Top 10 Commercial Plan Review Comments

Presented by Allen Burris

1

Revision Narrative

A missing or incomplete revision narrative causes delay in the initial review of the project and can result in an incomplete unreviewed submittal. This can create an additional review cycle adding time to the overall project. The revision narrative should include the following:

General Requirements

- On the top of the narrative document list, the original permit number and the revision number
- Identify in the narrative the pages that have changes in a list format. Each drawing, sheet or page should be a separate line item. Next to each page number, describe the changes for that page in detail. Do not use "general" statements.
- The revised drawing, sheet or pages shall have a cloud around the area(s) which were changed, and a numbered delta symbol used to identify the submitted revision. Clouds around the entire drawing will not be accepted.

County Specific Requirements

- Upload only the drawings and sheets which were revised. Do not upload specification sheets and calculations where no changes have been made.
- Each time you upload use the same drawing or sheet name. Do not create new names for the drawings or sheets which you upload.
- Previously approved plans, where there are no changes, will be deleted.

2

Scope of Work

The scope of work sets the expectations for the review. Without a clear scope of work, assumptions are made which can result in unnecessary plan review comments. The scope does not need to be a page of information but is should be a few sentences to provide enough detail. Some items that should be addressed in the scope are:

- Is this a new building or is it a renovation.
- Is the renovation a complete demo and rebuild or is it a partial remodel.
- Is the use of the space or occupancy classification changing.
- Is the project expanding into an existing tenant space or reducing the size of a tenant space.
- Is there additional square footage being added to the building.
- Is it entirely interior or is there exterior work as well.

3

Code Analysis

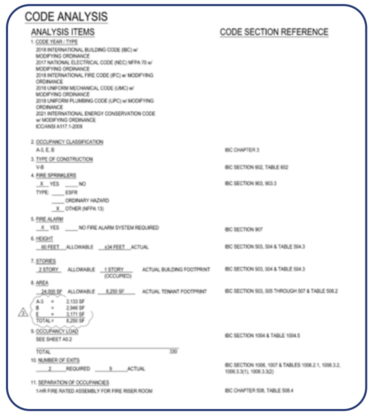
Missing or incomplete code analysis causes delay in the initial review of the project and can result in an incomplete unreviewed submittal. This can create an additional review cycle adding time to the overall project. The code analysis should include the following:

- Applicable Codes/year of design
- Type of construction
- Separation distance from property line or other structures
- Occupancy classification
- Occupant Load and Load Factors used
- Allowable/Actual floor area
- Allowable/Actual building height
- Allowable/Actual stories
- Exit analysis
- Fire protection requirements
- IECC compliance method
- Plumbing fixture analysis – Required/Provided

4

Code Analysis

- Place on cover sheet or general notes
  - "Code Analysis"
  - "Building Data"
  - "Building Analysis"
  - "Project Data"
  - "Building Code Summary"
  - "Building Information"
  - "Project Description"

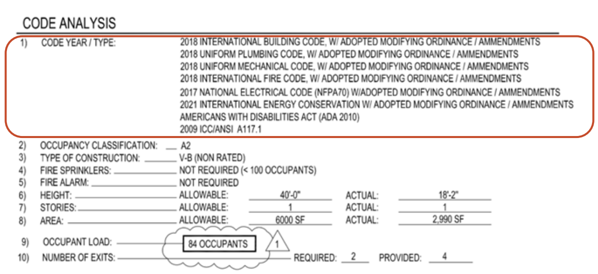


Southern Nevada ICC

5

Applicable Codes

- Identify the authority having jurisdiction (AHJ)
  - County, city, state, etc.
  - Local amendments published by the AHJ
  - Additional local requirements
- Type and scope of project
  - IRC or IBC
  - IEBC or IBC


CODE ANALYSIS

1) CODE YEAR / TYPE: 2018 INTERNATIONAL BUILDING CODE, W/ ADOPTED MODIFYING ORDINANCE / AMMENDMENTS
2018 UNIFORM PLUMBING CODE, W/ ADOPTED MODIFYING ORDINANCE / AMMENDMENTS
2018 UNIFORM MECHANICAL CODE, W/ ADOPTED MODIFYING ORDINANCE / AMMENDMENTS
2018 INTERNATIONAL FIRE CODE, W/ ADOPTED MODIFYING ORDINANCE / AMMENDMENTS
2017 NATIONAL ELECTRICAL CODE (NFPA70) W/ADOPTED MODIFYING ORDINANCE / AMMENDMENTS
2021 INTERNATIONAL ENERGY CONSERVATION W/ ADOPTED MODIFYING ORDINANCE / AMMENDMENTS
AMERICANS WITH DISABILITIES ACT (ADA 2010)
2009 ICC/ANSI A117.1

2) OCCUPANCY CLASSIFICATION: A2
3) TYPE OF CONSTRUCTION: V-B (NON RATED)
4) FIRE SPRINKLERS: NOT REQUIRED (< 100 OCCUPANTS)
5) FIRE ALARM: NOT REQUIRED
6) HEIGHT: ALLOWABLE: 40'-0" ACTUAL: 18'-2"
7) STORIES: ALLOWABLE: 1 ACTUAL: 1
8) AREA: ALLOWABLE: 6000 SF ACTUAL: 2,990 SF
9) OCCUPANT LOAD: 84 OCCUPANTS 1
10) NUMBER OF EXITS: REQUIRED: 2 PROVIDED: 4

+

S.N.B.O. Southern Nevada Building Officials

SOUTHERN NEVADA AMENDMENTS
TO THE
2024 INTERNATIONAL BUILDING CODE

Southern Nevada ICC

6

Occupancy Classification
vs
Occupant Load Factor

7

Occupancy Classification

- Primary purpose of the building, or portions of the building
- Considers the risk associated with the intended use of the building
  - How many people will occupy the space
  - What activities take place
  - If people are awake or asleep
  - How familiar occupants are with the building
  - Are occupants capable of self preservation
  - Materials or hazards might be present
- Sets limits to the size of the building with consideration of the type of construction
- Detailed descriptions of each category, and its sub-categories can be found in chapter 3

A	**Assembly** – Theaters, churches, restaurants, casinos
B	**Business** – Office buildings, doctor's office, colleges
E	**Educational** – Elementary, middle and high schools
F	**Factory Industrial** – Low and moderate hazards production and fabrication
H	**High Hazard** – Processing, manufacturing, and storage involving hazardous materials/chemicals
I	**Institutional** – Facilities that provide care or supervision limiting movement such as hospitals, day care, jails
M	**Mercantile** – Grocery store, general merchandise
R	**Residential** – Hotels, apartments, houses
U	**Utility and Miscellaneous** – Barns, sheds and garages

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Occupancy Classification vs. Occupant Load Factor

- Describes the risk associated with the occupants and activities within a building
- Considers the ability of the occupants to evacuate independently
- Used to determine the required fire protection systems and allowable height, story and area limits
- Only possible 10 designations listed in chapter 3 of the IBC
  - Some additional subgroups

