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I.S.O Types 1-6: Construction Codes

Categories of building construction established by Insurance Services Office, Inc. (ISO), in its *Commercial Lines Manual (CLM)* for purposes of developing rates for insuring commercial property, based on susceptibility to damage by fire. The six ISO *CLM* building construction categories and the associated ISO construction codes, from the least fire-resistive category to the most fire-resistive category, are as follows.

- Frame—Exterior walls of wood, brick veneer, stone veneer, wood ironclad, or stucco on wood. (Construction Code 1)
- Joisted Masonry—Exterior walls of masonry material (adobe, brick, concrete, gypsum block, hollow concrete block, stone, tile, or similar materials) with combustible floor and roof. (Construction Code 2)
- Noncombustible—Exterior walls, floor, and supports made of metal, asbestos, gypsum, or other noncombustible materials. (Construction Code 3)
- Masonry Noncombustible—Same as joisted masonry except that the floors and roof are of metal or other noncombustible materials. (Construction Code 4)
- Modified Fire Resistive—Exterior walls, floors, and roof of masonry or fire-resistive material with a fire resistance rating of at least 1 hour but less than 2 hours. (Construction Code 5)
- Fire Resistive—Exterior walls, floors, and roof of masonry or fire-resistive materials with a fire resistance rating of at least 2 hours. (Construction Code 6)

The American Association of Insurance Services (AAIS) uses nearly identical building construction categories in its materials addressing the development of rates for insuring commercial property in several of its programs.

Why Do These Classes Matter?

Determining the construction of the building is an essential part to receiving a quote. All property-insurers will need to know the construction type before they can provide a quote. This is because each construction type carries a different rate, depending on its susceptibility to certain perils (E.g. Fire). For example, let's say you have an apartment building you wanted to insure. You think it is Frame construction when it's actually Joisted Masonry. The premium you'll pay is going to be higher than if it was properly rated as a Joisted Masonry building.

ISO Types 1-6: Construction Code Descriptions

ISO 1 – Frame (combustible walls and/or roof)

Typically RMS Class 1

Wood frame walls, floors, and roof deck

Brick Veneer, wood/hardiplank siding, stucco cladding

Wood frame roof with wood decking and typical roof covers below:

- *Shingles
- *Clay/concrete tiles
- *BUR (built up roof with gravel or modified bitumen)
- *Single-ply membrane
- *Less Likely metal sheathing covering
- *May be gable, hip, flat or combination of geometries

Roof anchorage

- *Toe nailed
- *Clips
- *Single Wraps
- *Double Wraps

Examples: Primarily Habitational, max 3-4 stories

ISO 2 – Joisted Masonry (JM) (noncombustible masonry walls with wood frame roof)

Typically RMS Class 2

Concrete block, masonry, or reinforced masonry load bearing exterior walls

- *if reported as CB walls only, verify if wood frame (ISO 2) or steel/noncombustible frame roof (ISO 4)
- *verify if wood frame walls (Frame ISO 1) or wood framing in roof only (JM ISO 2)

Stucco, brick veneer, painted CB, or EIFS exterior cladding

Floors in multi-story buildings are wood framed/wood deck or can be concrete on wood or steel deck.

Wood frame roof with wood decking and typical roof covers below:

- *Shingles
- *Clay/concrete tiles
- *BUR (built up roof with gravel or modified bitumen)
- *Single-ply membrane
- *Less Likely metal sheathing covering
- *May be gable, hip, flat or combination of geometries

Roof anchorage

- *Toe nailed
- *Clips
- *Single Wraps
- *Double Wraps

Examples: Primarily Habitational, small office/retail, max 3-4 stories

If "tunnel form" construction meaning there is a concrete deck above the top floor ceiling with wood frame roof over the top concrete deck, this will react to wind forces much the same way as typical JM construction. It is slightly better from a fire rating standpoint and from a wind standpoint in terms of potential damage if the wood frame is damaged. Please provide comments in the construction details of SOV for this type of construction.

A subset of JM Construction is Heavy Timber Joisted Masonry JM Class II, also known at ISO 7. This is Joisted Masonry constructed buildings where the following additional conditions exist: Where the entire roof has a minimum thickness of 2 inches with Roof Supported by timber and having a minimum dimension of 6 inches, or where the entire roof assembly is documented to have a UL wind uplift classification of 90 or equivalent.

