

CONTRACTOR RULES AND REGULATIONS

The following regulations must be adhered to by all contractors (General and Sub-contractors) performing work within Western Canadian Place.

1.0 PLANS AND APPROVALS

- 1.1 The Contractor must advise the Western Canadian Place Property Management, at the above noted address, prior to any work commencing. All work is subject to review and approval by Property Management. Property Management may require additional plans, specifications, or review by base building consultants prior to approving construction and the cost of all such additional documentation shall be the responsibility the Contractor / Tenant performing the work. Under no circumstances will construction be permitted to proceed until the Contractor is in possession of plans and/or specifications that have been approved in writing by the Western Canadian Place Property Management. At any time, Western Canadian Place Property Management personnel may request that the Contractor produce a set of approved drawings. Failure to do so will result in an immediate stoppage of work.
- 1.2 The Contractor must inspect the premises and report any deficiencies or damaged materials to the Property Management office in writing prior to the start of any construction. Failure to do so will result in the Contractor being held fully responsible for the cost of any remedial work deemed necessary by the Landlord.
- 1.3 The Contractor must ensure that a Building Permit and any other required approvals are obtained and clearly posted at the job site. A copy of all permits required must be filed with the Western Canadian Place Property Management office prior to commencement of any work.
- 1.4 The Contractor must obtain a building Work Authorization/Access Permit, signed by the Operations Manager and/or Property Manager, and the tenant, prior to accessing the work site. The access permit includes all areas approved for access, a list of sub-contractors and a site foreman for each, the type of work to be performed, the timeframe required on site, any safety / security / hot work requirements, notice of submittal for insurance and WCB coverage, and the Contractor's signature.

2.0 TELECOMMUNICATIONS

- 2.1 All wiring and installations must have prior written approval of the base building consulting electrical engineers – SMP Engineering.
- 2.2 Provision for data and telecommunications equipment must be made within the tenant premises. Installation of data and telecommunications equipment is not permitted in building telephone riser rooms. Free air cabling is not permitted in Western Canadian Place. All data and phone cables must be in conduit or cable tray. The only free air cabling permitted is a maximum of the last three meters from the cable tray to an outlet location.

INSURANCE & WCB COVERAGE

3.0

The General Contractor must have General Liability Insurance of \$5,000,000.00, naming **bcIMC Realty Corporation (legal property owner) and QuadReal Property Group Limited Partnership by its General Partner, QuadReal Property Group G.P. Inc., their successors and assigns** as Additional Insured and must provide a certified copy of this Insurance Certificate to the Property Management office, prior to demolition or construction. The following three addresses must be identified on the insurance:

3.1

Retail/Atrium	801 – 6th Street SW T2P 3V8
South Tower	700 – 9th Avenue SW T2P 3V4
North Tower	707 – 8th Avenue SW T2P 1H5

- 3.2 The Insurance Agents/Brokers are requested to advise the Western Canadian Place Property Management Office within ten (10) days should the coverage be materially changed or cancelled.
- 3.3 All Contractors must provide proof of WCB coverage to the Property Management office, prior to commencement of any demolition or construction.

4.0 OCCUPATIONAL HEALTH AND SAFETY

PRIME CONTRACTOR FOR SAFETY

Each project will be required to have a Prime Contractor for Safety.

The Contractor shall:

- i) Be the Prime Contractor for Safety or shall adhere to the safety protocols of another Contractor assigned this role for the work area and acknowledge in writing acceptance of Prime Contractor status.
- ii) Covenant and agree not to do or omit to do anything in the performance of the Work that would cause itself, the Landlord, Landlord's Agent, Building Manager, or any other person who assumes or is responsible for the role of the Prime Contractor for Safety, to be in breach of the duties and responsibilities of any Prime Contractor for Safety with respect to the Work

The Prime Contractor for Safety:

- i) shall undertake the duties of the Prime Contractor for Safety as outlined in the applicable legislation; and
- ii) represents and warrants that it has adequate resources and is experienced and competent to be Prime Contractor for Safety and will maintain adequate and competent supervisors to oversee and ensure compliance with all health and safety requirements.

The Contractor shall at all times comply with all federal, provincial and local laws, statutes, rules, regulations, notices, orders and amendments thereto respecting occupational health and safety and workers.

ENFORCEMENT

IT IS THE TENANT'S RESPONSIBILITY TO ENFORCE THESE RULES WITH THEIR EMPLOYEES, CONTRACTORS AND SUBTRADES. CONTRACTORS AND THEIR EMPLOYEES OR SUBTRADES ARE ALLOWED ONLY IN THOSE AREAS IN WHICH THEY ARE WORKING. CONTRACTORS, EMPLOYEES, OR SUBTRADES FOUND IN UNAUTHORIZED AREAS WILL BE REMOVED FROM THE BUILDING PREMISES.

5.0 DELIVERIES

- 5.1** Delivery of all materials is to be coordinated through the Western Canadian Place Security desk. Large quantities of material for delivery will have to be coordinated outside of normal building business hours.
- 5.2** Dollies for the transportation of materials from the loading dock area to the individual floors are not available. All dollies must be supplied by the Contractor and must be rubber-wheeled dollies.
- 5.3** Under no circumstances are vehicles to be parked in the loading dock area for longer than 15 minutes unless written authorization is obtained from the Western Canadian Place Property Management office. Vehicles in the loading dock area are limited to the time of active delivery. Violation of the above will result in your vehicle being towed at the vehicle owner's expense.

