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November 18, 2014

Our Reference: 14243

The City of Fort Saskatchewan
10005 102 Street
Fort Saskatchewan, Alberta T8L 2C5

Attention: Janel Smith
Director, Planning and Development

Dear Madam:

Reference: Residential Building Heights Analysis

1.0 Introduction

In accordance with our October 1, 2014 proposal and further discussion during our October 9 meeting, ISL Engineering and Land Services (ISL) has completed a high level analysis of municipal and transportation engineering constraints, the preparation of a draft residential high rise district, and a graphic to illustrate building heights currently permitted in the City.

The purpose of this letter report is to provide you with the results of our high level municipal and transportation engineering analyses and highlight how those results have informed the draft RHR – Residential High Rise District. The draft District is provided in Appendix A.

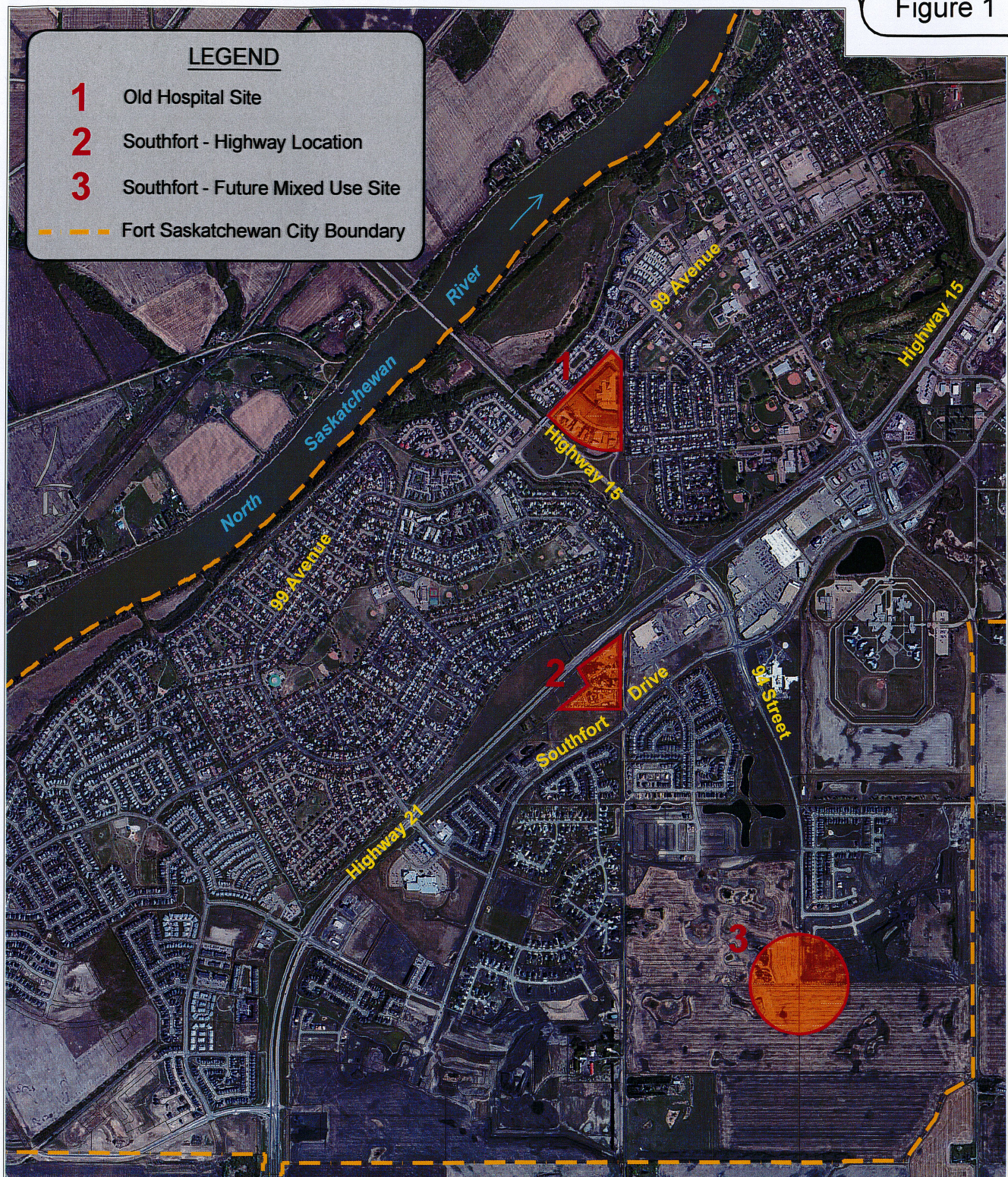
1.1 Locations

At the October 9 meeting, it was agreed that three locations would be examined for the purposes of conducting the high level engineering analysis to investigate whether existing or planned infrastructure can accommodate a high rise tower. These three locations are the old hospital site, a vacant site south of Highway 21 in Southfort, and a site in a planned mixed use node also in Southfort (see Figure 1).

2.0 Municipal Engineering Analysis

Using City documents, ISL conducted a high level analysis of municipal (storm, water, wastewater) and transportation infrastructure to determine if the existing systems could accommodate the development of a high rise residential tower at the three locations. Based on this analysis, there are no immediate or evident constraints to develop a 12-20 storey residential high rise in the three locations. Detailed analyses are required to support any proposed development to confirm the finding described below.

Figure 1



LEGEND

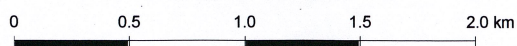
- 1** Old Hospital Site
- 2** Southfort - Highway Location
- 3** Southfort - Future Mixed Use Site
- Fort Saskatchewan City Boundary

LOCATION MAP

Fort Saskatchewan Building Heights Analysis

City of Fort Saskatchewan

Scale - 1:25,000



November 2014

2.1 Impacts on Stormwater Drainage System

As increasing building heights do not have a direct impact on the percentage of a site that is impervious, and thus the peak and total runoff from a site, the impacts on the City's stormwater drainage system were not assessed. While redevelopment can result in an increase of imperviousness, it can be offset onsite using a combination of Low Impact Development techniques such as green roofs, landscaped rain gardens, etc. It is also feasible to utilize underground stormwater storage facilities to offset any increases in runoff.

