



COMMERCE PLACE

400 BURRARD STREET

DESIGN CRITERIA MANUAL



Updated: October 2018

Commerce Place

Design Criteria Manual

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Design Criteria Manual

Section 1:

Introduction:

The Tenant Design Criteria Manual is prepared to assist Tenants in the design and construction of leasehold improvements before, during and after the substantial completion of the base building project.

The manual contains information about procedures and requirements established by the Landlord for Tenants who undertake improvements within the leased premises; it also outlines the basic design specifications for the building. The information provided here applies as a general rule and should be made available to the Tenant's designers and contractors, who are urged to acquaint themselves thoroughly with the material herein, as it will form the basis of the Landlord's approval of all Tenant submissions.

The Landlord's review of all drawings is for the purpose of obtaining information about the intended design and use of the premises and the impact such design and use may have on the base building systems, structurally, electrically and mechanically.

The Landlord's review is not intended to agree with your consultants design accuracy, only to review the impact on the base building systems and surrounding tenants.

It is recommended that the Tenant work and/or designer visit the site to inspect and verify all site conditions prior to commencement of design work.

The Landlord reserves the right to amend or add to the information in the manual at any time and the Tenant is obliged to abide by such changes upon notification thereof. All costs associated with the compliance shall be at the Tenant's expense.

This manual is intended to reflect only standard conditions or situations and does not amend the formal lease agreement, which is to govern in the event of any inconsistencies.

Permission to deviate from the criteria contained herein must be obtained in writing. Notes on drawings in conflict with the design criteria have no validity.

Tenant Coordination:

The Landlord will appoint a Project Manager, who will guide and assist the Tenant through the construction and renovation period and act as a point of contact within the Landlord's organization. All questions, comments and submissions are to be addressed to:

QuadReal Property Group
Suite 800 – Park Place
666 Burrard Street
Vancouver, BC V6C 2X8
Telephone: 604-975-9500

Landlord Consultants

ARCHITECT: Musson, Cattell, MacKey Partnership
#1600 – Two Bentall Centre
555 Burrard Street
Vancouver, BC V7X 1M9
Ph: 604-687-2990
E: mwhitehead@mcmparchitects.com
Attention: Mark Whitehead

STRUCTURAL ENGINEERS: Read Jones Christoffersen
#300 – 1285 West Broadway
Vancouver, BC V6H 3X8
Ph: 604-738-0048
E: rsteers@rjc.ca
Attention: Roger Steers

MECHANICAL Integral Group
#180-200 Granville Street
Vancouver, BC V6C 1S4
Ph: 604-687-1800
E: kchen@integralgroup.com
Attention: Kai Chen

ELECTRICAL AES Engineering
505 Burrard Street, Suite 950 –
Box 91, Vancouver, BC Canada
V7X 1M4
Ph: 604-569-6500
E: Paul.Luhman@AESengr.com
Sunny.Ghataurah@AESengr.com
Attention: Paul Luhman/ Sunny Ghataurah

FIRE CONSULTANTS CFT Engineering Inc.
#800 – 1901 Rosser Avenue
Vancouver, BC V5C 6R6
Ph: (604) 684-2384

Base Building Construction:

Base Building construction includes all structural, mechanical, electrical, sprinkler systems and architectural finishes as stated in the basic construction contract between the Landlord and the Landlord's contractors.

The Landlord will provide drawings indicating all major elements of the Tenant's floor to the Tenant, if available. The Landlord at the Tenant's expense will supply any additional drawings requested by the Tenant.

Any alterations and/or additions to the base building construction that may be required to accommodate the Tenant's office layout shall be subject to the approval of the Landlord. The Landlord retains the right to have such alterations carried out by the Landlord's contractor, under the supervision of the Landlord's consultants, at the Tenant's expense. The cost of such work shall include labour, materials, applicable taxes, all architectural, engineering and contractors' fees and such reasonable fee for supervision as the Landlord may charge.

Interior Design Guide:

Tenant's designers are urged to use the basic building systems to avoid expense and delay to Tenants when creating their improvements and restoring them at expiry of the Lease.

This is intended as a guide to Tenants and their designers and contractors:

1. Ceiling grid dimensions are 60' X 15'.
2. Keep ceilings at standard height.
3. Do not request changes to the partitions, doors, ceiling heights or finishes in the rooms in the core (i.e., male and female washrooms, vestibules, stairs, janitor, electrical and telephone closets).
4. Ensure that any wall finishing material introduced by a full floor tenant in the elevator lobby does not require changes to the elevator doorframes, call buttons or signals. Cladding of door frames with special approved finishes will be permitted to full floor Tenants.
5. Ensure that any floor finish material introduced by a full floor tenant in the elevator lobby does not require changes to the elevator door thresholds.
6. Locate additional washrooms, sinks, etc., as close as possible to the soil stacks to ensure adequate slope of drains.
7. Advise the Landlord as soon as possible, and in writing, of any changes required to any base building elements.
8. Drilling of holes in the aluminium frames of the windows is not permitted.

9. Arrange for air return openings in every sound baffle in ceiling plenum above a partition, to permit return of air through the ceiling space to the return air ducts at the core.
10. Comply with city regulations, with respect to access to Fire Department valve cabinets and acceptable routing through Tenant premises for a person with a hose and maximum distance of water throw.

Design and Working Drawings:

The Tenant may wish to retain the Landlord's Architects or Consultants, under direct contractual arrangements for the production of working drawings. If the Tenant chooses to employ Consultants other than the Base Building Consultants for the design work, the Landlord will have their drawings reviewed by the Base Building Consultants in order to ensure compatibility with the building's systems. The cost of this review will be charged to the Tenant.

A list of the Base Building Consultants is attached to this manual.

The Landlord will provide one set of base building information drawings indicating all the major elements of a typical floor to the Tenant. Any additional drawings that may be required by a Tenant shall be provided by the Landlord, upon request by the Tenant, and at the Tenant's expense.

All drawings are to be made in Metric with Imperial conversions in brackets.

For the purpose of this manual, the drawings approved by the Landlord shall be called "Approved Drawings". Any revisions made to the Approved Drawings must be submitted to the Landlord for further approval.

The Tenant shall submit to the Landlord two sets of prints of the completed working drawings and specifications for final approval at least fifteen (15) working days prior to the Tenant's commencement of construction. This is to allow the landlord sufficient time to review the proposed modifications. The Tenant drawings must include the following information:

1. Floor Plans:

- a) drawing scale of 1/8":1'-0";
- b) location of all major fixed elements within the Leased Premises dimensionally related to grid lines and demising partitions.
- c) locations, loads and layouts of rooms of unusual loading concentrations, such as centralized filing areas, Vaults, Safes, Etc.;
- d) location of power and telephone outlets;
- e) room names or uses. The number of persons working in the room will help in calculations for the mechanical requirements;
- f) floor materials and finishes throughout the Premises, including washrooms, kitchens/sinks if applicable;
- g) where the Leased Premises occupy less than a full floor, a drawing of the entire floor showing the location (complete with dimensions) of Leased

Premises and its relationship to the elevator lobby, exits, washrooms, etc., will be required.

- h) door hardware and keying schedule. Two copies of the hardware schedule must be submitted to indicate all elements including keying which must be to building standard.
- i) location of inter-floor stairs, if any, (subject to approval by the Landlord's structural engineer);
- j) clearly defining the extent of work of the Tenant.

2. Reflected Ceiling Plans:

- a) lighting layout, ceiling pattern, air transfer ducts, materials and suspension system details;
 - b) types and Wattage of any proposed special lighting fixtures;
 - c) locations and types of sound baffles above the ceiling, and clear identification of rooms requiring soundproofing.
 - d) the locations of any access panels required to service building systems.
 - e) the locations of any air transfer ducts through full height partitions. Cross talk silencers are required for all tenant and corridor demising walls.
3. Construction sections and details, at suitable scales, indicating all methods of construction, including partition details, baffles, doors, etc.
4. Complete mechanical, electrical, sprinkler systems, building automation and life safety system drawings, at a scale of 1/8":1'-0", showing all alterations to, or additions to, the existing Base Building work as well as Base Building conditions which remain unchanged. Tie-ins and extensions to base building security, fire alarm, and communication systems must also be clearly shown. All electrical work in electrical rooms to be installed in conduit. Heat generating equipment and their heat output will be required on the mechanical drawings. Thermostat locations and connections to VAV's and valves are to be clearly shown.
5. Structural drawings, at suitable scales, where special conditions warrant the production of such drawings e.g. openings in the slab, libraries, file rooms, vaults, etc. These drawings must be inspected by the Structural Engineer.
6. Architectural, mechanical and electrical specifications must be submitted, describing the quality and performance standards for all the Tenant work.
7. The tenant is responsible for obtaining all necessary permits and approvals, from the Building Department, Health Department, Fire Marshall, the Ministry of Labour, and any other governing authority having Jurisdiction.
8. The Tenant shall engage, at the Tenant's expense, the Landlord's approved contractors, for any mechanical, electrical, sprinkler, controls and balancing modifications or additions to the base building systems.

9. Upon completing its review, the Landlord shall return the drawings stamped and endorsed with its approval along with all comments and required corrections of the Landlord and its Consultants. The Tenant shall revise the drawings to include all the comments and corrections and provide the Landlord with a revised set of prints prior to commencing the Tenant work. Unapproved drawings shall be revised to conform to the Landlord's requirements by the Tenant and resubmitted to the Landlord for approval. 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.

Permits:

The Tenant is responsible for all necessary permits and approvals required by government authorities for construction. The Tenant must provide the Landlord with copies of such permits and approvals prior to commencement of construction.

The Tenant is responsible for the correction of any items of work, which do not meet with the approval of the Municipality's building inspector, notwithstanding the fact that the drawings have been approved previously by the Municipality or the Landlord. The Tenant will be given a specified time to complete corrections. Should the Tenant or the contractor delay the required correction unduly, the Landlord will make the correction at the Tenant's expense. All Building, Occupancy and Permit drawings will be submitted to the Landlord upon completion of work.

The Tenant upon completion of the premises shall obtain an "Occupancy Permit" in writing from the Building Department.

Insurance:

The Tenant and its contractors are required to provide a copy of the insurance coverage at least equal to the itemized amounts stipulated in the Lease. For further information see Section 4 of this manual.