6.0 ELEVATORS

- 6.1** If the Contractor requires the exclusive use of the freight elevator, the elevator must be booked through the security desk at least one (1) business day in advance, on a first come, first served basis. Contact Security at 403-216-3999. Exclusive elevator bookings cannot commence until 6:00 p.m. during the week. The janitorial services take precedence over any exclusive elevator bookings from 8:30 to 9:30 p.m. on weekdays.
- 6.2** Use of elevators, other than the freight elevators, for the moving of tools, equipment, or materials, is strictly prohibited. Elevators must always be left in a clean condition.
- 6.3** Care and caution must be taken by the Contractor and his suppliers to prevent damage to the elevators, as well as walls, floors, lobbies, loading dock, etc. Any damage or cleaning will be corrected by the Western Canadian Place Property Management office and charged back to the General Contractor.
- 6.4** The dimensions of the North and South tower freight elevators are identical @:

Width – 5' 7"
Length – 6'
Height – 9' 6"
Door opening – 3' 6" X 7'

- 6.5** The use of passenger elevators for moving, heavy materials, or construction purposes would be an unusual situation that would require special permission and be the method of last resort. This procedure must be authorized by the Western Canadian Place Property Management office and requires at least one fully qualified Otis technician to be in attendance. The cost of the Otis personnel will be charged back to the Contractor.

7.0 AIR QUALITY

- 7.1** Filter material must be installed and maintained in front of return air dampers prior to construction and removed when construction is completed. Failure to install this prior to the start of construction will result in the job site being shut down, with the potential for the contractor to be charged for a complete cleaning of the duct system.
- 7.2** All convection cabinets must be covered during construction and vacuumed out prior to occupancy. Any drywall or painting work performed in the public elevator lobbies will require special precautions to prevent public access to wet painted walls, and also to prevent the migration of drywall dust and paint into the elevator shafts.

8.0 NOISE AND CORING

- 8.1** No construction work involving drilling and/or coring, demolition of walls, ram setting, hammer drilling, jack hammering or grinding is permitted between the hours of 6:00 a.m. and 6:00 p.m. In addition, any work such as rotary saws or drywall screw guns that are audibly offensive to other tenants must be operated outside the previously referenced hours of 6:00 a.m. to 6:00 p.m.
- 8.2** Any penetration into the concrete structure requires the Western Canadian Place Property Management office's approval and must conform to the Requirements for Floor Structure Penetrations in Western Canadian Place below, prepared by Read Jones Christoffersen structural engineers. The Contractor must notify the Operations Manager of the time of the activity, and follow the time schedule precisely, so that the appropriate building systems may be prepared.

Western Canadian Place Requirements for Floor Structure Penetrations

Section 1 – Introduction

The proposed placement of any critically located or significantly sized opening, such as the opening required for a duct, stair, plumbing riser, etc. will be evaluated by the base building structural engineer. The structural engineer will review the effect of the opening on the building structure, define the method to be used for the penetration, and highlight any precautions to be taken during construction of the opening.

The proposed placement of smaller openings is to follow the requirements outlined below.

Special permission from the Structural Engineer is required for coring (wet and dry), or saw cutting, which may be withheld. **All penetrations in PT slabs are to be dry chipped** and subsequently sealed. The only approved sealing materials are listed below.

The Tenant and/or Tenant contractor and/or General Contractor assume all risks in coring and chipping the floor slab. Structural elements, cast in slab services, or PT tendons damaged by the contractor will be repaired by QuadReal Property Group LP at the appropriate party's expense. The Contractor may also be responsible for consequential damages if they fail to follow these regulations.

All coring and chipping require prior approval from QuadReal Property Group LP. Provide a dimensioned floor plan showing the location and size of the proposed holes and retain the base building structural consultant for specific instruction prior to slab work.

Section 2 – Conventionally Reinforced Structures

a. Penetrations into Beams

All proposed hole locations at beams are to be x-rayed and reviewed by the base building structural engineer. Additional x-rays may be required. The holes may be drilled upon receipt of written verification from the engineer.

b. Penetrations into Slabs

If the opening is within 3 meters of an existing slab opening, is greater than 200 mm in diameter, or must be cored or saw cut, the Structural Engineer must review and issue penetration instructions. The locations of all proposed penetrations into slabs are to be x-rayed to locate in-slab building electrical and alarm systems and structural reinforcing steel. If the opening is less than 200 mm in diameter, more than 3 meters from any other opening, and is to be dry chipped, a review of the x-ray images by the Manager of Construction Services or Manager Operations may be the only review required. Additional x-rays or a further review of the x-ray by the structural engineer may also be required. Either Manager may require a further review of the x-ray by the structural engineer.

c. Installation of drilled inserts or power actuated fasteners

For penetrations less than 2 inches deep, the contractor must use radar or a perforimeter to locate in-slab steel. All inserts or fasteners must not contact or damage in-slab steel items i.e.: conduit, rebar or dowels

Section 3 - Post Tensioned Cable Structures

a. Penetrations into Floor Slabs for Fasteners

All openings are to be constructed by a contractor who is approved by the Manager of Construction Services. Approved contractors will be required to demonstrate the competent use of equipment used to locate existing in-slab steel. It is important to note that concrete coverage for PT cables is often much less than the initial construction specifications and have been found at less than a ¼ inch below the surface.

