

WORKSHEET 2-1

THE MANITOBA RESIDENTIAL OCCUPANCY FIRE RISK INDEX

FIRE SAFETY PARAMETER VALUES

TABLE 2.1 CONSTRUCTION OF STRUCTURAL MEMBERS AND FLOOR AND ROOF⁽¹⁾ ASSEMBLIES
(Applies to each fire zone)

Building Height, Storeys	Combustible Construction				Protected Heavy Timber ⁽⁴⁾ FRR	Heavy Timber FRR	Noncombustible Construction			
	<45 min ⁽²⁾ FRR	45 min FRR	1 h FRR	2 h FRR			<45 min ⁽²⁾ FRR	45 min FRR	1 h FRR	2 h FRR
1 to 3	-3	0	1	2	2	1	-1	2	2	2
4	-4	-2	0	2	2	0	-2	0	2	2
5 to 6	-8	-6	-4	-2	-2	-4	-4	-2	0	2
>6	NP ⁽³⁾	-7	-6	-4	-4	-6	-8	-3	-2	0

Notes:

⁽¹⁾ *Fire resistance ratings* for roof assemblies are required only when the applicable article in MBC Subsection 3.2.2. requires a rated roof assembly.

⁽²⁾ <45 min requires a minimum FRR equivalent to 1 layer of regular 12.7 mm thick gypsum board covering the structural member or assembly.

⁽³⁾ NP = not permitted.

⁽⁴⁾ Protected Heavy Timber means heavy timber construction as per the MBC protected by 2 layers of 15.9 mm thick Type X gypsum board or equivalent thermal protection.

TABLE 2.2 HAZARDOUS AREAS IN RESIDENTIAL BUILDINGS
(Applies to each fire zone)

	No Fire Separations No Sprinklers	No Fire Separations ⁽⁴⁾ + Sprinklers	Non-Rated Fire Separations ⁽¹⁾ No Sprinklers	Non-Rated Fire Separations ⁽¹⁾ + Sprinklers	Fire Separations ≥1 h No Sprinklers	Fire Separations ≥1 h + Sprinklers
Tenant Storage Rooms	-7	-2	-3	-1	-2 ⁽³⁾	0
Furnace/Service Rooms	-4	0	-1	1	0	2
Common Laundry Rooms	-4	-2	-2	0	0 ⁽³⁾	2
Common Janitors' Rooms	-4	-2	-2	0	0 ⁽³⁾	2
Office, Assembly, or Light Industrial Occupancy in building	-4	-2	-2	0	0	2
Mercantile Occupancy or Storage Garage in building	-5	-4	-3	-2 ⁽⁵⁾	-1 ⁽⁶⁾	1
Elevator Machine Rooms ⁽²⁾	-4	-2	-2	0	0 ⁽³⁾	2
Refuse Storage Rooms	-7	-2	-3	-1	-2	0

Notes:

⁽¹⁾Fire separations must be present to act as smoke separations regardless of the FRR.

⁽²⁾Elevator Machine Rooms need not be separated from the elevator hoistway provided both the room and the hoistway are fire separated from the remainder of the building as per the MBC.

⁽³⁾Where the MBC permits floor assemblies to have a 45 min fire resistance rating, rated enclosures of 45 min FRR shall be considered to be 1 h FRR for the purposes of application of this parameter.

⁽⁴⁾Where hazardous areas are located immediately adjacent to exits, exit lobbies or public corridors, no credit is to be given for sprinklers for the purposes of this parameter if there is no smoke separation present. Such situations shall be considered "No Fire Separations, No Sprinklers" for the purposes of application of this parameter.

⁽⁵⁾Where the storage garage contains 5 vehicles or less, the score for this parameter should be "0".

⁽⁶⁾If the FRR of Storage Garage fire separations are at least 90 min, the score for this parameter should be "0".

TABLE 2.3 VERTICAL OPENINGS (Applies to entire building)

Vertical Opening Types	Unenclosed - Number of storeys ⁽¹⁾ open to a vertical service space ⁽²⁾			Enclosed ⁽³⁾ – Fire Resistance Rating of Enclosure		
	>3 sto	2-3 sto	1 sto	<1 h ⁽⁶⁾	1 h ^{(5) (6)}	>1 h
Exit Stair Shafts	NP ⁽⁴⁾	-7	-2	-1	0	1
Refuse Chutes/Linen Chutes	-10	-7	-3	-1	0	1
Vertical Service Spaces	-10	-7	-2	-1	0	1
Elevator Shafts	-10	-7	-2	-1	0	1
Existing Stair/Elevator Shafts (combined)	-10	-7	-2	-1	0	1

Notes:

⁽¹⁾Includes basement storeys and roof spaces.

