

Appendix C

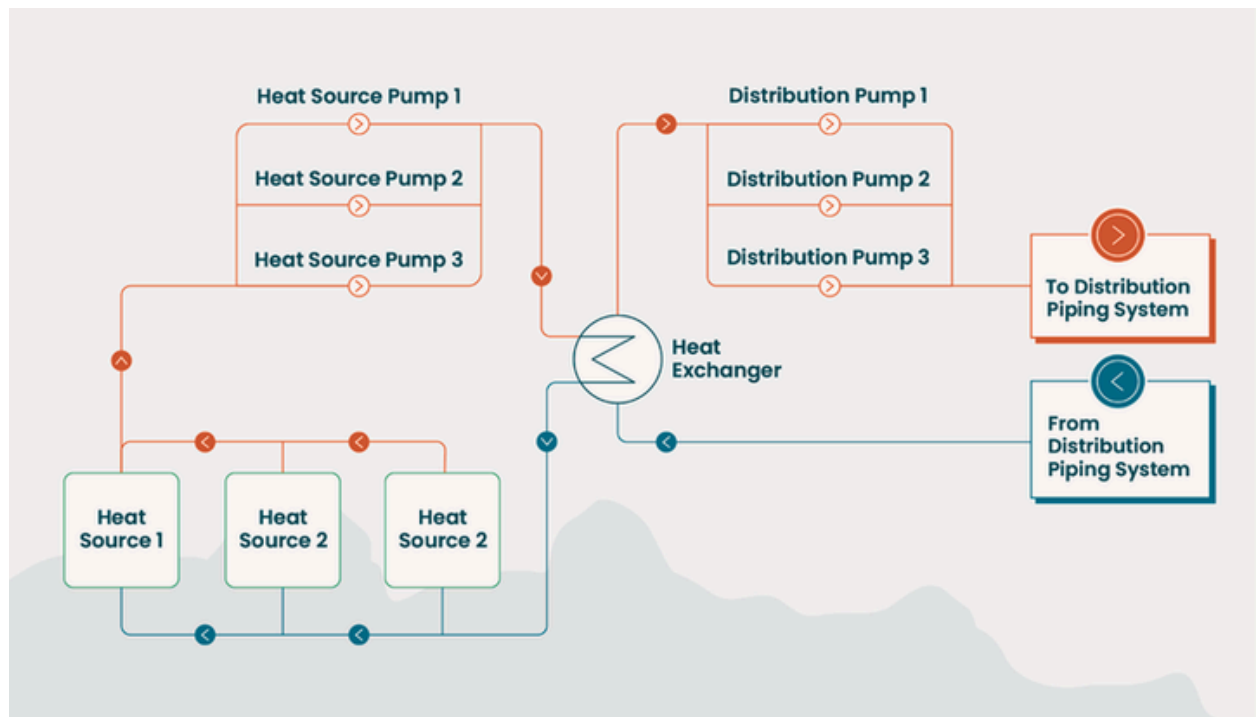
Infrastructure Space Requirements



ENERGY CENTRES

Space and Layout

- The energy centre should be located near an outside wall, providing easy access to the distribution piping system that will run in the streets and lanes outside the building. If the developer wishes to locate the room in another location, the developer will be responsible for all additional costs to connect to the distribution piping system.
- The room must have 400 m² floor space and a minimum 4.2 m ceiling height including allowance for all heat generating equipment, heat exchangers, meters, controls, pipe work, duct work and related equipment.
- Concrete housekeeping pads are required for thermal energy generation equipment and other mechanical equipment.
- The energy centre must be sealed to avoid air leakage; walls and ceilings are to be painted white and the floor must be waterproof and sealed.



Fire Protection and Life Safety

- The energy centre must be fire-rated, according to the BC Building Code.
- The room must contain sprinklers, a venting shaft (if required) and all life safety devices meeting NFPA (National Fire Protection Association) and Building Code standards.

Outdoor Air Ducts

- Louvered openings or intake hoods in the wall or roof and associated space are required to accommodate ducting for outdoor air and exhaust air.
- The energy centre will require two significant louvers for air intake and relief air. While these louvers do not need to be in the wall of the energy centre room, they must be constructed by code to have a fire resistance rating. This enclosure can make the ducts quite large, limiting the ceiling height in the spaces that they run.

Flue Venting (if applicable)

- Insulated and ventilated flue venting shaft terminating at roof level of the building is required. It must be equipped with ladders and platforms for emergency egress and rescue, per our specifications.
- The shaft must be ready for installation of flue venting ducts.
- Flue venting terminations will be in a manner that can be operated at full load without harming buildings, equipment, construction workers, or members of the public. The shaft sizing will be determined by Lonsdale Energy.
- Sleeves through the structure are needed to accommodate flues. The flue venting should not have excessively long horizontal runs (no more than 5 m.) and needs to be vented to the outside. The vents' terminations must be located away from opening windows and outdoor air intakes. Multiple flue vents cannot be combined.
- The developer will notify all stakeholders regarding Lonsdale Energy's centre room and flue venting.

