



POLICY REPORT DEVELOPMENT AND BUILDING

Report Date: September 7, 2010
Contact: A. Higginson
Phone No.: 604.873.7727
RTS No.: 8497
VanRIMS No.: 08-2000-20
Meeting Date: September 21, 2010

TO: Vancouver City Council
FROM: Director of Planning
SUBJECT: CD-1 Text Amendment - 745 Thurlow Street

RECOMMENDATION

- A. THAT subject to enactment of CD-1 By-law #493 for 745 Thurlow Street approved by Council with certain conditions of approval on September 16, 2008, Council refer to Public Hearing the application from Musson Cattell Mackey Partnership to amend the CD-1 By-law to increase the maximum allowable floor space ratio from 15.4 FSR to 16.1 FSR, together with:
- (i) plans prepared by Musson Cattell Mackey Partnership, received November 26, 2009;
 - (ii) draft CD-1 By-law amendments, generally as presented in Appendix A; and
 - (iii) the recommendation of the Director of Planning to approve, subject to conditions contained in Appendix B.
- FURTHER THAT the Director of Legal Services be instructed to prepare the necessary by-law, generally in accordance with Appendix A, for consideration at Public Hearing.
- B. THAT recommendation A be adopted on the following conditions:
- (i) THAT the passage of the above resolution creates no legal rights for the applicant or any other person, or obligation on the part of the City; any expenditure of funds or incurring of costs is at the risk of the person making the expenditure or incurring the costs;

- (ii) THAT any approval that may be granted following the Public Hearing shall not obligate the City to enact a by-law rezoning the property, and any costs incurred in fulfilling requirements imposed as a condition of rezoning are at the risk of the property owner; and
- (iii) THAT the City and all its officials, including the Approving Officer, shall not in any way be limited or directed in the exercise of their authority or discretion, regardless of when they are called upon to exercise such authority or discretion.

GENERAL MANAGER'S COMMENTS

The General Manager of Community Services RECOMMENDS approval of the foregoing.

COUNCIL POLICY

- CD-1 Rezoning - 745 Thurlow Street, approved at Public Hearing on September 16, 2008
- Metro Core Jobs and Economy Land Use Plan: Issues and Directions (2007).

PURPOSE AND SUMMARY

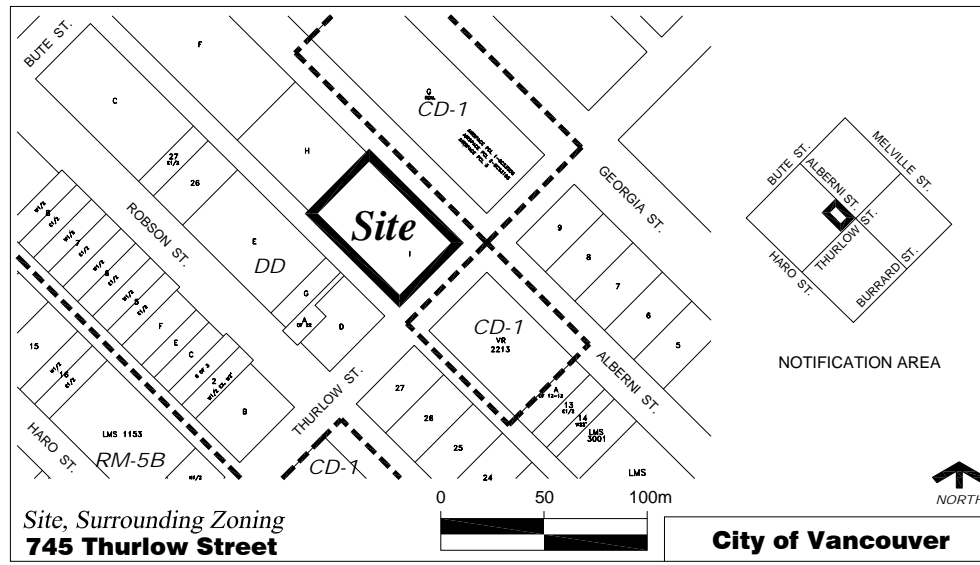
This report assesses an application to amend CD-1 By-law #493 for 745 Thurlow Street to increase the maximum allowable density from a floor space ratio (FSR) of 15.4 to an FSR of 16.1 to facilitate the adding of one additional floor of office space (18,178 sq. ft.) within the approved form of development.

BACKGROUND

Context: The site, located at the corner of Thurlow and Alberni Streets on the southern periphery of the Central Business District (CBD), is currently developed with a five-storey building containing retail uses at grade and below-grade, with a parking garage on the upper floors.

The site is surrounded by mixed-use commercial/residential and retail developments, with the 62-storey "Shangri-la" tower across the street at 1121 Alberni Street/1120 West Georgia Street.

Figure 1. Site and Surrounding Zoning



CD-1 Rezoning: At a Public Hearing in September 2008, Council approved the rezoning of this site from Downtown District (DD) to a Comprehensive Development District (CD-1) to permit an increase in the maximum density from 7.0 to 15.4 FSR. The development proposal was for a 24-storey office tower which included a two-storey podium of retail and services uses, and below-grade parking with access from the lane. That CD-1 By-law (#493) is scheduled for enactment at the end of the regular meeting of City Council on September 21, 2010.

PROPOSAL

This rezoning application is subject to enactment of the CD-1 By-law noted above and seeks to increase the maximum permitted commercial (office) floor area by 1 688.73 m² (18,178 sq. ft.). The proposed 25-storey building would continue to include retail and service uses on the first two floors, and office uses on floors 3 through 23. The 24th floor would be comprised of amenity rooms and a terrace for the benefit of building occupants, and extensive green roofs. The 25th floor would be comprised of mechanical rooms and equipment.

DISCUSSION

1. Form of Development (Note Plans: Appendix D)

The form of development approved by Council in 2008 would be largely unchanged. The additional floor of commercial space will be accommodated through an overall reduction in floor-to-floor heights throughout the office floors, resulting from the integration of mechanical, electrical and structural systems, and will not result in any change to the overall bulk and massing of the building. There is no height increase requested in this rezoning application.

Design development conditions established by Council in 2008 as a requirement of the CD-1 rezoning have been carried through and are part of a concurrent development application

which is now under review. These design development conditions have resulted in very small changes in the architectural expression.

2. Use and Density

The site is immediately adjacent to the Central Business District (CBD) which is the region's premier business and cultural district. The development of additional office space is a welcome addition to commercial and job-space capacity in the downtown core.

3. Additional Recommended Amendment

In addition to the requested increase in FSR, staff recommend that that CD-1 By-law #493 be amended to include a floor area exclusion clause related to the provision of thicker walls to control building leaks. This exclusion is now standard in most CD-1 by-laws.