⁽²⁾Means no fire or smoke separation exists between storey and vertical service space, or it is incomplete.

⁽³⁾Enclosed means a fire or smoke separation exists and is continuous throughout the enclosure.

⁽⁴⁾NP = Not Permitted.

⁽⁵⁾Existing wired glass or glass block enclosures, regardless of area of glass, are considered to have a rating of 1 h.

⁽⁶⁾Where the MBC permits floor assemblies to have a 45 min fire resistance rating, rated enclosures of 45 min FRR shall be considered to be 1 h FRR for the purposes of application of this parameter.

TABLE 2.4 AUTOMATIC SPRINKLERS⁽¹⁾ (Applies to entire building)

Incomplete or None or Partial	Unsuper-vised using NFPA 13 with Std Sprinklers	Unsuper-vised using NFPA 13R System ⁽²⁾⁽³⁾	Unsuper-vised using NFPA 13 with Residential Sprinklers	Supervis-ed ⁽⁴⁾ using NFPA 13 with Std Sprinklers	Supervised ⁽⁴⁾ using NFPA 13R System ⁽²⁾⁽³⁾	Supervi-sed ⁽⁴⁾ using NFPA 13 with Residential Sprinklers
0	4	4	6	8	8	10

Note:

⁽¹⁾New and refurbished automatic sprinkler system installations shall conform to the MBC.

⁽²⁾NFPA 13 requires residential sprinklers to be installed in all residential spaces.

⁽³⁾NFPA 13R sprinkler systems are limited to buildings 4-storeys or less in height

⁽⁴⁾Supervision as required in the MBC.

TABLE 2.5 FIRE ALARM SYSTEMS (Applies to entire building)

None	Incomplete ⁽¹⁾	2 Stage System ⁽³⁾	Single Stage System			
			Without Voice Comm	+ Voice Comm or Supervision ⁽²⁾	+ Voice Comm ⁽²⁾ + Supervised ⁽²⁾ with FD Notification	+ Voice Comm ⁽²⁾ + Supervised with FD Notification ⁽²⁾ + Fire Detectors ⁽²⁾
-4	-2	-1	0	1	2	3

Note:

⁽¹⁾Incomplete means that the existing system does not meet all of the requirements of the MBC related to the specific building, but that a fire alarm system exists in the building and is operational. (See Article 2.2.5.3)

⁽²⁾As per MBC

⁽³⁾Where a 2-stage fire alarm system is continuously monitored by supervisory staff such that there is no delay in evacuation of occupants or notification of the fire department, a 2-stage system can be treated as a single-stage system for the purposes of this parameter.

TABLE 2.6 SMOKE ALARMS WITHIN SUITES⁽¹⁾ (Applies to each fire zone)

None or Battery-Powered Units	Units with Minimum 10-year Non-Tamper Lithium Batteries	Single Station Units ⁽²⁾		Interconnected Units ⁽²⁾	
		Every Level	Every Level and All Bedrooms	Every Level	Every Level and All Bedrooms
-4	-2	0	1	0	2

Note:

⁽¹⁾Installed in conformance with the MBC.

⁽²⁾Hard-wired units are required.

TABLE 2.7 SUITE FIRE COMPARTMENTATION (Suite to Suite and Suite to Corridor) (Applies to each fire zone)

Incomplete/None ⁽¹⁾	Walls <45 min FRR ⁽²⁾		Walls ≥45 min FRR ⁽⁶⁾		Walls ≥1 h FRR ⁽³⁾⁽⁶⁾	
	Doors ⁽⁴⁾ <20 min FPR	Doors ⁽⁵⁾ ≥20 min FPR	Doors ⁽⁴⁾ <20 min FPR	Doors ⁽⁵⁾ ≥20 min FPR	Doors ⁽⁴⁾ <20 min FPR	Doors ⁽⁵⁾ ≥20 min FPR
-6	-3	-2	-2	-1	-1	0

Notes:

⁽¹⁾Incomplete/none refers to the case where there is no smoke separation between the spaces.

⁽²⁾At least equivalent to 12.7 mm thick regular gypsum board on both sides of steel or wood studs.

⁽³⁾Existing wired glass or glass block enclosures, regardless of area of glass, are considered to have an FRR of 1 h.

