

Appendix A

Detailed List of Developer's Responsibilities



Architectural and Engineering Design

We strongly recommend minimizing the development's energy capacity and energy usage to reduce associated fees and charges. This can be accomplished by strategies such as passive design measures, architectural optimization, enhanced building envelope performance, and on-site thermal energy storage.

All building services heating applications shall be connected to and employ an in-building hydronic heating system served by the community energy system, including but not limited to space heating, ventilation heating, and domestic water heating. Other heating energy sources including electricity and natural gas are not permitted and shall not be used for building services applications. This also applies to any commercial spaces on the property.

It is strongly suggested to locate any centralized in-building mechanical heating equipment (particularly domestic hot water production equipment) directly adjacent to the energy transfer station space to avoid potential temperature performance issues.

For domestic water heating, consider using hydronic instantaneous domestic water heating stations (also known as "heating interface units" or "heat transfer panels"). The benefits include:

1. Minimizing domestic hot water distribution piping and eliminating associated centralized equipment.
2. Eliminating domestic hot water recirculation piping and associated centralized equipment.
3. Drastically simplifying and reducing costs associated with high-rise domestic water pressure zones.
4. Eliminating costs associated with domestic hot water recirculation balancing and commissioning.

5. Significantly reducing energy usage for domestic water heating.
 - a. Eliminating domestic hot water central storage heat losses.
 - b. Eliminating domestic hot water recirculation heat losses.
 - c. Eliminating domestic hot water recirculation pumping energy.
 - d. Reducing the domestic hot water supply temperature below 60°C by eliminating the need to heat centrally stored domestic hot water to control legionella growth.
6. Helping to ensure low heating return water temperature to comply with our temperature performance requirements.

Lonsdale Energy provides a delivery point supply temperature of 65°C, subject to customer building hydronic flow dynamics. The delivery point is defined as the points immediately downstream of the supply isolation valve and immediately upstream of the return isolation valve on the building side of the energy transfer station. Modern buildings should not require greater than 65°C supply temperature setpoint any time during the year.

During steady heat load conditions, the actual supply temperature at the delivery point may vary by up to $\pm 2^{\circ}\text{C}$. During dynamic heat load conditions, the actual ramp-up time required to achieve supply temperature setpoint at the delivery point depends on the rate of change of heat demand from the customer in-building system. Actual supply temperature at the delivery point cannot change instantaneously to satisfy instantaneous changes in heat demand from the customer in-building system. It may take several minutes to ramp up to achieve setpoint.

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Return water temperature at the delivery point shall be no greater than 43°C year-round during all non-zero load conditions. Suggestions for meeting this performance requirement include the following:

1. Low supply water temperature space heating systems.
2. Low supply water temperature ventilation heating systems.
3. Heat interface units for instantaneous domestic water heating.
4. Scavenging system for centralized domestic water heating systems.
5. Stratifying domestic hot water tanks for centralized domestic water heating systems.
6. Careful consideration of part-load space heating conditions.
7. Careful consideration of part-load ventilation heating conditions.
8. Careful consideration of part-load domestic water heating conditions.
9. Systems and equipment should be checked for both design conditions and “worst case” part-load conditions as they relate to our temperature requirements.
10. Pressure-dependent balancing valves (manual balancing valves, circuit balancing valves, CBVs) should be avoided. Alternatives include modulating control valves, on/off control valves paired with flow-limiting valves (autoflow valves), and thermostatic balancing valves.

A detailed control methodology narrative must be submitted describing how the system will be controlled during both full-load and part-load conditions.

Lonsdale Energy Inspections

Lonsdale Energy inspections (pre-board/frame and final) are required during building construction. We will inspect construction against City-approved plans and drawings for the building permit.

Changes made affecting any heating, cooling and domestic hot water systems must be communicated to Lonsdale Energy for review and acceptance. Any changes made after the building permit is issued are subject to review, inspection, and approval. We suggest taking photos/videos/construction notes of installation throughout the construction period showing installations of heating and cooling systems, and domestic hot water systems.

Our final inspection is required prior to the City Building Inspector's final inspection. Lonsdale Energy inspections are a prerequisite to sign-off on the Certificate of Occupancy.

Performance and Security Deposit

There are two main performance requirements for buildings connected to the community energy system:

1. Domestic hot water will be heated to a minimum of 60°C under all load conditions, unless determined and noted otherwise by the customer's mechanical engineer and discussed with Lonsdale Energy. This may not be required if central domestic hot water storage is not used.
2. Maximum return water temperature of 43°C year-round under all non-zero load conditions at the delivery point of the energy transfer station.

The City authorizes Lonsdale Energy to require that customers provide a security deposit, in the form of a letter of credit or cash deposit.

- We will retain the security deposit for a minimum holding period of 18 continuous months after the issuance of the final Certificate of Occupancy.
- If the customer building has not been constructed, is not being operated or cannot be operated in accordance with our requirements, then we may retain a portion or all the security deposit.
- If the customer building has been constructed and is being operated in accordance with our requirements, then the security deposit will be returned after the minimum holding period has expired.

The design of the in-building system remains the responsibility of the developer, and review and acceptance by Lonsdale Energy does not release the customer from their obligation to meet the required technical and operating performance requirements. Any concerns regarding the in-building system not satisfactorily addressed during the building permit application may result in an increased security deposit.