2.2 Impacts on Water Distribution System

Increasing building heights can result in increased potable water demand associated with the increased population density. Depending on the specific development provisions (e.g. uses, height, site area, density), higher fire flow demands may be required as compared to other permitted uses. ISL compared the tentative redevelopment site locations with the existing and proposed water distribution network from the 2008 Water Distribution Study to provide a high level assessment of the impacts of allowing higher buildings at these sites. The results are as follows:

- The old hospital site is located adjacent to a 300mm and a 450mm water main and is in close proximity to the main reservoir and pump station. Thus the site appears to have an adequate water distribution network to support the redevelopment of the site to accommodate a 20-storey residential tower.
- The proposed site immediately southwest of Highway 21 and 92 Street is located just north of a 300mm water main along Southfort Drive. This site also appears to have an adequate water distribution network to support the redevelopment of the site to accommodate a 20-storey residential tower. The water distribution system will be further strengthened in the future as development progresses to the south.
- The proposed greenfield development in the southeast part of Southfort is proposed to have a 300mm water main grid based on the 2008 study. As long as this area is developed with a strong water distribution system (as supported by future hydraulic analysis), there are no concerns about the proposed increased building heights.

For each of the above cases, a site specific hydraulic analysis should be carried out at the time of plan amendment (if required to accommodate the development), and if no plan amendment is required, at redistricting; this is reflected in the draft RHR District regulations.

2.3 Impacts on Wastewater Collection System

Increased building heights can result in higher wastewater flows, which can become problematic where the existing wastewater sewers are at capacity. ISL compared the tentative redevelopment site locations with the existing and proposed wastewater collection system from the 2009 Sanitary Sewer Model Input Data Verification to provide a high level assessment of the impacts of allowing higher buildings at these sites. The results are as follows:

- The old hospital site is located adjacent to a 300mm sanitary sewer which connects into larger diameter trunk(s) to the north. Without conducting a hydraulic analysis, it is not possible to determine if this trunk has adequate capacity. However, the presence of the 300mm sewer does offer greater potential for accommodating infill than would a smaller size.

