

CODE ENFORCEMENT

THE ENERGY CODE IN MULTIFAMILY



TOWNHOUSES



- ❖ Townhouses are treated as if they are single family homes.
- ❖ Thermal envelope defined
- ❖ Air barrier details
- ❖ Insulation values on plans
- ❖ Mechanical equipment sized

MULTIFAMILY ENERGY

RESIDENTIAL ENERGY



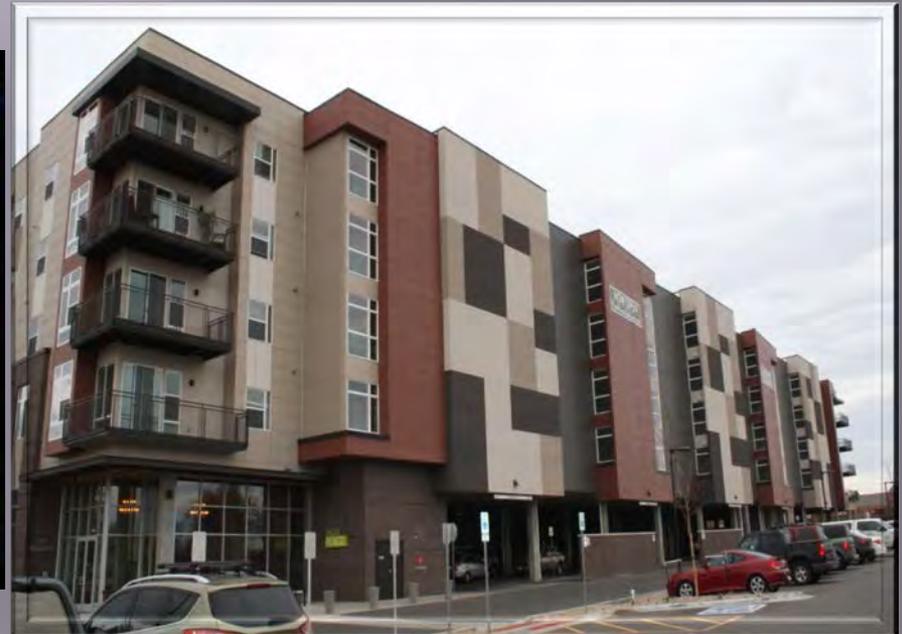
COMMERCIAL ENERGY





**MULTIFAMILY 3
STORIES OR LESS ARE
TREATED AS
INDIVIDUAL UNITS**

**MULTIFAMILY 4
STORIES OR MORE ARE
TREATED AS A
BUILDING**



CHALLENGES:

When a 3 story becomes a 4 story

- ❖ Different architects
- ❖ Different and multiple building materials
- ❖ Commercial requirements
 - ❖ Less understanding of the requirements
 - ❖ Less enforcement



APARTMENT PLANS

Sheet List Table

ISSUE	Sheet Number	Sheet Title
	A0-00B	COVER SHEET
	A0-01B	CODE ANALYSIS
	A0-02	ACCESSIBILITY DETAILS
	A0-03	ACCESSIBILITY DETAILS
	A0-04	ACCESSIBILITY DETAILS
	A0-05	ACCESSIBILITY DETAILS
	A0-06	ACCESSIBILITY DETAILS
	A0-07	FIRE RATED WALL ASSEMBLIES
	A0-08	FIRE RATED ROOF ASSEMBLIES
	A0-09	FIRE RATED FLOOR & CEILING ASSEMBLIES
	A0-10	FIRE RATED PENETRATION DETAILS
	A1-01B	ARCHITECTURAL SITE PLAN-BUILDING TYPE II
	A1-03	BUILDING TYPE II EGRESS DIAGRAM
	A2-04	BUILDING TYPE II SLAB AND FIRST FLOOR COMPOSITE PLANS
	A2-05	BUILDING TYPE II SECOND AND THIRD FLOOR COMPOSITE PLANS
	A2-06	BUILDING TYPE II ROOF COMPOSITE PLAN
	A3-02	BUILDING TYPE II ELEVATIONS
	A4-02	BUILDING TYPE II BUILDING SECTIONS
	A5-01	UNIT PLAN A1
	A5-02	UNIT PLAN A2
	A5-04	UNIT PLAN B2
	A5-05	UNIT PLAN C1
	A5-06	UNIT A1-A TYPE A ACCESSIBILITY PLAN
	A6-01	ENLARGED WALL SECTIONS
	A6-02	ENLARGED WALL SECTIONS
	A6-03	ENLARGED WALL SECTIONS
	A7-37	UNIT B1-A INTERIOR ELEVATIONS
	A7-01	EXTERIOR DETAILS
	A7-02	EXTERIOR DETAILS
	A7-03	WINDOW FLASHING DETAILS
	A7-04	EXTERIOR DETAILS
	A7-05	EXTERIOR DETAILS
	A7-06	EXTERIOR DETAILS
	A7-07	EXTERIOR DETAILS
	A7-08	EXTERIOR DETAILS
	A7-09	EXTERIOR DETAILS
	A7-10	EXTERIOR DETAILS
	A7-20	INTERIOR DETAILS
	A7-31	UNIT A1 INTERIOR ELEVATIONS
	A7-32	UNIT A2 INTERIOR ELEVATIONS
	A7-34	UNIT B2 INTERIOR ELEVATIONS
	A7-35	UNIT C1 INTERIOR ELEVATIONS
	A7-36	UNIT A1-A INTERIOR ELEVATIONS
	A8-02	BUILDING TYPE II STAIR PLANS
	A8-03	STAIR SECTION
	A8-04	STAIR SECTION
	A8-05	BREEZEWAY STAIR DETAILS AND SECTIONS
	A9-01	DOOR WINDOW AND ROOM FINISH SCHEDULE