Prior to installing power actuated fasteners or inserts in the existing floor slab, post-tensioning cables and other steel are to be located using electromagnetic, radar or x-ray equipment. No power actuated fasteners or inserts are to be installed vertically in-line with post-tensioning cables. Power actuated fasteners up to 20 mm long may be installed 75 mm or greater from the located line of post-tensioning cables.

b. Penetrations Through Floor Slabs

If the opening is within 3 meters of an existing slab opening, is greater than 200 mm in diameter, or must be cored or saw cut, the Structural Engineer must review and issue penetration instructions.

The locations of all proposed penetrations into slabs are to be x-rayed to located post-tensioned strands, in-slab building electrical and alarm systems, and structural reinforcing steel.

If the opening is less than 200 mm in diameter, more than 3 meters from any other opening, and is to be dry chipped, a review by the Manager of Construction Services or Manager Operations of the x-ray images may be the only review required. Additional x-rays or a further review of the x-ray by the Structural Engineer may be required. Either Manager may require a further review of the x-ray by the Structural Engineer.

c. Penetrations into Beams

All proposed hole locations at beams are to be x-rayed and reviewed by our base building structural engineer. Additional x-rays may be required. The holes may be drilled upon receipt of written verification from the engineer.

Section 4 - Slab Sealing Requirements

Upon completion of the installation, a watertight and fire/smoke seal must be installed between the existing floor slab and the newly installed conduit or pipe. Chipped areas and concrete spalls must be patched.

Patch materials shall be polymer modified, cementitious, fast-setting gel mortar formulated especially for repair of overhead and vertical surface concrete patching (28-day strength of 30 Mpa). Linear shrinkage shall conform to ASTM C157, 0.10% maximum.

Manufacturer's latest product data sheets must be submitted for patch materials to be used, certifying the patch material conforms to the specified requirements.

Patch materials:

- .1 MASTERPATCH 230 VP
- .2 Vulkem 2302
- .3 EMACO s88-ca
- .4 Patchmate o.v.
- .5 Renderoc hb2

8.3 Any work that requires access into another tenants' premises must be coordinated with the

Operations Manager. This will require a minimum of two business days' notice and must be at the convenience of those tenants.

- 8.4** All penetrations into post-tensioned cable slabs require sensing devices as specified in 7.2, prior to slab penetration. Any contractor who fails to follow these guidelines will be **immediately and permanently** removed from Western Canadian Place.

9.0 SAFETY & ISOLATION

- 9.1** The General Contractor and all sub-trades are required to attend the Western Canadian Place 'Contractor Orientation Program' before work commences. No trade worker will be able to work in the building without prior attendance at this orientation program.
- 9.2** The Prime Contractor is required to post his Safety Guidelines at the work site and supply first aid station in all areas of work.
- 9.3** All work performed must conform to the Workers Compensation Act, as well as any other applicable Municipal, Provincial or Federal codes and laws. Approval by the Western Canadian Place Property Management office does not supersede any other requirements of law and does not alleviate the Contractors' responsibility to abide by all governing legislation.
- 9.4** The Contractor must ensure that all fire exit routes, and doors to all mechanical, electrical, and janitorial rooms, always remain free and clear.
- 9.5** The Contractor may isolate any tenant equipment with permission of the tenant only. The Contractor is not permitted to isolate any base building equipment such as fans, motors, pumps, chillers, boilers, switchgear, elevators/escalators, or any other piece of equipment required for the operation of Western Canadian Place. The isolation and lock out of such equipment require prior notification to the Operations Manager. The actual isolation will be performed by the operator on shift, or the base building contractor assigned by the operator, but the Contractor will also be allowed to place his own lock out on the associated piece of equipment.

10.0 FIRE ALARM AND SPRINKLER SYSTEM

- 10.1** Requests to disable fire zones or open/close sprinkler valves require a permit. Opening/closing of sprinkler valves must be done under the supervision of the Operations personnel. Due to the latest in Fire Safety Codes, the Contractor may request the disabling of the sprinkler system **or** the disabling of fire zones during normal business hours but may not do both.
- 10.2** Requests to silence alarms for sprinkler work or disable the fire alarm system must be forwarded to the Operations Manager at least one business day in advance. Contact the Operations group at 403-216-3986 or 403-216-3987.
- 10.3** Sprinklers may only be off between the hours of 07:00 and 17:00. This is to ensure that operations staff is present in the building when any portion of the sprinkler system is disabled.

10.4 Hot Work Permits: Contractors must obtain a Hot Work Permit for any electrical hot work, welding, soldering, burning, cutting, and grinding. To obtain a Hot Work permit, 24 hours' notice must be given by the contractor by going to the security desk and filling out section 1 through 5 of the permits. The contractor may then pick up the white copy of the Hot Work Permit at the security desk and post it, after the 24 hours notice has passed and ensure it is posted near the Hot Work site (construction zone). Permits are only valid for the day of issuance unless an extension is approved by WCP. The contractor is responsible to complete the Fire Watch log on the permit, every half hour during the day and hourly afterhours, the Fire Watch must continue for 4 hours post Hot Work. Once the post Hot Work Fire Watch has been completed the contractor must bring the closed permit down to the security office. WCP staff will then inspect the area with the contractor and close off the permit on our end, only when satisfied no concerns exist.

10.5 Contractor will be responsible for all charges from fire department etc. for false callouts caused by their work.

11.0 PAINTING & ODOR CONTROL

11.1 The application of any paint, coating or adhesive other than latex or acrylic paint, requires the approval of the Operations Manager. Depending on the odorous nature of the product, the Operations Manager may require that the work proceed after hours only, and that odor removal measures are implemented. MSDS sheets are required onsite before the use of the product.