- The proposed site immediately southwest of Highway 21 and 92 Street is located a few hundred metres west of an existing 675mm sanitary trunk along Southfort Drive. This trunk should be able to provide the needed conveyance capacity for the increased building heights, subject to a detailed analysis at the time of development.
- The proposed greenfield development in the southeast part of Southfort will presumably be serviced by the 675mm trunk described above. The increased flows associated with the increased building heights can be expected to be very small as compared to the overall wastewater flows in the area and the available capacity in this trunk, and thus the increased building heights should not be a factor for the wastewater servicing.

For each of the above cases, a site specific hydraulic analysis should be carried out at the time of plan amendment (if required to accommodate the development), and if no plan amendment is required, at redistricting; this is reflected in the draft RHR District regulations.

3.0 Transportation Engineering Analysis

ISL performed a high level review of transportation impacts to identify constraints, if any, at the identified locations for a high rise residential development, and appropriate district regulations for consideration. Specific site impacts would be identified when a proposed development is submitted and the details of the development are confirmed (e.g. number of units, site access).

ISL reviewed the 2009 Roadway and Right of Way Review Report, which outlines existing capacity constraints can be mitigated in the short and long term through improvements.

The 2009 Right of Way Review Report assumed the following population growth in the tentative site redevelopment locations:

1. Old Hospital – no population or employment growth assumed (traffic zone 205)
2. Southwest of Highway 21 and 92 Street – 1618 population increase and 120 employment increase (traffic zone 505)
3. Greenfield development in southwest Southfort - 6335 population increase and 585 employment increase (traffic zones 507, 508, and 517)

If the identified improvements are implemented little or no additional mitigating measures would be required for the highway and greenfield locations in Southfort. As the 2009 Right of Way Review Report did not anticipate any population growth for the old hospital site, it is likely its redevelopment with a high rise residential building would require additional mitigating measures to address traffic capacity constraints. A Traffic Impact Assessment would be necessary to identify such measures. We also reviewed the “Old Health Centre Site Redevelopment Brief”, and found the transportation guidelines appropriate and applicable to the potential high rise residential development.

Although the additional mitigating measures for a residential tower cannot be determined without knowing the specific location, site access and number and type of units, we recommend that the draft district regulations consider the following issues to minimize the overall transportation impact while supporting the higher density development:

1. Allow mixed use – ground floor commercial or office will reduce vehicle trips generated by the site as residents may not need to leave the site to fulfill their needs.

2. Encourage alternative modes of transportation:
 - a. Create walkable neighbourhoods that provide mixed land use and grocery stores within 400m (preferably 200m)
 - b. Require direct sidewalk connectivity from building doors to City sidewalks
 - c. Require sidewalks offsite to connect to other uses
 - d. Require bicycle parking inside the building main floor for residents
 - e. Require bicycle parking near the building doors for visitors – if the building is built near the property line allow the bike parking on the City right of way.
3. Require unbundled parking, where the residential unit and the parking stall are separate purchases. This creates a strong financial incentive to reduce the number of cars owned and attracts persons who can manage their needs with less cars. Unbundling can reduce required parking by 10% to 20%.

Operationally, unbundling is difficult to achieve through Land Use Bylaw district regulations, as it is a matter of tenancy, not use. As a result, we suggest that the City explore how lower parking requirements may be achieved through its processes associated with reviewing and approving applications for condominiums and the within the regulations of the Condominium Act.
4. Encourage connectivity to public transit. If a location is within 200m walking distance of a public transit stop, require a 5% reduction in required parking.
5. Encourage a car share. If the building has a car share reduce required parking by 5% to 10% or by 4 to 8 parking spaces for each car share vehicle in the residential tower.
6. Prescribe parking maximums, not minimums.

4.0 Draft District

The draft RHR - Residential High Rise District is attached to this letter report as Appendix A. The text below highlights key features of the draft district and identifies how its provisions address the findings of the municipal and transportation analyses.

