Oshawa

Building Services
Structural Design Information Sheet

Description:

Permit Application Number:_____ Location:_____

Owner's Name:_____

Proposed:_____

Building Area:_____ m^2, Building Height:_____ m,Storey(s):_____ Basement(s):_____

Structural System:_____

Design Standards:

			Engineer's Initials
Ontario Regulation 163/24, as amended including O.Reg. 447/24, 2024 Ontario Building Code, Division B, Part 4 (OBC)			
Structural Commentaries on the National Building Code of Canada 2020 (NBC)			
1.	CSA-086-19	"Engineering Design in Wood"	
2.	CAN/CSA A371-14	"Masonry Construction for Buildings"	
3.	CSA S304 - 14	"Design of Masonry Structures"	
4.	CAN/CSA-A23.3-19	"Design of Concrete Structures"	
5.	CSA A23.1-19	"Concrete Materials & Methods of Concrete Construction"	
6.	CSA S413-14	"Parking Structures"	
7.	CAN/CSA-S136-16	"Cold Formed Steel Structural Members"	
8.	CAN/CSA-271-20	"Health and Safety Code for Suspended Equipment Operations"	
9.	CSA S367-12	"Air-, Cable-, and Frame-Membrane Supported Structures"	
10.	CSA-S16-19	"Limit States Design of Steel Structures"	
11.	CAN/CSA-S157-17/ S157.1-17	"Strength Design in Aluminum / Commentary on CSA S157-05, Strength Design in Aluminum"	
12.	CGSB CAN/CGSB-12.20-M89	"Structural Design of Glass for Buildings"	
13.	Canadian Foundation Engineering Manual, the Latest Edition		

Load and Effects:

a) Importance Category (Table 4.1.2.1) Low ☐ Normal ☐ High ☐ Post-Disaster ☐

b) Dead Load	*Self-Weight*		*Superimposed*	
Ground Floor	_____	kPa	_____	kPa
Other Floor	_____	kPa	_____	kPa
Roof	_____	kPa	_____	kPa
Mezzanine	_____	kPa	_____	kPa
Partitions	_____	kPa	_____	kPa
Parking Garages	_____	kPa	_____	kPa

Standard dead load factor _____

Overturning/uplift dead load factor _____

Engineer's initials _____

c) Live Loads Due To Use and Occupancy

Ground floor	_____	kPa	Balconies	_____	kPa
Other floor	_____	kPa	Mechanical areas	_____	kPa
Mezzanine	_____	kPa	Parking garage	_____	kPa
Concentrated loads	_____	kN	Crane capacity	_____	kN
Exit stairs	_____	kPa	Load on guards	H= V=	kN
Concentrated loads	_____	kPa	Fire/Garbage truck	_____	kN
Public corridors	_____			_____	

Engineer's initials _____

d) Loads Due to Snow, Ice and Rain

Importance Factor (Is) _____ Roof Specified Snow Load _____ kPa
Unbalanced Snow Load _____ kPa 1/50 Ground Snow Load (Ss) _____ kPa
1/50 Ground Rain Load (Sr) _____ kPa Drift Load _____ kPa

Calculated for Height Difference of - _____ m
Snow distributions and snow loading factors applied as per OBC and NBC fig. - _____

Are the roof drains designed to retain rain water for:
(i) Storm water management? Yes No (ii)Controlled flow within 24 hr period Yes ☐ No ☐
(iii) Ponding effect? Yes ☐ No If Yes, fill out the Flow Control Roof Drainage Declaration form

Engineer's initials _____

e) Loads Due to Wind

Importance factor (Iw)
1/50 Hourly wind pressure (q)_____kPa
Wind load applied as per OBC and NBC Fig. –_____
In 1st Dir: Factored base shear, V_f =_____Factored overturning moment, M_f =_____kN.m
In 2nd Dir: Factored base shear, V_f =_____Factored overturning moment, M_f = _____kN.m

f) Full and Partial Loadings

Applied as per the OBC and NBC Engineer's initials _____

g) Loads Due to Earthquakes

Seismic hazard values are obtained from the 2020 NBC Seismic Hazard Tool.

Based on Site Class (X_s) _____ or Based on Vs30 (X_v)_____ m/s

Sa(0.2, X) =_____Sa(0.5, X) =_____Sa(1.0, X)=_____Sa(2.0, X) =_____

Sa(5.0, X) =_____Sa(10.0, X) =_____PGA (X) =_____PGV (X) =_____

I_E = _____(Table 4.1.8.5.-A) Seismic Category = _____(Table 4.1.8.5.B)
Type of Irregularities:_____

Method of Analysis: Static ☐ Dynamic ☐ Software Used ☐

For Equivalent Static Force Procedure:

Weight of the building as per 4.1.8.2.(1), W = _____kN

Type of SFRS (1st Dir.) _____ (Table 4.1.8.9.) as per Standard No. _____ Clause _____
Rd= _____ Ro= _____