Appointment of Contractors:

All Tenant Contractors are subject to approval by the Landlord and MUST:

- a) furnish evidence of good standing with the WorkSafeBC (see Section 4);
- b) engage the services of the approved Base Building Sprinkler, Mechanical (HVAC), Building Automation and Controls, and Electrical subcontractors for approved Tenant work involving these trades;
- d) furnish the Landlord with a list of their Contractors' names, contacts and telephone numbers prior to construction and schedule a meeting of the General Contractor and designer with the Landlord's representative.

Commencement of Construction:

Construction may proceed only after the Tenant has:

- a) Submitted acceptable evidence of insurance coverage to the Landlord as set out in the Lease and in this manual (Section 4).
- b) Posted all required permits on site and forwarded copies of the same to the landlord for record purposes. Permits will include but not be limited to Building permit, clearance certificate from the WorkSafeBC, liability insurance certificate, and Notice of Project from the Ministry of Labour (if applicable).
- c) Made available on the Leased Premises a complete set of prints of the local authorities approved Drawings for the duration of the construction period for reference by the Landlord's authorized representatives.
- d) Receipt of the reviewed drawings and written notice from the Landlord to proceed with construction.
- e) Provided two sets of construction drawings and specifications and copies of all Addenda.
- f) Provided the landlord with a list of contractors performing the work.
- g) Provided the Landlord with a copy of;
 - The construction schedules complete with commencement, completion, and tenant move-in dates.
 - Signed copy of the contract
 - Copy of the contractors Safety Manual
- h) Where the Leased Premises occupy less than a full floor, a drawing of the entire floor showing the location (complete with dimensions) of Leased Premises and its relationship to the elevator lobby, exits, washrooms, etc. will be required.
- i) Provide the Landlord with two copies of the hardware schedule must be submitted to indicate all elements including keying which must be to building standard.
- j) Location of inter-floor stairs, if any, (subject to approval by the structural consultant);
- k) Clearly defined the extent of work of the Tenant.

During Construction:

The following information must be provided to the landlord during the course of the Tenant's project.

- a) Copies of all site meeting minutes.
- b) Copies of all Contemplated Changes at time of issuance to the Contractor.
- c) Copies of all Architect or Designer's site visit reports.
- d) Copies of all site reports from authorities having jurisdiction.
- e) Copies of safety meeting minutes.

Tenant's Contractor(s) Requirements

1. The Tenant shall engage his own contractor(s) to execute its leasehold improvements.
2. The Tenant's contractor's are subject to the following conditions:
 - (a) The Landlord reserves the right to approve all construction work carried out by the Tenant's contractors to ensure its compliance with approved drawings and building standards.
 - (b) The Tenant contractor(s) shall be approved by the Landlord prior to award of contract(s).
 - (c) The Tenant contractor(s) shall, prior to start of work, furnish evidence that they are adequately and properly covered by insurance; **See section four: Insurance & Indemnification**
 - (d) The Tenant contractor(s) shall be restricted to the area of the leased premises for all work and storage of materials and equipment.
 - (e) The Tenant contractor(s) shall arrange for the security of the Tenant leased area and equipment, materials, etc. during the construction period.
 - (f) The Tenant contractor(s) shall enforce safety regulations during the construction period.
 - (g) The Tenant contractor(s) shall observe non-working hours, 6:00 pm to 6:00 am Monday to Friday, unless permission is obtained in writing from the Landlord.

- (h) The Tenant contractor(s) shall provide and maintain adequate first aid and fire prevention facilities during the construction period.
- (i) The Tenant contractor(s) shall give the Landlord at least 48 hours advance notice to reserve the use of the Landlord's freight elevator for tenant's construction materials and equipment.
- (j) The Tenant contractor(s) shall remove all garbage and debris from the Tenant premises in sealed containers on a daily basis to a designated location. Contractors will do their best to ensure demolition and construction materials are recycled and keep a record of the quantity of material recycled during the renovation process.
- (k) **The Tenant contractor(s) shall not penetrate or fix to the exterior wall, windows, or window frames.**
- (l) The Tenant contractor(s) shall protect all finishes to basic building elements and reimburse the Landlord the cost to make good any damages.
- (m) The Tenant contractor(s) shall stack drywall over main beams at column lines. **Piles not to exceed 12" in height.**
- (n) **All noisy work such as coring and drilling must be carried out after normal business hours ie between 6:00 pm and 6:00 am weekdays, or any time on Saturday and Sunday. The tenant contractor(s) shall obtain the Landlord's approval in advance for any such work.**

NOTE: The Landlord may require x-rays of the concrete slab prior to drilling. The charge for any x-rays will be a Tenant's additional charge.

- (o) All coring and drilling must be approved in writing by the structural consultant prior to work commencing. Fire proof all fire related penetrations to comply with all codes and the Vancouver bylaw.
- (p) Contractors shall provide walk-off mats on construction side of elevator lobbies, into common areas and stairwells.
- (q) No work will be permitted on the buildings fire alarm, life safety or sprinkler systems without first coordinating it with the Building Management Office at (604) 975-3524 or the Building Operations Office at (604-975-9514). Base building Fire alarm system-related work is restricted to Tyco Integrated Fire & Security.
- (r) Welding, brazing and any heat or fume producing activities are not permitted unless coordinated with the Building Management Office. Fire watch procedures must be in place.

- (s) If additional security is required due to unloading facilities being open outside of normal building hours to accommodate contractor move-ins, such security shall be a Tenant's additional charge.
- (t) No electrical circuits, fans or pumps are to be turned off without the prior permission of the Building Management Office.
- (u) The Tenant contractor(s) shall not penetrate the suspended ceiling T-bar, mechanical diffusers, or light fixtures with screws, etc.
- (v) The application of any products producing toxic and/or noxious fumes, such as contact cement, paint, etc. must be limited to times prearranged with the Building Operations Office (telephone (604) 975-9514). No application of these types of products is permitted during normal business hours, without exception.
- (w) Before construction starts, the tenant contractor shall provide temporary filters to cover the pleated filters on each floor fan. When construction is completed, the contractor shall provide new pleated filters for floor fans.
- (x) When construction is completed, the contractor shall wash down the floor mechanical room floor to remove all construction dust. All mechanical equipment & panels must be dust free at completion of work.

Completion of Tenant's Construction:

The Tenant is required to submit an executed Statutory Declaration form to the Landlord on completion of the Tenant's work stating that the work has been completed in accordance with the approved drawings and all contractors have been paid in full. A copy of occupancy permit from the city of Vancouver must also be submitted.

Also required are letters from the Tenant's Designer/Professional Consultant stating that the installation has been completed in accordance with the contract drawings and specifications and authorities having jurisdiction.

The Tenant is required to carry out its construction work in strict accordance with the approved drawings. Variations must be approved and recorded on the "record" drawings. Copies of the "record" drawings, in AutoCAD format, must be provided to the Landlord at the conclusion of construction.

Any elements of the Base Building such as, but not limited to, ceiling components, doors, door frames, hardware, security hardware, etc., which the Tenant removes with the approval of the Landlord, shall remain the property of and must be turned over to the Landlord. At the end of construction, the Tenant must confirm in writing to the landlord that all base building surplus equipment/material has been delivered to the Landlord in working order.

Landlord Charges:

(a) Building Charges

This charge includes such items as site and/or security personnel for the Tenant construction purposes. The Tenant's charges for these items would be based at cost plus a 15% administration fee.

(b) Drawing Review

As outlined previously in this manual, the Tenant is not obliged to utilize the Base Building Consultants. Should, however, the Tenant choose to use consultants other than the Base Building Consultants, the Landlord reserves the right to have the drawings reviewed by the Base Building Consultants. All costs associated with this review will be billed directly to the Tenant plus a 15% administration fee.

Please note that additional charges and/or fines will be levied for any false fire alarms that may be set off by the tenant's contractor and/or sub-trades.

Work Regulations

Public Safety:

It is the Tenant's responsibility to ensure that the Tenant Contractors observe and comply with all applicable construction safety regulations including W.H.M.I.S. Any additional safety regulations which may be imposed by an authorized representative of the Landlord must also be complied with immediately and fully. Should failure to comply result in any construction delay, the Tenant will be held responsible for all resulting costs. The Tenant's Contractors shall provide and maintain adequate First Aid facilities during the construction period.

The Tenant shall ensure that the Contractor and his Subcontractors observe and enforce all construction safety measures as contained in the requirements of any federal/provincial legislature, regulations, municipal by-laws and requirements and the requirements of all other Authorities having jurisdiction which may pertain to construction of the work.

In the event of any conflict between any municipal by-laws, provincial or federal legislation, the provision that sets out the most onerous or stringent requirement shall apply.

The Tenant must ensure that it's Contractor and Subcontractors:

- a) Comply with, but not be limited to all ordinances, the requirements of all Acts and Regulations with respect to health and safety including Occupational Health and Safety Act, British Columbia(as amended) and Regulations for Construction

Projects (as amended) made thereunder; and Workplace Hazardous Material Information System (WHMIS) Regulation, including the following:

- i. Before commencement of work and throughout Contract, maintain on site and readily accessible to all those who may be exposed to hazardous materials, a list of all hazardous materials proposed for use on Site or Workplace together with current Material Safety Data Sheets (MSDS).
- ii. Ensure hazardous materials used and/or supplies on site are labelled in accordance with WHMIS requirements.
- iii. Provide detailed written procedures of safe handling, storage and use of such hazardous materials including special precautions, safe clean up and disposal procedures. Conform to Environmental Protection Act for disposal requirements.

Ensure that those who handle and/or exposed to or are likely to handle or be exposed to, hazardous materials are fully instructed and trained in accordance with WHMIS requirements.

Minors:

Minors are not permitted on the construction site at any time.

Emergency Contact:

The Tenant Contractors are required to post on the Leased Premises three (3) names and telephone numbers for emergency contact.

Temporary Services:

The Tenant's Contractor is responsible for the distribution and installation of temporary power and telephone within the Leased Premises during the construction period. Exposed electrical cords are not permitted outside of the Leased Premises. **The Tenant is responsible for the installation of telephone during the construction period. The tenant and its contractors will not have access to the Landlord's telephone.** The Tenant's contractors are to supply the necessary temporary heating units. Hook up and disconnect to the building supply line will be done by the base building mechanical trade to the Tenant's account. A consumption rate for recorded use will also be applicable to the Tenant's account.