4.1 Development Regulations and Urban Design

The proposed District contains regulations intended to create buildings that present an attractive aesthetic through the use of building materials, site design, and reducing building mass. Below highlights some of the regulations that enable this to be achieved.

1. Although the building height and density is set at a maximum of 20 storeys and 370 units per hectare respectively, height and density will be determined by a combination of factors including:
 - the results of the angular plane calculations,
 - a Wind Impact Study;
 - Sun/Shadow Study;
 - Hydraulic analysis; and
 - Transportation Impact Assessment.

2. To ensure a compatible relationship with similar residential districts, such as the RMM District and RMH District, a building setback of 7.0m (23.0ft) is required. The District also allows for zero front and side building setbacks on sites where pedestrian oriented streets are developed.
3. A maximum podium height of four storeys, landscaping in addition to requirements of the existing Land Use Bylaw, incorporation of continuous weather protection in the form of a 2.0m wide canopy for commercial frontages, and underground parking is required to facilitate a comfortable pedestrian environment;
4. To ensure building articulation and visual interest architectural treatment of all sides of the high rise development is required, and a minimum stepback of 3.0m is required for that portion of a building four storeys, and through façade articulation for those that are greater than 20.0m.

4.2 Municipal Engineering

In order to address potential impacts on stormwater drainage system, the water distribution system, and the waste water collection system the following regulations are included in the draft District:

- The development shall provide green roofs, landscaped rain gardens, or utilize underground stormwater storage facilities to offset runoff; and
- Prior to the approval or issuance of any Area Structure Plan (ASP) or ASP amendment, Land Use Bylaw amendment, or development permit, the owner shall provide a hydraulic analysis to demonstrate sufficient fire flows to the development and that the existing wastewater collection system can accommodate the anticipated wastewater flows.
- If off-site improvements are necessary to accommodate development the owner shall enter into a Development Agreement with the City that shall include an engineering drawing review and approval process. Improvements to be addressed in the Agreement include but are not limited to the relocation and repair of infrastructure, construction of on-street fire hydrants, construction of sidewalk connections to create a continuous pedestrian environment and improvements to adjacent intersections to facilitate traffic movements into the area.

4.3 Transportation Engineering

In order to address potential impacts on the transportation system the following regulations are included in the draft District:

- Prior to the issuance of any development permit for the Old Hospital Site the owner shall be required to provide a Traffic Impact Assessment (TIA) to assess anticipated traffic and mitigate any transportation system impacts.
- The development shall include a minimum of two 3.0m (9.8) wide walkways from the front property line to the building and from the visitor parking area to the building and may require off-site sidewalk connections to ensure connectivity from building doors to City sidewalks and other land uses;
- Resident bicycle parking shall be located inside the main floor of the building.
- If a development is located within 200m (656.1ft) of a public transit stop the Development Officer shall reduce the required parking by 5%.
- If a development has a car share program the Development Officer shall reduce required parking by 10% or 8 parking spaces for each car share vehicle in the high rise development.

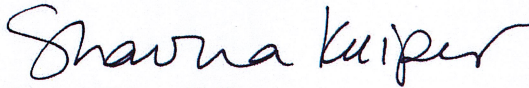
5.0 Graphic Illustration

The illustration of the RHR - Residential High Rise District is provided in Appendix B. The purpose of the graphic is to provide to City Council a visual representation of high rise development in the context of existing development height limits in the City. The illustration represents the development of a 20-storey tower along a typical cross section of 99 Avenue (Old Hospital Site).

6.0 Closing

We look forward to discussing the results of our work with you. We will be contacting you to schedule a time to meet and discuss the results of our work and draft district with you. If you have any questions, please feel free to contact me.

Sincerely,



Shauna Kuiper, M.Pl.
Senior Planner

Encl.



Appendix A

Draft RHR – Residential High Rise District



5.24 RHR – Residential High Rise District

5.24.1 RHR Purpose

This District is intended to provide for high rise housing and urban design direction for the successful integration of high density developments between 12 and 20 storeys, on large sites located outside the downtown and adjacent to arterial or collector roadways, preferably within 400.0m (1312.3ft) of a Residential Mixed Use Centre, or where identified by a statutory plan.