- Describes the anticipated concentration of people in a specific room or space based on its function
- Used to determine egress capacity
- Units are in sqft per person
- IBC Table 1004.5 lists common functions and their occupant load factor
- Occupant load can be a factor in determining the occupant classification, but the occupancy classification does not affect the occupant load
  - For example, a conference room in an office is typically classified as type B (Business), unless the occupant load is more than 50 people, then that space is an A-3 (Assembly) occupancy. The function of a conference room is assembly and must use an assembly load factor regardless of the B or A-3 classification

Occupancy Classification ≠ **Occupant Load Factor**

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TABLE 1004.5
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR[a]
Accessory storage areas, mechanical equipment room	300 gross
Agricultural building	300 gross
Aircraft hangars	500 gross
Airport terminal	
Baggage claim	20 gross
Baggage handling	300 gross
Concourse	100 gross
Waiting areas	15 gross
Assembly	
Gaming floors (keno, slots, etc.)	11 gross
Exhibit gallery and museum	30 net
Assembly with fixed seats	See Section 1004.6
Assembly without fixed seats	
Concentrated (chairs only—not fixed)	7 net
Standing space	5 net
Unconcentrated (tables and chairs)	15 net
Bowling centers, allow 5 persons for each lane including 15 feet of runway, and for additional areas	7 net
Business areas	
Concentrated business use areas	150 gross See Section 1004.8
Courtrooms—other than fixed seating areas	40 net
Day care	35 net
Dormitories	50 gross

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Occupancy Classification: It is used in conjunction the construction materials to determine limits to the height, floor area, and number of stories allowed for the building.

Occupant Load Factor: Is independent of occupancy classification. It is based on the use of the room or space. Higher square footage per person is less restrictive.

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Fire Resistance Rating for Separation
VS
Fire Rating for Protection of Structure

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Fire Resistance for Separation vs. Protection of Structure

Protection of structure:

- Based on construction type
- Does not contain fire in areas
- Protects the individual member from structural failure due to excessive heat
- Can have unprotected openings in assemblies
- Can be a single material applied to the structural element or encased in an assembly
- Different for primary and secondary members
- Methods of protection:
  - Gypsum
  - Intumescent paint
  - Monocoat
  - Fire blankets

Separation:

- To separate occupancies or areas
- Must be an assembly, not a single material
- Keeps fire and smoke contained to an area
- Openings must be protected
- Assemblies can be listed (such as UL) or prescriptive
- Methods of protection:
  - Rated wall assemblies
  - Rated floor/ceiling and roof/ceiling assemblies
  - Rated doors, windows and dampers
  - Firestop assemblies

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Fire Protection of the Structure – Chapter 6

All structural members and assemblies must meet the fire-resistance rating requirements specified for the type of construction

The fire-resistance rating of any structural member must be at least equal to the rating of the fire-resistance-rated assembly it supports [704.1]

TABLE 601

FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV				TYPE V	
	A	B	A	B	A	B	A	B	C	HT	A	B
Primary structural frame[f] (see Section 202)	3[a, b]	2[a, b, c]	1[b, c]	0[c]	1[b, c]	0	3[a]	2[a]	2[a]	HT	1[b, c]	0
Bearing walls												
Exterior[e, f]	3	2	1	0	2	2	3	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	3	2	2	1/HT[g]	1	0
Nonbearing walls and partitions Exterior	See Table 705.5											
Nonbearing walls and partitions Interior[d]	0	0	0	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary structural members (see Section 202)	2	2	1	0	1	0	2	2	2	HT	1	0
Roof construction and associated secondary structural members (see Section 202)	1 1/2[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	1 1/2	1	1	HT	1[b,c]	0

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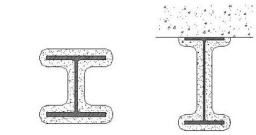
Methods of Protecting Structural Elements

Monocoat

- Cementitious spray applied material
- Thickness of coat determines fire resistance rating

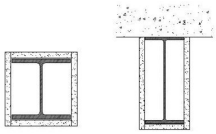


Intumescent Paint

- Expands when exposed to heat

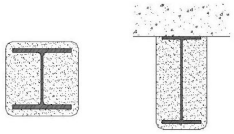
Rigid Board

- Gypsum board



Alternative Methods

- Fire Blanket
- Concrete encasement



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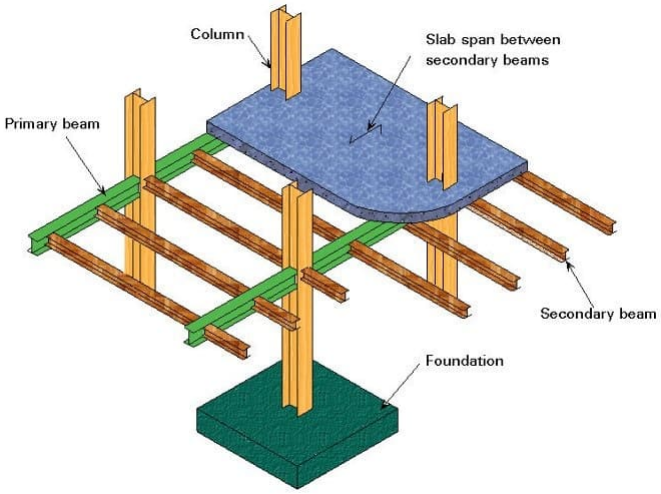
Primary vs Secondary Structural Members

Allowable materials are determined by the construction type of the building

Structural Components

- **Primary member** – columns, members such as beams and girders that connect directly to columns, members essential to provide vertical stability when gravity loads are applied to the primary structural frame
- **Secondary member** – Not directly connected to columns, bracing not designed as part of the primary structural frame or bearing walls



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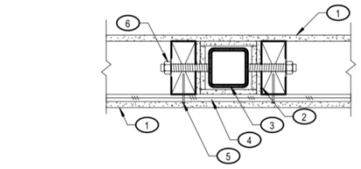
Structural Protection by Encasement Detail Examples



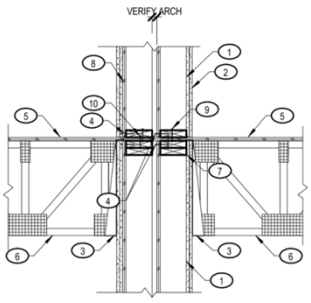
KEYNOTES:

1. 5/8" CONT. GYPSUM WALL BOARD, PER ARCH
2. 1/2" MIN GYPSUM WALL BOARD FOR INDIVIDUAL ENCASEMENT (2 LAYERS)
3. STEEL COLUMN PER PLAN
4. PLYWOOD SHTG AS OCCURS
5. EN
6. SEE "TYPICAL NAILER AT STEEL" DETAIL

NOTES:

A. SEE ARCH DETAILS, IF CONFLICTS ARISE, NOTIFY ENGINEER OF RECORD IMMEDIATELY
B. WITH ARCHITECT'S APPROVAL, INTUMESCENT PAINT MAY BE USED IN LIEU OF GYPSUM WALL BOARD ENCASEMENT

5 S-530 TYPICAL 2-HR COLUMN ENCASEMENT DETAIL IN 2x6 WALL
TDS109



KEYNOTES:

1. STUD WALL PER PLAN AND "TYPICAL WOOD STUD WALL CONSTRUCTION" DETAIL
2. DBL LAYER GYPSUM BOARD PER ARCH
3. FWH HANGER BY MITEK OR DG BY SIMPSON STRONG-TIE
4. EN
5. SHEATHING PER "TYPICAL WOOD DIAPHRAGM CONSTRUCTION" DETAIL
6. WOOD FLOOR TRUSS PER PLAN AS OCCURS
7. DBL 2x TOP PL PER PER LAP SPLICE DETAIL (TYP)
8. WALL SHEATHING PER PLAN
9. ELEVATED SHEAR WALL ATTACHMENT PER TYPICAL SHEAR WALL CONSTRUCTION DETAIL.
10. BN

6 S-571 WOOD FLOOR TRUSS AT 2 HOUR FIRE WALL
WW223R

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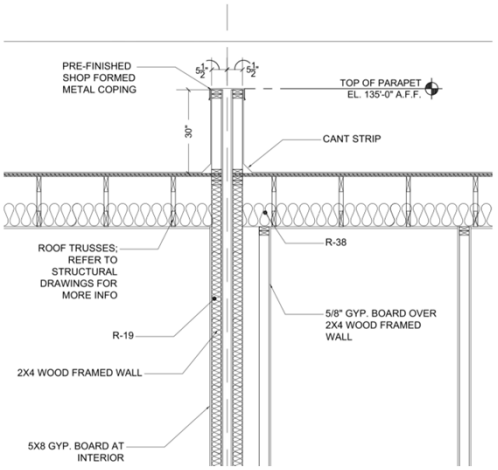
Fire Rating for Separation

- Occupancy separation
- Unit separation with party walls
- Fire walls create separate buildings or separate buildings onto smaller fire areas
- Isolating more hazardous areas



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Fire-rated Assemblies

Fire rated assemblies are either: [703.2.2]

- Certified by approved sources
  - UL Listed Fire Resistance Directory
  - Gypsum Association's Fire Resistance Design Manual
  - Listings can be generic or proprietary
- Prescriptive
  - Using specific building components listed in Section 721
- Can be calculated in accordance with Section 722

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UL Listed Assemblies

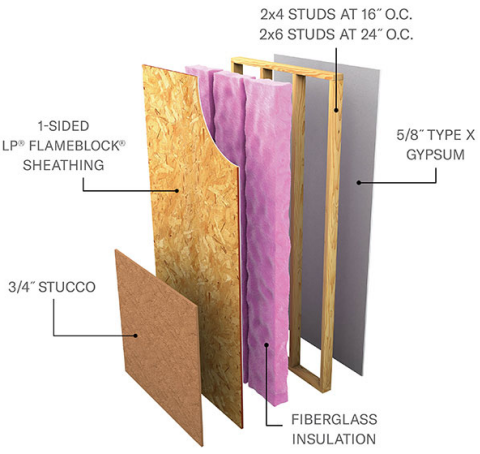
Specific assemblies that have been tested and approved for fire resistance

Must follow provisions for:

- Framing size
- Framing material
- Material thickness
- Type of insulation
- Type of sheathing
- Nail pattern
- Exterior finishes

U348

1-HOUR EITHER SIDE



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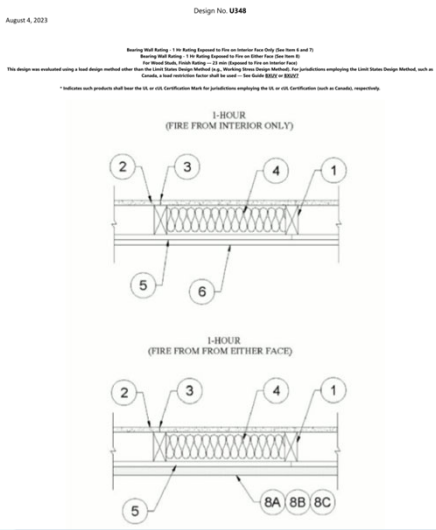
UL Listed Assembly – Example U348



Design No. **U348**

August 4, 2023

Bearing Wall Rating - 1 Hr Rating Exposed to Fire on Interior Face Only (See Item 6 and 7)
Bearing Wall Rating - 1 Hr Rating Exposed to Fire on Either Face (See Item 8)
For Wood Studs, Finish Rating — 15 min (Exposed to Fire on Interior Face).
This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide BXUV or BXUV7.

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

1-HOUR
(FIRE FROM INTERIOR ONLY)

1-HOUR
(FIRE FROM FROM EITHER FACE)

1. Wood Studs — Nom 2 by 4 in., spaced 16 in. OC in with two 2 by 4 top and one 2 by 4 bottom plates. As an option, nom 2 by 6 in., spaced 24 in. OC with two 2 by 6 top and one 2 by 6 bottom plates may be used in lieu of 2 by 4 studs and plates. Studs effectively fire stopped.

1A. Steel Studs and Floor and Ceiling Tracks — As an option to Item 1 — (Not Shown) — Top and bottom tracks of wall assemblies shall consist of steel members, min No. 20 MSG (0.0329 in. min bare metal thickness) steel or min No. 20 MSG (0.036 in. thick) galv steel or No. 20 MSG (0.033 in. thick) primed steel, that provide a sound structural connection between steel studs, and to adjacent assemblies such as a floor, ceiling, and/or other walls. Attached to floor and ceiling assemblies with steel fasteners spaced not greater than 24 in. O.C. Steel studs min 3-1/2 in. wide, No. 20 MSG (0.0329 in., min bare metal thickness) corrosion protected cold formed steel studs designed in accordance with the current edition of the Specification for the Design of Cold-Formed Steel Structural Members by the American Iron and Steel Institute. All design details enhancing the structural integrity of the wall assembly, including the axial design load of the studs, shall be as specified by the steel stud designer and/or producer, and shall meet the requirements of all applicable local code agencies. The max stud spacing of wall assemblies shall not exceed 24 in. OC. Studs attached to floor and ceiling tracks with 1/2 in. long Type S-12 steel screws on both sides of studs or by welded or bolted connections designed in accordance with the AISI specifications.

2. Gypsum Board* — Any 5/8 in. thick UL Classified Gypsum Board that is eligible for use in Design Nos. U501, U512 or U305. Nom. 5/8 in. thick, 4 ft. wide, applied vertically, and nailed to studs and bearing plates 7 in. OC, with 6d cement coated nails, 1-7/8 in. long, 0.0915 in. shank diam. and 1/4 in. diam. head. When steel framing is substituted for wood framing, 1 in. long Type S steel screws are used in lieu of nails.
CANOT MANUFACTURING UAC (View Classification) — CKNX.R35379

DAIKI GYPSUM INDUSTRY (SARABURI) CO LTD (View Classification) — CKNX.R19262

GEORGIA-PACIFIC GYPSUM L L C (View Classification) — CKNX.R6907

THAI GYPSUM PRODUCTS PCL (View Classification) — CKNX.R27577

UNITED STATES GYPSUM CO (View Classification) — CKNX.R1310

USG MEXICO S A DE C V (View Classification) — CKNX.R16089

3. Joints and Nailheads — Wallboard joints covered with tape and joint compound. Nail heads covered with joint compound.

4. Batts and Blankets* — Faced or unfaced mineral fiber insulation, 3-1/2 in. thick, nom 3.0 pcf, pressure fit in the wall cavity between stud plates, and cross bracing. If 2 by 6 in. studs (Item 1) are used, min 5-1/2 in. of unfaced mineral fiber insulation, nom 3.0 pcf, pressure fit in the wall cavity between stud plates, and cross bracing. Insulation may be applied in multiple layers to achieve final thickness.
See **Batts and Blankets*** (BZJZ) category for names of Classified manufacturers.