STRUCTURE

Issue Date	Sheet No.	Description
	S1-00	GENERAL NOTES
	S1-01	SCHEDULES & TYPICAL DETAILS
	S1-02	TYPICAL DETAILS
	S1-03	TYPICAL DETAILS
	S2-00A	BLDG. TYPE II FOUNDATION PLAN
	S2-00B	BLDG. TYPE II TENDON LAYOUT PLAN
	S2-01	BLDG. TYPE II 2ND FLOOR FRAMING PLAN
	S2-02	BLDG. TYPE II 3RD FLOOR FRAMING PLAN
	S2-03	BLDG. TYPE II ROOF FRAMING PLAN
	S2-11	BLDG. TYPE II FIRST FLOOR FRAMING PLAN
	S3-00	FOUNDATION SECTIONS
	S4-00	FLOOR FRAMING SECTIONS
	S5-00	ROOF FRAMING SECTIONS

MECHANICAL

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	M0-1	SPEC, ABBRS, LEGEND AND SHEET LOG
	M1-1	BLDG. TYPE II FIRST FLOOR MECHANICAL PLAN
	M2-1	UNIT PLANS MECHANICAL
	M3-1	EQUIPMENT LIST & DETAILS

PLUMBING

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	P1-1	BLDG. TYPE II - FIRST FLOOR PLUMBING PLAN
	P2-1	UNIT PLANS PLUMBING
	P3-1	WASTE, WATER & GAS RISERS
	P4-1	FIXTURE LIST AND DETAILS

ELECTRICAL

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	E2.1	BLDG. TYPE II - 1ST FLOOR ELECTRICAL PLAN
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	E2.3	BLDG. TYPE II - 3RD FLOOR ELECTRICAL PLAN
	E3.1	BLDG. TYPE II - TYPICAL UNITS ELECTRICAL PLAN
	E3.2	BLDG. TYPE II - TYPICAL UNITS ELECTRICAL PLAN
	E4.1	SCHEDULES
	E4.2	ONE LINE DIAGRAM/CALCULATIONS
	E4.3	ONE LINE DIAGRAM/CALCULATIONS
	E4.4	ELECTRICAL DETAILS
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Fire rated

