Building Code Analysis - Guide

OVERVIEW

The purpose of this document is to provide guidance in completing the Building Code Analysis to be submitted with a building permit application. The Building Code Analysis is required for new commercial, industrial, multi-family, and existing commercial/industrial/multi-family buildings with a change of major occupancy or with a substantial addition/alteration.

The completed Building Code Analysis form will assist in processing your application by providing a detailed code analysis and supporting drawings.

PROJECT DESCRIPTION GUIDE

Date: Date of application for the building permit.

Project Name: Proposed name of building, e.g. Frank Crane Arena.

Project Address: Self-explanatory.

Architect: Architect's name and company name.

Type of Work - (Division A 1.1.1.1.) Identify the project type as either New Construction, Addition, Addition & Alteration, Alteration or Change of Use.

Project Description: Provide a detailed description of the project (e.g. New, 6-storey, mixed-use building on a sloping site with 1 surface parking lot and 1 under building storage garage designed as a separate building as per BCBC 3.2.1.2. The lower 3 storeys are of non-combustible construction with 3 upper storeys of combustible construction. The building is designed to accommodate D, E or A2 occupancies in the commercial spaces and C occupancy above, with the parking garage as an F3 occupancy. The combustible floor area of the building exceeds the area permitted by the BCBC and an alternative solution is included as part of the BP application to address the total combustible load. The commercial at grade occupancy is also separated from the remainder of the building through an air space sub-division).

Building Code Version: Confirm the building code version to which the project is designed, the regulation for the issued building code and the last amendment regulation.

Basis for Code Analysis: Identify the part of the code applicable to the project (Part 3 or Part 9).

Building Classification: (3.3.2.6., 3.2.2.20. – 90.) (9.10.8.) Identify the classification of the building according to **3.2.2. Building Size and Construction Relative to Occupancy**. A building may have different major occupancies but generally has one classification based on the most restrictive governing article; however, superimposed occupancies may be separately classified. If the analysis is for an existing building with a change of major occupancy, identify the existing and proposed building classification.

The following drawing components are to be included as part of the Building Code Analysis in the building permit application package. See the following link to example Occupancy, Code & Safety Drawings.
In red print, reference to additional information is provided for clarification; see pages 4 & 5 of this document.

DRAWING COMPONENT	ABBREVIATION	DESCRIPTION
BCBC Analysis:	BCBCA	Summary of all pertinent code information. Minimum information to include: • Application of Division B (Part 3 or Part 9) • Alternative solutions to building code compliance and effect on design - Analysis Guide item # 01 • Building area - Analysis Guide item # 02 • Building height - Analysis Guide item # 03 • Number of storeys • High building confirmation - Analysis Guide item # 04 • Building classification listing all major occupancies and most restrictive classification - Analysis Guide item # 05 & Building Classification (see page 1) ▪ Number of streets facing building - Analysis Guide item # 06 ▪ Permitted construction - Analysis Guide item # 07 ▪ Max building area ▪ Required fire resistance ratings for floors, mezzanines, roofs and supporting structure - Analysis Guide item # 08 • Superimposed major occupancies - Analysis Guide item # 09 • Storage garage as separate building - Analysis Guide item # 10 • Fire walls - Analysis Guide item # 11 • Sprinkler requirements & NFPA standard - Analysis Guide item # 12 • Fire alarm requirements - Analysis Guide item # 13 • Importance category - Analysis Guide item #14 • Confirmation of accessibility standard applied (detail if alternate standards used in different portions of the building) • Confirmation of accessibility exemptions if applicable
Area Summary:	AS	Description of building area by floor. Minimum information to include: • Area by occupancy type - Analysis Guide item # 15 • Total area by floor - Analysis Guide item # 16 • Total area for building - Analysis Guide item # 17
Occupancy, Code & Safety Drawings:	OCSD	Floor plans (for each floor) and adequate building sections to capture critical elements. The OCSD drawings are required in addition to the typical architectural drawings. - See example plans and Analysis Guide item # 18 Minimum information to include: • All required fire resistance ratings (different colour for each required FRR with legend) ▪ Required fire resistance ratings for floors, mezzanines, roofs and supporting structure ▪ Separation of occupancies/suites/exits/janitor closets/service rooms/shafts/ elevators/laundry rooms/other as applicable ▪ Required spatial separation fire resistance ratings ▪ Size and extents of mezzanines (if applicable) ▪ Superimposed major occupancies (if applicable) ▪ Storage garage as a separate building (if applicable) ▪ Firewalls (if applicable) • Travel distances • Exit door(s) • Separations of exits • Graphic indication of occupancies