⁽⁴⁾These door assemblies are not required to have a fire protection rating and do not require a rated frame or rated hardware but must have self-closing and latching devices to ensure that they can prevent smoke movement into the corridor.

⁽⁵⁾Conforming to the MBC.

⁽⁶⁾Where the MBC permits floor assemblies to have a 45 min fire resistance rating, walls having an FRR of 45 min shall be considered to be 1 h FRR for the purposes of application of this parameter. The assigned score will therefore be "0" or "-1" depending on the type of door.

TABLE 2.8 TEMPORARY REFUGE AREAS (Applies to each fire zone)

Incomplete/No Door ⁽¹⁾	Walls ⁽²⁾ + Door ⁽³⁾		Exterior Balconies ⁽⁵⁾
	Walls <20 min FRR	Walls ≥20 min FRR ⁽⁴⁾	
-1	0	1	1

Notes:

⁽¹⁾Incomplete/no door refers to the case where there is no smoke separation between the spaces.⁽²⁾Walls shall be at least smoke separations or be rated as "Incomplete".⁽³⁾Doors do not need to have an FPR nor do they need to be self-closing.⁽⁴⁾Wired glass or glass block assemblies, regardless of the area of glass, are considered to have an FRR ≥20 min.⁽⁵⁾Balconies must have direct access from each suite, be at least 1.5 m deep and have an area of at least 1 m² per bedroom in the suite.**TABLE 2.9A ACCESS TO EXITS FROM SUITES**
BUILDING NOT SPRINKLERED THROUGHOUT (Applies to each fire zone)

Suite Has Direct Access to Fire Escape ⁽³⁾ + Dead End Public Corridor	Suite on Dead End Public Corridor ⁽¹⁾ >6 m +		Suite on Dead End Public Corridor ⁽¹⁾ ≤6 m +			Suite on 2 Directional Public Corridor +		
	≤15 m Travel ⁽²⁾	>15 m Travel ⁽²⁾	≤15 m Travel ⁽²⁾	≤30 m Travel ⁽²⁾	≤45 m Travel ⁽²⁾	≤15 m Travel ⁽²⁾	≤30 m Travel ⁽²⁾	≤45 m Travel ⁽²⁾
0	-2	-4	2	1	0	2	1	0

Note:

⁽¹⁾Dead end public corridor must lead to 2-directional corridor or 2 exits⁽²⁾Travel is the total distance an occupant must walk to move from the most remote point in a suite to an exit door.⁽³⁾Existing fire escapes are permitted on buildings 6-storeys and less in height and other aspects conform to MBC. New fire escapes must conform to MBC.**TABLE 2.9B ACCESS TO EXITS FROM SUITES**
BUILDING SPRINKLERED THROUGHOUT (Applies to each fire zone)

Suite Has Direct Access to Fire Escape ⁽³⁾ + Dead End Public Corridor	Suite on Dead End Public Corridor ⁽¹⁾ >6 m +		Suite on Dead End Public Corridor ⁽¹⁾ ≤6 m +				Suite on 2 Directional Public Corridor +			
	≤15 m Travel ⁽²⁾	>15 m Travel ⁽²⁾	≤15 m Travel ⁽²⁾	≤45 m Travel ⁽²⁾	≤70 m Travel ⁽²⁾	≤80 m Travel ⁽²⁾	≤15 m Travel ⁽²⁾	≤45 m Travel ⁽²⁾	≤70 m Travel ⁽²⁾	≤80 m Travel ⁽²⁾
0	-1	-3	2	1	0	-2	2	1	0	-2

Note:

⁽¹⁾Dead end public corridor must lead to 2-directional corridor or 2 exits⁽²⁾Travel is the total distance an occupant must walk to move from the most remote point in a suite to an exit door.⁽³⁾Existing fire escapes are permitted on buildings 6-storeys and less in height and other aspects conform to MBC. New fire escapes must conform to MBC.

TABLE 2.10 EXITS (Applies to each fire zone)

<2 Exits	Enclosed Stairs ⁽¹⁾ + Horizontal Exit ⁽⁵⁾			2 or more Enclosed Stairs ⁽¹⁾				1 Enclosed Stair ⁽¹⁾ + 1 Fire Escape (FE) ⁽²⁾ + Cross Corridor Barrier ⁽³⁾		
	Stair Direct to Outside	Stairs Direct to Outside	Stairs Through Complying Lobby ⁽⁴⁾	Stairs Through Non-Complying Lobby	All Stairs Direct to Outside	One Stair Through Complying Lobby ⁽⁴⁾	One Stair Through Non-Complying Lobby	With Cross Corridor Barrier ⁽³⁾	Stair Direct to Outside + FE	Stair Through Complying Lobby ⁽⁴⁾ + FE
-6	2	1	0	1	0	-1	4	1	0	-1

Notes:

⁽¹⁾Enclosure by a fire separation conforming to MBC. Existing wired glass assemblies with unlimited areas of glass are permitted where required FRR is 1 h or less.