5.24.2 RHR Permitted and Discretionary Uses

RHR Permitted Uses:

- Accessory development
- Apartment dwelling
- Fascia sign
- Home office
- Identification sign
- Park
- Projecting sign
- Show suite in an apartment dwelling

RHR Discretionary Uses:

- Assisted living facility
- Business support service
- Community garden
- Day care facility
- Eating and drinking establishment (limited)
- Health service
- Office service
- Personal service
- Professional, financial and office service
- Public Utility
- Retail store (convenience)
- Retail store (general)
- Show home
- Temporary sales centre

5.24.3 RHR Site Subdivision Regulations for Apartment Dwellings

| | Interior or Corner Site |
|-------------------|--|
| Site Area | 1,360.0m ² (14,638.9ft ²) minimum |
| Site Width | 40.0m (131.2ft) minimum |
| Site Depth | 34.0m (111.5ft) minimum |

5.24.4 RHR Site Development Regulations for Apartment Dwellings**

| | Site |
|-------------------------------------|--|
| Angular Plane | Where the lot abuts a District containing a Single Detached Dwelling, Semi-detached Dwelling, or Duplex Dwelling as a permitted use, a 45° Angular Plane shall be taken from a height of 10.5m (34.4ft) above the property line and subsequent storeys must fit within this angular plane. |
| Building Height | <p>a. The minimum Building Height shall be a minimum of 12 storeys or 40.0m (131.2ft) and a maximum of 20 storeys or 67.0m (219.0ft).</p> <p>b. The Building Height shall be determined by:</p> <ul style="list-style-type: none"> • Angular plan requirements; • Wind Impact Study; • Sun/Shadow study; • Hydraulic Analysis; and • Transportation Impact Assessment. |
| Building Setback | <p>a. A minimum Building Setback of 7.0m (23.0ft) shall be required from all lot lines and shall accommodate design features or street related activities, such as architectural elements, landscaping, public art or sidewalk cafes that contribute to the pedestrian-oriented character of the area.</p> <p>b. Notwithstanding (a.) above there shall be no Setback from the front or side lot lines where adjacent buildings abut the lot line to form a pedestrian-oriented street.</p> <p>c. Where no Setback is provided, development shall be subject to an encroachment agreement, if required.</p> <p>d. No utility servicing equipment shall be located within the front yard of any building.</p> |
| Podium Height | The maximum height of a podium base shall not exceed four (4) storeys nor 16.0m (52.0ft). |
| Tower Stepbacks | A minimum stepback of 3.0m (9.8ft), shall be required for that portion of the building exceeding 14.0m (45.9) or four (4) Storeys. |
| Tower Separation | The minimum distance between a residential tower and any other tower shall be 25.0m (82.0ft). |
| Density | A maximum of 370 dwelling units per net developable hectare. |
| Site Coverage | <p>a. 60% maximum for all buildings and structures.</p> <p>b. Notwithstanding "a" site coverage may be increased to 100% where the front or side lot lines of adjacent buildings abut the lot line to form a pedestrian-oriented street.</p> |
| Minimum Common Amenity Area | A Minimum Common Amenity Area of 4.5m ² (48.4ft ²) per Dwelling shall be provided in compliance with Section 5.14 of this Bylaw. |
| Minimum Private Amenity Area | A Minimum Private Amenity Area of 3.0m ² (33.3ft ²) per Dwelling shall be provided and achieved through the use of balconies. Balconies may project a maximum of 2.0m (6.56ft) into the minimum Setback, except where there is no Setback required. |