4. Parking

The Parking By-law was amended in 2009 to reduce both the minimum and maximum parking standards for non-residential uses downtown. Despite the proposed increase in floor area in this rezoning application, the development now requires fewer parking spaces than previously approved. All parking will be accommodated below grade, with access taken from the lane.

Engineering Services staff recommend that "Section 5. Parking" be replaced to reflect the current requirements as set out in Appendix A.

5. Sustainability

Council policy at the time that this text amendment application was received required that the project establish a design that would achieve a level of LEED® Silver at a minimum, or an equivalent achievement in green design, with points in specific categories.

The 2008 rezoning application contained a comprehensive sustainability proposal and a commitment from the applicant team and developer to register this project under the LEED® Green Building Rating system, with a goal of achieving LEED® Gold. This would result in this new building being the first office building in the city to so commit. The strategy and commitment to achieve this standard has been carried through to this text amendment application.

PUBLIC BENEFITS

1. Community Amenity Contribution:

The City's Financing Growth Policy anticipates community amenity contributions (CAC) from rezoning applications to mitigate the impacts of rezoning. Such CAC contributions are generally made feasible by the increase in land value which results from rezoning approval of a new land use, additional height and/or floor area. In the 2008 rezoning, it was concluded that the economics of the proposed office development, compared to that of the site developed with a major residential tower, which was possible under the DD zoning and remains possible under CD-1 #493, indicated that a CAC was not economically viable. In other words, the land value of the site as a residential development was greater than the land value of the site as an office development.

Real Estate Services has reviewed the developer's proforma submission for the proposed one addition floor of office space, and has concluded that the proposed increase in density for

office use results in no increase in overall land value which might warrant a CAC offering from the developer.

2. Development Cost Levy:

Development Cost Levies (DCL) collected from development help pay for facilities made necessary by growth. The 2008 rezoning to CD-1 anticipated a DCL payment of \$3,735,127, based on the area-specific DCL for Triangle West. It is anticipated that the DCL will not be paid until after September 30, 2010 and therefore the new rate adopted by Council on June 24, 2010 will be in effect. The new rate will generate a DCL (based on the original floor area) of \$4,158,122. The additional floor space generated by this text amendment application would add a further \$189,414, for a total DCL payable of \$4,347,535.

3. Public Art:

A public art budget of \$379,099 was established at the time of the rezoning in 2008 based on public art fees of \$0.95 per square foot. A Preliminary Public Art Plan has been accepted and a Public Art Agreement has been registered on title. The public art will be delivered prior-to occupancy of the building. The request for additional floor area increases the applicant's public art obligation by \$32,902 based on the new public art rate of \$1.81 per square foot multiplied by the additional floor area of 18,178 sq. ft..

FINANCIAL IMPLICATIONS

Approval of the report recommendations will have no financial implications with respect to the City's operating expenditures, fees, or staffing.

CONCLUSION

Planning staff have reviewed the proposal to increase the commercial (office) density in this project and conclude that it is supportable. Staff recommend that the application to amend the CD-1 By-law be referred to public hearing and be approved, subject to the conditions outlined in Appendix B.

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745 Thurlow Street
Proposed Amendments to CD-1 by-law #493

[All additions are shown in *bold italics*. Deletions are shown in ~~strikeout~~.]

Note: A By-law will be prepared generally in accordance with the provisions listed below, subject to change and refinement prior to posting.

Floor Area and Density

Amend Section 3.3 as follows:

- 3.3 The floor space ratio for all uses combined, must not exceed ~~15.4~~ *16.1*, except that if the development includes dwelling uses, the floor space ratio for all uses must not exceed 7.0.

Replace 3.5 (e) as follows:

- 3.5 Computation of floor space ratio must exclude:

- (e) *where exterior walls greater than 152 mm in thickness have been recommended by a Building Envelope Professional as defined in the Building By-law, the area of walls exceeding 152 mm, but to a maximum exclusion of 152 mm thickness, except that this clause shall not apply to walls in existence prior to March 14, 2000; and*

With respect to exterior:

- *Wood frame construction walls greater than 152 mm thick that accommodate RSI 3.85 (R-22) insulation, or*
- *Walls other than wood frame construction greater than 152 mm thick that meet the standard RSI 2.67 (R-15)*

The area of such walls that exceeds 152 mm to a maximum exclusion of 51 mm of thickness for wood frame construction walls and 127 mm of thickness for other walls, except that this clause is not to apply to walls in existence before January 20, 2009.

A registered professional must verify that any exterior wall referred to meets the standards set out therein.

Replace 5. as follows:

5. *Any development or use of the site requires the provision, development, and maintenance, of off-street parking, loading and bicycle parking, in accordance with the requirements of, and relaxations, exemptions and mixed-use reductions in the Parking By-law.*

* * * * *

745 Thurlow Street
PROPOSED CONDITIONS OF APPROVAL

Note: Recommended approval conditions will be prepared generally in accordance with the draft conditions listed below, subject to change and refinement prior to finalization of the agenda for the Public Hearing.

Note: Further design development and response to circumstances resulting from the Public Hearing may result in design and technical conditions as part of the Director of Planning approval.

PROPOSED CONDITIONS OF APPROVAL OF FORM OF DEVELOPMENT

- (a) That, prior to approval by Council of the form of development, the applicant shall obtain approval of a development application by the Director of Planning who shall have particular regard to the following:

Design Development

1. design development to reduce the height of the building to ensure that there is no penetration into the "Heather Bay to Lions" View Cone;

(Note to applicant: Building height must not exceed 300 ft., as per the CD-1 By-law.)

Sustainability

2. identification on the plans and elevations of the built elements contributing to the building's sustainability performance in achieving LEED® Gold; and

(Note to applicant: The LEED® checklist and written description of how the Gold level will be achieved should be incorporated into your development application drawing set.)

Engineering

3. One percent (1%) of the total number of required parking spaces must be designated as "Shared Vehicle Parking" spaces.

AGREEMENTS

- (b) That, prior to enactment of the CD-1 By-law amendments, the registered owner shall, at no cost to the City, and on terms and conditions satisfactory to the Director of Legal Services, and to the Director of Planning, the General Manager of Engineering Services and the Approving Officer as necessary, make arrangements for the following:

Public Art

1. amend the Public Art Agreement registered in the Land Title Office under number BB1169637 to secure payment of additional public art fees in the amount of \$32,902 based on the new public art rate of \$1.81 per square foot.

* * * * *

745 Thurlow Street
ADDITIONAL INFORMATION

Site, Surrounding Zoning and Development: This 2 412.60 m² (25,970.00 sq. ft.) site is comprised of a single parcel at the southwest corner of Alberni and Thurlow Streets. The site has a frontage on Thurlow Street of 39.96 m (131.10 ft.) and a depth of 60.37 m (198.07 ft.).

Proposed Development: A 25-storey office tower which includes a two-storey podium of retail and service uses is proposed.