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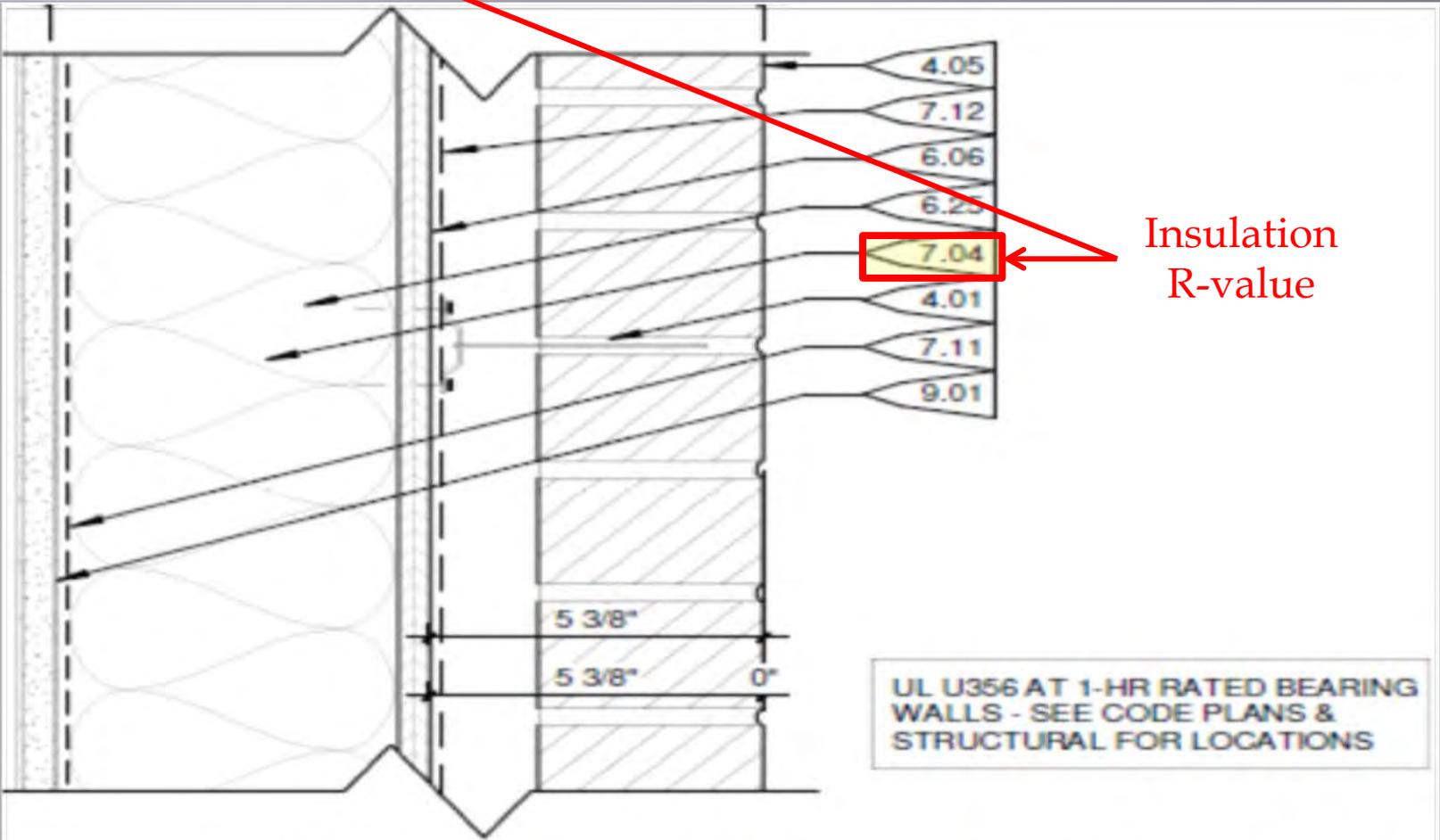
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7.04	2"X4" STUDS - R-15 FIBERGLASS BAT INSULATION, 2"X6" STUDS - R-19 FIBERGLASS BAT INSULATION
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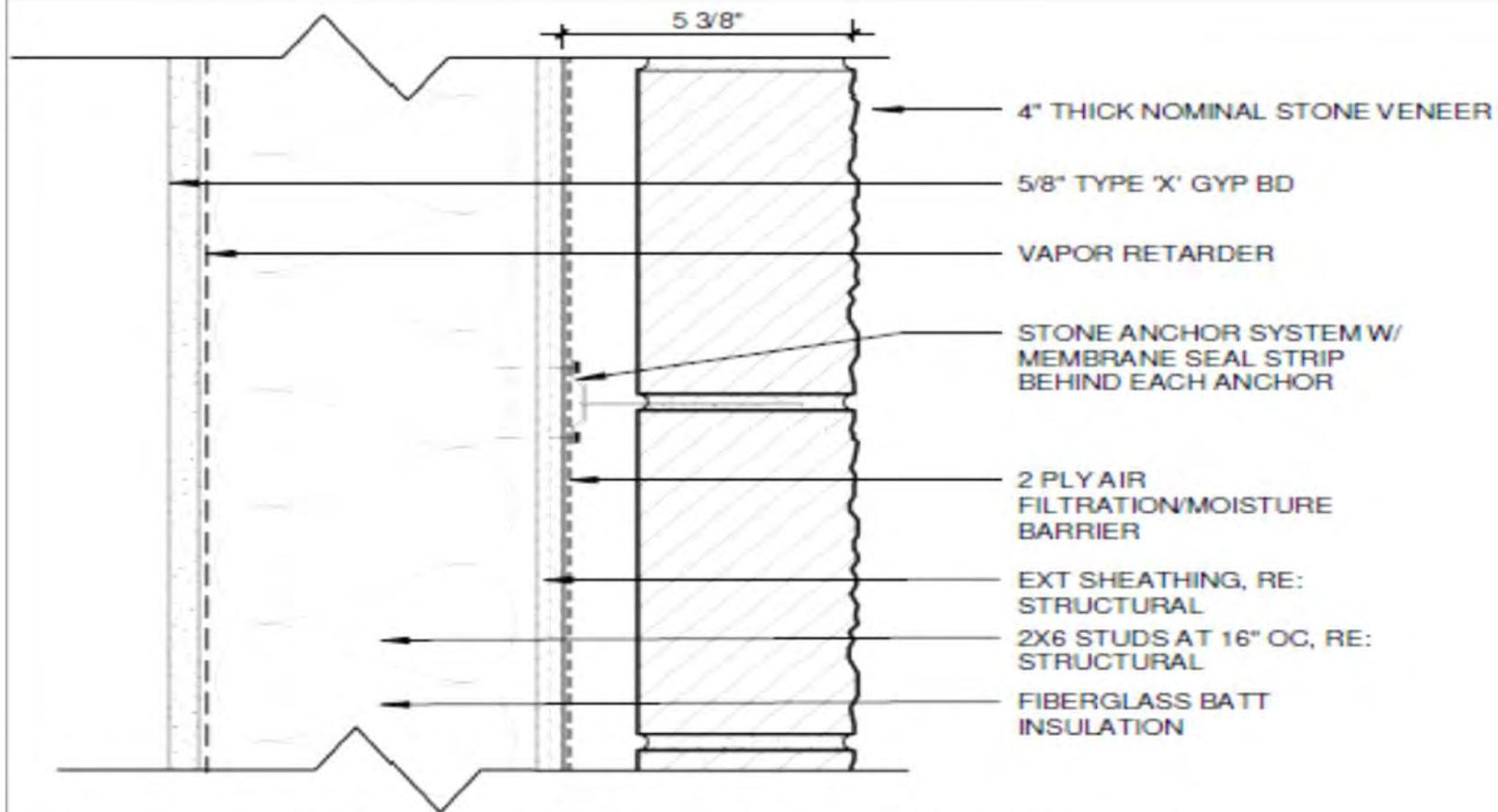


