

Toronto-Dominion Centre
Design & Construction
Manual

TORONTO
DOMINION
CENTRE

A  PROPERTY



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INTRODUCTION

Purpose: A Guide for Leasehold Improvements

The purpose of the Toronto-Dominion Centre (TDC) Design and Construction Manual (DCM) is to provide new and existing tenants and their contracted personnel with all the information they need to undertake leasehold improvements at the TDC.

The DCM sets out:

- Key TDC contact information
- Required and recommended consultants and contractors
- Design recommendations
- Building standards and other specifications
- Construction procedures, practices, and processes
- Waste, material reuse, and pollution control strategies
- Permit forms

Tenants, along with their designated project managers, their consultants and contractors, are responsible for following the processes, procedures, rules and regulations set out in this manual. They are also responsible for following all relevant federal, provincial and municipal codes, standards, by-laws, regulations and other rules.

Maintaining the Integrity of the TDC

The TDC is one of Canada's most iconic set of buildings. It is also one of Canada's most highly-ranked commercial office complexes for sustainability and building performance. Maintaining the integrity of the building's design, décor, and operations is crucial to maintaining the TDC's award-winning brand, and every person and organization connected with the TDC is expected to do their part.

It is imperative, therefore, that the landlord thoroughly review and approve any proposed tenant project, however small or limited in scope, before a tenant starts the work.

Contents to be read in conjunction with lease documentation

The contents of this manual are to be read in conjunction with the tenant's governing lease documentation, as well as with any additional, relevant written agreements between the landlord and tenant. The landlord reserves the right to amend, add, or delete any information contained in this manual at any time. The tenant is obliged to abide by such changes upon being notified of same. For the most recent updates on this manual and permit forms, please visit

www.tdcentre.com.

All costs associated with compliance shall be at the tenant's sole expense.

Vaccination Policy

All Vendors, Contractors and Consultants (Third Parties) shall comply, at their expense, with Cadillac Fairview's rules, regulations and requirements in connection with COVID-19, including, but not limited to, complying with CF's vaccination policy (which currently requires that all Third Parties that visit the Property be fully vaccinated), and shall ensure that their personnel including sub-vendors, contractors and consultants comply with same. Within five (5) days of CF's request, the

Third Parties should provide CF with such information with respect to the Third Parties and their Personnel and or sub-vendors, contractors and consultants as is reasonably required by the CF so that it can satisfy itself that the Third Parties have complied with the foregoing.

Questions

All questions, comments and submissions related to proposed tenant improvements should be addressed to:

TENANT PROJECTS DEPARTMENT

The Cadillac Fairview Corporation Limited

Suite 3800, P.O. Box 2

Toronto-Dominion Bank Tower

66 Wellington St. W.

Toronto, ON, M5K 1A1

T: 416-643-6660

tdcprojects@cadillacfairview.com



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The Cadillac Fairview Corporation Limited
Toronto-Dominion Centre Management Office

Toronto-Dominion Bank Tower

66 Wellington Street West

Suite 3800, P.O. Box 2

Toronto, Ontario M5K 1A1

Tel: 416-869-1144 Fax: 416-862-3662

www.tdcentre.com

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LIST OF PERMIT FORMS

All forms are available at www.tdcentre.com

FORM 1 – Construction Work Permit

FORM 2 – Service Work Permit

FORM 3 – Freight Elevator Requisition

FORM 4 – Hot Work Permit

FORM 5 – X-Raying, Scanning & Coring Work Permit

FORM 6 – Fire Protection System Bypass Permit

FORM 7 – Building System Shutdown Request

PART 1: TDC GENERAL INFORMATION

1.1 Landlord's Project Manager

The tenant (or the tenant's designate) is responsible for notifying the landlord of any and all leasehold improvements within the leased premises. Upon notification, the landlord will appoint an appropriate project manager to oversee, assist, and liaise with the appropriate project parties.

The primary functions of the designated project manager are to:

- Guide and assist the tenant (and/or the tenant's designate) and their contractors during the design, construction, and commissioning/completion phases of their improvements within the leased premises;
- Review and comment upon all drawing submissions and relevant documentation before, during, and after work within the leased premises;
- Act as a liaison between and among the landlord, the tenant (and/or the tenant's designate), the tenant's contractor(s), and the tenant's designer;
- Provide guidance and recommendations on TDC-approved contractors, trades, and base building consultants.

1.2 Consultants

The tenant is permitted to select their own design team for any proposed construction project. However, prior to engaging a consultant team, the tenant is advised to review the proposed team with the landlord as the selection is subject to the landlord's final approval.

1.3 Site Visit Before Design Work

The landlord recommends that the tenant and/or the tenant's design consultants visit the site to inspect and verify all site conditions before starting all design work.

1.4 Property Personnel Contact Information

The following table provides key contact information for the Cadillac Fairview Operations, Security & Life Safety Management, and Project Management departments and property services.

Table 1 – Property Personnel Contact Information

Cadillac Fairview Operations	Contact Information	Email
CF/TDC Management Office	(T) 416-869-1144	
Graeme Doyle Senior Manager, Operations	(T) 416-862-3657	graeme.doyle@cadillacfairview.com
Daniel Marquez Manager, Operations	(T) 416-304-7861	daniel.marquez@cadillacfairview.com
Stefano Martinez Manager, Operations	(T) 416-869-2792	stefano.martinez@cadillacfairview.com
Adam Tan Manager, Property Services	(T) 416-869-2274	adam.tan@cadillacfairview.com

TD Centre Parking	(T) 416-366-1423	tdcparking@reefparking.com
Building Operations Centre <i>Base Building Engineers (Control Room)</i>	(T) 416-363-7754	tdcbocc@cadillacfairview.com
CF Connect	(T) 1-800-665-1000	cfconnect@cadillacfairview.com
Shipping & Receiving 66 Wellington St. West Loading Dock	(T) 416-862-3655	

Cadillac Fairview Security and Fire & Life Safety	Contact Information	Email
Fotis Michalarias Senior Manager, Security & Life Safety	(T) 416-869-2957	fotis.michalarias@cadillacfairview.com
Steve Batte Manager, Security and Life Safety	(T) 416-869-2286	steve.batte@cadillacfairview.com
Kevin Wylie Manager, Fire and Life Safety	(T) 416-862-5237	kevin.wylie@cadillacfairview.com
Access Control Centre <i>Badges, keys, passcards and Contractor permits</i>	(T) 416-862-3651	tdcacc@cadillacfairview.com
Life Safety department (ERT) <i>Approval of fire alarm system work</i>	(T) 416-869-2276	
Security Supervisors <i>Fines, security officer booking, security related issues</i>	(T) 416-869-2289	

Cadillac Fairview Tenant Projects	Contact Information	Email
Dora Yeoh Senior Manager, Tenant Projects	(T) 416-869-2278	dora.yeoh@cadillacfairview.com
Jaclyn Terakita Manager, Tenant Projects	(T) 416-862-3660	jaclyn.terakita@cadillacfairview.com
Jennifer Yoshida Manager, Tenant Projects	(T) 416-862-3658	jennifer.yoshida@cadillacfairview.com
Nancy Guo Project Administrator, Tenant Projects	(T) 416-643-6660	nancy.guo@cadillacfairview.com

PART 2: PROPERTY CONSULTANTS AND CONTRACTORS

2.1 Base Building Consultants and Building Engineers

Cadillac Fairview recommends that tenants retain the base building consultants and consulting engineers listed in Table 2 below when initiating a tenant improvement.

Should a tenant retain alternate providers, Cadillac Fairview will engage those listed below to review the submitted drawings – for their impact on the base building systems ONLY – before authorizing the tenant to proceed with their intended scope of work.

All drawing review costs incurred by Cadillac Fairview will be charged back to the tenant with a 15% administration charge for handling, review, and coordination. For further information on the drawing review process, please see the Drawings Submission & Review – Office section.

Table 2 – Base Building Consultant Contact Information

Consulting Discipline and Address	Contact Information
Architect All TDC Properties B+H Architect	Contact: Mohsen Boctor (T) 416-596-2299 ext. 2258
Code Consultants Arup Fire Protection & Building Code Engineers	Contact: Graeme Mouat (T) 647-559-1257 (C) 416-569-9770
Environmental Consultant All TDC Properties Pinchin Ltd.	Contact: Valerie Johnston (T) 905-245-0688
Mechanical & Electrical Engineer All TDC Properties HH Angus	Contact: Amir Safa (Mech) (T) 416-443-8200 Sam Cabral (Elec) (T) 416-443-8243
Structural Engineer TD Bank Tower / 66 Wellington St. West, TD North Tower/ 77 King St. West, TD West Tower / 100 Wellington St. West, 95 Wellington St. W Exp.	Contact : Gordon Ho (T) 905-695-3217 ext. 3726 Contact: Roy Flood (T) 905-695-3217 ext. 3724
Structural Engineer TD South Tower / 79 Wellington St. W, 222 Bay St. Entuitive Corporation	Contact: Tom Jennings (T) 416-272-1075

Sustainability Consultant

All TDC Properties
WSP

Contact: Jani Loots
(T) 416-640-7265

TDC Base Building Controls

All TDC Properties
Johnson Controls Ltd. – Controls Group

Contact: Ramy Fanous
(T) 416-333-6378

TDC Commissioning Agent

All TDC Properties
Jones Lang LaSalle

Contact: Rade Kostic
(C) 416-876-0172

Vertical Movement Consultant

All TDC Properties
KJA Consultants Inc.

Contact: Andrew Wells
(T) 416-961-3938 ext. 25

2.2 Required Contractors/Consultants

When undertaking any project at the TDC, tenants are required to engage the following contractors/consultants for the noted services. This is because TDC's various systems are complex, and because TDC desires to maintain a consistent standard of care and quality of work.

Table 3 – Required Contractors/Consultants

Consulting Discipline and Address	Contact Information
Air Duct & Induction Unit Contractor	
New Air Duct Services Ltd. (Air Duct Cleaning)	Contact: Fluvio Visone (T) 416-560-4348
Packaged Maintenance Ltd. (Induction Unit Cleaning)	Contact: Ken Johnston (T) 905-951-1114
Base Building Controls	
Johnson Controls LP	Contact: Ramy Fanous (T) 416-333-6378
TDC Base Building Blinds	
<i>All TDC Properties</i> Solarfective - Legrand	Contact: Brad Brady (T) 416-346-6331
Base Building Structural Engineer	
Exp.	Contact : Gordon Ho (T) 905-695-3217 ext. 3726 Contact: Roy Flood (T) 905-695-3217 ext. 3724
Entuitive Corporation	Contact: Tom Jennings (T) 416-272-1075

Commissioning Agent

Jones Lang LaSalle

Contact: Rade Kostic
(C) 416-876-0172

Terraprobe Inc.

Contact: Joseph Gushue
(T) 905-796-2650 ext. 123
(E) jgushue@terraprobe.ca**Fire Alarm Contractor – Installation**

Guild Electric Ltd.

Contact: Yves Thibodeau
(T) 416-288-8222

Plan Group Inc.

Contact: Syd Oliveira
(T) 416-635-9040

Symtech Inc.

Contact: Brent Stewart
(T) 416-559-1094
(E) brent.stewart@symtech.com**Fire Alarm Contractor – Programming, Verifications & Service**

Chubb Edwards

Scheduling: Christina DeSantis
(T) 905-629-2600**Fire Alarm Contractor – Verifications ONLY**

Chubb Edwards

Contact: David Lee
(T) 905-629-2600 ext. 312238
(E) david.lee@chubbedwards.com**Approved Sprinkler Contractors**

Classic Fire Protection Inc.

Contact: Chris Berwick
(T) 416-740-3000

Viking Fire Protection

Contact: Chris Gowland
(T) 416-677-3936
(E) cgowland@vikingfire.ca

Onyx Fire Protection

Contact : John Lang
(T) 416-674-5633**Riser Room Management**

CF Connect

(T) 1-800-665-1000
(E) cfconnect@cadillacfairview.com**Security System Contractor**

Tyco

Contact: Gord Wilson
(T) 905-301-8921
(E) gord.walter.wilson@jci.com

Note: As part of base building services and quality control/assurance, the TDC sprinkler contractor will perform a site review of all work, both during the project and upon being notified that the project has been completed.

Refer to Table 15 for drain-down amounts. Tenants are required to submit a fire system bypass. This requires a minimum of 72 hours' notice and is subject to approval.

2.3 Recommended Contractors

The following table provides contact information for contractors of various disciplines that are familiar with the TDC's construction policies and procedures. This list is meant to serve as a recommendation only. Cadillac Fairview assumes no responsibility whatsoever for the use or selection of any contractor, or their workmanship and/or behaviour while working at the TDC.

Note that this list does not preclude alternate contractors from bidding on or performing proposed project work, subject to the approval of the assigned project manager.

Table 4 – Recommended Contractors

General Contractors	Contact Information
CLI Group	Contact: Chris Jamieson (T) 905-492-6131
Quoin Construction Ltd.	Contact: Tony Temelkovski (T) 905-232-5280 ext. 203
Greenferd Construction Inc.	Contact: Scott Hledin (T) 905-763-4200
Jesslin Interiors	Contact: Sonali Fernando (T) 416-757-8280
Marant Construction Ltd.	Contact: Gino Vettoretto (T) 416-425-6650
Rosscor General Contractors Ltd.	Contact: Emanuel DiFalco (T) 416-297-1811
Electrical Contractors	Contact Information
Ainsworth Inc.	Contact: Kevin Carr (T) 416-678-9381
Guild Electric Ltd.	Contact: Yves Thibodeau (T) 416-288-8222
Plan Group Inc.	Contact: Syd Oliveira (T) 416-635-9040
Symtech Innovations Ltd.	Contact: Fraser McGill (T) 905-747-8436
Impact Electrical & Mechanical Ltd.	Contact: Don Gorman (T) 905-219-0008
Mechanical Contractors	Contact Information
Impact Electrical & Mechanical Ltd.	Contact: Don Gorman (T) 905-219-0008

Modern Niagara Toronto Inc. (Downtown Division)	Contact: Bruce Laitinen (T) 416-360-1617 ext. 225
Onyx Mechanical	Contact: Chris Neilsen (T) 905-866-6699
Plan Group Inc.	Contact: Syd Oliveira (T) 416-635-9040
BSG Mechanical Services Inc.	Contact: Scott C. McLean (T) 905-829-1655
X-Raying, Scanning & Coring Contractors	Contact Information
CB Concrete Testing & Coring Ltd.	Contact: Steve Bagnato (T) 416-346-5665
Daly Concrete Coring Ltd.	Contact: Mike Daly (T) 416-717-7791
The Graff Company ULC (Graff X-Ray)	Contact: Customer Service (T) 905-457-8120
Unique Detection Ltd.	Contact: Mike Hunter (T) 1-888-651-0068
Roof Contractors	Contact Information
Flynn Canada	Contact: Mark Agius (T) 905-671-3971 ext. 1243
Dean Chandler	Contact: Ken Goodall (T) 416-751-7840
Bothwell Accurate	Contact: Mario Giredli (T) 905-673-0615
Flooring Contractors	Contact Information
Maple Group	Contact: Tony Tedesco (T) 905-857-6006
Terrazzo, Mosaic & Tile Co. Ltd.	Contact: Enzo Costantino (T) 416-653-6111
York Marble	Contact: Andre Marques (T) 416-235-0161
Window Film Installation Supplier	Contact Information
Convenience Group Inc.	Contact: Geoff Matheson (T) 416-951-9017

Base Building Lighting	Contact Information
Metalumen Manufacturing Inc. (Manufacturer)	Contact: Michael J. McNeill (T) 1-800-621-6785 ext. 253
Osram Encelium	Contact: Bob Simpson (T) 416-556-3561
STL Lighting Group (Distributor)	Contact: Steve Takacs (T) 416-540-3093
Lighting Control	Contact Information
Osram Encelium	Contact: Bob Simpson (T) 416-556-3561
Electrical Metering Provider	Contact Information
Carma Industries Inc.	Contact: Prakash Joseph (T) 416-712-0733 (E) pjoseph@carmacorp.com
Security System Contractors	Contact Information
Tyco Integrated Fire & Security	Contact: Gord Wilson (T) 905-301-8921 (E) gord.walter.wilson@jci.com
Chubb	Contact: Christopher Middleton (T) 905 301-3673 (E) chris.middleton@chubbfs.ca
Securitas Electronic Security, Inc.	Contact: Tom Nanou (T) 416-213-7579 (E) tom.nanou@securitases.com
Drywall Contractors	Contact Information
Four Seasons Drywall Systems & Acoustics Ltd.	(T) 905-474-9960
Maxan Drywall Ltd.	Contact: Clint Jensen (T) 905-829-0070 ext. 232
Strap Drywall Systems Inc.	Contact: Anthony Raponi (T) 905-841-8862
Trans-Ontario Ceiling & Wall Systems Inc.	Contact: Neil Arbour (T) 905-669-0666
Painting Contractors	Contact Information
American Colors Painting Inc.	Contact: Ralph Paparelli (T) 905-264-8674

L&L Painting and Decorating Ltd.	Contact: Radim Raskin (T) 905-761-7167
Urban Painting & Decorating Ltd.	Contact: Angela Rossi (T) 905-856-9598
Riser Room Management & Telecommunications	Contact Information
RYCOM TPM Inc. (Riser Room)	Contact: Customer Care (T) 1-877-792-6687
WiredScore (Telecom Consulting)	Contact: Joseph Morrison (T) 314-719-9073 (E) joseph@wiredscore.com
Housekeeping (Cleaning) Services	Contact Information
C&W Services	Contact: Nelson Andrade (T) 416-571-0436
Security Escort Provider	Contact Information
Paladin Security	Contact: Franco Lopez (T) 416-916-6767
Elevator Service Contractor	Contact Information
Thyssen Krupp Elevator Ltd.	Contact: Mark Johnson (T) 416-420-6045
Demolition & Environmental Contractors	Contact Information
Biggs & Narcisco Construction Services Inc.	Contact: Luis Narcisco (T) 905-470-8788
Curmann Contracting Ltd.	Contact: Chris Bowley, Fred Topley, Francesca Palleschi (T) 416-755-1512
I&I Construction Services Ltd.	Contact: Edward Barron (T) 905-884-1290
Air Balancing Contractors	Contact Information
ACE Commercial Inc.	Contact: Ajay Jhajj (T) 416-727-2009
Design Test Balance Inc.	Contact: Surrinder Sahota (T) 905-886-6513
Dass Enterprises Inc.	Contact: Ian Babich (T) 905-238-3377

2.4 Contractor Check Required – Third-Party Certification

Cadillac Fairview and the Toronto-Dominion Centre require all contractors, sub-trades and consultants doing work on behalf of Cadillac Fairview to be registered and approved by ContractorCheck.

Cadillac Fairview and the Toronto-Dominion Centre will annually review and approve pre-qualified contractors and sub-trades for TDC projects.

Contact Information:

ContractorCheck Limited
2235 Sheppard Ave. East
Atria II, Suite 1501
Toronto, ON, M2J 5B5

(T) 855-640-6949
(F) 416-640-2445
(email) info@contractorcheck.ca
(web) www.contractorcheck.ca

PART 3: DESIGN CONSIDERATIONS

3.1 Integrated Design Process (IDP)

The landlord recognizes that every leasehold improvement project is unique. Each presents its own opportunities and challenges, and each design team has its own personality.

With such complexity, the landlord strongly encourages tenants to follow the Integrated Design Process. By advocating multidisciplinary collaboration, the IDP ensures that all stakeholders, including the tenant, consultants, contractors and design professionals, are sufficiently engaged in the project and aligned as to the outcome.

3.2 Involving the Landlord Early in the Design Process

It is also important that the tenant involve the landlord early in the design process. This not only ensures that all requirements, conditions and issues are thoroughly considered, but it also contains costs and helps avoid unnecessary extras down the line.

For further information regarding the Integrated Design Process and/or the involvement of the landlord in design coordination meetings, please contact the Tenant Projects department.

3.3 Tenant's Project Team Responsibility

The **project team** refers to the tenant and all designates, including project managers, consultants, contractors, suppliers, etc. Ultimately, the tenant is responsible for their project team, and will be held solely accountable for oversights and/or a failure to adhere to any policies or procedures outlined.

The project team must provide the landlord with documentation that demonstrates that the mandatory requirements are incorporated into the design process and that these requirements are followed in the construction phase(s). Cadillac Fairview encourages the project team to also review the Recommended Best Practices in this document and wherever possible also incorporate these into the project's design strategy and construction activities.

Note: Project design professionals and builders must ensure that local codes, standards and by-laws are met. This responsibility is not superseded by the sustainable measures and requirements outlined in this manual.

3.4 Sustainable Design

Not all construction projects undertaken at TDC are required to be LEED or WELL-certified projects. However, the standards listed in the following pages are based on LEED v4 Operations, WELL Building Standard v1.0, Maintenance (O+M) and LEED v4 Interior Design and Construction (ID+C) requirements and can assist tenants with a LEED ID+C and WELL Certification for new and existing interiors.

The following section provides critical information on sustainable design requirements for proposed build-outs, as well as TDC base building standards. Tenants and their consultants should thoroughly review this section, as the project team must provide the landlord with documentation demonstrating that these sustainable design considerations have been incorporated into the design process, and implemented during the construction phase(s).

3.5 Sustainable Materials

This section of the guide applies to all materials purchased for facility renovations, retrofits and new construction activities at the TDC.

Fixtures, equipment, mechanical/electrical fixtures and equipment, plumbing or elevator components are not subject to these requirements.

3.5.1 Mandatory Requirements

Materials used for the project, including furniture, must meet one or more of the following criteria where applicable.

- All adhesives and sealants wet-applied onsite have VOC contents that meet the applicable VOC content requirements of SCAQMD Rule 1168 (2005), Adhesive and Sealant Applications (<http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1168.pdf>)
- All paints and coatings wet-applied on site have VOC contents that meet the applicable VOC content requirements of the South Coast Air Quality Management District Rule 1113 (<http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/r1113.pdf>)
- Thermal and acoustic insulation, flooring materials and finishes, ceiling materials and finishes, and wall materials and finishes are either inherently non-emitting of VOCs, or are tested and determined compliant in accordance with California Department of Public Health Standard Method V1.1-2010, using the applicable exposure scenario.

Recommended Best Practices

It is recommended that materials used for the project, including furniture, meet one or more of the following criteria, where applicable:

- Contain recycled content
- Are locally-sourced (i.e., extracted, manufactured and purchased within 160 kilometres of the TD Centre)
- Use salvaged, refurbished or reused products
- Contain bio-based products that meet the Sustainable Agriculture Network's Sustainable Agriculture Standard (<https://www.sustainableagriculture.eco>)
- Wood products are certified by the Forest Stewardship Council (<https://ic.fsc.org/en>)
- Are Cradle to Cradle™ certified (<http://www.c2ccertified.org/>)
- Products that have fully inventoried chemical ingredients to 100 ppm, and have no Benchmark 1 hazards. GreenScreen Chemicals provides assessments of projects and chemical ingredients (<https://www.greenscreenchemicals.org/>)
- Products do not contain substances that meet REACH criteria for substances of very high concern. (<https://echa.europa.eu/regulations/reach/understanding-reach>)
- Composite woods contain low formaldehyde emissions that meet the California Air Resources Board requirements for ultra-low-emitting formaldehyde, or no-added formaldehyde-based resins
- Paints, coatings, adhesives or sealants contain no added methylene chloride and perchloroethylene
- Furniture and furnishings have VOC content that meets all limits set by ANSI/BIFMA e3-2011 Furniture Sustainability Standard sections 7.6.1 and 7.6.2, tested in accordance with ANSI/BIFMA Standard Method M7.1-2011. Not applicable for salvaged/reused furniture.

3.5.2 Submittals

The project team is responsible for collecting and submitting documentation to Cadillac Fairview when the project is complete. Cadillac Fairview reserves the right to request and review supporting documentation during the project.

At a minimum the documentation must consist of the following:

Sustainability log noting which criteria the material meets from the mandatory requirements above – see following example. A more detailed template can be downloaded from the US Green Building Council - www.usgbc.org.

Each material claimed to meet one or more of the above criteria must have supporting documentation such as MSDS sheets, product data sheets, manufacturer's letter, etc.

Product Type	Product Name	Sustainability Criteria Met
Sealant	TREMstop Acrylic	VOC Content: 38g/L (SCAQMD Rule 1168)
Adhesive	Flextile Polymer Modified Unsanded Grout (500 Series)	VOC Content: 0 g/L (SCAQMD Rule 1168)
Insulation	Roxul Fabrock LT	No VOCs, 40% recycled content

3.6 Construction & Demolition Waste Management

Cadillac Fairview has procedures to divert construction and demolition debris from landfill and incineration facilities. To reduce the demand for virgin materials, prevent overburdening of existing landfills, and avoid pollution caused by incineration and ground water, the landlord aims to reach a minimum diversion rate of 90% (by volume).

3.6.1 Requirements

To help the landlord achieve a minimum of 90% waste diversion by volume, the project team is responsible for incorporating the following guidelines and requirements into their design and construction activities throughout the project:

- All waste must be evaluated for recycling or redirection back to the manufacturing process. Any materials that can be recycled or redirected must be diverted accordingly. See Table 5 for waste reduction strategies.
- The project team must designate areas specific for recycling construction and demolition waste and train workers on recycling protocols and effective container labelling.
- To minimize the demand for new/virgin products and materials, the project team should strongly consider innovative ways to recycle materials typically known to be difficult to recycle.

3.7 Waste Reduction Strategies

Table 5 lists various waste reduction strategies to increase the diversion rate.

