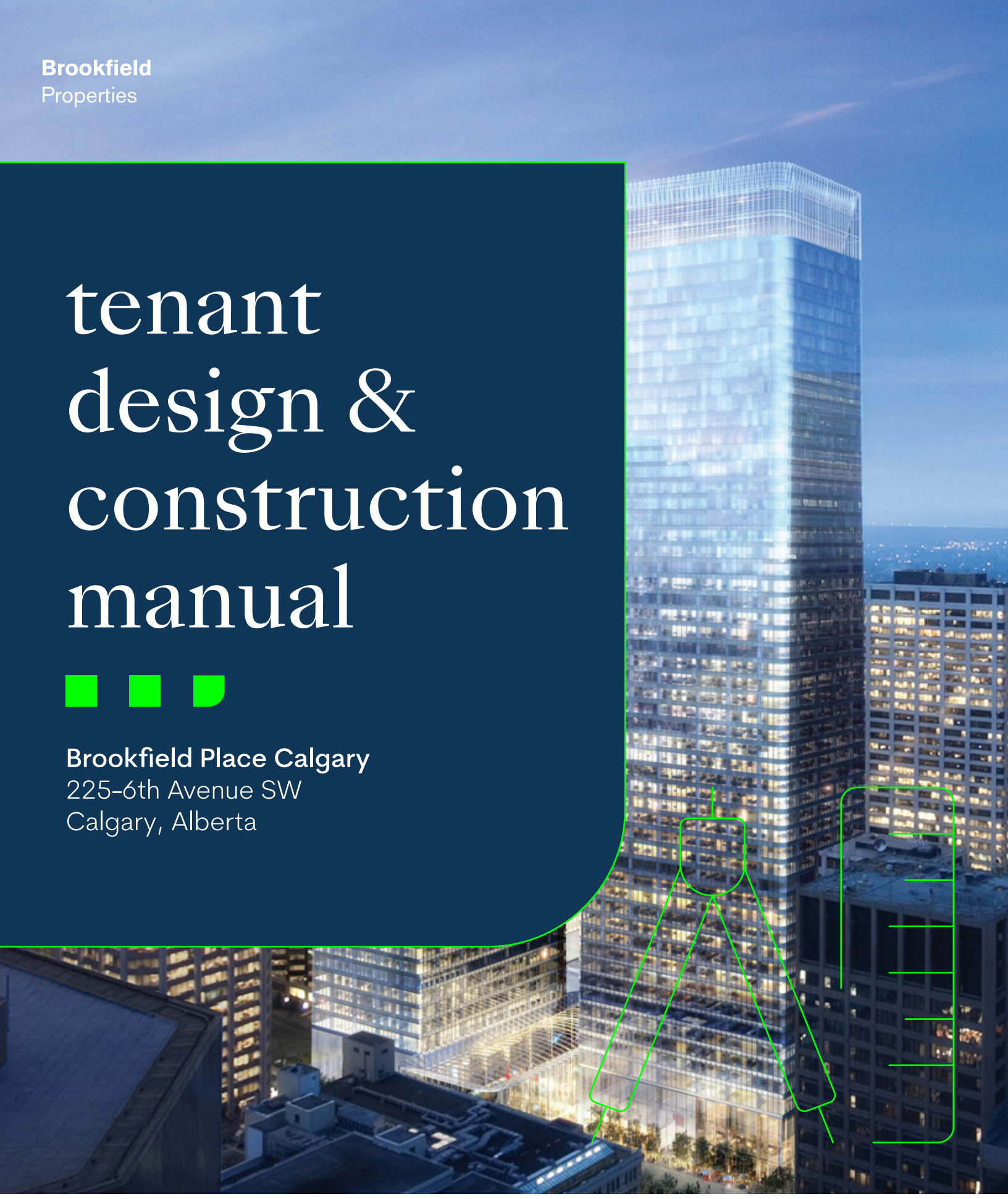
Brookfield
Properties

tenant design & construction manual

Brookfield Place Calgary
225-6th Avenue SW
Calgary, Alberta



This manual is subject to change from time to time. It is critical to refer to the most current version posted on the Building's website, axiistenantapp.com/BPCalgary

Table of Contents

Version 08-08-2022

INTRODUCTION

This Manual is prepared to assist and introduce the Tenant, the Tenant's Consultants and the Tenant's Contractors to the building standards used in the design and construction of this property. This standard also sets out the procedures, practices, rules, and regulations which will be applied to the Tenant's development of the Tenant's Work.

The integrity of the Building developed by the Landlord and its manager, together with all their systems and installations, are the result of meticulous care and planning. Therefore, any contemplated changes or alterations of existing designs and conditions must be completely compatible with the Building's operational or design specifications and/or established decor. It is imperative that any Tenant Leasehold Improvements - however small or limited in scope - be fully reviewed by the Landlord, before any implementation is permitted or undertaken.

Strict conformity to procedural guidelines for Tenant's Work as specified in the Lease is mandatory. Nevertheless, it must be clearly understood that in the event of any ambiguity of, or omission to the wording in this document, the approval authority to proceed or not to proceed with Tenant's Work will remain solely with the Landlord.

It will also be the Tenant's responsibility to ensure that a copy of this Manual is provided to the Tenant's Consultants and Tenant's Contractors and any person employed by them, and that the Tenant, the Tenant's Consultants and Tenant's Contractors and any person employed by them, adhere fully to the direction provided herein. Failure by the Tenant or the Tenant's Consultants and Tenant's Contractors, or any person employed by them, to comply with any of the general or specific guidelines because of a lack of understanding in, or awareness of, the Manual will not be accepted by the Landlord.

It is recommended that the Tenant and/or the Tenant's Consultants and Tenant's Contractors visit the Site to inspect and verify all Site conditions prior to the commencement of Tenant's Work.

The Tenant is responsible for the production of accurate and complete working drawings for the proposed construction within the Premises. Although the Landlord will supply the Tenant with base building drawings, neither the Landlord nor the Landlord's Representative shall be responsible for the same and the Tenant shall ensure that the Tenant's Consultants and the Tenant's Contractors confirm the accuracy of the dimensions in such drawings prior to the performance of the Tenant's Work.

Subject to Section 10.0 of this Manual, the Landlord reserves the right, from time to time, to add or amend the information, procedures and regulations contained herein.

In the event of an issue and where the Landlord is permitted, in accordance with the provisions of this Manual, to incur costs at the expense of the Tenant or the Tenant's Contractor, the Landlord will do so, but only after providing reasonable notice and reasonable time to allow the Tenant or the Tenant's Contractor an opportunity to remedy the issue. The Landlord will only incur costs on the Tenant's, or its Contractor's behalf, if the Tenant or its Contractor fails to remedy the issue or commence remedying the issue.

The Landlord reserves the right to enter the applicable portion of the Premises to complete Landlord Work. Such access shall be coordinated with the Tenant acting reasonably and in accordance with the Lease.

CONSTRUCTION COORDINATION

SECTION 1 - CONSULTANTS AND CONTRACTORS

1.0 BUILDING INFORMATION

Please refer to Appendix 1.

1.1 BASE BUILDING CONSULTANTS

Please refer to Appendix 2 for a complete list of Base Building Consultants.

1.2 APPROVED CONTRACTORS

Please refer to Appendix 3 for a complete list of Approved Contractors.

1.3 BASE BUILDING CONTRACTORS

Please refer to Appendix 4 for a complete list of Base Building Contractors.

CONSTRUCTION COORDINATION

SECTION 2 - GENERAL INFORMATION

2.0 LEGAL DESCRIPTION OF DEVELOPMENT LANDS

Please refer to Appendix 1**.**

2.1 LANDLORD'S REPRESENTATIVE

2.2 LANDLORD'S WORK

2.3 DEFINITIONS

2.1 LANDLORD'S REPRESENTATIVE

The Landlord will designate the Landlord's Representative for the Premises whose primary function will be:

- to provide guidance and assistance to the Tenant throughout the process of design and construction of improvements within the Premises; and
- to review, comment upon and approve all Tenant submissions prior to commencement of Tenant's Work within the Premises; and
- to be the liaison between the Landlord and Tenant, the Tenant's Consultants and Tenant's Contractors.

All questions, comments and submissions relative to Tenant's Work are to be addressed to the Landlord's Representative.

2.2 LANDLORD'S WORK

Construction contractors and consultants hired by the Landlord shall abide by all the requirements as outlined within this Manual as they apply to the Tenant.

2.3 DEFINITIONS

Unless otherwise defined in this Manual, capitalized terms used herein shall have the meaning ascribed to them in the Lease. Where the context so requires, defined terms in this Manual importing the singular sense shall include the plural sense and vice versa.

a. "Addenda" means revisions to the final Issued for Construction documents.

b. "Applicable Construction Laws" means applicable by-laws, codes, standards, regulations, laws, statutes, rules or ordinances including, without limitation, the current versions of the Alberta Fire Code, the *Building Code Act* and the *Alberta Occupational Health and Safety Act* and the regulations passed under such statutes or codes.

c. "Approved Contractors" means the contractors identified in Appendix 3 and "Approved Contractor" means any one of them.

d. "Authorities" means Governmental Authorities having jurisdiction at the location of the Building (including, without limitation, Authorities relating to Applicable Construction Laws).

e. "Base Building Consultants" means the consultants identified in Appendix 2 and "Base Building Consultant" means any one of them.

f. "Base Building Contractors" means the contractors identified in Appendix 4 and "Base Building Contractor" means any one of them.

g. "Base Building Work" means the base building work for the Building as described in this Manual**.**

h. "Building" means, as applicable, in which the Premises are or may be located, and as further described in Section 4.0.

i. "Building Operational Hours" means the hours that a building operator is available on site. Confirm hours with the Landlord Representative.

j. "Normal Business Hours" means (i) between 6:00 a.m. and 6:00 p.m. from Monday to Friday (inclusive) excluding statutory holidays in Alberta.

k. "Design Process" means the development and completion of the design for the Tenant's Work.

l. "Fixturing Period" means the period(s) provided for in the Lease.

m. "Issued for Construction" means, as the term is commonly used in the construction industry, the final documents used for construction of the Premises.

n. "Landlord" means Brookfield Place (Calgary) GP Inc., as the sole general partner of: Brookfield Place (Calgary) LP by its agent (and not as general partner): Brookfield Properties Canada Management LP, by its sole general partner: Brookfield Properties Canada Management Corporation

o. "Landlord's Representative" means the entity identified in Section 2.0.

p. "Lease" means the lease and all lease documentation subsequently executed between the Landlord and the Tenant.

q. "Manual" means this Tenant Design and Construction Manual.

r. "Open for Business" means the first day the Tenant begins the conduct of business in any part of the Premises.

s. "Premises" is as defined in the Lease.

t. "Project" means all work, coordination, management and activities required to complete the construction of the Development.

u. "Project Architect" means that Person identified in Appendix 1.

v. "Reviewed Drawings" has the meaning set out in Section 3.2.

w. "Safe Work Permit" means a permit that authorizes certain types of work that may be potentially dangerous to building occupants or disruptive to the building services and operations.

x. "Site" means the site of the Building.

y. "Substantial Performance of the Tenant's Premises" means the date the Tenant's Premises are ready to be used for the Tenant's business or are being used for the Tenant's business.

z. "Tenant" means the occupant and tenant under the Lease, including any Permitted Transferee, any person which has been granted a Sublease and

aa. "Tenants" means the tenants of the Landlord in the Building.

bb. "Tenant's Construction Manager" means such construction manager as the Tenant may appoint from time to time.

cc. "Tenant's Consultants" or "Tenant's Consultant" means the architects, engineers and other consultants, directly or indirectly, retained by the Tenant in connection with the Tenant's Work who shall be licensed or otherwise authorised to practise in Alberta.

dd. "Tenant's Contractors" or "Tenant's Contractor" means the contractors and suppliers, directly or indirectly retained by the Tenant in connection with the Tenant's Work including, without limitation, sub-contractors.

ee. "Tenant's Work" or "Tenant Leasehold Improvements" includes, without limitation, the Leasehold Improvements as set out in Section 4.2 of this Manual, and any other work performed on behalf of the Tenant in accordance with the Lease.

ff. "Turnover Date" means the date in respect of an applicable Fixturing Period which commences in accordance with the provisions of the Lease.

gg. "Work Authorization Permit" means a form to control and coordinate access to the Building while maintaining Building security and safe working conditions, as well as to transmit information between Tenants, Building management, Building operations and security.

hh. "Working Day" means any day which is not a Saturday, Sunday or statutory holiday in Alberta.

CONSTRUCTION COORDINATION

SECTION 3 - TENANT'S DESIGN AND WORKING DRAWINGS

3.0 TENANT'S CONSULTANTS

3.1 PRE-DELIVERY INSPECTION AND TURNOVER OF TENANT PREMISES

3.2 SUBMISSION AND REVIEW OF DESIGN PLANS & SPECIFICATIONS

3.3 SUBMISSION OF PRELIMINARY DESIGN AND SPECIFICATIONS

3.4 APPROVAL OF PRELIMINARY DESIGN PLANS AND SPECIFICATIONS

3.5 SUBMISSION OF FINAL PLANS AND SPECIFICATIONS

3.6 APPROVAL OF FINAL PLANS AND SPECIFICATIONS

3.7 REVIEW, APPROVAL AND COMMENTS

3.0 TENANT'S CONSULTANTS

- The Tenant shall engage the Tenant's Consultants to prepare dimensioned construction drawings and specifications that are necessary for the construction of the Tenant Leasehold Improvements. The approval by the Landlord of the Tenant's Consultants including, the Tenant's architectural, interior design, mechanical, electrical, fire protection and structural consultants, shall be obtained by the Tenant prior to the Tenant engaging any of its Tenant's Consultants.

- The Tenant may wish to retain the Base Building Consultants under direct contractual arrangement for the production of working drawings. If the Tenant chooses to employ consultants other than the Base Building Consultants for its design work, the Landlord's Representative will have such drawings checked and the construction inspected by the Base Building Consultants to ensure compatibility with the building's systems. The cost of such work by the Base Building Consultants will be charged to and paid by the Tenant. Rates for such reviews are available upon request directly from the Base Building Consultants, prior to the commencement of the Design Process. A list of Base Building Consultants can be found in Appendix 2 of this Manual.

- All drawings, including but not limited to space plans, architectural, structural, mechanical and electrical drawings, must be reviewed by the Landlord prior to the commencement of any Tenant's Work.

- The Landlord, from time to time, may require the Tenant to produce additional or more detailed drawings or information which, in the Landlord's opinion, may be necessary to identify and describe the nature of the intended improvements.

- The Tenant shall ensure its consultants visit the Site to verify the actual Site conditions prior to the commencement of the Tenant's Work.

- By giving approval to the Tenant's plans, the Landlord and its consultants do not waive the Tenant's responsibility to ensure that any and all Tenant Leasehold Improvements meet the requirements of the Lease, this Manual and the Applicable Construction Laws. The Tenant and the Tenant's Consultants shall inform themselves regarding the requirements of the Applicable Construction Laws, as well as this Manual, before preparing the plans and specifications.

  The Tenant shall require the Tenant's Consultants to purchase and maintain the following insurance coverage:

  Worker's Compensation

Minimum Required Limits:	▪ Worker's Compensation - Statutory Limits ▪ Employer's liability (where not covered by statutorily imposed Workers Compensation): ▪ $1,000,000 Each Accident for Bodily Injury by Accident ▪ $1,000,000 Each Employee for Bodily Injury by Disease ▪ $1,000,000 Aggregate Policy Limit for Bodily Injury by Disease

Commercial General Liability: Tenant's Consultant will place and maintain commercial general liability insurance covering all operations by or on behalf of the Tenant's Consultant on an occurrence basis against claims for bodily injury, property damage (including the loss of use thereof), personal injury and advertising injury.

Such insurance will have these minimum limits, terms and conditions:

Minimum Required Limits:	▪ $5,000,000 Products and Completed Operations Aggregate ▪ $5,000,000 Bodily Injury/Property Damage Per Occurrence ▪ $5,000,000 Personal Injury and Advertising Injury Limit ▪ (Limits may be a combination of Primary and Umbrella/Excess policies)
Required Terms and Conditions:	▪ Commercial General Liability Policy (IBC 2100 03/05(R)) ▪ Products and Completed Operations coverage maintained for at least two (2) years after contract completion ▪ Blanket Contractual Liability ▪ Independent Contractors ▪ Broad Form Property Damage ▪ Cross Liability and Severability of Interest ▪ Explosion, Collapse and Underground (XCU) – if work involves digging or excavating ▪ Personal Injury and Advertising Injury ▪ Incidental Medical Malpractice ▪ Landlord and "Additional Insured" described below to be included as additional insured ▪ Waiver of Subrogation in favor of Landlord and all other "Additional Insured" described below ▪ Including non-owned and hired automobile Liability

Automobile Liability: If the Tenant's Consultant operates an automobile in the course of performing work, the Tenant's Consultant will maintain Business Auto Liability covering liability arising out of any auto.

Minimum Required Limits:	▪ $2,000,000 Combined Single Limit Each Accident
Required Terms and Conditions:	▪ Business Auto Policy or Equivalent

Professional Liability (Errors and Omissions): Tenant's Consultant will purchase and maintain Professional Liability insurance.

Minimum Required Limits:	▪ $2,000,000 Each Claim and Annual Aggregate
Required Terms and Conditions:	▪ Insured's Interest in Joint Ventures (if applicable) ▪ Punitive Damages Coverage (where not prohibited by law) ▪ Limited Contractual Liability ▪ Retroactive Date Prior to Start of Services ▪ Extended Reporting Period of 36 Months or More ▪ No Pollution Exclusion

Additional Insured:

Brookfield Place (Calgary) GP Inc., Brookfield Place (Calgary) LP, Brookfield Properties Canada Management Corporation, Brookfield Properties Canada Management LP, Brookfield Properties (Canada) Inc., The Bank of Nova Scotia must be named as additional insured under the contractor's general liability policies.

The foregoing list of "Additional Insured" specified herein may be amended by Landlord from time to time upon reasonable notice in writing to the Tenant to add additional entities including, lenders, tenants, co-owners, joint ventures or other entities having an interest in the Building, as may be reasonably required.

All insurance policies shall be in a form reasonably acceptable to Landlord. The Landlord to provide reasonable written notice in the event of changing such requirements.

3.1 TURNOVER OF TENANT PREMISES

Prior to the Turnover Date of the Premises to the Tenant, the Landlord's Representative will schedule pre-delivery inspections with the Tenant and its agents. The Premises will include base building washrooms, and other on-floor common areas such as electrical and mechanical rooms.

Pre-delivery inspections will occur prior to the planned Turnover Date to review completion of the space against the turnover conditions as required in the Lease. In addition, the Landlord will accommodate access to the applicable portion of the Premises by the Tenant and/or the Tenant's Consultants at any other time prior to the respective Turnover Date, subject to Site conditions (and as determined by the Tenant and the Landlord acting reasonably) for the purposes of space planning and to verify Site dimensions and conditions.

3.2 REVIEW OF DESIGN PLANS & SPECIFICATIONS

- The Tenant's drawings will be reviewed by the Landlord for compatibility with the overall Project; comments and/or review will be marked on one (1) set of drawings or in a letter addressed to the Tenant or its designated representative. The distribution of such comments to the Tenant's Consultants shall be the responsibility of the Tenant.

- The Tenant's plans shall show Building grid lines, scale, Tenant's Consultant's building code identification number, designer's name and address, engineer's name, address and stamp, date of issue and revision number.

- For the purpose of this Manual, the Tenant's drawings reviewed by the Landlord shall be called "Reviewed Drawings". Any revisions made to the Reviewed Drawings by the Tenant and/or its agents must be submitted to the Landlord for further approval.

- The then-most current set of prints of the Reviewed Drawings must be kept on the Premises for the duration of the construction period and be available to the Landlord's Representative or its authorized representatives upon request.

3.3 SUBMISSION OF PRELIMINARY DESIGN AND SPECIFICATIONS

The Tenant will provide the Landlord with one (1) printed set of preliminary design plans and specifications for all of the Tenant's Work. These shall demonstrate design intent and shall be subject to the approval of the Landlord prior to the Tenant's preparation of final plans and specifications.

Preliminary drawings shall include the following information at a minimum (additional information is encouraged):

- Key Plan showing the location of the Tenant's Premises;
- Preliminary Floor Plans (1:100) indicating interior design (indicate all materials and finishes); Reflected Ceiling Plans (1:100) indicating ceiling materials, ceiling heights, the location, and type of all light fixtures, sprinklers, life safety, music speakers, air grilles, exit lights and signage; Samples and colour chips of all finishes visible in the common areas should be firmly applied to illustration boards (maximum size 216 mm x 356 mm (8 ½ " x 14")) and shall be clearly labelled and counter-referenced on the drawings.

3.4 APPROVAL OF PRELIMINARY DESIGN PLANS AND SPECIFICATIONS

Within ten (10) Working Days after receipt of the design plans and specifications, the Landlord shall notify its written approval thereof or indicate any changes required, in which case the Tenant shall resubmit for written approval, amended plans and specifications. Prior to resubmission the Tenant will, if necessary, discuss any required changes with the Landlord.

3.5 SUBMISSION OF FINAL PLANS AND SPECIFICATIONS

At least thirty (30) days prior to the commencement of each respective Fixturing Period, or any Fixturing Period provided for in the Lease, the Tenant shall submit one (1) printed set and one (1) PDF set of final Issued for Construction plans and specifications and such other information as may be necessary for the Tenant's Work to be reviewed. Electrical, mechanical, and structural drawings must be signed and sealed by the engineer responsible for the design.

Each set of final plans and specifications shall be in metric dimensions and be of uniform size not exceeding 610mm x 914mm (24" x 36") to a minimum scale of 1:100 and shall include, but not be limited to, the following:

(Not all the information is required within the specific disciplines listed below as long as all the information is provided within the drawings and specifications as a whole):

a. Architectural Submission

One (1) set of drawings (Scale 1:100 minimum) and a sample board of finishes. The Tenant must include the following:

i. **Key Plan**
- Where the Premises occupy less than a full floor, plans must be included of the entire floor showing the location (complete with dimensions) of the Premises and their relationship to the elevator lobby, exit stairs, washrooms, Fire Extinguishers, etc.

ii. **Floor Plans**
- Location of all major fixed elements within the Premises dimensionally related to grid lines and demising partitions;
- Furniture plan with room designation and uses;
- Location, and layouts of rooms of unusual loading concentration such as centralized filing areas, libraries, vaults, etc. (subject to the approval of the Landlord's structural engineer);
- Materials and finishes throughout the Premises;
- The number of people to occupy the Premises;
- Telephone and power outlet plan dimensioned;
- Location of inter-floor stairs if any (subject to the approval of the Landlord's structural engineer).

iii. **Reflected Ceiling Plan**
- Lighting layout;
- Partition layout;
- Location of any sound baffles above the ceiling;
- The locations of any access panels required to service building systems;
- Ceiling heights;
- Location of proposed special light fixtures, their manufacturer's name and catalogue cut sheets, lamps to be used and mounting details (recessed, surface, etc.);
- General pattern, grilles, diffusers, air transfer ducts, speakers, sprinkler heads, coves and recesses;
- Specify ceiling material by name, thickness and colour, as well as fire rating if required by Applicable Construction Laws.

iv. **Sections and Details**
- At a suitable scale to indicate partition details, baffles, doors, millwork, etc.

v. **Room Finish, Door and Hardware Schedules**
- All elements including the keying which must be to base building standard.

b. Mechanical Submission (stamped by Engineer)

One (1) set of drawings (Scale 1:100 minimum) prepared by a registered professional engineer.