Insulation
R-value

UL U356 AT 1-HR RATED BEARING WALLS - SEE CODE PLANS & STRUCTURAL FOR LOCATIONS

EXTERIOR WALL ASSEMBLY: BRICK ON WOOD STUDS

EY2



UL U356 AT 1-HR RATED BEARING WALLS - SEE CODE PLANS & STRUCTURAL FOR LOCATIONS

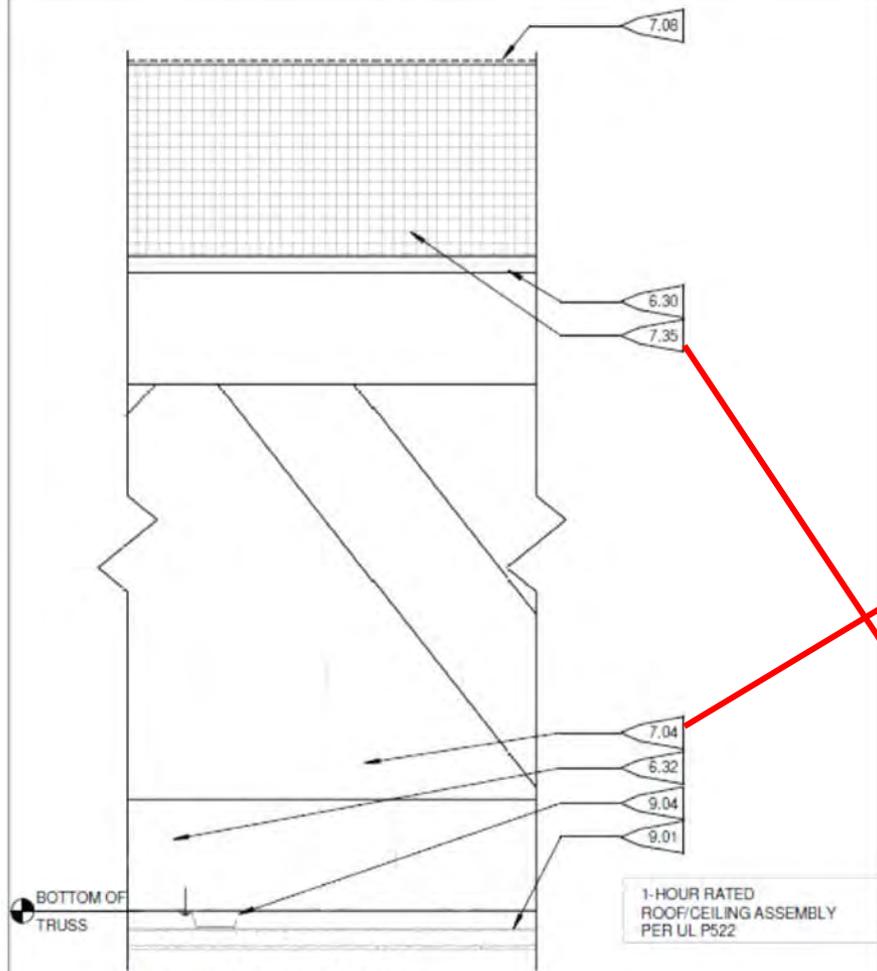
EX6

EXTERIOR WALL ASSEMBLY: BRICK VENEER ON CONCRETE

3" = 1'-0"

WALL ASSEMBLY IN BUILDING E ONLY

HORIZONTAL ASSEMBLIES



**ROOF ASSEMBLY:
WOOD TRUSS**

R1

3" = 1'-0"

PROJECT FLAGNOTES

NUMBER	FLAGNOTE
1.01	MINIMUM GAP BETWEEN STAIR STRINGERS AND CMU SHALL BE 1/4"
4.01	MASONRY ANCHOR WITH GALVANIZED SCREWS AND SEALING WASHERS
4.02	DOUBLE WYTHE MASONRY REINFORCING
4.04	CMU, RE: STRUCTURAL
4.05	BRICK MASONRY - RUNNING BOND (NOTE: 2 BRICK COLORS WILL BE USED)
4.06	VERTICAL REINFORCING, RE: STRUCTURAL
4.14	HORIZONTAL REINFORCING
4.15	FULL MORTAR BED, TYPICAL
4.25	CMU INTERNAL CAVITIES SHALL BE COMPLETELY FILLED WITH STANDARD CEMENT GROUT
6.06	EXTERIOR WALL SHEATHING, RE: STRUCTURAL
6.25	2X6 STUDS AT 16" ON CENTER, RE: STRUCTURAL
6.26	2X STUDS AT 16" ON CENTER, RE: STRUCTURAL
6.27	2X PLATE, RE: STRUCTURAL
6.28	SHEAR PANEL, RE: STRUCTURAL
6.29	FLOOR TRUSS, RE: STRUCTURAL
6.30	SHEATHING, RE: STRUCTURAL
6.31	FLOOR JOIST, RE: STRUCTURAL
6.32	ROOF TRUSS, RE: STRUCTURAL
6.36	2X BLOCKING AT MID-HEIGHT OF WALL
7.02	INTERLOCKING METAL WALL PANEL
7.03	FIBER-CEMENT LAP SIDING
7.04	2"X4" STUDS - R-15 FIBERGLASS BAT INSULATION, 2"X6" STUDS - R-19 FIBERGLASS BAT INSULATION
7.07	3/8" BACKER ROD AND SEALANT JOINT
7.08	ROOF MEMBRANE - LAP OVER TOP OF PARAPET SHEATHING AND BEHIND ATTACHMENT CLEAT
7.11	VAPOR BARRIER - WRAP INTO ROUGH OPENING
7.12	WEATHER RESISTIVE BARRIER - WRAP INTO ROUGH OPENING PER OPENING FLASHING DIAGRAM
7.32	1" RIGID INSULATION
7.33	2"X4" STUDS - R-15 FIBERGLASS BAT INSULATION, 2"X6" STUDS - R-19 FIBERGLASS BAT INSULATION,
7.35	6" RIGID INSULATION
7.41	2"X4" STUDS - R-15 FIBERGLASS BAT INSULATION, 2"X6" STUDS - R-19 FIBERGLASS BAT INSULATION, FLOOR /CEILING ASSEMBLIES MINIMUM R-38 BAT INSULATION
7.42	GALVANIZED STEEL FASTENER WITH SELF-SEALING GASKET
7.43	CORRUGATED METAL SIDING
9.01	5/8" TYPE X GYPSUM BOARD
9.03	FLOOR FINISH, RE: INTERIORS
9.04	1/2" RESILIENT CHANNELS
9.05	1/4" ACOUSTIC MAT AT RESTROOMS ONLY
9.06	1- 1/2" TOPPING SLAB (1- 1/4" AT RESTROOMS ONLY)
9.08	J RUNNER CHANNEL
9.09	METAL "C-H" STUD
9.10	1" GYPSUM BOARD SHAFT WALL LINER PANEL

