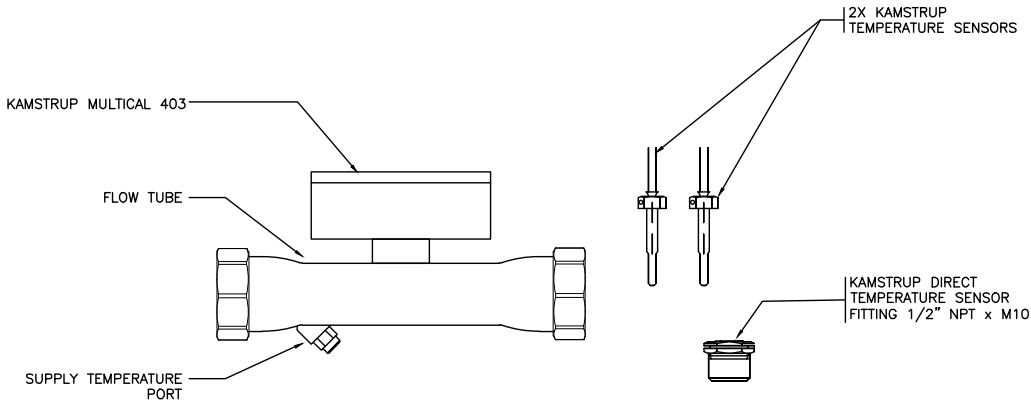
MAS B-3 1-1/4" FULL PORT, THREADED ISOLATION BALL VALVE.

NOTES:

1. PRIOR TO FABRICATION OF STEEL SPACER NIPPLES, MOCK UP THIS ASSEMBLY, SECURE BOTH ENDS IN A VICE, AND CONFIRM THE SPACER IS THE LENGTH REQUIRED TO MATCH EXACTLY THE ENERGY METER BODY AND ALLOW FOR A LEAK-FREE METER INSTALLATION.
2. BUILDER TO FLUSH THE SYSTEM WITH THE SPACER INSTALLED – DO NOT FLUSH WITH THE METER INSTALLED.

KIT #1 – METER SPACER KIT AND RETURN TEE

 PINCHIN LTD MECHANICAL ENGINEERING DIVISION <small>13775 COMMERCE PARKWAY, SUITE 200 RICHMOND, BC V6V 2V4 604.244.8101 WWW.PINCHIN.COM</small>	PROJECT NAME:	SCALE:
	BLATCHFORD DESS	N. T. S.
		DESIGN:
		SS
		CHECKED:
	GT	
	DATE:	
	MAR 24, 2025	
DRAWING TITLE:	JOB NUMBER:	
KIT #1 – ENERGY METER SPACER KIT	0247672.000	
	SHEET NUMBER:	
	M-1	



NOTES: 1. KAMSTRUP MULTICAL 403 THERMAL ENERGY METER BODY. (TYPICAL OF 1) – INCLUDES FLOW TUBE, CALCULATOR, 1 PAIR OF TEMPERATURE SENSORS (WITH ONE SENSOR FITTING 1/2" NPT x M10). ALSO INCLUDES NEW PAIR OF GASKETS WHICH MUST REPLACE OLD SPACER (KIT #1) GASKETS.

KIT #2 – KAMSTRUP ENERGY METER

N.T.S.

TYPICAL METER ASSEMBLY INSTRUCTIONS

NOTE: PRIOR TO INSTALLATION OF THE METER, BUILDER TO ENSURE FLUSHING OF THE DESS SERVICE LINES HAS BEEN COMPLETED, WITH NO DEBRIS PRESENT.

1. USING THE PREVIOUSLY ASSEMBLED METER SPACER IN THE DESS MANIFOLD, THE BUILDER IS TO UNSCREW THE METER SPACER BY LOOSENING THE UNION ADAPTER ON BOTH SIDES OF THE SPACER.


2. BUILDER IS TO HAVE A BUCKET OR DRAINAGE SYSTEM READY AS ONCE THE SPACER IS UNSCREWED FROM THE MANIFOLD SMALL AMOUNTS OF WATER WILL BE RELEASED.

3. THE KAMSTRUP ENERGY METER SHOULD BE SCREWED INTO BOTH SIDES OF THE UNION ADAPTER WITH A NEW SET OF GASKETS. THE SUPPLY TEMPERATURE SENSOR SHOULD BE INSTALLED IN THE METER BODY PORT. BUILDER TO COMPLETE.