Table 5 – Waste Reduction Strategies

Item	Reduction Strategy
Design	Review designs and plans to ensure optimal use of material. Where possible, specify materials with a longer lifespan and potential for recycling or reuse after deconstruction.
Planning	Plan and schedule projects efficiently and continuously monitor material quantities to minimize leftovers.
Packaging	Request that suppliers deliver products with minimum packaging. Where possible, order in bulk.
Storage	Store materials as required to prevent damage or contamination. Where possible, order materials on-demand to prevent long storage times and potential damage.
Ordering Errors	Review material quantities carefully to ensure the correct amount is received.
Ordering Excess	Order materials in appropriate quantities. Where possible, order pre-cut pieces or measure and cut accurately and collect and store reusable pieces.
Handling	Handle all materials with care to prevent damage, breakage or contamination.

*Throughout the project all construction materials should be evaluated for reuse onsite and/or at alternate sites. Where possible, return materials that cannot be reused to the supplier or manufacturer.

3.7.1 Submittals

The landlord reserves the right to request and review supporting documentation that demonstrates the specification and implementation of construction waste management strategies. Documentation must outline on-site plans for waste collection.

Upon Substantial Performance, the project team must submit a report with supporting documentation detailing the amount and types of waste diverted, and identifying the hauler and the recycler.

3.8 Material Reuse Strategies

Throughout the project, the project team should evaluate all construction materials for reuse on site and/or at alternate sites. Where possible, materials that cannot be reused should be returned to the supplier or manufacturer. Table 6 provides suggestions to institute the reuse of common materials during construction.

Table 6 – Material Reuse Strategies

Item	Reduction Strategy
Wood	Salvage off-cuts for bridging, blocking and back framing. Reuse or return palettes to vendors. Inspect wood forms for reuse for other areas of the project or other job sites.
Metal	Save cuttings for possible reuse. Joist off-cuts can be cut up and used as stakes for forming or for headers around openings in the floor assemblies.
Drywall	Reuse off-cuts to finish off gaps, small bulkheads, etc.
Cardboard	Use boxes for storage of tools and materials or floor protection.
Masonry	Crush on site and use for fill or as bedding for driveways.
Rigid Insulation	Use as ventilation baffles.

3.8.1 Submittals

The landlord reserves the right to request and review supporting documentation that demonstrates the specification and implementation of construction waste management strategies. Documentation must outline onsite plans for waste collection.

Upon substantial performance, the project team must submit a report with supporting documentation detailing the amount and types of waste diverted, and identifying the hauler and the recycler.

3.9 Air Quality Control

Any construction activity that produces VOCs and/or dust is considered a source of air pollutants. These pollutants can be created during demolition/repair/construction by materials that off-gas VOCs and/or equipment that generates combustion by-products. Table 7 provides some examples of potential air pollutant sources.

Table 7 – Pollutant Sources

Products	Sources
Building Materials	Wood, plaster, concrete, roofing, drywall, insulation, engineered wood, ceiling tiles, cove base
Wet Products	Paint & stains, sealants & coatings, caulking, adhesives, grout, acid finishes, epoxy coatings
Furnishings	Carpet & wall coverings, wood flooring, cabinets, furniture & partitions

Solutions	Solvents, fuels, cleaning products, pesticides
Equipment	Generators & heavy equipment, compressors, vehicles, portable heaters, welders & cutting torches, soldering guns

3.9.1 Mandatory Requirements

Maintaining high indoor air quality helps ensure the comfort and well-being of all building occupants and construction workers alike. The project team must therefore prepare an indoor Air Quality Management Plan. The Air Quality Management Plan will impact the choice of paints, coatings, sealants, flooring materials, etc.

To maintain satisfactory air quality, all systems, spaces under construction, and occupied spaces must be protected from dust, odours and other contaminants. Containing the work area, modifying HVAC operations, reducing emissions, and intensifying housekeeping are steps the project team should consider when preparing the Air Quality Management Plan.

The following elements are required to be implemented during construction as part of each project's indoor Air Quality Management Plan:

- HVAC Protection: Keep contaminants out of the HVAC system. Do not run permanently installed equipment if possible, or filtration media with MERV 8, as determined by ASHRAE 52.2-2007, must be used at each return air grill and return or transfer duct inlet opening. Maintain proper filtration if it is used.
 - o All ducts are either:
 - ◆ Sealed and protected from possible contamination during construction;
 - ◆ Vacuumed out prior to installing registers, grills and diffusers.
 - o If the ventilation system is operating during construction, all filters are to be replaced prior to occupancy.
- Source Control: Keep sources of contaminants out of the building and have a plan to eliminate any that are introduced.
 - o A secure area is designated to store and protect absorptive materials from absorbing and later releasing VOCs emitted by other sources. At a minimum, this area must be separated from general construction activity units, tarps or polyethylene barriers; materials must be stored off the floor; and access to this area must be restricted to essential construction personnel. Absorptive materials to be protected in this manner include but are not limited to: carpets, acoustical ceiling panels, fabric wall coverings, insulation, upholstery and furnishings.
 - o Install and allow wet materials to fully cure before installing any absorptive materials. Wet materials include but are not limited to: adhesives, wood preservatives and finishes, sealants, glazing compounds, paints and joint fillers.
 - o Install and allow hard finishes that require adhesive installation to dry for a minimum of 24 hours before installing any absorptive materials.
 - o Prevent exhaust fumes (from idling vehicles, equipment, and fossil-fueled tools) from entering the building.
 - o Enforce the no-smoking job site policy.
- Pathway Interruption: Prevent circulation of contaminated air when cutting concrete or wood, sanding drywall, installing VOC-emitting materials, or performing other activities that affect IAQ in other work spaces.
 - o All active areas of work are isolated from other spaces by sealed doorways or windows or through the use of temporary barriers.
 - o Disposable tacky mats are used at all entryways to the construction area to reduce the transfer of dirt and pollutants. Mats shall be positioned inside the construction area, and shall cover the width of the entryway

and be a minimum three (3) feet long in the direction of travel. Mats are to be replaced once tacky surface is completely used.

- o Saws and other tools use dust guards or collectors to capture generated dust.

3.9.2 IAQ Testing Before Occupancy

Baseline IAQ testing is to be conducted after construction ends and before occupancy, using testing protocols consistent with the United States Environmental Protection Agency “Compendium of Methods for Determination of Air Pollutants in Indoor Air”.

Test results must demonstrate that the contaminant levels listed in the table below are not exceeded. If the levels are exceeded, the project team must take remedial action and repeat the test until all requirements have been met.

Table 8 – IAQ Testing

Chemical Contaminant	Maximum Concentration
Formaldehyde	27 ppb
Particulate Matter (PM2.5)	15 ug/m ³
Particulate Matter (PM10)	50 ug/m ³
Total Volatile Organic Compounds	500 ug/m ³
Ozone	51 ppb
Carbon Monoxide (CO)	9 ppm and no greater than 2 ppm above outdoor levels

Recommended Best Practices

It is recommended that the project team incorporate the following sections of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, Second Edition (2007), ANSI/SMACNA 008-2008, into the project Indoor Air Quality Management Plan.

- HVAC Protection
 - o If conditioning is required during construction, use supplementary HVAC units instead of permanently installed equipment if possible.
 - o If permanently installed HVAC system must be used during construction, install filtration to protect the return (negative pressure) side of the system. Replace these filters regularly during construction.
 - o Do not store materials in mechanical rooms, to reduce potential debris and contamination to mechanical systems.
- Source Control
 - o Use low-toxicity and low-VOC materials to the greatest extent possible.
 - o Develop protocols for the use of any high-toxicity materials. Isolate areas where high-toxicity materials are being installed and use temporary ventilation for that area.
 - o Protect stored materials from moisture because absorbent materials exposed to moisture during construction can mould and degenerate long after installation. Store materials in dry conditions indoors, under cover, and off the ground or floor.
 - o If materials are improperly exposed to moisture, replace the material and consider testing air quality before occupancy to make sure no mould contamination has occurred.

- Pathway Interruption
 - o Depressurize the work area to allow a differential between construction areas and clean areas. Exhaust to the outdoors using 100% outdoor air, if possible.
- Housekeeping: Maintaining a clean job site results in fewer IAQ contaminants to manage.
 - o Maintain good job site housekeeping on a daily basis. Use vacuum cleaners with high-efficiency particulate filters and use sweeping compounds or wetting agents for dust control when sweeping.
 - o Keep materials organized to improve job site safety as well as indoor air quality.
- Scheduling: Sequence construction activities to reduce air quality problems in new construction projects. For major renovations, coordinate construction activities to minimize or eliminate disruption of operations in occupied areas.
 - o Keep trades that affect IAQ physically isolated on site and separated from each other by the construction schedule. For example, schedule drywall finishing and carpet installation for different days or different sections of the building.
 - o Install absorptive-finish materials after wet-applied materials have fully cured whenever possible. For example, install carpet and ceiling tile after paints and stains are completely dry.
 - o If applicable, plan adequate time to conduct a flush-out and/or perform IAQ testing before occupancy.

3.9.3 Submittals

The landlord reserves the right to request and review supporting documentation that demonstrates that the mandatory requirements have been specified and implemented.

The following documentation must be collected throughout the project and submitted to Cadillac Fairview upon project completion.

Upon project completion, the project team must provide the following documentation to the landlord:

1. At least six (6) photographs demonstrating the IAQ measures that were implemented during construction
2. Filter data sheets indicating the MERV rating that was installed during construction
3. Air quality test results demonstrating the project is below the air pollutant thresholds noted above

3.10 Energy & Water Efficiency

Commercial office interior renovations include the installation of mechanical and electrical systems and devices that are beyond base building supplied standards. These include: pot lighting, LED lighting, boardroom/conference room A/V equipment, supplemental air conditioning units, fan coil units, televisions, computer equipment, lavatory fixtures and kitchen appliances such as stoves, refrigerators, and toasters.

Using energy efficient technologies can significantly reduce electricity and water consumption. This ultimately results in lower operating costs.

Recommended Best Practices

- Lighting control systems, including daylighting control and occupancy sensor lighting controls
- For Energy Star eligible appliances, select models that are Energy Star certified
- Reduce connected lighting power density by 5% below ASHRAE 90.1-2010 using the space-by-space method or by applying the whole-building lighting power allowance to the entire tenant space

- Provide a separate control zone for each solar exposure and interior space
- Provide controls capable of sensing space conditions and modulating the HVAC system in response to space demand for all private offices and other enclosed spaces (e.g., conference rooms, classrooms)
- Training sessions/seminars for the project team and leased space occupants for equipment and system(s) use
- Thorough design and planning of expected occupancy demands
- Commissioning of all new (and if applicable, existing) equipment and systems
- Low/Ultra low flow lavatory and kitchen fixtures (water closets, faucets, etc.) that consume no more than:
 - o WCs 1.6 gpf/6 Lpf
 - o Urinals 1 gpf/3.8 Lpf
 - o Faucets 0.5 gpm/1.9 Lpm @ 60 psi
 - o Showerhead 2.5 gpm/9.5 Lpm @ 80 psi
 - o Any newly installed water closets, urinals, or showerheads should be WaterSense labelled.

3.10.1 Submittals

The landlord reserves the right to request and review supporting documentation that demonstrates that these measures have been specified and implemented. Upon request, the project team must provide relevant product cut sheets and engineering specifications.

PART 4: BUILDING STANDARDS

This part provides design information and guidance on the buildings of the TDC. Please review all the information closely to ensure that project drawings comply with the landlord's established standards and recommendations.

Note: These are general guidelines that should be confirmed by each tenant for their premises.

4.1 General Building Information

Table 9 provides general information on the TDC buildings. The project team may obtain additional information available online at tdcentre.com.

Table 9 – General Building Architectural Information

Tower	Storeys Above Grade	Crossover Floors	Building Sprinklered	Length of Fire Hose in Cabinets
TD Bank Tower / 66 Wellington St. West	56 above grade 3 below grade	3,6,9,14,19,24,29,33,38,44,49,54	Yes	22.9 m (75')
TD North Tower / 77 King St. West	46 above grade 3 below grade	2,7,12,15,20,24,28,33,37,43,41 (n/e & n/w), 40 (n/e, s/e & s/w)	Yes	22.9 m (75')
TD West Tower / 100 Wellington St. West	32 above grade 3 below grade	2,7,12,18,23,28,32	Yes	22.9 m (75')
TD South Tower / 79 Wellington St. West	39 above grade 2 below grade	5,10,16,20,24,29,34	Yes	22.9 m (75')
222 Bay St.	31 above grade 3 below grade	5,9,14,17,22,27,30	Yes	22.9 m (75')
95 Wellington St. West	23 above grade 4 below grade	2,6,10,14,16,21	Yes	22.9 m (75')

4.2 Architectural Finishes/Features

4.2.1 Ceilings

Where gypsum wallboard ceilings are not used, ceiling systems will consist of lay-in acoustic panels in a T-bar suspension system.

Tenants are strictly prohibited from fastening partitions, millwork, etc. to the ceiling grid. To stabilize such elements, Tenants shall use the slotted reveals provided in the ceiling grid system. Each grid member is designed to support only the acoustic tile and lighting fixtures. It is the tenant's responsibility to review the site to confirm ceiling systems in place.

Table 10 – Ceiling Grid Information

TD Bank Tower / 66 Wellington St. West

Armstrong Fine Fissured (14 3/4" x 59 1/2" x 5/8")

Armstrong Fine Fissured (22" x 59 1/2" x 5/8")

CGC, Mars Climaplus #86160 with A Type 'A' grid profile (20" x 60" x 3/4")

TD North Tower / 77 King St. West

Armstrong Fine Fissured (14 3/4" x 59 1/2" x 5/8")

Armstrong Fine Fissured (22" x 59 1/2" x 5/8")

CGC, Mars Climaplus #86160 with A Type 'A' grid profile (20" x 60" x 3/4")

TD West Tower / 100 Wellington St. West

Armstrong Fine Fissured (12 1/2" x 59 1/2" x 5/8")

Armstrong Fine Fissured (23 1/4" x 59 1/2" x 5/8")

CGC, Mars Climaplus #86160 with A Type 'A' grid profile (20" x 60" x 3/4")

TD South Tower / 79 Wellington St. West

Armstrong Fine Fissured (19 5/8" x 59 1/2" x 5/8")

CGC, Mars Climaplus #86160 with A Type 'A' grid profile (20" x 60" x 3/4")

222 Bay St.

Armstrong Fine Fissured (19 5/8" x 59 1/2" x 5/8")

CGC, Mars Climaplus #86160 with A Type 'A' grid profile (20" x 60" x 3/4")

95 Wellington St. West

Armstrong Georgian Square Lay-in (39 3/16" x 39 3/16" x 5/8")

CGC, Mars Climaplus Logix Panels (500mm x 1000mm x 19mm)

For all towers except 95 Wellington St. West

Code: ACT1

Item: Base building standard tile and grid

Supplier/Manufacturer: CGC

Series/Style: Mars Climaplus #86160 with A Type 'A' grid profile

Size: 20" x 60" x 3/4" Tile: 15/16" grid

Colour: white

Application: New ceiling for Meeting Rooms, LAN Rooms and Breakrooms

It is the responsibility of the tenant's project team to verify existing conditions.

4.2.2 Base Building Doors & Frames

Entrances to electrical rooms, janitorial closets, washrooms, stairways, etc. shall be hollow metal doors in pressed steel frames, painted to the base-building standard: Flecto Varathane #96 Satin Black Polyurethane.

The base building corridor doors and frames shall be solid core wood doors with mahogany veneer, finished with mahogany stain. For all suite entrance doors for leased premises on multi-tenant floors, the project team must submit a sample to the landlord's project manager for approval.

Before construction starts, the project team must apply CGI White Opaque Privacy Film to the interior face of all glass doors visible from common area corridors. The film may be removed after the construction work is completed.

4.2.3 Tenant Doors & Frames

All locks installed by the tenant at entrance and interior doors must be keyed to the Building Master Keying System. The system allows the tenant complete freedom to lock offices, while concurrently providing access to each office at all times for both normal cleaning and emergency situations. Sargent Cylinders hardware is required to adapt to the manufacturer's lock.

The landlord's Locksmith department maintains the master keying system and keeps key coding and distribution records. Tenants are strictly forbidden to engage external locksmiths or lock manufacturers to change the keying of any locks.

For further information on the TDC locksmith, please contact CF Connect.

4.2.4 Demising Walls

All interior demising walls shall be constructed with metal studs, acoustic insulation and gypsum wallboard running from the floor to the underside of the suspended ceiling.

The partitions that separate one tenancy from another will be acoustically attenuated from the suspended ceiling to the underside of the structural slab.

All services penetrating demising walls are to be fire stopped in accordance with all relevant building codes and standards. In cases where the tenant's work uncovers/encroaches on areas that do not comply with this requirement, the tenant is responsible, at their sole expense, to ensure that such elements do comply.

4.2.5 Perimeter Window Blinds

All perimeter windows are equipped with horizontal venetian blinds or rollershade blinds. As these blinds are an essential component of the building's HVAC system, tenants may not remove them. When operated properly, they help the HVAC system to efficiently heat and cool tenant premises. Consistent and proper use of these blinds is especially important for workspaces with southern or western exposures.

During winter and summer, the sun's low angle allows its rays to shine directly into workspaces. Lowering blinds and slanting the lower edges of the slats toward the window will help keep workspaces at a comfortable temperature.

With the landlord's approval, tenants may add sunshades, provided these are of a type and material that will not interfere with the normal operation of the perimeter induction/radiation units. All Base Building blinds are to be maintained. Alternate fabrics are not permitted.

4.2.6 Exterior/Perimeter Walls

To maintain the integrity of the building vapour barrier, it is strictly prohibited to penetrate the interior surface of exterior wall assemblies or of window frames and mullions. Partitions abutting a mullion shall be sealed with double-sided closed-cell PVC tape.

4.2.7 Signage

Tenant identification signs on main floor/lobby directories, elevator lobbies, and adjacent to tenant entrance doors must conform to Cadillac Fairview's design criteria, including for style, location and size.

Tenants must submit a written request for signs to the tenant Relations department approximately one month before the date the signage is required. The request should indicate the exact wording and spelling required. The cost of tenant signage is charged to the tenant's account.

4.2.8 LAN Rooms and Associated Equipment

The maintenance and monitoring of tenant-owned equipment (including A/C units) and LAN rooms shall be the tenant's responsibility. Cadillac Fairview TD Centre does not monitor LAN rooms on behalf of tenants, and alarm points are not permitted to be wired into the Building Automation System. All units using a condensate pump shall be wired such that if the condensate pump fails, the air conditioner cannot run.

Tenants shall, at their sole cost and expense, ensure that the following is in place for their respective LAN rooms and equipment:

1. Tenants shall enter into an equipment maintenance contract with an approved mechanical contractor to regularly service tenant A/C units according to manufacturer recommendations.
2. Tenants shall contract with a third-party monitoring company to monitor conditions within tenant LAN rooms.
3. Tenants shall contract with an approved mechanical contractor to respond on an emergency basis to any alarms or other equipment issues within tenant LAN rooms.

4.2.9 Control Systems

The project team must submit all control system modifications to the landlord before construction. This is to verify compatibility with base building standards.

All new and existing controls in renovated areas are to be verified and/or commissioned for proper operation. Commissioning is mandatory and is handled by the TDC base building commissioning agent. See TDC Required Contractors/Consultants in Table 3. Table 11 provides information about the TDC's control systems.

Table 11 – TDC Building Control Systems

TD Bank Tower / 66 Wellington St. West

- Electronic VAV boxes
- Electronic induction unit valves
- Integrated lighting controls with phone codes

TD North Tower / 77 King St. West

- Electronic VAV boxes
- Electronic induction unit valves
- Integrated lighting controls with phone codes

TD West Tower / 100 Wellington St. West

- Two main pneumatic static control pneumatic valves for north and south. Both main pneumatic valves on the floors have smoke mode override for safety
- Floors are constant volume off the pneumatic valve air stations
- Perimeter induction units have electronic induction unit valves and/or pneumatic induction unit valves
- Integrated lighting controls with phone codes

TD South Tower / 79 Wellington St. West

- Electronic VAV boxes
- Pneumatic smoke dampers
- Integrated lighting controls with phone codes

222 Bay St.

- Compartment unit fan system electronic VAVs and perimeter radiators
- Integrated lighting controls with phone codes

95 Wellington St. West

- Compartment unit fan system electronic VAVs and perimeter heating/cooling PCUs
- Integrated lighting controls with phone codes

4.2.10 Control Lines

Control lines must be capped to prevent loss of control air from affecting other building operations.

4.2.11 Static Sensing Lines

Water and air system static sensing lines must remain intact to ensure proper building operations.

4.2.12 Communication Trunk

The project team may obtain the communication trunk layout for the Building Automation System (BAS) from the landlord. Any additions to these systems must be documented and reflected in revised drawings, then returned to the landlord before tenant occupation. All communication wiring must be colour-coded for identification purposes.

4.2.13 Smoke Mode

Before whole-floor demolition, smoke damper lines must be capped in the riser room at the solenoid. After demolition, the smoke lines must be made safe and tested for air leaks.

These activities must be coordinated by the contractor and relevant subtrades, and a signed, written statement must be submitted to the landlord confirming that the smoke system was made safe.

4.3 Structural

4.3.1 Floor Load Design

The concrete floor slabs at TD Bank Tower/66 Wellington St. W., TD North Tower/77 King St. W., and TD West Tower/100 Wellington St. W. have all been designed to handle 125 pounds per square foot live load, including partitions.

At TD South Tower/79 Wellington St. W. and 222 Bay St., the concrete floor slabs have been designed to handle 100 pounds per square foot live load, including partitions.

Situations requiring unusually heavy loading, such as central filing areas, high-density file storage units, storage areas, vaults, and safes, must be specifically indicated on the project drawings. Plans for such situations are subject to the approval of the landlord's base building structural engineer. Live loads may not exceed the load limit for the floor slabs without the landlord's prior approval.

4.3.2 Base Building Structural Work

Any alterations and/or additions to the base building structure that may be required to accommodate the tenant's design shall be subject to the approval of the landlord and its base building engineer(s). The tenant's contractor may carry out this work (such as drilling, cutting, x-raying, coring), provided the landlord has approved of the contractor, but the landlord's base building engineer must supervise the work.

The tenant is responsible for all associated costs. If the landlord coordinates the work on the tenant's behalf, any costs incurred will be charged back to the tenant, plus a 15% administration fee.

4.4 Electrical Systems

4.4.1 Metering & Specifications

The tenant is responsible for all costs associated with the installation of electrical and mechanical metering consumption devices for the entire leased premises. Submeters are required for all electrical services, including receptacles, lighting, and supplementary HVAC units.

The contractor is responsible for the removal of all redundant cabling to the original source. Cable layouts are to coincide with the original base building drawings. Modifications to the base building trench system, including cutting, drilling, and coring, are prohibited.

The landlord strongly recommends that each tenant install a dedicated electrical panel. Please refer to the metering specifications for more information on metering requirements.

4.4.2 Lighting & Lighting Control

The lighting system at TD Bank Tower/66 Wellington St. W., TD West Tower/100 Wellington St. W. and TD North Tower/77 King St. W. consists of one lamp recessed-air handling LED fixtures, including electronic ballast and parabolic lenses.

Lighting in TD South Tower/79 Wellington St. W., 95 Wellington St. W. and 222 Bay St. is provided via two tube recessed fixtures with acrylic lenses. Light fixtures are complete with support clips over the T-bar grid and chained to slab, and these must be maintained. The contractor must ensure that clips are properly installed whenever the fixtures are removed or relocated for any reason.

Lighting power in all towers is 347 volts. All lighting fixtures have an electro connect wiring system. The exception is 95 Wellington St. W., which is either cabtire plug-in or electro connect, depending on the floor. It is the contractor's responsibility to maintain the base building standard zoning.

The two perimeter rows of fixtures contain two lamps. The grid members may support single fixtures. Clusters of two or more fixtures are to be independently supported from the concrete floor slab, as are hallway fixtures.

If a tenant requires additional fixtures, the tenant may order them through the landlord's manufacturer. **See Table 4 – Recommended Contractors.** The tenant and/or the tenant's contractor are responsible for any and all costs for damages to lighting fixtures.

All tenant luminaires located, either wholly or in part, within 15 feet of the perimeter glazing must be connected to the base building lighting control system. Alternatively, an occupancy sensor-based lighting control system in compliance with ASHRAE 90.1-2007 must be incorporated.

TD Centre is transitioning from a relay-based control system to an Osram Encelium Wireless System. The tenant is responsible for all costs associated with the purchase and installation of the lighting load control options. Tenant is to provide four (4) weeks' notice to TD Centre project manager prior to the start of construction. Tenant design must include:

- Wireless Area Lighting Controllers (WALC) for zone control.
- Wireless Control Module (WCM) or Connected Lighting Module (CLM) for (0-10v) individual fixture control. The WCM and CLM are UL924/CSA 22.2 No. 141 rated for emergency fixture control. A shunt relay is not required.
- Wall stations.
- Occupancy sensors.
- Lighting program commissioning including configuration requirements for: dimming set points, time out schedules, lighting scenes.
- As-built and commissioning report shall be provided to CF Project Manager and CF Operations - tdcooperations@cadillacfairview.com

The tenant or tenant's contractor must complete the Encelium Energy Management System Request for Startup Services form four (4) weeks in advance of when lighting control startup is required. Completed forms are to be emailed to your supplier or distributor and copy robert.simpson@osram.com and anthony.gadin@osram.com. The request form can be found at tdcentre.com under Forms & Permits.

4.4.3 Data, Communications & Telephone

TD Centre is WiredScore Certified Platinum, which ensures a high quality and number of internet service providers, redundancy and resiliency of telecom infrastructure, ease of installation and capacity to readily support new telecom services.

To ensure and maintain the integrity of telecom spaces, including the Main Telephone Rooms (MTR), riser rooms, Distributed Antenna System (DAS) and rooftop, all tenant construction move in/out work affecting the property's

common telecom spaces and tenant ceilings must be reviewed by RYCOM, the properties' onsite riser manager, in advance of work taking place. RYCOM must be engaged, to conduct pre-construction and post-construction inspections of all communication and data activity within the riser rooms. The tenant/contractor is responsible for all associated costs, and must submit drawings and any other requested documentation to RYCOM for approval before the work may begin. All requests require a minimum of forty-eight (48) hours' advanced notice. All requests should be forwarded to CF Connect at cfconnect@cadillacfairview.com. The Riser Room Access Request form is available at tdcentre.com.