Work Areas:

All construction materials, tools, equipment and workbenches must be kept within the Leased Premises throughout construction. All public lobbies, washrooms and stairs shall be kept clean of construction materials. Should the contractors use the public washroom, such contractors will be responsible for cleaning and/or repair of damages. The contractor shall be responsible for the implementation and maintenance of Dust Control measures. Smoke detectors & other dust sensitive equipment (i.e. thermostats etc.) should be protected from dust thereby eliminating the possibility of a false fire alarm

Garbage Removal:

The Tenant is responsible for ensuring that the Tenant Contractors remove all garbage and debris in approved containers from the Leased Premises, corridors and common areas after regular business hours. Garbage containers will not be provided by the Landlord. Should it be necessary for the Landlord to remove a Tenant's garbage or debris due to inaction by the Tenant, the Tenant will be invoiced for the cost thereof. Temporary storage of garbage or debris outside the Leased Premises is not permitted. The Tenant's contractor will not be permitted to dispose of construction debris in the building compactor.

The Tenant/Contractor shall make arrangements to provide a separate garbage container and place it in a suitable location agreed to by the Landlord. Removal of Tenant's construction debris will be scheduled between the hours of 6 pm to 6 am. Bins will only be accepted on site during these hours. Booking of the service elevator for down loading must be co-ordinated through the building security with a minimum of forty-eight (48) hours' notice. The Tenant's contractor is responsible for the most efficient use of the service elevator at the Landlord's discretion. Any expense incurred due to misuse of the freight elevator, i.e. overloading or debris dropped in door track will be charged back to the Tenant.

A building representative may be required, at the discretion of Management, after hours and the cost of it will be charged to the Tenant.

The cost of the extra garbage container and all tipping and disposal fees shall be the sole responsibility of the tenant/Contractor.

The contractor is to ensure that the floor is not loaded in such a way that it may overload the structural capacity of the floor. i.e. Drywall to be stacked no higher than 12" and must be stacked over structural beams.

Salvage:

All permanent improvements are the property of the Landlord and, as such, the Landlord holds exclusive salvage claims throughout the building.

Working Hours:

Work other than hoisting of materials shall be carried out in the Leased Premises from 6 pm to 6 am; Monday to Friday, without exceptions.

Any work which is required to be carried out at times other than those stated above, will require written approval from the Landlord prior to the work being performed. All work not contained within the demising walls and exposed to the public must be enclosed by full height, one side plywood boarding painted to match the Landlord's standard colour. No work is to proceed in areas exposed to the public during regular working hours, these hours being the generally accepted hours 6 am to 6 pm.

Temporary Fire Protection:

Operable fire extinguishers of the proper classification and in sufficient numbers to combat a potential fire in the work area must be kept in the Leased Premises throughout the construction period. Base building extinguishers are not to be removed from cabinets.

Security:

The Tenant and its contractor are fully responsible for the physical security of the Leased Premises and the contents thereof throughout the construction period. If required, temporary door(s), frame(s) and hardware are to be installed at the Tenant/Contractors cost. A copy of the key must be left with the Landlord in case of emergency within the suite. Storage of materials in the areas other than the Leased Premises will not be permitted.

Access to Occupied Tenant Spaces:

Contractors requiring access to occupied premises during construction will do so by appointment, to be arranged through the Landlord and at the reasonable convenience of the affected Tenant. Should access to other occupied premises be required after hours, a security guard may be required. The Landlord may arrange for the guard as required and all costs for this service will be billed directly to the Tenant.

Access and Deliveries:

All material deliveries MUST be scheduled with the building security office 48 hours in advance and be approved by the Landlord. Bookings of the service elevator are on a "first come first served basis". Personnel access and material deliveries to the Leased Premises are to be only by routes designated by the Landlord. Large deliveries must be made before 6 am or after 6 pm; Monday to Friday or any time on weekend and / or statutory holidays.

Please note that under Section CSA B44 94 Elevator Code, the weight of any single piece of freight or of any single hand truck and its load cannot be more than 25% of the rated load of the service elevator. The handling of items, which may exceed this 25% rated capacity or due to their dimension require special treatment, must be reviewed and

arranged with the Landlord. Any costs incurred as a result will be at the Tenant's expense. The Landlord or any of its agents will not be responsible for receiving or signing for any materials. No deliveries of any kind will be allowed through the Lobby without written approval from the Landlord in advance.

Access Panels:

The Tenant must provide access panels in walls, ceilings and floor construction as directed by the Landlord to permit necessary access to equipment and/or services. All sizes and locations of access panels are to be approved by the Landlord prior to installation.

Testing and Tie-ins:

The Tenant must obtain the Landlord's permission in writing prior to the installation of any tie-ins to the mechanical, controls, and fire protection or life safety systems and before testing any such tie-ins. Where any tie-ins are made to existing services i.e., domestic water, sanitary, etc. provisions for future accessibility and isolation must be made, and are the responsibility of the Tenant or their contractor. At the sole expense of the Tenant, the Landlord's fire safety consultant shall be retained to verify any and all fire system alternations. The Tenant will be held fully responsible for any damages that may result from such tie-ins.

Fire Alarms:

All revisions to the base building sprinkler system must be approved by the Landlord or authorized personnel. The sprinkler control valve will be closed and the sprinkler line drained down until completion of all Tenant revisions on each floor. All sprinkler systems components must be able to be made operable at the end of each day. The Landlord must be contacted forty-eight (48) hours in advance of any proposed sprinkler work, and before commencing work on the site. All precautions must be taken to ensure false fire alarms do not take place. Charges will be levied against the Tenant's account.

Sprinkler work requiring isolation of occupied areas must be completed during normal business hours 7 am to 5 am. The contractor must provide a fire watch person for occupied areas in accordance with the building fire plan.

After completion of all Tenants work the system must be water pressure tested at 150 psi. for two hours. The Landlord's base building engineering consultant must witness the test and send the test certificate to the Landlord. The sprinkler system will be reactivated once all tests have been approved. The Tenant is responsible to ensure that the relocation or addition of heads conforms to all applicable N.F.P.A. standards, I.A.O. requirements and to all authority requirements.

- a) A temporary smoke detection system must be installed in the event that the sprinkler system and building smoke detection system becomes inoperable at the end of each day.

- b) A full set of approved hydraulic calculations and drawings must be forwarded to the Landlord from the sprinkler contractor prior to any work commencement.

Arrangements must be made with the Landlord prior to performing any work on the fire alarm system. Only building personnel are allowed to isolate the fire alarm panel when modifying, installing, and/or relocating any alarm devices (i.e. pull stations, communication speakers, fire alarm bells, etc.).

The Fire Alarm System must be in an operable condition at the end of each day before 5 pm.

Plumbing:

Where plumbing is removed from Tenant premises, all water supply, drain lines and vent connections must be removed from the ceiling spaces back to the core riser and properly capped. Installation of water meter(s) will be required on all incoming lines to the Tenant's premises servicing any kitchens, private washrooms and HVAC equipment.

Powder Actuated Devices:

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

Drilling or Cutting:

The Tenant Contractors are not permitted to drill, cut or chase openings of any description in any part of the Base Building Structure. If such work is deemed to be necessary and acceptable by the Landlord and the Landlords structural engineer, it will be carried out after regular working hours by the Tenant/Contractor to their account. X-Ray of core slabs or walls, is mandatory, and will be at the Tenant's / Contractor's cost. All hole locations shall be submitted on the drawings, accompanied by the x-rays for review and approval by the Landlord prior to drilling. All x-raying and subsequent core drilling must occur between 6 pm and 6 am.

Fastenings:

The Tenant's contractors are NOT permitted to fasten to curtain walls, window frames, mullions, heating radiation covers, or walls, which may contain vapour barriers or special fire rated structures. Clips in lieu of screws MUST be used to fasten interior or demising walls to the ceiling T-bars. No wall partitions will be permitted to butt up to the windows. All walls must end at an existing window mullion.

Welding & Any Open Flame Work:

Open flames for welding, cutting or other purposes are not permitted without the prior consent of the Landlord. Proposed work of this nature must be approved by Base Building Operations in writing with at least 48 hours notice before the work is to be done. An operational fire extinguisher must be available in the immediate vicinity of the work, in

addition to those already present. The Tenant contractor shall co-ordinate shut off or covering of the smoke detectors with Building Operations. Should the Tenant contractor neglect to notify Operations regarding the above-noted work and a fire alarm is activated, resulting in a false alarm the Tenant contractor will be charged with all associated costs plus an administration fee of 15% per occurrence.

Damages:

The Tenant Contractors shall protect all finishes to the Base Building elements and reimburse the Landlord the cost to make good any damages. Polyethylene vinyl will be applied to protect all Base Building Carpet surfaces. Pressboard will be used in all common areas for move-ins and moving of materials.

Storage:

The Tenant Contractors will stack drywall in piles not exceeding 12” in height over the main beams at column lines. Do not overload the structure.

Noise:

Work such as coring and drilling MUST be carried out during non-business hours with the Landlord's approval in advance. The Landlord reserves the right to request any work that creates noise that could disrupt the surrounding tenant's right for quiet enjoyment of their own premises, to cease the activity and reschedule to an afterhours time frame. Under no circumstances will the Landlord be held accountable for any cost increases incurred by the tenant/contractor for alternate scheduling of the associated work.

Odours:

Any work that has the possibility of generating an odour which will offend other occupied area shall be moved to either after hour or weekend schedules (i.e. any painting operations other than those utilizing latex paint, concrete sealing, glue applications for tile or carpet, etc.).

Access to Premises:

The Landlord shall have free access to the Leased Premises at all times for the Purpose of completing, correcting or inspection of any work.

Parking:

Limited parking for trades people is permitted, space permitting, in the parkade at the contractors expense. Drop off and pick up of materials is from the loading dock. There is a 15 minute limit to drop off and pick up during normal business hours. With exceptions.

No vehicles may be parked, placed or worked from on the sidewalks, driveways, or any other property inside the street lines surrounding the property.

Where security card access is required for access to parking or other areas of the building it will be the Tenant Contractor's responsibility to obtain the Security Cards. There will be a refundable deposit for the security cards.

Work Conflict:

Tenant Contractors work shall be performed in a manner that will not interfere or conflict with any activities of the Landlord, other Tenants or the operation of the Complex.