4. BUILDER TO INSTALL THE RETURN TEMPERATURE SENSOR INTO THE 3/8" THREADED TEE ON THE RETURN PIPE USING THE SENSOR FITTING. BUILDER TO ALSO REMOVE THE BLACK IRON PLUG FROM THE TEE.

5. BUILDER TO CONNECT POWER LOCALLY TO EACH METER FROM THE 24V TRANSFORMER WHICH IS PROVIDED BY THE BUILDER. BRE TO COMMISSION THE METER (IF APPLICABLE).

6. PRESSURE TEST EACH METER INSTALLATION AND ASSOCIATED PIPING AFTER INSTALLATION IS COMPLETE AS PER THE DESS FS TH DESIGN GUIDE.

 PINCHIN LTD MECHANICAL ENGINEERING DIVISION <small>13775 COMMERCE PARKWAY, SUITE 200 RICHMOND, BC V6V 2V4</small> 604.244.8101 WWW.PINCHIN.COM	PROJECT NAME:	SCALE:
	BLATCHFORD DESS	DRAWN:
	DRAWING TITLE:	CHECKED:
	KIT #2 – KAMSTRUP ENERGY METER	DATE:
		JOB NUMBER:
		SHEET NUMBER:
		N.T.S.
		SS
		AB
		NOV 03, 2023
		0247672.000
		M-2

Appendix H – Blatchford DESS Agreement



Blatchford DESS Agreement For Multi-unit Lots

THIS DESS AGREEMENT MADE BETWEEN:

THE CITY OF EDMONTON
(the “City”)

- and -

[insert legal name of “Buyer” from Sale Agreement]
(the “Builder”)

- A. The Builder entered into a Sale Agreement with the City for Sale Land that is located in the Blatchford Community, which is envisioned to be a sustainable community that uses renewable energy, is carbon neutral, and committed to a reduced ecological footprint.
- B. The Sale Land is within the service area of the DESS Bylaw.
- C. The Builder will be required to install certain utility infrastructure in accordance with certain design and construction requirements within the Sale Land so as to be compliant with the DESS Bylaw.
- D. The City will be required to install an energy transfer station on the Sale Lands to facilitate the Development connection to the DESS. At the Builder's request, the City may enter into an agreement with the Builder to install the energy transfer station.
- E. The Builder and the City wish to outline the terms and conditions upon which they will coordinate the design and construction of the utility infrastructure and the energy transfer station for the Development.

NOW THEREFORE THIS DESS AGREEMENT WITNESSES that the City and the Builder agree as follows:

DEFINITIONS AND INTERPRETATIONS

- 1. In this DESS Agreement, unless expressly stated otherwise:
 - a) “Blatchford Community” means the community being developed on the Blatchford site consisting of approximately 536 acres, located in the City of Edmonton;
 - b) “Builder” means [insert legal name of “Buyer” from Sale Agreement];
 - c) “City” means The City of Edmonton;

- d) “Concept Design” means the initial design concept for the Development to be prepared by the Builder at its sole cost and submitted to the City, prior to the execution of the Sale Agreement by the City, and which is attached as Schedule “C” to the Sale Agreement;
- e) “DESS” means the district energy sharing system which provides heating, cooling and domestic hot water for the buildings in the Blatchford Community;
- f) “DESS Agreement” or “hereto”, “herein”, “hereunder”, “hereof” and similar expressions when used in this DESS Agreement refer to the whole of this DESS Agreement and not to any particular article, section or other portions hereof, and any reference to an article or section by number means the appropriate section or article of this DESS Agreement unless the context is expressly to the contrary or otherwise required;
- g) “DESS Bylaw” means the Blatchford Renewable Energy Utility Bylaw, No. 17943;
- h) “DESS Coordination Meeting” means the meeting during which the City’s Blatchford Renewable Energy team will outline the DESS design, inspection, and review processes with the Builder, and will aim to delineate Builder and the City responsibilities.
- i) “DESS Design Guide” means the Multi-Unit Lots DESS Design Guide (Version # - MONTH YEAR) included in the Sale Agreement.
- j) “DESS Exemption” means an exemption of the Development from the DESS Requirement, as described by the DESS Exemption Guide, and prescribed by the DESS Bylaw;
- k) “DESS Exemption Guide” means the DESS Exemption Guide (Version # - MONTH YEAR) included in the Sale Agreement.
- l) “DESS Requirement” means the requirement for the Development to connect to the DESS, as prescribed by the DESS Bylaw, and as described in the DESS Design Guide;
- m) “Development” means the construction of a multi-unit residential development that complies with the requirements of the Sale Agreement.
- n) “ETS Construction and Commissioning Costs” means costs incurred by the City for the construction, installation and commissioning of the ETS, including costs incurred for the procurement of all necessary ETS equipment and project management fees.
- o) “ETS Design and Inspection Costs” means the costs incurred by the City for design and inspection of the construction and installation of the ETS, including project management fees;
- p) “ETS Equipment Charge” means all costs incurred by the City for installation of energy transfer stations and associated equipment (including the ETS design, construction, inspection, commissioning, and project management fees) as provided for in Section 36 of the DESS Bylaw. The ETS Equipment Charge is comprised of the ETS Design and Inspection Costs and the ETS Construction and Commissioning Costs
- q) “Final Design” means the design submission prepared by the Builder at its sole cost, and submitted to the City including all revisions and modifications that complies with the requirements outlined in the DESS Design Guide.