Any installations that require cabling to pass vertically through more than one (1) riser room and/or cabling that extends beyond riser rooms through the parking garage, concourse, or ground level will require a pre-construction site review. The pre-construction site review should consist of the onsite riser manager, the landlord, the contractor, and the tenant. Subsequent to the audit, RYCOM will provide a written report outlining all findings. At the landlord's discretion, additional onsite review audits may be required at the tenant's/contractor's sole expense. For guidance on finding the best service providers for your organization or any additional support contact WiredScore at hello@wiredscore.com.

4.4.4 Telecom Service Providers

For guidance on finding the best service providers for your organization or any additional support contact WiredScore on Page 9.

Internet, telephone, and/or television service providers

- Allstream
- Beanfield
- Bell Canada
- Cogeco
- Rogers Cable Communications
- Telus Integrated Communications

Cellular service providers

- Bell Mobility – Neutral Host cellular in building antenna system – LTE Network
- Rogers Wireless – Neutral Host cellular in building antenna system – LTE Network
- Telus Mobility – Neutral Host cellular in building antenna system – LTE Network
- Wind Mobile – 3G cellular network located on the Concourse level only

4.5 Telecommunications Cabling

Cabling must conform to the standards as shown below. Specifically, all floor slab penetrations must be fire-stopped and smoke sealed. If a Contractor's work infringes on a conduit/penetration that does not comply with relevant codes and standards, it is the contractor's sole responsibility to ensure that measures are taken to meet these requirements. Non-compliant penetrations will be grandfathered; all work performed must be completely compliant.

- Work must be performed in a professional manner, adhering to standards such as those published by BICSI and local building and fire codes.
- Cables and innerduct/coreflex installed in the building's horizontal floor space will be plenum rated/FT-6, regardless of whether the space is plenum or not.
- Cables and innerduct/coreflex installed vertically throughout the building will be plenum rated/FT6/CMP, regardless of whether the space is plenum or not.
- Contractors will replenish the firestopping in the riser sleeves that are used to route the cables, regardless of

the previous condition of the firestopping. If cores must be drilled, all penetrations (wall or floor) must be x-rayed and approved by the base building structural engineer before work may proceed. Contractors must also have a CF permit for x-ray and coring activities.

- All cables and innerduct/coreflex must be independently supported. Attaching cables and innerduct/coreflex to ceiling hangers, gas/water pipes, tenant cable tray, tenant j-hooks or resting cables over tiles and light fixtures is not acceptable. All cables and innerduct/coreflex must be properly supported and “strain relieved”.
- Vertical cables and innerduct/coreflex must be labelled on either end and on every floor, and horizontal cables and innerduct/coreflex must be labelled every 30 linear feet.
- Cables and innerduct/coreflex must be properly dressed.

If the contractor fails to implement the above guidelines, then they will be asked to perform remedial action to correct the deficiencies. Failing to take corrective action will result in the contractor being barred from performing any work on the property until all deficiencies are corrected.

All telecommunication work performed at Cadillac Fairview must conform to the following codes and standards:

- ANSI/TIA/EIA telecommunications cabling standards
- Ontario Electrical Code (OEC)
- National Fire Protection Association (NFPA)
- Ontario Fire Code
- Ontario Occupational Health and Safety Act (provincially regulated companies) or Canada Labour Code Part II (federally regulated companies)
- Telecommunication standards and industry best practices as published by BICSI in the Telecommunications Distribution Methods Manual, Thirteenth Edition.

If the guidelines in this manual exceed the local building or fire codes, this manual is the governing document.

4.5.1 Building Risers: Copper or Fibre Cables

Contractors must install cables and innerduct/coreflex in a professional manner adhering to standards such as those published by BICSI and local building, electrical and fire codes.

- Cables and innerduct/coreflex installed in a building’s riser system must be FT-6 fire rated.
- Cables and innerduct/coreflex must be properly supported and “strain relieved”.
- Cables and innerduct/coreflex must be labelled on either end and on every floor.
- Cables and innerduct/coreflex must be properly dressed.
- Contractors will replenish the fire-stopping in the riser sleeves that are used to route the cables, regardless of the previous condition of the fire-stopping.
- Contractors will replace/repair fire-stopping where the cabling passes through a fire rated wall, floor or barrier.

Before any work can begin on any installations passing vertically through more than four (4) floors, the riser manager, RYCOM Corporation, must review and approve drawings.

4.5.2 Building Risers: Equipment

No active components requiring electrical power may be installed within the riser rooms. These spaces are common. They are intended to house equipment and components that serve base building systems and to deliver Telco services to the tenants.

Risers are to be left in “as is” or better condition. Contractors are required to sweep and/or vacuum and remove all

debris/firestop material from core holes.

Contractors are required to remove all equipment, ladders, cable reels, cable boxes, and tools from the risers at the end of each shift. Nothing is to be stored in tenant space either.

4.5.3 Building Floor Space: Copper or Fibre

Contractors must install cables in a professional manner adhering to standards such as those published by BICSI and local building and fire codes.

- Cables and innerduct/coreflex installed in the building's horizontal floor space or overhead ceiling space will be plenum rated/FT-6, regardless of whether or not the space is plenum.
- Firestop shall be replaced/repared by the contractor/service provider where the cabling and innerduct/coreflex passes through a fire-rated wall, floor or barrier.
- Cables and innerduct/coreflex installed in the buildings' horizontal floor space must be labelled on either side of the walls the cable penetrates through.
- Overhead cables and innerduct/coreflex must be routed in conduit, cable trays or on J-hooks. Running cables over the ceiling tiles and light fixtures is not acceptable. Cabling must be supported independent of existing conduit/threaded rod. Securing conduits or cabling to tenant cable tray or conduit will not be permitted as this could void the warranty on tenant's network cabling.
- Cables and innerduct/coreflex must be properly dressed, supported and strain relieved.
- FT-4 rated cables and innerduct/coreflex can be used provided they are fully enclosed in metal conduit for the entire length of the run.

4.5.4 Rooftop

Any access to TDC Rooftops is to be coordinated through the appropriate CF Manager. Any proposed work on roofs are to be submitted for Base Building review.

- Fall Arrest and Working at Heights training certificates must be readily available upon request.
- Proper rooftop PPE (Personal Protective Equipment) including harness, lanyard, and other prescribed safety equipment must be worn at all times on the rooftop.
- Before leaving the site, contractors must ensure all openings on the rooftop are repaired to meet code requirements. This is to ensure no water, rodents or insects can enter the building.
- Service providers/contractors must ensure their rooftop installation conforms to the requirements of the latest published version of Safety Code 6.
- Cinder blocks are to be lashed together using a lashing product similar or equal to aircraft cable. Ideally, this cable should be connected at either end so it makes it difficult for one to remove it. The service provider is to carry enough ballast on the non-penetrating rooftop mount to meet code requirements based on the equipment based on the rooftop.
- All equipment and cabling on the rooftop must be clearly labelled as owner of the service along with who the tenant in the building using the service is (if applicable). It is the service provider's responsibility to provide labels that will last through all four (4) seasons of a typical year.
- Service providers must install sufficient grounding wire from their mast located on the roof to the nearest telecommunications grounding bar. Ground wire shall be labelled in each riser room.
- Service providers must implement a surge arrestor at the transition point between outside plant and inside plant copper cabling to allow for the installation of FT-6 rated cabling within the building.

4.5.5 Outside Plant Work

The Telco provider is responsible for designing, engineering and obtaining permits for outside plant work, which details conduits and telecommunications cabling outside of the building.

The TDC will review and approve the Final Entrance Facility location. The contractor designing the work shall provide all drawings to TDC for comment and review. RYCOM TPM will review the drawings and provide onsite project management at RYCOM TPM's current billable rate.

4.5.6 Pathways

Pathways are spaces that allow telecommunication cabling to run from a source to a destination location. These spaces consist of conduits and sleeves. Pathways can be installed through parking levels, concourse levels, lobbies, riser rooms, and common areas.

TDC's specific requirements for pathways are as follows:

Telecommunication cabling shall be installed within conduits located in the parking garages, concourse levels, and common areas extending from the riser room to a tenant suite. Cabling is permitted to be run free air within the riser space, provided that best industry practices are followed and the installation conforms to section 2.0 Cabling. The owner is responsible for fixing and/or replacing any damaged cable running free air within the property. TDC will not be held responsible for any damages done or revenues lost.

Should the tenant or Telco provider want to install conduit within the riser, they should submit their plan to the onsite riser manager for review and approval. We recommend that the conduit be sized for expected growth.

Conduits, connectors, couplers, pull boxes, and covers located in the parking garage area and throughout other common visible areas must be painted powder coat white; no other form of paint will be accepted. Painting must be done off site.

Conduits and cabling must be labelled on both sides of walls and floor penetrations, and at both ends of a termination point. Labels shall clearly identify the ownership of the conduit. TDC also recommends adding items such as source and destination locations as well as contact phone numbers.

Labels on conduits running horizontal shall be placed approximately every fifteen (15) linear feet. Conduits running vertically in the riser system shall be labelled in two places: near the top in the middle at eye level, and near the bottom close to the core hole.

Any pre-existing conduits that are not currently labelled and have a single ownership should be labelled with the company who owns the pathway. Common pathways with multiple ownerships do not need to be labelled.

Any type of x-raying, scanning, or coring must have a permit assigned by the TDC project management team. The project manager must book a site review by TDC Operations personnel to confirm core locations and obtain approval before submitting a permit form. Permit forms can be downloaded from the TDC website from the Manuals, Forms & Permits section www.tdcentre.com.

All concrete structures require x-raying before any core drilling or cutting takes place. The tenant's contractor is required to use a TDC preferred contractor for this work. Both the base building structural engineers and the preferred contractor can review the work at the same time. No cutting of the structural steel and/or rebar shall be permitted or tolerated. Damage may result in fines and additional repair costs. The contractor is to have available on request a copy of the x-ray for the TDC representative to review.

The contractor is responsible to ensure that all vertical and horizontal holes that their pathway and/or cabling passes through are correctly fire-stopped.

Where the cabling enters into a conduit or connector, the contractor is responsible to provide fire-stopping of the conduit as well as the hole the conduit passes through in the fire rated wall.

TDC requests that contractors wear white gloves and take great care in handling the ceiling tiles when doing work on the concourse level ceiling tiles. If ceiling tiles are damaged, TDC will request the contractor performing the work repair and/or replace the ceiling tile.

4.5.7 Spaces

Spaces are places where telecommunication gear is located. This can include accumulation panels, passive equipment, active equipment, Telco gear, tenant telecommunication rooms or tenant gear.

TDC's requirements with respect to spaces are as follows:

No active components requiring electrical power shall be permitted to be installed within the riser rooms. These are common spaces, and intended to house equipment and components that serve base building systems, as well as deliver Telco services to tenants.

Tenants are permitted to install demarcation extension cables inside riser rooms or to gain access to the cellular floor system only. Under no circumstances are tenants permitted to install or terminate any station cabling within these riser rooms or to place active gear there.

Telco providers are permitted to set up Point-Of-Presence (POP) spaces within TDC. These spaces require design drawings from an engineering firm. Telco providers setting up these spaces are required to contact RYCOM TPM, the base building riser manager, to perform site review services. These site review services are billable back to the Telco provider at RYCOM TPM's current rates.

Consultants and designers are required to obtain the services of RYCOM TPM whenever a piece of hardware is to be installed or mounted within the riser room. RYCOM TPM will provide TDC's recommendations in writing, and they will be located and assign the required amount of space. These site review services are billable at RYCOM TPM's current rates.

If any contractor fails to adhere to the above guidelines, they will be asked to perform remedial action to correct the deficiencies. Further, any contractor who fails to take corrective action will be barred from performing any work on the property until all deficiencies are corrected.

4.5.8 Distributed Antenna System (DAS) - Riser Rooms, Common Areas and Tenant Space

Various service providers have installed wireless infrastructure within the property, referred to as Long Term Evolution (LTE) standard. To ensure the integrity of the DAS throughout the designed lifespan, it is important that contractors performing work on behalf of the tenants are aware of the system components and the process involved in the removal or relocation (if necessary) of infrastructure.

In the event of a tenant renovation, back-to-base project, or new build-out, the property's project manager must be informed that there is DAS infrastructure located within the project construction area. At that point, the landlord's project manager will notify RYCOM who will then coordinate the removal and relocation of the DAS equipment.

The costs associated with the relocation and coordination of DAS infrastructure will be billed back to the tenant or the general contractor/contractor performing the work on the tenant's behalf. Service providers/contractors must ensure their DAS installation conforms to the latest published version of Safety Code 6.

4.5.9 Return to Base Building - Cable Abatement Management & Control

To comply with fire codes, all abandoned cabling within the complex and in the riser rooms is to be restored to its originating source. RYCOM can assist the tenant with cable audit and abatement activities.

Should the tenant/general contractor/landlord request RYCOM's services, RYCOM will provide a Proposal for an Audit and Abatement for removing all abandoned cabling for the floors involved in the back-to-base project. Cable abatement activities are billable back to the last tenant unless other arrangements have been made with the landlord.

RYCOM recommends that the following parties attend the site review meeting: RYCOM representation, the building operator, tenant representation, consultants, engineers, and the contractor performing the work. These parties will walk through the scope of work and collaborate on how the scope of work will be or has been conducted. Once the site review is completed, RYCOM will provide a Site Review Report to all parties who attended.

4.6 Power

Capacity for the wiring of power and telephone systems is provided by means of an under-floor raceway system. Power for duplex outlets at 120/208 volts is available on each floor at a design capacity of two (2) watts per square foot of leased space. The tenant is solely responsible to supply, install and connect outlets.

4.7 Fire Alarm System

The Toronto-Dominion Centre uses the Edward EST3 Addressable Fire Alarm System.

During the construction phase, the tenant's contractor is responsible for any and all costs associated with deleting, remapping and re-verifying all devices, due to modifications at both the beginning and end of the renovation. These services can be carried out by a base building contractor only.

During tenant build-out, all additional fire alarm devices are to be installed as per ULC S524, Installation of Fire Alarm Systems and Ontario Building Code. These new devices will be tested under ULC S536 and verified under ULC S537.

The Manager, Fire & Life Safety will review and approve all drawings.

4.8 Elevators

The recommended base building elevator contractors are the only contractors permitted to undertake work involving elevator modifications, such as to call buttons, cab indicators, doors and frames. The tenant is responsible for any and all costs related to elevator modifications.

4.9 Mechanical Systems

4.9.1 Heating, Ventilation, & Air Conditioning (HVAC) Systems

All utility consumption equipment for tenant-installed, non-base-building space must be metered as per TDC's metering specifications.

Tenant comfort has been found to be best observed when the variable flow cooling occupied minimum setpoint is at 10% of maximum flow rate.

All Perimeter HVAC systems must be electrostatically painted black to match the TDC standard. For colour specification, please see your Cadillac Fairview project manager.

To maintain maximum efficiency, the following must be observed:

1. Furniture cannot be placed in any way over top of the induction unit to restrict or disturb supply airflow.

2. Furniture cannot be placed in any way in front of the induction unit to restrict or disturb return airflow.
3. Furniture placement must be 18" away from the induction unit to allow for cleaning, service and maintenance.
4. Tenant is responsible for any and all costs to remove tenant installations, furniture or fixtures in the event emergency access or cleaning is required.

TD Bank Tower/66 Wellington St. W., TD North Tower/77 King St. W., TD West Tower/100 Wellington St. W.

Perimeter areas are served by induction systems with freestanding, continuous floor enclosures located at the floor perimeter. Interior areas are conditioned by a central floor mechanical room and variable air volume systems (constant volume for 100 Wellington) that supply and return air to and from the space through slotted fluorescent lighting fixtures; ceilings serve as return-air plenums. Chilled water is available for tenant supplemental cooling and must be properly metered as per the metering specifications.

TD South Tower/79 Wellington St. W.

A central, variable air volume system with hot-water radiation at the floor perimeter provides air conditioning in this tower. Conditioned air is supplied to the space through slotted fluorescent lighting fixtures; the ceiling space serves as a return-air plenum. Condenser water is available for computer installations and equipment installations that require supplementary cooling. All utility consumption for purposes of supplemental cooling must be properly metered as per the metering specifications.

222 Bay St. and 95 Wellington St. W.

Air conditioning in this tower is provided by on-floor compartmental fan units with variable air volume. In 222 Bay St., heat is provided by hot water radiation at the floor perimeter. In 95 Wellington, heat is provided through a four-pipe fan coil unit. Conditioned air is supplied to the space through slotted fluorescent lighting fixtures; the ceiling space serves as a return-air plenum. Condenser water is available for computer and equipment installations that require supplemental cooling. All utility consumption for purposes of supplemental cooling must be properly metered as per the metering specifications. All condensation piping for supplementary cooling units must be insulated.

4.9.2 Plumbing

Tenants and their contractors must carefully consider plumbing installations. They must select the appropriate material: Plastic piping will not be permitted, including for coffee maker supply lines, water filter systems, refrigerators, and other applications.

Below are the requirements for plumbing installations:

- All chilled water piping must be installed with black steel pipe, complete with isolation valves.
- Type K copper is required for plumbing installations where the flow is under pressure.
- Type K copper is required for all restroom facility installations, including toilets, urinals and faucets.
- The appropriately specified type, as mandated by codes having jurisdiction, engineering design, or experienced professional judgment, must be used.
- All kitchen sink drains must be equipped with strainers/filters.
- Stainless steel flexible braided hoses to supply dishwashers.
- Garburators are not permitted.
- Grey water pumps are not permitted.

4.9.3 Perimeter Installations

For installations at the perimeter where there is extra humidity, an additional glazing wall must be installed. This is to ensure that the existing induction units are contained between the perimeter windows and the new glazing wall. Access doors for service and maintenance must be installed at every column bay.

4.9.4 Plumbing & Drainage

All plumbing material must be CSA/ULC approved. Subject to the landlord's approval, plumbing tie-ins to the main domestic cold-water supply and connections to the sanitary drain and vent risers are provided to allow for the addition of a limited number of private washrooms in leased premises. For these washrooms, the tenant's consultant is responsible to ensure that floor drains are added and properly sloped. Tenants requiring hot water for kitchens must provide hot-water tanks.

All hot water tank installations are to be completed with 2" deep indirectly drained drip pan, to fully cover the installation area, including isolation valves and all tank piping connections. Leak detector and solenoid shutoff assembly to be installed, with leak detector in drip pan connected to solenoid shutoff on incoming domestic cold water. Solenoid valve is to be located such that it cuts off the water supply to all fixtures/equipment, to fail closed and with no connection to base building BAS.

Note: Coring/Drilling into Base Building Mechanical Rooms is not permitted.

4.10 Metering Specifications

4.10.1 Tenant Responsibilities

The tenant is responsible for providing drawings and site access, as required, so the landlord can verify meter specifications and installations completed by the tenant. The landlord will also require ongoing access to tenant space for meter readings and calibrations. The tenant is responsible for all costs, including to supply, install, wire, program, and commission all electrical and mechanical metering consumption devices for the entire leased premises as per the requirements below.

4.10.2 Utility Meter Requirements

Tenants must install utility sub-meters for all utility services beyond base building services (which include HVAC, standard washrooms and common area lighting). Tenants on multi-tenant floors must be individually sub-metered for consumption; they may not share with other tenants on the floor.

Please see Table 12 below for minimum meter requirements for utilities. Detailed manufacturers' specifications for each specific utility meter type can be found later in this section.

Table 12 – Minimum Meter Requirements for Utilities

Utility	Minimum Meter Requirements
Electricity	<ul style="list-style-type: none"> All tenant electricity consumption, including plug and lighting Tenant-installed lighting and all plug loads in leased storage areas
Water	<ul style="list-style-type: none"> Office floor serveries: two (2) or more serveries per floor or greater than 10% of the usable area on the floor Storage area water use Showers, pools, tubs, steam rooms Laundry, car washing Fountains irrigation Humidification Domestic water backup cooling Cooling tower water Retail food or beverage business Dental offices or other high-consumption, non-food retail
Chilled Water	<ul style="list-style-type: none"> LAN/Server room cooling Condensor water Tenant-installed supplemental cooling units
Natural Gas	<ul style="list-style-type: none"> All direct tenant gas consumption Due to Measurement Canada meter standards, the gas meters will be installed by the landlord at tenant cost for all 100 Wellington St. W. (Tower 3) concourse tenants. All other concourse tenants using gas outside of Tower 3 are to contact the gas utility company directly for meter installation and account set-up.
Steam	<ul style="list-style-type: none"> All direct tenant steam consumption Contact Building Management

Meters must be accessible. The preferred location is in common areas or freight lobbies, with access hatches if required. Meters should be installed as per ASME standards for orientation at the nearest suitable location downstream of the base building riser. Please refer to the manufacturer's specifications regarding straight pipe distance requirements for meter installation details.

All meters will include the pulse output modules available as per the specifications and be wired to the base building via the Building Automation System (mechanical) or Carma (electrical) monitoring system.

The base building controls contractor will perform the BAS programming. Meters should be programmed so that the meter billing report includes programming details and daily and monthly trending reports.

For programming DCW, steam and gas meters, the tenant shall provide the following information to the base building BAS contractor:

- Network Engine (NAE)
- Field Controller (FEC)

- Physical Point (BI-7 or BI-8)
- Pulse Constant

For CHW consumption meters, the tenant shall provide.

- Network Engine (NAE)
- Address of Meter on Bus

Tenants are also to provide the following information about their sub-meters: Meter type, serial #, model #, cutsheet, and a drawing illustrating the location of the installed meter.

Meters shall be labelled in the field and on the BAS based on the following (tenant to receive confirmation from landlord):

STM
T# - Floor - M - CHW - TT- Tenant
DCW
NG

Example: T1 - 18 - M - STM - TT - TD Bank

The approved base building commissioning agent will commission and calibrate all meters as per the manufacturer's specifications. The project team is required to include a Meter Addition Information Work Sheet with the project closeout documentation.

4.10.3 Electrical Meter Specifications

Electronic metering and sub-metering requirements, equipment, and services must be supplied by Carma Industries.

METER INTERFACE DEVICE (MID-5)



Meter Interface Device (MID-5)

For applications where 5-Amp Step Down Current Transformers (SDCT) are required, the MID-5 is ideally suited. Typical applications include: critical services that cannot be shutdown for meter testing (reverification) or services over 400 Amp (Current Transducers only come in 100 Amp, 200 Amp and 400 Amp ratings). Any 5-Amp secondary SDCT can be interfaced to meter up to 5000 Amps (or more).

Note: For billing purposes, all SDCT's must be Measurement Canada Approved. SDCT must also be CSA approved.

Features

The 5-Amp Step Down Current Transformers (SDCTs) are interfaced to the METER MANAGER™ System through Carma 5-Amp Interposing Transducers.

- Metal enclosure, complete with hinged cover and utility seal tab
- Convenient Reverification without electricity shutdown
- 45° colour coded terminals for 5-Amp SDCT Secondaries simplifies installation.
- Integrated Shorting device for "Test" mode simply plugs in (no screws or rewiring required)
- Storage plug for Shorting device when not in use.



Optional NEMA-4 Enclosure (with clear cover) available.

Communication Capabilities

The Meter Interface Device has three phase-inputs for the 5-Amp max input current and three phase-outputs to carry low voltage signals back to the EMP over shielded-twisted pair cable. Transducers usually come in groups of three-phase service as can be seen in the photo, but can be configured for two or single phase as well. Compact and removable Transducers Card simplifies system reverification.

Easy To Install

Standard practice is to mount a Meter Interfaced Device enclosure close to the Current Transformers and run low voltage extension cable to the EMP (up to 1000ft/300m). A comprehensive Installation Manual steps through necessary procedures to properly install the MID-5.

Meets All Standards

- Measurement Canada (E-0266)
- CSA approved (File LR84853 under Model I080)
- Certified to US standards by CSA International

Specifications

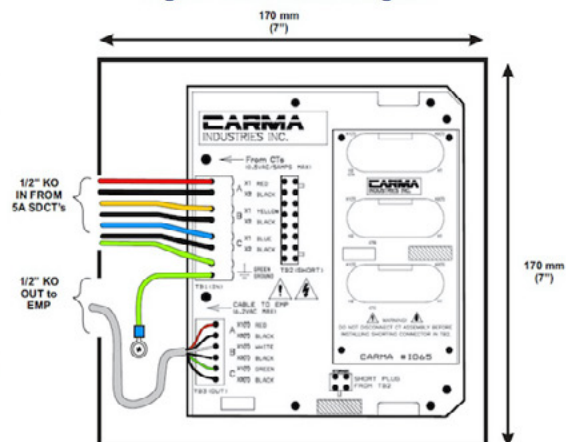
At 5Amp max input at TB1, the input voltage is nominally 0.5 VAC. The output voltage on TB3 is 6.2 VAC max, and is proportional to the input current.

Installation Requirements

The 5-Amp Transducer Card is mounted in the base termination card in a 7" w x 7" h x 4" d enclosure. This is complete with a Shorting Terminal (Tb2). This can be mounted directly to wall.

5AMP SDCT wiring distance is limited to the "burden rating" of the SDCT, but is usually between 15 and 75 ft. (consult 5AMP SDCT datasheets for exact ratings). Wire from 5AMP SDCT's must be protected with conduit (or installed in another enclosure) to ensure current loops are not opened.