ISO 3 - Non Combustible (NC)

Class NC-I, Typically RMS Class Class 4A, 4B, or 4C

Minimal combustible materials in the building construction

Typical steel frame walls with masonry in-fill, brick veneer, metal sheathing, EIFS. Steel framing is load bearing portion of the building frame. AMBS (all metal building system) pre-engineered construction is common. Light steel frame ISO 3 smaller geometry with no interior building support columns. Heavier ISO 3 larger geometries with internal support columns and heavier roof framing. If multi-story, floors are commonly concrete on steel frame on steel deck.

Roof deck and roof cover systems:

- *Steel deck

-BUR (built up roof with gravel or modified bitumen)
-Single-ply membrane
-Lesser extent foam/spray applied roof which is typically applied over an existing roof cover – this is not considered a roof cover replacement.
-Usually flat/low sloped

*Metal
-Lap seam metal panel (exposed fasteners)
-Standing seam metal panel (concealed fasteners)
-May or may not be coated/sealed
-May be gable, hip, flat or combination of geometries

Roof anchorage:
*Light steel frame ISO 3 may still incorporate clips, single wraps, or double wraps
*Because of heavier construction with no wood framing in roof, roof to wall anchorage is typically an engineered bolted and/or **structural** roof connection. Toe nailing, Clips, single wraps, double wraps do not apply.

Examples: warehouses, manufacturing facilities

A subset of NC Construction is Superior Non-Combustible Construction NC-II, also known as ISO 8. This shall apply to Non-combustible constructed buildings where the following additional conditions exist: Where the entire roof is constructed of 2 inches of masonry on steel supports; or, where the entire roof is constructed of 22 gauge metal (or heavier) on steel supports; or, where the entire roof assembly is documented to have a wind uplift classification of 90 or equivalent. This is heavy noncombustible construction.

ISO 4 - Masonry Non Combustible (MNC)

Class MNC-I, Typically RMS Class 2, 2C1, or 3C

Concrete block, reinforced masonry, tilt-up concrete load bearing walls – may be combined with some heavy steel framing. Floors commonly concrete on steel deck for multi-story buildings. Roof construction is typically heavy steel frames.

Roof deck and roof cover systems:

*Steel deck with insulation boards (commonly called insulated steel deck roofing system)
-BUR (built up roof with gravel or modified bitumen)
-Single ply membrane
-Lesser extent foam/spray applied roof which is typically applied over an existing roof cover – this is not considered a roof cover replacement.
-Flat/low sloped

*Lightweight insulating concrete or gypsum board on steel deck
-BUR (built up roof with gravel or modified bitumen)
-Single ply membrane
-Lesser extent foam/spray applied roof which is typically applied over an existing roof cover – this is not considered a roof cover replacement.
-Flat/slow slope
-Sometimes possibly heavier concrete on steel deck or precast concrete panels for roof frame may still be considered ISO 4 if exposed steel is not fire proofed to obtain fire ratings needed to be ISO 5.

*Steel frame with metal sheathing roof cover
-Lap seam metal panel (exposed fasteners)
-Standing seam metal panel (concealed fasteners)
-May or may not be coated/sealed
-May be gable, hip, flat or combination of geometries

Roof anchorage
*Because of heavier construction with no wood framing in roof, roof to wall anchorage is typically an engineered bolted and/or **structural** roof connection. Toe nailing, Clips, single wraps, double wraps do not apply.

Walls have minimum 1 hour fire rating

Examples: shopping centers, strip centers, office buildings, warehouses, schools

A subset of MNC Construction is Superior Masonry Non-Combustible Construction MNC-II, also known as ISO 9. This shall apply to Masonry Non-combustible constructed buildings where the following

additional conditions exist: Where the entire roof is constructed of 2 inches of masonry on steel supports; or, where the entire roof is constructed of 22 gauge metal (or heavier) on steel supports; or, where the entire roof assembly is documented to have wind uplift classification of 90 or equivalent.

ISO 5 - Modified or Semi Fire Resistive (MFR or SFR)

Typically RMS Class 4A or 4C

Protected steel and/or concrete or heavy masonry walls and floors.
Semi wind resistive
Roof deck and roof cover systems

*Heavy steel frame with concrete poured on steel deck
-BUR (built up roof with gravel or modified bitumen)
-Single ply membrane
-Lesser extent foam/spray applied roof which is typically applied over an existing roof cover – this is not considered a roof cover replacement.
-Flat/low sloped
-Exposed steel must be fireproofed to achieve required fire rating

*Precast concrete (PC) panels
-BUR (built up roof with gravel or modified bitumen)
-Single ply membrane
-Lesser extent foam/spray applied roof which is typically applied over an existing roof cover – this is not considered a roof cover replacement.
-Flat/low sloped

*Steel deck with insulation boards, gypsum, lightweight insulating concrete
-BUR (built up roof with gravel or modified bitumen)
-Single ply membrane
-Lesser extent foam/spray applied roof which is typically applied over an existing roof cover – this is not considered a roof cover replacement.
-Flat/low sloped
-Exposed steel must be fire proofed to achieve required fire rating.