| | |
|----------------------------|---|
| Landscaping | <ul style="list-style-type: none"> a. In addition to Part 4 - Section 4.8 and Part 5 – Section 5.10 of this Bylaw, a minimum of one deciduous tree shall be provided (minimum 50.0mm caliper, canopy occurring 2.0m (6.56ft) above finished grade) every 10.0m (32.8ft) along the street frontage, where the site is not built to property lines. b. The detailed Landscape Plan shall include two minimum 3.0m (9.8) wide walkways through the site (from the front property line to the building and from the visitor parking area to the building) to the satisfaction of the Development Officer. |
| Parking and Loading | <ul style="list-style-type: none"> a. Bicycle parking for residents shall be located inside the main floor of the building. b. Bicycle parking for visitors or commercial patrons shall be located adjacent to building entrances. If the development is built to the property line bike parking may be located on City right-of-way, subject to an encroachment agreement. c. Notwithstanding Part 11, if a development is located within 200m (656.1ft) of a public transit stop the Development Officer shall reduce the required parking by 5%. d. Notwithstanding Part 11, if a development has a car share program the Development Officer shall reduce the required parking by 10%, or 8 parking spaces for each car share vehicle in the residential tower. e. Resident parking shall be provided underground. Visitor parking may be provided at grade. f. Vehicular access shall be from the flanking roadway or abutting lane. In the event there is no flanking roadway or abutting lane, the vehicular access shall be designed in a manner that has minimal impact on abutting public roadways. g. Driveway ramps shall be at grade at the property line and must not exceed a slope of 6% for a distance of 4.5m (14.7ft) inside the property line. h. Adequate sight lines shall be maintained for vehicles entering and exiting the parkade, to the satisfaction of the Development Officer. Mirrors and/or a warning device may be required at the entrances by the Development Officer. i. Loading, storage and garbage collection areas shall be located to the rear or sides of the principal building. j. Service function areas, such as loading docks, truck parking, and utility meters, shall be incorporated into the overall design theme of the building and/or landscape. |

**** Internal site setbacks for condominium sites may be reduced and shall be determined at the discretion of the Development Authority.**

5.24.5 Urban Design Regulations and Site Planning

- (a) Architectural treatment of all sides of the building shall create visual interest through the use of architectural features, materials, windows and articulation.
- (b) The tower exterior shall be finished with glass curtain wall, cementitious envelope materials, pre-finished metal, and/or painted metal.
- (c) The building shall clearly differentiate residential entrances from commercial entrances through distinct architectural treatment.
- (d) Exterior lighting shall be designed and finished in a manner consistent with the design and finishing of the development, be provided to ensure a well-lit environment and to highlight the development, to the satisfaction of the Development Officer.
- (e) All mechanical equipment shall be screened from public view or be concealed by incorporating it within the roof envelope or by screening it in a way that is consistent with the character and finishing of the development.

5.24.6 Massing and Building Articulation

- (a) The podium shall incorporate continuous weather protection in the form of a 2.0m (6.56ft) wide canopy or any other architectural element wherever commercial frontages exist to create a comfortable environment for pedestrians.
- (b) The setbacks in the mid-portion of the tower shall be designed to reduce the impact of the upper levels above the podium base portion of the building, to maintain view corridors, maximize solar penetration, and reduce adverse microclimatic effects related to wind and shadowing.
- (c) The tower shall be differentiated from the podium, but should reinforce the design details, materials, and architectural expression from the podium.
- (d) The building shall incorporate articulated façades, rooflines and architectural treatments that establish the building as a distinctive landmark for the surrounding areas.
- (e) The Development shall incorporate design features to minimize adverse microclimatic effects such as wind tunnelling, snow drifting, rain sheeting, shadowing, and loss of sunlight, both on and off-site, consistent with the recommendations of the following studies to the satisfaction of the Development Officer.
 - a. Prior to the issuance of a development permit the submission of a preliminary Wind Impact Statement or a detailed Wind Impact Study, or both shall be required. The Statement or Study shall be prepared by a qualified, registered Professional Engineer, to professional standards. The Study shall be based on a computer model simulation analysis.
 - b. Prior to the issuance of a development permit the submission of a Sun Shadow Impact Study shall be required. The Study shall be prepared by a qualified, registered

Professional Engineer, to professional standards. The development shall minimize shadowing of on-site or adjacent amenity space, and adjacent development.

5.24.7 Entrances

- (a) Building entrances shall be oriented toward a public roadway.
- (b) All ground level residential units with street frontage shall have individual entrances that front onto the street and private outdoor amenity space. Entry transitions, such as steps, fences, gates or hedges, shall be provided to create an appropriate relationship with, and definition of, the public realm and the private space of dwelling units.
- (c) Main building entrances for any Use shall be designed for universal accessibility as per the Barrier Free Design Guide published by the Safety Codes Council (Alberta) 1999, as amended.
- (d) Level changes from the sidewalk to entrances of the building shall be minimized.