Drawings are to show all alterations and/or additions to the existing Base Building Work, as well as base building conditions that remain unchanged.

i. **H.V.A.C. Layout**
- Ceiling plan complete with detailed ductwork layout;

- All duct sizes;
- Location of A/C units or fan-powered-boxes;
- Location of all dampers, grilles, and diffusers;
- Transfer-ducts;
- Thermostats;
- Access doors;
- All other equipment as required;
- Heating load calculations;
- Air quantities required at each diffuser and additional information, if applicable.

ii. **Plumbing Layout**
- Floor plan indicating piping runs for drains, vents and water supply;
- Location of valves;
- Location of clean-outs, grease traps, and back-flow preventers;
- Other special or specific requirements;
- Indicate location of water meter and location of hot water tank, if applicable.

iii. **Sprinkler Layout**
- A dimensioned layout of the sprinkler piping and size indicating all sprinkler heads (new and relocated) is required;
- Sprinkler layout is to include calculations where more than 5 heads are added to the system;
- A dimensioned layout of new or relocated fire extinguishers;
- Pressure Relief Valve (PRV) setting and data is also required.
- Show all kitchen equipment fire suppression equipment with associated support systems.

c. Electrical Submission (stamped by engineer)

One (1) set of drawings (Scale 1:100 minimum) prepared by a registered professional engineer. Drawings are to show all alterations and/or additions to the existing Base Building Work, as well as base building conditions, which remain unchanged.

i. **Electrical Plan**
- Locate light fixtures, emergency and exit light fixtures;
- Specify size, wattage, type and mounting of fixtures;
- Locate all life safety devices including speakers, pull stations, smoke detectors and heat detectors;
- Submit wiring diagram showing circuitry of all electrical elements within the Premises;
- Provide electrical load summary separating lighting, power, and disproportionate/high use loads;
- Tie-ins and extensions to base building security, fire alarm and communication systems must be also clearly shown.
- Any other specific requirements.

ii. **Metering**
- The Tenant shall provide all metering for electrical loads.

d. Structural Submission (stamped by engineer)

One (1) set of drawings (Scale 1:100 minimum) prepared by a registered professional engineer. Drawings and specifications are to show all structural modifications and or review of excessive structural floor loading including but not limited to safes, lockers, file systems, and library shelving, to the base building.

e. Specifications

Specifications must be submitted with the working drawings describing the quality and performance standards for all of the Tenant's Work in "CSC (Construction Specifications Canada), 3 part format, Master format numbering system."

f. Signage

i. **Standard Signs**

- Main office lobby electronic directory (by Landlord). Order forms for the above will be sent directly to the Tenant for completion.

ii. **Corporate Identity**

- Interior signage seen through a glass entrance must be approved in writing by the Landlord's Representative prior to implementation.
- Signage is to be for corporate identification of businesses, but not for advertising the service(s) offered.
- Design drawings, separate from the standard architectural plans and sample board, if applicable, must be sent in duplicate to the Landlord to initiate the approval process. The drawings must indicate location, size, material, colour, and installation method of all proposed signage.
- Materials not acceptable are letraset, stencils, hand-drawn lettering, computer forms, photocopies, cardboard / gaterboard / chloroplast or plastic sign boards. Signs must be professionally designed and produced.

3.6 REVIEW OF FINAL PLANS & SPECIFICATIONS

Within fifteen (15) days after receipt by the Landlord of the Tenant's final plans and specifications, the Landlord shall provide its review/comments. The Tenant shall revise its drawings to include all the comments and provide the Landlord with a revised set of prints "Issued for Construction" prior to commencing the Tenant's Work. All revisions must be clearly identified on these revised drawings. The Landlord shall not be obligated to change or extend any of the dates contained in the Lease as a result of the drawings being rejected by the Landlord or its consultants, unless such rejection is not in accordance with this Manual or the Lease.

Subject to this Section 3.6, the Landlord's review of the Tenant's plans and specifications shall relate only to general compliance with this Manual and shall not extend to, and shall not be deemed to signify compliance with the Lease, Applicable Construction Laws, applicable laws, building codes or with life safety or emergency requirements of competent Authorities. The Landlord accepts no liability for claims against the Tenant in respect to any of these matters.

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CONSTRUCTION COORDINATION

SECTION 4 - BUILDING DESIGN PARAMETERS

4.0 GENERAL

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4.2 TENANT WORK

4.0 GENERAL

General Overview (Full Block Development)

The overall Brookfield Place Calgary development will occupy the entire city block between 1st and 2nd Streets SW and 6th and 7th Avenues SW. The East Tower (Phase 1) is designed as a 56 storey office building located on the north-east portion of the block. The second phase will include a 41 storey office tower (West Tower) located on the north-west portion of the block. The two office towers (East and West) are planned to share five and partial 6th parking levels of common below-grade parking, a loading dock and a central pavilion containing retail space and Plus 15 connections.

Total retail space at grade and Plus 15 level to contain approximately 40,000 rentable square feet.

The ground floors of both towers to contain office tower lobbies, retail spaces and direct connections to a central pavilion providing access to the Plus 15 level.

The East Tower component consists of 52 storeys of office space on floors 4 to 56 containing approximately 1.4 million square feet of rentable area above grade. The third floor of the office tower is a mechanical level and there is no 13th floor designation.

The development is designed to achieve Canadian Green Building Council (CaGBC) LEED Gold Core & Shell Certification 2009.

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4.2 TENANT WORK

The Tenant shall, at its expense, complete the Premises in accordance with the standards of other premises in comparable quality buildings of similar type and size in downtown core of Calgary, Alberta, and as reviewed by the Landlord, using new materials, including but not limited to the installation of:

Interior Partitions:	Interior partitioning, including the finishing thereof complete with millwork and fixtures.
Flooring Finish:	All flooring must be reviewed by the Landlord.
Power:	Power distribution within the Premises, to be distributed through partitions and to be carried out at the Tenant's expense. The Landlord will supply an electronic sub-metering system, on a floor by floor basis, approved by Measurement Canada. Tenants occupying space on a multi-tenant floor are required to supply and install receptacle panels, as required, within their own premises and separate electricity meter to meter all general power (plug loads), supplementary HVAC and any non-standard lighting loads. Purchase/installation of new meters must be arranged through the applicable Base Building Contractor. Floor lighting and HVAC electrical loads are metered by the base building meters that will be installed.
Mechanical Systems:	The Tenant may effect modification to the Landlord's on-floor mechanical systems within the Premises as may be required by the Tenant. Tenant will provide an air balancing report, to be performed by the Tenant using the applicable Base Building Contractor and reviewed by the Landlord.
Plumbing Connections	Plumbing distribution within the Premises, to be distributed through partitions and underslab and to be carried out at the Tenant's expense. All equipment serving the Premises, must be noted on the drawings. All domestic water piping and connections to base building valves must be Type 'L' copper or braided steel enforced tubing with threaded fittings. All piping and connections to base building sanitary or vent systems shall be cast iron or DWV copper. **PVC, PEX, and ABS are not acceptable.**
Electrical Systems:	The Tenant may effect modification to the Landlord's on-floor electrical system within the Premises as may be required by the Tenant. Tenant will provide an electrical load balance report, to be performed by the Tenant using the applicable Approved Contractor and reviewed by the Landlord.
Fire Hose Connections and Sprinklers:	Modifications to the Landlord's fire safety systems required by Authorities having jurisdiction, which shall be performed by the Tenant using the applicable Base Building Contractor.
Fire Alarm System:	Modification to the Landlord's fire alarm and life safety system required by Authorities having jurisdiction, which shall be performed by the Tenant using the applicable Base Building Contractor.

Signs:	Any common area Tenant visible signage, proposals for which must be presented to the Landlord for written approval. In accordance with Section 3.5(f) of this Manual, only those signs which are compatible with the Building and are tasteful in size, colour and logo will be approved.
Ceiling Tiles:	Installation or relocation of ceiling tiles.
Elevator Lobbies:	Finishing and modifications of the elevator lobby, including but not limited to floors, walls, ceilings, mechanical, electrical, elevator devices, and lighting, where a tenant leases the whole office floor.
Building Automation System:	Any modification to Building controls required as a result of Tenant modifications which will be carried out exclusively by the Tenant using the applicable Base Building Contractor.
Additional Requirements:	Any additional requirements of the Tenant.
Noise Criteria:	The typical floor office space shall not exceed NC35 as the average operating level, and NC40 within 3.0 meters (10'-0") of the on-floor mechanical Room, for noise resulting from mechanical equipment.
Communication Work	From building demarcation point to Tenant communication room. Tenant equipment is not allowed in base building rooms unless reviewed by the Landlord.

CONSTRUCTION COORDINATION

SECTION 5 - CONSTRUCTION PROCEDURES FOR TENANT WORK

5.0 TENANT'S REQUIREMENTS

The Tenant, at its expense, is responsible for the following:

a. Execution of the Lease for the Premises.

b. Insurance:

The Tenant must provide to the Landlord, evidence of insurance coverage for (a) Tenant's insurance as required in the Lease, (b) Tenant's Contractors' insurance (as outlined in this Manual) as amended from time to time by the Landlord, at the determination of the Landlord and with at least thirty (30) days prior written notice to the Tenant, prior to the undertaking of any construction in the Premises and/or any other areas requiring access within the Building and (c) Tenant's Consultants, as described in Section 3 of this Manual, at the determination of the Landlord and with at least thirty (30) days prior written notice to the Tenant prior to commencement of the design development. Insurance coverage shall be at least the minimum stated in the Lease and the Persons listed as "Additional Insured" in Section 3.0 of this Manual shall be named as additional insured.

c. Obtaining written approval from the Landlord, acting reasonably, for final Issued for Construction documents.

d. Permits:

The Tenant is responsible for obtaining all necessary permits and approvals from The City of Calgary, and any other Authorities having jurisdiction, in accordance with the Lease. The Tenant shall submit copies of the building permit and any other required permits or approvals to the Landlord, prior to the commencement of the Tenant's Work. The Tenant shall forward all comments from the Authorities to the Landlord's Representative for its review.

Upon receipt of the building permit, the Tenant shall forward one (1) copy of the building permit to the Landlord's Representative. One (1) copy of the stamped building permit drawings must be kept on site.

It is the Tenant's responsibility to have the Premises inspected by the building, electrical, plumbing and HVAC inspectors, ensure that the applications are closed, and provide evidence of permit closure.

e. Lien Protection:

If a Lien arising from the Tenant or the Tenant's Work is registered against the Site or given to the Landlord, the applicable provisions of the Lease shall apply to such Lien.

f. The fulfilment of the obligations and responsibilities of the Tenant's Contractors set out in this Manual.

5.1 TENANT'S CONTRACTOR'S REQUIREMENTS

The Tenant is required to engage its own contractors for the purpose of carrying out Tenant's Leasehold Improvements. The Tenant shall ensure that all Tenant's Contractors comply with the following:

a. The Tenant's Contractors shall, or in the case of items 5.1(a)(iii) the Tenant, prior to commencement of construction, furnish evidence that they are adequately and properly covered by insurance according to the following items:

i. Commercial General Liability policy to be in force with a limit to any one occurrence of $10,000,000.00. Such coverage includes products and completed operations liability, blanket contractual liability, personal injury liability, occurrence basis property damage and non-owned automobile liability, owner's and contractor's protective insurance with respect to the Premises and Tenant's Contractor's use of the Tenant's Work and with cross liability, severability of interest and breach of conditions clauses;

ii. "All risk" of physical loss or damage policy be provided covering the total contract price for the Tenant's Work and shall include a waiver of subrogation rights against the Landlord, Brookfield Properties (Canada) Inc., Brookfield Properties Canada Management Corporation, Brookfield Properties Canada Management LP, and any person for whom the foregoing persons are legally responsible and an endorsement to the policy stating that such policy is primary;

iii. "All risk" of physical loss or damage policy be provided covering the Tenant's Contractors' owned tools, equipment and property and shall include a waiver of subrogation rights against the Landlord, Brookfield Properties (Canada) Inc., Brookfield Properties Canada Management Corporation, Brookfield Properties Canada Management LP, and any person for whom the foregoing persons are legally responsible and an endorsement to the policy stating that such policy is primary;

iv. An automobile policy be in force covering all owned vehicles, with a $2,000,000.00 combined single limit liability for bodily injury and property damage;

v. The Landlord and while on Site, all contractors and subcontractors and trades of those insured, engaged in or connected with the construction of the Premises are listed as "Additional Insured" on the policy identified in 5.1(a)(i) above;

vi. All policies of insurance relating to Tenant's Work must be in amounts and in form and with insurers acceptable to the Landlord, acting reasonably, including an undertaking by the insurers to endeavor to give at least (30) days written notice of cancellation or material changes to the policy holder and the Landlord. The Tenant shall endeavor to give the Landlord at least thirty (30) days written notice of any material changes to any policy of insurance to be maintained by the Tenant or the Tenant's Contractor;

vii. Evidence of the existence of insurance coverage, referred to in this Section 5.1 must be submitted to the Landlord by means of a Certificate of Insurance from the Tenant's or the Tenant's Contractor's insurers or by a certified copy of the actual policy documents before commencement of Tenant's Work.

b. The Tenant shall retain the Approved Contractors, or those contractors as approved by the Landlord, as applicable, for the performance of the Tenant's Work. Notwithstanding the foregoing, Tenant's Contractors who will be performing physical modification to the Building or to the Building Systems must be reviewed in writing by the Landlord.

The Tenant shall furnish evidence of good standing with the Workers' Compensation Board ("WCB") with a valid WCB Clearance Certificate, to be provided to the Landlord prior to initiation of the Tenant's Work. The Tenant's Contractors shall keep WCB coverage in force at all times for the duration of the Tenant's Work. The Tenant's Contractors will confirm in writing that all employees engaged in the Tenant's Work are covered in accordance with the statutory requirements of the Authorities having jurisdiction over such employees. Where not covered by statutorily imposed

Workers' Compensation, Tenant's Contractor will maintain Employers' Liability Insurance with limits of not less than $1,000,000.00 per occurrence.

c. The Tenant shall engage the services of the Approved Contractors including but not limited to Tenant's Work involving fire alarm, sprinklers, fire protection systems, lighting controls, temperature controls, data/communications, roofing, locksmith, x-raying, air balancing, electrical and mechanical work.

d. The Tenant shall furnish the Landlord's Representative with all information listed in Section 5 of the Manual;

e. The Tenant shall comply with all Applicable Construction Laws.

f. The Tenant shall post on Site all permits obtained from Authorities. If the Tenant's Contractor fails to do so, the Landlord, with prior written notice to the Tenant but at its option, may cause the workmen, subcontractors and suppliers of the Tenant's Contractor to stop all work and leave the Premises. If after receiving adequate written notice the Tenant is unable to post all permits, the Landlord, at its option may remove all materials and work installed by the Tenant at the Tenant's expense.

5.2 COMMENCEMENT OF CONSTRUCTION

The Tenant must carry out all Tenant's Work in accordance with the Reviewed Drawings and construction work must comply with all Applicable Construction Laws.

It is the Tenant's responsibility to ensure that the Tenant's Contractors comply with all Applicable Construction Laws and requirements of the Workplace Hazardous Materials Information System ("WHMIS") and the Alberta Occupational Health and Safety regulations, policies and directives of the Landlord, as applicable, in accordance with Section 6 of this Manual, as may be amended in accordance with the Lease.

a. Construction may proceed only after the following have been complied with:

i. The Lease for the Premises has been executed.

ii. The Tenant's plans and specifications have been reviewed in writing by the Landlord;

iii. The Tenant has provided acceptable evidence of insurance as per the Lease and this Manual, naming the Landlord and Manager and the other entities identified as "Additional Insured" in Section 3.0 above as additional insured; and

iv. The Landlord shall issue written notice to the Tenant advising that all the conditions prerequisite to the commencement of Tenant's Work have been complied with to the satisfaction of the Landlord provided such notice is without prejudice to any right or remedy available to the Landlord.

b. Construction may proceed only after the applicable Tenant's Contractor has complied with the following:

i. Provided a copy of application for and issued building permit(s);

ii. Posted all required permits on Site, with a copy delivered to the Landlord's Representative;

iii. Made available at the Premises, a set of prints of the Landlord Reviewed Drawings and building permit drawings for the duration of the construction period for reference by the Landlord's and The City of Calgary Building Department authorized representatives;

iv. Provided acceptable evidence of insurance for itself and all sub-contractors, as required by Section 5.0, (unless provided by the Tenant) to the Landlord, naming the sub-contractors, Landlord and the Management Company and the other Persons identified as "Additional Insured" in Section 3.0 above as additional insured;

v. Submitted a construction schedule; and

vi. Submitted a valid certificate from Workers' Compensation Board; and

vii. Submitted copies of Addenda; and

viii. Provided a list of subcontractors indicating contact names and telephone numbers for after hour emergency use; and

ix. Submitted completed Work Authorization Permit, as provided by the Landlord's Representative prior to any Turnover Date or adjusted Turnover Date.

5.3 PROCEDURES DURING CONSTRUCTION

a. Tenant will submit to the Landlord's Representative during construction:

i. Copies of all on Site construction meeting minutes;

ii. Copies of contemplated changes to the Tenant's Work at time of issuance to Tenant's Contractors;

iii. Copies of all site visit reports by the Tenant's Consultants during the course of construction Tenant's Work;

iv. Copies of Site reports issued by Authorities having jurisdiction (if applicable); and

v. Copy of Designated Substance report (if applicable).

b. Inspection of Tenant Premises as required:

i. Prior to commencement of any Tenant's Work, an inspection of applicable Tenant Premises shall be performed by the Tenant, its agents and the Landlord's Representative.

ii. Intentionally left blank.

iii. The Landlord and its agents, architects, engineers and consultants shall have reasonable access, subject to Tenant's permit access process described in the Lease, to the Premises for the purpose of inspecting the Tenant's Work in progress. The Landlord or its consultants may note deficiencies in the Tenant's Work, which shall be corrected by the Tenant promptly.

iv. The Tenant shall directly engage, at the Tenant's expense, Base Building Contractors, for all mechanical and electrical tie-ins to the base building systems, all sprinkler, fire alarm, and building controls work, and all air and water balancing.

v. After completion of Tenant's Work another inspection shall be made between the Landlord's Representative and the Tenant for both Tenant areas and the floor, as well as the floors immediately above and below. Any damages caused by the Tenant's Contractors to the base building in the execution of the Tenant's Work shall be repaired by the Landlord's Representative at the Tenant's expense (see Section 8.0 of this Manual).

c. Interface with base building:

i. Prior to commencement of any Tenant's Work which will connect to or interface with the base building systems and services such as water, electricity, fire services, and air handling, the Tenant shall:

a. Advise the Landlord that such connection or interface is necessary; and

b. Provide details of the work required to be performed; and

c. Provide a schedule as to when such work is anticipated to be performed; and

d. Provide the names of the Tenant's Contractors who will be performing the interconnection or interface work.

ii. The Tenant shall not proceed with any such interconnecting or interfacing work without first getting the approval of the Landlord as to the scope and timing of the interconnection and interfacing work and such work shall only be conducted by Base Building Contractors as set out in this Manual in Appendix 4. The commissioning, testing or inspection of Base Building Work services may occur during times when the Tenant's Contractors are performing Tenant's Work in which case the interconnection and interfacing work will not be permitted to proceed in a way that interrupts or impedes completion of testing, commissioning or inspections of the Base Building Work services.

d. Safe Work Permit

A Safe Work Permit is a permit that authorizes certain types of work that may be potentially dangerous to building occupants or disruptive to the building services and operations. It can be obtained during Building Operational Hours.

All construction work involving, but not limited to the following requires a Safe Work Permit: (Refer to Appendix 8)

- Welding and open flame work (See Appendix 8)
- X-raying
- Drilling or cutting
- Lock-out or disabling of base building systems
- Fire alarm systems Sprinkler system modification (See Appendix 11)
- Dust producing activities
- Confined space entry
- Life Safety System testing or verification.

All contractors and Tenants must be aware that both the sprinkler and fire alarm systems, such as smoke detectors, cannot be simultaneously disabled or bypassed in a single work area at any one time during Tenant construction. The Tenant and their contractor are responsible to schedule their work in such a way that only one of these systems will be affected at any one time, and shutdowns will be scheduled accordingly.

5.4 COMPLETION OF TENANT CONSTRUCTION

a. Upon completion of the construction and prior to opening for business within the applicable portion of the Premises, the Tenant will submit the following closing documentation to the Landlord's Representative:

i. Certificate of Substantial Performance of the Tenant's Premises (as applicable and available); and

ii. Confirmation from the Tenant that all electrical panels have been tagged and circuit directories updated; and

iii. Confirmation from Tenant that all surplus base building equipment and material such as (but not limited to) ceiling components, doors, door frames, hardware, light fixtures, speakers, etc., which the Tenant removes with the approval of the Landlord's Representative, remain the property of, and must be turned over to, the Landlord's Representative in working order; and

iv. Verification report of fire alarm devices; and

v. Material & test certificates for sprinkler and standpipe work; and

vi. One (1) copy of consultant's approved air balancing report prepared by contractor from Landlord's Approved Contractors list; and

vii. One (1) copy of consultant's approved electrical load balance report prepared by contractor from Landlord's Approved Contractors list; and

viii. Final Electrical Safety Authority certificate of inspection; and

ix. Verification of all required meter installations; and

x. Final engineers' and architects'/designers' inspection reports.

b. Within 90 days of opening for business within the applicable portion of the Premises, or as noted below, the Tenant will submit the following to the Landlord's Representative:

i. Complete set of "as built" drawings (610mm x 914mm or 24" x 36" hard copy, PDF, and Auto CAD drawing format – most current version) approved by Tenant's Consultants to be provided within 90 days of being Open for Business in the applicable portion of the Premises; and

ii. Proof of closing of permit. Copy of clearance letter from The City of Calgary, indicating that the applicable Premises have been "completed substantially in accordance with plans issued with the permit(s)" and providing completion dates; and

iii. Executed statutory declaration from the Tenant and the Tenant's Contractors stating that all monies owing to their suppliers and subcontractors have been paid and that no Liens have been registered against the Lands; and

iv. Valid WCB Certificate from the applicable Tenant's Contractors; and

v. Proof of maintenance agreements for Tenant's supplementary equipment (as applicable); and

vi. Operations & maintenance manuals divisions 1 to 16; and

vii. Electrical load balance report.

A deficiency inspection will be carried out jointly by the Tenant and Landlord's Representative upon completion of the installations. Such inspection shall be scheduled by the Tenant with the Landlord's Representative.

CONSTRUCTION COORDINATION

SECTION 6 - RULES AND REGULATIONS

6.12 TEMPORARY FIRE PROTECTION

6.13 SPRAY FIREPROOFING

6.14 FIRE-STOPPING

6.15 TESTING AND TIE-INS

6.16 ACCESS PANELS

6.17 LANDLORD'S ACCESS TO PREMISES

6.18 POWDER ACTUATED DEVICES

6.19 DRILLING OR CUTTING

6.20 WELDING AND OPEN FLAME WORK

6.21 FIRE ALARMS / DEACTIVATION OF SMOKE ALARMS

6.22 FASTENING

6.23 DAILY CLEAN-UP

6.24 PRE-OCCUPANCY CLEANING

6.25 PROTECTION OF BASE BUILDING ELEMENTS

6.26 HAZARDOUS MATERIALS

6.27 ACCESS AND DELIVERIES

6.28 SYSTEM PROTECTION AND CLEANING

6.29 CARPET INSTALLATION

6.30 WORK CONFLICT

6.31 ROOF WORK / ACCESS

6.32 FINISH HARDWARE / LOCKSMITHING

6.33 AIR BALANCING

6.34 WATER BALANCING

6.35 AIR CONDITIONING UNITS

6.36 TENTANT'S DESIGN AND CONSTRUCTION GUIDELINES

6.37 LANDLORD'S TENANT CONSTRUCTION COORDINATOR

6.38 CO-ORDINATION

6.0 ALBERTA OCCUPATIONAL HEALTH & SAFETY

Each of the Landlord and Tenant will, and will cause their respective contractors to, cooperate and coordinate their work to ensure compliance with the *Occupational Health and Safety Act* (Alberta) and the regulations passed under such statute.

In order to clearly identify that neither the Landlord nor the Tenant shall incur obligations as the "prime contractor" (as defined in the *Occupational Health and Safety Act* (Alberta)) in connection with the performance of the Landlord's Work or the Tenant's Work, as applicable, the Landlord and the Tenant will each cause their respective Construction Managers and/or Approved Contractors or Tenant's Contractors to be separate prime contractors for their respective work/construction projects.

More specifically, the Tenant acknowledges and agrees that pursuant to the *Occupational Health and Safety Act* (Alberta), for any Tenant's work that is undertaken, it is responsible for meeting the Landlord/building owner's obligations as an owner and further that it is a person in control of the work site.

Each of the Landlord and Tenant will, and will cause their respective contractors to, notify the Landlord immediately in writing of any OH & S incidents of any kind, including Near Misses, that occur on site.

6.1 WORKPLACE AND PUBLIC SAFETY

It is the Tenant's responsibility to ensure that the Tenant's Contractors observe and comply with all applicable laws. Should the Tenant, Tenant's Contractors, or Tenant's Consultants fail to comply with applicable construction safety regulations or applicable laws, the Landlord's Representative shall give written notice to the Tenant of incident date, time, name of individual(s) involved and circumstances and incident details and a compliance directive. Should failure to comply result in any base building construction delay, the Tenant will be held responsible for all resulting reasonable, direct and verifiable costs in accordance with the Lease. The Tenant's Contractors shall provide and maintain adequate first aid facilities during the completion of the Tenant's Work.

All stairwell doors are to be kept closed at all times during construction for fire and safety reasons. Any construction site found to have stairwell doors propped open will be assigned a security guard, at the Tenant's Contractors' expense, until the situation is resolved.

Notice must be given in writing by the Tenant to the Landlord's Representative, in advance, as noted in Section 5.3 of this Manual, of any proposed disruption to the Building's air, power or water supply to be caused by the Tenant or the Tenant's Contractors. In addition to the above systems, the integrity of the Building's life safety or fire protection and security systems must be preserved at all times, no exceptions allowed.

The Landlord's Representative will co-ordinate with the Tenant's Contractors, the preparation of a scheduled shutdown of any of the aforementioned systems in order to safeguard the Building and its occupants.