Figure 1: Enclosure Diagram





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METER INTERFACE DEVICE (MID-5)



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- Certified to US standards by CSA International

Specifications

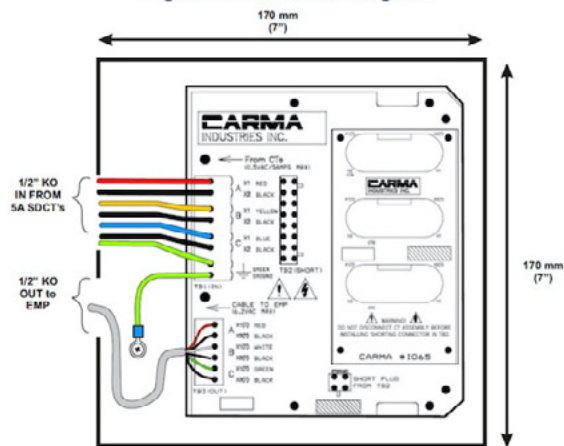
At 5Amp max input at TB1, the input voltage is nominally 0.5 VAC. The output voltage on TB3 is 6.2 VAC max, and is proportional to the input current.

Installation Requirements

The 5-Amp Transducer Card is mounted in the base termination card in a 7" w x 7" h x 4" d enclosure. This is complete with a Shorting Terminal (Tb2). This can be mounted directly to wall.

5AMP SDCT wiring distance is limited to the "burden rating" of the SDCT, but is usually between 15 and 75 ft. (consult 5AMP SDCT datasheets for exact ratings). Wire from 5AMP SDCT's must be protected with conduit (or installed in another enclosure) to ensure current loops are not opened.

Figure 1: Enclosure Diagram



METER INTERFACE DEVICE (MID-5)

Figure 2 - 5/10AMP Interposing Transducer Installation Details (3ph/3w DELTA)

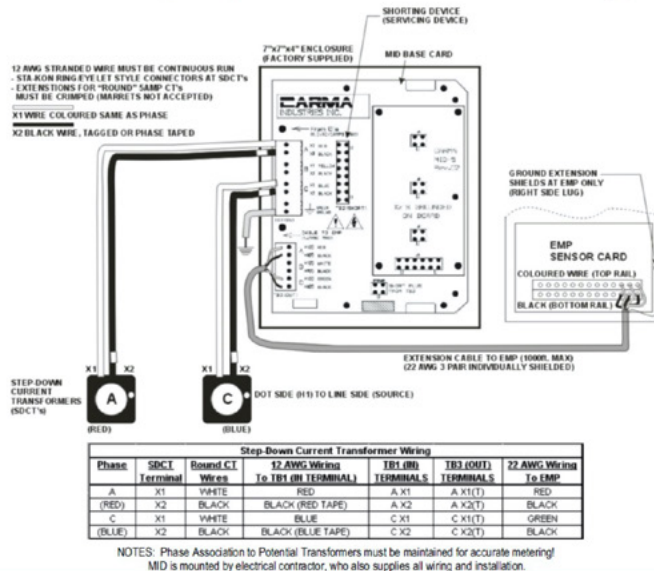
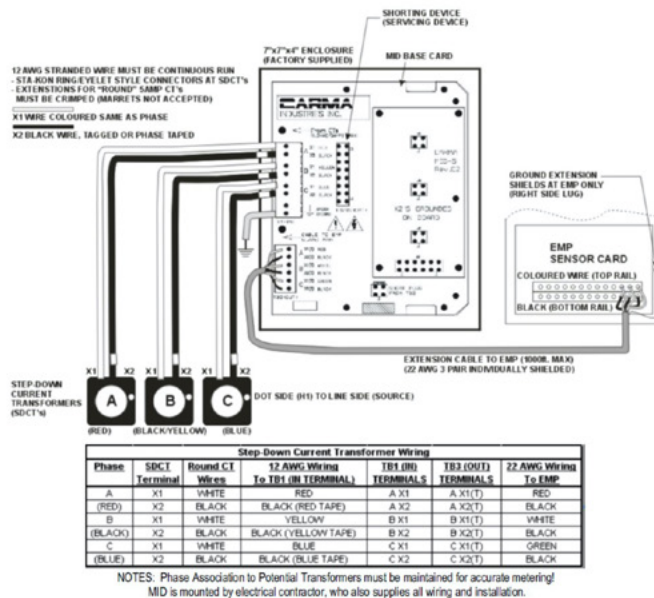


Figure 3 - 5/10AMP Interposing Transducer Installation Details (3ph/4w WYE)



4.10.4 Water Meter Specifications

Meter Type	Supplier
Badger RCDL rotating disc meter (sizes 5/8" to 2", depending on pipe size) with Recordall transmitter register for BAS signal output. If a meter is required for a pipe diameter greater than 2", contact Line Process Controls for Rotary meter specifications.	Timothy Murphy Line Process Controls 50 Venture Drive, Unit 8 Scarborough, ON M1B 3L6 (T) 416 291 8525 (F) 416 291 9987 (C) 416 570 8525 www.lineprocess.com www.jandmengineering.com

Unit of measurement: m³

Typical lead time for delivery – 4 weeks.



Badger Meter

Recordall® Industrial Meters

Nutating Disc Meter, Bronze and Thermoplastic

DESCRIPTION

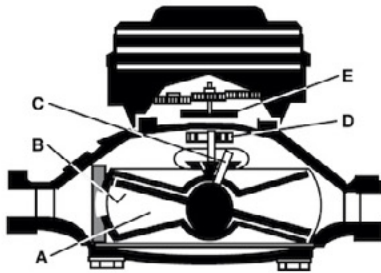
The Badger Meter Recordall (RCDL) positive displacement meters are one of the most cost effective methods in metering industrial fluids. The RCDL meter has a simple, efficient design for high accuracy and repeatability over the entire meter flow range.

Available in five sizes, 1/2" through 2" for flows up to 170 gpm, these meters are extremely rugged and reliable. Maintenance is seldom required, but if necessary, takes only a few minutes. All parts are designed and built of materials that meet your application requirements and provide an enduring and a trouble-free, precision flow meter.

To complement the RCDL meter line, Badger Meter offers a complete line of accessories that includes totalizers, electromechanical and electronic transmitters, rate of flow indicators and batch/process controllers.

OPERATION

The metering principle, known as positive displacement, is based on the continuous filling and discharging of the measuring chamber. Controlled clearances between the disc and the chamber provide precise measurement of each volume cycle. As the disc nutates, the center spindle rotates a magnet. The movement of the magnet is sensed through the meter wall by a follower magnet or by various sensors. Each revolution of the magnet is equivalent to a fixed volume of fluid, which is converted to any engineering unit of measure for totalization, indication or process control.



Liquid flowing through the meter chamber (A) causes a disc (B) to nutate or wobble. This motion, in turn, results in the rotation of a spindle (C) and drive magnet (D). Rotation is transmitted through the wall of the meter to a second magnet (E) or varied style of sensor pickup.



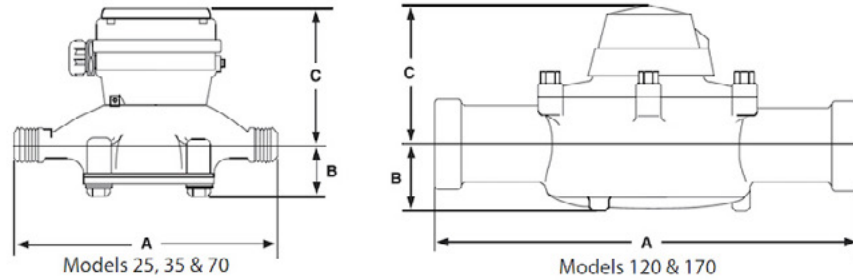
FEATURES

- Wide flow range
- Rugged bronze or thermoplastic housing
- Models 25 and 70—Bronze: 250° F option
- Easily maintained without removing from line
- Durable components for minimal maintenance
- Wide range of compatible accessories

PERFORMANCE

- Accuracy: $\pm 1.5\%$
- Repeatability: $\pm 0.5\%$
- Max. Operating Pressure: 150 psi
- Maximum Operating Temperature:
Plastic housing: 100° F
Bronze housing: 120° F

SPECIFICATIONS



Dimensions in Inches without Register						Flow Rate in Gallons		
Meter Model	Meter Size	Housing Material	Meter Length A	Centerline to Base B	Meter Length with Conn.	Cold Liquids 32...120° F	Chemicals & Oils 32...250° F (BZ) 32...100° F (PL)	Approx. Weight
M25	5/8"	BZ or PL	7-1/2"	1-3/8"	12-7/16"	1/2...25 gpm	1...25 gpm	5 lb
M25	3/4"	BZ or PL	7-1/2"	1-3/8"	12-5/8"	1/2... 30 gpm	1...30 gpm	5 lb
M35	3/4"	BZ	9"	1-3/4"	14-1/8"	3/4... 35 gpm	N/A	6 lb
M40	1"	PL	10-3/4"	2-1/4"	16-3/16"	3/4... 50 gpm	N/A	5 lb
M70	1"	BZ	10-3/4"	2-1/4"	16-5/8"	1...70 gpm	5...70 gpm	12 lb
M120	1-1/2"	BZ	12-5/8"	2-5/8"	19-3/4"	2...120 gpm	*See Note	20 lb
M170	2"	BZ	15-1/4"	3-3/8"	22-7/8"	2...170 gpm	N/A	30 lb

BZ = Bronze; PL = Plastic
NPT connection set assemblies available.

N/A = Not available in high temperature/chemical option.
*Note: Available for chemicals or fluids not to exceed 110° F (43° C)

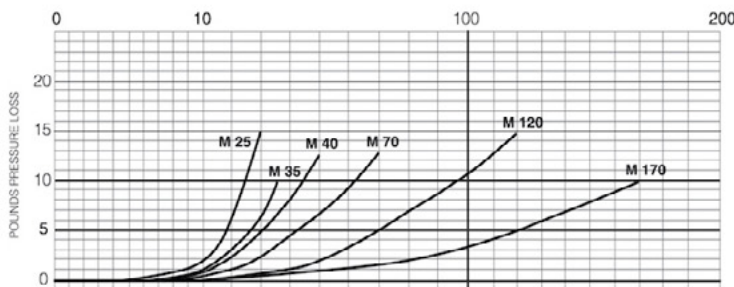
Meter Size	Height Dimensions in Inches with Register and Accessories					
	With Non Resettable Register	With Transmitter	With MS-ER1 Transmitter	With ECA Transmitter	With 258 Register	With Series 76 Register
5/8" & 5/8 x 3/4"	5-3/4"	7-3/8"	11-1/4"	9-3/8"	8"	15-1/4"
3/4"	6-1/8"	7-3/4"	11-5/8"	9-3/8"	8-3/8"	15-5/8"
1"	7-1/2"	9-1/8"	13"	11-3/16"	9-3/4"	17"
1-1/2"	9-1/8"	10-3/8"	14-1/4"	12-3/4"	11"	18-1/4"
2"	10-3/4"	12-1/4"	16-1/8"	14-3/8"	12-7/8"	20-1/8"

MATERIALS OF CONSTRUCTION

	Cold Liquid Units	High Temp. and/or Chemical Units Models 25 & 70
Housing	BZ or PL	BZ: 250° F, PL: 100° F
Chamber	Noryl	LCP
Disc	SAN	LCP
Crossbar	Nylon	Ultem
Magnetic Assembly	Nylon	Ultem
Chamber Retainer	Polyethylene	Metal Clip
Screen	Polypropylene	None

PRESSURE LOSS CHART

Rate of Flow in Gallons Per Minute



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Legacy Document Number: ITB-072



Recordall® Transmitter Register (RTR)

DESCRIPTION

APPLICATIONS: The Recordall® Transmitter Register (RTR®) is designed for use with all Recordall Disc, Turbo, Compound and Fire Service Meters to provide output compatibility with ORION®, GALAXY, Itron® ERT®, and Badger Meter, Inc. approved AMR technology solutions.

RESOLUTION: Digital output from the RTR typically has resolution of 1/10th of the register test circle (resolution may vary in some cases). The electronic resolution table in this brochure lists minimum output resolution for all Recordall meter applications.

MOUNTING: The RTR in its shroud assembly uses a bayonet mount compatible with all Recordall Disc and Turbo meters. A TORX® seal screw is provided to allow positioning of the register for the most convenient reading and to secure the register to the meter body in a tamper resistant mode. The RTR can be removed from the meter without disrupting water service.

MAGNETIC DRIVE: Direct drive high-strength magnetic coupling through the meter body to the wetted magnet provides reliable and dependable register coupling.

SEALED REGISTER: The RTR local register consists of a six-digit straight-reading mechanical odometer totalizer (located in the six o'clock position), a 360° test circle with sweep hand, and a flow finder to detect leaks. The register gearing is self-lubricating thermoplastic to minimize friction and provide long, reliable life. Permanent sealing eliminates moisture, dirt, and other contaminants. The leak rate of the seal is less than 10-6 cc/sec as tested by a helium mass spectrometer.

TAMPER-PROOF FEATURES: Customer removal of the RTR can be prevented by using a tamper resistant TORX seal screw. TORX seal screws are provided as standard accessories with the RTR. Optional tamper detection seal wire screws are also available.

CONSTRUCTION: The housing of the RTR is constructed of a strengthened glass lens top and a corrosion-resistant metal bottom. Internal construction materials are thermoplastics for long-life and high reliability. The integrity of the adhesive seal joining the glass top to the metal base provide unmatched protection in water meter applications. A corrosion and tamper resistant TORX seal screw is provided to secure the RTR to the meter. The shroud assembly is thermoplastic.

TEMPERATURE: The operating range of the RTR is -40...49° C (-40...120° F). The water meter should not be subjected to temperatures below freezing.

MOISTURE: The RTR achieves true water resistance due to the adhesive technology used in the sealing process. Leak rates less than 10-6 cc/sec, as tested by a helium mass spectrometer, are comparable to a true hermetic seal. Due to this unique sealing process, the RTR exceeds all applicable requirements of AWWA Standard C707 regarding moisture intrusion. Register fogging and condensation are no longer an issue.

WIRE CONNECTIONS: The RTR is provided as either a factory prewired assembly or as a register with pre-sized wire harness available for connection in the field.



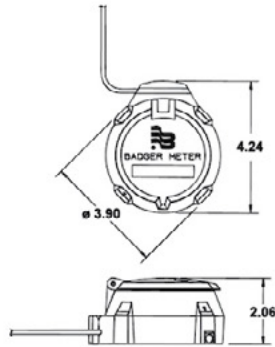
SPECIFICATIONS

Transmitter/Register	Straight reading, permanently sealed, magnetic drive
Unit of Measure	U.S. gallons, cubic feet, cubic meters, clearly identified on register face
Number Wheels	Six with 3/16" high numerals font type
Test Circle	360° circle with ten major increments with ten divisions each
Weight	9 ounces
Humidity	0...100% condensing
Temperature	-40...49° C (-40...120° F)
Signal Characteristics	Open Drain (FET)
Visual Resolution	1/100th of Test Circle
Electronic Resolution	1/10th of Test Circle
Typical Signal Duration	15...75 ms @ 25° C (77° F) 8...75 ms over operating temperature range at 67 µA
On State Resistance	7.5 Ohms @ 25° C (77° F)
Power Source	External
Maximum Switching	30V DC @ 1 mA @ 25° C (77° F)

ELECTRONICS: The piezoelectric switch circuit board is completely sealed against moisture inside the unit and sealed to ensure protection from humidity.

ELECTRICAL: The electronic circuitry is designed to provide immunity to electrical surges and transients per IEC801-2, IEC801-4 Severity Level 4.

OPERATING CHARACTERISTICS: The RTR has an output equal to 1/10th of the meter test circle with the characteristics of an open drain FET. The on-state condition is a solid-state switch closure. Off-state condition is an open circuit. Powered by an external source, the RTR has a maximum rating of 30V DC at 1 mA (25° C).



Dimensional Drawing



RTR Register

MEASUREMENT RESOLUTION: The minimum electronic resolution of the RTR is as noted below. To verify the correct resolution for your application, contact your Badger Meter regional sales office.

RECORDALL Disc Series	Size	Resolution Gallons	Resolution Cubic Feet (ft ³)	Resolution Cubic Meters (m ³)
M25	5/8"	1	0.1	0.01
M25	3/4"	1	0.1	0.01
M35	3/4"	1	0.1	0.01
M40	1"	1	0.1	0.01
M55	1"	1	0.1	0.01
M70	1"	1	0.1	0.01
M120	1-1/2"	10	1	0.1
M170	2"	10	1	0.1

RECORDALL Turbo Series	Resolution Gallons	Resolution Cubic Feet (ft ³)	Resolution Cubic Meters (m ³)
1-1/2"	100	10	0.1
2"	100	10	0.1
3"	100	10	0.1
4"	100	10	0.1
6"	100	10	1
8"	100	10	1
10"	100	10	1
12"	1000	100	1
16"	1000	100	10
20"	1000	1000	10

IMPORTANT

The RTR® should only be connected to a Badger Meter, Inc. approved product. Connection to an unapproved product will void the RTR warranty.

Fire Service Meters	Resolution Gallons	Resolution Cubic Feet (ft ³)	Resolution Cubic Meters (m ³)
3"	100	10	0.1
4"	100	10	0.1
6"	100	10	1
8"	100	10	1
10"	100	10	1

RECORDALL Compound Series	Resolution Gallons	Resolution Cubic Feet (ft ³)	Resolution Cubic Meters (m ³)
2"	100	10	0.1
3"	100	10	0.1
4"	100	10	0.1
6"	100	10	1

Resolution stated as summed total with (2) RTRs, Summator/ Splitter and a single AMR module. Please see the Turbo Series and Disc Series sections for individual high and low side resolution.

Fire Series Assemblies (FSA)	Resolution Gallons	Resolution Cubic Feet (ft ³)	Resolution Cubic Meters (m ³)
4"	100	10	0.1
6"	100	10	1
8"	100	10	1
10"	100	10	1

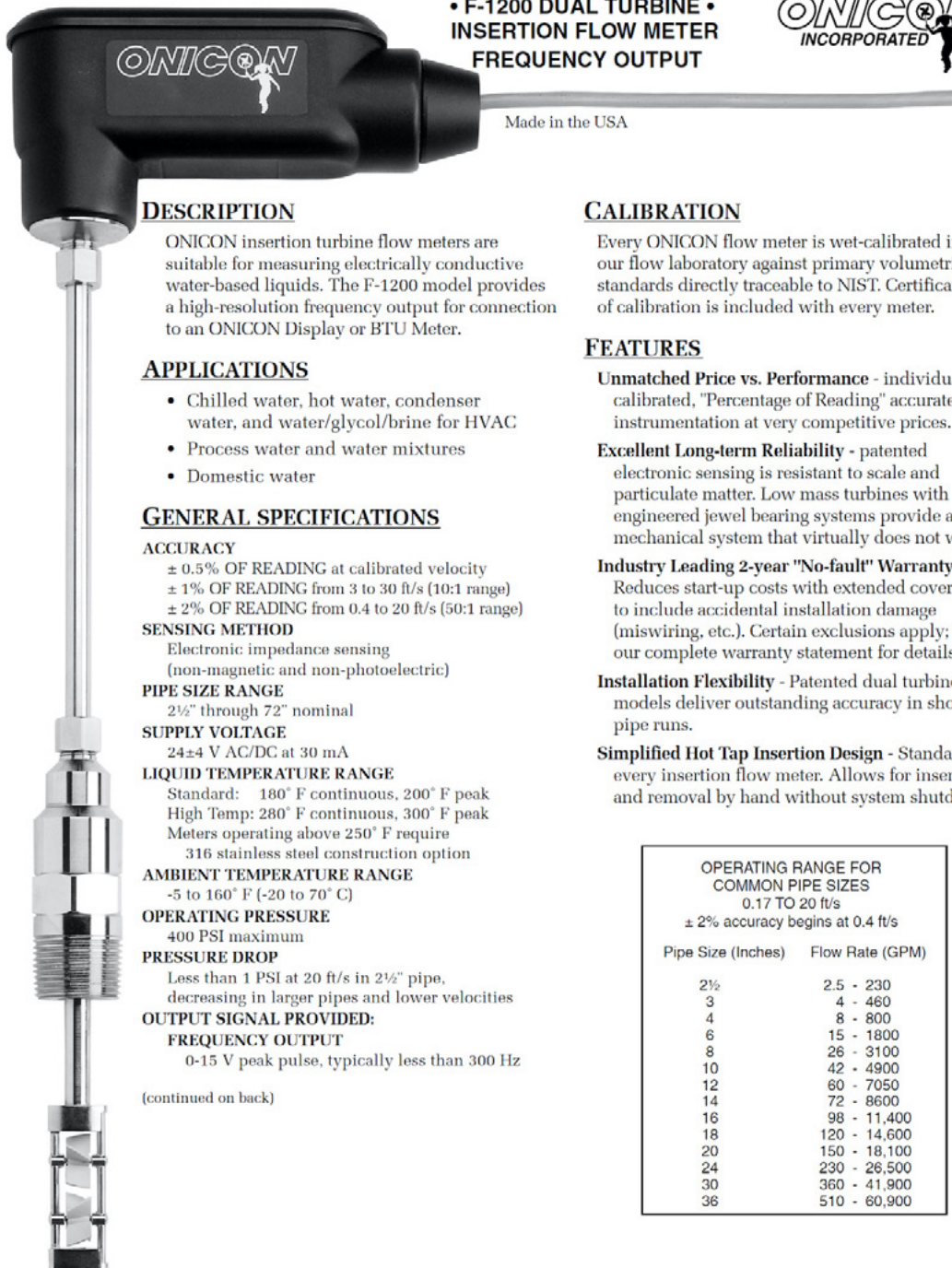
Resolution stated as summed total with two RTRs, Summator/ Splitter and a single AMR module. Please see the Turbo Series and Disc Series sections for individual mainline and by-pass resolution.

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4.10.5 Chilled Water Meter Specifications

Meter Type	Supplier
Onicon F1200 Dual Turbine flow meters	Antonio Figueiredo Kildonan Energy Products 2800 14th Ave, Unit 19 Markham, ON L3R 0E4 (T) 416-494-9457 ext. 114
Unit of measurement: ton hrs	



**• F-1200 DUAL TURBINE •
INSERTION FLOW METER
FREQUENCY OUTPUT**



Made in the USA

DESCRIPTION

ONICON insertion turbine flow meters are suitable for measuring electrically conductive water-based liquids. The F-1200 model provides a high-resolution frequency output for connection to an ONICON Display or BTU Meter.

APPLICATIONS

- Chilled water, hot water, condenser water, and water/glycol/brine for HVAC
- Process water and water mixtures
- Domestic water

GENERAL SPECIFICATIONS

ACCURACY

- ± 0.5% OF READING at calibrated velocity
- ± 1% OF READING from 3 to 30 ft/s (10:1 range)
- ± 2% OF READING from 0.4 to 20 ft/s (50:1 range)

SENSING METHOD

Electronic impedance sensing (non-magnetic and non-photoelectric)

PIPE SIZE RANGE

2½" through 72" nominal

SUPPLY VOLTAGE

24±4 V AC/DC at 30 mA

LIQUID TEMPERATURE RANGE

Standard: 180° F continuous, 200° F peak
High Temp: 280° F continuous, 300° F peak
Meters operating above 250° F require 316 stainless steel construction option

AMBIENT TEMPERATURE RANGE

-5 to 160° F (-20 to 70° C)

OPERATING PRESSURE

400 PSI maximum

PRESSURE DROP

Less than 1 PSI at 20 ft/s in 2½" pipe, decreasing in larger pipes and lower velocities

OUTPUT SIGNAL PROVIDED:

FREQUENCY OUTPUT

0-15 V peak pulse, typically less than 300 Hz

(continued on back)

CALIBRATION

Every ONICON flow meter is wet-calibrated in our flow laboratory against primary volumetric standards directly traceable to NIST. Certification of calibration is included with every meter.

FEATURES

Unmatched Price vs. Performance - individually calibrated, "Percentage of Reading" accurate instrumentation at very competitive prices.

Excellent Long-term Reliability - patented electronic sensing is resistant to scale and particulate matter. Low mass turbines with engineered jewel bearing systems provide a mechanical system that virtually does not wear.

Industry Leading 2-year "No-fault" Warranty - Reduces start-up costs with extended coverage to include accidental installation damage (miswiring, etc.). Certain exclusions apply; see our complete warranty statement for details.

Installation Flexibility - Patented dual turbine models deliver outstanding accuracy in short pipe runs.

Simplified Hot Tap Insertion Design - Standard on every insertion flow meter. Allows for insertion and removal by hand without system shutdown.

OPERATING RANGE FOR COMMON PIPE SIZES	
0.17 TO 20 ft/s	
± 2% accuracy begins at 0.4 ft/s	
Pipe Size (Inches)	Flow Rate (GPM)
2½	2.5 - 230
3	4 - 460
4	8 - 800
6	15 - 1800
8	26 - 3100
10	42 - 4900
12	60 - 7050
14	72 - 8600
16	98 - 11,400
18	120 - 14,600
20	150 - 18,100
24	230 - 26,500
30	360 - 41,900
36	510 - 60,900

F-1200 SPECIFICATIONS cont.