4A. Batts and Blankets* — As an Alternate to Item 4 when wood studs are used. As an Alternate to Item 4 when steel studs are used, but Optional Items 7A or 7B are required. Faced or unfaced glass fiber batts, 3-1/2 in. thick, having a min density of 0.6 pcf (min R-13 thermal insulation rating), pressure fit in the wall cavity between stud, plates, and cross bracing.
See **Batts and Blankets*** (BZJZ) category for names of Classified manufacturers.

4B. Fiber, Sprayed* — As an Alternate to Item 4 when wood studs are used. As an Alternate to Item 4 when steel studs are used, but Optional Items 7A or 7B are required. — (100% Borate Formulation) — Spray applied cellulose material. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product with a nominal dry density of 2.7 lb/ft3. Alternate Application Method: The fiber is applied without water or adhesive at a nominal dry density of 2.5 lb/ft3, in accordance with the application instructions supplied with the product.
Applegate Greenfiber Acquisition LLC — Insulmax and SANCTUARY for use with wet or dry application.

4C. Fiber, Sprayed* — As an Alternate to Item 4 when wood studs are used. As an Alternate to Item 4 when steel studs are used, but Optional Items 7A or 7B are required. Spray applied cellulose fiber. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product. The minimum dry density shall be 4.30 lbs/ft.3
INTERNATIONAL CELLULOSE CORP — Cellar-fit.

4D. Fiber, Sprayed* — As an Alternate to Item 4 when wood studs are used. As an Alternate to Item 4 when steel studs are used, but Optional Items 7A or 7B are required. — Spray applied cellulose insulation material. The fiber is applied with water to interior surfaces in accordance with the application instructions supplied with the product. Applied to completely fill the enclosed cavity. Minimum dry density of 4.3 pounds per cubic ft.
NU-WOOL CO INC — Cellulose Insulation.

5. Building Units* — Building units placed with the laminate face against or laminate face away from, and nailed to, the wood framing with 1-7/8 in long, 6d nails, spaced 6 in. OC, on the perimeter and 12 in. OC, in the field. When steel framing is substituted for wood framing, Type S steel screws are used in lieu of nails with a minimum penetration length through the steel stud of 5/8 in.
LOUISIANA-PACIFIC CORP — Type Ranguard T-Sdg.

LOUISIANA-PACIFIC CORP — Type LP FlameBlock T-Sdg.

6. Exterior Facings — (For use with Wood Studs, Item 1) - Any exterior facing approved by the Authority Having Jurisdiction installed in accordance with the manufacturer's installation instructions.

7. Exterior Facings — (Not Shown) (For use with steel Studs, Item 1A, but limited to the use of Mineral Wool insulation Item 4) - Any exterior facing approved by the Authority Having Jurisdiction installed in accordance with the manufacturer's installation instructions.

7A. Cementitious Stucco — (Optional unless Item 1A, Steel Studs, are used in conjunction with Item 4A, 4B, 4C or 4D Batts and Blankets - Not Shown) - Portland cement or synthetic stucco systems with self-furring metal lath or adhesive base coat. Thickness from 1/2 in. to 3/4 in. depending on system.

7B. Brick Veneer — (Optional unless Item 1A, Steel Studs, are used in conjunction with Item 4A, 4B 4C or 4D Batts and Blankets - Not Shown) Brick veneer, minimum thickness of 2.3 inches, meeting the requirements of local code agencies. When brick veneer is used, the rating is applicable with exposure on either face. Brick veneer fastened with corrugated metal wall ties attached over sheathing to wood studs with 8d nail per tie: ties spaced not more than each sixth course of brick and max 32 in. OC horizontally. One in. air space provided between brick veneer and sheathing. For steel studs, Type S steel screws are used in lieu of nails with a minimum penetration length through the steel stud of 3/8 in.

8. Exterior Facings — (Not Shown) — Required for 1 Hour Rating on the Exterior Face. The following exterior facing shall be installed in accordance with the manufacturer's installation instructions:

8A. Brick — Brick veneer, minimum thickness of 2.3 inches, meeting the requirements of local code agencies. Brick veneer attached to the studs with corrugated metal wall ties attached to each stud with 8d cement coated nails, every sixth course of bricks and max 32 in. OC horizontally. One in. air space provided between brick veneer and sheathing. For steel studs, Type S steel screws are used in lieu of nails with a minimum penetration length through the steel stud of 3/8 in.

8B. Cementitious Stucco — Portland cement with self-furring metal lath. Minimum thickness of 3/4 in. with a mix ratio of 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.

8C. Gypsum Board* — Nom. 5/8 in. thick, 4 ft. wide exterior sheathing applied vertically. Single layer nailed to wood studs and bearing plates 8 in. OC with 1-7/8 in. long 6d cement coated nails. Vertical joints centered over studs and staggered min. 1 stud cavity from the vertical joints of the building units (item #5). The joints and nail heads do not need to be treated with joint compound.
GEORGIA-PACIFIC GYPSUM L L C — Type DGG

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2023-08-04

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Proprietary Assemblies

Must use the same material from the company listed on the detail

GA FILE NO. ASW 0985	PROPRIETARY*	2 HOUR FIRE	60 to 64 STC SOUND

GYPSUM WALLBOARD, STEEL H STUDS

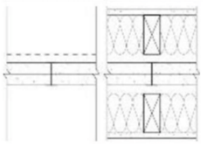
Two layers 1" x 24" proprietary type X gypsum panels inserted between 2" floor and ceiling runners with 2" steel H studs between adjacent pairs of gypsum panels. **(NLB)**

A ¾" minimum air space must be maintained between steel components and adjacent framing (indicated by dashed lines in sketch). As an alternate, the steel components may be covered with 6" wide battens or full sheets of ½" type X gypsum wallboard.

Sound tested with 2 x 4 stud wall faced with ½" gypsum wallboard each side of system and 3½" glass fiber insulation in stud space.

