

APPENDIX E – GREEN BUILDING DESIGN APPROACH

Below are some specific recommendations that are to be considered and where possible, included in the design:

Reduce Heating, Cooling, and Lighting Loads through Climate-Responsive Design and Conservation Practices:

- (a) use passive solar design; orient, size, and specify high-performance, energy efficient windows (e.g., U-0.24 including frame); and locate landscape elements with solar geometry and building load requirements in mind;
- (b) use high-performance building envelopes; select walls (clear field effective value of R-30 or higher), roofs (clear field effective value of R-40 or higher), and other assemblies based on long-term insulation, air barrier performance, and durability requirements;
- (c) limit the fenestration and door area to the maximum allowable as per National Energy Building Code (NECB) 2020, article 3.1.1.6 (Winnipeg twenty-nine percent (29%)); and
- (d) consider an integrated landscape design that provides deciduous trees for summer shading, appropriate planting for windbreaks, and attractive outdoor spaces.

Specify Efficient HVAC and Lighting Systems:

- (a) use energy efficient HVAC equipment and systems – there is a desire to use energy and carbon efficient equipment and systems which could include the utilization of a ground source or an air to water heat pump system. It is anticipated that natural gas will be employed for supplementary heating, with a view to one hundred percent (100%) electrification in the future;
- (b) use lighting systems that consume less than 0.09 watt/square metre for ambient lighting;
- (c) use Energy Star® approved energy efficient appliances; and
- (d) run the energy model using a future weather file (for the year 2040) to ensure the predicted cooling loads do not exceed the proposed designs equipment capacities.

Optimize Building Performance and System Control Strategies:

- (a) employ energy modelling early in the design process;
- (b) use sensors to control loads based on occupancy, schedule and/or the availability of natural resources such as daylight or natural ventilation if applicable;
- (c) consider the use of modular components such as boilers or chillers to optimize part-load efficiency and maintenance requirements; and
- (d) use a comprehensive, building commissioning plan throughout the life of the Project.

Solar Ready Ground Design: At minimum the following is required to incorporate "solar ready" principles:

- (a) designating the area of the ground for future solar PV;
- (b) consider ground HVAC placement to prevent future shading; and
- (c) provide necessary conduits to enable future electric and communications connection requirements.