Clean-Up:

Prior to moving in, the Tenant and Contractor are responsible for cleaning the following:

- a) carpets and all other floor coverings which may have become soiled during the construction;
- b) light fixtures and lenses (including fixtures previously installed);
- c) inside face of windows and curtain wall mullions; perimeter radiation units (inside & out);
- d) public corridors adjacent to the Leased Premises, and service areas used during construction, including base building electrical and mechanical rooms;
- e) window coverings, i.e. blinds, control devices, ductwork;
- f) elevator(s) and loading area(s);
- g) installation of new filters in equipment within the premises and/or the compartment unit serving the floor.

NOTE: The Tenant/Contractor may choose to retain the Base Building cleaning contractor for this work, but all costs are a direct Tenant expense.

Move In:

It is the responsibility of the Tenant to advise the Landlord in writing, at least two weeks prior to the anticipated move in date, of the following:

- a) Name of the moving company, including a primary and secondary contact name and telephone number;
- b) Date and time of the move in;
- c) Elevator requirements;
- d) Any other special services or requirements.

Commerce Place Design Criteria Manual

Section 2: Description of Finishes

FINISHES:

Floors:

Finished concrete floor slabs suitable to receive carpet. Carpet will be provided in multi-tenant corridors and elevator lobbies. Carpet for multi-tenant corridors and elevator lobbies will be a building standard maintained by the landlord.

Walls:

Core walls, exterior walls, columns and Tenant demising partitions are taped and sanded drywall. The Landlord shall provide building standard demising partitions to delineate the Tenant's leased premises which shall be composed of 2 ½" steel studs, 2 ½" bats insulation fill, with 1" layer of drywall on each side. Deviations will be allowed in finishes on the tenant side of the demising partitions subject to the Landlords approval and at the Tenants expense. From T-bar grid to slab above, 1" of drywall is required on each side with rough finished joints. On the multi tenant floors, the public corridors, if any, will be wallpapered. Minimum width of any public or Tenant suite corridor will be 1.1 meters unless the building code dictates otherwise due to the high occupancy loads. Clear width must take into account door obstruction. All interior partition walls must terminate at an existing building window mullion. No walls will be permitted to end in the middle of a window (fake mullions will not be permitted). All mullions are to remain the base building colour. No exceptions.

Exterior walls shall be drywall with painted finish. Tenants shall not fix to or puncture the exterior drywall membrane for the installations of partitions, furniture, electrical outlets, etc. **No exceptions.**

Ceilings: (Tenant Space and Corridors)

The ceilings in the tenant spaces will be CGC Radar # 2619. These tiles are available in 15" X 60". They are to be cut to meet the dimensions; 14-3/4" X 59-3/4"

The ceilings in the common hallways are USG 8223, White Shadow line Taper 2' X 2'. The Tenant and contractor will be responsible for all ceiling tiles previously installed. No ceiling grid may be cut without the written authorization of the Landlord.

Elevator Lobbies:

Elevator lobbies on multi-tenant floors will be wallpapered with base building standard wall paper.

The elevator doors on the ground floor will be stainless steel finish. Elevator doors on multi tenant floors will be Steelcase Mist colored to the building standard.

The floor finish on multi-tenant floors will be carpet to building standard.

Suite Entry Doors:

Doors (on multiple tenant floors only)

The Landlord shall provide one demising building standard (solid core wood) door 3'.0" x full height and wood frames (s) and a second standard door if required by Code for exiting. All doors will be equipped with building standard stainless steel Corbin Emhart latch set in dull chrome finish. All doors will be keyed to the building standard key-code and master-key system. Doors are hung on 2 pairs of 4½" x 4½" stainless steel butts, complete with floor stops.

As an alternative to the standard single door application, the Landlord may approve the installation of a combination wood door and glazed sidelight in wood frames.

Hardware:

Hardware will be locksets on the stairway doors and exterior doors to premises and locksets and passage sets within the suites/or acceptable lever handle with finish to match base building.

All door locks installed by the Tenant, on both entrance and interior doors must be keyed to the building Master Keying System. The system, while allowing complete versatility and freedom for the Tenant regarding the locking arrangements for their offices, provides access to each office at all times for both normal cleaning and especially emergency situations. It is the contractors responsibility to ensure the correct keyway is installed to accommodate the Master Key System.

Suite entrance/exit/access door hardware will be Corbin Emhart with a brushed stainless steel finish. Closers will be mounted on the tenant side of doors and will have a brushed stainless finish.

All locking hardware must be compatible with existing base building Corbin Emhart type.

Outside locksmiths or lock manufacturers are NOT permitted to change the bitting or keying of the locks.

Keys and Cylinders:

The Landlord will provide building standard cylinders and two keys for each demising doors supplied by the Landlord. All additional locks supplied by the Tenant shall be key-coded to the **Building's Master Key System** and can be purchased from the Buildings Locksmith Al Scott Lock and Safe (604) 581-5000.

Window Coverings:

Building standard window coverings and necessary hardware will be provided by the Landlord and must not be removed.

Signage:

- (a) A building standard identification sign for Tenant's entrance door shall be provided by the Landlord at Tenant's expense.
- (b) Tenant identification shall be provided on the main floor lobby directory by the Landlord at Tenant's expense.
- (c) Standard base building elevator lobby directional signs shall be provided by the Landlord at the Tenant's expense.
- (d) All other Tenant signage must be approved by the Landlord before installation.

Structural Systems

No coring of slab is permitted without written approval of the consultant. X-raying of the slab for penetrations is mandatory and must be performed after hours and coordinated with the building operation's staff. All costs related to structural penetrations, including consultant's review and security arrangements will be the sole cost of the tenant.

General floor framing systems are included in the drawings supplied by the Landlord. Unusual loading situations, such as filing rooms, safes, computer installations, etc. must be brought to the attention of the Landlord. The Landlord will not be responsible for any partitioning layout revisions necessitated by unusual loading conditions.

Design loads are as follows:

Live Load: 65lbs. per square foot
Partitions: 20 lbs. per square foot

Mechanical Systems

Heating, Ventilation and Air Conditioning (H.V.A.C.)

Each floor of the office tower has a separate Variable Air Volume (VAV) air handling unit which mixes outdoor air and return air in a mixing plenum then distributes that air to a ducting system where volume and temperature control is provided for by Titus ESV-3000 VAV boxes.

Each floor air handling unit has a chilled water cooling coil and filter section. Titus ESV-3000 model single duct VAV boxes are used throughout the ceiling space to modulate the amount of air delivered to the space and continuous perimeter baseboard, hot water radiators are used to reheat the air to satisfy the different zone conditions.

Air is exhausted through general and washroom exhaust air systems with the fans located in the penthouse mechanical room.

The mechanical system operation is controlled and monitored by a programmed central computer system.

Heating of all the building is provided for by Low Temperature How Water LTHW piping systems serving perimeter baseboard and ground floor heating systems.

Two Volcano fire tube model 58125 KDA, 5.24 million BTUH, natural gas fired boilers are located in the penthouse mechanical room with the associated pumping, valving and pipework.

Balancing of the air system will be done by the Landlord's Balancing Contractor at the Tenant's cost. A copy of the balancing report will be forwarded to the tenant for his use.

It is required that controls be installed and set by the Building Controls contractor at the Tenant/Contractor's expense. Air transfer grilles must be installed in all sound baffles above the ceiling. Engineered air transfer ducts must be installed in all demising walls.

Cooling for the building is provided by two 250 ton centrifugal R-22 chillers and a BAC forced draft cooling tower located in a well at the roof level.

New Equipment Installation:

Should a Tenant require supplemental cooling continuously i.e. computer room, an independent system should be installed at the Tenant's sole expense subject to the written approval of the Landlord. Electrical and water meters are to be installed and connected to the building automation system, for monitoring purposes, at the Tenant's expense.

Plumbing:

Core area washrooms where shown on the drawings are complete with all fixtures. The plumbing systems can be broken down as follows:

- Storm water
- Sanitary drainage and vent
- Domestic hot and cold water systems

Most of the plumbing distribution systems are concealed.

The domestic hot water boiler and the tank system are located in the mechanical penthouse.

Due to the building height there are domestic water booster pumps in the basement water entry room.

Tenants requiring high volumes of hot water must provide their own hot water tanks and water meters must be installed for consumption charges if deemed necessary by the landlord.

Fire Protection:

Two 100 hp fire pumps located in the parking level water entry room serve the sprinkler and standpipe systems throughout this fully sprinklered building. There is more than adequate fire protection coverage in this building. Fire cabinets are supplied with 10 lb. fire extinguishers which are shown on the mechanical drawings, one sprinkler control valve and one drain valve are provided on each floor.

The office space is protected with a full sprinkler system. Tenants shall relocate heads or provide additional heads and must utilize the base building sprinkler contractors to suit their partitioned space and to conform to provincial fire safety codes.

Dry sprinkler systems are incorporated throughout the parking garage.

Welding:

Insurance regulations dictate that a welding and burning permit be obtained from the Landlord prior to bringing this type of machinery on site. This permit must be attached to the equipment at all times. No welding is to be carried out without the approval of the Project Manager. This will ensure that the necessary Fire Protection Systems are bypassed. Any costs incurred by the Landlord due to the neglect of the Tenant/Contractor will result in these charges being forwarded to the Tenant/Contractor's account.

Cross-Over Floors:

One cross over floor located on floors 4, 8, 12, 16 & 19.

Electrical Systems

General:

The electrical / telephone room is provided on each floor. This room is intended for basic electrical and communications services and is not accessible to tenants or their contractors. Any space of this nature that a Tenant requires for their own equipment, or use, must be provided within the Leased Premises.

Lighting:

The Landlord will supply lighting fixtures, complete with modular wiring system, for the Tenant areas on the basis of one fixture per 66 sq. ft. The lighting fixtures will be installed in the 15" X 60" ceiling grid. Lighting will be provided on an open floor basis to 50-55 foot candles maintained.

All fluorescent lighting shall be F28 T8/XLSP35OCO, 28 Watt lamps, 3500 K finish with electronic low harmonic 347 Volts Ballasts with louver cover.