PROPRIETARY GYPSUM BOARD

PABCO Gypsum - 1" PABCORE® Gypsum Shaftliner Board Type X



Thickness: 3½" (Fire)
11¾" (Sound)
Approx. Weight: 9 psf
Fire Test: WFCI #07073, 2-18-08
Sound Test: RAL TL07-373, 12-4-07

25 2HR FIRE RATED WALL
SCALE: NTS

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Fire Wall is not a Generic Term

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Key Terms – Fire and Smoke Resistant Assemblies

Fire Wall – Wall assembly with a fire resistance rating and sufficient structural stability under fire conditions to allow for the building to collapse on either side without collapse of the wall

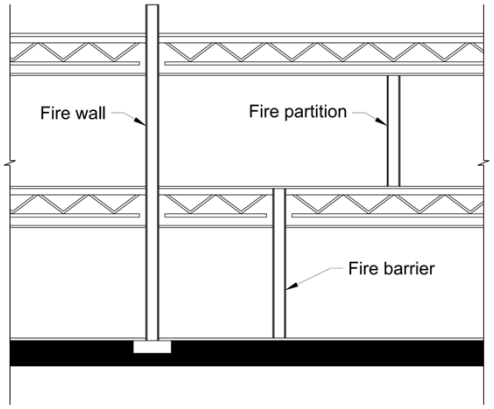
Fire Barrier – Wall assembly with a fire resistance rating designed to restrict the spread of fire. Used to separate mixed occupancy buildings, to enclose exits, etc.

Smoke barrier – Continuous membrane or assembly designed to restrict the movement of smoke with a minimum fire rating of 1-hour. Used in institutional occupancies and Areas of Refuge

Fire partition – Vertical assembly designed to restrict or slow the spread of fire in which openings are protected

Smoke partition – Continuous wall assembly designed to restrict the movement of smoke. Used in institutional occupancies and Areas of Refuge

Horizontal assembly - A fire-resistance-rated floor or roof assembly of materials designed to restrict the spread of fire in which continuity is maintained



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Fire Wall

Fire walls create separate buildings for code analysis.

A fire wall:

- Has sufficient structural stability to collapse on either side without collapse of the wall [706.2]
- Extends continuously from the foundation through the roof
- Has protected openings
- Has a fire resistance rating of not less than required by Table 706.4

Openings [706.8]

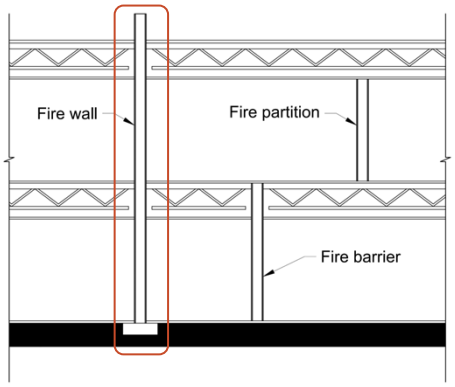
- Must be protected in accordance with Section 716
- A single opening shall not exceed 156 sq ft
- The aggregate width of openings shall not exceed 25% of the wall length at any floor

Ducts may not penetrate fire walls

Party walls shall be fire walls with no openings [706.1.1]

TABLE 706.4 FIRE WALL FIRE-RESISTANCE RATINGS

GROUP	FIRE-RESISTANCE RATING (hours)
A, B, E, H-4, I, R-1, R-2, U	3 [a]
F-1, H-3b, H-5, M, S-1	3
H-1, H-2	4 [b]
F-2, S-2, R-3, R-4	2



Where a fire wall separates occupancies that are also required to be separated by a fire barrier, the most restrictive requirements of both apply [706.1]

Exceptions:

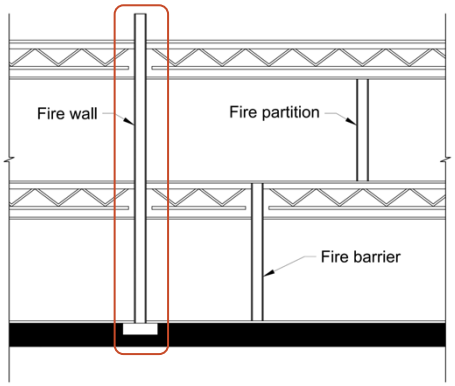
- Openings are not allowed in party walls
- Openings shall not be limited if both buildings have automatic sprinklers

25

Fire Wall

Applications:

- Divide a large building into smaller areas
- Divide a building into different construction types
- Party Walls



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Fire Barrier

Wall assembly with a fire resistance rating designed to restrict the spread of fire in which continuity is maintained.

The required fire rating of a fire barrier depends on the use of the barrier

Applications:

- Separating fire areas – Section 707.3.10
- Enclosing egress components – Chapter 10 and Section 713.4
- Separating occupancies – Section 508.4 and 509.1
- Atriums and control areas – Chapter 4

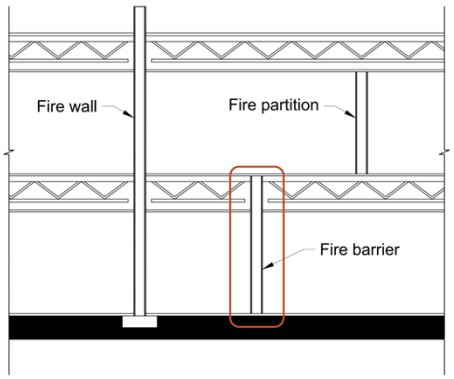
Openings must be protected and are limited to what is allowed in 707.6

Continuity [705.5]

- Horizontal: Extended to adjacent interior or exterior walls
- Vertical: From the top of the floor assembly below to the bottom of the floor assembly or roof deck above
- Construction below should have the same fire rating as the fire barrier it supports and be fire blocked at every level [705.5.1]
- Extend through all concealed spaces

Exceptions:

- In some shaft enclosers and some egress stairways, the fire barrier can stop at the top of the enclosure



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Fire Partition

Vertical assembly designed to restrict or slow the spread of fire in which openings are protected

Fire partitions have a fire resistance rating of at least 1-hour

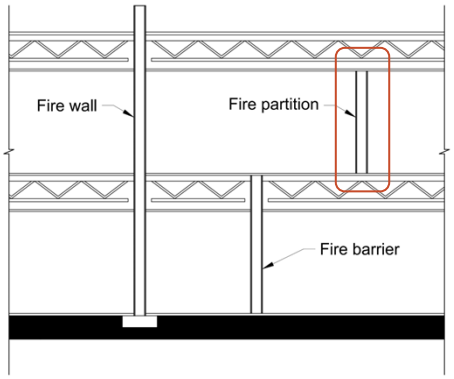
Can be made of any materials that are allowed in the construction type

Continuity [708.4]

- Foundation or floor/ceiling assembly below to deck/slab or underside of assembly above
- Fire blocking in combustible concealed spaces per 708.4.2

Applications:

- Corridor walls [1020.3]
- Enclosed elevator lobbies [3006.3]
- Egress balconies [1020.2]
- Vestibules [1028.2]
- Walls separating sleeping/dwelling units [907.2]
- Special uses [Chapter 4]
  - Occupancies R and I-1 [420]
  - Covered and open malls [402]
  - Ambulatory care facilities [422]



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Smoke Barrier vs Smoke Partition

Smoke barrier

The purpose of a smoke barrier is to subdivide a building into smoke compartments to prevent the spread of smoke and toxic gases from one area to another, thereby protecting life safety and allowing for safer evacuation and horizontal relocation of occupants, especially in hospitals. These barriers act as a continuous membrane, such as a wall, floor, or ceiling assembly, designed to restrict the movement of smoke and maintain tenable conditions in escape routes. Smoke barriers differ from smoke partitions in that they are required to be fire rated.