DRAWING COMPONENT	ABBREVIATION	DESCRIPTION
Spatial Separation Analysis:	SSA	Summary of spatial separation calculations for all exterior building faces/fire compartments. - Analysis Guide item # 19 Minimum information to include: • Wall area • Length to height ratio (if not sprinklered) • Opening area • % Opening • Limiting Distance (allowed and proposed) • Construction Requirements: ▪ Required fire resistance ratings ▪ Construction type (combustible or non-combustible) ▪ Cladding type (combustible or non-combustible)
Energy Compliance Summary:	ECS	Summary of energy compliance path. - Analysis Guide item # 20 Minimum information to include: • Energy standard or code • Climate zone • Heating degree days • Compliance path type (prescriptive or performance) • If prescriptive path applicable, the U & R values for the following: ▪ Roofs ▪ Walls above grade ▪ Walls below grade ▪ Floors ▪ Slabs on grade ▪ Opaque doors ▪ Fenestration • If performance path applicable, date and author of energy model
Occupant Load & Washroom Count Analysis:	OLWCA	Summary of occupant load calculation as per Table 3.1.17.1. broken out per type of use of floor area. - Analysis Guide item # 21 • Area per person by type of use • Area per type of use • Occupants by type of use Summary of required water closets calculation as per Section 3.7. broken out by occupancy type. - Analysis Guide item # 22 Minimum information to include: • Required and proposed washrooms by gender • Required and proposed universal washrooms
Door Schedule:	DS	Summary of all doors and hardware. Minimum information to include: • Unique reference number for each door or door type • Required fire resistance rating • Door height and width • Hardware to include as a minimum: ▪ Exit (panic) device or handle style ▪ Deadbolt ▪ Closer ▪ Hold opens • Glazing area and type
Fenestration Schedule:	FS	Summary of all fenestration. Minimum information to include: • Unique reference number for each window or window type • Height and width of total unit and openers • Operation of openers • Special glazing (tempered, fire resistant, other) • Restrictors

DRAWING COMPONENT	ABBREVIATION	DESCRIPTION
Wall, Floor & Roof Assemblies:	WFRA	Summary of all wall, floor and roof assemblies. Minimum information to include: • Unique reference number for assembly type • Actual fire resistance rating with BCBC or tested assembly reference (if applicable) • Actual STC rating with BCBC or tested assembly reference (if applicable) • Effective R – Values for exterior assemblies • Detailed listing of all assembly components

The following items provide additional information corresponding to the red text and numbers in these documents:

ANALYSIS GUIDE:	
01	**Alternative solution(s) -** Describe any proposed alternative solutions and the effect on the proposed construction. e.g. Fire Alarm System – to reduce complete and unnecessary building evacuation due to false alarms, it is proposed to subdivide the fire alarm system into evacuation areas by individual building and allow alarm sounding in the building of origin and in sequence to other buildings in the event of fire spread.
02	**Building area m²:** (Division A 1.4.1.2., 3.2.2.5.) To determine the footprint (superimposed area over grade) of the building for the purpose of building classification. Defined in BCBC, ***Building area*** means the greatest horizontal area of a *building* above *grade* within the outside surface of exterior walls or within the outside surface of exterior walls and the centre line of *firewalls*. For additions and alterations, indicate the building area in m^2 for existing and new portions of the building and provide a total. Provide a simple description of the areas (e.g. existing building, east addition). If a portion of the building is to be demolished, provide the m^2 to be demolished.
03	**Building height:** (Division A 1.4.1.2., 3.2.1.1., 9.10.4., 9.10.8.9.) Identify the number of storeys above and below grade.
04	**High building:** (3.2.6.) As defined in BCBC. Include height in metres above grade to the floor level of the top storey. Note: For 3.2.2.50. & 3.2.2.58., no portion of the access route shall be more than 20m below uppermost floor level.
05	**Major occupancies classification:** (3.1.2.1., 9.10.2.) Identify each of the major occupancy groups in the building and describe their use. (e.g. D - Business and Personal Services/Medical Clinic). Refer to BCBC 3.1.2. and to Appendix A to the building code for definitions of multiple major occupancies.
06	**Number of streets:** (3.2.2.10., 3.2.5., 9.10.20.) Enter number of streets as defined in BCBC. A fire fighting access plan can be provided with the information in graphic form.
07	**Construction type:** (3.2.2.20. - 90., 3.2.1.4., 9.10.6.) Identify the project construction restrictions ("combustible permitted", "non-combustible required") (refer to Building Classification). Indicate the construction proposed ("combustible", "non-combustible", "combination") and whether heavy timber construction is used.
08	**Required fire resistance ratings:** (3.2.2.20. – 90., 3.2.1.2., 3.2.1.4., 9.10.8.) Identify the fire resistance rating required for floors, roofs and mezzanines, as well as the supporting members for these. Indicate where non-combustible construction is used in lieu of ratings (where permitted). Note that the fire resistance ratings required may change for different major occupancies.
09	**Superimposed major occupancies:** (3.2.2.7., 9.10.2.4.) If the building is designed with superimposed major occupancies, provide a brief description. (e.g. Three stories of Group C – Residential, superimposed over one storey of Group E - Retail) and include building classification and group/division in "Building Classification". Information can be provided on building section.
10	**Storage garage:** (3.2.1.2., 9.10.4.3.) Identify if there is a storage garage and if it is to be constructed as a separate building or not. Identify the fire separation proposed.
11	**Fire walls:** (3.1.10., 9.10.11.) If incorporated into the design, provide location and the rating proposed.
12	**Sprinklers, standpipe:** (3.2.1.5., 3.2.2.18., 9.10.1.3.(8), 9.10.8.2.) Identify if sprinklers are required by BCBC, Bylaw 7224, not required or if they are existing. Identify the NFPA Standard and if a standpipe system is required.

ANALYSIS GUIDE:	
13	**Fire alarm system:** (3.2.4., 9.10.18.) Identify if required BCBC or not required, and type of system, single stage or two stage.
14	**Importance category:** 4.1.2.1.(3) Identify the importance category for Part 3 buildings - Low (low human occupancy), (minor storage) or Normal (all building except those listed in other categories) or High (explosive or hazardous substances) (post-disaster shelter) or Post-disaster (buildings essential for provision of services in the event of a disaster)
15	**Area by occupancy type:** (Division A 1.4.1.2.) Floor area meaning the space on any storey of a building between exterior walls and required firewalls, including the space occupied by interior walls and partitions, but not including exits, vertical service spaces, and their enclosing assemblies. This information is used to determine occupant load, which in turn determines exiting capacity requirements and washroom requirements.
16	**Total area by floor:** The total area on each floor measured within the outside surface of exterior walls.
17	**Total area for building (GFA):** The total area on each floor of the building measured within the outside surface of exterior walls added together.
18	**Occupancy, code & safety drawings:** See example plans. A separate set of drawings helps provide simplicity and clarity in visual display of these code items. Scale of drawings to be appropriate to the building project while providing easy readability. Additional code items can be added as appropriate, e.g. cross - over floors identified on elevation drawings.
19	**Spatial separation:** (3.2.3., 9.10.14., 9.10.15.) Provide the spatial separation information for each building face/compartment as applicable. Provide a description of the exposing building face (e.g. “West Elevation”, “North Wall, Fire Compartment 1”) and identify the same on the drawings. Where calculations are complex (i.e. a wall face divided into smaller fire separated compartments), for clarity, calculations should be shown on an elevation drawing.
20	**Energy efficiency:** State the compliance path utilized in the design and any additional requirements from rezoning (if applicable).
21	**Occupant load:** (3.1.17., 9.9.1.3.) Provide design information for the occupancy and occupant load per floor and the method of calculation. Additional information is required if code design occupant loads are not used.
22	**Health requirements, plumbing facilities:** (3.7.2., 9.31.1.1.) Plumbing fixture calculations should confirm that the number of plumbing fixtures provided is not less than required by the occupant loads for the various occupancies. It may be necessary to provide a breakdown of the various occupancies in order to provide the required information with clarity. Where there is a change of occupancy or specific use, an adjustment of the number of plumbing fixtures may be required within an occupancy. Additional information is required if code design occupant loads are not used.