11.2 Any painting of the perimeter convactor cabinets requires the removal of the cabinet cover. This is to ensure that the covers are not adhered to the base, and that no paint lines are visible once a cover has been removed and replaced for maintenance.

12.0 GARBAGE & HOUSEKEEPING

12.1 Construction or waste materials are not to be stored in adjacent vacant space unless specific permission is received from the Western Canadian Place Property Management office.

12.2 The Contractor must arrange for, and coordinate waste removal with the Operations Manager. Under no circumstances is the building trash compactor to be used. **Disposal of any construction material in washroom sinks or toilets, such as drywall mud, latex paint residue, grout, solvents, or anything else, is strictly prohibited.**

12.3 General contractor to ensure all construction waste materials, in accordance with the site waste management program, are to be recycled, when applicable, and diverted from landfill. Construction waste materials are to include, but not limited to, all metal, drywall, wood, cardboard, plastic, concrete, clear glass. General contractor is required to supply the landlord with a photocopy of the recycled weights or weigh bill.

12.4 The Contractor and their staff must only use the washroom designated by the Operations Manager. Clean up of any washroom other than the designated washroom will be charged back to the Contractor.

- 12.5** The Contractor is responsible for all cleaning after construction, and this cleaning must conform to the building standards (Spotless after construction with no trace of the Contractor's presence remaining). Any final construction clean must be performed by the janitorial service provider for Western Canadian Place, at the Contractor's expense. Any additional cleaning required by the Landlord or other tenants will be charged back to the Contractor.

It is the responsibility of the Contractor to ensure that all occupied areas, including other tenant space, tenant washrooms, public corridors, elevator lobbies and passenger elevators remain clean and free of dust and debris at all times. It is required that walk-off mats be placed within the renovation area and immediately adjacent to exit doors and be cleaned as often as required to prevent dust being carried by foot throughout Western Canadian Place.

13.0 SITE SECURITY

- 13.1** The Contractor is responsible for site security. This includes final access to the actual jobsite, securing of materials and tools, securing of the jobsite at the end of the workday. Should a contractor leave the site, they must ensure all doors are securely latched behind them, at no time may a contractor leave a door propped open for any reason.
- 13.2** Consumption of alcoholic beverages or use of drugs on any work site is strictly prohibited. Moreover, the Contractor must ensure that workers are not under the influence of drugs or alcohol, or smelling of alcohol, at any time while working. We will enforce this by stopping all work by the Contractor.
- 13.3** All trades and workers associated with the project must sign in and out at the Security desk. Security will issue a Trade Identification Card to be worn while in the complex.
- 13.4** Contractor shall sign necessary roof waivers prior to staff having access and going on roof.

14.0 REQUIRED CONTRACTOR LIST

- 14.1** There is specific work which must be performed by the Base Building contractors. Work within the ceiling plenum is restricted to specific contractors, and other work is open to any contractor, subject to the Landlords' approval. Some contractors may not be permitted in Western Canadian Place due to previous unsatisfactory work or conduct. The following is a list of required contractors.

- 14.2** Required Contractors:

Sprinkler Work

Constant Fire Protection Systems Co.

Wade Weatherbee

Phone: 403-532-3205

Fax: 403-532-0185



Building Automation Controls

Siemens Canada Limited
Crystal Corcoran
Phone: 403-259-3404
Cell: 403-561-9629
Fax: 403-253-1323

Base Building and Tenant Security system

Converjint Technologies
Derek Reid
Phone: 403-291-3241
Fax: 403-291-2577

Base Building Electrical Systems

All fire alarm system, emergency power lighting & systems, all security system wiring (Tenant & Base Building), new 120/208V and 600V power distribution including transformers and panels, tie-ins to bus ducts, 600V switchgear and MCC's, must be performed by:

Western Electrical Management Ltd.
Rob Oakes
Site phone: 403-454-0723
Head office: 403-291-2333
Cell: 403-998-1121

Elevators

Otis Canada Inc
Jeff Mckinnon
Phone: 403 -541-5256
Cell: 403-404-0061

Base Building Mechanical Systems

All tie-ins to base building systems including heating/cooling, water supply, vent and drainage & natural gas, as well as all mechanical work within the ceiling plenums must be performed by:

Windmill Mechanical
Hans Langejans
Head office:



Tel: 403-735-0770

Fax: 403-735-0771

or

Bailes Mechanical

Scott Riedlinger

Head office:

Tel: 403-207-3290

Fax: 403-207-4313

15.0 CONTACT LIST

Western Canadian Place Property Management Office
Suite 245, 801 – 6th Street SW
Calgary AB T2P 3V8

General Manager

Brenda McManus

Phone: 403-202-7525

Email: brenda.mcmanus@quadreal.com

Property Administrator

Suzy Mah

Phone: 403-202-7577

Email: suzy.mah@quadreal.com

Operations Manager

Jerry G Serpico

Phone: 403-333-0110

Email: jerry.serpico@quadreal.com

Security

Manager, Security & Life Safety

Marcel Dubois

Phone: 403-371-4218

Email: marcel.dubois@quadreal.com

Security Systems Coordinator

John Howe

Phone: 403-216-6620

Email: john.howe@quadreal.com



16.0 BASE BUILDING CONSULTANTS

ELECTRICAL

SMP Engineering Ltd.
Contact – Rick Foreman
Phone: 403-270-1455
Cell: 403-809-8714
Email: rforeman@smpeng.com

MECHANICAL

TMP Consulting Engineers
Contact – Mr. Brian Norrie
Main office: 403-259-6707
Fax: 403-252-7066
Direct: 403-451-8923
Email: briann@tmpeng.ca

STRUCTURAL

Read Jones Christoffersen Ltd.
Contact – Mr. Bryan Colvin
Phone: 403-283-5073
Email: bcolvin@rjc.ca

Should there be any questions or problems relating to these regulations, the Contractor is to contact the Property Management Office. We insist on adherence to the above regulations in order that construction work will be carried out co-operatively, expeditiously, and in a safe manner.