THERMAL vs. SOUND



THERMAL vs. SOUND

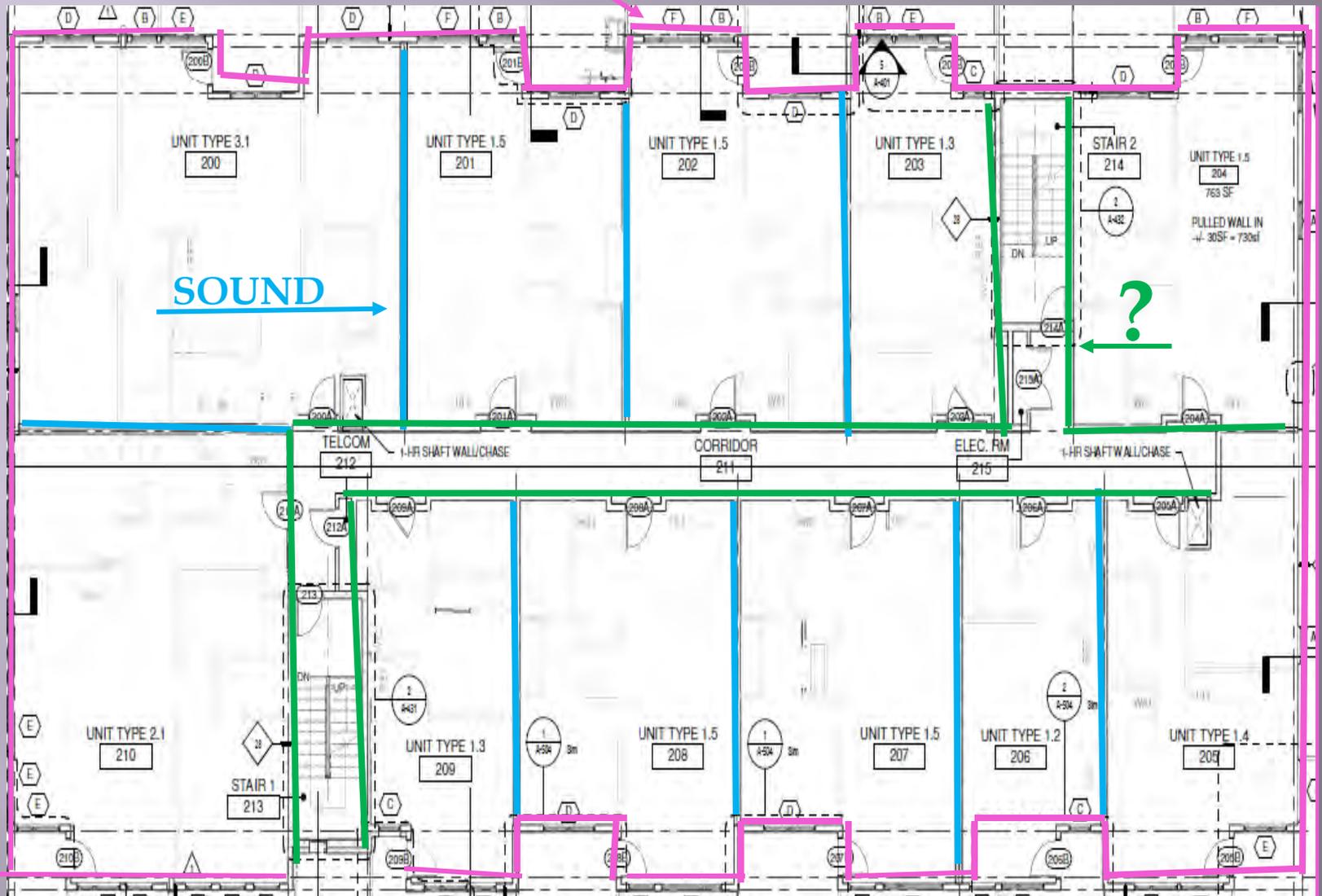
SOUND



THERMAL



THERMAL



SOUND

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WALL INSULATION

RESCHECK WALLS R-19

REAL LIFE APPLICATION WALLS R-11

Compliance: Passes using UA trade-off

Compliance: **5.4% Better Than Code** Maximum UA: **3029** Your UA: **2864**

The % Better or Worse Than Code Index reflects how close to compliance the house is based on code trade-off rules. It DOES NOT provide an estimate of energy use or cost relative to a minimum-code home.