Tenants will be required to provide any local switching within their Leased Premises. Each office floor is divided into four lighting zones controlled throughout by the Delta Controls system located in the Operations Office and performs the following functions:

- i) Automatic time scheduling of all base lighting and Tenant lighting loads, except emergency lights
- ii) Manual override at select locations
- iii) Special holiday and vacation scheduling

Lighting fixtures utilize a plug in system, which provides the least costly method for future additions and/or relocations and affords maximum flexibility on an open floor basis.

Low voltage master switches are provided to control all lighting. There should be a maximum of 4 zones per floor.

All lighting, including the base building standard fluorescent lights will be wired into the central programmer at the Tenant's cost. All lighting relays must be located in mechanical/electrical room on the same floor. (not in ceiling plenums)

In order to conserve energy, tenants will be permitted to install pot and track luminaires that are designed to use the compact florescent and I.e.d lamps.

For other types of lamps not mentioned above, the tenant will confirm with the electrical consultant before purchasing. The above lighting must not consume more than 0.04 watts per square foot and must be controlled by local switching.

The Landlord's base building electrician will ensure that the lighting zone(s) are appropriately divided or additional relays installed, at the Tenant's/Contractor's cost, to ensure the Tenant's sector(s) does not encroach outside of the Leased Premises.

Power:

The Tenant is to provide a service panel within their suite direct from that floor's electrical room. Such services will be to the Landlord's approval. Large facilities (computer rooms, etc.) requiring an exceptionally large service will require detailed review by the Landlord to determine the feasibility of providing such a service. If the service proves feasible, the service shall be provided by the Tenant.

All heavy-duty services will require check power consumption metering by the Tenant. It may also be necessary for heavy-duty services to be fed directly from the main electrical Vault, a situation that will require both Landlord and Tenant review.

All electrical outlets must be labeled to corresponding service panel breakers and updated when required.

Extra 120/208 volt and/or 347/600 volt 3 phase, 4 wire power other than that provided through the ceiling junction box system may be installed if available, at the Tenant's expense. Any pull box that has to go through the slab should be mounted on the underside of the slab.

Conduit systems above the ceiling with drilled holes for floor pedestal devices will be subject to the occupancy condition on the floor below.

Telephone:

Telephone outlets shall be by wiring in partitions. Conduit system above the ceiling with drilled holes for floor pedestal devices will be subject to the occupancy conditions on the floor below. All special switchboard facilities required by each Tenant and all wiring shall be provided by the Tenant. The Tenant's Service provider shall carry out arrangements for connection of telephone services.

Communication wiring shall be secured to the underside of the ceiling slab with ceiling hooks and labelled. All costs are at the tenant's expense.

Meters:

Electrical meters will be required for heavy non-standard use such as computer rooms, after normal hours operations, and all Tenants located in the retail areas.

Should the Landlord, for submetering purposes, deem an electrical check meter necessary, a 'Quadlogic' meter is to be installed. This Quadlogic meter is the only approved meter as it is power line capable. Models will vary based on the application to be served. The model is to be specified by the Tenant's engineer and verified by the Landlord's project manager.

The Landlord's project manager will provide details to the engineer with respect to the Landlord's local meter numbers and billing details. All documentation regarding the meter installation is to be handed to the Landlord's project manager to ensure certification of the meter has been performed and thus accurate billing.

The Landlord will accept no alternative meter. All costs associated with these check meter installations are at the sole expense of the Tenant or its contractor.

Emergency Power (if applicable):

The building is equipped with an emergency diesel generator and automatic transfer switch located in the generator room at P1 level of the Parkade to provide power to the following loads:

- diesel fuel pump
- egress lighting
- exit lighting
- fire alarm system
- security system
- elevators

An additional transfer switch is installed in the electrical room on the 21st floor to provide power to:

- Air Compressors
- Elevators

Commerce Place Design Criteria Manual

Section 3:

Tenant / Contractor's Responsibility

MECHANICAL

Labour, Materials & Fees:

Provide all labour and new materials for the complete installation of the systems. Ensure that complete installation meets with the approval of all authorities having jurisdiction in accordance with all codes, etc.

Arrange and pay for all permits and fees required for this installation.

Use materials that are C.G.A. & U.L.C. listed and C.S.A. approved for the intended application.

Materials shall conform to the requirement of the British Columbia Building Code and comply with flame spread, smoke development and British Columbia fuel contribution ratings for the application.

Comply with the intent of the base building specifications.

Comply with all requirements as outlined in the Landlord's "Design Criteria Manual".

Examine the Site:

Examine the site and be familiar with all the conditions covered by these specifications. Extras will not be allowed for failure to properly evaluate conditions.

Take field dimensions prior to any installation.

Compliance with Codes:

Comply with all latest Municipal, Provincial and National codes and regulations having jurisdiction.

Debris & Clean Up:

Keep premises clean as work progresses, avoid accumulation of debris, ensure that during construction all open vents are sealed and any controls (thermostats etc.) are covered. On completion of the work, clean up and remove from site all scrap materials resulting from the work. Clean all equipment prior to final inspection.

Manufacturer's specifications for cleaning of products such as wall coverings, partition glass, and flooring shall be provided to the Building Management office.

Damaged ceiling tiles and any other part of the building affected by the Tenant's work shall be repaired.

When electrical / mechanical rooms are soiled with construction dust from drywall etc. the Tenants contractor is responsible for having them cleaned at the Tenants expense.

Co-ordination & Co-operation:

Co-ordinate the work with all trades to ensure work may progress without delay. Arrange the schedule of all work in co-operation with the General Contractor.

Co-ordinate the work with all trades and co-operate to ensure services do not conflict with the other services and/or structure.

As Built Drawings:

Tenant's mechanical contractor shall indicate in red ink on an extra set of white prints all changes and deviations from locations on plans as job progresses. On completion of the work provide the landlord with one set of completed drawings (prints) showing location of all equipment, piping, ducting etc. and one electronic copy in AutoCAD format of the same.

Warranty:

Guarantee all work, equipment and materials for one year from substantial completion of the contract (A/C unit compressors - 5 years).

Ensure that all equipment is properly guaranteed by the manufacturer.

Shop Drawings:

Submit shop drawings of all fixtures and equipment (including wiring diagrams) to the Landlord for his records. Landlord review of shop drawings is gratuitous and does not relieve the tenant or his contractor of his responsibilities.

Cutting and Patching:

Provide cutting and patching for work. Allow for x-ray of concrete slabs to ensure that steel reinforcing is not cut. Arrange to provide for the making good to finishes and include for the cost of this work. Any cutting of the roof and related curbing and repair will be done by the landlord's designated contractor at the tenant's expense.

Data and Voice Cabling:

The Landlord's consultant, Mott Electric (604- 683-5752) shall first approve all data and voice cabling installations. Communication wiring shall be secured to the underside of the ceiling slab with hooks and labeled. All costs are at the Tenants expense. All abandoned cabling must be removed back to its source.

Wiring:

All power wiring: Electrical Specifications
24 volt wiring only: Electrical Specifications

Include for all necessary starters, disconnects, transformers and relays etc.

Ensure co-ordination between trades to avoid gaps and overlaps and to ensure all equipment is operational.

Demonstration:

Allow for demonstration of all equipment to the Landlord and the Landlord's operating staff.

Miscellaneous:

Provide structural steel support members as necessary to hang equipment, fans, ductwork, and piping from the building structure.

Paint all miscellaneous bare metal one coat grey oxide primer.

Maintenance & Operating Instructions:

Prior to hand-over of the premises to Property Management, the tenant's contractor is to calibrate all thermostats to ensure accurate operation.

Provide the landlord with two copies of manufacturers maintenance and operating instructions for all equipment.

Present the instruction in indexed three ring hard cover binders, with spine label project indicator, and index sheet. Including all shop drawings, permits, warranty details, certificates, contractor names, and telephone number lists for all project trades in this manual.

Interruption of Services:

Any interruptions of the base building systems shall be co-ordinated with the Landlord for the time and duration and shall strictly adhere to the Landlord's instructions in this regard.

Include cost of premium time in tender price for the work outside normal working hours to maintain all mechanical services in operation without disruption to existing tenants.

Workmanship:

Employ a responsible foreman to supervise the work and retain for duration of construction period.

Employ only skilled plumbers, steamfitters, and sheet metal workers for the execution of the work. Workmanship shall be first class as regards to durability, efficiency, safety, and neatness of detail.

PLUMBING

Piping Materials:

Drainage and Vent Piping: DWV copper pipe with drainage fittings and solder joints.

Domestic water piping: Type 'L' copper. Exposed piping in finished areas shall be chrome plated.

Domestic water valves:

Crane Jenkins, Lunkenheimer, Kitz or Red-White ASTM as per following Red-White/Toyo schedule:

- a) Gate Valves (50 mm and smaller) – soldered 1400 kpa [200psi] w.o.g. Fig. 299
- b) Gate Valves (65 mm and larger) – flanged 1200 kpa [200psi] w.o.g. Fig. 415A
- c) Globe Valves (50 mm and smaller) – soldered 2070 kpa [300psi] w.o.g. Fig. 222 with suitable composition disc
- d) Globe Valves (65 mm and larger) – flanged 1400 kpa [200psi] w.o.g. Fig. 400A
- e) Standard Check Valves – 50 mm and smaller (soldered 2070 kpa [300psi] w.o.g. Fig. 237); 65 mm and larger (flanged 1400 kpa [200psi] w.o.g. Fig. 535A
- f) All bronze ball valves substituted for gate and globe valves shall be standard port with solid ball. Up to 50 mm – 4140 kpa [600psi] w.o.g. Fig. 5044A

Sprinkler System:

Pipe & Fittings: Must meet NFPA 13 requirements and base building specifications

Valves: Jenkins, Crane, or CheckRite valves for sprinkler system must be as per the following schedule:

Gate Valves:

- (a) 50 mm and smaller – 1400 kpa [200psi] w.o.g. Jenkins 820, bronze screwed 1210 kpa [175psig] cold water, OS&Y, Underwriters pattern.
- (b) 65 mm and larger – Grinnell listed gear operated butterfly valves, steel flanged, 1210 kpa [175psig] cold water with downstream flange removed.
- (c) Where Victaulic piping systems are used, provide Victaulic Fireball Series 708 or 727 valves with built-in supervisory switch and Victaulic No. 710/714 check valves. All components shall be ULC and FM labeled.

Check Valves:

(a) 65 mm and larger – Check-Rite ULC approved wafer style.

Provide Potter OSYS-UA1 tamper-proof supervisory alarm contact switch for each valve.