MATERIAL

Wetted metal components
Standard: Electroless nickel plated brass
Optional: 316 stainless steel

ELECTRONICS ENCLOSURE

Standard: Weathertight aluminum enclosure
Optional: Submersible enclosure

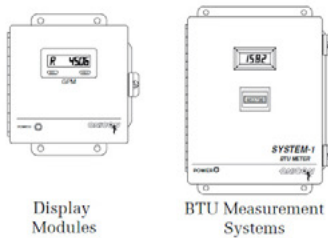
ELECTRICAL CONNECTIONS

3-wire minimum for frequency output
Standard: 10' of cable with 1/2" NPT conduit connection
Optional: Indoor DIN connector with 10' of plenum rated cable

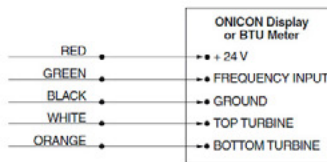
F-1200 Wiring Information

WIRE COLOR CODE		NOTES
RED	(+) 24 V AC/DC supply voltage, 30 mA	Connect to power supply positive
BLACK	(-) Common ground (Common with pipe ground)	Connect to power supply negative
GREEN	(+) Frequency output signal: 0-15 V peak pulse	Signal for ONICON Display or BTU meter
DIAGNOSTIC SIGNALS		
ORANGE	Bottom turbine frequency	These signals are for diagnostic purposes - connect to local display or BTU Meter
WHITE	Top turbine frequency	

ALSO AVAILABLE



F-1200 Wiring Diagram

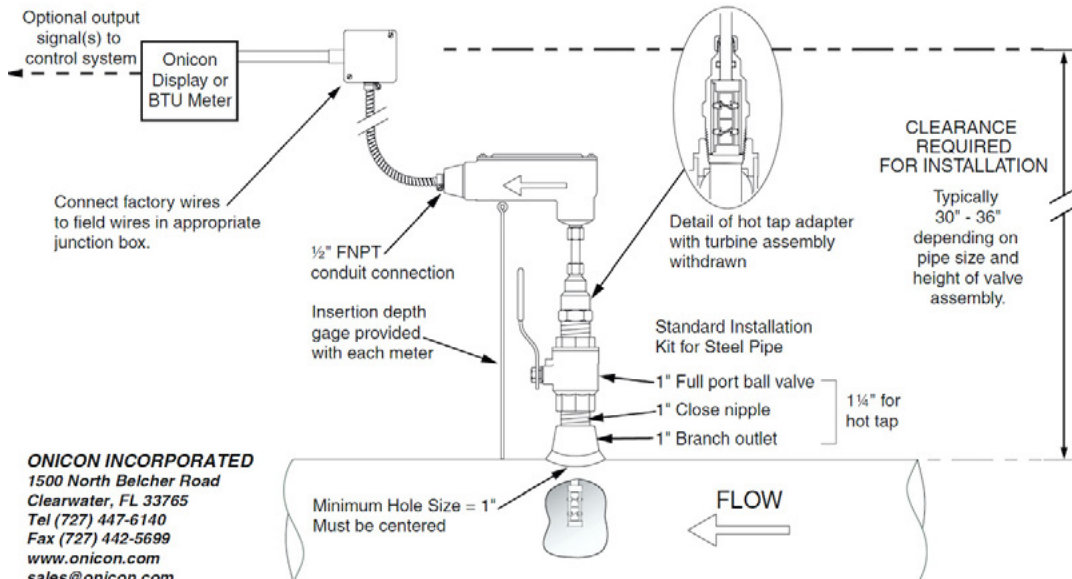


NOTE: Black wire is common with the pipe ground (typically earth ground).

Typical Meter Installation

(New construction or scheduled shutdown)

- Acceptable to install in vertical pipe
- Position meter anywhere in upper 180° for horizontal pipe



ONICON INCORPORATED
1500 North Belcher Road
Clearwater, FL 33765
Tel (727) 447-6140
Fax (727) 442-5699
www.onicon.com
sales@onicon.com

Note: Installation kits vary based on pipe material and application. For installations in pressurized (live) systems, use "Hot tap" 1 1/4 inch installation kit and drill hole using a 1 inch wet tap drill.



• SYSTEM-10 BTU METER •



DESCRIPTION

The System-10 BTU Meter provides highly accurate thermal energy measurement in chilled water, hot water and condenser water systems based on signal inputs from two matched temperature sensors (included) and any of ONICON's insertion or inline flow meters (ordered separately). The basic model provides local indication of energy, flow and temperature data through an alphanumeric display. An isolated solid state dry contact is provided for energy total. Optional analog outputs and network communications are also available.

APPLICATIONS

Chilled water, hot water and condenser water systems for:

- Commercial office tenant billing
- Central plant monitoring
- University campus monitoring
- Institutional energy cost allocation
- Performance/efficiency evaluations
- Performance contracting energy monitoring

ORDERING INFORMATION

The System-10 BTU Meter is sold complete with temperature sensors and standard thermowells. Flow meters are purchased separately.

ITEM #	DESCRIPTION
SYSTEM-10	System-10 BTU Meter
SYSTEM-10-OPT1	Add for 6" and larger pipes
SYSTEM-10-OPT2	Add for 2.5" - 3" copper tube
SYSTEM-10-OPT3	Add for 4" copper tube
SYSTEM-10-OPT4	Upgrade to outdoor thermowells (pair)
SYSTEM-10-OPT5	Upgrade to hot tap thermowells (pair)
SYSTEM-10-OPT8	High temperature sensors (over 200°F)
SYSTEM-10-OPT9	Add one analog output
SYSTEM-10-OPT10	Add four analog outputs
SYSTEM-10-OPT11	Auxiliary pulse input
Choose from the following flow meters:	
F-1100/F-1200	Insertion Turbine Flow Meter (1 1/4" - 72")
F-1300	Inline Turbine Flow Meter (3/4" - 1")
F-2000 Series	Full Bore Vortex Flow Meter
F-3000 Series	Full Bore Electromagnetic Flow Meter
F-3500	Insertion Electromagnetic Flow Meter (3" - 72")
Refer to catalog for flow meter installation kits. Consult with ONICON for additional flow meter types.	

FEATURES

Simple Installation and Commissioning - Factory programmed and ready for use upon delivery. All process data and programming functions are accessible via front panel display and keypad.

Single Source Responsibility - One manufacturer is responsible for every aspect of the energy measurement process ensuring component compatibility and overall system accuracy.

N.I.S.T. Traceable Calibration with Certification - Each Btu measurement system is individually calibrated using application specific flow and temperature data and is provided with calibration certifications.

Precision Solid State Temperature Sensors - Custom calibrated and matched to an accuracy better than $\pm 0.15^\circ \text{F}$ over calibrated range.

Highly Accurate Flow Meters - ONICON offers a wide variety of insertion and inline type flow measurement technologies including turbine, electromagnetic and vortex sensing. Each type offers unique advantages depending on the application. All ONICON flow meters are individually wet calibrated and designed to operate over a wide flow velocity range with accuracies ranging from $\pm 0.2\%$ to $\pm 2.0\%$ of rate depending on the model.

Complete Installation Package - All mechanical installation hardware, color coded interconnecting cabling and installation instructions are provided to ensure error-free installation and accurate system performance.

Serial Communications - Optional communications card provides complete energy, flow and temperature data to the control system through a single network connection, reducing installation costs.



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2113 / 0298-1

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08-10

SYSTEM-10 BTU METER SPECIFICATIONS



CALIBRATION

Flow meters and temperature sensors are individually calibrated followed by a complete system calibration. Field commissioning is also available.

ACCURACY

Differential temperature accuracy $\pm 0.15^\circ\text{F}$ over calibrated range
Computing nonlinearity within $\pm 0.05\%$

PROGRAMMING

Factory programmed for specific application
Field programmable via front panel interface

MEMORY

Non-volatile EEPROM memory retains all program parameters and totalized values in the event of power loss.

DISPLAY

Alphanumeric LCD displays total energy, total flow, energy rate, flow rate, supply temperature and return temperature.

Alpha: 16 character, 0.2" high; Numeric: 6 digit, 0.4" high

OUTPUT SIGNALS

Standard:
Isolated solid state dry contact for energy total:
Contact rating: 100 mA, 50 V
Contact duration: 0.5, 1, 2, or 6 sec

Optional:

Analog Output(s) (4-20 mA, 0-10 V or 0-5 V):
One or four analog output(s) available for flow rate, energy rate, supply/return temps, or delta-T.
Serial Communications:

BACnet IP or MS/TP	LONWORKS
Siemens Apogee - P1	Johnson Controls Metasys - N2
MODBUS RTU RS485 or TCP/IP	

TEMPERATURE SENSORS

Solid state sensors are custom calibrated using N.I.S.T. traceable temperature standards.
Current based signal (mA) is unaffected by wire length.

TEMPERATURE RANGE

Liquid temperature range: 32° F to 200° F
Optional liquid temperature ranges: 122° F to 302° F
200° F to 500° F
Ambient temperature range: 40° F to 120° F

LIQUID FLOW SIGNAL INPUT

0-15 V pulse output from any ONICON flow meter

MECHANICAL

Electronics Enclosure:

Standard: Steel NEMA 13, wall mount, 8"x10"x4"
Optional: NEMA 4 (Not UL listed)
Approximate weight: 12 lbs

Temperature Thermowells:

Standard: 1/2" NPT brass thermowells (length varies with pipe size) with junction box
Note: 6" pipes and larger require SS thermowell option.

- Optional:
- 1/2" NPT stainless steel thermowells
 - Outdoor junction box with thermal insulation
 - Hot tap thermowells with isolation valves are available in plated brass or stainless steel.

ELECTRICAL

Input Power*:

Standard: 24 VAC, 50/60 Hz, 500 mA
Optional: 120 VAC, 50/60 Hz, 200 mA
230 VAC, 50 Hz, 150 mA

*Based on Btu meters configured for network connection without the optional analog outputs

Internal Supply:

Provides 24 VDC at 200 mA to electronics and flow meter

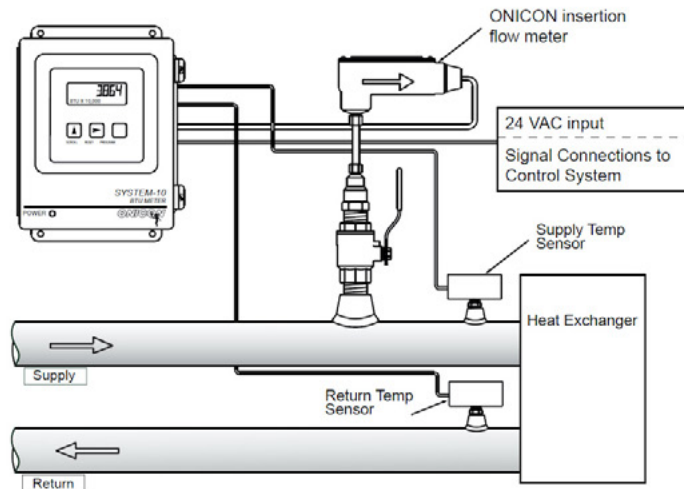
Wiring:

Temperature signals: Use 18-22 ga twisted shielded pair
Flow signals: Use 18 - 22 ga - see flow meter specification sheet for number of conductors.

Note: Specifications are subject to change without notice.

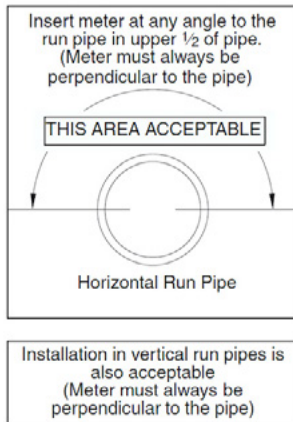
TYPICAL SYSTEM-10 INSTALLATION

Insertion turbine flow meter shown. Any ONICON flow meter may be used with the System-10 BTU Meter. Consult with ONICON for additional flow meter types.



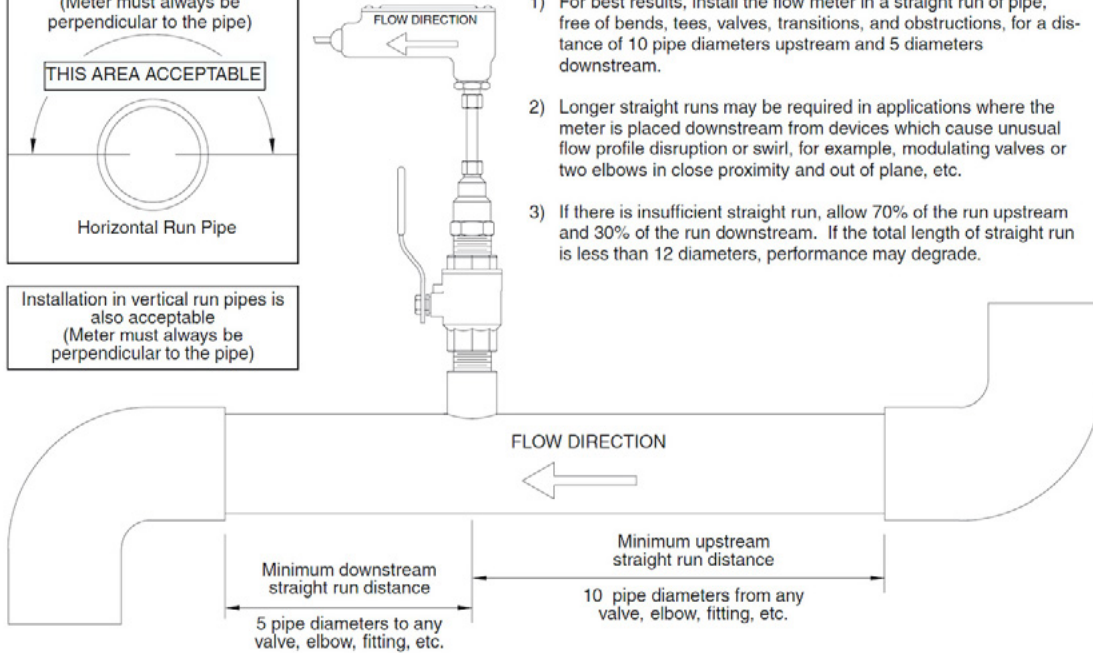
1500 North Belcher Road, Clearwater, Florida 33765 • Tel 727 447-6140 • Fax 727 442-5699

MECHANICAL INSTALLATION LAYOUT
Series F-1200 Dual Turbine Flow Meters



GENERAL PRACTICES

- 1) For best results, install the flow meter in a straight run of pipe, free of bends, tees, valves, transitions, and obstructions, for a distance of 10 pipe diameters upstream and 5 diameters downstream.
- 2) Longer straight runs may be required in applications where the meter is placed downstream from devices which cause unusual flow profile disruption or swirl, for example, modulating valves or two elbows in close proximity and out of plane, etc.
- 3) If there is insufficient straight run, allow 70% of the run upstream and 30% of the run downstream. If the total length of straight run is less than 12 diameters, performance may degrade.



0058 / 3-18-99

1500 North Belcher Road, Clearwater, Florida 33765 Tel (727) 447-6140 Fax (727) 442-5699
www.onicon.com E-mail: sales@onicon.com

4.10.6 Gas Meter Specifications

Meter Type	Supplier
American Meter Company diaphragm meter or Elster rotary meter, as appropriate, for consumption volumes with TCI compensating index for connection to BAS	Timothy Murphy Line Process Controls 50 Venture Drive, Unit 8 Scarborough, ON M1B 3L6 (T) 416 291 8525 (F) 416 291 9987 (C) 416 570 8525 www.lineprocess.com www.jandmengineering.com
Unit of measurement: m ³	

Typical lead time for delivery is 4 to 8 weeks. If meter certification is required, additional lead time may be necessary. Due to Measurement Canada meter standards, the Landlord will install all gas meters at 100 Wellington St. W. (Tower 3) concourse at the Tenant's cost. All other concourse Tenants using gas outside of Tower 3 are to contact the gas utility company directly for meter installation and account set-up.

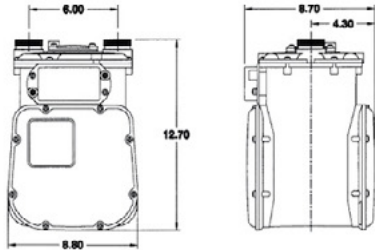
All gas-fired equipment used inside or outside the property must be identified to the Fire and Life Safety team for fire protection system inspections and approval.



AC-250

FEATURES

- Die-cast aluminum case
- Oil-impregnated, self-lubricating bearings
- Exclusive convoluted diaphragm
- Rigid, reinforced flag rods
- Graphite-filled phenolic valves
- Long-life grommet seals
- Temperature compensation available from -30° F to 140° F
- 10 LT, 20 LT, 30 LT and #1 Sprague connection sizes
- Pointer or odometer index
- 5 PSI MAOP and 250 cfh at 1/2-inch w.c. differential
- Automatic meter reader compatibility



WEIGHT = 12 lbs.

- Reference Materials**
 Installation Instructions AIM-3715
 Repair Parts List RPL-3835

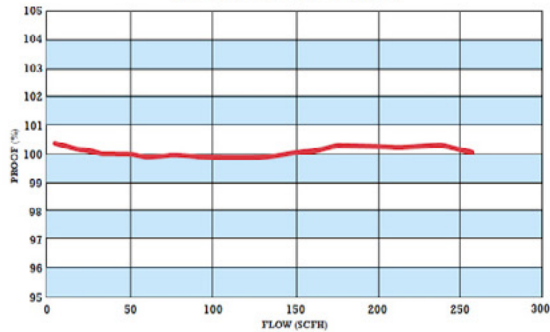
APPLICATIONS —The American class AC-250 is the industry's most cost-effective gas meter for residential applications. It is unequalled for accuracy retention and for life cycle maintenance economies.

Rated Gas Capacity For 0.60 S.G. Gas

Inlet Pressure PSIG	Inches W.C. Differential	Capacity SCFH
.25	1/2"	250 ^{1,2}
.25	2"	565
1	2"	583
2	2"	600
5	2"	656
10	2"	742

- 1 - Propane - 158 cfh
- 2 - Butane - 138 cfh

AC-250 PROOF CURVE



Order Information:

Regular or Temperature Compensated: _____
 U.S. or Metric: _____
 Size of Connection: _____
 Type of Index: _____
 Proof Preference: 100 +/- 1% _____
 Standard Color - ASA #49 Grey: _____
 Contact American Meter with any questions or orders at the address and phone number below.

American Meter
 300 Welsh Road, Building One • Horsham, PA 19044-2234 • USA
 Tel: (215) 830-1800 • Fax: (215) 830-1890

Canadian Meter
 3037 Derry Road, West • Milton, Ontario L9T 2X6 • Canada
 Tel: (905) 878-2361 • Fax: (905) 878-5758

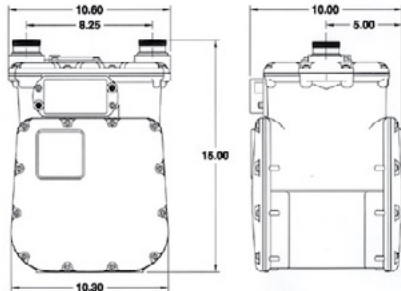
Elster AMCO
 300 Welsh Road, Building One • Horsham, PA 19044-2234 • USA
 Tel: (215) 830-1800 • Fax: (215) 830-1894





AL-425

- One-piece, die-cast aluminum case
- Oil impregnated, self-lubricating bearings
- Convulated duramic diaphragms
- Rigid, reinforced flag rods
- Graphite-filled, phenolic valves
- Long-life grommet seals
- Automatic meter reader compatibility
- Temperature compensation available from -30°F to 140°F
- 10 or 25 PSI MAOP
- 20 LT, 30 LT, 45 LT and #3-4 Sprague connection sizes
- Full warranty
- Pointer or odometer index



WEIGHT = 21 lbs.

Reference Materials

- Installation Instructions AIM-3715
- Operation/Maintenance
- Manual & Video 52722P002
- Repair Parts List RPL-3806

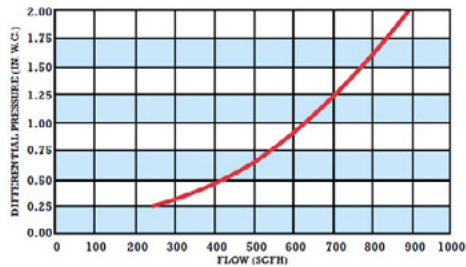
APPLICATIONS —
This meter is ideally suited for larger residential or small commercial/industrial installations. Its 25 PSIG MAOP case-rating affords the opportunity to utilize pressure factor measurement. Pressure equivalent indexes are available.

Rated Gas Capacity For 0.60 S.C. Gas

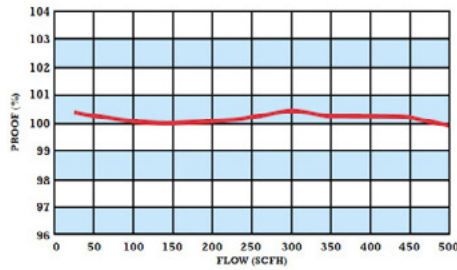
Inlet Pressure PSIG	Inches W.C. Differential	Capacity SCFH
.25	1/2"	425 ^{1,2}
.25	2"	898
1	2"	920
2	2"	955
5	2"	1038
10	2"	1154
15	2"	1269
20	2"	1367
25	2"	1462

1 - Propane - 268 cfh
2 - Butane - 234 cfh

AL-425 CAPACITY CURVE @ .25 PSIG inlet



AL-425 PROOF CURVE



Order Information:

Model No.: _____
 Regular or Temperature Compensated: _____
 U.S. or Metric: _____
 Size of Connection: _____
 Type of Index: _____
 Proof Preference: 100 +/- 1% _____
 Standard Color - ASA #49 Grey: _____
 Contact American Meter with any questions or orders at the address and phone number below.

American Meter
 300 Welsh Road, Building One • Horsham, PA 19044-2234 • USA
 Tel: (215) 830-1800 • Fax: (215) 830-1890

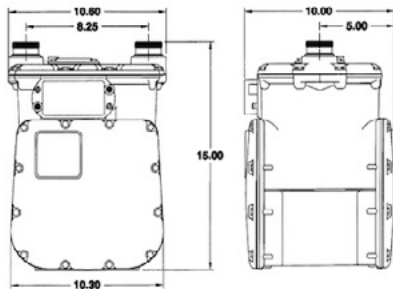
Canadian Meter
 3037 Derry Road, West • Milton, Ontario L9T 2X6 • Canada
 Tel: (905) 878-2361 • Fax: (905) 878-5758





AC-630

- Convoluted diaphragms
- Unique valve design
- Smaller meter profile
- Superior corrosion resistance
- Regular or TC tangent
- Automatic meter reader capability
- Permanent lube bearings
- 20 LT, 30 LT, 45 LT and #3-4 Sprague connection sizes
- Full warranty
- Pointer or odometer index



WEIGHT = 21 lbs.

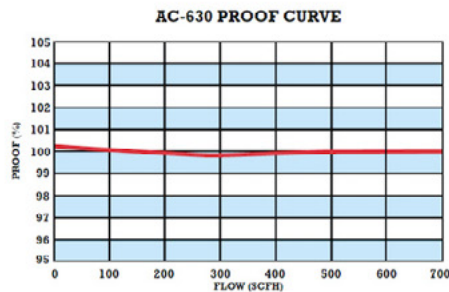
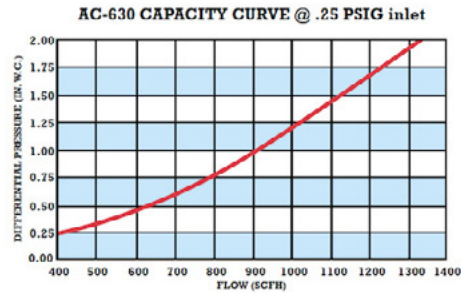
- Reference Materials**
- Installation Instructions AIM-3715
 - Operation/Maintenance Manual & Video 52722P002
 - Repair Parts List RPL-3850

SAVE MONEY — on installation and maintenance with the AC-630. Long-term performance is proven with 40 years of craftsmanship that have gone into its development. **Plus**, just one serviceperson is needed to install the 21 lb. AC-630, reducing your costs and lowering the possibility for injury.

Rated Gas Capacity For 0.60 S.G. Gas

Inlet Pressure PSIG	Inches W.C. Differential	Capacity SCFH
.25	1/2"	630 ^{1,2}
.25	2"	1320
1	2"	1340
2	2"	1390
5	2"	1515
10	2"	1710
15	2"	1890
20	2"	2010
25	2"	2160

1 - Propane - 397 cfh
2 - Butane - 347 cfh



Order Information:
 Model No.: _____
 Regular or Temperature Compensated: _____
 U.S. or Metric: _____
 Size of Connection: _____
 Type of Index: _____
 Proof Preference: 100 +/- 1% _____
 Standard Color – ASA #49 Grey: _____
 Contact American Meter with any questions or orders at the address and phone number below.

American Meter
 300 Welsh Road, Building One • Horsham, PA 19044-2234 • USA
 Tel: (215) 830-1800 • Fax: (215) 830-1890

Canadian Meter
 3037 Derry Road, West • Milton, Ontario L9T 2X6 • Canada
 Tel: (905) 878-2361 • Fax: (905) 878-5758



RPM Rotary Gas Meter

03 Elster American Meter

RPM Rotary Gas Meter Models

Standard models and optional accessories provide versatility and flexibility to fit the most demanding applications.



RPM Series Rotary Meters meet the following:

- ASME Boiler & Pressure Vessel Code; Section VIII
- ANSI B16.5 Flanged Pipe & Fittings
- ANSI B31.8 Gas Piping
- ANSI B109.3 Rotary Gas Meters (2000)
- 49 CFR 192 Min. Federal Safety Standards
- National Safe Transit Association (NSTA-1A-Packaging)
- Measurement Canada approval AG-0420 REV 4

Standard Models

CTR - Uncorrected Mechanical Totalizer

CID - CTR with Instrument Drive

CRVP - CTR with Remote Volume Pulser (RVP)

CMTC - Continuous Mechanical Temperature Compensator

TCID - CMTC with Instrument Drive

TRVP - CMTC with Remote Volume Pulser (RVP)



Optional Accessories

Other options include

- Reverse Flow
- Thermowell
- RVP Mounting Kit
- Instrument Drive Kit
- Pete's Plugs II®
- Mounting bolts and flange gaskets
- Gasket Strainers
- Pressure Compensating Indexes
- Restricting Orifice Plate
- Differential Pressure Gauge Kit
- 1-1/2" NPT Mounting Kit for 2" flanged meters
- Proving Clamp
- Factory AMR/AMI Installation

Available Register Masking & Multipliers

RPM register masking & multipliers are available in both English and Metric units.