Roof anchorage

*Because of heavier construction with no wood framing in roof, roof to wall anchorage is typically an engineered bolted and/or **structural** roof connection. Toe nailing, Clips, single wraps, double wraps do not apply.

Overall construction of fire resistive materials with fire rating less than 2 hours but greater than 1 hour. Exterior walls, floors and roof deck typically of masonry materials not less than 4 in thick but less thick than required for the 2 hour minimum rating for fire resistive construction.
Examples: high and mid-rise office buildings and condos

ISO 6 - Fire Resistive (FR)

Typically RMS Codes 3A, 3B, or 3C

Reinforced Concrete Construction building frame and floors and/or very well protected steel and concrete
Floors are minimum 4" cast in place concrete, precast concrete or concrete on protected steel
Wind resistive
Precast construction - brought in from elsewhere / Cast in Place is poured on site
Roof deck and roof cover systems

*Cast in place reinforced concrete or precast concrete
-BUR (built up roof with gravel or modified bitumen)
-Single ply membrane
-Lesser extent foam/spray applied roof which is typically applied over an existing roof cover – this is not considered a roof cover replacement
-Flat/low sloped
-In some cases, structural concrete poured on steel deck, but exposed steel must be fireproofed to achieve required minimum 2 hour fire rating
-If exposed concrete, such as on parking deck, leave roof cover as Unknown on SOV. This is typically an exposed or sealed concrete roof deck and the ISO 5 or 6 construction and occupancy will account for the roof deck/cover type. Can provide construction comment on SOV.

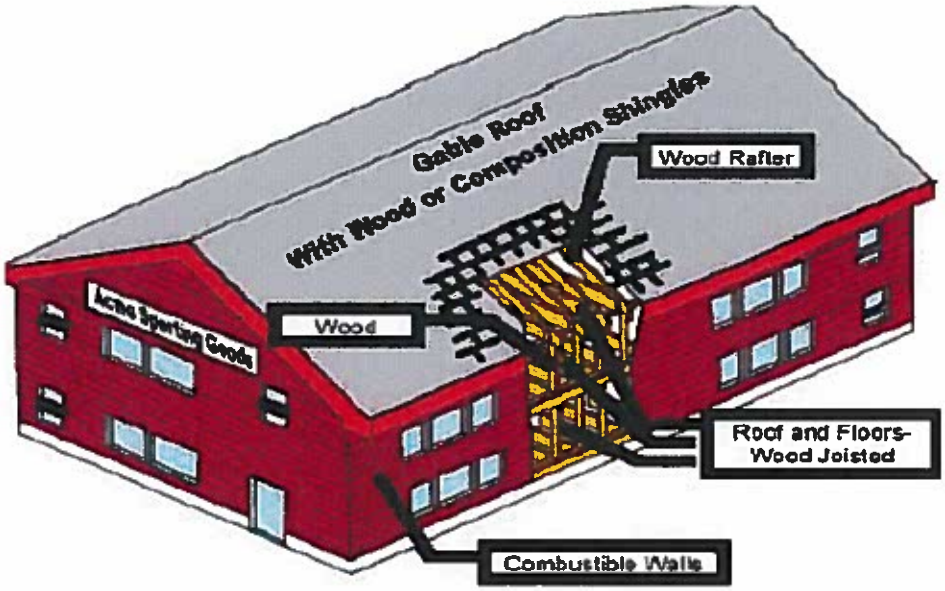
Roof anchorage

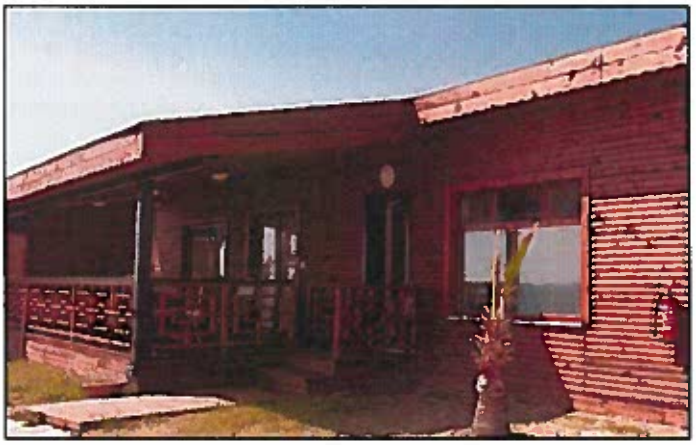
*Because of heavier construction with no wood framing in roof, roof to wall anchorage is typically an engineered bolted and/or **structural** roof connection. Toe nailing, Clips, single wraps, double wraps do not apply.