Appendix A

TENANT GREEN DESIGN GUIDE

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Introduction

This Tenant Green Design Guide is supplemental to and is intended to be read and used in conjunction with the buildings' Tenant Design Criteria Manual.

This guide contains general information, procedures and recommendations designed to assist tenants in the design and construction of their improvements within their premises with the ultimate goal of being environmentally responsible and economically profitable and creating a healthy workplace for all employees.

The Lease and any other agreement(s) between the tenant and landlord of the building shall govern and take precedence over any information included in the Tenant Design Criteria Manual and this Tenant Green Design Guide.

Our Commitment

We are committed to strategically develop and continually improve environmental best practice regarding our managed properties and the impact they have on the communities in which we do business. These principles embody the elements of sound property management practices with social and environmental principles of sustainability.

We seek the involvement of stakeholders, including our clients, employees, tenants, and suppliers, in our efforts to reduce greenhouse gas emissions, increase waste diversion and assist us in reducing the environmental footprint of the properties that QuadReal manages.

This commitment takes many forms, including the development of a culture of conservation and sustainability through appropriate and effective communication. We offer education programs to staff and we engage tenants in conservation practices and stewardship as well as inform all parties on the use of effective waste, energy, and utilities management principles, all of which are incorporated in this Green Design Guide.

You play an important role in our building and we want you to know about our commitment to Responsible Property Management. Please visit our website for more information about our promise and for a listing of all our buildings that have been certified "Green" or have received industry related awards and recognition.

Why a Green Design?

It is well documented that more than 30% of the total energy produced and 60% of the electricity generated is consumed by buildings annually. Additionally, a typical North American commercial construction project generates up to 1.13 kilograms or 2.5 pounds of solid waste per square foot of occupied floor space.

Green Design not only has a positive impact on public health and the environment, it reduces operating costs, enhances employer organizational marketability, has the potential to increase occupant productivity and demonstrates a commitment to a sustainable community. Beyond that, it contributes to

a sustainable environment by reducing our energy and natural resource consumption and cutting down on the waste and pollution we create.

Many leading organizations consider the impact their workplaces have on a range of financial drivers and a Green Design can assist in securing a competitive advantage. This can provide the following benefits:

- ✓ Enhance company reputation
- ✓ Attract and retain talented employees
- ✓ Enhance employee wellbeing and productivity
- ✓ Enhance and protect organizational knowledge
- ✓ Reduce Liability

Some of the economic benefits of a green building are:

- ✓ Lower utility bills and operating costs because of energy and water efficiency systems
- ✓ Lower waste and dumping costs because of landfill diversion measures (recycling/reuse programs) used during construction and occupancy
- ✓ Lower energy bills from efficiencies in HVAC systems
- ✓ Fewer employee sick days taken and heightened worker productivity because of improved indoor air quality

Getting Started

Whether you have an in-house team that serves your facility design needs or you rely on outside firms to assist you, it is paramount that you select design consultants that are wholly committed to a Green Design. Once your design team is established choose other advisors (including engineers, suppliers, commissioning services and contractors) that are equally engaged in environmental best practices.

Key considerations in a Green Design include:

- ✓ Energy efficiency in mechanical and electrical installations that addresses thermal considerations, noise and indoor air quality and meets flexibility and privacy needs
- ✓ Environmentally friendly interiors that support healthy work environments and avoid / minimize harmful emissions
- ✓ Effective Waste Management practices and indoor environmental controls during renovation work

This document includes several initiatives and strategies that should be considered when arranging service agreements and construction documents and will assist you in developing and refining plans and specifications that achieve your Green Design goals.

Often the first question asked is "What does a Green Design cost?" Many measures can be done with no additional cost while others may involve minimal upfront costs but will save money over the long haul. Some green measures may cost considerably more, but yield benefits that are more difficult to quantify, such as improved productivity. In all cases, the key to eliminating or minimizing additional costs is to establish your design team and set your goals very early in the process.

Energy Efficiency

Water:

It is important to consider reducing our consumption of this resource in order to ease the burden on water and sewer infrastructure systems in our cities. Through Green Design you can maximize water efficiency within your space to reduce the burden on water supply and wastewater systems.

These strategies, in aggregate, will help you to reduce potable water consumption up to 20% over a typical installation. Use the following as a guide to achieving this goal:

Fixture	Maximum Requirement		Flow		<u>Index:</u>
Water Closets	6.0	(LPF)	1.6	(GPF)	(LPF) liters per flush
Urinals	3.8	(LPF)	1.0	(GPF)	(LPM) liters per minute
Shower Heads	9.5	(LPM)	2.5	(GPM)	(L/CY) liters per cycle
Faucets	8.3	(LPM)	2.2	(GPM)	(GPF) gallons per flush
Replacement Aerators	8.3	(LPM)	2.2	(GPM)	(GPM) gallons per minute
Metering Faucets	0.95	(L/CY)	0.25	(G/CY)	(G/CY) gallons per cycle

Choose the most efficient water consuming fixtures available when installing new fixtures, whether these are for a kitchen, private bathroom, employee gym, etc. Technologies are changing at a rapid pace so ensure your consultants incorporate the best available in your Green Design.