English Units (FT³)

- 4 x 1000^{1,3}
- 5 x 100^{1,2,3}
- 5 x 1000^{2,3}
- 6 x 10¹
- 6 x 100^{1,2,3}
- 6 x 1000⁴

Metric Units (m³)

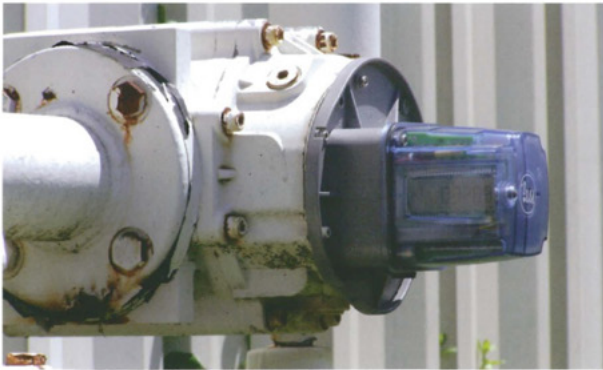
- 5 x 0.1¹
- 6 x 0.1¹
- 6 x 1^{1,2,3}
- 6 x 10^{2,4}



¹ 1.5M-11M CTR, ² 16M CTR, ³ 1.5M-11M CMTC, ⁴ 16M CMTC

MERCURY TCI

“Give new life to an old meter.”



“Reduce costs with integrated AMR.”



Specifications

- 20 year nominal battery life
- 20 year calibration
- 2 minute proving with a Model 5 and Mercury TC Tester
- Submersible
- Total Accuracy: +/- 0.25%
- Redundant input from any rotary meter
- Back-up memory module contains the last 90 days of time stamped data
- LCD characters invert electronically for left-side or right-side mounting (**smart!**)
- Adapter plates for all popular rotary meters
- Two isolated volume pulse output channels
- One isolated alarm pulse output channel
- Integrated infrared communications port (**cool!**)
- Rugged pushbutton toggles the LCD scroll list through 10 parameters
- UV Resistant Polycarbonate enclosure
- Battery life indicated in months or percent
- Highly responsive temperature sensor
- Ambient temperature: -40 to 160 °F (-40 to 71 °C)
- Ambient humidity: 0 to 100% condensing
- No new software required. Configured with widely used Masterlink
- User-configurable Fixed Pressure Factor
- Compatible with Itron, Sensus, Hexagram, Cellnet and other AMR devices
- 4 Year Warranty
- CSA Class I, Div 1 & 2, Group D Certification

At Mercury Instruments, the Customer is King.



P 513.272.1111 3940 Virginia Avenue, Cincinnati, Oh 45227
F 513.272.0211 www.mercuryinstruments.com www.rmg.com



Meter Type

Carma Current Transducers & MIDs as per attached specifications and installation guidelines

Supplier

Prakash Joseph
Carma Industries
1 Dundas Street West, Suite 2304
Toronto, ON M5G 1Z3
(T) 416-712-0733
(E) pjoseph@carmacorp.com

Meter Calibration work Sheet													
Meter Number	Description Of Use	Owner Name	Location Tower/Level/Room	Manufacturer	Serial Number	Calibration Date	Calibration Frequency	Asset Number	Functionality Condition	Range/ Capacity	Billable To	Monthly Consumption	Measuring Unit
Downstream Meter #		Is The Meter Connected To BAS / Which System		Description / Reason For Calibration									
Meter System Sketch/ Description													

Data Compiled by the HFM Team
This form is proprietary to HFM. It is intended for the use of the Cadillac Fairview Meter Inventory project only, and contains information that is privileged and confidential.
Copying, distribution or use of it is prohibited.

The electrical contractor is to supply and install Carma Industries digital sub-metering for all tenant power and lighting. TDC strongly recommends that the contractor install a dedicated electrical panel for each tenant on the floor.

The tenant's contractor is responsible for acquiring all sub-metering installation details from Carma Industries and for complying with all requirements outlined in the installation details sheets.

Carma will require a soft copy of the project single line documentation, project specification, and any project-specific details in order to review and estimate the project cost. Once Carma receives the meter quotation request, Carma will provide the electrical contractor with an electronic copy of the Carma Industries METERMANAGER™ System Installation Manual for review and reference.

The tenant's contractor is responsible for all of the following:

- Conduit(s) for the communications Local Area Network (LAN)
- Conduit for CT and PT leads (CT-Current Transducer, PT-Potential Transformer)
- Connectors, fasteners, and junction boxes for conduit
- Providing and mounting PT enclosures for housing PTs and fuse blocks in 10"x10"x4" D- Box
- Installing all CTs on the phases corresponding to their assigned PTs as per the EMP wiring chart and individual CT serial numbers
- Ensuring that the white dot on the CTs points toward the power source
- Connecting line-side of PT fuse block to CT source using red, black and blue 12-gauge wire
- Where step-down CTs over 400 amps are required, providing and mounting enclosures for housing 5 Amp Transducers and Shorting Terminals in a 10"x10"x4" D-Box. Shorting terminals will be supplied by Carma Industries
- Where step-down CTs over 400 amps are required, mounting shorting terminals and connecting current transformer secondaries using red, black, blue and white 12-gauge wire
- Ensuring that CTs and PTs are accessible by Measurement Canada inspection personnel
- Performing any corrections or tracing deemed necessary by Carma Industries
- Coordinating access to EMP enclosures that are Measurement Canada sealed with Carma
- Installing all conduit connections to EMPs in a water-tight manner
- Balancing all electrical loads

Meter Addition Information Work Sheet

Units of Measurement:

Water: m³

Chilled Water: ton hrs

Gas: m³

Pre-Operational Cleaning Procedures

All mechanical contractors shall clean, flush, and charge any and all new piping for “Closed Systems” using the following methods: Ferroquest FQ7103 and Corrshield MD4102, or a landlord-approved equivalent.

Once the mechanical contractors have finished the procedure, they must provide Cadillac Fairview with a “final flush water” sample so CF can confirm system cleanliness. Once accepted by Cadillac Fairview, the new piping shall be charged with Corrshield MD4102 to achieve a molybdenum level of 100 ppm or better. The contractor shall not connect the new piping to the existing systems until CF has provided approval.

The tenant will be held responsible for any contamination of any “existing systems” by means of an improperly cleaned and/or charged retrofit system(s). The tenant will bear the cost of rectification, as determined by Cadillac Fairview, and all associated costs will be charged back to the tenant’s account.

4.11 Application

Iron oxide corrosion products, oil, grease, and dirt from new heat exchangers auxiliary equipment and piping can be successfully removed with Ferroquest 7103 (GE Technologies – Neutral pH Iron Cleaner) at temperature ranges from 1°C to 80°C.

4.11.1 Typical Dosage and Usage Guidelines

The concentration of the Ferroquest solution should always be at least 1% or 10kg/1000L or 100lbs/1000IG. Below this level, the cleaner may not prevent the objectionable “flash rusting” reaction from occurring during the draining and flushing operation of the cleaned system.

The following factors affect the dissolving rate of the deposit on the metal surface:

- Concentration of Ferroquest 7103
- PH of the cleaning solution
- Temperature of cleaning solution
- Type of iron oxide deposits
- Percent of non-iron oxide constituents in the deposit
- Thickness of the deposit
- Surface condition (hard or soft) of the deposit.

The use of either softened or un-softened makeup water has no effect on the dissolving rate of the corrosion products in the system.

A minimum of 72 hours is required to completely remove rust deposits and dissolve the oily film on the surface of the

metal in a system with an ambient temperature of 16°–24°C (60°–75°F). For optimum effect, Ferroquest 7103 should be continuously circulated during the entire cleaning operation.

Field experience has shown that a system's re-circulating pump may be satisfactorily used throughout the entire cleaning operation. Once the process is complete, the system should be drained and flushed. After the spent pre-operational cleaning solution has been effectively removed from a cleaned system, it should be immediately refilled with makeup water and the required concentration of corrosion inhibitor.

4.11.2 Water Balancing Verification

Upon completion of the tenant work on both open and closed water systems, the landlord's approved contractor shall submit all water balancing reports to the landlord. The tenant is responsible for the cost of these reports.

4.12 Fire Protection

4.12.1 Sprinkler, Fire Hose & Cabinets

Each floor at the TD Centre is equipped with fire hose cabinets (FHCs), portable fire extinguishers, smoke detectors, and automatic sprinkler systems. Floors 2 to 16 at 222 Bay St. also have interior window sprinklers on the south and west perimeters. As well, every floor at 222 Bay St. and 95 Wellington St. W. has an alarm valve.

With the approval of the Manager, Fire & Life Safety, tenants may add additional FHCs. Tenants are responsible for the cost and must submit drawings for review before beginning the work.

In some specific circumstances, tenants may instead upgrade the base building FHC by installing 100-foot long hoses. Again, the tenant is responsible for the costs associated with this upgrade and must submit drawings to the Manager, Fire & Life Safety to review and approve before beginning the work.

All existing tenant FHCs will be reviewed for the installation of a new/newer 1 ½" PRV valve and new valve on the 2 ½". This replacement is a TDC base building standard.

TDC Operations review all existing tenant FHCs to determine if the PRV valves should be replaced.

Chubb Edward Securities must inspect and certify any fire alarm device that has been replaced, modified or altered, as per ULC S537.

4.12.2 Design Guidelines – General Requirements for Office Floors

4.12.2.a Manual Pull Stations

- Any fire alarm manual pull station that has been replaced will remain in its existing location, provided it is within ULC S524 requirements of 1400 mm.
- New fire alarm manual pull stations are to be installed at 1200 mm.
- Manual pull stations installed at mag locks require local release.

4.12.2.b. Smoke Detection

All building electrical and telephone rooms must have a smoke detector as per ULC S524 requirements.

- All sides of the openings of interconnected areas, such as internal stairs, require smoke detection devices. Signal sequence programming must be altered to provide signal operation to all interconnected floor areas.
- New or relocated smoke detection wiring with the floor areas must be FAS 90 Cable in EMT with flexible connections to each device not exceeding five (5) feet.

4.12.2.c Floor Areas Smoke Detection

- All common office floor areas and public corridors require smoke detection as per ULC S524 requirements
- In a 30-foot x 30-foot area, coverage is to be 900 sq. ft. per device.
- In corridors no wider than 10 feet, coverage should be no more than 20 feet from the end wall and no more than 40 feet apart.
- Devices are to be programmed as supervisory input to the fire alarm system.
- New or replacement smoke detection wiring within the floor areas must be FAS 90 Cable in EMT with flexible connections to each device not exceeding five (5) feet.
- Area protection is not required in spaces such as individual offices, conference rooms, boardrooms, kitchen, and washrooms with an area less than 900 sq. ft.

4.12.2.d Voice Communication Speakers

- All speakers are to match existing floor speakers. Any painted speaker is to be replaced.
- Speakers are to be 70V, tapped at 0.5 watt.
- General open office coverage is 30 feet x 30 feet.
- Speakers must meet minimum audibility requirements of 65dba.
- Note that sound will not carry from an open area or corridor through a door to an office or through two sets of doors to a back room. Speakers would be required in each room.
- New or relocated speaker wiring within the floor areas must be FAS 90 Cable in EMT with flexible connections to each device not exceeding five (5) feet.

4.13 Chilled Water

Victaulic couplings are **not** permitted on any chilled water in TD Bank Tower/66 Wellington St. W., TD West Tower/100 Wellington St. W., TD North Tower/77 King St. W., and 222 Bay St. All couplings must be welded.

Victaulic couplings are permitted in TD South Tower/79 Wellington St. W. and 95 Wellington St. W.

4.14 Induction Units

Unless otherwise approved by the landlord, induction units are to be base building standard black: PPG Industries Inc. V-56-90/BT SAT WROGHT Iron Black

For service and maintenance, the landlord must have complete access to the perimeter induction units, including those that the tenant has modified through leasehold improvements.

PART 5: TENANT DRAWINGS

5.1 General

All drawings should be sent to tdcprojects@cadillacfairview.com:

5.1.1 Drawing Review Process – Limited to Base Building Systems

Drawing review by the landlord and its base building consultants is limited to the impact of the proposed design on the base building systems.

The review process does not verify or consider whatsoever the adequacy of the design in relation to applicable and/or relevant building codes, standards, tenant requirements, etc. The tenant's design team is responsible to consider and/or verify the adequacy of the design against applicable and/or relevant building codes, standards, tenant requirements, etc.

As well, the review process does not consider whatsoever the functionality or performance of the designed systems in the installed condition.

5.1.2 Landlord's Right to Request Additional Information

The landlord reserves the right to request additional information, to define or clarify any item, before giving approval.

If a tenant fails to observe any TDC requirement when preparing drawings, the landlord or the landlord's base building consultant may request revisions and resubmission.

The landlord also reserves the right to alter any section of this Design & Construction Manual information without notice, which may require the tenant to make a further submission.

5.1.3 Notice Required and Turnaround Time

The landlord requires up to ten (10) business days to review drawings and provide comments and/or approval. Any revisions to the approved drawing set must be re-submitted for subsequent approval. Resubmissions also require up to ten (10) business days for review.

When submitting drawings, the tenant and/or the tenant's design team should consider the turnaround time, and plan accordingly. The landlord will not be held responsible for any delays in the project that may result from tardy or incomplete submissions or drawings requiring resubmission.

5.1.4 Fees for Drawing Review

Drawing reviews carried out by any of the landlord's base building consultants (mechanical, electrical, or structural) will be subject to the fees listed below. These costs will be charged back to the tenant, plus a 15% administration fee, as per TDC's standard lease agreement.

Architectural	Approximately \$750/drawing set*
Electrical	Approximately \$950/drawing set*
Mechanical	Approximately \$950/drawing set*
Telecom	Approximately \$750/drawing set*
Structural	Approximately \$750/drawing set*

Sustainability (Office)	Approximately \$700/drawing set*
Sustainability (Retail)	Dependent upon complexity of structural work.
Vertical Movement	Approximately \$750/drawing set.

* Assuming buildout is no larger than one floor

Engineering drawings and site inspection fees can vary for each project, and are subject to change without notice. Should the tenant elect to engage any base building consultant, the corresponding fee shall be waived.

If, during construction, the landlord deems it necessary for the base building consultant to verify the work in progress, the additional cost of this review will be charged to the tenant in full plus the 15% administration fee.

5.2 Drawings Submission & Review – Office Space

5.2.1 Drawings and Specifications

The tenant is responsible for submitting the following to the Tenant Projects department:

1. One (1) electronic set of all project plans (CAD & PDF) issued for tender and related documentation in one complete package
2. Complete architectural, structural, mechanical, sprinkler, electrical, building-automation, security system and life-safety system drawings
3. Specifications from the engineers

The drawings must show:

- all proposed work;
- all parts of the base building system that remain unchanged;
- Tie-ins and extensions to base building security, fire alarm and communications systems.

5.2.2 Environmental/Sustainable Document Submissions

As part of TDC's commitment to environmentally sustainable practices, tenants must submit the following additional documents with the drawing set:

1. Waste management plan for any and all construction debris
2. IAQ management plan
3. Material and product data sheets
4. Project schedule indicating when IAQ testing will take place

5.2.3 Structural Drawings

Where the tenant's project has special requirements, such as high-density file storage areas or openings in slabs, the tenant should provide structural drawings.

If the project requires openings of any kind (i.e., coring drilling) in the concrete floor, the tenant should contact the landlord's base building structural engineer in advance of submitting the drawings so the landlord's base building structural engineer can review and approve the proposed renovations.

The landlord's base building structural engineer must review and approve all renovations having a structural impact.

5.2.4 Reflected Ceiling/Lighting Plans

Reflected ceiling/lighting plans should include:

- Lighting layout, including fixture types and counts, pattern, materials and suspension details
- The locations of all access panels required to service building systems

5.2.5 Floor Plans

Where the leased premises occupy less than a full floor, plans must show the entire floor plan and identify the location of the premises and their relationship to the elevator lobby, exits, washrooms, etc.

Floor plans should include the following information:

1. Location of all major fixed elements within the leased premises dimensionally related to grid lines and demising partitions
2. Room names and uses, including the location and layout of rooms with unusual loading concentrations
3. Materials and finishes throughout the premises

5.2.6 Approved Drawings

The project team must keep a set of prints of the approved permit drawings on the premises for the duration of the construction period. A full set of City-approved drawings and permits must be available for reference purposes to the landlord's authorized representatives.

5.3 Drawings Submission & Review – Retail Space

A meeting with Cadillac Fairview's Client Design and Delivery team and the property's retail project manager is to be coordinated at the start of the project.

5.3.1 Mechanical & Electrical Submission

The mechanical and electrical drawings are to include all of the following:

1. Detailed ductwork layout, diffuser layout, and proposed location of thermostat(s)
2. Complete heat gain/loss calculations
3. Location and details of any required roof opening and related roof-mounted equipment
4. Sprinkler layout showing pipes, size and head location
5. Plumbing layout indicating fixture specifications, hot water tank, drains and any other equipment and materials
6. Single line riser diagram with an electrical load summary on the basis of watts per square foot showing connected and demand loads and electrical panel schematics
7. Location of all electrical equipment and light fixtures, including night, emergency and exit lights. Specify size, wattage, type and mounting with specifications that accompany each drawing
8. Location and details of electrical and mechanical meters as per the Meter Addition Information Worksheet

5.4 External Hoarding

Any work outside of the leased premises must be enclosed by full-height plywood hoarding painted to match the surrounding finishes.

5.5 Retail Hoarding

The tenant is permitted to install its own storefront hoarding, provided the hoarding meets with the landlord's design criteria outlined below. Note: Complete hoarding install, including mudding, sanding and painting, is to be completed within a three-day time frame, without exception.

- Hoarding must be built to the underside of the ceiling. The top portion is to be angled back to the ceiling to avoid damaging concourse ceiling tiles, perimeter electrical outlets and hanging hooks. Please refer to the drawing on SK-01 on page 63.
- All corners and edges on hoarding are to be trimmed with 1"x 3" MDF.
- Hoarding is to be secured in place from the structure above demising walls, using two-sided tape.
- All hoarding, including MDF trim, is to be taped, mudded and sanded. No screws should be visible.
- All hoarding, including door(s), frames and MDF, are to be painted with one primer coat and two finish coats of TD Centre's standard Pittsburg Paint: Product 415-4 (Summer Suede) in Speedhide Interior Latex Eggshell.
- If the proposed hoarding will obstruct/conceal a fire hose cabinet, pull station or fire exit sign, the tenant is to coordinate any installation and/or removal of temporary fire hose/pull station/fire exit signage with the TDC Fire & Life Safety team. Tenants must ensure that sprinkler heads are not blocked and can operate fully.
- Any damages to base building finishes are to be repaired by the tenant.

The tenant is responsible for the cost of the hoarding.

5.5.1 Retail Hoarding Graphics

The tenant is responsible for the design and installation of all hoarding graphics. Tenant must submit proposed graphics to the landlord for review and approval prior to install.

The tenant is responsible for all associated design, production and installation costs.

The tenant is not permitted to tape or otherwise add any signs or posters to the hoarding.

5.6 Construction Dust Migration Minimization

This supplemental instruction is issued to clarify the contract. You are instructed to promptly perform the following instructions. These instructions will not change order, directive or the value of the contract.

In areas of construction that are open to the elevators (e.g., full floor construction), Pinchin's "TDC - Construction Dust Migration Minimization" procedure is to be in place.

Please refer to pages 65-66.

This is to be in place for the duration of construction. Please also refer to pages 67-68 for the Elevator Dust Protection Detail. If there is no elevator lobby, then the contractor must install a temporary structure to allow for the implementation of the Pinchin procedure.

Sticky dust mats are also required going in and out of the poly enclosure, as well as at ALL elevators. These dust mats should be changed with regular frequency or at the request of the CF PM.

Regular vacuuming and cleaning of elevator sills with magnets is required.

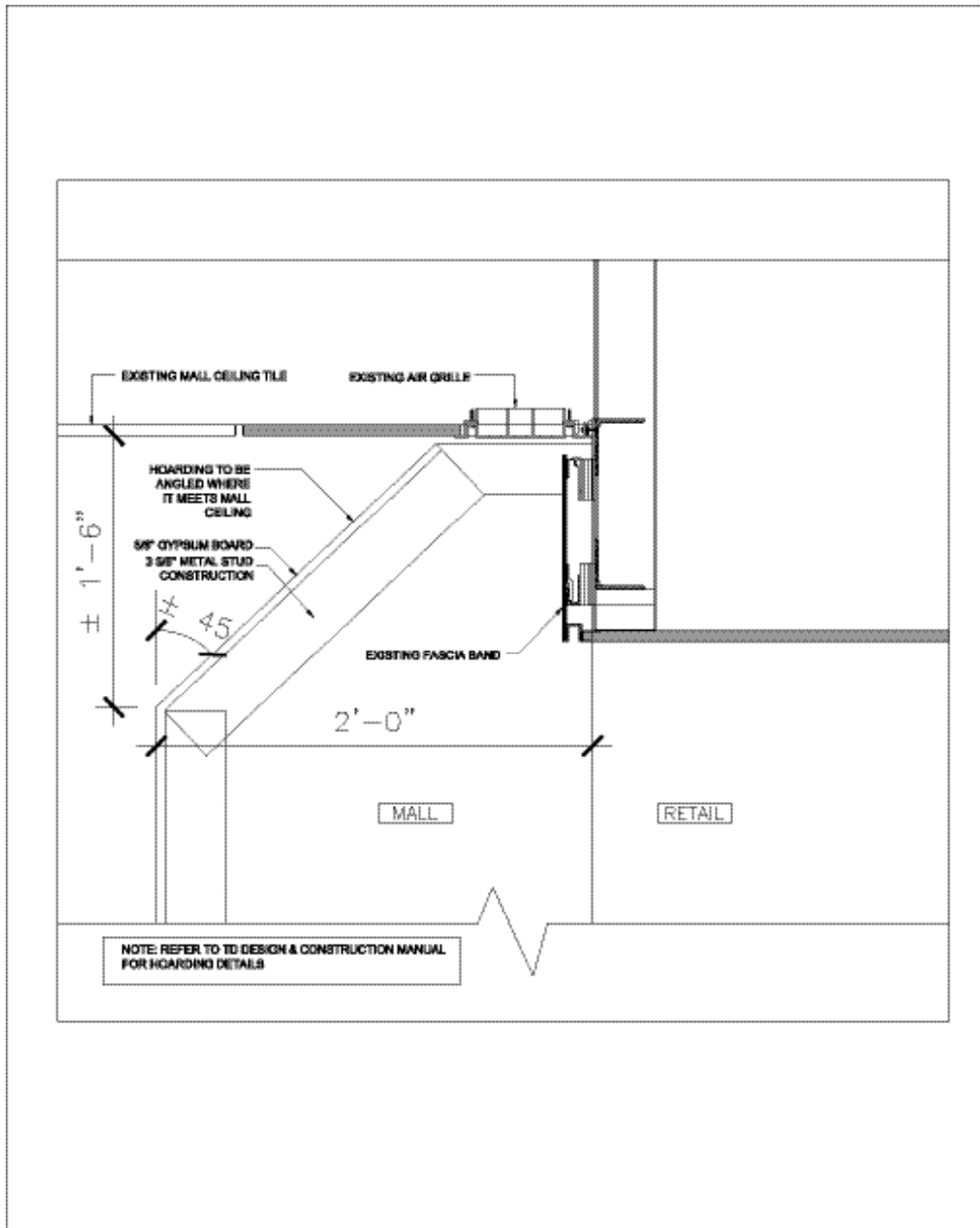
All costs for this dust migration procedure are to be borne by the contractor.


5.7 Signage and Hoarding

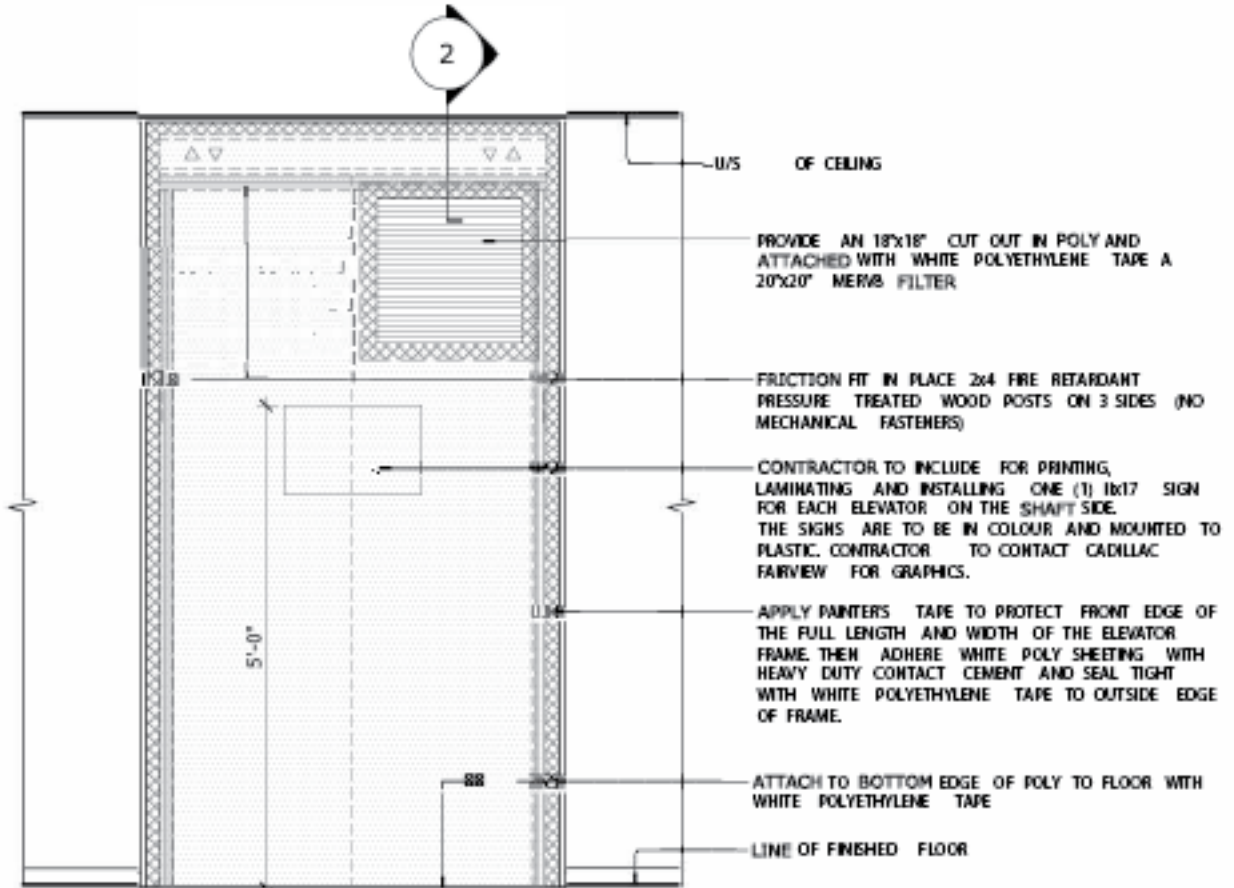
5.7.1 Construction Signage

All signage is to be computer printed at a minimum font size of 20 point. Signage should be laminated and secured with non-visible means. Hand written notices are not permitted.