Piping Supports:

Support all piping using Clevis type hangers and riser clamps. Use hangers of the same material as pipe, or insulating inserts between hanger and pipe. Hanger to be Grinnell Fig. 260 adjustable clevis for steel piping, and Grinnell Fig. CT-65 plastic coated adjustable clevis for copper piping up to and including 100 mm dia, or equal. Riser clamps to be Grinnell Fig. 261 for steel piping and Grinnell Fig. CT-121-C plastic coated for copper piping, or equal.

Provide pipe covering protection saddle at each hanger where pipes are insulated.

Escutcheon Plates:

Provide escutcheon plates at all walls where pipes are exposed to view. Escutcheons shall be satin finish stainless steel, or stain finish chrome, or nickel-plated brass escutcheons with non-ferrous setscrews.

Unions:

Provide unions to connect all piping to equipment to facilitate ease of maintenance.

Pipe Insulation:

Insulate all domestic cold water piping and horizontal condensate drain lines with 1" thick fiberglass heavy density pipe insulation with all service jacket (ASJ). Adhere a factory applied vapour barrier jacket, lap smoothly and securely at the longitudinal seams with vapour barrier adhesive. Adhere 3" butt joint strips over all end joints to ensure a continuous vapour barrier.

Insulate domestic hot water piping with 1" thick fiberglass heavy density pipe insulation with full service jacket.

Finish all exposed insulation with 6-oz fire retarding canvas.

Clearly label pipes contents on pipe surface (i.e. D.H.W. or D.C.W.) and identify flow direction.

Piping Installation:

Piping shall be concealed in finished areas and grouped so that valves etc. are accessible through as few access panels as possible.

Run piping parallel to building lines with crossing over kept to a minimum.

Identify all visible piping fully exposed or in accessible spaces (i.e. lay-in ceilings) with legend lettering, direction of flow and field colour band to meet code requirements. At minimum, colour code pipes with 50-mm wide bands.

Medium	Legend	Legend & Flow Arrow Colour	Field Colour Band
Condensate	Cond.	Black	Yellow/
Cold Water	C.W.	Black	Green/
Domestic Hot Water	D.H.W.	Black	Green/
Sanitary Sewer	San.	Black	Green/
Plumbing Vent Line	Vent	Black	Green/

Valve Tagging:

All valves shall have securely affixed to them a brass plate tag with embossed black numbers.

Prepare for the Landlord a list of valve numbers indicating location and function. The number sequence will be provided to the landlord.

Access Doors:

Provide access doors to all otherwise inaccessible valves. Access doors shall suit the surface of application and must be approved by the landlord.

Drains:

Provide Series Z-401B or 2010-AJ floor drain (manufactured by Zurn of J.R. Smith) where shown.

All interior floor drains shall be piped and connected to Zurn Z-1022A or P.P.P.=p0500 bronze trap seal primers with integral vacuum.

Cleanouts:

Floor cleanouts shall be cast iron construction with gas tight non-seizing plugs. Tops shall be round, heavy duty, scoriated nickel bronze, adjustable to floor finish. Cleanouts shall be complete with recessed tops where required to suit floor finishes.

Plumbing Vents:

Plumbing vents are not necessarily shown on drawings. However, install vent system in accordance with British Columbia standard / Regulations.

H.V.A.C

Ductwork:

Provide ductwork as indicated on drawings.

Provide all ductwork to "SMACNA" standards. Fabricate all ductwork from galvanized steel to the clear inside dimensions as noted on the drawings, with all flat surfaces cross broken.

Install all ducts free from leaks and seal all holes with sealant.

Duct thickness as follows:

Maximum Size	Gauge
up to 12"	26
13" to 30"	24
31" and over	22

Where any construction impediment or requirement renders the dimensions impossible, alter ductwork so as to give an effective cross sectional area equal to that originally shown without exceeding an aspect ratio of 4:1. Make changes at no additional cost to the owners.

Use long radius bends where possible. Use square elbows c/w turning vanes wherever bends are impractical, (Duro Dyne "Durovane Rail" or "Ducturn" or equal).

Brace ducts so they do not vibrate or sag. Support horizontal ducts up to 20" wide with 1" x14 ga. galvanized straps passing under ducts, on 8'0" centres to meet SMACNA or ASHRAE Standards. Use angle iron support for ducts over 20" wide or deep.

Provide approved access doors to all balancing and fire dampers etc.

Supply and install splitter dampers at all supply air branch take-offs. Dur-Dyne SRP or equal hardware.

Paint inside ductwork black where visible through grilles, etc.

Flexible ducting to be class 1 air duct connectors as listed and labeled by Underwriters Laboratories of Canada, with flame spread of not more than 25 and smoke development classification of not more than 50.

All round duct through 24" diameter shall be United Sheet Metal spiral lock-seam Uni-seal duct manufactured from galvanized steel meeting ASTM A-527-71 in the following gauges:

<u>Diameter</u>	<u>Metal Thickness</u>
3" - 8"	28 Ga.
9" - 14"	28 Ga.
15" - 24"	26 Ga.

All fittings shall be United Sheet Metal standard, or equal, uniform fittings manufactured from galvanized steel meeting ASTM A-527-71 with continuous weld or standing seam construction in the following gauges:

<u>Diameter</u>	<u>Metal Thickness</u>
3" - 8"	24 Ga.
9" - 14"	24 Ga.
15" - 24"	22 Ga.

Duct Insulation:

Insulate ductwork with 1" thick internal neoprene coated fiberglass duct liner where indicated. Adhere with min 50% covering of fire retarding adhesive and supplement with welding pins.

Make provisions for duct liner so that sizes shown on drawings are clear inside dimensions inside the insulation.

Fire Dampers:

Provide Nailor, Ruskin or controlled air ULC rated Type B fire dampers.

Install in accordance with N.F.P.A. 90A rated to suit fire rating of membrane to be protected.

Fans:

Provide fans as scheduled on the drawings.

Adjust fans and motors to operate quietly, and make dampers tight to prevent vibration.

Provide fans with spring isolation to give a minimum 95% efficiency.

Provide flexible connections at each fan 24 oz. per yard tensile strength of not less than 500 lbs. with metal to 3" fabric to metal "Grip-Loc" duct connections.

Balancing:

Engage the services of the Landlord's balancing contractor to balance and test all air handling systems under this section.

Install any additional devices required by the balancing contractor to facilitate effective air balancing.

Ensure that air handling systems are free from obstructions, that dampers are positioned correctly, that moving equipment is lubricated in accordance with manufacturer's recommendations, and that filters are clean prior to commissioning balancing.

Make modifications to the air handling system and adjust variable speed pulleys and volume control dampers where necessary until each diffuser and grille supply or exhaust quantity is within +/-5% of specified quantities.

Control Dampers:

Outdoor intake and relief dampers shall be opposed or parallel blade low leakage type.

Frames to be reinforced extruded aluminum with vinyl jamb and blade seals. Blades to be 6" maximum on centres. Damper actuators shall be oil submerged, spring return, two position 120/1/60 electric type. Bearings to be non-corrosive nylon.

Damper seal shall be designed for minimum air leakage by means of overlapping seals. Dampers to be Nailor or approved equal.

Variable (Constant) Air Volume Valves (V.A.V.) (if applicable):

The valve shall be of Venturi shape and designed to achieve linear air flow to operator stroke relationship for precise control of air delivery. The valves shall have a tubular shock absorber to prevent any fluttering noise that may occur due to aerodynamic instability in the system or its components. The valves shall have mechanical means of achieving pressure independence.

V.A.V. valves shall have factory-mounted operators furnished by the base building controls contractor. Base building control system is Delta Controls and is maintained by ESC Automation.

Valves shall be factory calibrated for minimum and maximum CFM settings as specified by use of actual airflow tests. V.A.V (CAV) valves shall be as manufactured by E.H. Price, Titus, or Nailor.

Controls:

Provide for new and relocation of existing control components as indicated on drawings.

Controls are Delta Controls and will be installed by the base building controls contractor (ESC Automation) and must be calibrated & cleaned at the expense of the Tenant.

ELECTRICAL

General:

All work shall be in accordance with the latest edition of the Municipal and British Columbia Building Code and any other Ordinance.

Examine the site and all drawings and specifications of all trades and be familiar with the work of this trade. No allowances will be made for the failure to do so.

All electrical work shall comply with C.S.A. electrical bulletins applicable to tender close. Where specific bulletins are not named they are still considered an integral part of this specification.

Grounding shall be in accordance with the requirements of the British Columbia Electrical Code. Provide all grounding required regardless if not shown on the drawings.

Provide all new materials having C.S.A. approval. All workmanship shall be first class in regard to standard practices, safety, accessibility, durability and neatness of detail for acceptance by the Landlord's representative.

Arrange and pay for all permits and inspection fees required for the work of this trade. It is the responsibility of this contractor to submit to the Electrical Inspection Department and/or supply authority any and all drawings and specifications required for permits, fees, approvals, examinations and services.

Provide all cutting and patching required for the work of this trade. All shop painted equipment damaged in transit shall be touched-up to match existing finish.

Avoid accumulation of debris as the work progresses. On completion of the work, clean up and remove from the site all scrap materials resulting from the work of this trade.

Co-ordinate the work of this trade with all other trades on the job so that the work may progress without delay.

Prior to final inspection, clean all electrical equipment. Clean all construction dust and dirt from installed equipment at the conclusion of the job.

Upon completion of the work, provide the final unconditional certificate of acceptance from the city inspector to the Landlord.

Provide a one-year guarantee on all materials, and labour from the date of acceptance by the owner.

The Electrical Contractor shall adjust phase loading, such as not to exceed a 10% phase imbalance.

The electrical contractor shall submit shop drawings for power distribution equipment, fire alarm equipment, and all luminaries with associated equipment, i.e. poles, brackets etc. to the Landlord.

The shop drawings shall bear the name of the manufacturer, the manufacturer's catalogue number, and the engineer's designation, along with all pertinent information on each piece of equipment.

All equipment shall be mounted, plumbed true.

The electrical contractor shall obtain one set of blueprints, for 'as built' purposes, and make all necessary revisions on these blueprints to reflect actual on-site changes.

At the end of construction, prior to final inspection by the engineer, the electrical contractor shall submit the as built drawings for review. Final inspection will not be carried out until these drawings are submitted.