⁽²⁾Existing fire escapes permitted only on buildings 6-storeys or less and other aspects conform to MBC. New fire escapes must conform to the MBC.

⁽³⁾Cross corridor barriers are smoke partitions and need not have an FRR nor do doors in them need to have an FRR (see Article 2.2.10.4).

⁽⁴⁾Lobby complying with MBC.

⁽⁵⁾Horizontal exit conforms to MBC except that, for the purposes of this parameter, exiting through a vertical fire separation with a 2 h FRR, which divides all floors of a building, shall be considered as horizontal exiting (see Article 2.2.10.2).

TABLE 2.11 INTERIOR FINISHES OF WALLS AND CEILINGS⁽¹⁾

(Applies to each fire zone)

Exits FSR ⁽²⁾⁽³⁾			Public Corridors FSR ⁽²⁾		Other Spaces, including suites FSR ⁽¹⁾⁽²⁾⁽⁴⁾	
≤25	>25≤75	>75≤150	≤75	>75≤150	≤150	≤200
0	-1	-2	0	-1 ⁽⁵⁾	0	-1

Note:

⁽¹⁾For high buildings required to conform to Subsection 3.2.6 of the MBC, requirements for smoke developed classifications of interior finishes must also be met.

⁽²⁾Does not apply to exposed heavy timber construction.

⁽³⁾Includes exit lobbies where exits are permitted to discharge through a lobby.

⁽⁴⁾Does not apply to wall and ceiling finishes of bathrooms provided that their FSR does not exceed 200.

⁽⁵⁾For sprinklered buildings, interior finishes in public corridors with FSR ≤ 150 shall be scored as "0".

TABLE 2.12A SMOKE CONTROL FOR BUILDINGS WHOSE UPPERMOST FLOOR LEVEL IS 18 m OR LESS ABOVE GRADE
(Applies to each fire zone)

None	Vented Stairwells ⁽¹⁾	Mechanical Pressurization of Stairwells ⁽¹⁾	Cross Corridor Barriers	Pressurized Corridors	Pressurized Corridors + Cross Corridor Barriers ⁽²⁾
0	1	1	1	2	3

Note:

⁽¹⁾As per Subsection 3.2.6 of MBC.

⁽²⁾Cross corridor barriers are smoke partitions and need not have an FRR nor do doors in them need to have an FPR (see Article 2.2.10.4).

TABLE 2.12B SMOKE CONTROL FOR BUILDINGS WHOSE UPPERMOST FLOOR LEVEL IS GREATER THAN 18 m ABOVE GRADE
(Applies to entire building)

None	Vented Stairwells ⁽¹⁾	Mechanical Pressurization of Stairwells ⁽¹⁾	Vented Stairwells ⁽¹⁾ or Mech Press ⁽¹⁾ + Cross Corridor Barriers	VS ⁽¹⁾ or MP ⁽¹⁾ + Pressurized Corridors	VS ⁽¹⁾ or MP ⁽¹⁾ + Pressurized Corridors + Cross Corridor Barriers ⁽³⁾
NP ⁽²⁾	0	0	1	1	2

Note:

⁽¹⁾As per Subsection 3.2.6 of MBC

⁽²⁾NP = Not Permitted

⁽³⁾Cross corridor barriers are smoke partitions and need not have an FRR nor do doors in them need to have an FPR (see Article 2.2.10.4).

TABLE 2.13 FIRE SAFETY PLANNING
(Applies to entire building)

No FSP ⁽¹⁾ or No Exit Drills	FSP ⁽¹⁾ Developed & Approved ⁽²⁾ + 1 Exit Drill/Year Involving Staff Only	FSP ⁽¹⁾ Developed & Approved ⁽²⁾ + 1 Exit Drill/Year involving Staff and Occupants
-2	0	2

Notes:

⁽¹⁾Fire safety plan as per MFC.

⁽²⁾Approved by fire department.