6.2 POLICING OF MEN, WORK PERMITS AND SECURITY BADGES

The Tenant's Contractor will be responsible for the safety and actions of its tradesmen and delivery people. Any individual found performing an unsafe act or exhibiting disregard for existing work, or disrespect towards Tenants or other people on the Project will be promptly removed from the property and not permitted to return.

Work Authorization Permit and Security Badges:

The Tenant shall complete Work Authorization Permits in advance of the Tenant's Work. Prior to the Turnover Date, the Landlord will provide a Work Authorization Permit number to be used by all Tenant's Contractors, and identify a location on Site where Tenant's Contractors will obtain security badges for sub-trade personnel for the Project on a daily basis.

Only authorized companies named on the Work Authorization Permits will be allowed to sign out badges as well as keys and/or access cards. Badges, keys and access cards are to be surrendered to security at the end of each day. The badges must be worn in plain view while on Site. Any workman on Site without a badge will be escorted off the Site.

The Tenant's Contractors will be required to assume full responsibility for all keys, access cards and badges signed out to them and/or their subcontractors and shall be responsible for all direct, costs associated with the replacement of such keys and the re-keying of any locks necessitated by the loss of same by the Tenant's Contractors.

Access cards remain the property of the Landlord. No markings or defacing of any kind will be permitted.

6.3 EMERGENCY CONTACT

The Tenant's Contractor must provide the Landlord's Representative with the name, address, and 24 hr telephone number of the person to be contacted in case of an emergency on Site.

6.4 WORKING HOURS

Subject to the restrictions set out in this Manual, the Tenant's Work can be carried out within the Tenant's Premises during Normal Business Hours. All noisy, disruptive and odourous work must be completed outside of Normal Business Hours.

6.5 SECURITY

The Tenant and its Tenant's Contractors shall be fully responsible for the physical security of the Premises and the contents thereof, throughout the Tenant's Work period, which shall be deemed to have commenced at the time of the Turnover Date for each applicable portion of the Premises to the Tenant for construction of Tenant's Work.

6.6 MATERIAL DELIVERIES AND SERVICE ELEVATORS

Tenant's Contractors shall contact the Landlord's Representative who will advise of the times that service elevators and/or loading dock areas are available. Tenant's Contractors shall plan on doing the majority of deliveries, including garbage removal, outside of Normal Business Hours. Use of the service elevators will be allowed in accordance with the instructions outlined below, and in accordance with the Lease.

The service elevator will be equitably shared by all Tenants and their contractors performing construction activities within the Building. The Building service elevators are the only elevators that serve the tower floors from the truck loading dock and are available for small deliveries during the day on a first come first serve basis.

The Tenant Contractor shall notify the Landlord's representative for all deliveries. A minimum of forty-eight (48) hours advance notice is suggested for small deliveries and seven (7) days' notice is required for truck loads. Deliveries will only be received at the loading dock and shall be immediately delivered to the floors where the material is to be used. There shall be no stockpiling of materials permitted at or in the vicinity of the loading dock. Unscheduled deliveries shall be refused and any material left unattended at the loading dock will be removed and costs assessed to the Tenant's Contractor.

All large material deliveries, for both Landlord and Tenant, brought into the Building by the service elevator must be scheduled after Normal Business Hours. To ensure efficient use of the service elevator these times must be coordinated in blocks. Large deliveries shall be defined as deliveries that require exclusive use of the service elevator for one or more lifts.

All materials shall be delivered through the loading dock facilities. Truck sizes are restricted and are to be confirmed with the Landlord's Representative. Any Tenant's Contractor found moving materials into the Building in an unauthorized manner will be removed from the Building. Workmen are required to use the designated service elevators: under no circumstances are the passenger elevators to be used for construction material deliveries. Any damage verified as being caused by the Tenant or the Tenant's Contractors, whether or not reported, will be repaired by the Landlord at the Tenant's cost.
Critical dimensions and load information for the service elevator cabs is provided in Appendix 6.

6.7 PARKING AND ACCESS

All required parking by Tenant's Contractors is the responsibility of the Tenant's Contractors, together with applicable parking fees. Under no circumstances are vehicles to impede or block access to the parking facilities or loading dock facilities, or be parked in the underground parking facilities.

Vehicles found in violation of the above will be towed away with all costs borne by the owner of the vehicle.

Parking at the loading dock is not permitted except for delivery purposes as approved by the Landlord's Representative.

6.8 TEMPORARY FLOOR LOADING

The Tenant's Contractors shall generally distribute material evenly across the floor and shall stack material over main building structure. Drywall piles are not to exceed 300mm in height so as to prevent over-loading of the slab.

6.9 WORK AREAS

All construction materials, tools, equipment and workbenches must be kept within the Premises throughout the Tenant's Work construction period. All public lobbies, washrooms and stairs shall be kept clean and clear of construction materials. The building washrooms shall not be used for the cleaning of tools or the disposal of materials.

Any damage verified as being attributable to Tenant's Contractors will be repaired by the Landlord's Representative at the reasonable and direct cost of the Tenant.

No materials or tools shall be kept or stored inside base building rooms, unless used for work inside these rooms. No material shall be stored in the service elevator lobbies or in any other fireman's access route.

The Landlord's Representative will, without notice, remove such materials and back charge the Tenant's Contractors for the cost of this service.

The Landlord is not responsible for the safekeeping of tools/equipment/material.

6.10 GARBAGE REMOVAL AND EXCESS BASE BUILDING MATERIAL

It is the Tenant's responsibility to ensure that all Tenant's Contractors, including telephone companies, remove all garbage and construction debris in proper containers and leave the Premises in a broom swept condition, on a daily basis.

All garbage removal must be performed after Normal Business Hours via the service elevator. The Tenant's Contractors and the Tenant are required to remove garbage directly from the Site without the use of a container unless approved as per below. All garbage must be staged on the floors until the Tenant's Contractor removal truck has arrived at the Site. Garbage may not be staged on the dock in anticipation of a disposal truck.

All excess and like new Building standard materials (i.e. uncut ceiling tiles, ceiling grid cross tees, light troffers, and light fixtures) provided by the Landlord for installation by the Tenant's Contractors shall be relocated to the designated storage by the Tenant's Contractors. The Landlord's Representative will advise the Tenant and the Tenant's Contractors of designated storage on Site.

Should the Landlord's forces be required to remove the Tenant's Contractor's garbage, the Tenant's Contractor will be charged for all associated costs.

Only approved waste disposal contractors will be allowed on Site. Arrangements for placing disposal bins must be made in advance through the Landlord's Representative. Disposal bin should be placed on ¾" plywood to protect the loading dock finishes.

Construction Waste Policy

The Landlord is committed to minimizing potential adverse effects on the environment while promoting the use of efficient management systems and tenant practices in its buildings. Compliance with this environmental commitment is the responsibility of all parties employed or contracted by Brookfield Properties.

Through the adoption and adherence to the principles of reduce, reuse and recycle, Brookfield Properties together with its Tenants and contractors will strive to minimize the potential negative environmental impact of excessive construction waste generation. We are committed to conducting construction in our buildings in accordance with all applicable laws, and where no law exists, to voluntarily adopt our own standards, where appropriate.

Construction and demolition work should be planned and managed in accordance with the Landlord's Construction Waste Policy, to be provided by the Landlord to the Tenant:

- Reduce the materials brought to the Site to the minimum required to construct the work and to the minimum required to package and transport the material; and
- Reuse material where appropriate on renovations or changes to existing work; and
- Recycle material by separation of recyclable material and diverting it to an appropriate recycling facility.
- Contractors shall provide confirmation of proper disposal of construction waste in keeping with regulations and guidelines in effect in the Province of Alberta and The City of Calgary.

6.11 TEMPORARY SERVICES

The Tenant's Contractors are responsible for the distribution of temporary power within the Premises during the construction period. Exposed electrical cords are not permitted outside the Premises. Tenant's Contractors are also required to provide temporary filters (MERV 8) for the HVAC system during the construction period of the Tenant's Work.

6.12 TEMPORARY FIRE PROTECTION

The Tenant and the Tenant's Contractors are responsible for providing operable fire extinguishers in the Premises throughout the construction period. These extinguishers must be sufficient in number and of suitable types to combat a potential (type A, B, or C) fire in the work area and to suit the requirements of The City of Calgary.

The base building fire extinguishers are not to be used for the above purpose.

6.13 SPRAY FIREPROOFING

Removal or dislodgment of spray fireproofing material from steel decks, beams, trusses, and columns must be avoided wherever possible. When fireproofing has been disturbed, the Tenant's Contractors must notify the Landlord's Representative. All fireproofing must be replaced with a suitable and approved fireproofing material. The replacement material must be installed in accordance with applicable building and fire codes. In no case may the original level of protection be reduced. Spray fireproofing shall be reinstalled by the Landlord's Representative, at the Tenant's expense.

Note: The Landlord reserves the right to request from the Tenant, an independent inspection of the fireproofing by a qualified consultant at the Tenant's expense.

6.14 FIRE-STOPPING

The Tenant's Contractors must ensure that all fire-stopping is reinstated where penetrations are required between building fire separations. The replacement material and method for reinstallation must meet the applicable building code and FM Global requirements. A CSA-ULC and FM Global approved material (i.e., "Firestop") must be used to seal all core and floor penetrations. All pipes passing through a floor penetration must be sleeved, caulked and waterproofed. If the Tenant's Contractors fail to undertake the appropriate provisions, the Landlord will complete the work at the Tenant's expense.

6.15 TESTING AND TIE-INS

The Tenant must obtain the Landlord's permission, prior to any testing or the installation of any tie-ins to mechanical, electrical, fire protection, security or life safety systems. The Tenant will be held fully responsible for any damages which may result from tie-ins performed by the Tenant or its Tenant's Contractors and be charged for any necessary repairs. All reasonable, direct costs associated with such tie-ins shall be at the Tenant's expense.

All tie-ins are to be done by the Tenant using Base Building Contractors only. Where the Tenant intends to tie into a closed-loop system, the Tenant's system shall be flushed, cleaned, and certified clean by the Landlord prior to the first connection. A summary of the potential tie-ins follow:

a. Sprinkler and Standpipe System

Scheduled interruptions to Tenant's life safety systems work, including but not limited to sprinkler and fire alarm, may be necessary to accommodate base building testing and approvals, and shall be scheduled in consultation with the Tenant with reasonable notice. All revisions to the base building sprinkler and standpipe system must be reviewed by the Landlord. After completion of all Tenant modifications the Tenant's system must be water pressure tested at 200 psi for two hours. An IAO test sheet must be witnessed by the Landlord's Representative, and the sprinkler system will be reactivated once the test has been approved. The Tenant must provide hydraulic calculations for all modifications required to the base building system. Requests for the sprinkler shutdowns must be processed through the Landlord's Representative in advance, as noted in Section 5.3 of this Manual. The costs for drain down and recharging of the sprinkler system testing and making this final connection by the base building sprinkler contractor will be billed to the Tenant's account.

To the extent that the sprinkler systems are energized no more than one standpipe will be drained down at a time. Riser system will not be open for more than ten minutes before it is reconnected or capped off.

b. HVAC Shutdown

All requests for air system shutdowns must be submitted by the Tenant in writing to the Landlord's Representative for approval in advance, as noted in Section 5.3 of this Manual.

c. Electrical Power Shutdown

All requests for electrical power shutdowns must be made by the Tenant in writing and submitted to the Landlord's Representative for approval in advance, as noted in Section 5.3 of this Manual.

d. Domestic Water Shutdown

All requests for water system shutdowns (fire line, chilled, heating, condenser, standpipe, sprinkler, domestic water, etc.) must be submitted by the Tenant for approval to the Landlord's Representative in advance, as noted in Section 5.3 of this Manual.

e. Revisions to Fire Alarm Speakers

All verification work on the fire alarm system will be done between the hours of 8:00 p.m. to 6:00 a.m., and on weekends. The Tenant shall provide advance notice to the Landlord's Representative, as noted in Section 5.3 of this Manual of proposed dates to the Landlord's Representative for approval.

Tenant's Contractor must make prior arrangements with the Landlord's Representative for any Tenant's Work to be performed that will affect the integrity of the life safety systems.

All modifications to the base building fire alarm speakers must be reviewed by the Landlord.

f. HVAC Controls

Request for additional controls or modification to control wiring must be made to the Landlord's Representative and carried out by the Tenant using the applicable Base Building Contractor, as set out in this Manual in Appendix 4, at the Tenant's expense.

g. Metering

All additional meters, except as specified in the Lease, required by the Tenant shall be supplied and installed by the Tenant using the applicable Base Building Contractor. Associated costs shall be borne by the Tenant. Metering to be based upon Landlord approved equipment products. Tenant is to coordinate connection to the BAS with the base building controls contractor.

6.16 ACCESS PANELS

The Tenant must provide access panels in floors, walls and ceiling construction of sufficient size as directed by its engineering consultants or the Landlord and as required by Applicable Construction Laws to permit necessary access to service and equipment by the Landlord or its agents. This includes all necessary structures to access such equipment. The design and location of access panels must be reviewed by the Landlord. Tenant shall perform access panel walk-through with building operations prior to installing ceiling system. All tenant and base building systems shall remain accessible.

6.17 LANDLORD'S ACCESS TO PREMISES

The Landlord and its representatives, consultants and contractors shall have unencumbered access to the Premises subject to proper notice to the Tenant, and in accordance with the Tenant's access permit process, at all times for the purpose of inspecting work. Copies of reports and/or minutes of such inspections shall be provided to the Tenant.

6.18 POWDER ACTUATED DEVICES

Powder actuated tools must not be used to secure fasteners which support ceiling suspension systems or equipment suspended from the underside of slabs.

6.19 DRILLING or CUTTING

The Tenant's Contractors are prohibited from drilling, cutting or chase openings of any description in any part of the building structure without the prior approval of the Landlord's Representative.

Where such work as described above is deemed to be necessary and acceptable to the Landlord's Representative (and the Landlord's structural engineers, if necessary), it will be carried out by the Tenant using the Approved Contractors at the expense of the Tenant. Prior to cutting, core drilling, or chasing openings of any size through the building's structure, the Tenant's Contractors must first mark the locations and have them reviewed by the applicable Landlord's consultant. Work of this type shall require x-ray inspection of the slab in addition to the Landlord's consultant's review, prior to cutting or drilling. The Tenant shall be responsible for all reasonable, direct and verifiable costs relating to such work including, without limitation, all of the reasonable consulting services provided by the Landlord's structural consultant and the cost of any x-ray required.

Precautions must be taken to ensure that cores do not fall on occupants or contents of the floor below and that all water is vacuumed away before draining to the floor below.

Subject to approval and with five working days advance notice by the Landlord's Representative, x-raying is to be performed after 10:00 p.m. and before 6:00 a.m.

Any damage to cast-in electrical wiring or plumbing will have to be repaired by the Tenant using the Approved Contractor at the Tenant's cost.

The Tenant's Contractors shall provide temporary firestop material in any penetrations through fire-rated walls or slabs to maintain appropriate smoke/fire separations during construction. Fire separations are to be restored to base building condition.

The Tenant's Contractors shall re-establish removed or damaged fire and smoke separations and baffles within the same work day (8 hours maximum) and shall provide permanent and/or temporary separations

and baffles to maintain the base building design standards.

Subsequent removal and disposal of temporary facilities, including making-good of effected work, remains the Tenant's Contractors' responsibility.

6.20 INTENTIONALLY LEFT BLANK

6.21 FIRE ALARMS/DEACTIVATION OF SMOKE ALARMS

Prior to carrying out work which results in heat or fumes being generated, including but not limited to welding and cutting with a torch, all open flame work, all grinding, spray painting, cutting (wood, steel, floor, etc.), sweep dusting near a smoke detector, sanding, core drilling, draining and filling of sprinkler systems and testing of mag locks or other devices added to the fire alarm system, the Tenant or its Tenant's Contractor must give the Landlord's Representative daily notice, so that smoke alarms on the necessary floors can be deactivated.

In the event that the Tenant or its Tenant's Contractor neglects to notify the Landlord's Representative regarding the above-noted work and a fire alarm is activated resulting in a false alarm caused by the Tenant or its Contractors, the Tenant will be charged with the fire department's cost and all associated costs incurred. A subsequent alarm will result in the removal of the offending Tenant's Contractor from the property and the imposition of additional life safety management measures as required by the Landlord. All fines and charges will be the responsibility of the Tenant.

Since some time could elapse between the occurrence and the fire department invoice, the Tenant will be advised in writing immediately after the alarm that one of its Tenant's Contractors was responsible and that charges will be forthcoming. It is the responsibility of the Tenant to recover such costs from the Tenant's Contractor responsible.

In the event the Tenant does not pay such aforementioned amount within thirty (30) days after demand, the Landlord shall have the right, without limitation to any other right or remedy for the collection of such amount, to deduct such amount from the Leasehold Improvement Allowance owing to the Tenant, or any advanced rent deposit or security deposit being held.

Once work has been completed by the Tenant's Contractor in an area where a request was made for the fire alarm to be isolated, it is the responsibility of the Tenant's Contractor to contact the Landlord's Representative to have the zone(s) restored. If the Tenant's Contractor leaves the Site unsupervised and without fire protection, the Tenant will be charged the cost associated with restoring the zone(s).

6.22 FASTENING

The Tenant's Contractors are not permitted to use mechanical fastenings into curtain walls, window frames, or walls which may contain air/vapour barriers or special fire rated structures. Clips in lieu of screws must be used to fasten interior walls to the ceiling grid.

6.23 DAILY CLEAN-UP

Drains, including janitor's sinks may not be used to dispose of materials such as drywall compound, concrete or paint, which may clog or hamper flow through the drainage system. Tenant's Contractors must make arrangements to dispose of such materials off-Site. If the drainage system becomes clogged or restricted and is verified as being caused by the Tenant or the Tenant's Contractors, the Landlord may undertake, at the Tenant's expense, a full cleanup program.

6.24 PRE-OCCUPANCY CLEANING

Upon completion of Tenant's construction, the Tenant is to ensure that Tenant's Contractors clean up and remove all construction debris from the Premises, together with all equipment and tools and the Premises are left clean and in move-in condition. In addition, all public lobbies, circulation corridors, and stairwells must also be given a post-construction cleaning if affected by the Tenant's Work.

Prior to regular office cleaning procedures, the following items must be cleaned at Tenant's cost within the Premises:

- Light fixtures and lenses;
- Ceiling grid and ceiling tiles;
- Carpets and all other floor coverings;
- Public areas and service areas affected by the Tenant's work: corridor walls and doors, service rooms, utility rooms, stairwells and lobbies;
- All washrooms;
- Perimeter fan coil units, if applicable;
- Building supplied window coverings;
- Interior and perimeter supply air diffusers;
- Return and exhaust air grilles;
- Heating coils (cleaning shall be carried out by the Tenant using the Landlord's base building cleaners and charged to the Tenant's account);
- Inside faces of all exterior glazing including window frames and mullions;
- All interior partition glazing.

The Landlord's Representative will inspect the pre-occupancy cleaning to ensure that the Premises are acceptable for occupancy. In the event cleaning is not performed by the Tenant's Contractors to the Landlord's satisfaction acting reasonably, and the Tenant fails to remedy after reasonable notice, the Landlord's cleaning contractor may, at the option of the Landlord, perform such work as deemed necessary prior to move in, at the Tenant's expense.

6.25 PROTECTION OF BASE BUILDING ELEMENTS

Any damage verified as being caused by the Tenant or the Tenant's Contractors, or anyone for whom the Tenant is responsible in law shall be repaired forthwith to the reasonable satisfaction of the Landlord by the Tenant or, at the Landlord's option, by the Landlord at the Tenant's expense.

The Tenant and the Tenant's Contractors shall take great care to protect all Base Building Work elements accessible from within the Premises including, but not limited to, the following:

a. Public Area: The Tenant shall be responsible for cleaning and making good, at the Tenant's expense, any damage verified as being made by the Tenant or its Tenant's Contractors in all public areas. In particular, this includes, but is not limited to, any damage to glazing, wall and floor finishes including sidewalks, laneways, and base building fixturing.

b. The Tenant shall protect all Base Building Work within the Premises with appropriate protection materials and shall obtain the Landlord's Representative approval of the protection procedure proposal prior to commencing work, moving construction materials or equipment across or within public areas.

c. Mechanical and Electrical Rooms: The Tenant shall be responsible for cleaning and making good, at the Tenant's expense, any damage to the mechanical and electrical rooms caused by the Tenant's Contractors.

d. Washrooms: The Tenant shall be responsible for cleaning and making good, at the Tenant's expense, any damage verified as being made by the Tenant or the Tenant's Contractors to the washrooms designated for Tenant use during Tenant's Work. The Tenant or the Tenant's Contractors shall not use the washrooms for cleaning of construction tools, such as paint brushes, etc. and dumping of liquids and garbage.

e. Stairs and Access Areas: The Tenant is responsible for cleaning and making good damage, at the Tenant's expense, to stairs and areas used for access during Tenant's Work. Fire doors in stairs shall not be wedged open by the Tenant or the Tenant's Contractors.

f. Elevators: The Tenant shall use only those service and passenger elevators designated by the Landlord for vertical transportation of construction personnel, material, and equipment. Any damage verified as being made to the elevator cabs, mechanisms, doors and frames caused by the Tenant or the Tenant's Contractors, shall be repaired by the Landlord at the Tenant's expense.

6.26 HAZARDOUS MATERIALS

All waste of a hazardous chemical or flammable nature must not be allowed to accumulate. Such waste must be removed from the Site as quickly as possible, or when directed by the Landlord's Representative, but no later than the same day, in accordance with the material's Material Safety Data Sheet, (MSDS).

6.27 ACCESS AND DELIVERIES

Personal access and material deliveries to the Premises are to be only by routes designated by the Landlord's Representative and as indicated in Section 6.6 and 6.7. The handling of items which, due to weight or dimension, require special treatment must be reviewed and arranged with the Landlord's Representative. The Tenant's Contractors and/or Tenant are responsible to unlock the Premises each day for their trades' access. The Landlord shall not be responsible to unlock Tenant's Premises doors.

6.28 SYSTEM PROTECTION AND CLEANING

No work shall commence until arrangements have been made with the Landlord for the protection of on-floor air conditioning units. It will be the Tenant's responsibility, at the Tenant's expense, to return them to their original state, as determined at Tenant Turnover and in accordance with the Landlord's reasonable specifications.

Supply and install temporary filters at all mechanical return air openings to the compartment room, shafts and equipment. This shall include but not be limited to; compartment units, air handling units, induction units, fan coil units, heat pumps etc. Replace media throughout construction. Remove temporary filters prior to air balance and re-occupancy. Seal all open-ended ducts during construction and remove prior to connection or occupancy. Seal all open plumbing pipes and floor drains to prevent construction debris from entering piping systems during construction. Only remove upon completion of final cleaning of space.

6.29 CARPET INSTALLATION

Carpets may not be glued to the floor, except where a "quick-release" type of glue is used and Landlord's written approval has first been obtained.

Note: The Landlord reserves the right to approve other methods of application.

6.30 WORK CONFLICT

Tenant's Contractors' work shall be performed in a manner that will not unduly interfere or conflict with any activities of the Landlord, the Landlord's Representative, or other tenants. Other than pursuant to the requirements of this Manual, the Landlord shall not unduly interfere with the Tenant's Contractors work.

6.31 ROOF WORK

For any roof access, an Access To Rooftop Release from Liability and Waiver of Liability Agreement must be filled out and orientation provided by Operations. For a copy of the waiver form, please refer to Appendix 10.

6.32 FINISH HARDWARE/ LOCKSMITHING

The Tenant will provide a hardware schedule to the Landlord's Representative. All door hardware on both entrance and interior doors must have locks which are compatible with the Building master keying system and may be opened by the master keys for the Building. Only the Landlord's locksmith may produce master keys (see list of Base Building Contractors).

6.33 AIR BALANCING

The Tenant must provide the Landlord with an air balancing report upon completion of all Tenant's Work. The report must be completed by the Tenant using the Landlord's designated air balancing company, at the Tenant's expense, and must be reviewed by the Landlord's consultant prior to final submission to the Landlord's Representative. The report is to include the following:

a. CFM at each light troffer and diffuser outlet when the thermostat is calling for full cooling and full heating; and
b. Temperature at furthest light troffer and diffuser; and
c. CFM, static pressure and temperature at AC-unit outlet when thermostat is calling for full cooling; and
d. CFM and static pressure at exhaust grille and/or air boot outlet; and
e. Supply and return air CFM, static pressure and temperature at main duct leaving and returning to mechanical room when thermostat is calling for full cooling; and
f. Design and actual readings in all cases.

Any change to fan powered boxes shall be noted on an adhesive label showing original and revised minimum and maximum CFM. This label shall be at least 100mm x 50mm and placed in a readily visible location near the VAV controller. Also to be indicated on this label are corresponding differential pressure valves for revised minimum and maximum.

All changes to piping, duct work, and equipment shall be recorded in a record set of drawings and kept on-Site at all times.

Any and all work to re-balance or adjust air within Premises that is caused by base building testing or balancing work completed by the Landlord after the Tenant has completed its final balancing shall be at the cost of the Landlord.