Fire rating not less than 2 hours for walls, floors, and roofs. This typically requires walls of masonry materials minimum of 4 in thick, hollow masonry minimum 8 in thick, floors and roofs minimum of 4 in thick reinforced concrete, and any structural steel load bearing components with minimum of 2 hour fire rating,

Examples: high-rise office buildings and condos, parking garages

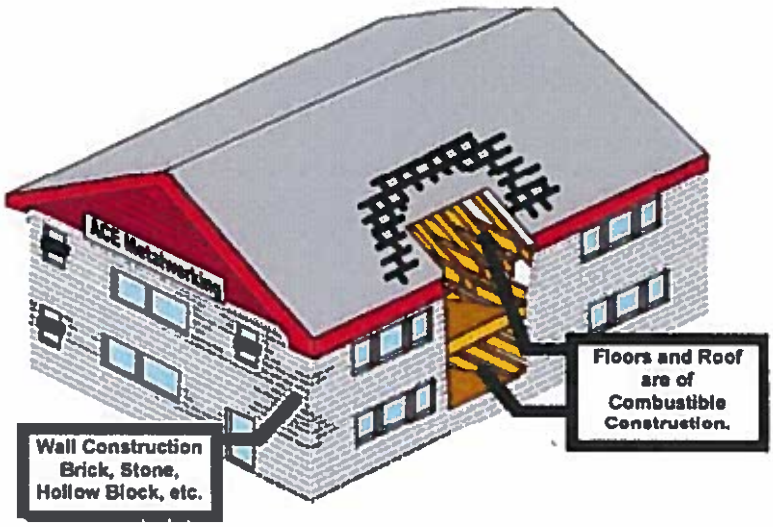
ISO 1 – Frame (combustible walls or roof)





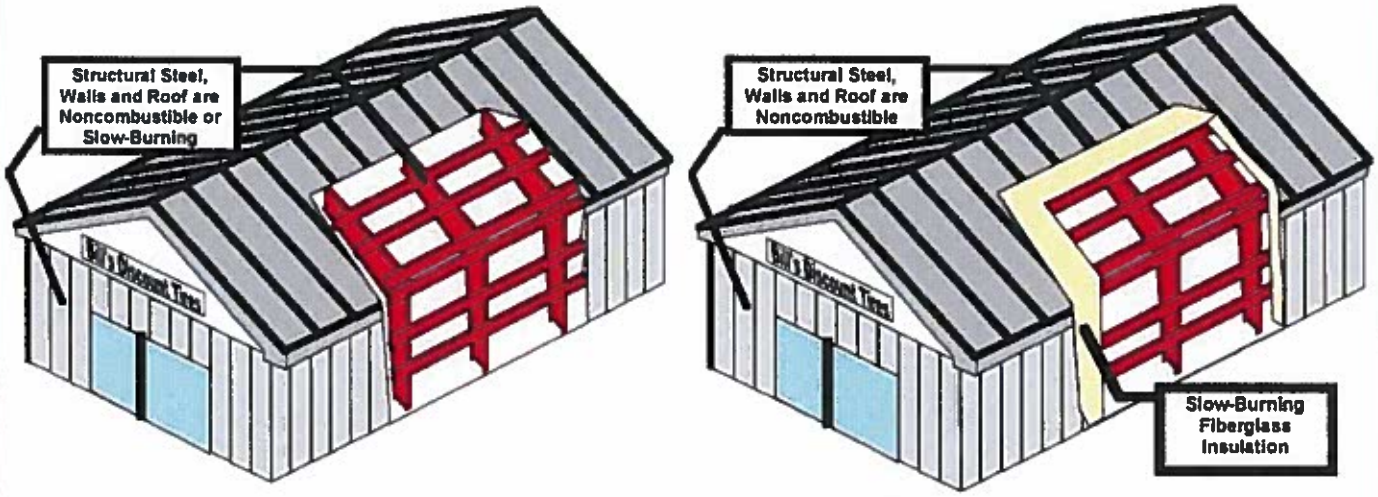
Source: www.isopropertyresources.com

ISO 2 – Joisted Masonry (JM) (noncombustible)