Note: Mechanical and electrical drawings are reviewed by the landlord's consultants. Tenants should direct any questions to these consultants.



 <p>B+H Architects 481 University Avenue, Suite 300 Toronto, Ontario, Canada M5G 2H4 t 416.596.2299 f 416.596.0599</p>	SHEET TITLE:	REFERENCE	PROJECT NO.:
	PROJECT:	TORONTO-DOMINION CENTRE HOARDING DETAIL AT CEILING	DATE: DCT 12
			SCALE: NTS
			DRAWN BY: CG
			REVISION: SK-01



NOTE: CONTRACTOR TO ADJUST AND MODIFY THE POLY PROTECTION DURING ANY FLOORING DEMOLITION OR INSTALLATION TO PREVENT DUST FROM ENTERING THE ELEVATOR CABS AND SHAFTS.

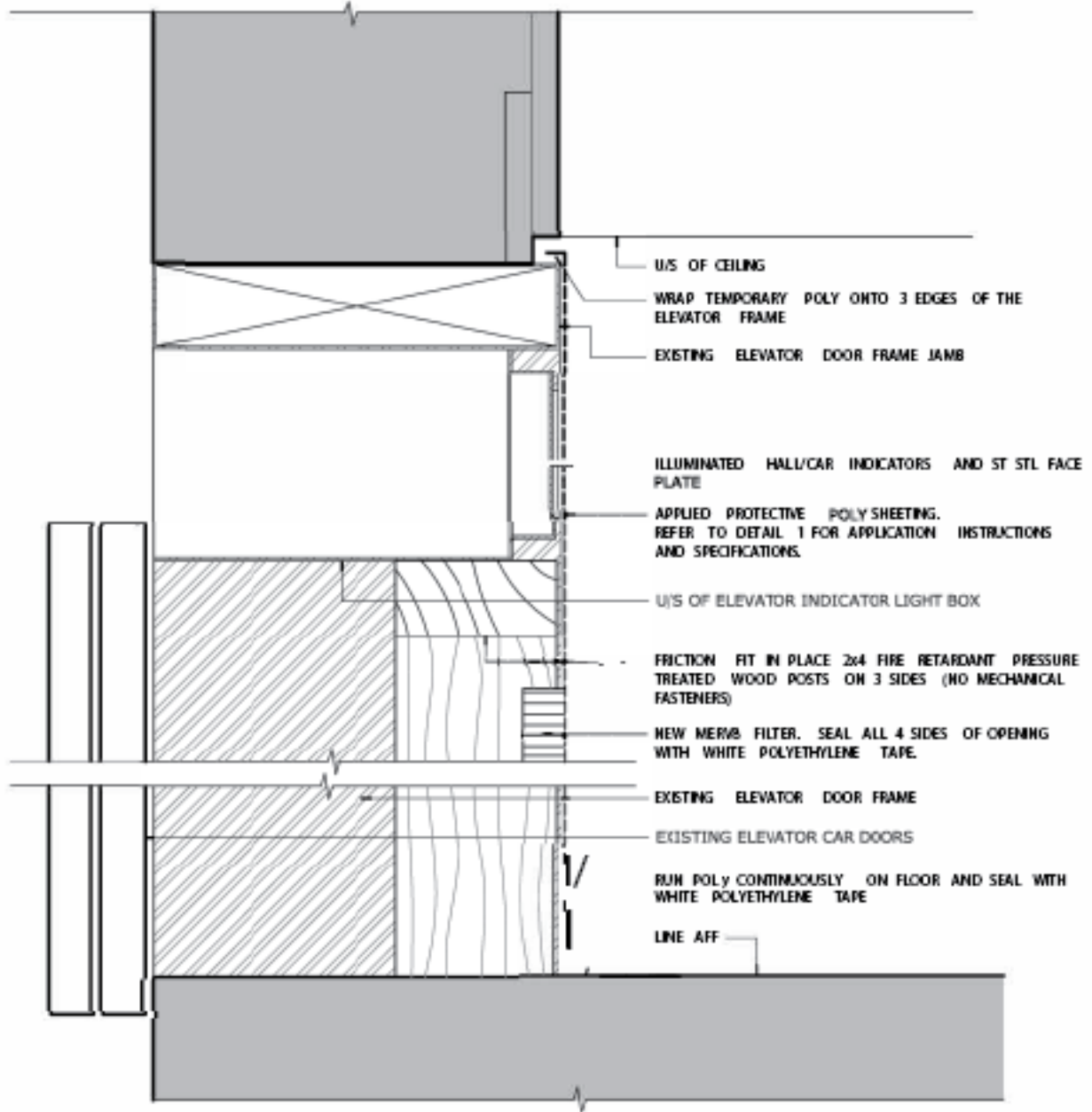
NOTE: ENSURE TO INCLUDE REMOVAL OF ALL ADHESIVE ALL TAPE USED ON AND AROUND THE DOOR FRAMES AND FLOOR.

SUGGESTED PRODUCTS (OR EQUAL):		
PROTECTIVE POLY SHEETING		
MANUFACTURER:	AMERICOVER	ASFR6 6mm ANTI-STATIC, FIRE RETARDANT POLY SHEETING
COLOUR:	WHITE	
CONTACT CEMENT		
MANUFACTURER:	HENKEL	LOW ODOUR CONTACT CEMENT
POLYETHYLENE TAPE		
MANUFACTURER:	ECHOTAPE V1-N6120	POLYETHYLENE TAPE
COLOUR:	WHITE	

ELEVATOR DUST PROTECTION ELEVATION



SCALE: 1/2" = 4'-0"



**ELEVATOR DUST PROTECTION
DETAIL**



u

SC_ALE: 3/8" = 1' - 0" = 1/8" = 1/8"

5.7.2 Pinchin Site Instructions



Site Instructions

Project Name:	TDC - Construction Dust Migration Minimization	Date:	June 28, 2018
Project Address:	66 Wellington Street West, 77 King Street West, 100 Wellington Street West, 79 Wellington Street West, 222 Bay Street, 95 Wellington Street West, Toronto, ON	Client Name:	Cadillac Fairview Corporation
Project Location:	Tower 1 - Tower 6	Client Project/P.O. No.:	N/A
Pinchin Project Manager:	Mark Stroombergen	Pinchin File No.:	224215

This supplemental instruction is issued to clarify the contract. You are instructed to promptly perform the following instructions. These instructions will not a change order or change directive, and will not change the value of the contract.

Description of Instructions:

1. The following instructions are provided to prevent dust (generated by construction activities) from entering the elevator cabs and hoist ways during general construction activities of Suite demising.
 - 1.1 Construct rip proof polyethylene passage flaps across the entrance to the elevator lobbies.
 - 1.1.1 Construction is to be from floor to ceiling/deck. Overlap polyethylene flaps by a minimum of 12 inches.
 - 1.1.2 Flaps to be weighted at the bottom using pieces of 2X4 wood at least 6 inches in length.
 - 1.1.3 Flaps are to remain overlapping and should not be propped open during regular construction activities on the floor.
 - 1.1.4 Should dust still migrate from construction floor to elevator lobbies, install negative air units on the floor, exhausting to the exterior of the building to redirect air flow from elevator lobbies.
2. The following instructions are provided to prevent dust generated by lobby construction activities from entering elevator cabs and hoist ways.
 - 2.1 Use existing polyethylene flaps at entrance to elevator lobbies, or install flaps to separate elevator lobbies from remainder of the floor.
 - 2.1.1 Install negative air units within elevator lobbies which will exhaust out of the elevator lobbies and onto the adjacent floor.



Site Instructions

66 Wellington Street West, 77 King Street West, 100 Wellington Street West, 79 Wellington Street West, 222 Bay Street, 95 Wellington Street West, Toronto, ON
Cadillac Fairview Corporation

June 28, 2018

Pinchin File: 224215

2.1.2 Number of negative air units will be determined on site by amount of dust generated and by the air movement created by elevators.

Prepared by Pinchin Ltd.

Name and Title:	 Mark Stroombergen
Company:	Pinchin Ltd.

Template: Master Template, Supplemental Instruction, September 7, 2017

PART 6: CONSTRUCTION PROCEDURES

6.1 Pre-Construction

The landlord recommends that the tenant and the tenant's designer carefully review the information contained in this part before starting any work. This will help ensure that the tenant's submission package is complete, and allow the landlord to expedite any required revisions and approvals.

6.1.1 General Requirements

6.1.1.a Appointment of the Contractor

The tenant is required to engage its own contractors, and sub-contractors where applicable, for the purpose of carrying out its construction work. All contractors are subject to approval by the landlord and must:

- be in good standing with the provincial Workers' Safety & Insurance Board;
- ensure that the work performed by each unionized trade does not conflict with the work that other unionized trades are legally entitled to do by virtue of their collective agreements;
- use subcontractors for automation, mechanical, electrical and fire-alarm approved work that are familiar with the base building systems;
- use base-building-required contractors where directed by the landlord in this manual.

Please refer to the list of Recommended Contractors in Table 3 for contractors of various disciplines who are experienced with the TDC's construction policies and procedures.

Note: The list of Recommended Contractors is meant to serve as a recommendation only. Cadillac Fairview assumes no responsibility whatsoever for the selection/use of any contractor, their workmanship, or their behaviour while working at the TDC.

6.1.1.b Trades

For all project work at the TDC, the tenant must employ contractors whose union affiliation is compatible with the landlord's contractors. This is because the landlord may be bound by collective bargaining agreements that require all labour employed in connection with any work to be performed on or in the premises to have union affiliations compatible with those collective bargaining agreements.

The tenant must employ contractors with the following union affiliations:

- **Bricklayer and masonry work:** Contractors bound to either the Provincial ICI Collective Agreement between Ontario Provincial Conference and the Masonry Industry Employers Council of Ontario; or the Brick and Allied Craftworker Union Provincial ICI collective agreement
- **Carpentry work:** Contractors bound to the Provincial ICI Collective Agreement with The Carpenters' Employer Bargaining Agency and The Carpenters' District Council of Ontario, United Brotherhood of Carpenters and Joiners of America
- **Labourers work:** Contractors bound to the Labourers ICI Provincial Collective Agreement with the Labourers Employer Bargaining Agency and Labourers International Union of North America, Ontario Provincial District Council

The tenant is solely responsible for all damages (and associated repair costs) that may result from its contractors' failure to comply with this requirement.

The tenant is permitted to use non-unionized trades only for painting, furniture moving/setting, and audio/visual installations/work.

6.1.1.c Required Documentation

The tenant must submit the following documents/information to the landlord's assigned project manager, before any proposed work begins:

1. Written confirmation that landlord has accepted the tenant drawings/specifications
2. Construction schedule: Schedule must be provided in a Gantt chart format showing milestones and must be broken down by trade and the duration of the work
3. Confirmation that the base building consultant has approved all relevant drawings
4. Copies of all general contractors' health & safety policies, together with a letter indicating that their policy will provide blanket coverage for all sub-trades
5. All relevant TDC permit forms, completed to the best of the contractor's ability. The most recent TDC work permits can be obtained from www.tdcentre.com.
6. Comprehensive contact information, including emergency contact numbers and email addresses for all of the contractors' and subcontractors' employees designated to work on the project
7. A copy of all relevant City of Toronto building permits (i.e. mechanical, electrical, etc.)
8. A copy of the Notice of Project (if applicable)
9. A copy of the Health Department approval (if applicable)
10. Valid WSIB Clearance Certificate
11. MSD sheets (if applicable)
12. Certificate of Insurance with complete coverage and additional insured parties named.
13. A letter on signed company letterhead indicating that the contractor has read this entire document and agrees to abide by the terms and conditions as stated herein
14. A copy of the Hazardous Materials Assessment Report applicable to the work area
15. Coordination with RYCOM for DAS antennas (if applicable)

6.1.1.d Health & Safety

The tenant and its contractor are responsible to ensure strict compliance with OHSA and any other applicable health and safety regulations. The tenant and its contractor shall take all necessary precautions to safeguard workers and the public from injury and accident, while preserving the integrity of all private and public property.

The landlord will visit the site regularly to review the project progress, workmanship, and general safety conditions, and to ensure that the work conforms with the landlord's contractors rules and regulations. The landlord reserves the right to issue a "cease work" order until any unsafe work conditions or practices are resolved.

6.1.2 TDC Permits

The TDC is a very large and intricate complex. To manage the daily activities throughout the complex, and to create a line of communication between the contractor and the facility operations, the landlord has created several permit forms.

Table 13 describes the various forms and when they should be used. To obtain any form, visit tdcentre.com.

Table 13 – Permit Forms Descriptions

Permit	Description
Construction Work Permit	This permit must be filled out and submitted to the landlord prior to the execution of any work. In addition to the permit, a detailed Trades sheet must be attached. This sheet must provide the names and contact numbers of all personnel that will work on the project (i.e., general contractor and subtrade personnel).
Service Work Permit	This permit is used for service contracts between tenants and contractors. This form permits a contractor access to a tenant space to perform service and maintenance work.
Freight Elevator Requisition	This form is used to secure the exclusive use of the freight elevator.
Hot Work Permit	This permit is used to notify the Fire & Life Safety department of any work for the purpose of welding of any type. A Fire Protection System Bypass permit must accompany.
X-Raying, Scanning and Coring Work Permit	This permit is used to schedule x-raying, scanning and coring work (typically for plumbing and electrical floor penetrations).
Fire Protection System Bypass Permit	This permit is used to notify the Fire & Life Safety department of any work on Fire Protection systems (i.e., sprinkler systems, fire alarms, etc.)
Building Systems Shutdown Request	This permit is used to notify the building team of any systems shutdown.

Tenants must submit permit forms to the email addresses listed. If a tenant requires clarification or assistance completing or submitting any permit form, please speak to the assigned Cadillac Fairview project manager.

In addition to the above, whenever a tenant wishes to reserve the freight elevator, the tenant must submit a TDC Elevator Requisition permit.

Failure to submit a completed permit application for any cited activities could result in a construction violation, and the tenant may be subject to a fine. Please see the Construction Violations section for further information.

Forms and permits can be obtained from your project manager or at tdcentre.com.

6.1.3 Insurance Requirements

The contractor must provide evidence, in a form acceptable to the landlord, that the contractor has General Liability Insurance for a minimum of \$5M.

If a company is a subsidiary of another firm, the contractor must provide proof of adequate insurance, either in the form of an actual Certificate of Insurance, as outlined above, or a letter and Certificate of Insurance from the parent firm indicating acceptance of responsibility for the subsidiary's work.

Insurance coverage must include the names listed in Table 14 as additionally insured parties for all towers.

Table 14 – Additionally Insured Parties

The Cadillac Fairview Corporation Limited
Ontrea Inc.
OPB(TDC) Inc.

6.1.4 Construction Deposit

The landlord requires a construction deposit, payable by cheque made out to The Cadillac Fairview Corporation Limited
Re: TD Centre.

The construction deposit can range between \$1,000 and \$10,000 per floor per project. The assigned project manager will advise the contractor of the exact amount of the deposit.

The landlord will hold the deposit, with no interest accruing, until the landlord receives all close-out documentation.

Additionally, if for any reason the contractor fails to rectify any outstanding deficiencies at project completion, or repair any damage done to the TDC premises, the landlord will use the deposit to execute the work on the contractor's behalf.

The landlord may also apply the construction deposit against any outstanding fine levied by the landlord for infractions incurred by the contractor during the project.

The landlord will refund any unused monies to the contractor.

6.2 Construction in Progress

The following pages contain critical information for all contractors and subtrades working on the TDC premises. All contractors and subtrades must abide by the policies, procedures, and guidelines contained in this manual. The tenant is also responsible to ensure that their project team abides by this manual.

6.2.1 Construction Access

Construction contractor(s) and sub-trade(s) must sign in and sign out at Access Control Centre located at 66 Wellington St. West, P1 Level. They are to access TDC via the freight elevators ONLY. They are to access ONLY the floor(s) where they are permitted to work. Failure to follow these access rules constitutes a violation under this manual, and the landlord will automatically issue a fine. The fine will increase by 50% for any subsequent violations.

6.2.2 Construction Hours

The tenant must communicate, agree on, and arrange working hours with the assigned project manager.

Generally, construction may take place within the leased premises during normal business hours – 0700 to 1900 hrs, Monday to Friday.

Known noise-generating work, such as demolition, hammering, drilling, cutting, and other sensitive work must be done outside normal business hours – generally between 1800 to 0700 hrs, Monday to Friday, and any time during weekends.

Sensitive work is defined as work that causes odours, vibrations, noise or other undesirable effects that, in the landlord's opinion, are objectionable or interfere with the safety, comfort or convenience of the building and its occupants.

If at any time the landlord deems that work is sensitive, it reserves the right to immediately reschedule the work to the evenings, between 1800 to 0700 hrs at the tenant's sole expense and responsibility.

Note: Hours for noisy or smelly work may be modified due to the operation of neighbouring tenants and special events. Tenant is to contact landlord for further clarifications prior to pricing their work.

6.2.3 Temporary Services

The contractor is responsible for the distribution of temporary power and telephone service within the work areas. Exposed electrical cords are not permitted outside the occupied areas.

6.2.4 Construction Services

Table 15 contains costing information for various services required in typical construction projects. The contractor must request these services via the TDC Permit Forms found on the TDC website.

Cheques for all properties must be made out to: The Cadillac Fairview Corporation Limited.

Cheques pertaining to sprinkler/standpipe system drain downs or H-tests must be *hand delivered* to a representative of the Emergency Response Team, or the assigned project manager, 72 hours in advance of the scheduled work.

6.2.5 Fire Alarm Bypass Procedures

Contractors submitting bypass permits must await approval from the Fire and Life Safety department before any work can begin. Prior to any work, the contractor must attend the Access Control Centre (ACC) located at 66 Wellington St. W.; P1 Level. The contractor must call from the ACC to our Security Operations Centre (SOC) and initiate their bypass request. Only then may the contractor begin their work.

Upon completion of the work, the contractor must attend the ACC again and call SOC to restore their bypass request. Please note that bypass requests are not transferable; the same contractor that initiates the bypass must also restore it.

Table 15 – Construction Service Costs

Service	Cost
Hydrostatic Test	\$600/day (+15% admin fee + HST)
Drain Down	\$600/day (+15% admin fee + HST)
Standpipe Drain Down	\$600/standpipe/zone/day (+15% admin fee + HST)
Cancellation of any of the above	50% refund of payment
Audit – Contractor Logs or Passcards	\$50/hour
Freight Elevator Requisition	Self-Operated - \$80/hour Operator Assisted - \$120/hour* The cost will be split among the number of companies using the freight elevator. All after-hours use must be booked through CF Connect.

**Note: If included with drain down, no additional charge. All H-tests to be witnessed by base building sprinkler contractor.*

All cheques pertaining to sprinkler/standpipe system drain downs or H-tests must be hand delivered to a representative of the Emergency Response Team, or the assigned project manager, 72 hours in advance of scheduled work. Cheques must be made out to The Cadillac Fairview Corporation Limited.

6.2.6 Shipping, Receiving, and Hoisting

Materials and equipment may be brought to the site via the loading dock and freight elevators ONLY. Contractors are strictly prohibited from using passenger elevators and escalators. Violations of this rule will result in fines.

There are three loading docks at the TDC:

- TD Bank Tower/66 Wellington St. W.
- TD South Tower/79 Wellington St. W. with access via Piper Street (at York St. & Wellington St. W.)
- 95 Wellington St. W. with access via Piper Street (at York St. & Wellington St. W.)

Tenants must reserve loading dock facilities and freight elevators 72 hours in advance of intended use. Reservations

must be made via CF Connect. Unless otherwise specified, freight elevator use will be shared. Exclusive use can be requested, subject to landlord approval. Special arrangements must be made for heavy or bulky items requiring special handling or hoisting.

Service charges will apply. Payment must be made within 45 days of receiving invoice.

Small item delivery and pick-ups (such as office supplies) are permitted at the loading dock between 0700 and 1900 hrs. Deliveries and pick-ups are permitted at the loading dock between 0700 and 1800 hrs. Forty-five (45) minutes are allowed for loading/unloading.

All large deliveries, including construction materials, furniture, etc. must be delivered between 1900 and 0700 hrs. Tenants require specific, prior permission to deliver construction materials to the loading dock Monday to Friday between 0700 and 1800 hrs.

All vehicles entering the loading dock are subject to vehicle inspection or search, and must render shipment manifests and delivery destinations. The maximum clearance is 3.65 m (12 feet); vehicles exceeding this height will be turned away. Passenger vehicles or passenger type vans without commercial plates will be denied entry.

The contractor must notify TDC Security of their arrival and completion of work via the two-way intercom speaker at the Access Control Centre (ACC) that is connected to the Security Operations Centre (SOC).

Under no circumstances should the building waste compactor or equipment be blocked by bins or vehicles or be used for construction materials. Failure to comply with this rule will result in a vehicle ban and towing from the TDC at the owner's sole expense.

The Shipping and Receiving access ramp is considered a "Security Zone." Therefore, only Security Personnel and CF staff conducting work or carrying out maintenance duties are allowed access.

Equipment and/or material deliveries to the construction site must be via designated routes. The contractor may not use landlord's equipment such as bins or dollies. Contractors are prohibited from moving material through the concourse between the hours of 0700 and 1800 hrs.

Construction disposal bins are permitted between 1730 and 0700 hrs Monday to Friday and anytime during weekends and holidays. Bins should be placed in designated areas only.

Contractors, service personnel and tenants must take all necessary precautions to minimize damage to elevator walls, doors, floors and ceilings. The tenant and tenant's contractor will be responsible for all costs associated with repairs to damaged items/finishes. Contractors are expected to report any property damage to Security immediately to ensure accountability.

Table 16: Freight Elevator Specifications

	TD Bank Tower No. 33	TD Bank Tower No. 34	TD North Tower No. 75	TD North Tower Floors P1 to 12 No. 76	TD West Tower No. 85	TD West Tower Floors 19-32 No. 91	TD South Tower No. 117	222 Bay St. No. 143	95 Wellington St. No. 210
Cab Length	92"	92"	92"	62"	63"	60"	91"	112"	60"
Cab Width	84"	65"	86"	91"	91"	83"	62"	65"	72"
Cab Height	120"	120"	132"	114"	114"	114"	114"	114"	122"
Cab Weight Capacity (kg)	3175	2270	3630	1360	1815	1590	2700	2700	1590
Door Height	108"	108"	108"	88.5"	89"	89"	96"	96"	98"
Door Width	60"	50"	60"	54"	47.5"	45"	48"	54"	43"

6.2.7 Site Work

The tenant and their contractor must ensure that all construction work is carried out strictly according to the approved drawings. They must also ensure that all construction work complies with all applicable laws, by-laws, codes and regulations, including all applicable construction safety regulations such as, but not limited to, OSHA and WHMIS.

Detailed below are requirements for typical workplace construction activities.

6.2.7.a Building Automation System (BAS) Work

The tenant's project team is responsible for providing the landlord's project manager with an itemized list of all systems and items, such as temperature sensors and access control card readers (HID Singo Series / mobile ready), that will be tied in to the TDC Building Automation System (BAS). The purpose of this list is to ensure that connections are appropriately captured so as to mitigate the effects of any potential oversights that surface when the tenant begins operations within the leased premises.

6.2.7.b Drilling, Cutting, and X-raying

The landlord and the landlord's base building structural engineer must review and approve any and all proposed drilling or cutting into the building's concrete structure. Drilling or cutting without authorization is strictly prohibited.

Before drilling or cutting, the contractor is to engage the base building x-ray contractor (or landlord-approved equivalent) to locate all embedded material via an x-ray of the slab in the immediate location of the proposed hole. All drilling/coring locations shall be identified in drawings, accompanied by the corresponding film, for review and approval by the appropriate parties at the tenant's sole expense. For landlord projects, the contractor is responsible to cover the costs associated with base building structural engineer review.

Once the Operations team has approved the locations of the drilling, coring, and x-ray work, the tenant must submit an X-Raying, Scanning & Coring Work permit. The landlord requires 14 days' advance notice before issuing a permit.

Coring/Drilling into Base Building Mechanical Rooms is not permitted.

6.2.7.c Electrical Power Shutdowns

The tenant must submit all requests for electrical power shutdowns in writing to the assigned project manager for approval at least five (5) weeks before the scheduled shut-down date. See Building Systems Shutdown form.

Shutdowns may take place on weekends only, between 0000 and 0600 hrs.

For shutdowns required on a 600V or 13.8kV switchboard, the landlord will supply an electrician to de-energize and re-energize the respective feeder. The minimum fee for this work is \$2,500.00. An electrician must remain onsite for the duration of the shutdown. Four (4) hours of electrician time is included in the base fee. If the electrician is required beyond four hours, the tenant will be charged \$200 per hour for the additional time required.