Public Input: A notification postcard was sent to nearby property owners on December 10, 2009 and rezoning information signs were posted on the site on December 17, 2009. Three responses have been received. Two respondents supported the proposed rezoning. The third respondent requested clarification about the application, but did not express an opinion.

Comments of the General Manager of Engineering Services: The General Manager of Engineering Services has no objection to the proposed rezoning, subject to the proposed amendment to Section 5 of the CD-1 by-law, as noted in Appendix A.

Urban Design Panel Comment: The Urban Design Panel reviewed this proposal on February 10, 2010, and supported the proposed use, density and form of development and offered the following comments:

EVALUATION: SUPPORT (7-0)

- **Introduction:** Alison Higginson, Rezoning Planner, introduced the proposal for a concurrent rezoning and development application. The rezoning requests a text amendment to the CD-1 bylaw for the site which was approved at a public hearing in 2008. The rezoning would increase the allowable density from 15.4 to 16.1 FSR by adding one complete level of office floor space. The additional floor which equates to approximately 19,000 sq. ft. would be accommodated within the form of development through reductions in the interstitial space in the office floors. Staff are supporting the rezoning based on the policies of the Metro Core Jobs and Economy Use Plan which encourages and supports the provision of additional job space in the downtown core.

Ralph Segal, Development Planner, further described the proposal noting the reduction in the floor to floor dimension has allowed for the accommodation of the additional storey. There is a view cone passing over the site which sets the height of the building. In a recent consideration by Council of the view corridors, Council decided that the present view cones will be maintained. Mr. Segal noted that the slight increase in density is not an urban design issue in the context of Metro Core seeking job space and predicted that Council would grant the increase in density. Mr. Segal described the architectural plans regarding suite layouts and he noted that the massing was basically the same as seen at the rezoning stage by the Panel. The building will have a unique form with two massing elements and differing treatments, a rectilinear element and a canted element with triple glazing and target of LEED® Gold certification. The public art plan has been given a preliminary approval and it envisions a coloured programmable lighting array carefully integrated into the architecture both on the façade of the building and in the ground plane.

Advice from the Panel on this application is sought on the following:

1. Has the proposed detailed architectural expression advanced appropriately for this prominent site?
2. Do the Thurlow and Alberni streetscapes/public realm treatment contribute to the animation of the highly pedestrianized precinct?

Ms. Higginson and Mr. Segal took questions from the Panel.

- **Applicant's Introductory Comments:** Mr. Whitehead, Architect, further described the proposal noting the massing will represent the use inside. He added that there was a desire to bring more office space to the top of the building as a statement of function as well as to provide a better proportioned massing. The area has a lot of rectangular buildings and they felt this building would be a foil to some of the buildings behind the site. He also noted that retail is planned for the third floor. The podium is canted back as a counter point to the mass above. Mr. Whitehead described the curtain wall and other planned architectural elements of the building.

Bruce Hemstock, Landscape Architect, noted that the ground plane is a combination of working with the street expression and bringing a lane expression together to create a high quality landscape. On the lane there will be exposed aggregate concrete as well as concrete and will function as a service place but will also encourage pedestrians use. The glass canopy will collect rain water which will drain into an element in the ground plane. At the entry, three different colours of granite as well as basalt will be used to encourage movement from the street into the lobby. An outdoor patio space on the second level with some outdoor space for the restaurant will be created. There will be a green roof on the top of the building with an outdoor gathering area that has been broken up into different spaces. He noted the sustainable initiatives will include the collection of storm water that will be stored within the building for re-use.

The applicant team took questions from the Panel.

- **Panel's Consensus on Key Aspects Needing Improvement:**
 1. Consider developing a full scale model of the glazing to work out detailing issues;
 2. Design development to the Alberni Street ground plane;
 3. Consider more passive environmental strategies.
- **Related Commentary:** The Panel supported the proposal.

The Panel supported the additional floor area as they felt it wouldn't impact the massing of the building. They thought the architectural expression had advanced enough for the site and that it was a cohesive project and that all the elements on the building seemed coordinated with the exception of the Alberni Street treatment. Several Panel members were concerned with the angled wall as they thought there could be some detail issues with the vertical mullions. They liked the variation in the glazing of spandrel to clear to the different coloured glazing which they felt would help to differentiate the two masses. However, they felt a full scale mock up was needed on site to gauge the transparency and character of the glazing and how the two curtain wall elements would come together.

Several Panel members noted that it would need to be a work of art on the inside of the building because that is what will be visible from the street. Another Panel member was concerned with the closeness of the Shangri-La building and suggested the applicant look at ways to mitigate privacy between the residential and office uses.

A couple of Panel members thought the building was too masculine and a bit on the chunky side although it may be the nature of the program fitting on the site. One Panel member thought the scale and size of the LED fins deserved some study and thought they might be too small relative to the scale of the building.

There was some concern regarding the ground plane on Alberni Street. The Panel noted that the treatment was different from the other elevations and felt it should have the same architectural language. A Panel member suggested the LED lights on the building could show up in the landscape treatment which would help to animate the ground plane. Another Panel member was concerned with the cantilevered face of the building with the second level deck and the potential for vertigo in people using the space. It was suggested that a trellis or tree canopies over the seating area would make for a more comfortable space. The Panel members liked the landscape noting there was a continuous thought to the patterning and as well various outdoor rooms had been created. The one area on the upper floor that needs a little more development is the relationship between the interior amenity space and the outdoor space. The only door to the outside from the actual amenity space is on the north side and there is no connection on the south side.