Smoke Partition

The purpose of a smoke partition is to limit and contain the spread of smoke within a building during a fire or other emergency, allowing time for occupants to evacuate and for smoke detection and suppression systems to activate. Smoke partitions are continuous, sealed membranes that extend from floor to ceiling, but they do not provide significant fire resistance, distinguishing them from smoke barriers and other fire-rated assemblies.

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Means of Egress Common Path of Travel

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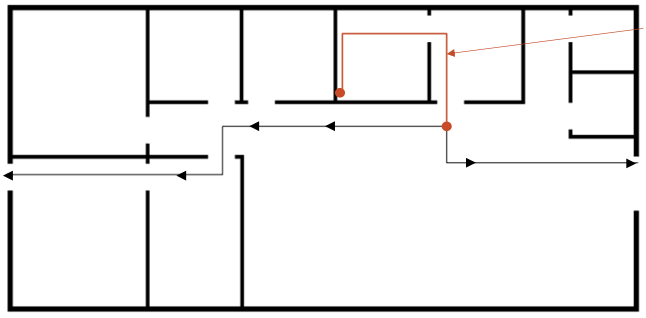
Exit Access – Common Path of Travel

That portion of exit access travel distance measured from the most remote point of each room to the point where occupants have separate and distance access to two exits or exit access doorways



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Exit Access – Common Path of Travel

The allowable length for common path of travel is dependent on the occupancy group, occupant load and whether the building is sprinkled.

Limitations for each occupancy group are listed in Table 1006.2.1

TABLE **1006.2.1 SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY**

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without Automatic Sprinkler System (feet)		With Automatic Sprinkler System (feet)
		Occupant load		
		OL ≤ 30	OL > 30	
A[c], E, M	49	75	75	75[a]
B	49	100	75	100[a]
F	49	75	75	100[a]
H-1, H-2, H-3	3	NP	NP	25[b]
H-4, H-5	10	NP	NP	75[b]
I-1, I-2[d], I-4	10	NP	NP	75[a]
I-3	10	NP	NP	100[a]
R-1	10	NP	NP	75[a]
R-2	20	NP	NP	125[a]
R-3[e]	20	NP	NP	125[a, g]
R-4[e]	20	NP	NP	125[a, g]
S[f]	29	100	75	100[a]
U	49	100	75	75[a]

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Accessible Door Maneuvering Clearance

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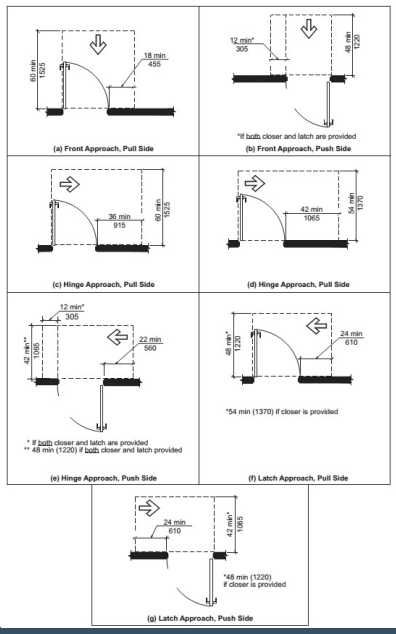

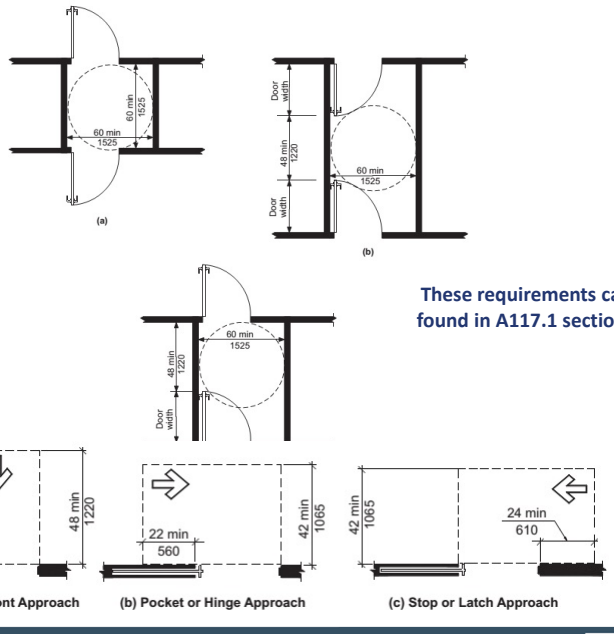

These requirements can be found in A117.1 section 404

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Energy Code Requirements

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IECC Required Items on Plans

C103.2 Information on construction documents.

Construction documents shall be drawn to scale on suitable material. Electronic media documents are permitted to be submitted where approved by the code official. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Energy compliance path.
2. Insulation materials and their R-values.
3. Fenestration U-factors and solar heat gain coefficients (SHGCs).
4. Area-weighted U-factor and solar heat gain coefficient (SHGC) calculations.
5. Mechanical system design criteria.
6. Mechanical and service water-heating systems and equipment types, sizes and efficiencies.
7. Economizer description.
8. Equipment and system controls.
9. Fan motor horsepower (hp) and controls.
10. Duct sealing, duct and pipe insulation and location.
11. Lighting fixture schedule with wattage and control narrative.
12. Location of daylight zones on floor plans.
13. Air barrier and air sealing details, including the location of the air barrier.

2024 IECC Additions (now section C105.2)

- Thermal Bridges as Identified in Section C402.7
- Location of pathways for routing of raceways or cable from the on-site renewable energy system to the electrical distribution equipment
- Location reserved for inverters, metering equipment and energy storage systems (ESS), and a pathway reserved for routing of raceways or conduit from the renewable energy system to the point of interconnection with the electrical service and the ESS
- Location and layout of a designated area for ESS
- Rated energy capacity and rated power capacity of the installed or planned ESS.

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Compliance Paths

Compliance paths are used to ensure compliance with IECC, mechanical codes, electrical codes, lighting requirements, and plumbing codes. There are multiple options for each discipline

- Prescriptive
  - Individual components/systems meet requirements listed in the code
  - Most common
- Performance
  - Overall assembly or building analysis and complex energy modeling
  - Offers more flexibility and opportunities for "trade-offs"
  - Uses analysis software to calculate total efficiency of the building

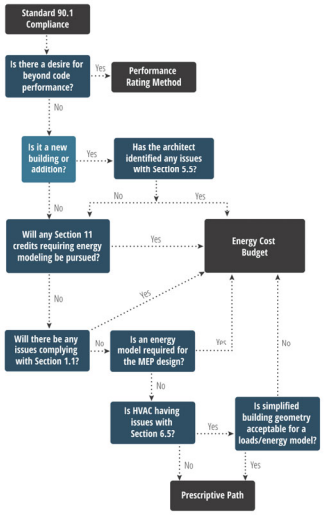

Image sourced form csemag.com

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Thermal Envelope Requirements – C402 and R402

Minimum R-values and U-factors for

- Roofs
- Skylights
- Exterior walls
- Walls adjacent to unconditioned space
- Windows
- Floors
- Walls below grade
- Slabs-on-grade

Thermal Envelope Certificate is required to be displayed in commercial buildings near the space conditioning equipment and filed with the construction documents [IECC C401.3].