**TABLE 2.14A FIRE BRIGADE RESPONSE
BUILDING NOT SPRINKLERED THROUGHOUT**
(Applies to entire building)

FD Response ⁽¹⁾ ≤6 min		FD Response ⁽¹⁾ >6 min but ≤ 9 min		FD Response ⁽¹⁾ >9 min	
With FD Elevator ⁽²⁾	Without FD Elevator	With FD Elevator ⁽²⁾	Without FD Elevator	With FD Elevator ⁽²⁾	Without FD Elevator
1	0	-1	-2	-2	-3

Notes:

⁽¹⁾Fire department response time means processing time plus travel time from the fire station to the building and excludes setup time which is estimated as 5 additional minutes

⁽²⁾Conforms to MBC requirements for fire department elevators.

**TABLE 2.14B FIRE BRIGADE RESPONSE
BUILDING SPRINKLERED THROUGHOUT**

FD Response ⁽¹⁾ ≤5 min		FD Response ⁽¹⁾ >5 min but ≤ 9 min		FD Response ⁽¹⁾ >9 min	
With FD Elevator ⁽²⁾	Without FD Elevator	With FD Elevator ⁽²⁾	Without FD Elevator	With FD Elevator ⁽²⁾	Without FD Elevator
2	1	0	-1	-1	-2

Notes:

⁽¹⁾Fire department response time means processing time plus travel time from the fire station to the building and excludes setup time which is estimated as 5 additional minutes

⁽²⁾Conforms to MBC requirements for fire department elevators.

TABLE 2.15 BASIC REQUIREMENTS

The following must conform to the MBC or MFC:

Basic Requirement	Yes – Complies with MBC/MFC	No – Requires Upgrading to Comply with MBC/MFC
Utilities Installation, including electrical equipment vaults		
HVAC Installation		
New Elevator Installation		
Fire-stopping		
Standpipe System		
New Sprinkler Systems comply with MBC		
Fire Alarm Audibility in all spaces		
New Fire Alarm Systems comply with MBC		
Testing/Maintenance of fire safety equipment complies with MFC and MBC testing requirements for control of smoke movement and mechanical venting		
Occupants must care for themselves in evacuation, except infants in care of responsible persons. (No trained staff to assist egress.)		
Non-sprinklered zones provided with protection for a floor area, with a barrier free path of travel, in conformance with the MBC.		
High buildings, as defined in MBC, conform to MBC additional requirements for high buildings, except for parameters addressed in this risk index.		

WORKSHEET 2-2

FIRE SAFETY EVALUATION FOR RESIDENTIAL OCCUPANCIES

Table No.	Occupant Safety Parameter	Fire Control Provided	Refuge Provided	Egress Provided	Overall Fire Safety
1	Construction			N/A	
2	Hazardous Areas			/2 =	
3	Vertical Openings				
4	Automatic Sprinklers		/2 =	/2 =	
5	Fire Alarm	/2 =	N/A		
6	Smoke Alarms	/2 =	N/A		
7	Apartment Fire Compartmentation			/2 =	
8	Bedroom Fire Compartmentation	N/A		N/A	
9	Access to Exits	N/A	N/A		
10	Exits	N/A	/2 =		
11	Interior Finishes	/2 =	N/A		
12	Smoke Control	N/A			
13	Fire Safety Planning	N/A	N/A		
14	Fire Brigade Response		N/A		
	EVALUATION TOTALS⁽¹⁾				

Notes:

⁽¹⁾Totals to be transferred to Worksheet 2-3

WORKSHEET 2-3

COMPARISON TO BENCHMARKS FOR RESIDENTIAL OCCUPANCY BUILDINGS⁽¹⁾

MBC Reference ⁽²⁾	Building Height	Fire Control Benchmark	Refuge Benchmark	Egress Benchmark	Overall Fire Safety Benchmark
3.2.2.52	1-3 storeys	-2.5	-3	-3	-5
3.2.2.50 3.2.2.48	4-6 storeys	5	2	-1	2
3.2.2.47	>6 storeys	6.5	3	1	4

Notes:

⁽¹⁾Scores shown are those calculated for a typical building of the same height complying with the MBC.

⁽²⁾While building heights were used in determining applicable MBC 2011 article for reference, building areas are not considered in determining benchmark values.

EQUIVALENCY EVALUATION FOR RESIDENTIAL OCCUPANCY BUILDINGS

Fire Safety Provided (Total from above)	Fire Safety Required (Benchmark from above)	Column 1 \geq Column 2	
		Yes	No
	Fire Control Benchmark =		
	Refuge Benchmark =		
	Egress Benchmark =		
	Overall Fire Safety Benchmark =		
Column 1	Column 2	Column 3	