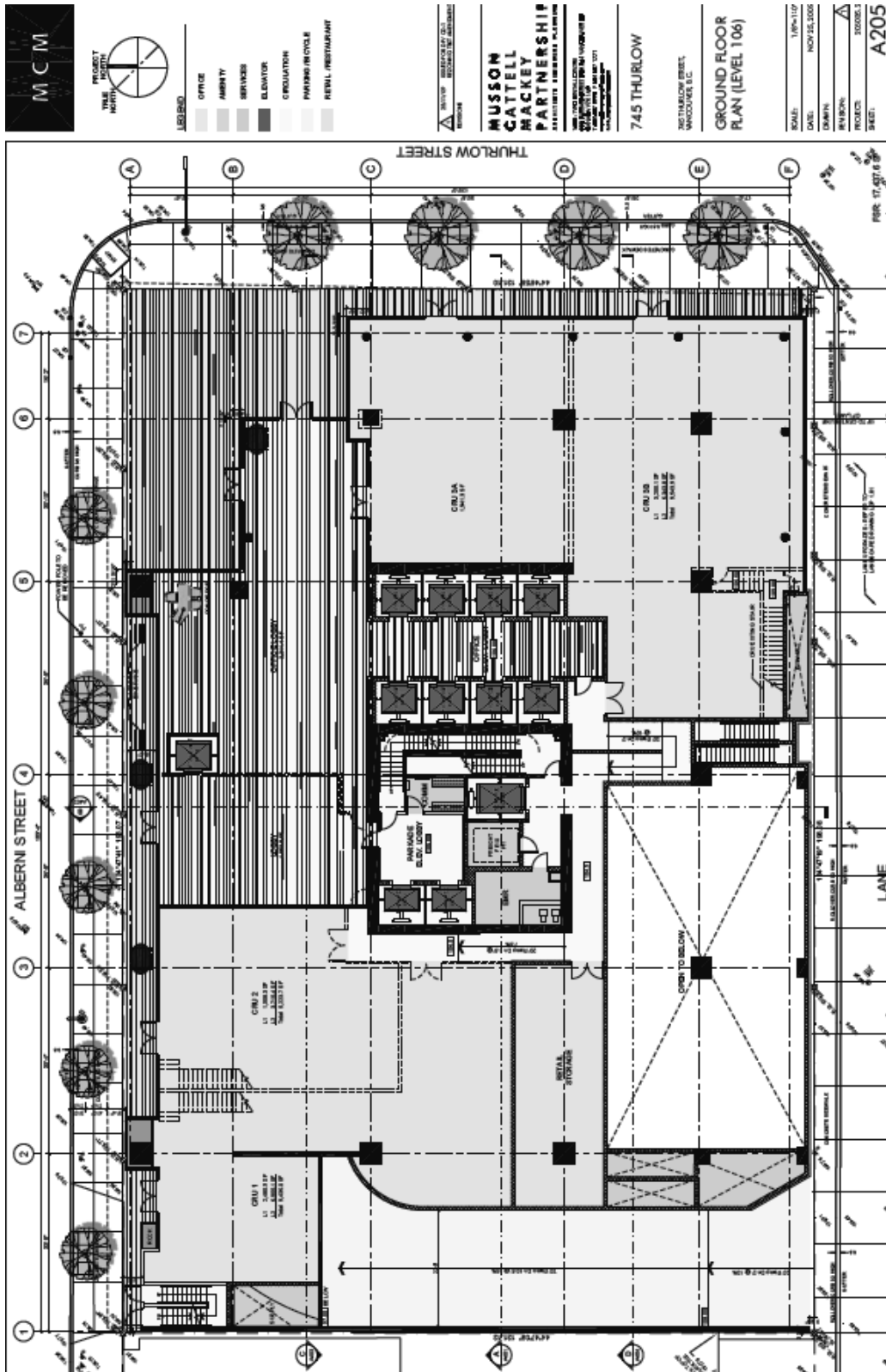
It was noted that there is no expression of the restaurant on the third floor and one Panel member suggested a change in the expression that would suggest restaurant use. It was also noted that the window washing equipment needed to be considered for the building.

The Panel supported the environmental strategies but a several Panel members thought more passive strategies could be added rather than relying on the triple glazing and use of shading devices on the building to make for better energy performance.

- **Applicant's Response:** Mr. Whitehead noted that the window washing system had been considered. He thanked the Panel for their comments and said he appreciated them and would be moving forward with the project.

Comments of the Applicant: The applicant has been provided with a copy of this report and concurs with the content and recommended conditions of approval.