6.34 WATER BALANCING

Water balancing by a Base Building Contractor is required for all tie-ins to base building water systems. The following items must be noted in the final report:

a. GPM at each piece of equipment;
b. Pressure drop at each column;
c. Entering and leaving water pressures and temperatures;
d. Final marked position of balancing valves;
e. GPM at main service;
f. Other balancing as directed by Landlord's Representative.

Each piece or equipment tied into a base building water system must be equipped with a circuit-balancing valve.

6.35 AIR CONDITIONING UNITS

Where air conditioning units are disconnected so that Tenant's Work may take place, the units must be fully serviced by the Tenant before being reconnected to the Building system. Prior notice of such disconnections must be submitted in writing to the Landlord's Representative. After the work is completed, the mechanical systems (chilled water, heating and condenser) must be flushed (both new and used lines) and samples must be provided to the Landlord.

Additional air conditioning units shall only be installed where required. Units may be added to the base building tenant chilled water system where available. All piping shall be pressure tested at 150% of operating pressure; tests shall be witnessed by the Landlord's Representative. All piping is to be chemically cleaned and flushed to the Landlord's Representative's satisfaction. The Base Building Consultant for water treatment shall supervise the cleaning process at the expense of the Tenant. Two (2) samples shall be required for testing and acceptance of cleaning as follows:

i. with chemical cleaner added, after circulation as specified;
ii. after flushing for a time as prescribed by the Base Building Consultant.

All products used for cleaning must be acceptable to the Base Building Consultant. Prior to tie-in to the base building system the above samples must be tested and accepted, and pressure testing completed, after which the Tenant must obtain prior written approval from the Landlord's Representative, allowing the tie-in to take place. Failure to do so may result in the Landlord's Representative causing a chemical cleaning of the building piping as well as cleaning of the associated building system at the Tenant's expense. For this reason, Tenant's Contractors are urged to work closely with the Base Building Consultant for water treatment. All piping circuits shall be equipped with isolation valves at the system riser and at each piece of equipment, suitably tagged and identified.

All piping is to be properly labeled identifying system and direction of flow every 6 meters and where piping passes through floors or walls. Each piping circuit shall be complete with circuit balancing valves for balancing purposes and future use. All chilled water, condenser water piping and condensate piping shall be insulated when installed enclosed in ceiling spaces, etc. Supplemental air conditioning units installed in electrical, communication and like areas shall be equipped with full coverage drip trays, piped to drain.

Domestic water connections for backup purposes must be complete with back flow preventers per plumbing code requirements and be valved at the A/C units (tagged and labeled). Backflow prevention devices shall be installed in accordance with Applicable Construction Laws including CAN/CSA-B64.

Backflow prevention devices shall be field tested in accordance with CAN/CSA-B64.10-94. Such testing shall be witnessed by the applicable Base Building Consultant or another individual as may be designated by the Landlord in advance of the scheduled testing date. Upon completion of the testing, the Base Building Consultant shall, at the Tenant's expense, issue to the Landlord's Representative a letter to confirm the testing. Such testing shall be coordinated by the Tenant and shall take place prior to the system being put into service.

Automatic switch over valves are not permitted, a control sequence must be provided for change over from condenser water to domestic water and only where the use of domestic water for such purposes is permitted by the City of Calgary. The control sequence will be verified during A/C unit commissioning and thereafter approved by the Landlord's Representative. A framed schematic, together with a control sequence and instructions for valve position during switch over, chemical cleaning and normal operation must be placed adjacent to the A/C unit for future reference. All valves must be permanently labeled or tagged.

If domestic water back-up feed is required then the Tenant shall provide a water meter complete with remote read-out, which must be installed without exception. A/C units utilizing domestic water as a primary cooling medium are not permitted due to their environmental impact and City of Calgary Bylaw 40M2006.

The Tenant or the Tenant's Contractors shall submit unit specifications, catalogue cuts, etc., to the Landlord's Representative for approval. The maintenance and upkeep of Tenant owned A/C units shall be the Tenant's responsibility. A maintenance contract, with an Approved Contractor, must be maintained at all times by the Tenant, at the Tenant's expense. The Tenant or the Tenant's Contractors shall forward a copy of the contract to the Landlord's Representative, for its records. All units using a condensate pump shall be wired such that if the condensate pump fails, the air conditioner cannot run.

6.36 TENANT'S DESIGN AND CONSTRUCTION GUIDELINES

Standard of Workmanship and Material: All Tenant's Work is to meet all Applicable Construction Laws. All work by the Tenant and the Tenant's Contractors within the Premises shall be completed with materials of high quality and shall be based on environmentally responsible designs which minimize environmental impacts of the construction process and during the Tenant's Work. All workmanship and materials shall be equivalent to the base building standard and quality as characterized by the plans and specifications. Inferior installed materials and workmanship, which do not meet the aforesaid standards or conform to Applicable Construction Laws, shall be replaced, by the Tenant, at the Tenant's expense. The Tenant shall ensure that the Tenant's Contractors comply with the following requirements:

a. Architectural

i. Partitions and workstations should not prevent access to mechanical equipment, fan-powered boxes, controls, thermostats or other items that require periodic service. Further, partitions should align with window mullions and perimeter columns. Where applicable, to facilitate the removal of exterior windows, removable filler panels are to be used in order to extend partitions to the window mullions (see Appendix 7 of this Manual).

ii. Mechanical fastening to T-bars or curtain walls or any mechanical enclosures are not permitted. Tracks are to be clipped to T-bar or mullion with non-staining gasket.

iii. Obstructions to exterior glazing are not permitted.

iv. Alterations to roller blinds are not permitted.

v. Solid ceilings are to be provided with access panels to allow maintenance of plumbing connections, reheat coils, dampers, light fixtures, electrical junction boxes, alarm bells and other equipment with the potential for future access for maintenance or adjustment. The Landlord's Representative must be consulted for an inspection prior to solid ceilings being closed.

vi. The Tenant's Contractors are responsible for the cleaning of fan powered box filters, once the Tenant's Work has been completed. Such Tenant's Work must be to the satisfaction of the Landlord's Representative or his delegate.

vii. Partition changes will often necessitate a review and revision to the air handling system, i.e. supply and return ductwork, ceiling baffles and balancing, in order to achieve tenant comfort. Partition changes will often necessitate a review and revision to the sprinkler system to provide suitable coverage.

viii. Locations requiring heavy loads, i.e. libraries, large filing systems, concentration of filing cabinets, safes and/or vaults, should be identified on drawings and loading checked and accepted by the Landlord's structural engineer. Any fees associated with this approval will be at the Tenant's expense.

ix. All kitchens, serveries and washrooms are to have floor drains installed. All added mechanical spaces must be concrete-curbed, floors water-proofed and floor drains installed. The Landlord reserves the right to have areas relocated during the design phase, as not to cause potential damage to sensitive areas below. The Tenant may be required to add protective devices as applicable (i.e. drains pans, water sensors, etc.)

x. Full height partitions in tenant spaces require return air openings suitably sized for the required air volume.

xi. Keying of locks to be done by Building locksmith. (see Appendix 4)

xii. Only water-based sealers are to be used for wood or stone flooring. No solvent sealers are to be used.

xiii. All exposed metal furring at air slots is to be painted to match adjacent surface.

xiv. Where drywall baffles occur above ceiling they are to extend across door openings and glazing.

xv. Baffles are to be tightly fitted and caulked around ductwork and piping joints are to be taped.

xvi. Ceiling system modification: Keep the ceiling in the Premises at the building standard height. No holes are to be drilled or punched in the base building T-bar system. Removal, relocation and/or replacement of installed ceiling tiles will be the responsibility of the Tenant at its expense. Ceiling tiles should be handled carefully to prevent damage. Any change in the base building ceiling height or material must be reviewed by the Landlord in writing prior to the commencement of work. Follow all code requirements where fixtures are relocated or new fixtures added adjacent to one another, i.e. the fixtures shall be self-supporting, independent of the ceiling.

xvii. Partitions perimeter wall: Double sided tape must be used where Tenant partitions abut to perimeter curtain wall and ceilings. Fastening shall be accomplished without screws or bolts. All partitions which abut the curtain wall must be centered on the window mullions.

xviii. Above ceiling baffles: The area above the finished ceiling acts as a return air plenum for the HVAC equipment. Care must be taken when introducing products and elements to this area. The use of fiberglass insulation for soundproofing, baffles, demising and air transfers, is subject to approval of the Landlord. Any fiberglass installed above the t-bar ceiling should be complete with an air/vapour barrier, sealing in all fibre. As an alternate, foil wrapped fiberglass with the unsealed edges painted (sealed) could be utilized. All to meet requirements of Applicable Construction Laws relating to flame spread and fibre retention.

b. Electrical, Communications and Cabling

i. Conduit is to be used in all inaccessible areas, the ceiling plenum and for all home runs. BX cable is acceptable for short runs of not more than 10 linear feet and must be accessible and not visible from below the plenum space. Conduit must be secured to the structure. Conduit hung from other conduit, ceiling components or equipment will not be permitted.

ii. Daisy chaining of light fixtures is not permitted.

iii. All work by electrical and/or communications contractors will include zone conduit and/or cable tray for voice/data communications, a/v, security or similar low voltage cabling. The use of free-air cables is not allowed with the exception of fire rated cable per applicable code, which shall be neatly and securely fastened either in cable tray or appropriate cable supports and harnesses with maximal intersupport cable sag of 6” from the underside of floor slab above and spaced a maximum of 6’ apart. All cables shall be completely supported by the harnesses so that no weight is transferred to any other existing non-structural fixture or ceiling cable structure. Cable supports are not to be supported from T-Bar support system. Provide cable installation and suspension details in addition to cable specifications.

iv. If required, work in other Tenants’ Premises is to be arranged through the Landlord’s Representative. All such work must be coordinated for a mutual acceptable time frame. Security supervision, if applicable, may be required at all times, the cost of which will be at the Tenant’s expense.

v. Unused electrical/telephone floor holes must be properly filled with concrete and a suitable plastic cup/plug. The Tenant’s Contractor will remove any abandoned wires in raceways or ceilings.

vi. Not more than six (6) duplex outlets are to be installed on any one 15-amp circuit. All wiring shall be copper. Panel loading is subject to Landlord’s approval.

vii. The Tenant’s Contractor will ensure that electrical panels, disconnects, and meters are properly sized and identified immediately upon completion of the Tenant’s Work. Provide mechanically attached lamicoid nameplates to all equipment. Lamicoids to match base building standards.

viii. Occupancy sensors are recommended for all private areas, open office areas and low use areas.

ix. No bare wire is acceptable in ceiling spaces used as return air plenums. The Tenant’s Contractor will ensure that wires shall be carried in EMT or flexible metallic jackets. All conduits up to and including 4” (100mm) size shall be EMT thin wall with steel set screw couplings and connectors. Provide flexible metal conduit for connections to motors and transformers. All conduits must be installed to conserve headroom, parallel and perpendicular to building lines. Do not caddie clip conduits to ceiling hangers.

x. Where plenum rated communication cables are used, they must not be attached to the suspension wires supporting the T-bar. Laying the cable on top of the acoustic tiles is not acceptable or permitted. The Landlord will not assume any responsibility for damage which may result from the failure of the Tenant's Contractor to observe this requirement.

xi. The Tenant's Contractor will be responsible for ensuring that openings, through walls or floors, are properly sealed, to safeguard the fire rating of electrical rooms and other spaces. Replacement fire stopping will be installed in accordance with Applicable Construction Laws. Under no circumstances shall the level of fire protection be reduced.

xii. Upon completion of all electrical work, an electrical inspection is required and is to be obtained by the Tenant's Contractor. The Tenant's Contractor will co-ordinate same through the Landlord's Representative.

xiii. The Tenant's Contractor will be responsible for ensuring the need for any special grounding for computer connections and that proper interfaces are used to avoid false alarms.

xiv. New panel boards, disconnect switches, splitters and meters are subject to the Landlord's approval, acting reasonably.

xv. Tenant data and voice telecommunications equipment must not be installed in base building telephone rooms.

xvi. No telephone, communication, data, security, computer or other cables may be installed in the Building without the prior approval and consent of the Landlord's Representative. In any event, no wiring of any kind shall be installed without the required conduit; nor shall any loose wire or cabling be allowed to remain without a casing or unpanelled in the ceiling plenums unless approved for such installations and installed in a manner reasonably acceptable to the Landlord.

xvii. No Tenant panels, transformers or distribution equipment shall be installed in the base building electrical rooms except as reviewed by the Landlord acting reasonably (exact location must be provided at the completion of the Landlord's schematic design phase). Any additional distribution equipment required by the Tenant shall be installed within the Tenant's leased space.

xviii. All telephone communication cables must be identified at every floor level within the communication riser. Each cable or group of cables must be identified with the name of the Tenant, the installing Tenant's Contractor's name, telephone number and the date of installation. The installation of all infrastructure cabling within base building risers shall be in accordance with the base building cabling infrastructure management specifications, to be provided by the Landlord on completion of riser design, and requirements of the Landlord. Before proceeding, contact the Landlord's Representative who will arrange for access to Telephone Rooms.

xix. All Tenant's Work to be done in the telephone rooms and infrastructure will be carried out exclusively by the applicable Approved Contractor.

xx. All sound masking cabling and speakers will be supported independently from the ceiling.

xxi. Fire Alarm System
Scheduled interruptions to Tenant's Life Safety Systems work, including but not limited to sprinkler and fire alarm, may be necessary to accommodate base building testing and

approvals. Any changes to the fire alarm or life safety systems must be installed and verified by the Landlord's Base Building Contractors as per National Standards of Canada specification CAN/ULC-S524-M91 and CAN/ULC-S537-97 respectively, to preserve the integrity of Life Safety Systems. This includes any security door locks interface (electromagnetic locks) to the fire alarm system. The Tenant's Contractors will familiarize themselves with the appropriate municipal requirements for the installation of electromagnetic locks and provide verification from the base building electrical consultant.

xxii. Smoke Detectors
Smoke detectors and duct-mounted smoke detectors will be isolated when work in an area may activate a smoke alarm (i.e. open flame, cutting or sanding).

xxiii. Heat Detectors
Heat detectors will be isolated when work in an area may activate a heat detector alarm (i.e. open flame).

xxiv. Electromagnetic Locking Devices (EMLD's)
The Tenant's Contractors must comply with all requirements of the Alberta Building and Fire Code as they apply to the installation, testing and commissioning of EMLD's, which must be tied into the base building fire alarm system. All final connections and verification of EMLD's that are to be connected to, and released by the alarm system, must be made by the fire alarm manufacturer at the Tenant's expense.

c. HVAC and Plumbing

i. Tenant's Consultant is to verify that the fire hose coverage is code compliant.

ii. Tenant's Contractor to install temporary filter medium (MERV 8) over pleated filters in compartment units and/or fan-powered box filters prior to start of the construction of the Tenant's Work as well as a temporary filter (MERV 8) on return air openings to prevent the migration of dust into all systems and areas of the Building and building equipment. At the completion of the Tenant's Work, the Tenant or the Tenant's Contractor shall remove and dispose of filters, clean diffusers, grills, vents, etc. clean fan-powered boxes and compartment unit and above ceiling air plenums and other areas as required by the Landlord's Representative.

iii. Exhaust from printing machines, or kitchens are not to be connected to the sanitary exhaust system. The Tenant's Contractor will ensure that careful consideration is given to the inclusion of ecology units or special ductwork in kitchen exhaust systems.

iv. Tenant's Contractor will ensure that each perimeter office, at a minimum, either shares a VAV box with its neighbour or has an individual unit. Each perimeter office should also have individual overhead linear diffusers or light troffer(s) as may be applicable for cooling. Consideration should be given to the placement of control thermostat locations and the tenant's furniture layout. Do not install thermostats where they will be affected by heat generating equipment or items, or where radiant sun will affect proper operation.

v. The Landlord's Representative requires that the thermostats be protected in order to prevent potential damage from airborne particles during the drywall sanding stages. All work in this regard, will be carried out by the Tenant at the Tenant's expense.

vi. Both the Tenant and the Tenant's Contractor should give consideration to the provision of sufficient air to interior conference rooms in order to prevent overheating. Exhaust fans are a

minimum requirement. A separate or dedicated fan powered box is more effective for tenant comfort.

vii. The supplementary air conditioning units shall be inspected by the manufacturer's service representative upon installation at the Tenant's expense to ensure proper operation by the Tenant. Thereafter, at the request of the Tenant, inspection and servicing can be done under contract by the Landlord's forces as a contracted service at the Tenant's expense. All supplementary air conditioning units shall be installed in accordance with building standards and Applicable Construction Laws.

viii. Tenant's Contractors will hire an air balancing company to re-balance the air system upon completion of work and provide a balancing report to the Landlord. System balancing is subject to the approval of the Landlord's Representative and will be accepted following review and approval by the applicable Base Building Consultant.

ix. All internal plumbing and services are the responsibility of the Tenant. All equipment serving the Premises, must be noted on the drawings.

x. All domestic water piping and connections to base building valves must be Type 'L' copper or braided steel enforced tubing with threaded fittings.

xi. All piping and connections to base building sanitary or vent systems shall be cast iron or DWV copper. PVC, PEX and ABS are not acceptable. XFR may be acceptable in some areas of the Complex and the Tenant must request review and acceptance by the Landlord, prior to design submission.

xii. Subject to the outline specifications in Appendix 5, potable water supply lines, drain lines, and vent risers will be provided with valved and capped connections by the Landlord to support future connections. All tie-ins required by the Tenant shall be completed with isolation valves and service designation.

xiii. Tenant's Contractor will ensure that flexible ducts are secured to rigid ducts by mechanical fasteners and tape or sealant. (tape alone is NOT acceptable). No joints will be allowed on flex.

xiv. Tenant's Contractor will ensure that piping and ductwork is installed according to industry standards and to the standards of the building construction (i.e. from slab or structure and not from existing piping or ductwork). Contact with ductwork or other piping/conduit is not allowed under any circumstances; all installations must be free from vibration.

xv. Tenant's Contractor will ensure that no dissimilar metals come in contact with piping and that electric connectors are used where required.

xvi. Provision must be made for the inclusion of a water check meter for all domestic water use.

xvii. Tenant's Contractors will ensure that supply piping has shut-off valves and backflow preventers where required by Applicable Construction Laws (i.e. City of Calgary water backup and computer A/C units). The Tenant or the Tenant's Contractor shall provide backflow preventer field tests that are witnessed by the Landlord's Representative and associated reports prior to placing systems into operation. At no time will base building systems be tied into, operated or manipulated in any way without compliance with Section 5.3 of this Manual.

xviii. All kitchens, serveries and washrooms constructed within the Premises are to have floor drains installed by and at the expense of the Tenant.

xix. All mechanical spaces added within the Premises must be concrete-curbed, floors water-proofed and floor drains installed by the Tenant or Tenant's Contractor. The Landlord reserves the right to have areas relocated during the design phase so as not to cause potential damage to sensitive areas below.

xx. With respect to any water sourced installations, the Tenant may be required to add protective devices as applicable. This may include the following: waterproofing membranes, drains pans, water sensors, automatic water shutoffs, and B.A.S. connections as may be required for leak detection and containment.

xxi. Tenant's Contractor will fill holes with concrete after removal of pipes or drains. Large openings shall be treated in accordance with the requirement of the Landlord's Representative following review by the applicable Base Building Consultant for structural engineering at the expense of the Tenant.

xxii. Tenant's Contractor will caulk and seal new installations of floor pipes and drains to prevent water leakage and to maintain the fire rating of the assembly penetrated

xxiii. It is the responsibility of the Tenant's Contractors pursuant to this Manual to seal any openings through walls or floors to safeguard the fire rating assembly in question

xxiv. The Tenant is responsible for the supply and installation of electric hot water heaters. A leak detection system must be installed as a part of the hot water tank installation.

6.37 LANDLORD'S TENANT CONSTRUCTION COORDINATOR

At the Landlord's option, the Landlord may designate a Tenant Coordinator to coordinate Tenant's construction activities with the work and access of other tenants. In no event shall the involvement of the Landlord or the Tenant Coordinator constitute the Tenant Coordinator, the Landlord or the Landlord's Representative as a prime contractor under Applicable Construction Laws.

6.38 INTENTIONALLY LEFT BLANK

CONSTRUCTION COORDINATION

SECTION 7 - LEED GUIDELINES

7.0 LEED GUIDELINES (OPTIONAL)

7.0 LEED GUIDELINES (OPTIONAL)

A LEED guideline for the benefit of those tenants who choose to pursue a LEED Commercial Interior (LEED-CI) certification for their Premises will be provided by the Landlord upon the Tenant's request.

CONSTRUCTION COORDINATION

SECTION 8 - BUILDING CHARGES AND LANDLORD SERVICES

8.0 BUILDING CHARGES AND LANDLORD SERVICES

8.1 INVOICING OF SERVICES

8.2 TERMS AND CONDITIONS OF SERVICES

8.0 BUILDING CHARGES AND LANDLORD SERVICES

The Tenant shall pay the following to the Landlord with respect to services ("Services") which the Landlord performs at the written request of the Tenant or other expenses arising pursuant to any obligation of the Tenant expressly required by this Manual.

The total costs and expenses (collectively, the "Costs") incurred or paid by the Landlord to third parties in connection with the Services including, without limitation, the following:

i. Charges levied by Authorities in relation to the Services,

ii. All taxes, and duties related to the Services,

iii. For greater certainty, certain components of the costs shall be based on the applicable rates set out in Section 8.2 of this Manual, and

iv. An administrative fee of 15% of the Costs ("Fee").

v. In the case where the Landlord incurs costs as indicated within this Manual associated with damages, misconduct, and/or non-compliance caused by the Tenant or the Tenant's Contractor hereunder, and where the Tenant has failed to remedy or make reasonable efforts to commence remedy of the same, after reasonable notice has been given by the Landlord, an administration fee of fifteen percent (15%) shall apply to the Landlord's reasonable, direct and verifiable out of pocket expenses.

8.1 INVOICING OF SERVICES

The Landlord may submit invoices to the Tenant on a monthly basis. Each invoice shall be itemized for the Costs incurred or paid to date during the payment period, and the applicable Fee related to such Costs. The amounts set out in the invoice submitted by the Landlord shall be paid by the Tenant within thirty (30) days after submittal of the invoice to the Tenant.

In the event of a dispute or upon the Tenant requiring additional details with respect to invoiced charges, the Landlord shall provide such detailed back up within thirty (30) days of receiving the Tenant's written request. Such requests shall not preclude the Tenant's obligation to make payments for invoices as prescribed above, but Tenant shall have the right to dispute accuracy of statement, acting reasonably, and if there was an error in the statement, to recover costs from Landlord.

8.2 TERMS AND CONDITIONS OF SERVICES

Any work, equipment or services provided by the Landlord at the written request of the Tenant shall be authorized in writing by the Tenant and shall be paid by the Tenant as follows:

a. Thirty-five percent (35%) of the amount payable by the Tenant as estimated by the Landlord shall be paid to the Landlord by the Tenant at the time the Tenant authorizes the provision of such work, equipment or services by the Landlord.

b. On an incremental basis, the Tenant shall pay the balance of the amount payable by the Tenant for such work, equipment or services forthwith upon receipt of Landlord's invoices which shall be issued in conjunction with the incremental progress of the provision of such work, equipment or services work and be inclusive of all applicable hold backs deducted at source to the Landlord's contractors and consultants.

CONSTRUCTION COORDINATION

SECTION 9 – SPECIFIC RETAIL TENANT REQUIREMENTS

9.0 SPECIFIC RETAIL TENANT REQUIREMENTS

9.0 SPECIFIC RETAIL TENANT REQUIREMENTS

“Brookfield Place Calgary – Retail Tenant Design Criteria” is available upon request and to be read in conjunction with this Manual.

CONSTRUCTION COORDINATION

SECTION 10 - MANUAL REVISIONS

10.0 MANUAL REVISIONS

10.0 MANUAL REVISIONS

All changes shall be consistent with the construction of comparable quality buildings of similar type in the downtown core of Calgary, Alberta, including but not limited to design elements, finishes, materials, products, systems, functionality, efficiency, sustainability, and space usability aspects. Revisions shall also be consistent with the Lease, all relevant ancillary documents, and the existing Manual provisions such as respective Landlord and Tenant obligations and responsibilities, completion responsibilities, specifications, plans, reporting, payment obligations, communications. Changes shall not result in a reduction of services, communications and updates, and/or specifications, including without limiting the generality of the foregoing, those outlined in the appendices attached to this Manual.