The base building specifications shall form an integral part of this specification and shall be strictly adhered to.

The interior design drawings are to be consulted for all locations of devices and mounting instructions. Where device styles, colour, or orientation are specified on the interior design drawings these shall be strictly followed. Where requests by the designer are in conflict with the applicable codes, the Landlord's engineer shall be contacted for a decision.

The Tenants electrical contractor shall be responsible for the installation and certification of any metered service. The fees and deposits for such metered service shall be the sole responsibility of the Tenant/Contractor.

Electrical contractors should note that existing metered services that have been disconnected for more than six (6) months are required by local hydro regulations to be re-inspected by BC Hydro regardless if any changes took place.

Conduits and Raceways:

Wire shall be installed in conduit, and sized for the connected load(s) and protection as required, unless otherwise specified.

Conductor material to be annealed commercial grade, copper, 98 percent conductivity, up to #10 AWG solid, with T90 (NYLON) insulation, #8 and larger, stranded, with RW90 insulation, unless noted otherwise, 300V rating for Fire Alarm, security, and other low voltage circuits, 600V rating for 120/280V circuits, 1000V rating for 347/600V circuits.

Minimum wire size shall be #12 AWG unless otherwise stated. Home runs in excess of 25m (75ft) for circuits protect by a 15A overcurrent device, shall be #10 AWG.

The current carrying capacity of the feeders, sub-feeders and branch circuit conductors shall be sized to equal or better than shown on the drawings. If wire or cable sizes with equivalent current carrying capacity other than that specified are used, ensure that the voltage drop shall not be more than 2%.

All conductors are to be installed in raceways as described below:

- A) Interior exposed surface raceways, branch circuit wiring from panel, concealed in accessible ceilings and walls or in concrete block construction: E.M.T. Raceways.
- B) In metal stud partition walls, branch circuit wiring from panels in suite or Tenant occupancies, in concrete block walls for final drops and for final drops to fixtures in ceiling spaces. (Length not to exceed 3 M in this application); Armoured Cable (Bx).

All conduit and wiring is to be concealed in all finished areas.

Minimum raceway size for telephone and communication conductors is 19 mm (3/4 ").

Devices

Switches:

The building is equipped with a low voltage lighting control system. Under this system, each floor is divided into lighting zones that are automatically controlled.

Switches shall be suitable for the voltage and load controlled and can be single pole or three way. White rocker style switches shall be used for low voltage lighting control and 120V circuits in all finished areas not on lighting control. White toggle style switches shall be used for 347V circuits in all areas not on lighting control.

Receptacles:

- a) Duplex receptacles shall be CSA Type 5-15 R, 125V, 15A, U ground, equal to Hubbell specification grade 5262. They shall be white and are to be of the "Designer" rectilinear style, except black for all floor box locations.
- b) Single receptacles shall be CSA type 5-15 R, 125V, 15A, U ground. They shall have ivory moulded housings and coverplate.

Cover Plates:

- a) Coverplates shall be metal with white colour, black for all floor box locations.

Equipment Isolating Disconnects:

Disconnecting devices to be sized for the current carrying capacities of the equipment to be isolated. Provide number of poles as required by the equipment to be isolated. Type of enclosure as indicated below:

- 1) Dust free or standard- EEMAC Type 1.
- 2) Outdoor or damp location- EEMAC Type 3R.

- 3) for direct exposure to water under pressure- EEMAC Type 4.
- 4) For high dust concentration of non-ignitable dust- EEMAC Type 5.

Manufacturers: Commander, Arrow-Hart, Scepter, F.P.L.. Square D, Westinghouse, or equal.

All devices of the same type, size and rating are to be of the same manufacturer throughout the project.

Service and Distribution:

The Landlord provides 347 V distributions for the base building lighting system on a ceiling grid system. Provide additional 347V, 15A rated circuits to match existing for any fixtures which cannot easily be serviced through the existing grid system.

The Landlord provides 208 / 120 V, 3 phase, 40KW power to a distribution panel located in the core electrical room on all floors. The Tenant shall provide the necessary transformers, breakers and feeders from the appropriate panel via EMT conduit to the Tenant panel. Manufacturer for the distribution shall match existing. All branch breakers shall be minimum of 10 KA at 250V and 14 KA at 600 V. All transformers shall be type "ANN", design factor of K13.

Provide and install complete secondary distribution system as detailed on the drawings.

Acceptable manufacturers for the distribution equipment include:

Commander, Federal Pioneer Limited, ITE (Siemens), Square D, Westinghouse. Label all disconnect switches, starters, and panels to clearly indicated equipment controlled or area serviced. Indicate fuse size and type on all fused disconnects.

Provide circuit breaker panels of the type, with ampere capacity, number of poles, branch breaker capacity etc., as specified in panel schedule. Mounting to be as indicated.

Provide a typed directory card on the inside of the panel door in a metal frame with clear plastic cover.

All branch breakers shall be thermal-magnetic trip indicated, ambient temperature compensated and bolted to the bus-bar.

All surface mounted equipment shall be mounted on 19 mm (3/4") plywood backboard.

Lighting:

Provide fixtures complete with all accessories and mounting hardware, and lamps as approved by the Landlord as an equal fixture. Products of equal quality by alternate manufacturers such as Sylvania, York, Peerless, Prescolite, Halo, C & M, Capri, Midday etc. are also acceptable.

Emergency Power:

Emergency power, as previously outlined, is provided via a diesel emergency generator.

Exit Fixtures:

Provide exit fixtures to match base building exit fixtures style and voltage. Housing to be LER 2 series Die-Cast LED edge Lit Sign

Extend base building exit fixture circuit from existing exit locations to new locations.

Exit fixture circuit is connected to the building emergency distribution system.

Fire Alarm System:

The building fire alarm system is existing and operating. Before performing any changes to the system, alert the Landlord 24 hours in advance to allow the zone to be isolated.

All devices, which are disconnected and reconnected to the fire alarm system, are to be verified for the operation prior to final inspection. Verification and testing must be performed by the Base Building Fire Alarm Contractor.

Provide certification of verification on project completion.

Installation to ULC CAN4-5524-M82.

Verification ULC CAN4-5537.

Sequence of operation shall be as designed for the base building.

Telephone/Data/Communications Raceway Systems:

A system of riser sleeves is provided in the Electrical Rooms.

- (a) Tenants are required to make arrangements directly with Telus. and/or others, for the supply and installation of telephone services to their premises.
- (b) Refer to Landlord's information drawings for general scope of empty conduits for telephone wiring in the ceiling space.
- (c) Any additional space the Tenant may require for equipment of this nature, must be provided within the Tenant's premises. In addition, any special cooling or ventilation equipment required to accommodate the Tenant's telephone or computer equipment, will be at the Tenant's expense. The landlord's consultant shall first approve all telephone cabling installation. Communication wiring shall be secured to the underside of the ceiling slab with ceiling hooks and labelled. All costs are at the tenant's expense.
- (d) The main telephone cable entry room is located on the P1 (Parkade) level of the Building.

NOTE: The telephone company will not lift or replace carpet, ceiling tile etc. The Tenant's contractor would be responsible for any such items which would include re-clipping of corridor ceiling tiles.

Security System:

The security system used at Commerce Place is Key Scan. All perimeter doors are secured via maglocks tied into the Key Scan system and monitored by the Paladin Security Monitoring station. Tie in of Tenant Spaces to the building security system is available at the Tenants expense. After- hours access is addressed by a Key Scan card reader system for all perimeter doors.

Access card distribution is conducted through the security desk upon proper authorization.

Wiring for Other Trades:

Provide power wiring for the mechanical trades unless noted otherwise. Provide all starters and disconnect switches as required. L.V. Controls and control wiring is provided by the mechanical trade.

Verify size, location, and electrical requirements of all mechanical equipment prior to the installation of the related electrical equipment. Maintain all clearances as required for mechanical equipment servicing.

The electrical contractor shall provide all line voltage wiring and terminations of time clocks, controls, transformers etc. required by the mechanical contractor.

General:

The Landlord reserves the right, from time to time, to add to or to amend the foregoing information, procedures and regulations.

Regulations and procedures as amended from time to time will affect any Tenant work undertaken after the amendment is issued.

Commerce Place Design Criteria Manual

Section 4:

Insurance and Indemnification

Indemnification and Insurance Requirements

In this section, the "Landlord" is defined as "bclMC Realty Corporation and Commerce Place Vancouver Holdings Inc." and "QuadReal Property Group Limited Partnership" or its officers, agents, employees and representatives.

Indemnification:

The Tenant/Contractor shall indemnify and hold harmless the Landlord, its agents and employees from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of or attributable to the performance by the Tenant / Contractor(s) of the Tenant's work provided that any such claims, demands, losses, costs, damages, actions, suits or proceedings are:

- a) attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property.
- b) caused by a negligent act or omission of the Tenant / Contractor or anyone for whom the Tenant / Contractor may be legally liable.

Your liability under this section shall not extend to damage incurred by the Landlord where the primary cause of the injury or damage arises out of:

- a) the use of maps, drawings, reports, surveys, change orders, designs or specifications provided by the Landlord, its agent and employees.
- b) decisions or instructions by the Landlord.

Insurance:

Prior to commencement of the Tenant's work, the Landlord must be provided with evidence that the insurance specified in this section is in place with an insurance company licensed to do business in the Province of British Columbia.

All insurance policies shall contain the following clause:

"It is understood and agreed that the coverage provided by this policy will not be changed or amended in any way to the detriment of any named insured or cancelled until 30 days after written notice of such change or cancellation shall have given to all named insured."

Comprehensive General Liability:

Without restricting the generality of the "Indemnification" section, above, the Tenant and Contractor, shall provide and maintain, either by way of a separate policy or by an endorsement to the existing policy, comprehensive general liability insurance acceptable to the Landlord, subject to the limits of not less than five million dollars (\$5,000,000.00) inclusive per occurrence for bodily injury, death, and damage to property including loss of use thereof.

The insurance shall be in the Tenant's name and anyone employed directly or indirectly by the Tenant to perform a part or parts of the work. **bcIMC Realty Corporation, Commerce Place Vancouver Holdings Inc. and QuadReal Property Group Limited Partnership** shall be listed as an additional named insured.

The insurance shall preclude subrogation claims by the insurer against anyone insured thereunder.