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REVISIONS

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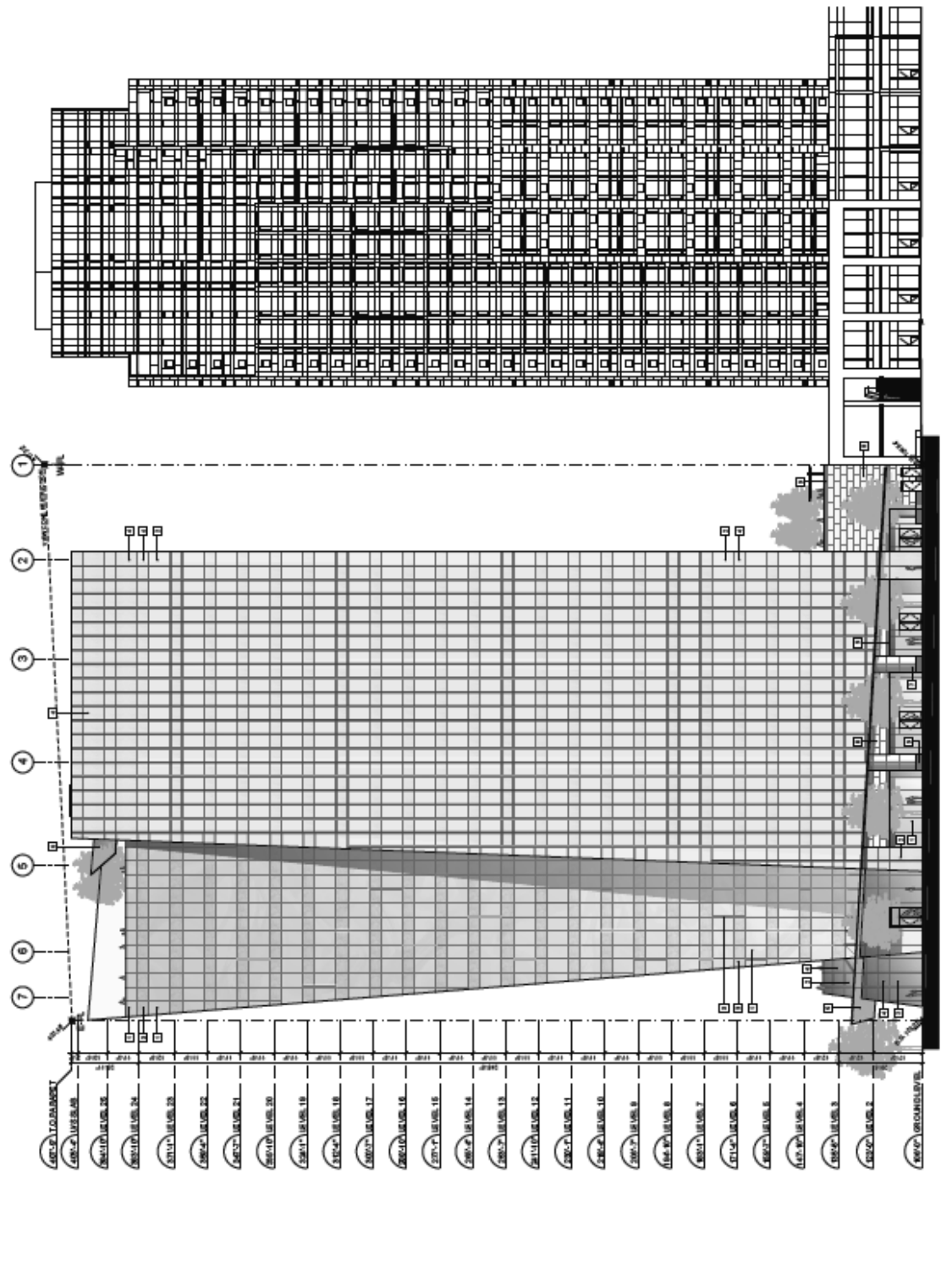
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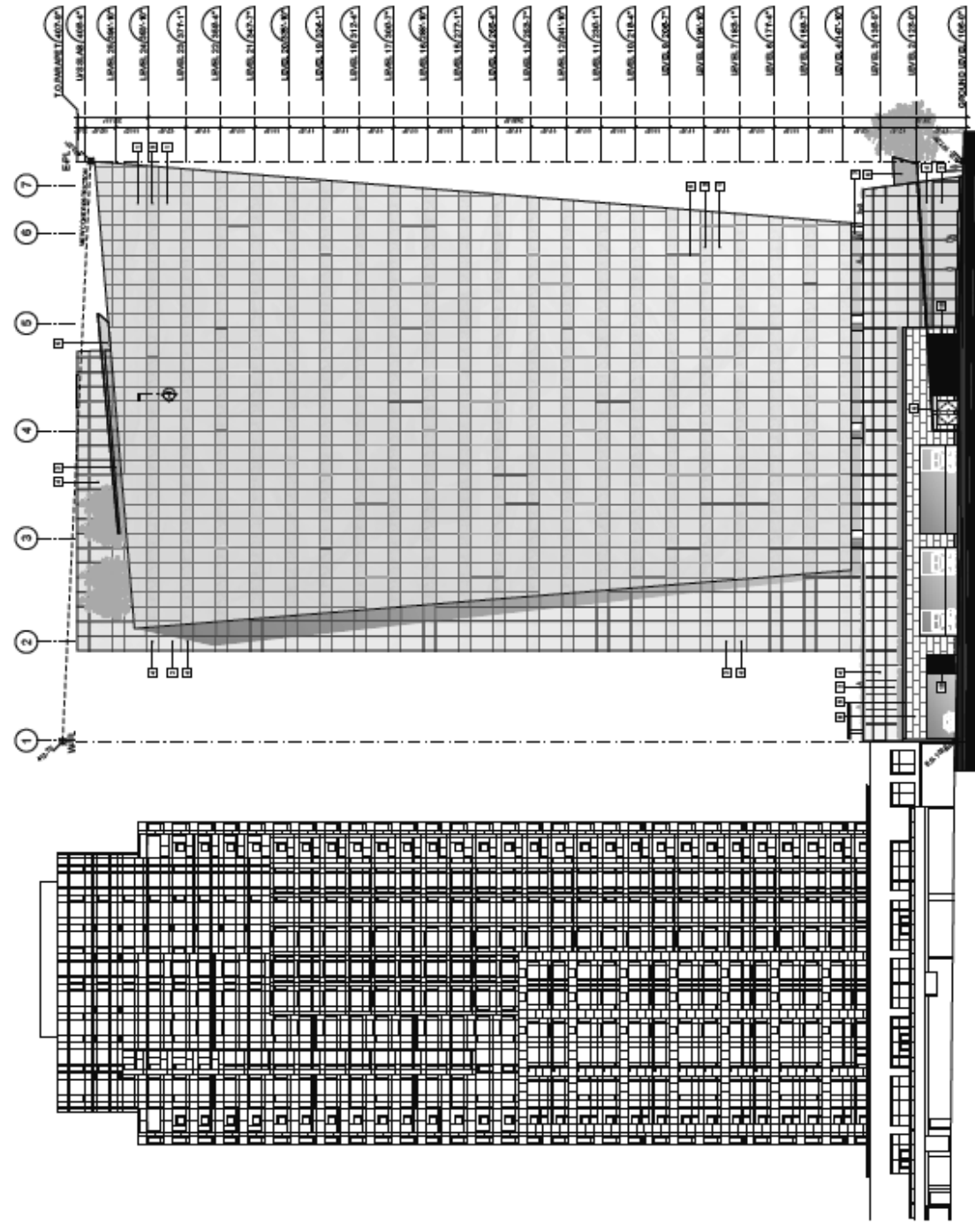


**MUSSON
GATTELL
MACKAY
PARTNERSHIP**

745 THURLOW

BUILDING
ELEVATION - SOUTH
(LANE)