Lighting:

Understandably, a lot of emphasis goes into designing premises lighting in a Green Design. After all, it accounts for more than 60% of total premises energy costs and represents the largest single opportunity for savings. The building standard lighting system already achieves a high level of energy performance though the use of T8 lighting and proper spacing of fixtures.

Taking advantage of as much natural light as possible should be the initial focus. Next is an efficient lighting design. Energy efficient solutions are flooding the marketplace at an increasing rate and your design team is crucial to ensuring latest technologies are used.

A Green Design for lighting incorporates many elements, the highlights of which are detailed below:

- ✓ Use energy efficient fluorescent lights with electronic ballast (less than 10W/m²) for general office lighting
- ✓ Design for light levels to 35-40 foot candles or 1 watt per square foot and incorporate task lighting where higher lighting levels are needed.
- ✓ For special purpose lighting, use compact fluorescents or LED's.
- ✓ Install comprehensive occupancy-based lighting control systems with appropriate zoning and incorporate daylight harvesting (use of natural light within 4.5 meters (15 feet) of windows and under skylights). Simple solutions include occupancy sensors in private offices or meeting rooms and/or electronic dimmer switches.
- ✓ Use LED in exit signs which only consume 1.6W of power versus 30W in conventional signs.

- ✓ Where the base building system does not meet your needs, you may wish to consider installing upward facing or indirect lighting using parabolic lenses to reflect off the ceiling as a replacement to standard overhead fluorescent fixtures. Not only does this system produce a softer and shadow free light, computer screen glare is also reduced.

An added benefit to lowering the energy use in lighting systems is the reduction in the heat loads created which has a positive effect in the cooling system/s of the building.

Heating Ventilation and Air Conditioning:

Improved and enhanced indoor air quality is fundamental in achieving overall employee satisfaction. Thus your goal is to establish and design to quantifiable standards for indoor air quality (IAQ) performance.

A successful Green Design for HVAC is often conditional on the base building capacities and systems. Where feasible:

- ✓ Provide for separate control zones in every room or area with a solar exposure
- ✓ Zone interior spaces separately
- ✓ Install controls and systems capable of sensing space use and modulating HVAC systems in response to space demand. This includes private offices and specialty occupancies (conference rooms, kitchens, etc.)

Equipment and Appliances:

Install only Energy Star rated equipment and appliances, including kitchen and laundry appliances, office equipment, electronics and commercial food service equipment and, more importantly, ensure equipment and computers are turned off when not in use.

Energy Measurement:

The ability to track energy consumption within the premises is a key step in energy conservation and awareness. It allows ongoing accountability and optimization in energy performance over time. By installing metering equipment that measures and records consumption within your space on all electrical, gas and water services you are able to monitor energy usage, which in turn allows you to identify, influence and see the results of any energy programs and initiatives you undertake.

For larger projects, continuous metering equipment should also be installed for the following end uses:

- ✓ Lighting systems and controls
- ✓ High consumption areas such as computer / server rooms
- ✓ "plug load" measuring consumption of office equipment, photocopiers, computers, etc. which are plugged into electrical outlets throughout your space

Construction and Commissioning:

The construction phase begins once you have a contract with the contractor you have selected. It ends when the project is complete and ready for occupancy. The last step prior to occupancy should be a commissioning period.

A project cannot be deemed a success until proven with written verification that confirms the project's mechanical, HVAC and electrical systems are installed and calibrated and performance is validated to the intended design. This verification process is completed by a commissioning team and should be included as part of your project work.

Further Reductions in Footprint:

In order to further reduce your energy footprint once you have designed and constructed efficient space, you may want to give consideration to purchase Green Power for your premises.

Environmentally Friendly Interiors

Floor Materials:

Floor finishes have the greatest single environmental impact of any fixed item over the life of a typical tenant's occupancy timeframe. This is due to a tendency to replace floor materials at the end of every lease cycle. If reusing existing floor finishes is not possible or practical, many environmentally friendly options are available at similar and often lower cost than typical selections. For example:

- ✓ Use modular carpets, reconditioned options or those with high recycled content
- ✓ Choose low emissions products
- ✓ Use linoleum instead of vinyl
- ✓ Select carpets from vendors who will take back the product for recycling at the end of its useful life.

Walls, Wallcovering & Paint:

Research indicates a link between open plan work environments and improved organizational learning. By reducing the number of walls or offices and moving towards an "open work" plan, you are not only reducing upfront costs, but increasing employee morale and wellbeing. This has the potential to generate further proven organizational productivity through inherent increases in natural light and better ventilation associated with this design approach.

Minimize the amount of volatile organic compounds "VOC" in paints, adhesives and sealants that are specified. This contributes to a healthier and more pleasant work environment for staff, especially at the beginning of your occupancy. Natural paints cost only a little more than standard paints and are completely VOC free. These provide a tangible demonstration of your company's commitment to maintaining a healthy environment for employees. Avoid the use of vinyl wall coverings as much as possible as most tend to have a high VOC content.

Furniture:

Workstations can also have a significant environmental impact, particularly if they are not designed for easy assembly and reassembly, and capable for reuse or recycling. Improvements to indoor environment quality can be attained using products that contain no or low “VOC”.