LONSDALE ENERGY - DEVELOPER GUIDELINES AND REQUIREMENTS

Access

- Adequate access for construction, operation, maintenance, and replacement of equipment must be provided.
- All doors and access hatches must be complete with hardware.
- The energy centre rooms should have easy access to a loading dock (if available) and a wide (double) door or overhead roll up door for the removal or placement of equipment. That means, stairs or standard width corridors are not appropriate.
- The energy centre will require two significant louvers for air intake and relief air. While these louvers do not need to be in the wall of the energy centre room, they must be constructed by code to have a fire resistance rating. This enclosure can make the ducts quite large, limiting the ceiling height in the spaces that they run.

Structural

- Adequate structural capacity (floor and ceiling) must be provided for thermal energy generation equipment, pipe work, heat exchangers, pumps, and related equipment and for construction, operation, maintenance, and replacements. The estimated load for our equipment is 100 psf live load for floor and ceiling. Single loads can be up to 12,000 lb./30 sq. ft.

Electrical Supply

- Electrical conduit and feeders from the main electrical room to the energy centre room are required.
- A separate revenue meter for billing of the electrical service by the electrical utility is required.
- Standard electrical outlets must be provided.
- The minimum electrical capacity as agreed must be provided.
- The main disconnect switch is to be located inside the energy centre room, with the exact location to be coordinated with Lonsdale Energy.

LONSDALE ENERGY - DEVELOPER GUIDELINES AND REQUIREMENTS

Lighting

- Lighting in the energy centre room and venting shaft lighting and emergency/exit lighting (if required) will be provided.

Floor Drains

- Large floor drains (minimum 6 in.) complete with trap primers at suitable locations are required. A minimum 6 in. sanitary drain connections must be coordinated with Lonsdale Energy.

Natural Gas Supply (if applicable)

- A dedicated 5 psig natural gas service with a gas meter station for delivery of the agreed amount of BTU/h is required. A gas meter station for the energy centre with an approximate area of 10' x 15' will be required for the meter station. The gas meter station should be located near the energy centre room to minimize piping size and length. Natural gas piping shall run through cored or sleeved holes from the meter station into the energy centre room.

City Water Supply

- A minimum 1.5 in. domestic cold-water line complete with isolation valve, minimum 60 psig, is required.

Approvals

- All legal requirements and documentation are required for the building to operate (e.g., professional approvals, seismic signoffs, occupancy certificates).

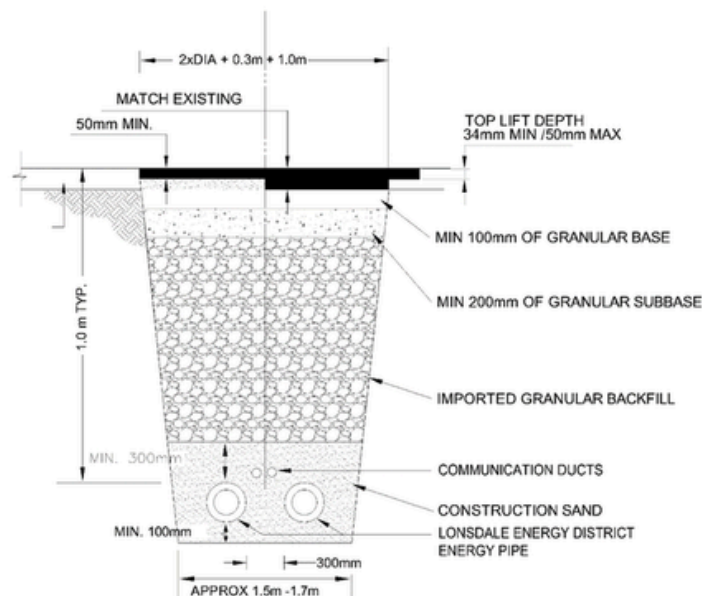
DISTRIBUTION PIPING SYSTEM

Service Connection

- Civil, mechanical, architectural and landscape plans will show the service connection into the property/building including dimensions from the property line. Civil plans will also show Lonsdale Energy's distribution system mains for coordination purposes. Mechanical plans will show the proposed coordinated routing of Lonsdale Energy services to the energy transfer station area.

Clearance Requirements

- Permanent structures or objects will not be close to or above Lonsdale Energy's service connection. Examples include soil cells, trees, large centres, structural elements, stairs, permanent centreers, streetlighting and lamp bases, stormwater infiltration facilities, or other utilities. The minimum horizontal clearance from our piping to adjacent buried utilities is 1.5 m. The minimum vertical clearance for utility crossings is 0.3 m. A minimum 1.7 m wide clear corridor is required for the trench.



TRENCH DETAIL

NOT TO SCALE

LONSDALE ENERGY - DEVELOPER GUIDELINES AND REQUIREMENTS

Penetrations

- The developer is responsible for sealing any penetrations through interior or exterior walls for Lonsdale Energy services, including waterproofing, fireproofing, or smoke sealing. We suggest developers employ a permanent hydrostatic sealing system for our services.
- The developer is responsible for the cost of providing all penetrations through interior or exterior walls for Lonsdale Energy service into the building. The approximate size and location of penetrations must be coordinated prior to construction.
- The developer is responsible for the building design, including structural and architectural considerations. The exact size and location of penetrations are to be field coordinated during construction.