SCALE: 1/8" = 1'-0"
DATE: NOV 26, 2009
DRAWN BY: [Name]
PROJECT: [Name]
SHEET: A302





REVISIONS

**MUSSON
GATTELL
MACKEY
PARTNERSHIP**
ARCHITECTS - INTERIORS - PLANNING

1000 LINDEN LANE
SUITE 100
WILCOX, NE 60151
TEL: 402.333.1100
WWW.MGMPARTNERSHIP.COM

745 THURLOW

745 THURLOW STREET
WILCOX, NE, NE

ROOF PLAN

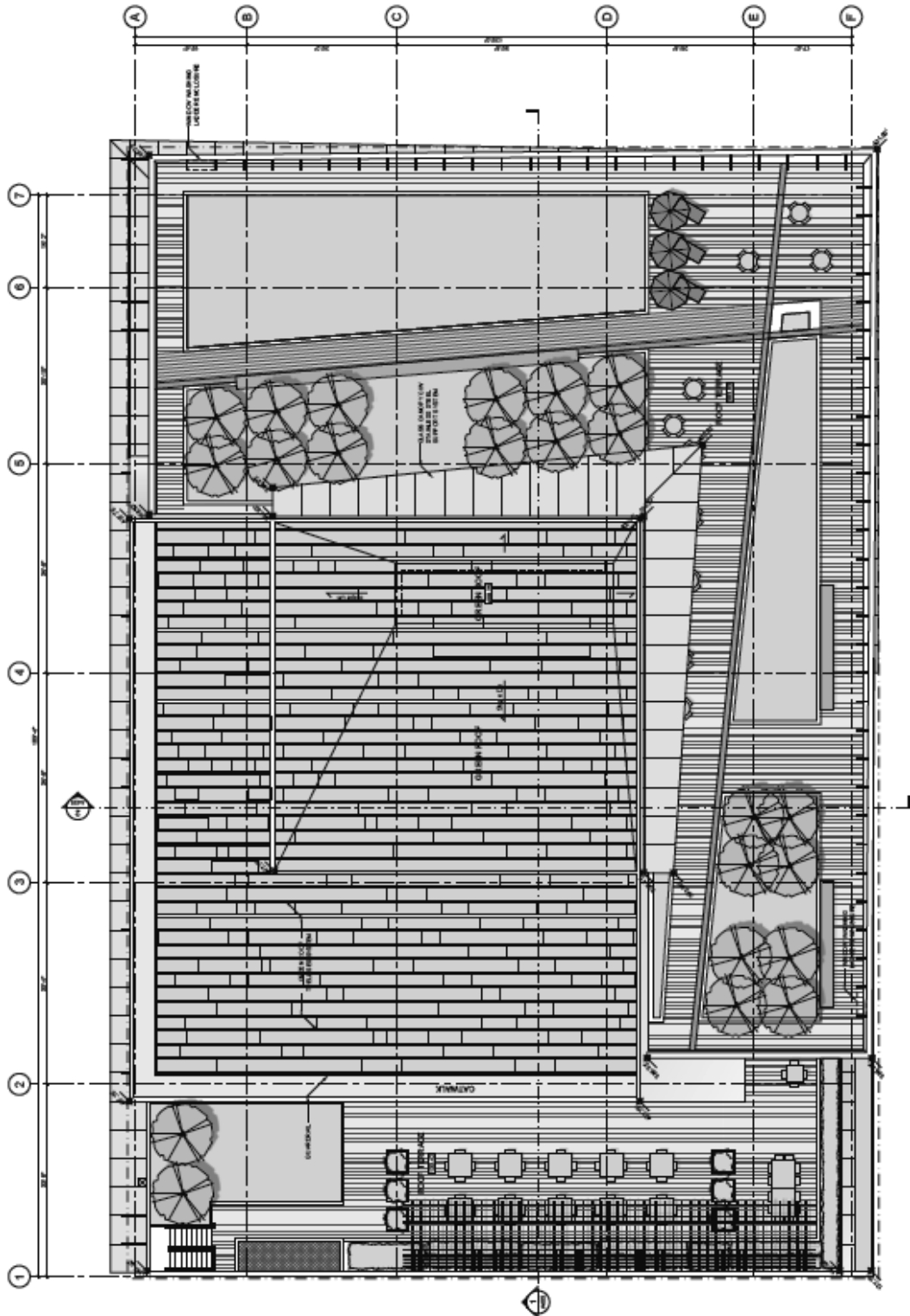
SCALE: 1/8"=1'-0"
DATE: NOV 25, 2009

DRAWN: [Name]

REVISION: [Number]

PROJECT: 2008052

SHEET: A217



ENVIRONMENTAL RESPONSE

The 745 Thurlow Street Project will embody a sustainable design philosophy at all levels, from the reuse initiatives of the demolition, material selection of the exterior skin, high use of recycled content within the building structure, green roofs at all levels of the project, strategies incorporated into the management and operation of the building systems to the water conservation of the landscape. A wide range of green building strategies have been pursued to meet the sustainable goals of this project. Rental and the project team are committed to being accountable for their sustainable commitment and, as such, have registered the project under the LEED® Green Building Rating System with the goal of achieving a LEED® "Gold" minimum for the project – the first office tower in the city to do so.

As recommended in the rezoning conditions for the site, the redevelopment of the site at 745 Thurlow Street has utilized the Leadership Through Energy and Environmental Design (LEED®) Core & Shell as a reference point for its Green Building strategy. All consultants involved in the project will have LEED® Accreditation and a track record of sustainable design. Several members of the consultant team are assessors for Canada Green Building Council. Attached is a LEED® Scorecard reflecting the strategies outlined to achieve LEED® "Gold" or better.

The two most significant elements are energy efficiency and occupancy comfort. These aspects have formed the major thrust of our investigations, including energy modelling and materials selection. Other major green building aspects are discussed and solutions and strategies are noted.

Energy and Atmosphere

Building Form - Orientation

As outlined in previous sections of this document, the sculptural form of the project is generated primarily by urban design, office planning constraints, and views. The external detailing and materials used to delineate this form have responded to the primary orientation of the project and its response to solar heat gain. Within the rectilinear orientation of the floor plate to the City grid, solar heat gain will be controlled by glazing performance relative to the main orientation of each facade.

Building Façade Design

External façade expression is primarily generated by daylighting, office planning standards and views. Solar control is applied in an integrated fashion to mitigate solar heat gain based on orientation and thermal heat loss on all facades. Utilization of a high performance, triple glazed, thermally broken curtain wall system provides a high degree of overall thermal performance and solar control opportunities.

745 Thurlow is designed using triple glazing with two low-e surface coatings, resulting in superior building envelope. With an R40 insulated roof, a glazing value of 0.15 Btu/ft²/F (centre of glass) and an R8 spandrel panel section, energy consumption to maintain occupancy thermal comfort will be reduced significantly.

Primarily, shading coefficients for high performance glazing are quoted based on sunlight hitting the coating at 90 degrees. For low-e coatings, performance increases as the angle of incidence increases. The angle of the flared facade away from the path of the sun increases the effectiveness of the coatings.

In addition to the reduced energy savings, occupants benefit from a superior building envelope due to the radiant effects of glazing. In today's modern office environments, large quantities of poorly insulated glazing results in occupancy thermal discomfort at the perimeter, mainly due to radiation exchange between the cold surface temperature of the glass and the occupant. Using a thermally superior envelope, the surface temperature of the interior glass is closer to the ambient air temperature, preventing thermal occupancy discomfort.

The glazing make-up and fit design of the triple-glazed units also react to their orientation with higher performance dictated for the two south facing elevations. Triple glazing provides an expansion of the opportunities available to mitigate these effects, while still allowing a high degree of natural light and unobstructed views. This, combined with the introduction of another high performance low-e coating in a triple-glazed curtain wall unit and ceramic frit in the upper and lower portions of the vision panels, has enabled shading coefficients to be:

- 0.24 For the south facing facades
- 0.35 For the north facing facades

Increased effectiveness from the addition of ceramic frit and the increased angle of incidence will have a positive impact on these coefficients.

Daylighting

Nine-foot ceilings and glazing to the ceiling level provide maximum opportunity for daylight penetration, controlled by the flared southern exposure and ceramic frit to the upper portion of the vision panel. Open plan of the floors with minimal visual invasion of the structure will allow for maximum utilization of the daylighting opportunities within the floor plate.

Heating and Cooling

745 Thurlow will be fitted with a four-pipe fan coil system as part of the base building. This system will provide heating and cooling to tenants and offers maximum tenant flexibility and controllability of their internal environment. Heating will be distributed to fan coil units via three gas fired condensing boilers with an optimum operating efficiency of 93%. Heating piping distribution and temperatures will be 180°F supply and 100°F return, meaning constant condensing optimum efficiency throughout the lifetime of the building. In addition to the thermal benefits of using a lower temperature set point pump energy is reduced due to the large temperature differential. In order to reduce electrical energy consumption, each fan coil will be fitted with an ECM motor. This motor is DC based and has brushless bearing, reducing friction losses in the motor. As fan coils run for a significant portion of the commercial office year, significant electrical energy savings can be achieved. In addition to ECM motors on fan coil units, all circulation pumps will be supplied with variable speed drives, which will modulate water flow rates to match load conditions. This reduces electrical pump energy compared to a conventional constant flow system.

Chilled water to fan coil units will be provided via three water-cooled chillers, with optimum efficiency and a cooling tower with two separate modules to allow independent operation. Chillers are sized to suit the year round cooling requirements of tenant server rooms throughout the year and provide cooling during summer months and periods of high load.