General office furniture contributes to a significant percentage of waste going to landfills. Consider reusing as much office furniture as possible which saves money and the environment. Cost effective, environmentally, and healthy (no or low VOC) products are readily available, and some manufactures agree to take back products for reuse or recycling at the end of your use.

Millwork:

A Green Design incorporates built in waste receptacle millwork to ensure that all recyclable materials generated within your space is diverted from landfill. The following waste streams should be taken into consideration when working with your property management team:

Kitchens/Kitchenettes/Serveries	Photocopy Areas	Meeting/ Boardrooms
- Organic Waste	- Paper	- Paper
- Cans and Bottles	- Toner Cartridges	- Cans and Bottles
- Paper	- Battery Recycling	- Waste
- Plastics and Styrofoam		- Organic waste

Each receptacle should be properly labeled according to the building's identified waste streams.

During Construction or Renovations

Waste Management:

An effective waste management program is based on the 3Rs, Reduce, Recycle and Reuse.

The element that needs to be considered right from the start is REUSE!

If your Green Design requirements are due to a relocation, be sure to walk through your new premises and consider any existing fixtures and furniture that can be reused. Also look to reuse whatever materials, equipment, and resources you can from your existing premises.

If demolition of some or all the premises is to be undertaken ensure suppliers, contractors and/or subcontractors retrieve / retain packaging (e.g. skids, plastic wrap etc.) for reuse.

This leads us to the next step in waste management, RECYCLE!

Your contractor should be advised to contact local salvaging/recycling companies and arrange for recycling services. At a minimum, you should ensure your contractor recycles the following waste materials that could not be reused and may be generated throughout demolition or construction:

- ✓ Concrete / masonry / stone
- ✓ Steel and other metals
- ✓ Wood
- ✓ Gypsum
- ✓ Cardboard
- ✓ Plastic
- ✓ Blue Box waste
- ✓ Glass
- ✓ Ceiling tiles
- ✓ Carpet

The final step in your waste management efforts is to REDUCE!

Prevent damage of materials due to mishandling, improper storage and contamination so they do not end up as waste. Where possible, use prefabricated components built at a central facility to avoid waste generation at the site.

An important element of the commitment to waste management is ensuring effective documentation is kept during the construction process. This is done through a Waste Diversion Report. The report is comprised of a compilation of waybills, invoices, letters, and other documentation from your suppliers/contractors that is appropriately indexed and shows product types, quantities and details of waste diverted and waste sent to landfill. A copy of your Waste Diversion Report should be provided to us when completed.

It is therefore essential that you inform your contractor early in the renovation process about the following processes and procedures that form part of a Green Design.

Designate a central Waste Collection Area onsite that is dedicated to the separation and storage of all waste generated during demolition and construction.

- ✓ Provide separate containers in the Waste Collection Area that are sized to accommodate the estimate amount of each waste type and quantity.
- ✓ Clearly indicate the material type being stored in each container using appropriate signage and labels.
- ✓ If space is insufficient to provide proper sorting, ship all materials to a sorting station.
- ✓ Co-ordinate daily inspections of containers to check for and remedy cross contaminations.
- ✓ Ensure the material type is clearly labeled on each container.
- ✓ Arrange for and/or promptly transport containers to receiving facilities when containers are full.

Provide "blue box" recycling bins on site for recycling waste generated by site workers and visitors. Waste deposited in the bins should include aluminum, food or beverage cans, glass and plastic bottles and jars for food or beverage, cardboard, and paper products.

Within 14 days...

- ✓ Have suppliers and contractors provide a letter listing the item(s) to be reused and the item(s) and quantity being removed from the site.
- ✓ Those items being removed from the site should show a list of proposed salvaging / recycling facilities to be used and further specify the material(s) that will be accepted by each facility and whether the material(s) will be reused, recycled or sent to landfill.
- ✓ Follow any salvaging / recycling facilities' material acceptance requirements to ensure materials are properly sorted, grouped, and packaged for collection.



Additional information and suggestions on waste management practices can be found on these websites:

Calgary Region - <http://www.garbagegoodguys.com>

Calgary Region - <https://recovery.cascades.com/en>

Web Based - Buy and Sell of Recycling materials – <http://www.recycle.net/>

Indoor Environment:

Prevent indoor air quality problems arising from the construction / renovation process.

Protect all materials from moisture damage whether stored on-site or installed with the use of absorptive materials. Provide filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 at each return air grill when air handlers are used during construction. Air handling systems serving the premises will only be turned on in the construction area when filters have been installed.

Additionally, reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants. This would include adhesives, sealants, and sealant primers. Specify low volatile organic compound "VOC" materials in all products being used. This is often accomplished with no additional cost.

Special consideration should be given to the selection of furniture and fixtures to ensure VOC levels are minimized and sufficient time for "off gassing" of new furniture is allowed to occur in a warehouse designed for this purpose rather than on the construction site. Be sure to order these products early in your process so it does not delay your overall construction schedule.

Information and Resources

To assist you in identifying environmentally friendly and sustainable ("green") goods and services; sourcing, using and disposing office products in an environmentally preferable manner; and recognizing the vast array of products and services available, we have identified a few of the thousands of web sites available in your pursuit of Green Design.