Envelope Assemblies

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	U-Factor	UA
Ceiling 1: Flat Ceiling or Scissor Truss	14,821	38.0	0.0	0.030	445
Wall 1: Wood Frame, 16" o.c.	5,781	19.0	0.0	0.060	267
Window 1: Vinyl Frame:Double Pane	996			0.350	349
Door 1: Solid	336			0.200	67
Wall 2: Wood Frame, 16" o.c.	2,097	19.0	0.0	0.060	94
Window 2: Vinyl Frame:Double Pane	360			0.350	126
Door 2: Solid	168			0.200	34
Wall 3: Wood Frame, 16" o.c.	6,268	19.0	0.0	0.060	271
Window 3: Vinyl Frame:Double Pane	1,080			0.350	378
Door 3: Solid	672			0.200	134
Wall 4: Wood Frame, 16" o.c.	2,097	19.0	0.0	0.060	94
Window 4: Vinyl Frame:Double Pane	360			0.350	126
Door 4: Solid	168			0.200	34
Floor 1: Slab-On-Grade:Unheated Insulation depth: 2.0'	580		10.0	0.767	445



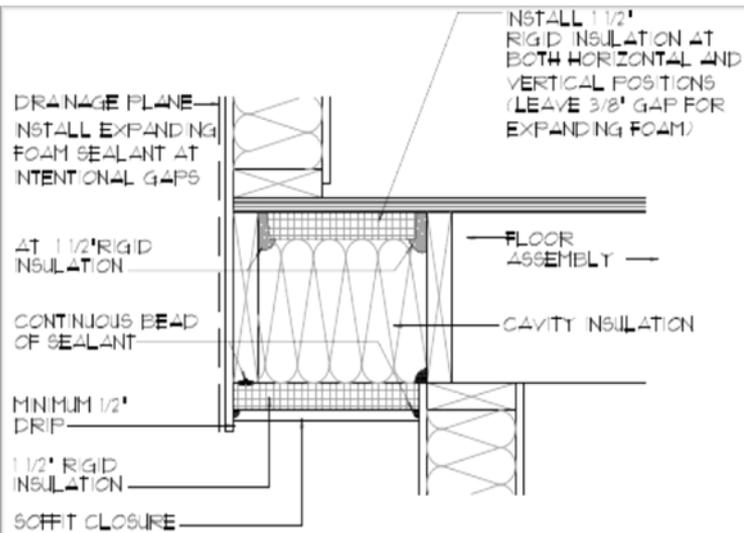




AIR SEALING AT JOINTS



A PICTURE IS WORTH A THOUSAND WORDS



- Plans examiners can verify the requirement is demonstrated on the plans
- Builders understand how to build the component to comply with the code and how the architect designed the building
- Inspectors have a tool to aid in enforcing the requirements

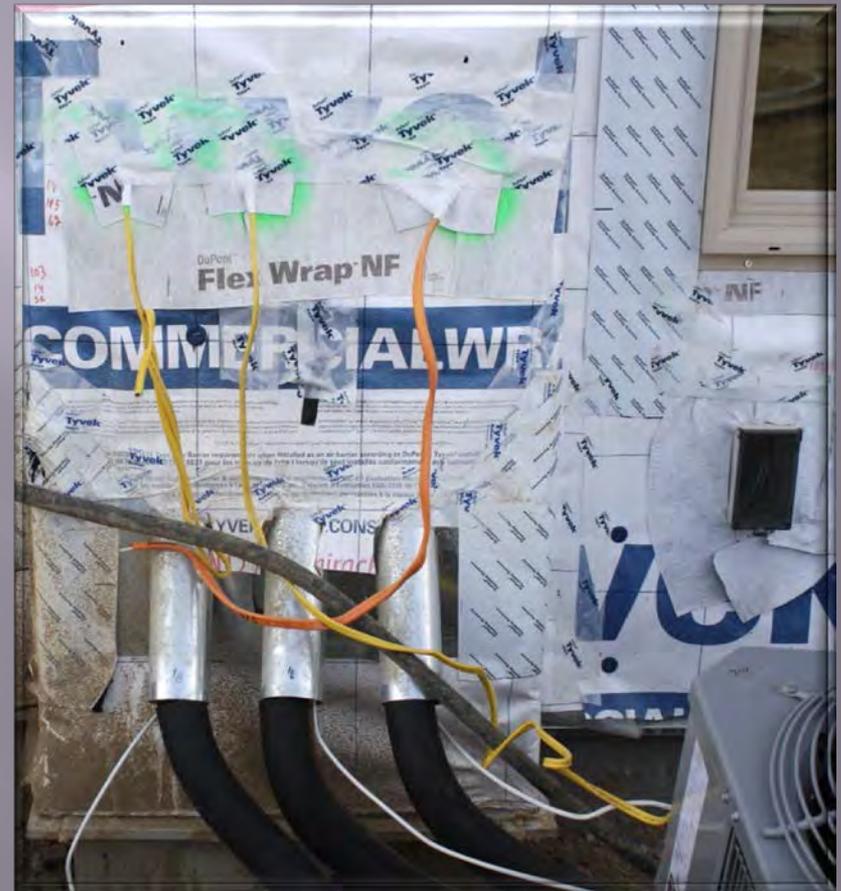
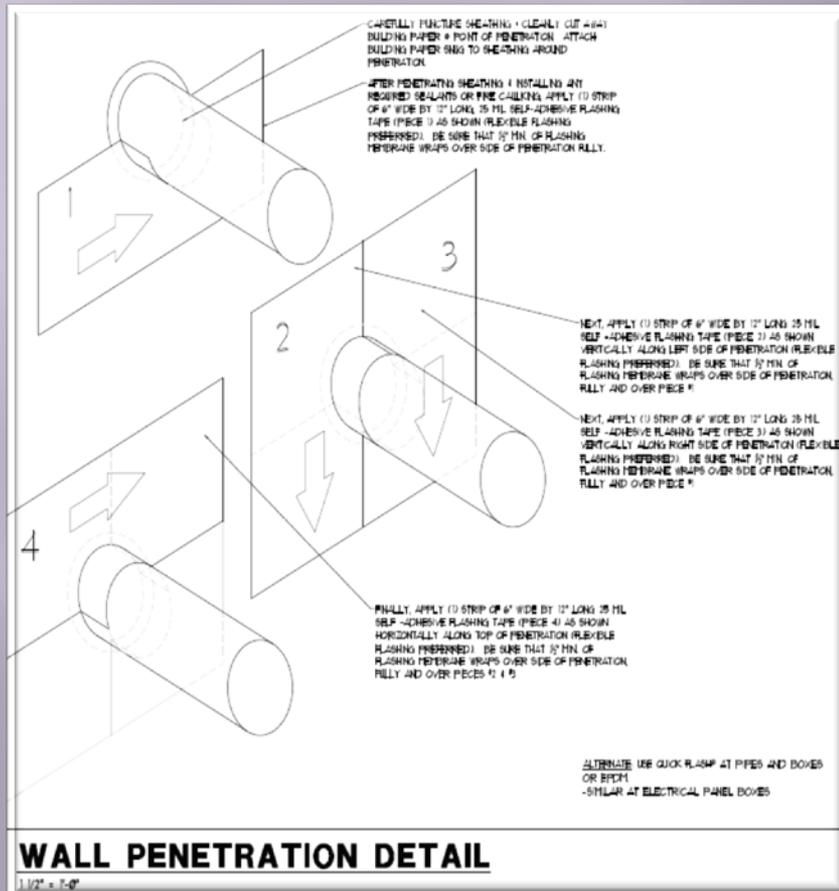
INSULATED CANTILEVER