Demand Control Ventilation

Outside air will be supplied to each office floor through two outside air heat recovery ventilation units, with an efficiency of 60%. This heat recovery unit extracts heat from the washroom, transformer room and general office exhaust air and transfers the heat into the cold incoming outside air without transferring pollutants. In order to maximize efficiency, outside air is modulated to each office floor via two VAV boxes, each controlled by a CO₂ sensor-mounted in the occupied zone. This means only the required quantity of outside air is supplied to each floor based on the number of occupants in the space. This design reduces fan power from the HRV units, heat energy from the boilers and maintains high levels of ventilation to occupants.

ENVIRONMENTAL RESPONSE (cont'd)

Free Cooling

In order to reduce and minimize chiller energy during winter months, outside ventilation air is supplied to the back of the fan coil units at a temperature of 40°F. Using this temperature maximizes free cooling in the core zone of the building which is required year round, as the air temperature is low enough to satisfy the cooling requirement of the space during the winter and shoulder seasons.

Elevators

An office project of this size is characterized by high elevator peak demand. Utilization of energy-reducing elevators—elevators that produce and store energy in the ascending mode during peak times—will have a significant impact on energy utilization, especially during the peak morning, lunchtime and end of work hours.

Lighting

Sustainable lighting strategies will be employed within the building so that a minimum level of energy case for the building will be 15% to 20% less than ASHRAE 90.1, including:

- Compact fluorescent fixtures
- LED signs
- High efficiency ballasts.

745 Thurlow Street's lighting systems will employ high efficiency luminaires (18 lamps) and automated, light systems:

- daylighting controls,
- zone-switched luminaires,
- occupancy sensors,
- dimming ballasts tied to daylight sensors to provide a high degree of user flexibility.

Light pollution will be eliminated by the absence of uplighting and the exterior lighting will be specified in accordance with IESNA specifications. Appropriate light power density levels will be specified and a high degree of measurement and control of all systems will positively impact power consumption and energy, user flexibility and energy management. The introduction of photovoltaic technology is contemplated on the terrace roof with the power either stored in batteries, or used in the building immediately.

CFC's

Refrigeration equipment will be free of HCFC's.

Systems Optimization

- All major systems will be commissioned by an independent commissioning agent.
- Controls for major systems will be metered and monitored in order to optimize their use.

Analysis and energy modelling has been applied to the strategies mentioned above. Energy utilization is a major factor within the sustainability strategy for an office building such as this and it is our belief that energy levels will be reduced by at least 33% of the model National Energy Code for buildings through the application of the concepts that we have outlined.

SITE USE

An increased intensity of development such as this, due to the more efficient use of the downtown land base, the proximity of the site to mass rapid transit systems and the site's integration into a mixed use community such as the Robson / Thurlow / George Street neighbourhood, enables residents of the Downtown Peninsula to live, work and shop in close proximity, reducing their reliance on automobiles and thus a consequent reduction in carbon footprint. Inherent in this location and development strategy is the use of alternative transportation strategies, such as:

- Location on transit routes and within easy walking distance of the Burrard Street SkyTrain Station
- Car cooperative systems with preferential parking within the development
- Recharge stations for electric cars
- Bicycle parking and end of trip facilities will be provided for building occupants within the project.

Storm Water Management

- A construction storm water management plan to minimize the impact of excavation on the local storm water system will be implemented
- A green roof will be utilized over the majority of the roofscope of the project at both the podium and tower roof levels
- A permeable approach to hard landscape elements will ensure lower maximum discharge levels and purify water runoff
- Stormwater will be stored for reuse to irrigate landscape elements.

Light Pollution Reduction

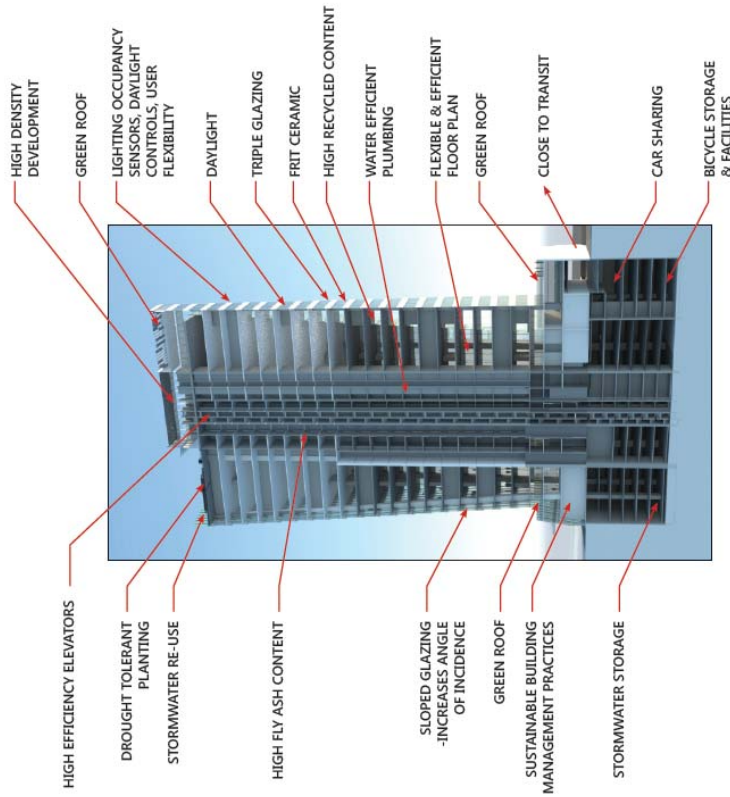
- Outdoor lighting levels will be minimized on all outdoor decks.
- Perimeter lighting (within 20 feet of the exterior curtain wall) will have a high level of control, including dimming
- Low reflectance exterior lighting and lower angle lighting locations will be utilized on exterior lighting such that zero direct beam illumination will leave the project site
- A higher number of low-mounted fixtures will be utilized for exterior lighting.

Water Efficiency

All roofscapes on the project will be a combination of Green Roof and Permeable, low albedo, hardscape to provide an outdoor amenity for building occupants within a sustainable framework.

Water Conservation

745 Thurlow will be designed with optimum water management. Rain water will be collected from the roof of the tower and collected in a rainwater storage tank in the parkade. This tank is sized to meet 100% of the irrigation water requirements in summer. During the shoulder season and winter months where irrigation is not required, the collected rainwater will be used to provide water flushing to water closets and urinals. In addition to the above, all lavatory faucets will be fitted with aerators to restrict water flow to 0.5 GPM.



ENVIRONMENTAL RESPONSE (cont'd)

Green Roofs

All of the horizontal surfaces of the project are either habitable spaces, vegetated spaces, or a combination of the two. This strategy reduces the project's ecological footprint and maximizes the use of the precious resource of outdoor area in the Downtown.