CONSTRUCTION COORDINATION

APPENDIX 1 – BUILDING INFORMATION

Landlord		**Brookfield Place (Calgary) GP Inc.,** as the sole general partner of: **Brookfield Place (Calgary) LP** by its agent (and not as general partner): **Brookfield Properties Canada Management LP,** by its sole general partner: **Brookfield Properties Canada Management Corporation**
	Address:	1210, 225 – 6th Ave. SW Calgary, Alberta T2P 1N2 Telephone: (403) 770-7200 Fax: (403) 770-7210
Legal Description of Development Lands		Brookfield Place Calgary East: DESCRIPTIVE PLAN 1711094 BLOCK 44 LOT 44 Brookfield Place Calgary West (Bow Parkade) DESCRIPTIVE PLAN 1711094 BLOCK 44 LOT 45
Manager		**Brookfield Properties Canada Management Corporation**
	Address:	1210, 6th Ave. SW Calgary, Alberta T2P 1N2 Telephone: (403) 770-7200 Fax: (403) 770-7210
Landlord's Representative	Contact:	Manager, Construction Services
	Telephone:	(403) 770-7200

Security Control Centre:	403-265-4469
Locksmith:	Please refer to Appendix 4
Loading Dock/Freight Elevator Booking:	403-265-5879

CONSTRUCTION COORDINATION

APPENDIX 2 - BASE BUILDING CONSULTANTS

Project Architect:		**Dialog**
	Contact:	Gerry Doering
	Email:	GDoering@dialogdesign.ca
	Address:	Suite 300, 134 – 11th Avenue SE, Calgary, AB T2G 0X5
	Telephone:	(403) 541-5456
Electrical & Fire Alarm		**Mulvey & Banani International Inc.**
	Contact:	Jaycee Elliott
	Email	jaycee.elliott@mbeng.ca
	Address:	Suite 700, 110 – 12th Ave. SW, Calgary, AB T2R 0G7
	Telephone	(403) 781 7301
Mechanical:		**Hidi Rae Consulting Engineers Inc.**
	Contact:	Chris Saunders
	Email:	chris.saunders@hidi.com
	Address:	Suite 240, 11012 Macleod Trail South, Calgary, AB T2J 6A5
	Telephone:	(403) 217 0100 ext. 451
Structural Engineers:		**Entuitive Corporation**
	Contact:	Randy Thesen
	Email	Randy.thesen@entuitive.com
	Address:	Suite 300, 209 8th Avenue SW, Calgary, AB T2P 1B8
	Telephone:	(403) 879-1270
Code Consultant:		**Jensen Hughes Consulting Canada Ltd.**
	Contact:	Michael Bonder
	Email:	mbodnar@jensenhughes.com
	Address:	Suite 106, 5855 – 9th Street SE, Calgary, AB T2H 1Z9
	Telephone:	(403) 984-5801
LEED Consultant:		**WSP Canada Inc.**
	Contact:	Jon Rocheleau
	Email:	Jon.Rocheleau@wspgroup.com
	Address:	4015 7th Street SE, Calgary, AB T2G 2Y9
	Telephone:	1.877.221.7946

CONSTRUCTION COORDINATION

APPENDIX 3 - APPROVED CONTRACTORS

Subject to further review or discussion with Tenants, the Approved Contractors shall be limited to the following:

Mechanical HVAC:	**Arpi's Industries Ltd.** **Botting & Associates** **Modern Niagara Alberta Inc.** **Trotter & Morton** **Windmill Mechanical Services**
Mechanical Plumbing:	**Arpi's Industries Ltd.** **BCK Mechanical Systems** **Botting & Associates** **Chisholm Industries Ltd.** **Modern Niagara Alberta Inc.** **Trotter & Morton**
Sprinklers:	**Constant Fire Protection** **DT Fire** **Tyco Integrated Fire & Security Canada (Simplex Grinnell)** **Vipond Inc.**
Electrical:	**CANEM Systems Ltd.** **Custom Electric Ltd.** **O'Dell Electric Ltd.** **Trotter & Morton Electrical** **Western Electrical Management Ltd.**

***Note**: Only joint ventures between Approved Contractors will be permitted*.

CONSTRUCTION COORDINATION

APPENDIX 4 - BASE BUILDING CONTRACTORS

Mechanical:		**Arpi's Industries Ltd.**
	Contact:	Al Martin
	Email:	Al.Martin@arpis.com
	Address:	6815 40 St. SE, Calgary, AB T2C 2W7
	Telephone:	(403) 236-2444
Electrical:		**Western Electrical Management Ltd.**
	Contact:	Rick Parkinson or Steve Barker
	Email:	rparkinson@westernelectrical.com
	Address:	3770 – 12th St. NE, Calgary, AB T2E 8H9
	Telephone:	(403) 291-2333
Fire Alarms:		**Western Electrical Management Ltd. (Chubb Edwards)**
	Contact:	Rick Parkinson or Steve Barker
	Email:	rparkinson@westernelectrical.com
	Address:	3770 – 12th St. NE, Calgary, AB T2E 8H9
	Telephone:	(403) 291-2333
Sprinklers:		**Tyco Integrated Fire & Security Canada (Simplex Grinnell)**
	Contact:	Ken Dowse
	Email:	kdowse@simplexgrinnell.com
	Address:	431 Manitou Road SE, Calgary, AB T2G 4C2
	Telephone:	(403) 444-3248
Mechanical Controls:		**Johnson's Controls**
	Contact:	Ken Nishi
	Email:	Kenneth.m.nishi@jci.com
	Address:	9832 Fairmont Dr. SE, Calgary, AB T2J 0S1
	Telephone:	(403) 252-5549
Air Balancing:		**Hydro-Air Technical Services**
	Contact:	Allan Reid
	Email:	hydroair@telus.net
	Address:	9832 Fairmont Dr. SE, Calgary, AB T2J 0S1
	Telephone:	(403) 252-5549

Roofing:		**Durwest Construction Systems**
	Contact:	Kevin Malcom
	Email:	kevin@durwestalta.com
	Address:	10665 46 St. SE, Calgary, AB T2C 5C2
	Telephone:	(403) 253-7385
Locksmith (Keying):		**Brookfield Properties Canada Management Corporation**
	Contact:	Sam Sheronick
	Email:	Sam.sheronick@brookfieldproperties.com
	Address:	Suite 327, 111 5th Ave. SW, Calgary, AB T2P 3Y6
	Telephone:	(403) 213-5372
Elevators:		**Thyssenkrupp Elevators**
	Contact:	Troy Prusky
	Email:	troy.prusky@tkelevator.com
	Address:	Unit 5, 2419 52nd St. SE, Calgary, AB T2C 4X7
	Telephone:	(403) 259-4183 or 1-800 233-5757
Water Treatment & Balancing:		**Arpi's Industries Ltd.**
	Contact:	Al Martin
	Email:	Al.Martin@arpis.com
	Address:	6815 40 St. SE, Calgary, AB T2C 2W7
	Telephone:	(403) 236-2444
Security Systems:		**Johnson's Controls**
	Contact:	Marcus Lloyd
	Email:	Marcus.t.lloyd@jci.com
	Address:	Suite 104, 6046 12th St. SE, Calgary AB T2H 2X2
	Telephone:	(403) 258-5569
Integrated Building System:		**Brookfield Properties Canada Management Corporation**
	Contact:	Jeff Moldon
	Email:	Jeff.moldon@brookfield.com
	Address:	Suite 1700, 335 – 8th Ave. SW, Calgary AB T2E 5A5
	Telephone:	403-770-7113

In order to protect the integrity of base building systems within the Building, the following work must be performed by the above-named Base Building Contractors:

The Base Building Electrical Contractor must perform the following electrical work, unless approved otherwise at the discretion of the Landlord:

- All modifications to the Base Building fire alarm system;
- All final connections and installation of the equipment within the riser rooms to the base building bus duct riser.

The Base Building Security Contractor must perform the following work:

- All final connections to the Base Building security systems including programming, commissioning, testing and verification.

The Base Building Mechanical Contractor must perform the following mechanical work:

- Not applicable.

The Base Building Sprinkler Contractor must perform the following sprinkler work:

- Not applicable.

The Base Building Contractors must also perform the following other work:

- Mechanical control work must be performed by the mechanical control work Base Building Contractor;
- Air and water balancing must be performed by the air and water balancing Base Building Contractor;
- Chemical water treatment and cleaning must be performed by the chemical water treatment and cleaning Base Building Contractor.

CONSTRUCTION COORDINATION

APPENDIX 5 – BASE BUILDING OUTLINE SPECIFICATION

GENERAL

This outline specification describes, in general terms the Brookfield Place Calgary project and associated work in Calgary, Alberta. All elements in this outline specification (unless otherwise noted) are base building items.

1. Architectural

a. General Overview

- The overall Brookfield Place Calgary project occupies the entire city block between 1st and 2nd Streets SW and 6th and 7th Avenue SW. The current East Tower of the Brookfield Place Calgary is a 56 storey office building located on the north-east portion of the block. The future second phase will include a 41 storey office tower (West Tower) located on the north-west portion of the block.

- Total retail space at grade and Plus 15 level to contain
- approximately 40,000 rentable square feet.

- The ground floors of both towers to contain office tower lobbies, retail spaces and direct connections to a central pavilion providing access to the Plus 15 level.
- The East Tower component consists of 52 storeys of office space on floors 4 to 56 containing approximately 1.4 million square feet of rentable area above grade. The third floor of the office tower is a mechanical level (no 13th floor designation).
- The development is designed according to Canadian Green Building Council (CaGBC) LEED Gold Core & Shell Certification 2009.

b. Below Grade

i. Parking Levels

- Parking levels P1 to P6 contain approximately 540 parking spaces. Loading dock is located at the P2 level.

- Minimum headroom clearance conforms with municipal requirements in parking areas (currently 2100mm to any obstruction).

- A separate reserved parking area is designated within the parkade, accessible by separate card access.

- Suspended slabs in the garage slope to drains and have a traffic topping membrane protection system complete with waterproof membrane, which extends 150mm up columns and concrete walls. Driving aisles, loading dock areas and turning radius areas have a heavy duty traffic topping system.

- Perimeter walls, core walls, partitions, columns, mechanical service lines and underside of structure in parking areas are painted gloss white for security and maintenance.

- Mechanical service lines are labeled. Columns with assistance stations are colour coded. Columns are banded with colour coding to identify levels.

- Parking stalls and traffic markings are applied with yellow traffic paint.

- Parking spaces for the disabled are provided adjacent to shuttle elevator lobbies. These parking spaces are identified by signage and wheelchair pictograms in blue paint. Underground parking for bicycles is provided on the mezzanine parkade level.

- A parking signage system is extended throughout parking areas.

- Refer to section D Electrical for description of assistance stations and security systems.

- Storage areas located on the parking levels have concrete floors with, concrete block or gypsum board walls with resilient cove bases, and painted exposed concrete ceilings. Storage areas are ventilated but not air conditioned.

- Electrical service rooms have painted, fire retardant plywood mounting and painted, ceilings and walls.

- Mechanical service rooms have painted, ceilings and walls.

- Exit stairs are cast-in-place concrete (painted with non-slip finish), with painted steel balustrades and handrails. Walls and ceilings are smooth finish painted concrete or gypsum board.

- Entry to elevator vestibule on parking levels is through clear, wired glazed hollow metal doors within glazed metal screens, with power operators for wheelchair access. Elevator lobbies have painted gypsum board ceilings, painted walls, porcelain tile flooring and base.

ii. Loading and Garbage Handling

- Nine large loading bays, three small truck bays and three courier bays provided.

- Four garbage containers serve all office and retail tenants. A compactor is provided to compact garbage at a 4:1 ratio.

- The dry garbage, recycling, disaster recovery, dock lock up and hazardous/special waste rooms are air conditioned with epoxy floors and base. Walls are concrete block with epoxy paint. The ceiling and exposed structure is painted.

- A refrigerated garbage/organic storage room complete with a wash down area is provided.

- A recycling room is provided off the loading area for sorting and storage of paper, cardboard, glass and metal containers. Recycling containers are provided to serve all office and retail tenants.

- An oversized scissor lift is provided off the loading bay to accommodate an oversized pallet jack. 3 additional regular sized scissors lifts will be provided for movement of smaller equipment. An oversized scissor lift is also provided at the end of the loading bay to bring goods from the truck level to the dock level.

c. Office Tower

i. General

- The typical office tower floor to ceiling height is 2.75m, with additional height on the fourth and 56th floor (3.65m).

ii. Building Envelope

- The exterior wall of the ground floor is composed of a suspended structural glass wall assembly with vertical strong backs. The glazing is tempered clear low-iron glass.
- Openings in the facade at mechanical floors conceal intake and exhaust louvers behind. Opening surrounds are clad in metal.
- Building entrances are revolving glass doors, with glass canopies. Glazed swing doors are located adjacent to revolving doors.
- The office tower is clad in a unitized flush glazed curtain wall system with low E vision glass. A unitized thermally broken curtain wall system is used. Window mullions, where applicable, have a custom exterior prefinished colour.
- Vision glass is hermetically sealed insulating units with low-emissivity coating to improve thermal performance. The unitized aluminum curtain wall framing is thermally broken, designed as a pressure equalized rainscreen system.
- Building system design, including curtain wall and the HVAC system, takes into account and makes allowance for the higher solar heat gain on the south face of the Building.
- Exterior doors at grade (other than primary entrances) are insulated hollow metal with pressed steel frames and painted.

iii. Ground Floor Public Space

- The ground floor lobby exterior wall incorporates clear low iron glass with painted steel support system.
- The main building entrances have tempered glass revolving doors and balanced swing doors with brushed stainless steel. Revolving doors have power assist, glass canopies, and full 360° drainage at the floor. One or more swing doors are power operated for barrier free access.
- Flooring is granite with a honed finish.
- The main lobby walls are clad in high honed finish limestone panels. The base is granite or stone of equivalent quality.
- Ceiling consists of suspended white plasterboard with linear slot lighting throughout, and lighting slots at the core perimeter and elevator lobbies.

iv. Main Floor Directory

- An interactive freestanding computerized directory LCD screen is incorporated in the lobby.

v. Public Washrooms, Showers & Locker Rooms

- Floors and walls are porcelain tiles.
- Ceilings are suspended gypsum board, painted with light coves over vanity, toilets and urinals. Gypsum board coves over vanities have indirect lighting. Coves act as supply and return air plenums to eliminate ceiling grilles or louvers. Sprinkler heads are concealed, finish to match ceiling colour.
- Vanities are polished quartzite material. All services below vanities are concealed from reasonable view. Full width mirror above vanity extends to the tile line above.
- Pre-finished metal toilet partitions are ceiling hung.
- Brushed stainless steel recessed washroom accessories.
- Floor drains are provided in all washrooms.
- Urinals, water closets, and lavatories are high efficiency, low flow fixtures with electronic flush valves and control. Electronic flush valves and faucet controls are hard wired. Refer to building LEED criteria for plumbing fixture performance.
- High quality steel lockers are provided in change room areas.

vi. Central Alarm and Control Facility

- The central alarm control facility ("CACF Room") is located on the ground floor.
- The CACF room contains the following facilities:
  - Emergency voice communication system
  - Elevator emergency recall panel
  - Fire alarm annunciator panel
  - Sprinkler system flow signal panel
- The CACF room has resilient sheet flooring and cove base, painted gypsum board walls, and acoustic tile ceiling.

vii. Typical Single Tenant Floors

- The Landlord finishes service areas including the service elevator lobby, exit stairs, and base building mechanical, electrical, and telephone rooms.
- All base building electrical and communications rooms at and above grade have painted floors, walls, and exposed structure above. Backboards are fire retardant.
- All dry mechanical spaces at or above grade have epoxy finished concrete floor, painted walls and exposed structure above. Wet mechanical areas have fuel-resistant waterproof

flooring with integral cove base. Floors slope to drains as required. Curbs are provided around wet mechanical areas to contain spillage, where practical.

- Service elevator lobbies have resilient flooring, resilient cove bases, painted walls and fire rated gypsum board ceilings where required.

- Core walls include stud framing and electrical outlets. Installation of gypsum board and finishing is the responsibility of the tenant. At passenger elevator lobbies, Landlord provides exposed structure ceiling and concrete floors ready to receive floor finishes by the tenant. Upright sprinklers, emergency lighting and all life safety devices are installed by the Landlord to meet code requirements for occupancy permit. Relocation of these services and additional distribution to the suit tenant layout is the responsibility of the tenant.

- Doors to services rooms and exit stairs are fire rated and 2100mm hollow metal doors in pressed steel frames.

- Landlord tapes, sands and primes paint column enclosures, with finishes by the tenant.

- Ceilings beyond core are modular metric 750mm x 750mm non-directional texture acoustic ceiling tile with square edges, in suspension system with 25mm tees. Landlord installs ceiling grid, cut ceiling tiles and tiles around life safety devices. Remaining tiles are placed in on-site storage for delivery and installation by the tenant at their expense.

- Ceiling height in office areas is 2750mm above finished floor.

- Light fixtures installed on floors are for emergency lighting only. Lights beyond core are recessed LED luminaire fixtures complete wiring to electric distribution panels. All other lighting fixtures are placed in on-site storage for delivery and installation by the tenant at their expense. Cove light fixtures are provided in multi-tenant elevator lobbies. Refer to electrical outline specification section for further details.

- Floors beyond core are concrete with steel trowelled finish, ready to receive floor finish by tenant.

- Window treatment consists of manually chain operated roll up perforated solar shades, 3% open. Exterior window blinds are installed by Landlord. Prefinished housing matches interior curtain wall colour.

- Sprinklers in tenant areas are fully recessed type to suit base building open concept layout. Alterations to suit tenant layout is by the tenant.

viii. Base Building Washrooms

- Base building washroom floor finish and wall finish are porcelain tiles.

- Barrier free door openers installed.

- Washroom ceilings are suspended gypsum board, painted with coves over vanity, toilets and urinals. Gypsum board coves over vanities have indirect lighting. Coves act as supply and return air plenums to eliminate ceiling grilles or louvers. Sprinkler heads are concealed, finish to match ceiling colour.

- Vanities are caesar stone. Full width mirror above vanity extending to the tile line above.
- Pre-finished metal toilet partitions are ceiling hung.
- Washroom accessories are brushed stainless steel.
- Floor drains are provided in all washrooms.
- Urinals, water closets, and lavatories are high efficiency, low flow fixtures with electronic flush valves and control. Electronic flush valves and faucet controls are hard wired. Refer to building LEED criteria for plumbing fixture performance.

ix. Exit Stairs

- Tenants permitted to use exit stairs to travel between floors. Stairs are 250mm wider than the current Alberta Building Code minimum requirement.
- Exit stairs are cast-in-place concrete (painted with nonslip finish), painted steel balustrades and handrails. Walls and ceilings are smooth finish painted concrete.

x. Hardware

- Finish hardware is heavy duty commercial mortise type with lever handles. Finishes in public areas are brushed stainless steel. Lever handles are provided for barrier free access.
- Landlord provides base building recessed fire extinguisher cabinet modules with painted steel doors and trim and pre-finished steel tub in custom colour. Additional extinguisher cabinets required to suit tenant layouts is the responsibility of the tenant. Cabinet doors & trim in service areas are painted steel.

xi. Elevators and Escalators

- The office tower is serviced by 30 passenger elevators. Four parking shuttle elevators during Phase 1. Two elevators serve ground and levels P1 to P6 (outside core) and two elevators serve +15 to P5. Two tower service elevators serve levels P Mezz, P1 and P2, tower floors and mechanical level 57. Two retail service elevators are provided; one serves the Plus 15 retail, main floor, Pmezz, P1 and P2; one serves Plus 15 Retail, main floor and P2. Elevator specifications are detailed in section 6 and Appendix 6.
- All passenger elevator cabs have granite flooring, glass and/or stone wall finishes with stainless steel trim. Ceilings are stainless steel, with cove lighting. Doors and car operating panels are clad in brushed stainless steel.
- Service elevator entrances have painted finish, with custom stainless steel finish on ground floor.
- Escalators have high quality finishes - stainless steel (skirt, front plate, comb, decking and covers), black Teflon handrails, clear glass balustrade, silver aluminum steps.

xii. Public Art

- The Landlord incorporates a public art component in accordance with the Landlord's City of Calgary development permit #2012-4963 requirements.

d. Mechanical Floors

i. General

- The third floors and the elevator penthouses are mechanical floors.

ii. Mechanical Space Finishes

- The penthouse mechanical and electrical spaces have a poured concrete floating acoustic isolation floor where required, with walk on pedestrian traffic topping with waterproof membrane in the mechanical areas.

- Walls are concrete block or gypsum board, with paint finish. Ceilings are exposed structure (all fire rated as required). Mechanical piping is painted and colour coded with banding.

iii. Building Maintenance System Main Façade

- Main building façades are maintained by a powered roof car on tracks mounted above the penthouse roof surfaces. The roof cars have telescopic masts.

- The roof cars are stored on the roofs.

- Swing stages are used to access the main curtain wall façades.

iv. Ground Floor

- Interior and exterior façade maintenance at the ground floor is by means of a portable scissor lift.

v. Power and Water

- Power and water are provided at the main roof and at the ground floor. All hose bibs are non-freeze type, power to be 3 phase.

e. Signage

i. General

- The Landlord develops and installs a consistent signage program and specifications are used throughout the office tower common areas, Plus 15, parking levels and exterior areas.

ii. Exterior Signage

- Building entrance signage

- Municipal address

- Siamese connection signage
- Prohibitive signage

iii. Office Tower, Concourse and Plus15 Level Signage

- Main building (computerized) directory - 1 per tower
- Common area directional signage
- Base building room identification signage
- On floor directory and tenant signage – multi tenant floors only
- Washroom signage
- Code related signage at elevator lobbies, exits, fire alarm devices
- Room number identification signage on multi-tenant floors

iv. Parking Garage Signage

- Entrance signage
- Directional and instructional signage
- Painted markings, including parking space numbering (all spaces)

2. Structural

a. Fire Ratings

- The structure is designed for a 2 hour fire rating for the columns and 2 hours for floors and walls unless noted otherwise.

b. Description of Structural Systems

i. Superstructure

- A structural steel frame is 75mm concrete on steel composite deck with structural steel open web trusses framing on to rolled or plated rolled columns. A reinforced concrete core system is used for the lateral and central gravity framing scheme. The reinforced shear walls are coupled elements with door and opening lintels as a rigid frame action linking the central core walls.

c. Structural Design Criteria

Table 1: Basement Level		
Live Load (typically and for car ramp)	50 psf	2.4 kPa
Live Load in mechanical/electrical and storage areas	150 psf	7.2 kPa

Table 2: Superimposed Dead Loads		
Suspended mechanical/electrical	5 psf	0.3 kPa
Water proofing system	5 psf	0.2 kPa

Table 3: Ground Floor		
Live Load (within tower footprint)	150 psf	7.2 kPa
Superimposed Dead Loads (used in conjunction with permanent live loads noted above only)		
Partition Allowance	25 psf	1.2 kPa
Suspended Mechanical Allowance	25 psf	1.2 kPa
50 mm Built-up Floor Finish	25 psf	1.2 kPa
Superimposed Dead Loads (external areas)	25 psf	1.2 kPa
Landscaping	650 psf	31.2 kPa
Suspended mechanical allowance	25 psf	1.2 kPa

Table 4: Typical Office Floors		
Live Load		
Office Areas	80 psf	3.9 kPa
Elevator Lobbies/Mechanical Areas	100 psf	4.8 kPa
Security Corridor/Stairs	100 psf	4.8 kPa
Toilet Areas	50 psf	2.4 kPa
High Density Filing Areas (2 area = 90 sm)	175 psf	8.4 kPa
Superimposed Dead Loads		
Office Areas		
Partition Allowance	20 psf	1.0 kPa
Suspended Ceiling	5 psf	0.3 kPa
Suspended Mechanical	5 psf	0.2 kPa
Core Areas		
Office Areas	As req'd	As req'd
Partition Allowance	75 psf	1.2 kPa
Suspended Ceiling	5 psf	0.3 kPa
Suspended Mechanical	5 psf	0.2 lPa

i. Vertical Deflections

- Typical Interior Elements

  All typical floor framing elements, except those specifically noted below, are designed for a maximum live load deflection of l/360. Note that on the typical floors where the maximum span is in excess of 9 meters, this translates to a theoretical allowable live load deflection of slightly in excess of 25 mm. However, the design of the floor framing elements is such that they are governed by vibration rather than deflection, which results in a slight reduction in the actual live load deflection that exists. The actual live load deflection is in the order of 35 mm to 45 mm. All interior partitions, building services and the like are detailed to accommodate these deflections.

- Elements Supporting Masonry Partitions

  Horizontal structural elements supporting masonry partitions are designed for a maximum live load deflection of l/720.