It must record:

- R-values of insulation
- U-factors of fenestration
- Air leakage test results

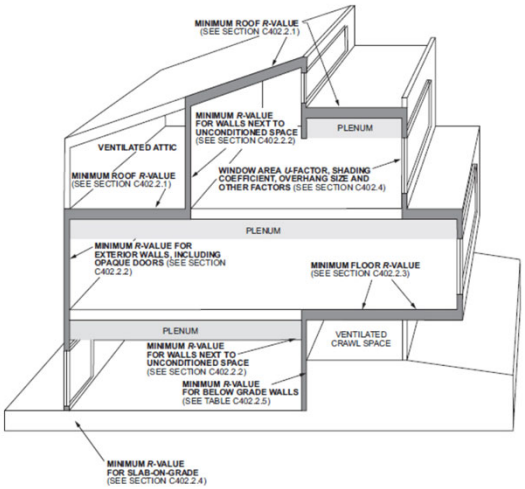

Image sourced from ICC's 2021 IECC Code and Commentary, created by US Dept. of Energy

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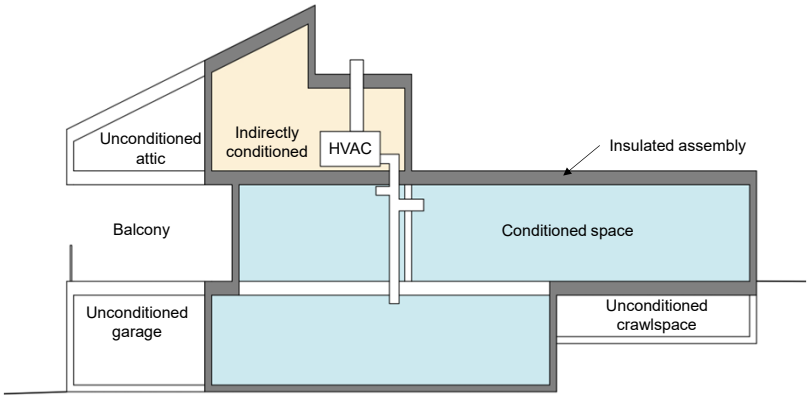
Conditioned Space

Conditioned space – A space that is enclosed within the building thermal envelope and is directly or indirectly heated or cooled.



Indirectly conditioned spaces are:

- connected through openings to conditioned spaces
- are separated from conditioned spaces by uninsulated walls, floors or ceiling contain uninsulated ducts, piping or other sources of heating or cooling

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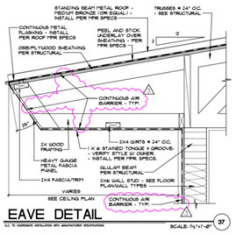
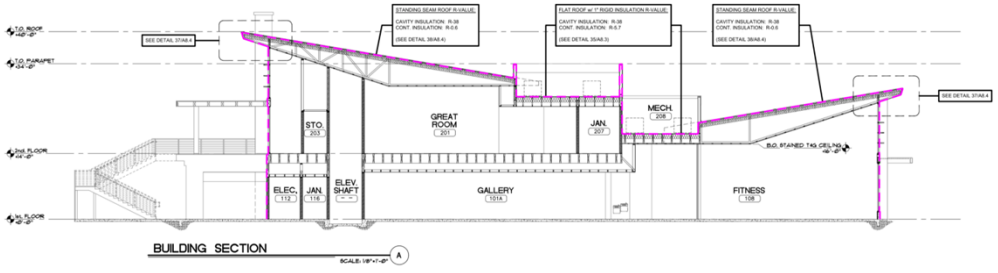
Air Barriers

Assembly or component that restricts the passage of air ("air leakage") through the building envelope

A continuous air barrier with sealed joints and penetrations is required in most buildings [IECC C402.6.1.1]

- Can be located inside, outside or within the thermal envelope, in any combination [IECC C402.6.1]





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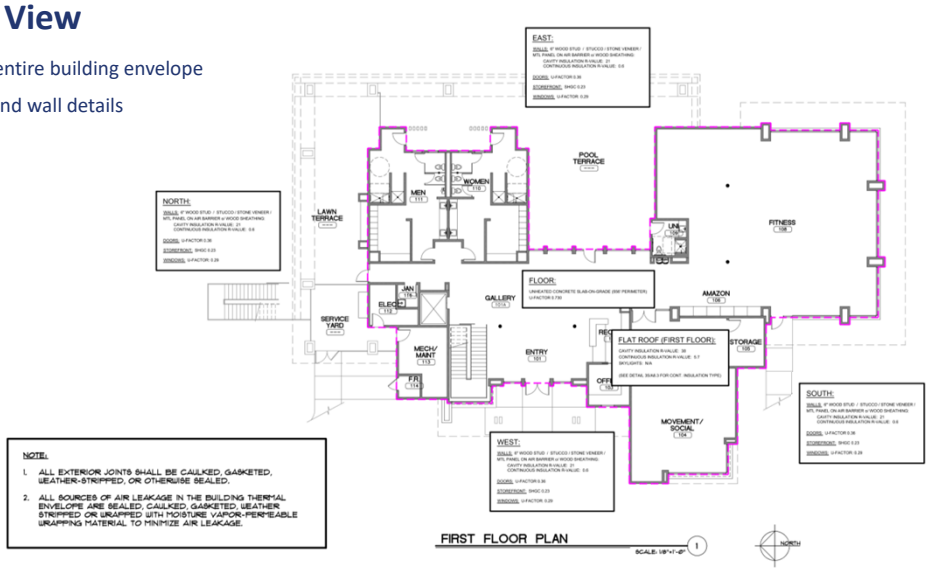
Air Barrier – In Plan View

- Continuity of barrier around entire building envelope
- Verify consistency with roof and wall details
- Provide notes for sealing



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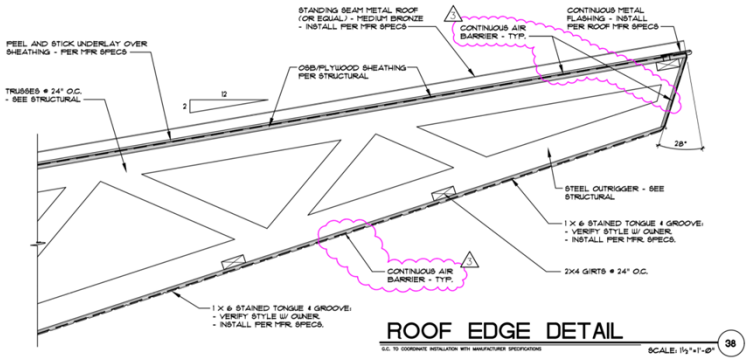
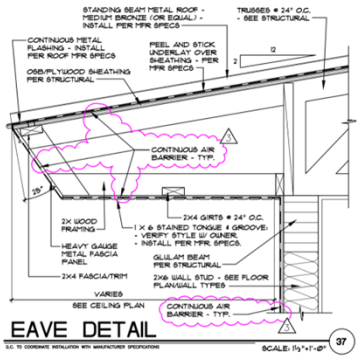
Air Barrier – Roof Details

- The exact layer being used as a barrier should be called out





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Baby Changing Tables

1210.4 Baby changing table.

Where newly constructed buildings or facilities contain restrooms that are provided for public use, a minimum of one (1) baby changing table shall be provided to comply with all of the following:

1. Located within a public restroom or other area as approved by the building official.
2. Continuously available to both male and female occupants.
3. Applicable provisions of ICC A117.1 for Diaper Changing Tables.