EcoLogo™ Program – Launched by the Canadian Federal government in 1988, EcoLogo has grown to service thousands of buyers and sellers of green products throughout the United States and Canada. EcoLogo™ is North America's oldest environmental standard and certifications organization. At this site, you will be able to make important, green conscious decisions while you browse through a list of over 7,000 product and service offerings. <http://www.ecologo.org/en/>

Bullfrog Power – Bullfrog sources power exclusively from generators who meet or exceed the federal governments Environmental Choice Program EcoLogoM standard for renewable electricity. <http://bullfrogpower.com>

Public Works Canada - offers several reference guides and publications including Environmentally Responsible Green Office and an Environmentally Responsible Construction and Renovation handbook.

<http://www.pwgsc.gc.ca/realproperty/text/publications-e.html>

BUILDSMART® - a program of Metro Vancouver, is a sustainable building information source for the design and construction industry, helping make smart, sustainable choices when crafting the future of our constructed environment. The site features a sustainable products directory, technical resources, and information covering the life cycle of a building including Design, Construction, Operations, Retrofit/Renovation and finally Deconstruction. <http://www.gvrd.bc.ca/BuildSmart/>

Taking it to the Next Level

If you wish to take your commitment to designing and constructing sustainable office interiors to an elevated level, we highly recommend you consider certification of your interior renovations to the LEED®

- CI rating system offered by the Canadian and United States Green Building Councils. A two-page summary is attached to this guide as Schedule 1 with detailed information available at the following websites:

<http://www.cagbc.org/>

<http://www.usgbc.org/>

Of paramount importance is to ensure your consultants are LEED Accredited Professional with experience in LEED accreditation programs to alleviate costs that can be associated with their learning curve.

Schedule 1

LEED® - CI Summary

What is LEED?

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ is a voluntary, consensus-based national rating system that encourages and accelerates global adoption of sustainable green building and development practices through the creation and implementation of universally understood and accepted tools and performance criteria.

LEED Basic Facts

- LEED is implemented by the Canadian Green Building Council for the Canadian market and by the U.S. Green Building Council for the United States market which are not for profit and non-profit organizations respectively
- LEED is a point-based system for rating the environmental performance of buildings
- Ratings of CERTIFIED, SILVER, GOLD or PLATINUM are awarded based on the number of points a project achieves
- LEED includes a third-party review and certification process
- There are several versions of LEED, each addressing different building types and construction scopes

LEED –CI

LEED for Commercial Interiors is the green benchmark appropriate for the tenant improvement market. It is the recognized system for certifying high-performance green interiors that: are healthy, productive places to work; are less costly to operate and maintain; and have a reduced environmental footprint. LEED–CI provides a framework to make sustainable choices to tenants and designers who do not occupy whole buildings.

LEED–CI addresses the following categories of environmental performance, which are explained in more detail in the sections that follow:

- Sustainable Sites
- Water Efficiency
- Energy & Atmosphere
- Materials & Resources
- Indoor Environmental Quality
- Innovation in Design

Sustainable Sites

This section looks at the environmental choices in terms of the site, its surroundings, and certain aspects of the base building in which the LEED–CI project is taking place. Several issues addressed in this section may be outside of the scope of influence of the tenant. Within Sustainable Sites, LEED–CI addresses environmental performance in areas such as the reuse of brownfield sites, stormwater management, heat island effect, on-site renewable energy, and transportation management.

Water Efficiency

Points for water efficiency are awarded to project teams for their reduction in potable water use relative to standard practice. Low flow fixtures such as toilets, showers and faucets all contribute towards these points.

Energy & Atmosphere

Energy conservation may be the most important way to reduce the negative environmental impact of buildings, since energy use is implicated in resource depletion, global warming, and air pollution to name but a few impacts.

To reflect the importance of this section, it contains three prerequisites – mandatory measures that must be completed to obtain any level of LEED certification. These are:

- Fundamental Commissioning – to ensure that testing procedures are conducted before tenant occupancy
- Minimum Energy Performance – to ensure compliance with energy code standards
- CFC Reduction – to ensure the avoidance of ozone depleting CFCs in mechanical equipment

LEED rewards projects with points for meeting or exceeding energy efficiency standards for lighting, HVAC, and appliances. Points are also available for electricity from green sources, energy metering and enhanced commissioning.

Materials and Resources

The energy and resources required to extract, manufacture and transport building materials have significant environmental impacts. To reduce these impacts, the design team should emphasize the use of materials that have a minimal environmental impact and low embodied energy.

This section has one prerequisite – the provision of space for storing recyclables in the finished project – and assesses the recycled content, reused content and locality of the materials used. Points are also available for diverting construction waste from landfill and selecting sustainable materials such as FSC certified wood or rapidly renewable materials such as bamboo.

Indoor Environmental Quality

Earth-conscious building design doesn't stop at the building entrance, but includes issues related to the indoor environment: air quality, natural lighting, and outdoor views. Healthy workspaces mean healthy, happy and productive staff with reduced absenteeism; many measures in this section make commercial sense too.

All projects must comply with two prerequisites in this section – tobacco smoke control and ventilation rates in accordance with or better than minimum standards.

Beyond that, LEED encourages a healthy working environment in two ways. First, LEED awards project points for minimizing harmful substances such as pollutants from construction process and harmful substances (particularly VOCs) in materials, paints, sealants, and furniture. Second, LEED recognizes design features that actively contribute toward health and wellbeing, namely natural day lighting, views out and comfortable and controllable heating, ventilation, and lighting systems.

Innovation in Design

The final section allows projects to be rewarded for innovation measures not covered elsewhere in LEED or to achieve points by demo

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