Operation and Maintenance

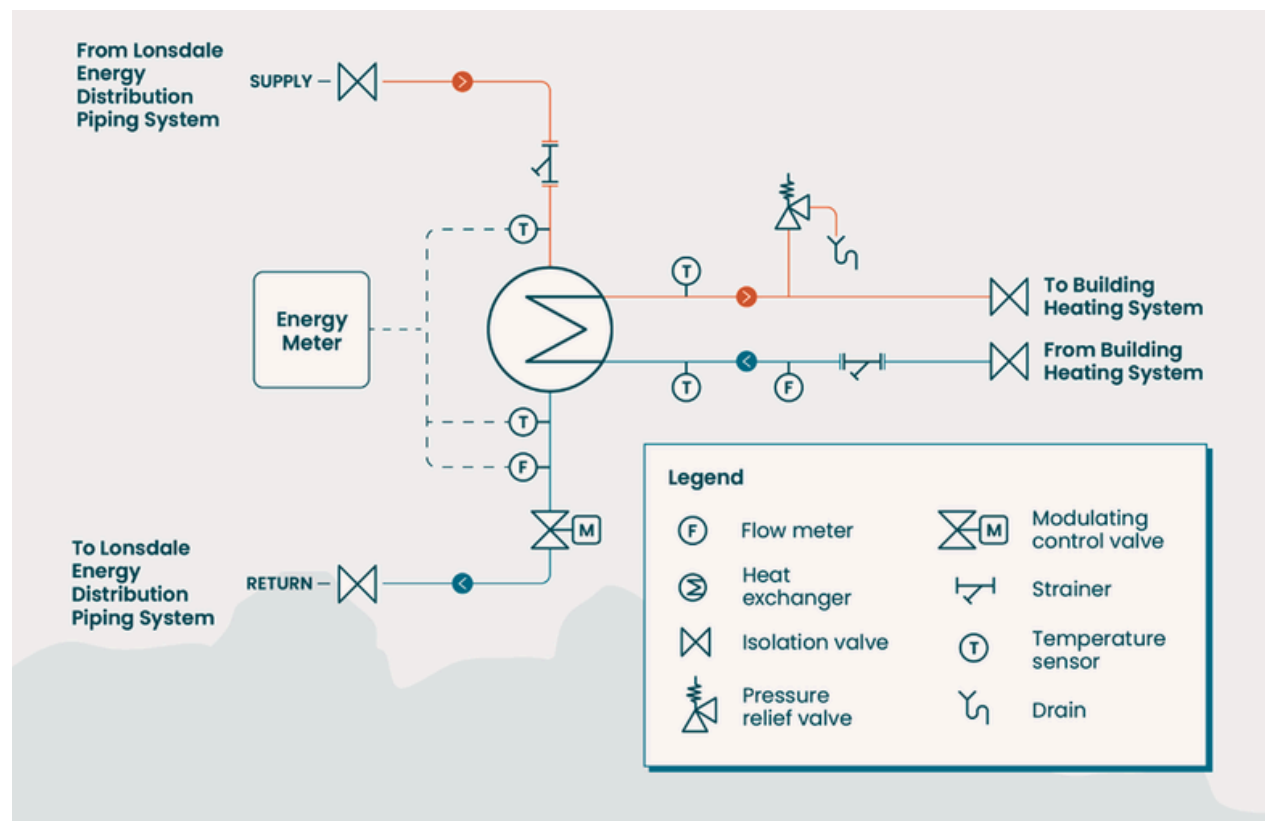
The customer is responsible for maintaining good water quality in the building hydronic systems.

Poor water quality can cause fouling, decreased thermal efficiency and heat transfer, and increased pumping costs. Appropriate and ongoing maintenance and water quality management can help ensure a hydronic system's longevity, reliability, and performance.

The customer will be held responsible for any damage to our equipment due to poor water quality in the building hydronic systems.

Energy Transfer Station Requirements

A dedicated mechanical space is required for the energy transfer station.



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- This space should be located directly where the our service connection enters the building, on the highest below-grade level.
- An estimated minimum space of 3 m. x 2.5 m. x 2.75 m. high is required (to be confirmed by Lonsdale Energy following confirmation of the energy capacity of the premises by the customer's mechanical engineer).
- A dedicated energy transfer station room with a lockable door that swings outward is recommended. The space may also be located within a building mechanical room with lockable fenced space and a gate that swings outward, provided by the developer.
- A clear path for maintenance and access is required.
- Building equipment and services should not be located within or routed through our space. Any items required by code are to be fully coordinated with us prior to building permit issuance.
- A concrete housekeeping pad for Lonsdale Energy's heat exchanger is required. The exact size and location are to be coordinated during construction.
- One 120V/15A circuit with dedicated neutral to our energy transfer station control panel.
 - The power is to be brought into the bottom right of the panel. The exact location is to be coordinated during construction. Lonsdale Energy's electrician will land in the panel.
 - The dedicated circuit in the circuit breaker will be labelled with "Lonsdale Energy".
- Electrical receptacles in the space are to be ground fault circuit interrupters.
- The room must allow for 2 kW heat gain from our equipment. The room temperature must not exceed 35°C.