- Perimeter Elements Supporting Cladding

  Horizontal structural elements supporting cladding are designed for a maximum live load deflection of l/1000 or 9 mm maximum (vertical). The secondary structural steel system supporting the atrium façade is designed for a wind load deflection of l/175.

ii. Material Properties

- Typical concrete elements are cast using the following concrete materials (28 day strengths):

Basement Slabs, Columns, Walls	– 35 MPa (5,075 psi)
Perimeter Foundation Walls	– 35 MPa (5,075 psi)
Slabs on Metal Deck	– 30 MPa (4,350 psi)
Slab on Grade	– 25 MPa (3600 psi)

3. Mechanical

a. General

- Plumbing, fire protection, heating, ventilation and air conditioning are provided in accordance with the requirements of the latest applicable codes, standards and local requirements of the City of Calgary, including the current Model National Energy Code of Canada and the Alberta Building Code

- In order to allow for the phased construction and potential future separation of each of the two office towers, each office tower has stand-alone mechanical systems, independent of each other.

b. Design Criteria

i. Heating and cooling systems are designed to maintain space temperatures as follows;

- Outdoor Conditions Winter –34.4ºC with 24 kmh wind

  Summer 32.2ºC db, 18.8ºC wb

- Indoor Conditions Winter 22ºC ±1ºC, minimum RH 15-20 %

  Summer 24ºC db ±1ºC, Maximum RH 55%

ii. The internal load allowances for the air conditioning system design are as follows:

			Office	Retail	Lobby
Occupancy	(area per person)	m²	9.29	4.6	6.96
	(usable Area)	sf	125	50	75
Lighting	(power per unit area)	w/m²	10.60	N/A	65
		w/sf	0.8	N/A	6
Receptacle	(power per unit area)	w/m²	16	107	N/A
		w/sf	1.5	10	
Supplementary Cooling	(power per unit area)	w/m²	10	—	—
		w/sf	0.75	—	—
Fresh Air	Flow rate/unit area	l/s/m²	1.0	0.6	0.6 Min
		cfm/sf	0.2	0.12	0.12 Min

iii. Supplementary cooling capacity consists of valved and capped chilled water for tenant extension to load.

iv. Fresh air flow for office spaces is controlled from CO2 sensors located on each floor which control constant volume flow devices. CO2 level is controlled at or below 900 ppm.

c. Description of HVAC and Fire Protection System

i. Typical Office Floors

- Cooling air is provided from on-floor, compartment-style variable air volume air conditioning units located in a core mechanical room on each office floor. Each unit includes a fan, chilled water cooling coil, MERV 13 air filter and appropriate sound attenuation. Compartment units are provided with variable speed drives for volume modulation under control of duct static pressure. A two-way control valve on the chilled water supply to the compartment unit cooling coil modulated to maintain the desired air supply temperature.

- Insulated supply air ductwork from each compartment unit is distributed to zone digitally controlled variable volume terminal units (VAV).

- Perimeter zones are between structural columns in length by 4.5 meters of depth. Structural columns are typically 9.0 meters to 12 meters.

- Corner zones are from 20.9 to 41.8 square meters for between 4.5 to 9 meters of exterior exposure length in one direction by 4.5 meters of exterior exposure length in the second direction.

- Interior zones are up to 110 square meters in floor area.

- The elevator lobby is a separate zone provided under the base building.

- Typical floors feature 24 perimeter zones and 11-14 interior zones, depending on location within the building.

- Interior zones are provided with cooling-only VAV controllers.

- Light fixture mounted air troffers (diffusers) are not visible from the occupied space.

- The ceiling cavity is a return air plenum with return air vented from the office space through openings in the base building light fixtures. CO2 detector is located in the return air path at the opening to the compartment room to control an outside air constant volume controller located on each compartment room outdoor air damper.

- Outdoor air is filtered, heated and humidified or cooled and dehumidified to provide tempered air supply to each compartment room. The total outdoor air supply is variable in volume to meet the needs of occupied floors only.

ii. Ground Floor Lobby and Plus 15 Level

- An air conditioning unit located at the level 3 mechanical floor is capable of delivering 100% outdoor air to the ground floor entrance lobby.

- The air delivery to the lobby is sufficient to provide the required cooling. Space heating is accomplished by perimeter fan coil units as well as by heating the supply air in the supply unit. The lobby air handler is under control by the building pressure sensing system. During cold weather, additional fresh air is heated and introduced at the lobby level to minimize stack effect.

- Separate Plus 15 supply unit is located at the level 3 mechanical floor of each tower. Separate ecology unit, sized for all food tenants, is provided.

iii. Pavilion

- An air conditioning unit located at the level 3 mechanical floor of each tower is capable of delivering outdoor air to the pavilion.

- The air delivery to the pavilion is sufficient to provide the required cooling. Space heating is accomplished by recessed perimeter fan coil units as well as by heating the supply air in the supply unit. The lobby air handler is under control by the building pressure sensing system. During cold weather, additional fresh air is heated and introduced at the lobby level to minimize stack effect.

- Air delivery for the north portion of the pavilion is from sidewall supply air diffusers and perimeter floor diffusers at the glazing. Air delivery for the south / lower level portion of the pavilion is from perimeter floor diffusers at the glazing.

iv. Description of Proposed Ventilation System

- Each floor is provided with washroom and general exhaust ventilation systems designed to expel air from each floor. Up to 90% of the outdoor air supply quantity is removed to result in a net positive pressurization of each floor during normally occupied periods.

- Air is transferred from the office area ceiling return plenum to vent through openings in each washroom.

- General exhaust air shafts are provided within the core with ducted outlet into the ceiling plenum of each floor. General exhaust connections on each floor are provided with VAV boxes to regulate floor pressure based upon the demand based ventilation airflow added to each floor. Ductwork may be provided by the tenant to directly connect general exhaust to areas requiring ducted venting. This system cannot be used for grease-laden vapours and the capacity of the system may vary over the seasons. The general and toilet exhaust fans are provided with variable frequency drives to provide control of Building pressurization.

- Exhaust systems for the tower are split at the mid height and the lower portion drawn down to the third floor fan room for discharge. The upper half discharges to the top of the Building.

v. Special Cooling and Heating Requirements

- Elevator machine, telephone and communication, and fire control rooms are mechanically cooled.

- Tenant cooling requirements beyond that provided in the base building air conditioning system are provided from valved chilled water connections within the core of the Building. Approximately 17 kW (5 tons) per floor is available. Metering of consumption required by the Landlord.

- All non air-conditioned interior Building spaces are heated to maintain 21°C (70°F) minimum temperature with thermostatically controlled hydronic unit heaters, fan coils, convectors or wall-fin radiation.

- On-floor Electrical/COMM rooms are mechanically cooled through the use of fan coil units so as to maintain the required room temperatures.

vi. Smoke Control Ventilation Provisions

- The fire alarm system initiates smoke control consisting of smoke venting to aid fire-fighting. Fan and damper positions are monitored and controlled from the fire alarm system.

- The fire floor is automatically exhausted under control by the fire alarm system. The ventilation air riser and a smoke exhaust fan located in the mechanical penthouse are used for smoke exhaust. Low leakage smoke dampers located on the fresh air shaft are used to control smoke exhaust on each floor. Damper open and closed status are monitored and transmitted to the fire alarm system.

- Smoke control fans, dampers and controls are on emergency power and controlled from the CACF room.

- Tower exit stairs are pressurized in an emergency. Fresh air is tempered and introduced from the top and bottom of the building. Pressurization shafts are fire rated and air is injected on every 5th floor. Pressure control modulates the air volume to maintain a slight positive pressure in the stairwell.

- Stair pressurization fans and ductwork are provided to each stair extending below grade. Air is supplied at the lowest stair level and relieved to the outdoors at the highest stair level.

- Vestibules separating below grade stairs from parking areas are continuously pressurized with fresh air to prevent ingress of car fumes.

vii. Fire Protection Measures

- Each office floor is sprinklered in accordance with the Alberta Building Code and NFPA-13 requirements for an open office plan, changes to suit tenant layout are tenant's responsibility. The office sprinkler classification is Light Hazard with recessed pendant heads located one per 20.9 square meters. Retail and lobby areas are Ordinary Hazard Group 2 classified. Parking levels and loading dock are Ordinary Hazard classification systems. (All Hazard classifications and groupings indicated reference NFPA requirements.)

- A hydraulically designed combined sprinkler and standpipe system is provided. Risers are provided in each tower stair well and cross connected for redundancy. Fire pumps provide the necessary flows and pressures under emergency conditions.

- Fire department connections at 2.5 inches are provided in stairwells for each floor. Additional 100mm diameter connections are provided to enable future extension of the standpipe system provided under the tenant fit-up. Fire extinguisher cabinets are provided throughout the building to suit code requirements.

- Ten pound dry chemical fire extinguishers are provided in all extinguisher cabinets.

- Additional dry chemical type fire extinguishers are provided in each floor's electrical and compartment room, as well as all other mechanical, electrical and building service rooms.

d. Plumbing System

i. Water Service

- Separate street water supplies serve the domestic water and fire service.

- Distribution is provided on each floor to washroom fixtures.

- Additional capped and valved 20mm domestic cold water lines are provided on two sides of the typical office and podium cores for extension by a future tenant. Tenant's service may be metered at the Landlord's discretion.

ii. Supply piping has shut-off valves and backflow preventers where required by applicable laws.

iii. Domestic Hot Water System

- Base building domestic hot water is generated by under-counter mounted instantaneous

electric hot water heaters located within each washroom. Office tenants expected to

- provide their own point of use domestic hot water heaters to suit. Domestic hot water is supplied at 43ºC (110ºF).

iv. Fixtures and Trim Selection

- Plumbing fixture and trim are provided to meet the low water consumption requirements of the Alberta Plumbing Code and suitable to achieve LEED Gold Core and Shell certification.
- Water closets are of the wall hung type with elongated bowls. Water closets within the men's and women's washrooms have exposed electronic hands free flush valves.
- Wall hung urinals have exposed electronic hands free flush.
- Flush valves are complete with sediment filters.
- Lavatories are vanity under counter mounted with electronic hands free tempered water trim. Water and drain connections are insulated for condensation and sound attenuation.
- Special water closets are provided for male and female barrier free (wheelchair) access.

v. Provisions for Tenant Services

- The base building electronic control and monitoring system may be extended by the tenant to connect to control and monitoring points that the tenant may add. Allowances are made for four additional temperature monitoring points per floor.
- The chilled water system risers can accommodate the addition of 5 tons of cooling per floor by the provision of capped connections on the risers at every floor.

e. Emergency Generator, Exhaust and Cooling System

i. Minimum of 24 hours duration of continuous supply to 100% load capacity of the generators. Fuel tanks are located in a dedicated room on the lowest parking level.

ii. Transfer pumps and supply piping for the generators are provided.

iii. Exhaust stacks complete with a muffler system are provided from generator discharge to the building exterior. Generator exhaust discharges are located in a location suitable to meet local environmental requirements, distant from air intakes and other critical receptors.

f. Parking and Loading Areas

i. Parking areas are ventilated to meet the requirements of the local authority. Control of push/pull fan systems is from CO monitors located strategically throughout the parking areas.

ii. Tempering of makeup air is provided from gas fired makeup units to maintain minimum temperature in the underground parking.

iii. Loading dock exhaust fans are controlled from CO as well as HC monitors, to keep air quality

within regulated limits. Heating of the dock area is provided to maintain a minimum set point temperature.

g. Controls and Monitoring

i. Automated electronic building control and monitoring system (BCS) is incorporated as part of the overall strategy of controlling energy consumption, environmental comfort and related costs.

ii. The ECMS is an independent LAN based Direct Digital Control (DDC) system designed with open protocol technology.

iii. The EMCS is separate from lighting, fire and other functions, but will have status links to these systems.

iv. All programming has operator adjustable parameters and is be capable of trending to permit fine tuning by building operators based on operational experience.

h. Commissioning

i. A separate fundamental commissioning will be conducted and will include:

- Water balance of all hydronic systems.
- Air balance of all air systems.
- Control system functional checkout.
- Equipment and system start-up and checkout.

4. ELECTRICAL

a. General Overview

i. The electrical system is designed to offer ease of operation, maintenance and flexibility.

ii. All components are of a modular construction for fast and efficient servicing and to provide flexibility for on-going reconfigurations.

iii. All electrical work complies with or exceeds the minimum requirements of the applicable codes, rules and regulations of the latest:

- Alberta Building Code
- Electrical Safety Code
- Local Electrical Codes and Requirements
- CSA Standards
- IEEE Standards
- IES Standards

- ASHRAE Standards

iv. CaGBC LEED Gold Core and Shell Certification, 2009.

v. Building utilizes state of the art components intended to satisfy the needs of a contemporary highly automated office environment.

b. Life Safety Systems – Emergency Power

i. Two standby emergency generators are provided. The generators are intended to automatically service the essential needs of the Building in case of utility source power failure. One generator is dedicated to base building requirements and the other available for tenant use.

ii. Generators support the following base building loads:

- Emergency egress lighting
- Exit lighting
- Fire Alarm System
- Landlord Security system
- Two (2) chillers and associated pumps.
- Elevators
- Smoke removal system
- Fire pump
- Sump pumps and sewage pumps
- Building automation system (BAS)
- Telephone backboards

iii. A 2000A 277/408V bus duct riser serving the entire tower provide support for tenant on-floor emergency load.

c. Exit Lighting

i. Illuminated exit signs are provided at all means of egress and paths leading to such means. Power supply is from the emergency power system described above. All exit signs are energy efficient LED type.

d. Emergency Lighting

i. Selected lighting fixtures are connected to normal/emergency system so that on failure of utility source power these will provide a minimum of 10 lux average illumination along all means of egress and paths leading to these.

ii. In addition to the emergency lighting powered by the generators, all above grade stairwells are provided with battery operated emergency lighting.

e. Energy

i. State-of-the-art components utilized to minimize energy consumption wherever practical throughout the Building, namely, high efficiency light sources and lighting fixtures with electronic ballasts.

ii. Occupancy sensors are provided in open office area and most other spaces to conserve energy.

f. Power To Tenant Spaces, typical Floor Office

i. Power to tenant office space is provided from 277/480 volt, 4 pole bus duct risers. Bus ducts rise through the electrical rooms on each floor. A 100mm curb and fire stopping is provided at all penetrations through the floor.

ii. A bus duct mounted cable tap box is provided on each floor to feed a splitter trough.

iii. Lighting panels are provided for the base building lighting system, fed from the 277/480V splitter trough.

iv. Dry-type transformers on each floor, one in each electrical room, are fed from the splitter trough. Each transformer in turn provides power to two electrical panels to feed tenant miscellaneous power loads. Transformers are harmonic mitigating type to withstand harmonic distortion created by non-linear loads.

v. Space for future service is available on the bus duct cable tap off box and for one 200A connection

vi. Space within core electrical room is available to accommodate two 42 CGS panels.

vii. Power capacities provided as follows:

- 0.75 watt/square foot for office, public space and corridor lighting.
- 1.25 watts/square foot for miscellaneous power (plug load).
- 1.0 watts/square foot spare capacity in the bus duct risers for special uses.
- This total of 3.0 watts/square foot is exclusive of power required for HVAC and elevator services.

g. Lighting Design

i. High efficiency and high colour rendering lamps and energy saving fixtures are used throughout. All base building fixtures are equipped with energy efficient LED; lamps equal to be 3500 K, with a CRI of 85.

ii. Lighting levels conform to recommendations set out by the Illuminating Engineering Society.

iii. Public Spaces: Recessed LED down lighting or linear LED cove lighting is integrated into the architectural elements, with 200-250 Lux. dimmable accent lighting used to highlight artwork, sculptures, etc.

iv. Office Areas: Recessed LED direct/indirect with lensed diffuser, 750mm x 750mm air handling luminaire.

v. Only emergency lights are installed, remainder to be placed in storage for installation by the tenant.

vi. Washrooms: Down lighting to provide general lighting.

vii. Stairwells: Lensed fluorescent luminaires at each landing and mid landing.

viii. Exit Lighting: Energy efficient type at all exits and where required by code. Public areas are edge lit type. Other office areas are cast aluminum bodies. All service areas are press steel construction.

ix. Exterior: Low level LED floodlights LED post top luminaires used for illumination of exterior walkways and building entrances.

x. Underground Parking Structure: Surface mounted fluorescent strip lights with T-8 lamps provide higher than published standard lighting levels.

h. Telecommunications Infrastructure

i. One (1) Telecommunication Service Providers ("TSP") room is provided as the service entry points for multiple carriers. The TSP rooms is designed to allow both fiber optic and copper-based telecommunication carrier services to the building main telecommunications room.

ii. Diverse riser pathways emanate from the TSP room, one to Sixth Avenue and one to 1st Street, through Enmax ductbank.

iii. The TSP rooms are connected to a building communications pathway riser system servicing all floors of the building for vertical transport of the buildings backbone cabling requirements. Two communication rooms per floor provided.

i. Fire Alarm and Detection Systems

i. A computerized zoned, non-coded, modified two stage system is provided. This system is designed to fully integrate with other life safety, sprinkler, security and smoke exhaust systems.

ii. The system employs fully programmable addressable devices, each with its own unique address allowing the building operators to specifically identify the detector in alarm.

iii. The primary means of detection/suppression is the automatic sprinkler system; however, in certain critical areas this system is supplemented by the following types of early warning detection:

- Electrical & telecommunication rooms - smoke detector.
- Stairwells - photo-electric smoke detectors every 3rd floor.

- Elevator shafts - thermal detectors at top and bottom.
- Air handling systems - duct mounted air sampling smoke detectors.

iv. A complete emergency voice communication system is provided for fire-fighter monitoring and control of egress.

v. Speakers to be used for audibility.

vi. A central control and annunciator panel is located on the ground floor, in the C.A.C.F. room, adjacent to the main entrance.

j. Security System

i. A security control room is the security command centre for the entire Building.

ii. Security system is provided with a fully integrated intelligent distributed architecture approach utilizing a central control with fully standalone remote processing units located throughout the Development.

- The system automatically controls card access readers, electro-magnetic locks, strikes, door contacts and is connected to the fire alarm system. The system is also designed to allow for off-Site monitoring from a recognized central station.
- Computerized card access control allows the building operator to restrict movement or access to any part of the building to only those authorized to do so.
- Card readers are provided in the building at critical points including all exterior doors, elevators, loading dock, typical floor communication rooms and other critical areas restricted to the public.
- Tenant is responsible for security installation within its own office facilities.
- Rough-in for card readers, door contacts, electro-magnetic locks and signal bells are provided at all exit stair doors in the tower to allow access control devices installed at these locations by tenant occupying single or multiple floors.

iii. Surveillance/CCTV system is provided to monitor critical points including public areas, building perimeter, parking, ground floor exits, elevator lobbies in parking and ground floor, loading areas and building main entrances. All CCTV monitors are located within the security control room.

iv. Tenant to review base building CCTV and surveillance plans, designs and specifications in advance of the same being finalized. Tenant to view all as-built drawings and specifications of the same as well as review physical system once constructed, fully installed and operational.

v. Duress alarm system is provided for the underground parking areas. The system consists of panic alarm buttons/intercom, alarm horns and strobe lights strategically positioned throughout the parking areas.

vi. Defibrillator stations are connected to the security system for monitoring.

k. Building Lighting Control

i. A microprocessor based low voltage lighting control and energy-monitoring system is provided to control all lighting in the Building. Exterior lights, ground floor, and typical office floor lighting are controlled by points in the system.

ii. In addition to the low voltage lighting control system, occupancy sensors are provided throughout the Building including all washrooms and typical floor rentable areas.

l. Tenant Electrical Metering

i. A microprocessor based electronic metering system is provided to allow accurate distribution of utility costs. All on floor electrical loads are metered including the air handling unit.

ii. A metering 'riser' is established in the building to accommodate additional metering points (for multi-tenant floors for example). All metering data is centrally accumulated for proper allocation.

iii. Each typical office floor includes three meters for metering the following: on-floor air handling unit, plug loads and base building lighting.

5. ACOUSTICS AND VIBRATION

a. General Overview

i. Ceiling tiles on typical tenant floors are mineral fibre tiles having a Noise Reduction Coefficient (NRC) of 0.70 and a minimum Ceiling Attenuation Class (CAC) of 35.

ii. Average operating sound levels from base building mechanical and electrical equipment on typical tenant floors don't exceed NC-40 within 3.0 m of the core, and NC-35 elsewhere.

iii. The penthouse mechanical and electrical spaces are a poured concrete floating acoustic isolation floor where required, with walk on pedestrian traffic topping and waterproof membrane in the mechanical areas.

iv. The design of the floor framing is carried out in the context of the requirements of the industry standards with particular attention to the "walking vibration" and AISC Steel Design Guide 11 Series, "Floor Vibrations Due to Human Activity", as prepared by Tomas M. Murray, David E. Allen, and Eric E. Ungar dated in 1997.

6. CONVEYING SYSTEMS

b. Elevator Systems

i. Description of Systems:

- Passenger Elevators No. 1 - 10:

a. Quantity:	10
b. Capacity:	1600 Kilograms
c. Speed:	4.0 MPS
d. Floors Served:	Lobby, 4-24

e. Stops/Openings: 21/21
f. Machine Location: Overhead
g. Machine Type: VVVF-AC Traction
h. Operation: Group Destination Dispatch

- Passenger Elevators No. 11-20:
  a. Quantity: 10
  b. Capacity: 1600 Kilograms
  c. Speed: 5.0 MPS
  d. Floors Served: Lobby, 24-41
  e. Stops/Openings: 18/18
  f. Machine Location: Overhead
  g. Machine Type: VVVF-AC Traction
  h. Operation: Group Destination Dispatch

- Passenger Elevators No. 21 - 30:
  a. Quantity: 10
  b. Capacity: 1600 Kilograms
  c. Speed: 6.0 MPS
  d. Floors Served: Lobby, 41-56
  e. Stops/Openings: 16/16
  f. Machine Location: Overhead
  g. Machine Type: VVVF-AC Traction
  h. Operation: Group Destination Dispatch

- Service Elevators No. 1-2:
  a. Quantity: 2
  b. Capacity: 1800 Kilograms
  c. Speed: 5.0 MPS
  d. Floors Served: P2, PM, +15 Main, 3- 5
  e. Stops/Openings: 59/59
  f. Machine Location: Overhead
  g. Machine Type: VVVF-AC Traction
  h. Operation: Simplex Selective Collective

- Parking Shuttles No. 1 & 2:
  a. Quantity: 2
  b. Capacity: 1600 Kilograms
  c. Speed: 1.75 MPS
  d. Floors Served: P5-P1, PM, G, +15
  e. Stops/Openings: 8/8
  f. Machine Location: MRL
  g. Machine Type: VVVF-AC Traction
  h. Operation: Duplex Selective Collective

- Retail Shuttle No. 1:
  a. Quantity: 1
  b. Capacity: 1800 Kilograms
  c. Speed: 1.75 MPS
  d. Floors Served: Front P2, Pm, G Rear +15
  e. Stops/Openings: 4/4
  f. Machine Location: MRL

g. Machine Type: VVVF-AC Traction
h. Operation: Simplex Selective Collective

- Retail Shuttle No. 2:
  a. Quantity: 1
  b. Capacity: 1800 Kilograms
  c. Speed: 1.75 MPS
  d. Floors Served: Front P2, G, +15 Rear PM
  e. Stops/Openings: 5/5
  f. Machine Location: MRL
  g. Machine Type: VVVF-AC Traction
  h. Operation: Simplex Selective Collective

ii. Special Operations:

- Independent Service: All Elevators
- Anti-Nuisance Service: All Elevators
- Standby Power: All Elevator
- Fireman's Emergency: All Elevator
- Earthquake Emergency: All Elevator
- Door Hold: All service elevators
- Attendant Service: All service elevators

iii. Additional Equipment:

- Central Control Station: All elevators, with single LCD monitor, keyboard control, and master intercommunication station.
- Fire Control Station: All elevators, as required by code.
- Counterweight Safeties: Provide as required by code.

iv. Hoistway Entrances:

- General: One-Piece welded 14-gauge frames, with flush type 16-gauge door panels.
- Passenger Elevators:
  - Type – Size: Center-Opening, 1100mm x 2400mm.
  - Ground Floor: Cladded entrances with sub-frames; steel sheet, shop prime finish. Door panels; stainless steel finish with milled stainless steel sills.
  - Typical Floors: Steel sheet, shop prime finish with extruded aluminum sills.
- Service Elevator:
  - Type – Size: Two-Speed side opening, 1200mm x 2400mm.
  - Ground Floor: Stainless steel finish frames and doors, with milled stainless steel sill.
  - Typical Floors: Steel sheet, shop prime finish, with extruded aluminum sills.

c. Escalator Systems

i. Description of Systems:

- Escalators No. 1 & 2:

-	Quantity:	Two
-	Size:	1000mm Step Width
-	Step Speed:	0.5 MPS – Reversible
-	Floors Served:	Ground & Plus15 Level
-	Balustrade:	Glass
-	Number of Flat Steps:	Three, Upper & Lower

ii. Finishes:

- Balustrade: Structural glass w/o mullions; joints vertical.
- Decking & Molding: Stainless steel finish.
- Skirt Panels: Manufacturers' standard low friction material.
- Handrails: Teflon

CONSTRUCTION COORDINATION

APPENDIX 6 – SERVICE ELEVATOR CAPACITY & DIMENSIONS

- Service Cars (SE1 and SE2):
  - a. Clear height: 12’-8” (3861 mm)
  - b. Door opening size (height & width): 4’-0” x 7’-6” (1219mm x 2286mm)
  - c. Interior platform dimensions – allowance for handrails: approx. 65” x 101 ½ “ +/- 1” (clear space between hand and bumper rails)
  - d. Weight capacity: 5500 lbs (2500 kg)

CONSTRUCTION COORDINATION

APPENDIX 7 - TYPICAL STANDARD DETAILS

All standard details shall reflect and include design elements, finishes, materials, products, systems, functionality, efficiency, sustainability, and space usability that are found within comparable quality buildings (commonly rated as Class AA) of similar type and size in the downtown core of Calgary, Alberta.