The comprehensive general liability insurance shall include coverage for:

- a) premises and operations liability;
- b) products completed operations liability;
- c) blanket contractual liability;
- d) cross-liability;
- e) elevator and hoist liability;
- f) contingent employer's liability;
- g) personal injury liability arising out of false arrest, detention or imprisonment or malicious prosecution. Libel, slander or defamation of character, invasion of privacy, wrongful eviction or wrongful entry;
- h) shoring, blasting, excavating, underpinning, demolition, pile driving and caisson work, work below ground surface, tunneling and grading, as applicable;
- i) liability with respect to non-owned licensed vehicles.

All liability insurance shall be maintained continuously until twelve months after completion of the Tenant's/Contractor's work.

Automobile Liability Insurance:

The Tenant/Contractor shall provide and maintain liability insurance in respect to owned licensed vehicles subject to limits of not less than one million dollars (\$1,000,000.00) inclusive.

The Tenant/Contractor shall be responsible for any deductible amounts under the policies.

Property Insurance:

The Tenant/Contractor shall provide insurance acceptable to the Landlord insuring the full value of the Tenant's work and the full value as stated of products that are specified to be provided by the Landlord for incorporation into the work. The insurance shall be in the joint names of the Tenant and the Landlord and all others having an insurable interest in the Tenant's work. The policies shall preclude subrogation claims by the insurer against anyone insured thereunder.

Such coverage shall be provided for by either an "All Risks Builders' Risk Policy" or by a combination of a "Standard Builders' Risk Fire Policy" including "Extended Risk Difference in Conditions Policy" providing equivalent coverage.

The coverage referred to in this "Property Insurance" section shall apply to:

- a) all products, labour and supplies of any nature whatsoever, the property of the insured or of others for which the insured may have assumed responsibility, to be

used in or pertaining to the site preparation, erection and/or fabrication and/or reconstruction and/or repair of the insured project, while on the site or in transit.

- b) the installation, testing and any subsequent use of machinery and equipment including boiler(s) or pressure vessel(s) forming part of the Tenant's work.
- c) damage to the Tenant's work, caused by an accident to and/or the explosion of any boiler(s) or pressure vessel(s) forming part of the Tenant's work.

Such work shall exclude construction machinery, equipment, temporary structural and other temporary facilities, tools and supplies used in the construction of the Tenant's work, which are not expendable under the contract. Such coverage shall be maintained continuously until completion of the Tenant's work.

The Tenant/Contractor shall be responsible for any deductible amounts under the policies maintained pursuant to this "Property Insurance" section, and for providing such additional insurance as may be required to protect the insured against loss on items excluded from the policies.

WORKSAFE BC:

Prior to commencing the Tenant's work, and until the completion thereof, the Tenant/Contractor shall provide evidence of compliance with all requirements of local Provincial statutes with respect to Workmen's Compensation including assessments or payments due thereunder.

At any time during the performance of the Tenant's work when requested by the Landlord, the Tenant/Contractor shall provide such evidence of compliance by the Tenant/Contractor, and any or all of your contractors and/or sub-contractors.

Commerce Place Design Criteria Manual

Sustainable Tenant Design

Sustainable Tenant Design:

QuadReal Property Group and the owners on whose behalf it manages, support and encourage sustainable design in the buildings we operate. Sustainable-design offers a host of advantages to office tenants including a reduction in their operating costs, a healthier workplace for their staff as well as improving the environment with the right choices for materials and office equipment.

It is now easier than ever to make sure that your office renovations have as little negative impact on the environment as possible, while providing a more comfortable place to work. Here are some things to consider before starting your renovation:

- **Hire Interior Designers, Engineers, and Contractors** that are knowledgeable about sustainable design and construction practices. One good place to start is the Canada Green Building Council's website where they have a directory of accredited professional experts in sustainable design/construction (www.caqbc.org).
- **Install low VOC (Volatile Organic Compounds) materials.** Make environmentally conscious choices when selecting carpets, adhesives, paints, finishes, sealants and composite wood products.
- **Incorporate sunlight and access to views in the design** of the space so all of your employees reap the benefits. Day-lighting, or allowing abundant natural light indoors, enhances interior light quality and reduces energy demands. The use of glass in sustainable-design office space should be selected with consideration given to visible light transmittance, heat loss and gain, ultraviolet ray transmittance, and color. The use of high-performance glazing systems in the design of interior or private office placement admits more light while simultaneously rejecting a higher percentage of solar heat gain, resulting in better day-lighting and reduced cooling loads.
- **Insist that contractors recycle** as much construction waste as possible. Did you know that contractors can recycle concrete, metal, glass, wood drywall, plastics and even packaging waste? Demolition and construction waste accounts for over 30% of total waste sent to landfills. Recycling construction waste can also be less expensive than sending waste to the land fill, as tipping charges are much lower at recycling depots than landfills.
- **Install materials with high recycled content.** Building construction accounts for over 40% of raw materials used globally. By using materials with a high recycled content, you are reducing the need for raw material extraction and reducing the amount of waste that ends up in a landfill. Again, materials with a high recycled content are becoming readily available at little or no additional cost.
- **Take stock of what you already have.** Is there something in your existing space that could be reused or adapted in your new space?
- **Save energy! Put occupancy sensors and/or light switches** in rooms that aren't constantly used (kitchens, supply rooms, meeting rooms) so the lights automatically shut off when staff aren't around. Minimize or eliminate specialty lighting. Advances in lamp,

ballast, and fixture technology produce more light with less energy. Good lighting design uses as little as 0.5 to 0.75 1P watts per sq. ft. of floor space, compared to lighting loads of 2.5 to 3 watts in traditional office design. Furthermore, sensors that measure indoor light levels can raise and lower artificial lighting in response to changing outdoor conditions, and occupancy sensors turn lights off when not needed.

- **Ventilation systems.** Tenant design should take into consideration improved ventilation with well-designed mechanical and electrical systems to deliver air-flow effectiveness, provide plentiful fresh air, and reduce exposure to bio-contaminants such as microbial diseases, fungi, and moulds. High-efficiency filtration systems are very effective in reducing air quality. Improved ventilation also removes indoor pollutants generated by the off-gassing of materials such as carpet, adhesives, sealants, furniture coverings, and paints and varnishes, as well as reduces carbon dioxide levels.
- **Reduce water use.** Many cost-effective options can reduce water use by up to 30 percent. Toilets now use 1.6 gallons per flush versus 3 to 5 gallons per flush on older models. Sensor-operated faucets and urinals help save water and improve sanitary conditions.
- **Materials Selection.** Building and finish materials should be selected with regard to renewability, recycled content, manufacturing processes, packaging, and shipping (i.e., using materials that are locally manufactured or harvested). Sustainable-design practices also incorporate less-toxic premises materials and furnishings. Carpets and floors, paints, varnishes, furniture, and other materials should be carefully and researched prior to specification. Life-cycle cost analyses of materials should also be conducted to compare not only a system or material's first cost but also to consider its cost over the building's entire life span. An increase in the manufacturing of such products has reduced their costs while increasing selection and quality.

Sustainable Tenant Design: The Bottom Line

Sustainable design does not come from employing piecemeal changes that create minor reductions in resource use and total life-cycle costs. Tenants can benefit the most from sustainable design if they work with qualified designers, construction managers and building management to take a holistic approach to planning, designing, and construction of their space. Simultaneously considering design, construction, and interlinked issues, such the building electrical/mechanical and lighting systems optimizes all aspects of a project. In the end, an integrated approach often creates multiple benefits for both the building owner and the tenant.

Commerce Place Design Criteria Manual

List of Pertinent Contacts and Approved Contractors

COMMERCE PLACE PREFERRED CONTRACTOR LIST

ELECTRICAL CONSULTANT

AES Engineering	604-569-6500	Paul Luhman Sunny Ghataurah	Paul.Luhman@AESengr.com Sunny.Ghataurah@AESengr.com
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MECHANICAL CONSULTANT

Integral Group	604-687-1700	Kai Chen	kchen@integralgroup.com
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STRUCTURAL ENGINEER

Read Jones Christoffersen	604-738-0048	Roger Steers	rsteers@rjc.ca
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ELECTRICAL CONTRACTORS

MDE Mechanical/Electrical	604-291-1995	Mel Di Nunno	mel@mde-electrical.com
Mott Electric	604-683-5752	Howard Smith	hsmith@mottelectric.com
Sassco	604-299-1640	Craig Paquin	cpaquin@sascocontractors.com
Corporate Electric	604-879-0551	Brian Killins	bkillins@corpelec.com

FIRE PROTECTION SYSTEMS

Fire Alarm

Tyco Integrated Fire & Security	604-515-8872	Steve Fedele	sfedele@simplexgrinnell.com
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Sprinklers

Priority Fire Systems	604-876-9666	Fred Kappler	fred@pfsltd.ca
Tyco Integrated Fire & Security	604-515-8872	Lawrence Tang	ltang@simplexgrinnell.com

BUILDING CONTROL SYSTEM

ESC Automation	604-574-7790	Tom Westendorf	tomw@esautomation.com
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BALANCING CONTRACTOR

KD Engineering	604-872-8651	Richard Salary	richardsalary@kdengineering.com
Western Mechanical Services	604-324-1434	Emily Mudry	emudry@westernmechanical.ca
Pacific Rim Technical Services	604-721-3195	Ken Mah	pacrimts@telus.net

MECHANICAL – HVAC

MDE Mechanical/Electrical	604-291-1995	Mel Di Nunno	mel@mde-electrical.com
MCR Mechanical	604-939-8258	Mario Iorio	mcrprojects@telus.net
Davidson Bros.	604-522-4798	Wayne Davidson	wdavidson@davidsonbros.ca
Pacific Mechanical Systems	604-251-3766	Kirk Johnson	kirk@pacificmechanical.ca

PLUMBING

MDE Mechanical/Electrical	604-291-1995	Mel Di Nunno	mel@mde-electrical.com
MCR Mechanical	604-939-8258	Mario Iorio	mcrprojects@telus.net
Davidson Bros.	604-522-4798	Wayne Davidson	wdavidson@davidsonbros.ca
Pacific Mechanical Systems	604-251-3766	Kirk Johnson	kirk@pacificmechanical.ca

LOCKSMITH

Al Scott Lock & Safe	604-581-5000	Vivian	alscottvivian@shaw.ca
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