   Exception: Baby changing tables are not required in facilities that have been issued a permit or license which restricts the admission of children on the basis of age.

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Adult Changing Station

1110.4 Adult changing stations.

Where provided, adult changing stations shall be accessible. Where required, adult changing stations shall be accessible and shall comply with Sections 1110.4.1 through 1110.4.4.

1110.4.1 Where required.

Not fewer than one adult changing station shall be provided in the following locations:

1. In assembly and mercantile occupancies, where family or assisted-use toilet or bathing rooms are required to comply with Section 1110.2.1.
2. In Group B occupancies providing educational facilities for students above the 12th grade, where an aggregate of 12 or more male and female water closets are required to serve the classrooms and lecture halls.
3. In Group E occupancies, where a room or space used for assembly purposes requires an aggregate of six or more male and female water closets for that room or space.
4. In highway rest stops and highway service plazas.

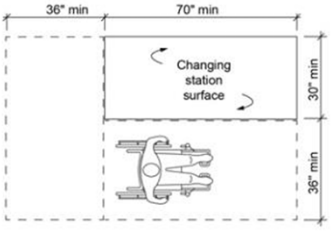

FIGURE 1110.4.5.3
SIZE AND MANEUVERING CLEARANCES AT THE ADULT CHANGING SURFACE

1110.4.5.3.1 Size. The changing surface shall be 70 inches (1778 mm) minimum in length and 30 inches (762 mm) minimum in width.

1110.4.5.3.2 Capacity. Materials, fastening mounting devices and support structure shall support a user weight of not less than 400 pounds (182 kg).

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Electric Vehicle Charging Stations

1107.2 Electrical vehicle charging stations.

Electrical vehicle charging stations shall comply with Sections 1107.2.1 through 1107.2.4.

Exceptions:

1. Electrical vehicle charging stations provided to serve Group R-3 and R-4 occupancies are not required to comply with this section.
2. Electric vehicle charging stations used exclusively by buses, trucks, other delivery vehicles, law enforcement vehicles and motor pools are not required to comply with this section. 1107.2.1 Number of accessible vehicle spaces. Not less than 5 percent of vehicle spaces on the site served by electrical vehicle charging systems, but not fewer than one for each type of electric vehicle charging system, shall be accessible. Where new electric vehicle charging stations are installed in facilities with existing electric vehicle charging stations, the total number of accessible spaces provided shall include both existing and new electric vehicle charging stations. Where an electric vehicle charging station charger can simultaneously charge more than one vehicle, the number of electric vehicle charging stations provided shall be considered equivalent to the number of electric vehicles that can be simultaneously charged. Spaces serving Electric Vehicle Charging Stations per this section shall not account for any of the accessible parking spaces, required by Section 1106, on the site unless specifically provided with accessible identification signage with the International Symbol of Accessibility and meet all of the requirements for an accessible parking space in addition to the requirements of this section. To be used as a required accessible parking space, the space cannot be restricted to electric vehicles only.

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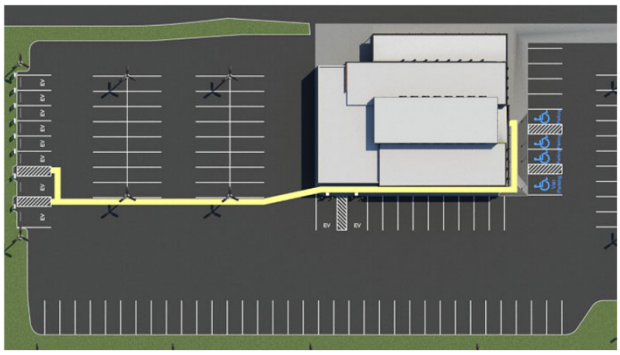
Electric Vehicle Charging Stations Are Not Parking Spaces

Electric Vehicle Charging Stations

Electric Vehicle Parking Spaces



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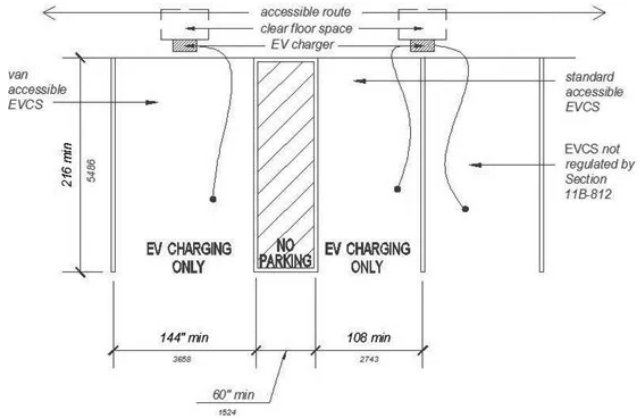
Non-compliant Electric Vehicle Charging Station



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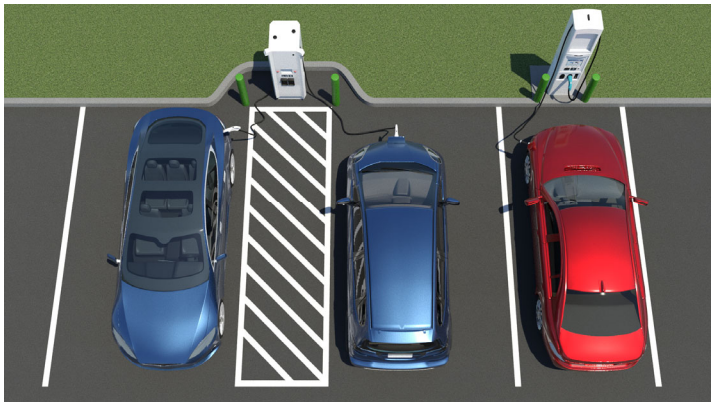
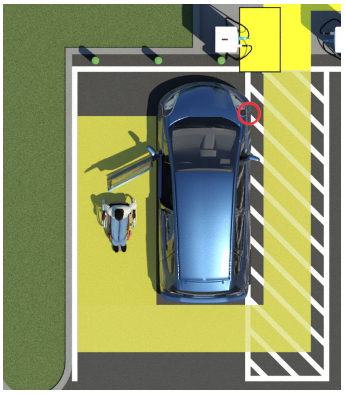
Compliant Electric Vehicle Charging Station





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Questions?

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Thank You!

To contact me with questions, email me at : allen.burris@clarkcountynv.gov

If you would like more information on Joining SNICC or being part of the code development process, go to www.snicc.org

For information on attending the 2026 EduCode in February of 2026, go to https://educode.us/

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