B = _____Ta = _____Mv = _____J = _____Max interstory deflection = _____

Base shear = _____ kN Overturning moment = _____kN.m

Type of SFRS (2nd Dir.) _____ (Table 4.1.8.9.) as per Standard No. _____ Clause _____
Rd= _____ Ro= _____

B = _____Ta = _____Mv = _____J = _____ Max interstory deflection = _____

Base shear = _____ kN Overturning moment = _____kN.m

Important Note: SFRS shall be clearly shown on the floor plans and section:

h) Elements of Structures, Non-Structural Components and Equipment

Applied as per Article 4.1.8.18	Engineer's initials	_____
Typical details of connections of non-structural elements shall be shown on the permit plans.	Engineer's initials	_____

i) Other Effects

Applied as per Articles 4.1.5.10. through 4.1.6.4. of OBC	Engineer's initials	_____

j) Limit States Design (working stress design not permitted)

Safety Check for Strength and Stability as per OBC, 4.1.3.2.	Engineer's initials	_____
Fatigue, Serviceability, Deflection and Vibration as per OBC 4.1.3.3. through 4.1.3.6..	Engineer's initials	_____

k) Fire Resistive Designs

Load restricted factors as per Certifications Laboratories	Engineer's initials	_____

Foundation System (Limited States Design):

(OBC, 4.1.3., 4.2.)	Engineer's initials	_____

Description: _____
Factored bearing resistance (ULS):_____kPa
Bearing pressure for settlement (SLS))_____kPa
Retaining structures: p = k (yh + q) =_____ (____ x ____ + ____) =_____
Soil investigation report by_____Dated_____

Signature _____
Name _____
Title _____
Organization _____
Address _____
Email Address _____
Phone / Fax No. _____
Date _____

Professional Seal

EABO

Engineers Architects

Building Officials

A Joint Committee of:

Professional
Engineers Ontario

Ontario Association of
Architects

Ontario Building
Officials Association

c/o Professional
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GUIDE TO

THE FLOW CONTROL ROOF DRAINAGE DECLARATION

Why is this form necessary?

The Flow Control Roof Drainage Declaration form provides the Chief Building Official with assurance that the mechanical and structural engineers have coordinated their designs. Because the use of flow control roof drains causes ponding of water on a building's roof the structural engineer must design the roof structure to handle additional loads. There are three possible roof drainage scenarios.

1) System uses no flow control roof drains. There is no additional loading of roof structure.
2) System uses flow control roof drains that meet the criteria specified in M2. The roof structure must include the load accumulated by a 24h rainfall but rain and snow loads do not need to be considered to act simultaneously.
3) System uses a flow control system that does not meet the minimum drainage criteria specified in M2. As a result, rainwater retention on the roof will add loads in excess of an accumulated 24h rainfall. Structural engineers must design the roof to accommodate the actual excess rainfall load and a simultaneous snow load as set out in subsection 4.1.7 of the Ontario Building Code.

Completing the flow control roof drainage declaration

This document must be completed by the professional engineers responsible for the design of the roof structure (Structural Engineer) and the roof drainage system (Mechanical Engineer). In each section the appropriate professional engineer shall check one statement. Select the one that describes the basis for the design submitted for permit.

Both engineers shall affix their seals to the appropriate section. Sign and date the seal in accordance with Section 53 of Regulation 941, Professional Engineers Act.

FLOW CONTROL ROOF DRAINAGE DECLARATION

THIS FORM TO BE COMPLETED BY THE MECHANICAL AND STRUCTURAL ENGINEERS RESPONSIBLE FOR DESIGN

Permit Application No.

Project Name:

Building Location: Municipality:

The roof drainage system has been designed in accordance with the following criteria: (please check one of the following).

M1. ❑ Conventionally drained roof (no flow control roof drains used).

M2. ❑ Flow control roof drains meeting the following conditions have been incorporated in this design:

(a) the maximum drain down time does not exceed 24h,
(b) one or more scuppers are installed so that the maximum depth of water on the roof cannot exceed 150mm,
(c) drains are located not more than 15m from the edge of roof and not more than 30m from adjacent drains, and
(d) there is at least one drain for each 900 sq.m.

M3. ❑ A flow control drainage system that does not meet the minimum drainage criteria described in M2 has been incorporated in this design.

PROFESSIONAL SEAL APPLIED BY:

Practitioner's Name:

Firm:

Phone #:

City: Province:

Mechanical Engineer's Seal

S1. ❑ The design parameters incorporated into the overall structural design are consistent with the information provided by the Mechanical Engineer in M2. Loads due to rain are not considered to act simultaneously with loads due to snow as per Div.B, 4.1.6.4.(3) of the Building Code.

S2. ❑ The structure has been designed incorporating the additional structural loading due to rain acting simultaneously with the snow load. The design parameters are consistent with the control flow drainage system designed by the mechanical engineer.

PROFESSIONAL SEAL APPLIED BY:

Practitioner's Name:

Firm:

Phone #:

City: Province:

Structural Engineer's Seal