@ FLOOR

WALL PENETRATIONS

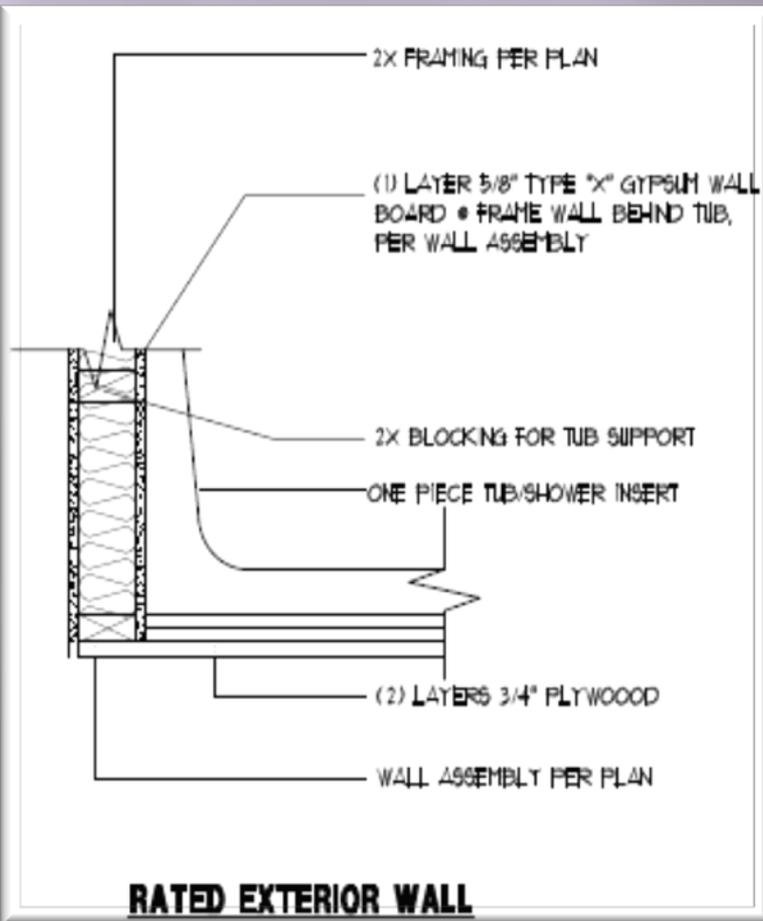
DETAIL BURIED IN EXTERIOR DETAILS

REAL WORLD APPLICATION

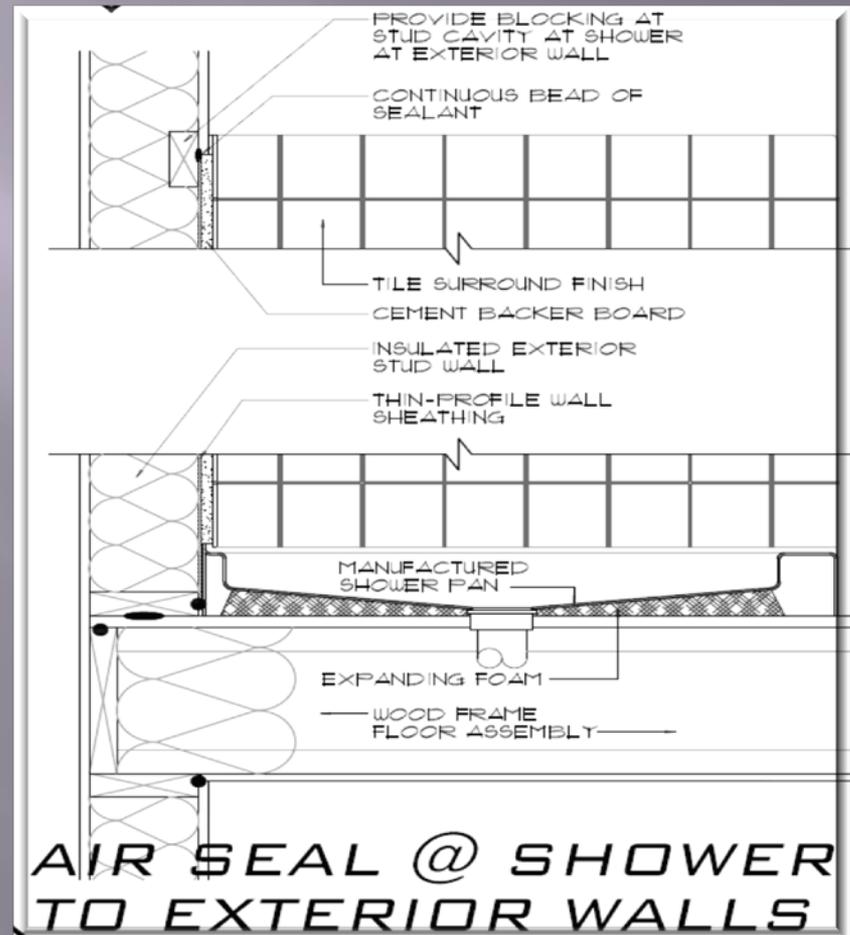


DETAIL FOR TUB/SHOWER IN PLANS

APARTMENT DETAIL

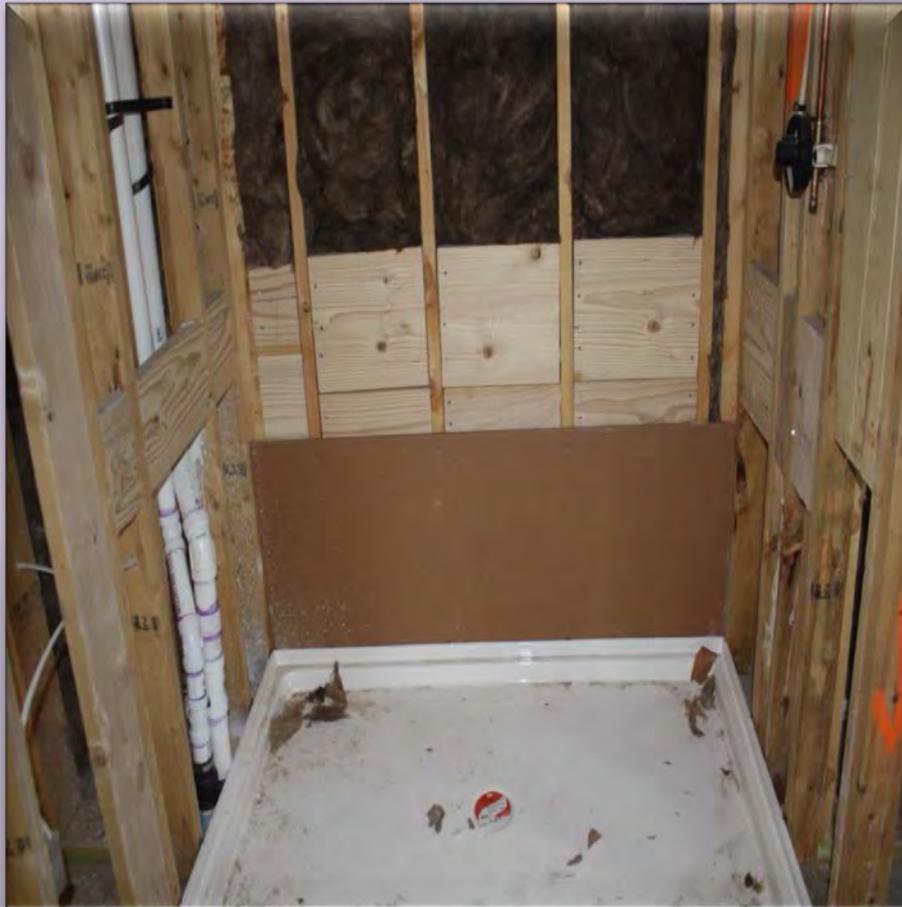


TOWNHOME DETAIL



REAL WORLD APPLICATION NO DETAIL PROVIDED ON THE PLANS

PRE-DRYWALL WITH
"AIR BARRIER"



AFTER DRYWALL



PLAN NOTES

ENERGY NOTE PLACED IN THE GENERAL NOTES SECTION

Provide insulation for mechanical system piping per 2012 IECC 403.3.

AIR BARRIER NOTES PLACED IN WALL SECTION

3. Openings between window and door assemblies and their respective jambs and framing.

- All windows and doors will be foamed with a closed cell spray foam

10. Attic access openings.

- rigid insulation will be attached to the top side of the attic access panel for an R-50

11. Rim joists junction.

- 2" closed cell spray foam and R12 batt insulation

PLAN NOTES

ENERGY NOTE PLACED IN THE GENERAL NOTES SECTION

Provide insulation for mechanical system piping per 2012 IECC 403.3.

NO

AIR BARRIER NOTES PLACED IN WALL SECTION

3. Openings between window and door assemblies and their respective jambs and framing.

- All windows and doors will be foamed with a closed cell spray foam

10. Attic access openings.

- rigid insulation will be attached to the top side of the attic access panel for an R-50

11. Rim joists junction.

- 2" closed cell spray foam and R12 batt insulation

YES

TRAINING

- **CONTRACTORS**
- **ARCHITECTS**
- **BUILDERS**
- **CODE OFFICIALS**





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