- r) “Sale Agreement” means the agreement dated the same date as this DESS Agreement for the sale of the Sale Land between the City and the Builder;
- s) “Sale Land” means the Sale Land as defined in the Sale Agreement (insert legal description).

2. This DESS Agreement shall be interpreted in accordance with the laws of the Province of Alberta.

DESS EXEMPTION

3. The Builder may request a DESS Exemption by providing sufficient evidence to the City that the Builder will design and build the Development to at least a net-zero carbon standard in accordance with the requirements outlined in the DESS Exemption Guide.

4. If the Builder obtains a DESS Exemption, then the Builder is not required to comply with the DESS Requirements so long as the conditions applicable to the DESS Exemption are being met.

FINAL DESIGN

5. The Builder shall arrange for a DESS Coordination meeting within 30 days of signing this DESS Agreement as outlined in the DESS Design Guide.

6. Final Design shall be provided by the Builder to the City as required by the Sales Agreement. In addition to the City’s review pursuant to the Sale Agreement, the City will review the Final Design to complete design development of the energy transfer station for the Development.

7. The Builder shall be solely responsible for all costs in preparing the Final Design, including any modifications. The Builder will reimburse the City for all costs associated with the City’s preparation of the ETS Equipment Charge estimate and the City’s review of the Final Design as required to develop the design for the energy transfer station.

ETS EQUIPMENT CHARGE

8. The Builder will pay to the City the ETS Design and Inspection Costs as follows:
- a) A fee of 20% of the ETS Design and Inspection Costs estimate at least 15 days in advance of the DESS Coordination meeting;
 - b) A fee of 80% of the ETS Design and Inspection Charge estimate with the submission of the Final Design; and
 - c) An amount equal to the remaining ETS Design and Inspection costs.

9. Unless the Builder enters into an agreement with the City to undertake the construction and commissioning of the ETS, the Builder will pay to the City, ETS Construction and Commissioning Costs as follows:

- a) The Builder provides the City with written notice at least 9 months in advance of the date when the room in which the ETS is to be installed (the “ETS Room”) is complete and ready for ETS construction to begin (the “Handover Date”). On the Handover Date, the following conditions must be met in order for the City to proceed with construction and commissioning of the ETS:
 - i) completion of the secondary DESS (builder side) system as outlined in the DESS Design Guide and in accordance with approved designs;
 - ii) completion of the ETS Room in accordance with approved designs; and
 - iii) inspection and acceptance of the ETS Room and secondary DESS (builder side) system by the City.

Delays in the Handover Date may result in increases to the ETS Construction and Commissioning Costs.

- b) A fee of 50% of the ETS Construction and Commissioning Costs estimate at least 30 days prior to the Handover Date;
- c) A fee of 50% of the ETS Construction and Commissioning Costs estimate within 15 days of the final ETS operational sign off by the City;
- d) If applicable, an amount equal to all the remaining costs including all change orders.

10. The City will provide the Builder with a final invoice for the ETS Equipment Charge within 30 days of the installation and a final sign-off of a fully operational energy transfer station. The Builder shall pay the amount included in the final invoice within 30 days of receipt of the invoice. If the final total energy transfer station costs reconcile to an amount lower than the amount the Builder has already paid to the City, the City will reimburse the Builder with the balance amount upon the installation and a final sign-off of a fully operational energy transfer station.

RESPONSIBILITY FOR COSTS

11. Estimates provided by the City do not limit the Builder's obligation to pay the ETS Equipment Charge which is the full costs of installation of the ETS (including design, construction, inspections, commission).

12. If the Builder does not make the payments noted in sections 8 and 9 above, then the City will not be obligated to participate in any of the subsequent activities described as applicable. The Builder acknowledges that delays in design development for the energy transfer station may impact the schedule for provision of DESS to the Development.