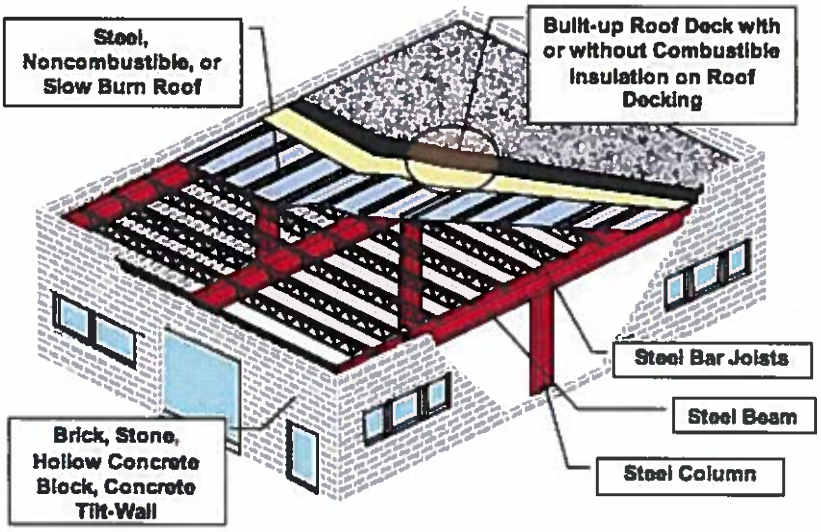


ISO Types 1-6: Construction Code Descriptions

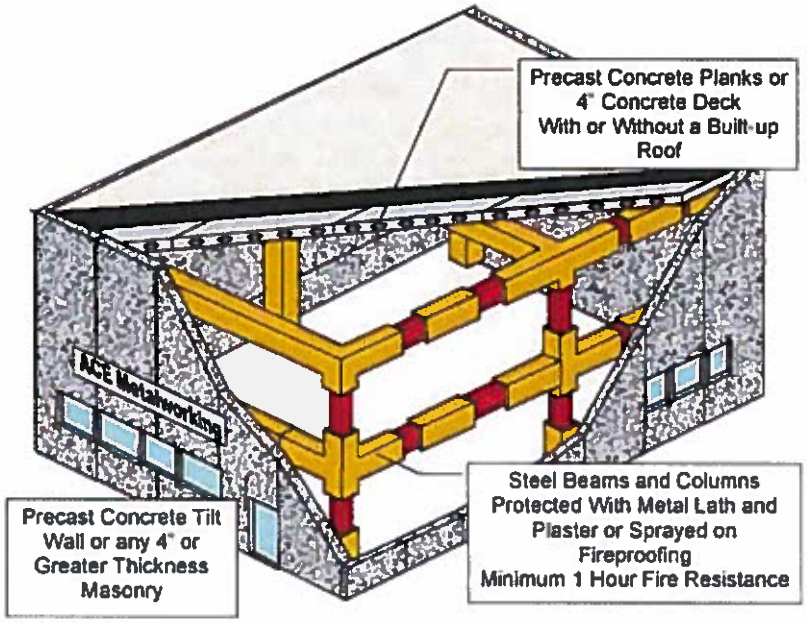
ISO 3 - Non Combustible (NC)

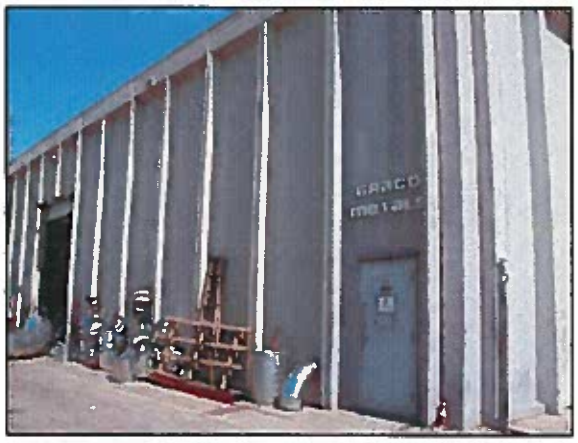


ISO 4 - Masonry Non Combustible (MNC)



ISO 5 - Modified or Semi Fire Resistive (MFR or SFR)





ISO Types 1-6: Construction Code Descriptions

ISO 6 - Fire Resistive (FR)