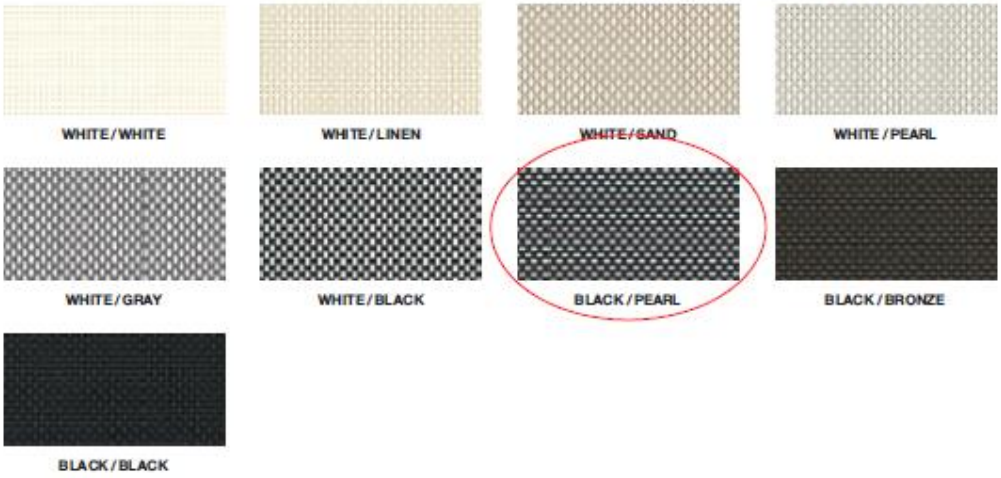
1. Window Coverings

- The Brookfield Place specified fabric is GlacierScreen 3% Open" colour Black/Pearl.

FABRIC SELECTOR

GlacierScreen HD1003 | 3% openness

Fabric is also available in:
5% openness (see GlacierScreen HD1005, page 4-29)
10% openness (see GlacierScreen HD1010, page 4-41)



Specifications

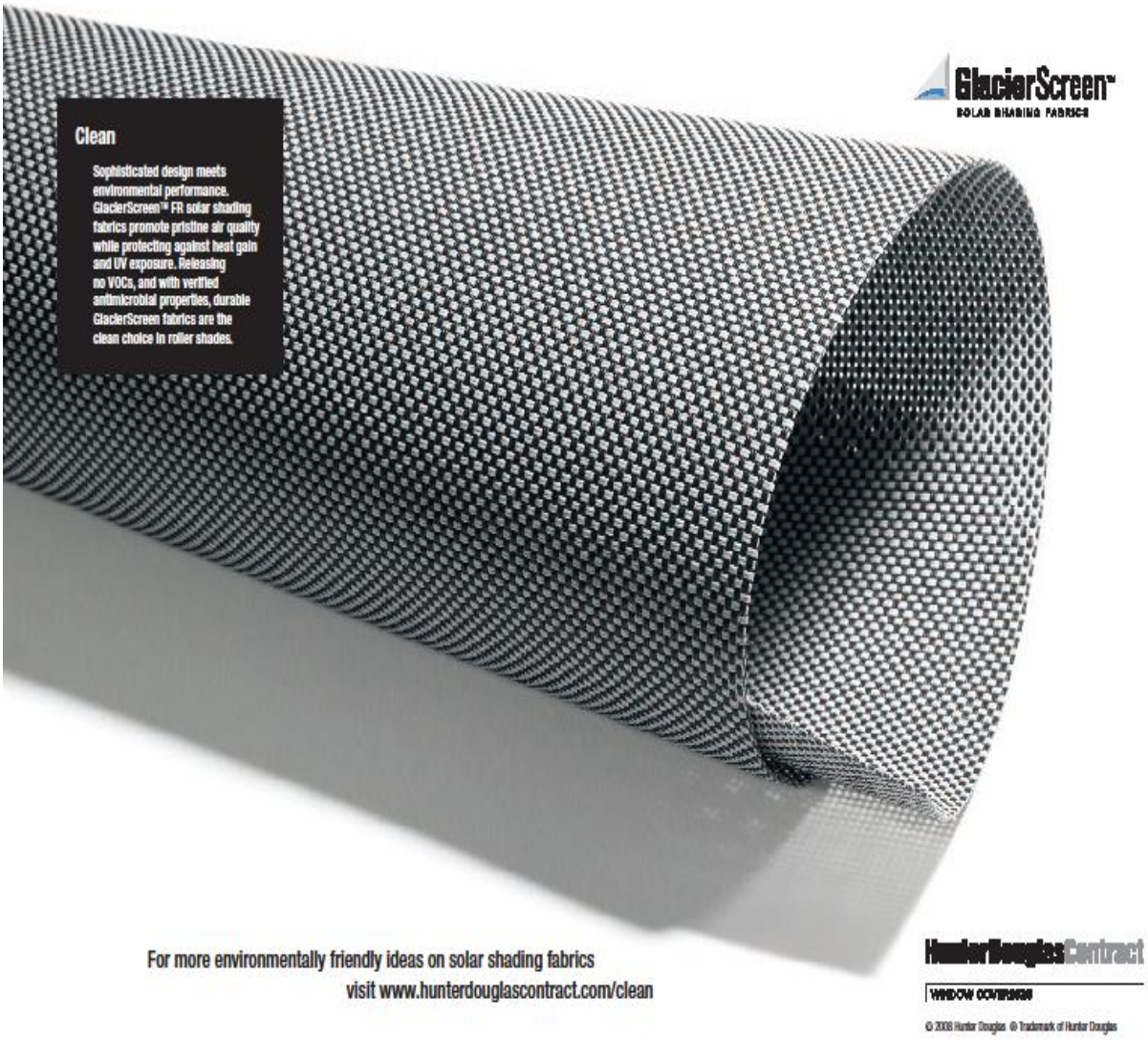
MAX. FABRIC WIDTH:	118"	OPENNESS FACTOR:	3%
ROLL LENGTH:	32.8 yd	COMPOSITION:	78% vinyl, 22% polyester
FABRIC WEIGHT:	14.6 oz/yd²	FIRE CLASSIFICATION:	NFPA 701-2004 TM#1 Cal Tech Title 19
FABRIC THICKNESS:	0.0283"		

	SOLAR OPTICAL PROPERTIES					SHADING COEFFICIENT WITH INSULATING		
COLOR	Ts	Rs	As	Tuv	Tv	1/8CL	1/4CL	1/4HA
WHITE/WHITE	21	67	12	4	18	0.34	0.34	0.32
WHITE/SAND	13	50	37	4	11	0.44	0.43	0.37
WHITE/LINEN	20	63	17	4	16	0.36	0.36	0.33
WHITE/PEARL	15	54	31	4	13	0.42	0.41	0.36
WHITE/GRAY	8	38	54	4	9	0.51	0.50	0.40
WHITE/BLACK	6	29	65	4	7	0.57	0.55	0.43
→ BLACK/PEARL	4	18	78	4	6	0.64	0.61	0.46
BLACK/BLACK	4	4	92	4	6	0.73	0.69	0.51
BLACK/BRONZE	4	6	90	4	5	0.72	0.68	0.50

TS Solar Transmittance
RS Solar Reflectance
AS Solar Absorptance
Tuv Ultra-violet Transmittance
TV Visual Transmittance

1/8 CL 1/8" Clear Glass
1/4 CL 1/4" Clear Glass
1/4 HA 1/4" Heat Absorbing Glass

- The solar optical properties are used to calculate the shading coefficient.
- The shading coefficient represents the percentage of solar heat gain that is transmitted to the interior through the glass and shading system. Darker colors provide maximum glare reduction and visibility.


GlacierScreen™
SOLAR SHADING FABRICS
Clean
Sophisticated design meets environmental performance. GlacierScreen™ FR solar shading fabrics promote pristine air quality while protecting against heat gain and UV exposure. Releasing no VOCs, and with verified antimicrobial properties, durable GlacierScreen fabrics are the clean choice in roller shades.
For more environmentally friendly ideas on solar shading fabrics
visit www.hunterdouglascontract.com/clean
HunterDouglasContract
WINDOW COVERINGS
© 2008 Hunter Douglas ® Trademark of Hunter Douglas

CERTIFICATE OF COMPLIANCE

GREENGUARD
PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS
UL.COM/GG
UL 2818
GOLD

Hunter Douglas

GlacierScreen™ Solar Shading Fabrics

Restrictions:

4736-420
Certificate Number

01/10/2008 - 11/16/2015
Certificate Period

Certified
Status

UL 2818 -2013 Gold Standard for Chemical Emissions for Building Materials, Finishes and Furnishings

Product tested in accordance with UL 2821 test method to show compliance to emission limits on UL 2818. Section 7.1 and 7.2.

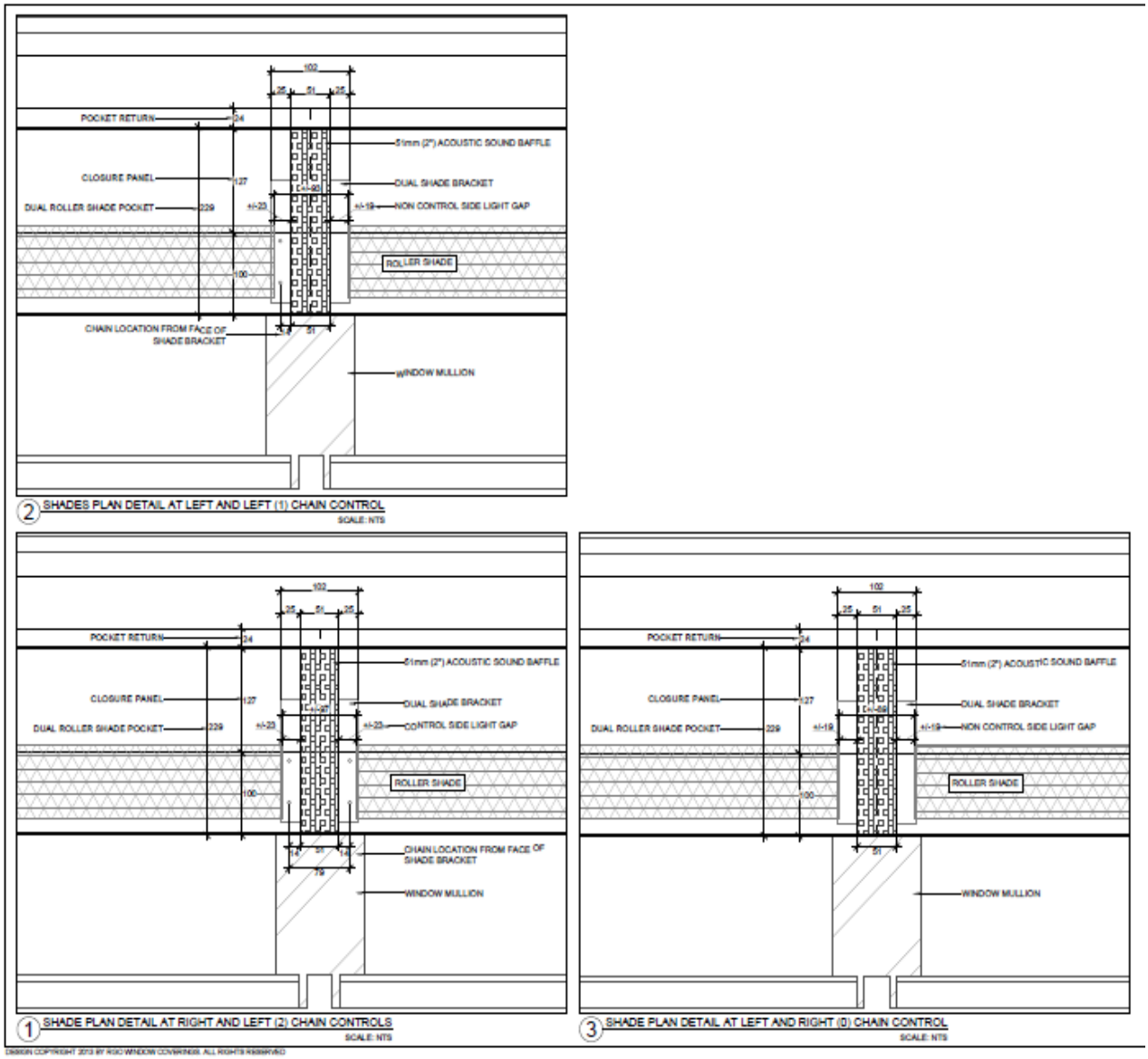
Building products and interior finishes are determined compliant in accordance with California Department of Public Health (CDPH) Standard Method V1.1-2010 using the applicable exposure scenario(s).

Environment

UL Environment investigated representative samples of the identified Product(s) to the identified Standard(s) or other requirements in accordance with the agreements and any applicable program service terms in place between UL Environment and the Certificate Holder (collectively "Agreement"). The Certificate Holder is authorized to use the UL Environment Mark for the identified Product(s) manufactured at the production site(s) covered by the ULE Test Report, in accordance with the terms of the Agreement. This Certificate is valid for the identified dates unless there is non-compliance with the Agreement.

2. Window Blind/Window Mullion Coordination

- If interior partitions or other installations are installed up against the interior window mullions, they need to be constructed to allow for the operation of the exterior window blinds that overlap a portion of the window mullion face. To be reviewed on site by the Tenant, their designer and contractors.



CONSTRUCTION COORDINATION

APPENDIX 8 – HOT WORK PERMIT

Hot Work Permits (HWP) are available at Security control desk. The Hot Work Permit process will ensure that any hot work done at a Property will be conducted in the safest manner possible. Cutting, grinding, brazing, welding, soldering, thawing pipe, torch applied roofing are all examples of hot work which includes any operation that involves open flames or could produce heat and/or sparks.

The following hot work procedures are to be followed at all times:

1) The Hot Work Worker (collectively known as "Worker") will sign in at the designated location and inform the property of the work to be completed. The Property will assess the work required and will follow the process and recommend alternatives to hot work. Every request for hot work should be evaluated for risk and alternative options should be explored. Hot work completed in a high hazard area must not be permitted or must be at the discretion of the Designated Hot Work Manager and be completed with increased safety precautions.

2) The Worker which is the person completing the hot work is responsible for:

    - Following all of the procedures and the requirements contained in this policy and the permit;
    - Ensuring that hot work is completed in the safest way possible;
    - Taking all reasonable efforts to prevent false or nuisance fire alarms;
    - Conducting a fire watch in conformance with this policy and the insurance provider for the entire duration of the work including any breaks and for up to at least 1 hour after work has been completed;
    - Notifying the appropriate person(s) at the property of any hot work to be completed on the premises and the context of the work that is to be completed as well as expected start and end times. The Designated Hot Work Manager or designate will review the type of work and determine if fire alarm or other fire detection or protection system are to be bypassed or shut off;
    - Informing the appropriate person(s) at the property when any work has been completed or if circumstances have changed. The Worker will notify the appropriate person(s) at the property when it can return fire detection or protection systems to normal operations;
    - Providing accurate information to fill out the permit, ensuring the permit is completely filled out and signing the permit;
    - Ensuring that equipment used for hot work is in good working order and that all the required codes and standards are followed;
    - Transporting and storing pressurized gas cylinders in accordance with the applicable codes, standards and safety requirements;
    - Providing metal guards or fire retardant tarpaulins if required for the work;
    - Ensuring the appropriate fire hose or fire extinguisher is available for use during hot work.

3) If hot work is required, the Property and the Worker will fill out the left portion of the hot work permit. Under "Permit Expires", the expiry must be after the hot work task is completed and before the end of the Workers shift. No hot work for the task is permitted after the permit expires.

4) The Property will review the hot work permit for accuracy and completeness. The Property will not sign off on the permit until a pre-inspection is completed.

5) The Property will assess based on the work to be completed whether fire protection or detection systems (smoke detectors, heat detectors, etc.) need to be bypassed or shut off. The Property will also contact the Fire Department and Monitoring Agency (if applicable) for impairments and according to any requirements in the Fire Safety Plan.

6) The Property will not allow the Worker access to the work location unless they have all of the required permits (ex. Safe Work Permit).

7) The Worker can now access the work location and start preparing it for hot work by removing combustibles within 35 feet, sweeping the area clean and checking all of the other safety precautions listed on the permit. Just preparations. No hot work is allowed until the property completes an inspection and signs off on the permit.

8) The Worker will inform the property that they are ready for the pre-inspection. A Property representative (Security/Operations) also known as a Hot Work Inspector will conduct a pre-inspection of the space ensuring that all of the safety precautions listed on the permit have been met and that the permit is complete. If the property representative is satisfied that all the requirements have been met they will sign off on the permit. All of the sections of the permit must be completed.

9) The stringed copy of the permit will be posted in the work area.

10) The hot work may now begin. The Worker will follow all precautions listed on the permit and conduct a continuous fire watch while hot work is being completed.

11) The person(s) conducting the fire watch are responsible for:

- Must be separate individual(s) than the person performing the Hot Work;
- Patrolling the affected area, the area above, the area below and any adjacent areas or rooms at pre-determined intervals during hot work and after hot work has been completed and for the entire duration of any impairment. A continuous fire watch is required during and for up to 1 hour after hot work has been completed;
- Completing a Fire Watch Patrol Log Sheet which will detail the person completing the patrols, the date, the start and end time, the areas patrolled and any comments;
- Notifying emergency services if fire, smoke or other dangerous occurrence is found;
- Pulling a fire alarm pull station or alerting occupants by other means if fire or smoke is discovered;
- Extinguishing any small fire as long as the person feels comfortable doing so, is adequately trained and is not in danger;
- Inform the appropriate persons or departments at the property if any unsafe or other notable occurrences are discovered;
- Stopping hot work and any other work if a fire occurs or fire alarm tones are heard.

12) The Worker will notify the property once hot work has been completed. The Worker must remain on site for at least 60 minutes after the hot work has been completed and conduct a continuous fire watch.

13) When hot work has been completed and after the 60 minutes of fire watch the Worker will notify the property that they are ready for the post inspection. A Property representative

(Security/Operations) or Hot Work Inspector will conduct a post inspection of the hot work space checking the work area, the area above and the area below for any indication of fire or unsafe condition.

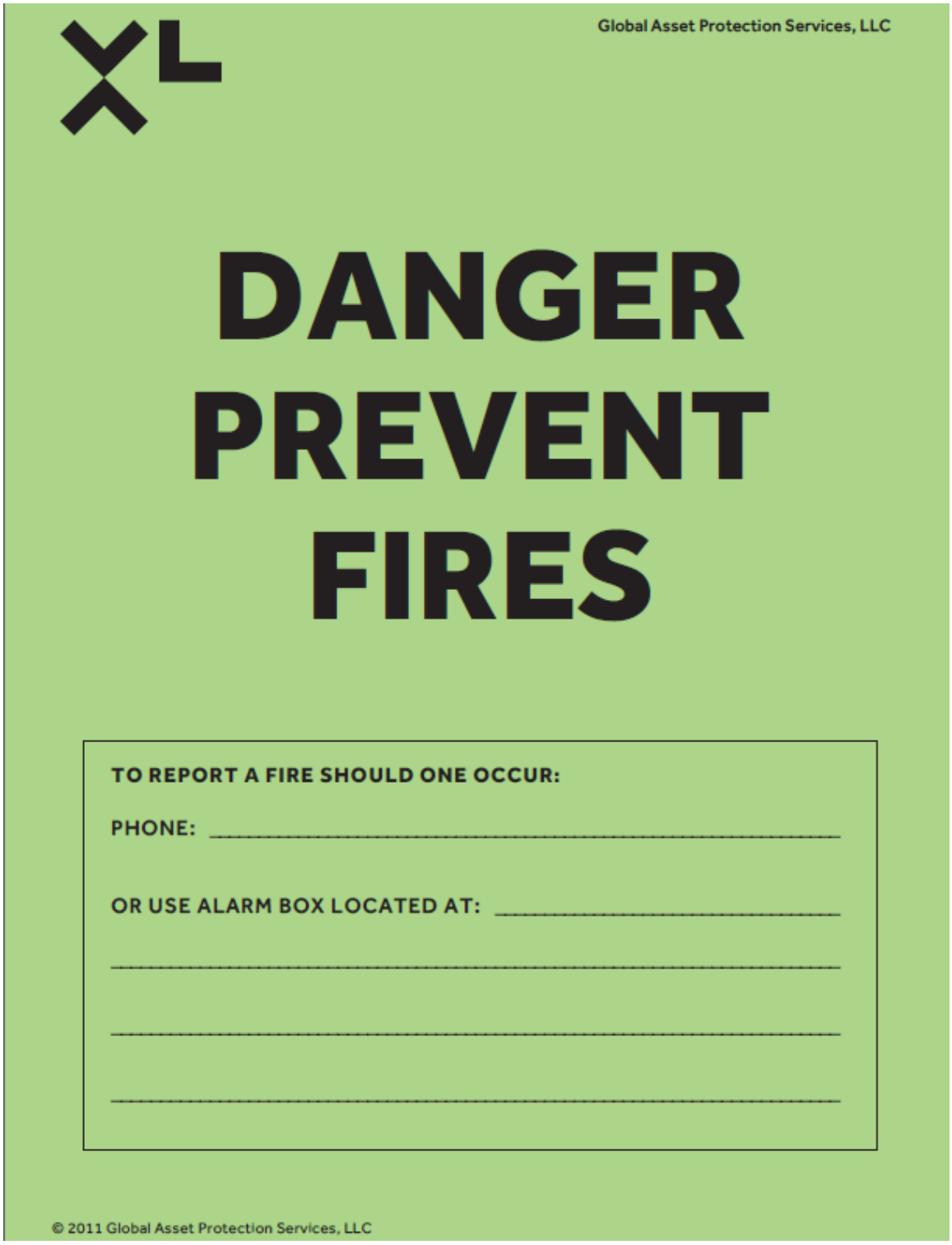
14) After ensuring that work has been completed the property will return any fire detection and detection systems (smoke detectors, heat detectors, etc.) to normal operations. Be aware that any sweeping, sanding, dusting or other work may trigger a fire alarm and the proper precautions should be taken to avoid false or nuisance fire alarms.

15) The Property will conduct a fire watch for an additional 3 hours making sure to complete a fire watch log sheet. The fire watch conducted by the property will be at the discretion of the Designated Hot Work Manager and shall be based on the nature of work and hazards involved. A fire watch must be completed for the entire duration of any impairment.

16) The Property will retrieve the permit and file it in the appropriate location.

Additional requirements:

- Contractors found not to be following the policy may be subject to work stoppages, removal from site and/or subject to costs associated with false fire alarms and other expenses;
- The Contractor may enquire with the Security Department about hiring Security Personnel to conduct the fire watch. Any associated costs are the responsibility of the Contractor. The Property has the right to refuse based on any unsafe work conditions or other limitations;
- The Contractor may not at any time begin hot work without first notifying the Property, filling out the appropriate forms and ensuring the appropriate life safety systems are by-passed/shutoff. The Contractor will be liable for any costs associated with non-compliance.
- Contractors are responsible for having fire extinguishers, metal guards and fire retardant tarpaulins as required;
- Personal protective equipment supplied by the property must be worn by employees or contractors hired to work on behalf of the property when entering construction space;
- A fire alarm that occurs in hot work space will suspend all work including hot work until the alarm is investigated and the all clear is given;
- Hot work is not permitted in areas occupied by tenants or the public as it would create a hazard. Reasonable effort should be made to control access to the hot work area;
- Hot work should not be permitted in high hazard areas such as areas not protected by sprinklers or other fire suppression systems either by design or because of impairment. If hot work must be completed in the space, then the Designated Hot Work Manager must create additional safety precautions and contact the fire department and insurer to ensure the work is completed in the safest way possible. Additional safety precautions must be taken.
- Hot work is not permitted in high hazard areas that store flammable liquids or gas or areas that have an explosive atmosphere (due to dust, vapours, etc.)


Global Asset Protection Services, LLC
DANGER
PREVENT
FIRES
TO REPORT A FIRE SHOULD ONE OCCUR:
PHONE: _____
OR USE ALARM BOX LOCATED AT: _____
_____
_____
_____
© 2011 Global Asset Protection Services, LLC

Global Asset Protection Services, LLC

HOT WORK PERMIT

Date: _____ Time: _____

Permit:

Work By: ❑ Employee
❑ Contractor _____

Start Time: _____ Expected Completion: _____

Location: _____

Work to Be Done: _____

_____

_____

_____

Person Doing Hot Work: _____

I understand the area shall be monitored for 60 minutes after completion of the job and thoroughly inspected at the end of the 60 minutes.
After the 60 minute period, additional intermittent patrols should be made for an additional three hours (four hours total after hot work ceases).
If your corporate guidelines specify another time interval or fire watch procedure, the corporate guideline takes precedence.

Fire Watch Signed: _____

Precautions listed on the right column have been taken, the work area has been examined and the permit is authorized for this Hot Work.