13. If this DESS Agreement is terminated, the City shall be entitled to keep any fees paid by the Builder for the ETS Equipment Charge. The City will issue a final invoice outlining the fees paid and the costs incurred.

DESS REQUIREMENT

14. Subject to sections 3 and 4 above, the Builder will design and construct the Development in accordance with the DESS Design Guide.

TERM AND TERMINATION

15. This DESS Agreement shall remain in effect until:

- a) the Builder has completed the Development;
- b) the City or the Builder (with the City's approval) has installed the energy transfer station for the Development; and
- c) the Builder has paid the amounts included in the final invoice for the ETS Equipment Charge; unless terminated earlier pursuant to section 16 below.

16. This DESS Agreement will terminate upon the occurrence of either of the following:

- a) termination of the Sale Agreement; or
- b) the exercise by the City of the Buy Back Option as provided in the Sale Agreement.

NOTICE

17. Notice in writing or other correspondence required or permitted to be given to either party pursuant to this DESS Agreement shall be sufficiently given when transmitted by telefacsimile (addressed as if to be mailed in the manner hereafter provided) and transmitted to the following fax number(s), or

when personally delivered or mailed by registered mail, postage prepaid, addressed:

a) to the City as follows:

Blatchford Redevelopment Office
Integrated Infrastructure Services
13th floor, Edmonton Tower
10111-104 Avenue NW
Edmonton, AB T5J 0J4

Phone: (780) 868-4554
Fax: (780) 496-6577
E-mail: christian.felske@edmonton.ca
Attention: Christian Felske

b) to the Builder follows:

[insert address for notice of Builder] Phone: (780)
Fax: (780)
Attention:

GENERAL

18. The waiver of any covenant, condition or provision hereof must be in writing. The failure of any party at any time to require strict performance by the other party of any covenant, condition or provision hereof shall in no way affect such party's right thereafter to enforce such covenant, condition or provision, nor shall the waiver by any party of any breach of any covenant, condition or provision hereof be taken or held to be taken as a waiver of any future breach of any such covenant, condition or provision.

19. Notwithstanding any other provision contained in this DESS Agreement, it is expressly understood and agreed between the Builder and the City that the City, in entering into this DESS Agreement, is doing so in its capacity as an owner of a utility and not in its capacity as a regulatory, statutory or approving body pursuant to any law of the Province of Alberta and nothing in this DESS Agreement shall constitute the granting by the City of any approval or permit as may be required pursuant to the Municipal Government Act, R.S.A. 2000 Ch. M-26, and any amendments thereto, and any other legislation in force in the Province of Alberta. The City, as far as it can legally do so, shall only be bound to comply with and carry out the terms and conditions stated in this DESS Agreement, and nothing in this DESS Agreement restricts the City, its municipal council, its officers, servants or agents in the full exercise of any and all powers and duties vested in them in their respective capacities as a municipal government, as a municipal council and as the officers, servants and agents of a municipal government.

20. Each of the parties hereto covenants and agrees with the other that each shall, from time to time and at all times hereafter, make, do, and execute or cause or procure to be made, done or executed such further acts, deeds and assurances, consents and approval as may be necessary for the more effectually carrying into effect the terms of this DESS Agreement.

21. If any of the terms and conditions as contained in this DESS Agreement are at any time during the continuance of this DESS Agreement held by any Court of competent jurisdiction to be invalid or unenforceable, then such terms and conditions shall be severed from the remaining terms and conditions and such severance shall not affect the enforceability of the remaining terms and conditions in accordance with the intent of these presents.

22. The parties' express intention is that time shall be of the essence in this DESS Agreement.

23. This DESS Agreement shall enure to the benefit of the parties hereto and their permitted successors and assigns.

24. This DESS Agreement is the entire agreement between the Parties regarding the subject matter of the DESS Agreement, and supersedes any previous agreements, negotiations and understandings. There are no agreements, representations, warranties, terms, conditions or commitments regarding the subject matter of the DESS Agreement except as expressed in the DESS Agreement.

IN WITNESS WHEREOF the parties hereto have caused their corporate seals to be affixed by the hands of the proper officers authorized in that behalf as at the day and year first above written.

THE BUILDER has executed this DESS Agreement as of the ____ of _____, 20 ____ .

Per: _____

THE CITY has executed this DESS Agreement as of the ____ of _____, 20 ____ .

THE CITY OF EDMONTON, as
Represented by the Director, Renewable Energy
Systems

Per: _____
Christian Felske