6.2.7.d Riser Room Access/Work

RYCOM manages access to the riser rooms throughout the TDC. Please see Table 3 - Required Contractors/Consultants for RYCOM's contact information.

The tenant's contractor is responsible for coordinating access to the riser rooms, and must supply any requested

documentation to RYCOM in advance of performing the work.

Work in the riser rooms must be done in accordance with all relevant and applicable building codes and standards. Specifically, all floor slab penetrations must be smoke-stopped and fire-sealed.

If a tenant's work infringes on a conduit/penetration that does not comply with relevant codes and standards, the tenant is responsible to ensure that measures are taken to meet said requirements. Penetrations that are not compliant will not be "grandfathered"; all performed work must be completely compliant.

6.2.7.e Security Electrical Contractor

Only approved contractors may work on the Security & Life Safety Systems (i.e., card readers, cameras, etc.). Please see Table 3 for a list of TDC Required Contractors/Consultants.

6.2.7.f Air System Shutdowns (HVAC)

The tenant must submit requests for air system shutdowns for approval by the assigned project manager and TDC operations manager. Any equipment shutdown impacting other tenants will require at least 5 weeks notice. (See Building Systems Shutdown form.)

Note: A tenant's request for extra air conditioning will take precedence over a contractor's shutdown request.

6.2.7.g Sprinkler Systems

The landlord must approve all requested revisions to the base building sprinkler system.

The sprinkler-control valve will be closed and the line(s) will be drained until the work on a given floor is completed. Upon completion of all work, the system must be water-pressure tested at 200psi for two hours. H-tests must be performed when twenty (20) or more heads have been altered as per NFPA 13.

It is imperative that the tenant forward test certificates to the Fire & Life Safety Manager within 24 hours of testing. The sprinkler system will be reactivated once all tests have been approved.

When ceiling tiles are removed during construction, existing sprinkler heads must be temporarily removed, and upright heads installed in accordance with relevant codes and standards. Once construction is complete and ceiling tiles have been installed, the original sprinkler heads must be reinstated in accordance with relevant codes and standards.

During both return to base and tenant build-outs, the general contractor is responsible at all times for maintaining proper sprinkler detection once the ceiling has been removed and/or the upright heads are changed to pendant heads. Sprinkler heads may be covered by paper bags or cellophane during spray painting, resin application or other construction that would cause damage to the sprinkler head. Plastic based bags, cups or cellophane is not acceptable.

6.2.7.h Freight Elevator Bookings

Elevators must be booked a minimum of 72 hours in advance. Charges will apply, see Table 15 for rates.

6.2.7.i Elevator Machine Room Access

If there is work running through or to be completed inside any elevator machine rooms, the elevator maintenance firm must be present during the entire duration of the work. This is to be at the tenant's sole cost.

6.2.7.j Water System Shutdowns

Contractors must submit all requests for water system draindowns, such as fire system and domestic water, to the TDC

Fire & Life Safety department at least 72 hours in advance. Requests for standpipe shutdowns require 96 hours' notice. See Building Systems Shutdown form.

If the contractor wants to cancel the shutdown, they must provide the Fire & Life Safety department with at least 24 hours' notice. The contractor will be charged 50% of the full draindown cost if they fail to provide adequate cancellation notification to TDC Fire & Life Safety staff.

6.2.7.k Plumbing

Where plumbing is removed within the leased premises, all lines and connections must be removed from the ceiling spaces back to the core riser and properly capped. This rule applies even if the plumbing runs through other occupied areas before reaching the core riser.

6.2.7.l Access Panels

Tenant to provide access panels as requested by CF in order to permit access to equipment or services. Access panels must be a minimum of 600 mm x 600 mm (24"x24").

6.2.7.m Power-Activated Devices

Power-activated fasteners may not be used to fasten materials to the metal deck.

6.2.7.n Revisions to Life Safety Systems

For any work on the life safety systems, the tenant must use the TDC Required Contractors/Consultants in Table 3.

The authorities having jurisdiction must approve all revisions to the base building life safety systems. Revisions to the fire alarm system must be approved by the landlord, and any proposed revisions must equal or exceed the standard level of protection and detection throughout the TDC.

Any person working on the fire alarm system must have on their person a valid Canadian Fire Alarm Association (CFAA) certificate.

The contractor is solely responsible to clear all Trouble Alerts from the system. At no time is the fire alarm system to remain in Trouble Mode after work is completed, and at no time is any work on the system to impair detection or communication with adjacent or satellite areas.

6.2.7.o Electromagnetic Locking Devices

Electromagnetic locking devices and related signage must be installed in accordance with the Ontario Building Code. The landlord has no authority to respond to requests for deviations.

Before activating the electromagnetic locking devices, the installing contractor must complete the installers'/owners' certificate required by the City of Toronto Fire Department and must have it verified by the landlord's fire alarm service contractor.

The contractor is solely responsible to make all arrangements with the landlord's fire alarm service contractor seven (7) business days in advance of such work. The contractor must submit all required form(s) to the Life Safety department when the request for verification by the landlord's fire alarm service contractor is made. All verification paperwork must be submitted to the manager of the Fire & Life Safety department within 24 hours of completion.

6.2.7.p Voice-Communication Speakers

At no time may a floor be occupied during normal office hours if the speaker system is out of operation. All revisions must be performed during the night shift and co-ordinated to ensure that the system is fully operational and checked out by the start of business the following day.

6.2.7.q Peripheral Devices

Fire alarm peripheral devices, including, but not limited to, pull stations, smoke/thermal heat detectors, speaker systems, and pre-action systems may not be modified/tampered with without the landlord's prior approval. Additionally, the base building EVC speakers may only be painted using a ULC compliant paint, verified by ULC and GE upon completion of all work. Alarm speakers must not be painted. Speakers that have been painted will be replaced and re-verified at the tenant's sole expense.

6.2.7.r Fire System Work

At the start and end of any work on the TDC Fire Protection System, the contractor is responsible for employing the TDC-required contractor to re-map the fire system. This applies for such work as temporary or permanent deletion or removal of smoke alarms, manual pull stations, speakers and/or heat detectors. Failure to engage the TDC-required contractor to re-map the fire system will result in all rectification costs being charged back to the contractor and/or the tenant.

6.2.7.s Fireproofing Material

All fireproofing material that is either removed through construction/deconstruction or found to be non-existent on structural steel elements and floor penetrations must be reinstated with a suitable and approved fireproofing material. The landlord-approved fire resistant material is CAFCO 300SB. This material is specially designed for the retrofit construction market.

The contractor is solely responsible for installing replacement material according to the relevant building and fire codes.

If the tenant wishes to paint the existing fireproofing material, it is the tenant's responsibility to ensure this is possible. The tenant must engage the Base Building Consultant for approval. Consult your CF Construction Manager.

6.2.7.t Fire Watch/Hot Work

Before requesting a permit for hot work, the contractor must always consider whether there is a safer alternative.

If hot work is deemed necessary, the contractor must submit the TD Centre Hot Work permit in advance. Before the start of any hot work, the contractor must: sign-in at the Access Control Centre, initiate their fire alarm bypass if applicable and set up their work area for inspection. A Cadillac Fairview employee will then complete a Zurich Hot Work permit for approval before the work begins. The Zurich Hot Work permit must be displayed at the project location.

Upon the completion of the hot work, a fire watch must be conducted for one (1) hour. Areas that do not contain early warning detection systems (smoke detectors) will require spot checks every thirty (30) minutes for three (3) hours after the original one (1) hour fire watch.

Areas that do not contain early warning detection systems are:

- Parking Garages
- Loading Docks for 66 Wellington, 79 Wellington & 96 Wellington
- Mechanical Rooms (with the exception of areas protected by pre-action systems)

- 100 Wellington Concourse

During a required fire watch, the appointed fire watch must:

- be a different person from the one conducting the hot work;
- work alongside the tenant, contractor or employee who performs the hot work;
- maintain a constant vigil during the hot work for stray sparks, ignition or other fire hazards;
- have an ABC 10 lb fire extinguisher within 10 feet and be trained in the use of it; and
- remain in the work area for one hour after the work is done to ensure there are no smoldering fires.

6.2.7.u Common Area Restrooms

The tenant's contractor and their subtrades may not use common area restrooms, except where the tenant occupies a full floor. Public restrooms are available on the concourse level.

6.3 Site Protection

Contractors must ensure that all building finishes, including window film (where applicable) and carpets, are adequately protected to prevent damage. The following protection is required:

- The contractor must supply and protect carpet finishes with plywood and plastic sheets.
- Dust control mats must be placed at all construction exit points.
- When handling TDC retail concourse ceiling tiles, all trades must wear clean white gloves to prevent stains or damage.

The landlord will repair any damage to building finishes and charge the cost to the contractor. Damaged concourse ceiling tiles will be replaced by the landlord at a rate of \$1500 per occurrence, charged to the contractor.

6.4 Window Film

To boost the HVAC systems' capacity to manage the solar gains in leased premises, window film has been installed in various locations throughout TDC. Table 16 details the location of installed window film.

Table 17 – Window Film Location

Building	Location
<i>TD Bank Tower / 66 Wellington St. W.</i>	<i>South & east facades – Floors 14 to 55</i>
<i>TD North Tower / 77 King St. W.</i>	<i>South & west facades – Floors 14 to 46</i>
<i>TD West Tower / 100 Wellington St. W.</i>	<i>All sides, all floors</i>
<i>TD South Tower / 79 Wellington St. W.</i>	<i>South, east & west facades – Floors 4 to 11 & 24 to 33</i>
<i>222 Bay St.</i>	<i>None</i>
<i>95 Wellington St. W.</i>	<i>None</i>

6.5 Construction Visits and Violations

The landlord periodically visits the construction site to review general health and safety and construction practices. This is done to ensure that the proper and prescribed construction policies, procedures, and guidelines are followed throughout the project and to educate and promote a culture of health and safety.

The landlord encourages the tenant's project team to talk to the landlord about how to promote safety while concurrently abiding by all applicable policies, procedures, guidelines, and this Design & Construction Manual.

The tenant's contractor is responsible for the actions of all project tradespeople and delivery people. Poor construction practices, unsafe workplace health and safety practices, and delinquent behaviour are not tolerated whatsoever. Any person found to be performing an unsafe act or exhibiting a blatant disregard for existing work, or disrespect towards tenants or other people at the TDC will be promptly removed from the premises and not permitted to return.

The landlord will record any violations, and will issue fines/warnings according to Table 17 below. Incidents remain recorded for 18 months.

The TDC has a zero tolerance policy for any violation of provincial, federal or other authorities having jurisdiction codes or regulation. Fines, according to Table 17, will be automatically levied. Continued disregard will result in an escalation of 50% per occurrence with the possibility of being barred from working at the property.

Continued neglect for the stated construction guidelines and expectations may result in a temporary or indefinite ban from performing work in the Cadillac Fairview Toronto office portfolio.

The landlord will not be held responsible for the costs resulting from the ban of a contractor and/or an employee from the TDC premises.

The landlord will bill any costs associated with a construction violation back to the contractor.

If, at any point in the project, the action(s) of a contractor results in a cost to the landlord, the contractor will be held solely responsible for all costs plus a 15% administration fee. The landlord will make appropriate and reasonable notifications and issue invoices accordingly.

Table 18 – Construction Violations & Associated Fines

Construction Violations	Fine Per Occurrence
Cause of fire. Any incurred damages will be added to this fine	\$10,000
Failure to comply with the Cadillac Fairview / TDC & AIG Fire Watch/Hot Work Policy	Up to \$5,000
Negligent or deliberate disconnection of the fire alarm system without authorization, contractor certification or activation of fire alarms (i.e., tones and/or no tones)	\$5,000
Leaving the TDC premises without reinstating the fire alarm system bypass	\$3,000
Obstruction of any fire equipment (i.e., pull stations, hose stations, etc.)	\$1,500
Improperly stored compressed gas cylinders while not in use	\$1,500
Failure to comply with the national or provincial fire code, building code, OHSA, ESA or any other relevant code regulation or applicable act.	Up to \$5,000
Failure to post all building permits, WSIM, WHMIS, H&S Policy in visible location	\$500
Storage of combustibles in common areas or unsafe accumulation of refuse	\$1,000
Obstructing or “wedging open” any means of egress	\$500/door
Smoking while working on project sites at TDC premises	Automatic Removal from TD Centre
Storing equipment in areas other than the construction site (including riser rooms)	\$1,500/room
Failure to return badges, keys or passcards to the Access Control Centre	\$500
Failure to wear appropriate/required PPE as required by OHSA	\$500 to General Contractor
The use of passenger elevators and escalators by contractor.	\$500
<i>*Any additional costs for damages will be charged back to the vendor</i>	
Unauthorized parking, welding, sawing and/or cutting in the loading dock	\$500
Unauthorized garbage disposal at the loading dock	\$500
Improper implementation of dust control measures at entrance and exit to construction areas.	\$500
<i>*Any additional cleaning costs will be charged back to the vendor</i>	
Failure to use wooden support for construction bins in the loading dock	\$500
Failure to comply with pandemic regulations, including but not limited to mask mandates	\$500 + subject to increase with subsequent infractions
Failure to comply with any TDC rules or regulations is open to fines of up to \$5,000 at the discretion of Cadillac Fairview Management.	

6.6 Site Cleanliness

6.6.1 Cleanliness

At the end of each day, contractors must ensure that the construction site and common areas are completely free of debris, dirt, marks, etc. If necessary, they should make arrangements with the base building cleaners for cleaning. The contractor is solely responsible for the cost of any cleaning required.

When working near the elevator lobbies and air handling equipment, contractors are required to ensure that dirt and debris does not enter the elevator shaft or air handling equipment. They must install protection such as a plastic sheet taped around the elevator door perimeter to ensure a tight seal. Refer to IAQ guidelines for additional information.

Contractors must take safety precautions when extension cords are required. Where possible, the extension cord must be run through the ceiling to the desired location.

6.6.2 Garbage & Waste

The contractor is solely responsible to remove all generated construction debris. This also applies to all packaging material for furniture or construction. To avoid fire hazards, contractors must avoid accumulating large quantities of construction debris within the construction premises. To remove construction debris or packaging material, contractors must reserve the freight elevator.

Contractors must arrange for disposal bin delivery through the Shipping and Receiving department. The Shipping and Receiving department can provide contractors with a list of companies authorized to deliver disposal bins. Bins must be placed upon wooden supports in designated areas. As loading dock space is limited, disposal bins are only allowed to remain in designated areas between 1730 and 0600 hrs Monday through Friday, and all hours on Saturday, Sunday and holidays. After the bins have been removed, the contractor shall leave the area in a tidy, swept condition.

For recycling information purposes, the disposal bin provider will be required to submit a copy of the materials weight scale ticket to the Facilities Operations Manager within 24 hours.

Please also refer to the Construction & Demolition Waste Management guidelines. project teams are required to incorporate those guidelines into their projects.

6.6.2.a Yard Bins for Controlled Demolition Removal

Contractors are required to book all bins through CF Connect by email at cfconnect@cadillacfairview.com

CF Connect requires the following info when booking a bin:

- Size of the bin
- Name of the company delivering the bin
- Name and telephone number for onsite contact

If contractors require a freight booking, please use the “Scope of Work” line on the freight requisition.

Any bin that has not been booked and confirmed by CF Connect must be approved by the onsite security supervisor. If the TDC cannot accommodate the unbooked bin, we will turn it away immediately.

Bins can be delivered starting at 1730 hrs and must be removed no later than 0600 hrs the following morning.

6.6.2.b Location of Loading Docks

66 Wellington Street West

TDC’s underground loading dock located at 66 Wellington Street West services:

- TD Bank Tower/66 Wellington St. W.
- TD North Tower/77 King St. W.
- TD West Tower/100 Wellington St. W.
- 222 Bay St.

79 Wellington Street West

TDC’s outdoor loading dock located at 79 Wellington St. W. services TD South Tower/79 Wellington St. W. only. It can accommodate one (1) 20-yard bin maximum at one time.

95 Wellington Street West

TDC's outdoor loading dock located at 95 Wellington St. W. services 95 Wellington St. W.. It can accommodate one (1) 20-yard bin maximum at one time.

6.7 Construction Completion

Before work is deemed substantially performed, the contractor must obtain the landlord's written approval indicating that work has been carried out in a satisfactory and acceptable manner.

If the contractor does obtain the landlord's approval, the landlord may be required to complete or revise various portions of the work to align it with TDC standards. The tenant will be solely responsible for the cost of any such work.

6.7.1 Premises Cleaning

Upon construction completion, and before the leased premises are occupied or reoccupied, the tenant is responsible for ensuring the premises are in a clean, "move-in" condition.

To avoid possible conflict with the building's cleaning program, tenants/contractors are requested to employ the TDC Housekeeping Services provider. Please see the list of Recommended Contractors in Table 3 for post-construction cleaning.

The following areas and/or items are to be cleaned:

- All light fixtures and lenses
- Ceilings and ceiling tiles
- Floor tiles and carpets
- Corridor walls and doors immediately adjacent to the occupied premises
- Perimeter radiation or induction units – both inside and outside
- Intake grills, discharge grills, lint screens, coils, drains (as applicable) for induction units
- Convector grills and fins for hot water heating/radiation systems
- Interior face of perimeter windows – where window film is installed, the landlord's contractor will perform this work at the tenant's expense
- Electrical trench header ducts, including those adjacent to the occupied premises
- All service rooms
- Venetian blinds. Note: the base building cleaning company shall carry out this cleaning; the cost will be charged to the tenant's account.
- All restroom facilities where tenants occupy the full floor

In addition, all plumbing drains are to be flushed and cleared to the main plumbing stack, and all janitor sinks must be snaked back to riser stand.

6.7.2 Premises HVAC Systems

To minimize post-construction cleaning costs, the landlord highly recommends that the project team protect any HVAC systems affecting the work area by supplementary filtration and periodic cleaning during construction. Refer to IAQ for additional information.

Before the tenant takes occupation, the TDC Recommended and/or Required Contractors must provide a Consolidated Air Balancing Report verifying that the items listed below have been completed. The tenant is responsible for covering verification costs.

Consolidated Air Balancing Report (including perimeter induction units and VMA on open area):

- Calibration of all induction unit controls and VAVs
- Cleaning of all perimeter induction units with steamed cleaning process
- Duct cleaning (supply, return, exhaust and transfer) for base building distribution systems as well as additional base building terminal equipment, such as fan coil units
- Equipment cleaning of fan coils, heat pumps, exhaust fans and/or any other air handling equipment including replacement air filters and/or coil cleaning as determined to be necessary by Operations**
- Dedicated floor compartment fan units
- Pressure sensing equipment, such as duct static sensors
- Condensate drains for HVAC equipment having such to the point of termination
- Verification of all HVAC systems. Refer to Commissioning

**to be determined during initial project kick-off meeting

Note: Service calls after the tenant has taken occupation that are determined to be caused by lack of cleaning will be charged back to the respective tenant(s).

6.7.3 Commissioning

Commissioning the leased premises prior to move in is a required construction practice at the TDC. The base building commissioning agent handles all commissioning (see Required Property Consultants in Table 3). The tenant is responsible for all costs associated with commissioning.

Commissioning is a structured and documented process aimed at ensuring that mechanical and electrical systems are designed, installed, functionally tested, and capable of being operated and maintained according to the owner’s operational needs.

The commissioning process confirms the design criteria with respect to achieving business functionality and occupant comfort. Ensuring that the HVAC and electrical systems will perform as designed and intended is paramount to the tenant’s satisfaction with the leased premises over the duration of the term.

It is essential to understand the fundamental differences between commissioning processes and the standard services provided by engineering consultants. Please see Table 18.

Table 19 – Commissioning Process

Program Phase

- Review and verify documentation of Owner’s Requirements (Design Intent – DI)
- Review and verify documentation of Designers’ Basis of Design (BD)
- Develop a Commissioning Plan

FOR CADILLAC FAIRVIEW PROJECT MANAGER USE ONLY	
Project Value:	Budgeted: <input type="checkbox"/> Yes <input type="checkbox"/> No Project/Expense Code:
Project Manager:	Project Type: <input type="checkbox"/> Operations <input type="checkbox"/> Project Management
Procurement Method: <input type="checkbox"/> RFP	Sole Source (Approved): <input type="checkbox"/> Yes <input type="checkbox"/> No

Design Phase

- Review and verify that the schematic design satisfies the DI and BD
- Refine the Commissioning Plan
- Review and verify commissioning specifications for construction documents
- Review and verify that the construction documents satisfy the DI and BD

CONSULTANT		PROJECT ADMIN	
Review of all documents (digital and hardcopy)		Document filing review upon close-out	
Name:		Name:	
Initial:		Initial:	
Date:		Date:	
PROJECT MANAGER		PROJECT SPONSOR	
Final review		Final review	
Name:		Name:	
Initial:		Initial:	
Date:		Date:	

6.7.4 Required Close-Out Documentation

In order for a project to be considered substantially performed and for the landlord to release the security deposit, the tenant and/or the contractor is required to provide close-out documentation within four (4) months of substantial performance of site work.

The tenant must submit the documentation to your CF project manager electronically in one submission, separated by the folder structure outlined below. Please see the Contractor’s Project Close Out Check List below.

Contractors may also download the Check List from tdcentre.com.

Note: Not all fields are applicable to tenant projects.

If for any reason any of the listed items are not provided to the landlord’s satisfaction and within four (4) months of Substantial Performance, the landlord will contact the tenant to coordinate the delivery of said documents. If the documents are not delivered to the landlord within an acceptable period as agreed upon by both the landlord and tenant, the landlord will carry out the required measures to substantially close the project. The tenant will be responsible for any and all costs of this work, as well as a 15% administration fee.

1. AS-BUILT DRAWINGS				
Architectural, mechanical, electrical, structural, and communication to include:				
A. One (1) electronic as-built CAD (.dwg) drawing				<input type="checkbox"/>
B. One (1) electronic as-built PDF (.pdf) format drawing				<input type="checkbox"/>
C. Copies of engineers' review letters or review stamp stating acceptance of all as-built drawings				<input type="checkbox"/>
D. Locations and identifications of all terminal control devices (e.g., thermostats, etc.)				<input type="checkbox"/>
DESCRIPTION	CONTRACTOR	CHECK IF N/A (MUST provide a reason if N/A)		CF PROJECT MANAGER
2. METERS				
A. Verification of all required meter installations, including floor plans	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
B. Meter Addition Information Work Sheet including meter locations and sent to energy manager	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Note: Depending on project requirements, include all info on BTU and domestic water meters				
3. BALANCING				
A. Air and water balancing reports including mechanical engineers' review letter or confirmation of review and acceptance	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
4. LIGHTING				
A. Lighting Circuits/Zone Relay Diagram for base building lighting programming	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Note: This information should be made available to the CF project manager at least two (2) weeks in advance of the tenant move-in date to ensure adequate timing for building operations to program all lighting codes				
5. SYSTEM PREPARATION				
A. Chilled Water Flush-Out reports if connected to the base building CW riser (if applicable)	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
B. Completed Duct Cleaning report (new air duct services)	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
C. Completed Perimeter Induction Unit Cleaning letter (packaged maintenance)	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
6. SUSTAINABILITY				
A. IAQ Test reports and/or flush-out results/calculations	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
B. Waste diversion log and waybills	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
C. Sustainable purchasing log	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
7. FIRE SYSTEM				
A. Fire Alarm Verification reports	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

DESCRIPTION	CONTRACTOR	CHECK IF N/A (MUST provide a reason if N/A)		CF PROJECT MANAGER
8. TRAINING AND DOCUMENTATION				
A. All equipment operation and maintenance manuals	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
B. Conducted operational training (at handover), including trouble shooting guides	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
C. Recommended preventative maintenance tasks	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
D. Recommended spare parts list	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
E. Document change in systems control sequence	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
F. Engineer/PM and CF Operations wrap-up meeting to review project completion/handover				<input type="checkbox"/>
9. PROCUREMENT				
A. Certificate of Substantial Performance from the consultant	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
B. Proof of either publication in the Commercial Daily News or Certificate of Last Supply	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
C. Statutory Declaration	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
D. Statement of accounts from all vendors (indicating paid and outstanding invoices)	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
E. Procurement checklist				<input type="checkbox"/>
10. SYSTEM TESTING/COMMISSIONING				
A. Verification of hazardous material reporting and implementation (project) from the consultant	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
B. Verification of hazardous material reporting (master plan) from the consultant	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
C. Copy of performance and product warranties and extended warranties + D31	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
D. Updated schedules, set points and updated technical specifications	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
E. Completed deficiency-free Commissioning Report (Jones Lang Lasalle)	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
F. Copies of all site visit & final deficiency reports, and consultant(s)' review letters stating all deficiencies are resolved	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
G. Verification of equipment performance	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
H. Verification and documentation of energy performance and savings from the consultant	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
I. Financial savings stated/actual verification from the consultant	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
J. Verification of BAS sequence and alarming from the consultant	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
K. RYCOM's report for completion of the removal and re-installation of DAS antennas (if applicable)	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
L. Report from Base Building Structural Engineers for coring review (if applicable).	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

DESCRIPTION	CONTRACTOR	CHECK IF N/A (MUST provide a reason if N/A)		CF PROJECT MANAGER
11. SAFETY/INSURANCE				
A. WSIB Certificate	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
B. Certificate of Occupancy	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
C. City of Toronto permit closure documents (building, HVAC, and plumbing)	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
D. ESA and all other relevant permit closure documents	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
E. Identification and labelling of hazards completed/ reviewed, and function/location of safety devices	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
F. All regulatory documents	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
G. Technical specification (as-built)				
12. MISCELLANEOUS				
A. Manufacturer/Vendor/Contractor contact information	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
B. Upload as-builts, commissioning reports, balancing reports and any other documents to project history log (ArchiDATA)	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
C. Electronic PDF files of ALL above close-out documents	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
D. Complete Contractor Performance Evaluation	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>



A  PROPERTY