Issuing Individual Signed: _____

Supervisor Signed: _____

This job has been reviewed with the area supervisor and Hot Work has been determined to be the only method available to complete this job.

(Required if work is in "high hazard area")

Area Supervisor Signed: _____

MAINTAIN PART 2 IN A CONSPICUOUS LOCATION WITHIN THE WORK AREA DURING THE HOT WORK. ISSUER SHALL COMPLETE AND RETAIN PART 1.

PERMIT EXPIRES

Time: _____ Date: _____

Check the box when the item has been completed. Permit shall not be issued until the following precautions have been checked.

Yes N/A

- ❑ Means other than Hot Work or moving to a safer location have been considered.
- ❑ Hot work equipment in good repair.
- ❑ Sprinklers, where provided, are operational and will not be taken out of service while this work is being done.
- ❑ There are no combustible fibers, dusts, vapors, gases, or liquids in the area. Tanks and equipment previously containing such have been purged.
  Where normally present, the absence of gases or vapors has been verified by a combustible gas detection instrument. If there is a possibility of a leak developing in nearby piping, equipment, or tanks, this area is being continuously monitored.
- ❑ The work will be confined to the area or equipment specified on this permit.
- ❑ Surrounding floors have been swept clean, and if combustible, wet down where possible.
- ❑ Ample portable extinguishing equipment such as hose lines or extinguishers have been provided.
  Located: _____
- ❑ All combustibles have been relocated 10 meters (35 ft) (further for elevated work) from the operation including areas on opposite sides of walls if heat can be transferred to them through the work piece, any which cannot be moved are protected with metal guards or fire retardant tarpaulins.
- ❑ ❑ All walls, ceilings, or floors being worked on are of noncombustible construction (including internally).
- ❑ ❑ All floor and wall openings within 10 meters (35 ft) of the operation have been tightly covered.
- ❑ ❑ A fire watch has been assigned to watch for fires or the potential for fires in the work area, on floors above and below, and on the opposite side of walls. This watch shall continue during any lunch or rest period and for at least one hour after the work has been completed.

To Report a Fire, Phone: _____

Or Use Alarm Box Located at: _____

1477_01/2012

Global Asset Protection Services, LLC

HOT WORK PERMIT

Date: _____ Time: _____

Permit:

Work By: ❑ Employee
❑ Contractor _____

Start Time: _____ Expected Completion: _____

Location: _____

Work to Be Done: _____

_____

_____

_____

Person Doing Hot Work: _____

I understand the area shall be monitored for 60 minutes after completion of the job and thoroughly inspected at the end of the 60 minutes.
After the 60 minute period, additional intermittent patrols should be made for an additional three hours (four hours total after hot work ceases).
If your corporate guidelines specify another time interval or fire watch procedure, the corporate guideline takes precedence.

Fire Watch Signed: _____

Precautions listed on the right column have been taken, the work area has been examined and the permit is authorized for this Hot Work.

Issuing Individual Signed: _____

Supervisor Signed: _____

This job has been reviewed with the area supervisor and Hot Work has been determined to be the only method available to complete this job.

(Required if work is in "high hazard area")

Area Supervisor Signed: _____

FINAL CHECK: Work area and all adjacent areas to which sparks and heat may have spread including floors above and below and on opposite sides of the walls were inspected after the final patrol (four hours after the hot work ceases) is made.

Signed: _____ **Completed:** _____

PERMIT EXPIRES

Time: _____ Date: _____

Check the box when the item has been completed. Permit shall not be issued until the following precautions have been checked.

Yes	N/A	
❑		Means other than Hot Work or moving to a safer location have been considered.
❑		Hot work equipment in good repair.
❑		Sprinklers, where provided, are operational and will not be taken out of service while this work is being done.
❑		There are no combustible fibers, dusts, vapors, gases, or liquids in the area. Tanks and equipment previously containing such have been purged. Where normally present, the absence of gases or vapors has been verified by a combustible gas detection instrument. If there is a possibility of a leak developing in nearby piping, equipment, or tanks, this area is being continuously monitored.
❑		The work will be confined to the area or equipment specified on this permit.
❑		Surrounding floors have been swept clean, and if combustible, wet down where possible.
❑		Ample portable extinguishing equipment such as hose lines or extinguishers have been provided. Located: _____
❑		All combustibles have been relocated 10 meters (35 ft) (further for elevated work) from the operation including areas on opposite sides of walls if heat can be transferred to them through the work piece, any which cannot be moved are protected with metal guards or fire retardant tarpaulins.
❑	❑	All walls, ceilings, or floors being worked on are of noncombustible construction (including internally).
❑	❑	All floor and wall openings within 10 meters (35 ft) of the operation have been tightly covered.
❑	❑	A fire watch has been assigned to watch for fires or the potential for fires in the work area, on floors above and below, and on the opposite side of walls. This watch shall continue during any lunch or rest period and for at least one hour after the work has been completed.

To Report a Fire, Phone: _____

Or Use Alarm Box Located at: _____

1477_01/2012

CONSTRUCTION COORDINATION

APPENDIX 9 - SAFE WORK PERMIT

Safe Work Permits are available from the Landlord, and must be filled out for any work that requires the fire alarm zones to be disabled. This includes but is not limited to: Dust generating work, coring, and painting.

Brookfield

SAFE WORK PERMIT

PROPERTY		Permit No.

Section 1 - PROJECT DESCRIPTION & PARTICIPANTS

DESCRIPTION OF WORK TO BE PERFORMED (Permit Valid for Day of Issue Only Unless Extension Approved by Brookfield Management - Max 5 days)	Date of Work (DD/MM/YY)
	Start Time: (24 Hour Clock)
Location of Work (within property)	End Time: (24 Hour Clock)

WORKER NAME	PHONE NUMBER	COMPANY

SECTION 2 - HAZARDS ASSOCIATED WITH WORK TO BE PERFORMED

☐ Electrical	☐ Dust, Mist, Fumes	☐ Public Safety
☐ Welding, Cutting, Hot Work	☐ Noise	☐ Vehicle Traffic
☐ Flammables / Explosives	☐ Automatic Machinery	☐ Roof Work (Sign Annual Roof Waiver)
☐ Confined Space	☐ Working Alone	Wind Speed : _____ km/h
☐ Fall Hazard	☐ Others:	☐ Electromagnetic Hazard - Narda Needed

SECTION 3 - SPECIAL PRECAUTIONS REQUIRED

GENERAL WORK SITE	LOCK-OUT / TAG-OUT	SPECIAL	WORKING ALONE
☐ Site Inspection Performed	☐ Electrical Switches	☐ Crane/Hoist/Rigging	☐ Radio
☐ House Keeping	☐ Valves	☐ Man-Lift	☐ Telephone
☐ First Aid Kit on Hand	☐ Machinery	☐ Confined Space Permit	Contact #
☐ Ladder/Scaffold Use	☐ Pneumatics	☐ Fall Protection Plan	Brookfield Security Phone Number (403) 444-2888
☐ Work Area Cordoned Off	☐ Others:	☐ Buddy System Required	
☐ Warning Sign Posted		☐ Others:	In an emergency call 9-1-1 then inform Brookfield Security
☐ Supplementary Illumination			

Fire System Notice: No Smoke & Flow Points are to be disabled at same time on the same floor	SMOKE HEADS DISABLED	GREEN TAG #
	FLOW/ZONES DISABLED	RED TAGS #
	OTHER PRECAUTIONS	IMPAIRMENT #

The completion of the Special Precaution or Protection check lists in whole or in part does not limit the worker or contractor's safety measures, control and procedures required to complete this project. Any work arising from this project must be performed in full accordance with the applicable Occupational Health and Safety Act and provincial Regulations for this Jurisdiction. This Permit does not replace all other work permits required under legislation.

SECTION 4 - PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIREMENTS

☐ Safety Boots	☐ Hearing Protection	☐ Traffic Vest	☐ Respirator - Type
☐ Safety Glasses/Goggles	☐ Hard Hat	☐ Chemical Clothins / Suit	☐ Safety Harness/Lines
☐ Gloves	☐ NARDA Alert	☐ 2-Way Radio / Phone	☐ Others

SECTION 5 - AGREEMENT TO THE SAFE WORK PERMIT

By signing below you agree to abide by the conditions outlined above in this safe work permit and to the RULES AND REGULATIONS outlined on the back of this sheet. RANDOM CHECKS WILL BE PERFORMED TO ENSURE PRECAUTIONS ARE BEING TAKEN AND PPE IS PROPERLY UESED AS PER THE REQUIREMENTS AGREED UPON ABOVE.

CONTRACTOR ACKNOWLEDGEMENT		OCCUPATION / TITLE
Name	Signature	

BROOKFIELD REPRESENTATIVE		PERMIT EXTENSION
Name	Signature	Number of Days: _____ Management Signature:

CONSTRUCTION COORDINATION

APPENDIX 10 – ACCESS TO ROOFTOP RELEASE FROM LIABILITY AND WAIVER OF LIABILITY AGREEMENT

ACCESS TO ROOFTOP

RELEASE FROM LIABILITY AND WAIVER OF LIABILITY AGREEMENT

THIS AGREEMENT EFFECTS YOUR LEGAL RIGHTS,
PLEASE READ THIS AGREEMENT CAREFULLY BEFORE SIGNING.

TO: Brookfield Place (Calgary) LP, Brookfield Place (Calgary) GP Inc., Brookfield Office Properties Canada LP, Brookfield Office Properties Management Corporation, Brookfield Office Properties Management LP, Brookfield Office Properties Inc., The Bank of Nova Scotia. and, each such corporations' respective directors, officers, employees, agents, principals, partners, successors and assigns and, all persons for whom any of the foregoing persons are legally responsible (collectively, the "Company")

RE: Access to the Roof of Brookfield Place Calgary located at 225 6th avenue SW, Calgary AB and additional roof structures (Atrium/Plus 15 Bridges/Balconies)(the "Building")

In consideration of the Company permitting the undersigned access to the roof of the Building and other good and valuable consideration (the sufficiency and receipt of which is hereby acknowledged by the undersigned), the undersigned, on his or her own behalf and on behalf of his or her heirs, executors, administrators, insurers, spouse, civil partner, children, attorneys, successors and assigns hereby waives, and hereby releases the Company of all liability, obligation and responsibility for or with respect to, any and all lawsuits, actions, claims, proceedings of any nature or kind, judgments, interest awards, damages, penalties, fines, losses, legal and other professional fees, charges and disbursements, and amounts paid in settlement (collectively, "Claims"), against the Company which may result from, or may arise directly or indirectly as a consequence of or be related to, or may be due to, the undersigned being granted access to the roof of the Building or from the granting by the Company of this permission and, the undersigned, on his or her own behalf and on behalf of his or her estate, executors, administrators, insurers, attorneys, successors and assigns, agrees to indemnify and save harmless the Company from, against and in respect of any personal injury (including, without limitation, bodily injury, injury resulting in death, personal discomfort, mental anguish, shock, sickness or disease), death, or, any loss of, damage to, disappearance of, or destruction of, property of any nature or kind, which may result from, or may arise directly or indirectly as a consequence of or be related to, or may be due to, the undersigned being granted access to the roof of the Building or from the granting by the Company of this permission.

The undersigned acknowledges that hazards exist on the roof of the Building, which hazards include, without limitation, tripping hazards, low head-room, heavy winds, temperature extremes, lightning and birds.

DATED this _____ day of _____, 20_____.

SIGNED, SEALED and DELIVERED in the presence of:

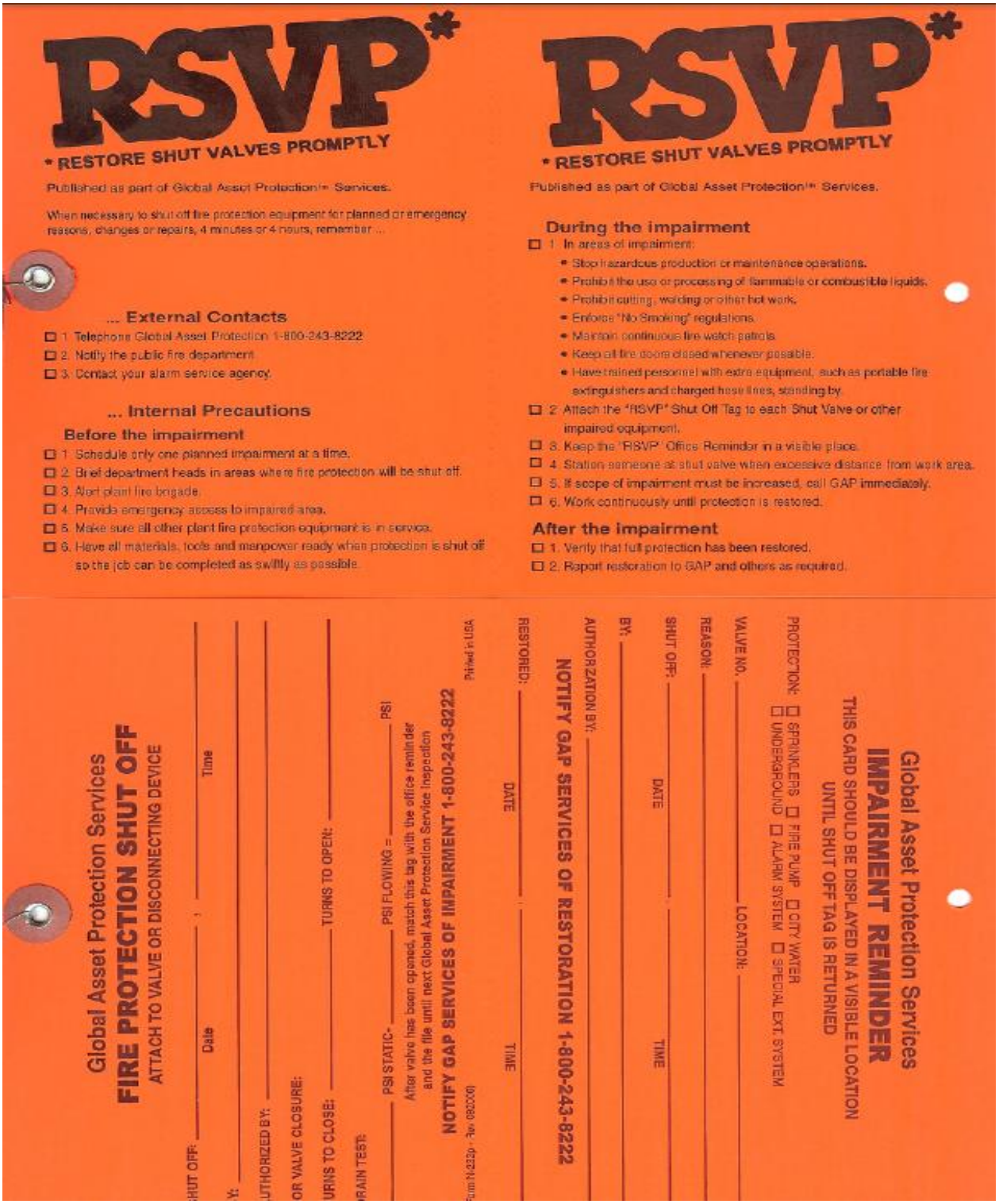
Witness:	Contractor:
_____	_____
Name of Witness:	Contractor Name: _____ Company Name: _____ Phone No. _____

CONSTRUCTION COORDINATION

APPENDIX 11 - SPRINKLER SHUT OFF

1. Sprinkler Shut Off (RSVP – Restore Shut Valves Promptly) are available from the Landlord, and must be filled out for any work requiring isolation of sprinkler lines. Please note the following: Only one impairment is allowed at a time;

- Cease hazardous operations in the affected area. During isolation of sprinkler lines, the fire alarm system must remain active.
- Remove, whenever possible, combustible materials from the affected area.
- Take emergency measures to limit the area of impairment as much as possible.
- Ensure that the impairment lasts for as short a time as possible.
- Ensure all materials, equipment and labour is on hand ready to complete the work quickly.
- If it is necessary to leave the work, re-commission the system; and
- Maintain a continuous watch during the period of impairment.



RSVP*

*** RESTORE SHUT VALVES PROMPTLY**

Published as part of Global Asset Protection℠ Services.

When necessary to shut off fire protection equipment for planned or emergency reasons, changes or repairs, 4 minutes or 4 hours, remember ...

... External Contacts

- ☐ 1. Telephone Global Asset Protection 1-800-243-8222
- ☐ 2. Notify the public fire department
- ☐ 3. Contact your alarm service agency.

... Internal Precautions

Before the impairment

- ☐ 1. Schedule only one planned impairment at a time.
- ☐ 2. Brief department heads in areas where fire protection will be shut off.
- ☐ 3. Alert plant fire brigade.
- ☐ 4. Provide emergency access to impaired area.
- ☐ 5. Make sure all other plant fire protection equipment is in service.
- ☐ 6. Have all materials, tools and manpower ready when protection is shut off so the job can be completed as swiftly as possible.

RSVP*

*** RESTORE SHUT VALVES PROMPTLY**

Published as part of Global Asset Protection℠ Services.

During the impairment

- ☐ 1. In areas of impairment:
  - Stop hazardous production or maintenance operations.
  - Prohibit the use or processing of flammable or combustible liquids.
  - Prohibit cutting, welding or other hot work.
  - Enforce "No Smoking" regulations.
  - Maintain continuous fire watch patrols.
  - Keep all fire doors closed whenever possible.
  - Have trained personnel with extra equipment, such as portable fire extinguishers and charged hose lines, standing by.
- ☐ 2. Attach the "RSVP" Shut Off Tag to each Shut Valve or other impaired equipment.
- ☐ 3. Keep the "RSVP" Office Reminder in a visible place.
- ☐ 4. Station someone at shut valve when excessive distance from work area.
- ☐ 5. If scope of impairment must be increased, call GAP immediately.
- ☐ 6. Work continuously until protection is restored.

After the impairment

- ☐ 1. Verify that full protection has been restored.
- ☐ 2. Report restoration to GAP and others as required.

Global Asset Protection Services
FIRE PROTECTION SHUT OFF
ATTACH TO VALVE OR DISCONNECTING DEVICE

SHUT OFF: _____ Date _____ Time _____
BY: _____
AUTHORIZED BY: _____
FOR VALVE CLOSURE: _____ TURNS TO OPEN: _____
TURNS TO CLOSE: _____
DRAIN TEST: _____ PSI STATIC- _____ PSI FLOWING = _____ PSI
After valve has been opened, match this tag with the office reminder and the file until next Global Asset Protection Service inspection

NOTIFY GAP SERVICES OF IMPAIRMENT 1-800-243-8222

Form IV-232p - Rev. 0800001 Printed in USA

RESTORED: _____ DATE _____ TIME _____
AUTHORIZATION BY: _____

NOTIFY GAP SERVICES OF RESTORATION 1-800-243-8222

BY: _____
SHUT OFF: _____ DATE _____ TIME _____
REASON: _____
VALVE NO. _____ LOCATION: _____
PROTECTION: ☐ SPRINKLERS ☐ FIRE PUMP ☐ CITY WATER
☐ UNDERGROUND ☐ ALARM SYSTEM ☐ SPECIAL EXT. SYSTEM

Global Asset Protection Services
IMPAIRMENT REMINDER
THIS CARD SHOULD BE DISPLAYED IN A VISIBLE LOCATION
UNTIL SHUT OFF TAG IS RETURNED

CONSTRUCTION COORDINATION

APPENDIX 12 – INTEGRATED BUILDING SYSTEM

Brookfield Place Calgary is equipped with an Integration Building System (IBS). This system provides a common integrated building network where multiple disparate systems like Building Automation Systems (BAS), Lighting Systems, Access and Security systems, Metering systems, and others are combined onto one common converged TCP/IP network creating much greater flexibility and service for building operations and tenants alike. It monitors and controls all building HVAC systems that provide the most efficient and optimized energy use for heating, cooling and ventilation. Note that additional Building Automation Controllers that require TCP/IP connectivity will need to be connected to the base building IBS network.

The Integrated Building system ("IBS") shall integrate with the building systems only over Ethernet (IP) protocols (BACnet IP, ModBus TCP, OPC etc.). The IBS only provides connectivity to field devices and shall not provide any direct control. All commands must be executed on the management level of the respective control system.

Smart Building network design and tenant interface includes:

- The existing system is vertically stacked communication rooms, one on each floor, and two main telecom room on level 3 and level 58.
- Access Layer multiport Switches (POE) located on each floor in each North Telecom Room is the connection point for the tenant's POE and Ethernet building systems components.
- Horizontal connections (floor based) can be copper to allow for Power over Ethernet (POE+ 30w). Tenants may be required to upgrade or expand on the floor based Access switches for any new or modified Data Drop points, at Tenant's cost.
- The implementation of the IBS network allows for further integration of Tenant IT and M&E systems with base building M&E systems. Integration between these systems allows tenants to further leverage base building systems to maximize comfort and enhance tenant systems. Examples of this include:
    - Tenant Audio/Video systems integrating with base building lighting to allow for scene changes to incorporate lighting.
    - Tenant off-site security system integrating with base building security system to allow for global administration of access control across an entire portfolio.
    - Base building security system triggering sequence of events in the base building elevator and/or building automation system to ensure convenient access to office space at desired comfort levels.

The system is powered by per-floor UPS backed up power system that the tenant will need to provide load and wattage capacity to the Property Management Office for approval.

In relation to Enterprise Software Integration, at the minimum, the enterprise level IBS shall support the following industry standards:

- Ethernet, TCP/IP communication;
- Support for web-services (SOAP) messaging (HTTP, HTTPS);
- Ability to integrate (store logs) with standard relational database engines via open database connectivity standards (ODBC, JDBC etc.);
- Provide secure access to the system and comply with the IT security standards;
- Field devices like BAS application specific controllers or lighting control modules must use open protocol native BACnet.

Tenants are required to coordinate with the approved IBS consultant on additional ports for devices requiring Power over Ethernet and TCP/IP connectivity to the base building network. Tenants are also recommended to coordinate with the approved IBS consultant on the integration of tenant base building mechanical and electrical systems to the base building network.

Lighting Control

Brookfield Place Calgary provides an addressable network lighting control system. The lighting control system is connected (through Ethernet) to the Integrated Building System (IBS). Note that additional lighting control panels and lighting equipment, including switches or access points, that require TCP/IP connectivity will need to be connected to the base building IBS network.

Tenants are recommended to install day light and occupancy sensors for perimeter offices and occupancy sensors/vacancy sensors for internal offices and conference areas. All sensors shall be addressable and compatible with the base building lighting control system, *Encellium* control system.

Telecommunications

Telecom rooms are on the north and south side of the core and allow for the installation of infrastructure fiber optic or copper cable risers. The base building Telecom rooms do not allow for installation of tenant-owned active equipment such as PCs, servers or network switches.

The building is equipped with two service entrance conduits that are designed to bring in both fiber and copper services from several Service Providers (outside building property lines) terminating at the Point-Of-Presence (POP) room (3.04). The Service Providers will connect to the Owners conduits at the property line.

The Point-of-Presence (POP) room also serves as a place where the Tenant's telecommunications companies can physically connect passive gear to one another and exchange the services provided across connections.

Tenants are required to provide additional base building switches in order to accommodate demand for available switch ports in conjunction with additional tenant base building mechanical and electrical systems under tenant construction scope. All additional IBS networking equipment shall match the current installed hardware specifications in use within the tower.

Security

The base building access control system is Software House - C-Cure 9000. The CCTV system is Milestone and the card-readers are HID Multi-Class. The system features include alarm monitoring, intrusion detection, door control, asset tracking and access credential production.

The current security system is comprised of the following components:

- Elevator floor access control
- Elevator alarm integration
- Elevator intercoms
- Door access control
- Coordinated video and access control alarm response
- Monitoring of various alarm points

Tenants shall install their own security system. Subject to approval from the Landlord, the tenant security system can be interfaced with and monitored by the base building security system. Note that additional base building security access control panels, cameras and/or intercoms that require TCP/IP connectivity will need to be connected to the base building IBS network.

Tenant Design requirements for Electrical Plans

- Location of data drops (Power over Ethernet, POE) for lighting, lighting controls, security, mechanical and electrical metering and any other systems that the tenant design consultants is planning to connect to the base building integration systems.

Tenant Design requirements for Mechanical (and BAS) Plans

- Location of data drops (Power over Ethernet, POE) for any mechanical systems that the tenant design consultants is planning to connect to the base building integration systems.
- Show all work, which is an alteration, or addition, tie-in to the computerized BAS. Indicate tie-ins and extensions to base building security, fire alarm and communication systems, as well as:
    - Location of data drops (Power over Ethernet) for BAS systems that the tenant design consultant is planning to connect to the base building integration systems;
    - Location of data drops (Power over Ethernet) for mechanical metering systems, if not part of BAS;

CONSTRUCTION COORDINATION

APPENDIX 13 – RETAIL TENANT SIGNAGE GUIDELINES

“Brookfield Place Calgary – Retail Tenant Design Criteria” is available upon request and to be read in conjunction with this Manual