Solutions include integrated planters, rooftop and interspace green roof systems and green walls / screens for rooftop mechanical spaces. The combined effect of these green roof strategies is that 50% of the site area is returned to a green state, combined with low-albedo paving materials for the balance of the horizontal surfaces virtually eliminating heat-island effect and diverting storm water.

LANDSCAPE

The landscape areas for this project all sit on roof decks and contribute to the many sustainable components of the project. The majority of the landscape is planted with green roof planting with the majority being intensive (growing medium depths exceeding 300mm). The plant material selection, although based on aesthetic preference, utilizes drought tolerance, native or non-invasive species, biodiversity and attractiveness to insects and song birds as criteria for selection. The use of moisture sensors located within the various exposures and micro climates of the planting areas. Water supply for the irrigation will be a combination of recovered storm water with potable water as a backup to this system.

Storm water management for the site has been accomplished by ensuring that over 50% of the exposed sky / roof are covered with landscape and that the landscape components maximize growing medium depths to ensure peak storm flows are reduced and capacity for storm water detention is fully realized.

Landscape materials will be locally sourced and chosen for durability, reusability and base material composition. Our first choice will be to source products derived from recycled materials with low embodied energy.

MATERIALS AND RESOURCES

Existing Structures
The existing structure is currently a concrete parking structure within retail podium below. During the deconstruction of the existing building, maximum use of the materials available within the existing structure will be investigated, including recycling and the reusing of steel and reuse of the concrete, which will be crushed as aggregate and utilized within this or other projects.

Construction Waste Management

At least 75% of the construction waste will be diverted from the landfill routes to other locations.

Recycling Materials

Major strategies that will be followed:

- A goal of 50% recycled content within the project.
- A concrete frame and core structural system utilizing 40% fly ash content
- 100% recycled content for structural elements, including the core walls, core footing and foundation.
- Steel reinforcement and structural steel components have up to 80% recycled content.

ENVIRONMENTAL RESPONSE (cont'd)

Certified Wood
 Although the use of wood within a project such as this is limited in scope, FSC Certified Wood will be utilized throughout the project, including formwork.

Office Design
 Strict adherence to the principles of office planning to produce optimal floor layouts contribute to the maximization of the primary product of this development – office space – and consequently the resources used to build it.
 • Efficient column layout and column-free floor layout
 • Adherence to universally accepted office planning modules
 • Access to natural light – low slits and 9' callings
 • Uninterrupted perimeter walks
 • Open column-free corners

Design development of the structural, mechanical and electrical systems has also yielded a saving in materials and cost by providing an additional floor within the governing envelope, further optimizing the resource use of the project.

Durable Construction
 The nature of the floor plan for this project, with highly adaptable and reusable clear span floor plates, has allowed for the use of more durable materials in the design, thereby increasing the longevity and re-use in the future.

AIR QUALITY
 Indoor Environmental Air Quality (IQ2)
 Reduce CO2 and concrete production by the use of high fly ash content concrete.

IAQ Management Plan
 Development and implementation during construction and pre-occupancy of an indoor quality management plan will be pursued.

Low Emitting Materials
 Low emitting materials will be mandated on this project, including:
 • Low VOC paints, adhesives and sealants
 • Agri fibre products.

OPERATIONS AND MANAGEMENT
 Berrall LP is one of Canada's largest real estate advisory and services organizations and is a recognized leader of Responsible Property Investment (RPI) practices. RPI incorporates environmental, social and governance considerations in a comprehensive approach to real estate investment management. To help improve building performance from both sustainable and economic perspectives, Berrall actively participates in environmental, third-party building certification programs. Berrall are the first major national real estate firm to formally support the BCMA BES (formerly Go Green) certification program and has supported the largest number of BCMA BES certified buildings of all private sector owners/ managers in Canada.

Berrall advocates Leadership in Energy and Environmental Design (LEED®) standards, for new development and redevelopment projects and are actively involved in the development of the LEED® Canada for Existing Buildings - Operations and Maintenance (LEED® Canada EB - O&M) certification program.

Some of Berrall's key property initiatives include:

- Green Specifications for cleaning, landscaping and snow removal
- Formal Responsible Cleaning Program (RCP)
- Eco-friendly office purchase program
- Eco tracking Berrall's office utility, waste and GHG emissions tracking tool.

Berrall's dedication to RPI extends beyond property portfolios; to our commitment to Corporate Social Responsibility. Berrall has implemented an environmental program through a series of measures, including energy management, paper reduction, employee commute and corporate travel. Being ranked as one of the "50 best Employers in Canada" for three consecutive years is a testament to our employees' dedication to a shared vision. Berrall is pleased to have partnered with Bullfrog Power TM, supporting a new green electricity and, corporate, are committed to carbon neutrality in 2020.

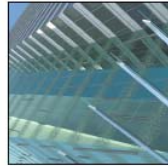
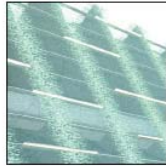
Table 14.18 - Energy & GHG

Table 14.18 - Energy & GHG			Table 14.19 - Materiality		
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MATERIALS

To reduce resource use, improve longevity and ease maintenance, the materials strategy for the project is to use durable materials that require minimal maintenance. Materials will also contribute a sense of grandeur and timelessness to those who experience the building.

The tower element is comprised predominantly of glass with ceramic frit spandrels. All exposed aluminum will be unpainted and anodized. The solidity of the base is reinforced by the use of natural stone and stainless steel structural elements. Unfinished stainless steel is used on the exterior. The exterior base materials and floor finishes are carried into the interior public areas of the project.



APPLICANT, PROPERTY, AND DEVELOPMENT PROPOSAL INFORMATION

APPLICANT AND PROPERTY INFORMATION

Street Address	745 Thurlow Street
Legal Description	PID: 028-194-128 Lot I, Block 18, DL 185, Plan BCP44449
Applicant	Musson Cattell Mackey Partnership
Architect	Musson Cattell Mackey Partnership (Mark Thompson)
Property Owner	2748355 CANADA INC.
Developer	Bentall Real Estate Services

SITE STATISTICS

Site Area	2 412.6 m ² (25,969 sq. ft.)
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DEVELOPMENT STATISTICS

	DEVELOPMENT PERMITTED UNDER EXISTING ZONING	PROPOSED DEVELOPMENT
ZONING	CD-1	CD-1 Amended
USES	Commercial (retail, office, service, incl. hotel) Cultural & Recreational Dwelling in conjunction with Retail and Service uses	No change proposed.
MAX. FLOOR SPACE RATIO	15.4 Except that if dwelling uses are provided the floor space ratio for all uses must not exceed 7.0	16.1 No change proposed to the exception for dwelling use.
FLOOR AREA	399,923 sq. ft.	418,101 sq. ft. (+18,178)
MAXIMUM HEIGHT	91 m (300 ft.)	No change proposed.
PARKING SPACES	268 - 338	314