5.24.8 Development Regulations for Commercial Uses

- (a) Commercial uses, if developed, shall be developed within the first two (2) storeys of the high rise development;
- (b) Personal service, retail store (convenience) uses, professional, financial and office service uses and eating and drinking establishment (limited) shall not exceed 1,000.0 m² (10,763.9ft²) in gross floor area or 10% of the gross floor area of the high rise development in which they are located, whichever is less. These uses are not permitted as a freestanding use in a stand-alone building, shall only be located in the first two floors of the high rise development, and shall have separate access at grade from residential uses;
- (c) The placement and type of windows shall allow viewing into the building to promote a positive pedestrian-oriented street.
- (d) At least 70% of ground floor commercial façades shall have clear glazing on the exterior; and
- (e) Where the building frontage exceeds 20.0m (65.6ft), the front façade of the building shall be visually broken up with articulation at a minimum of 20.0m (65.6ft) intervals.

5.24.9 Sustainable Practices

- (a) The development may apply LEED techniques to reduce consumption of water, energy, and materials consistent with best practices in sustainable design. Green sustainable targets may include Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, and Indoor Environmental Quality.
- (b) The development may include Low Impact Design techniques to manage stormwater and reduce run off. This may be achieved by providing elements such as green roofs, landscaped rain gardens, or onsite bioretention facilities.

5.24.10 Technical Studies and Assessments

- (a) In addition to Section 2.8.6 of this Bylaw, the Development Authority may also request that the applicant complete and submit any or all of the following:
 - i. Traffic Impact Assessment;
 - ii. Hydraulic Analysis;
 - iii. Wind Study; and
 - iv. Sun/Shadow Study.
- (b) Notwithstanding the above, the owner shall be required to submit a Traffic Impact Assessment for development of the Old Hospital site south of 99 Avenue, east of Highway 15.

5.24.11 Off-site Improvements

- (a) Prior to the issuance of any development permit, the owner shall enter into a Development Agreement with the City for off-site improvements necessary to serve the development. The Agreement shall include an engineering drawing review and approval process.
- (b) Improvements to be addressed in the Agreement shall include any infrastructure improvements identified in any completed Traffic Impact Assessment, Hydraulic Analysis or other study, and are not limited to the following:
 - i. Relocation of all underground and above ground utilities and maintaining required clearances as specified by the utility companies;
 - ii. The construction of on-street fire hydrants, to the satisfaction of the Development Officer;
 - iii. Provision of bicycle parking in accordance with Section 11.2 that is attributed to non-residential uses within the first two (2) storeys, where no front yard setback is provided.
 - iv. Removal of all existing accesses as necessary to the site, with the restoration of the right-of-way to the satisfaction of the Development Officer;
 - v. Repair of any damage to the abutting roadways and sidewalks resulting from construction of the development, to the satisfaction of the Development Officer. The site shall be inspected by the Development Officer prior to the start of construction and once again when construction is complete;
 - vi. Provide sidewalk connections from the site to adjacent developments to create a continuous pedestrian environment;
 - vii. The improvements to adjacent intersections to facilitate traffic movements into the area, if deemed required by a Traffic Impact Assessment or the Development Authority; and
 - viii. Upgrading of adjacent right-of-ways directly abutting the site to appropriate standards.

5.24.12 Additional Development Regulations for RHR

- (a) All development and uses within this Land Use District are subject to the applicable provisions of Part 4 - General Regulations for all Land Use Districts, Sections 5.1 to 5.13 of Part 5 - Residential Land Use Districts, Part 11 - Parking and Loading, and Part 12 - Signs;

- (b) Prior to the issuance of a Development Permit, the Owner shall enter into an Encroachment Agreement for any portion of the development that is to be located on public land to the satisfaction of the Development Officer.



Appendix B

Illustration – Building Heights Analysis



City of Fort Saskatchewan Height Analysis

