

Plan review re-submittals shall include the following:

- a. Submit response letter:
 - i. Each review comment shown with the response to that comment (i.e. revised on Sheet A3 or "See electrical note #5" or "you missed it on Sheet 1 of 6") etc.
- b. **TWO** complete sets of plans shall be submitted:
 - i. Revision title, number, and date revised on title sheet.
 - ii. Item clouded and referenced to revision#;
 - iii. Re-submittal charges per sheet on only the revised pages.
Identify the revised sheets by "clouding" the sheet number.

*You may request a "Word" document of reviews for your use in response letter.
Email request to felstrup@naperville.il.us*

1) R106.1 SUBMITTAL DOCUMENTS.

Construction documents, special inspection and structural observation programs and other data shall be submitted in one or more sets (36" x 24") with each application for a permit. The construction documents shall be prepared by a registered design professional where required. Exception: HVAC drawings may be submitted on 11" x 17" but scale not less than 1/8" = 1'0".

2) R106.1 PERMITS -

All plans for additions, basements, decks and screen porches' shall be prepared to an industry standard. All details shall be incorporated into submitted plans, no sketches will be accepted.

3) THE BUILDING CODES ADOPTED BY THE CITY OF NAPERVILLE

Per Ordinance 12-159, passed by The City Council on December 18, 2012, all plans submitted on or after March 1, 2013 will be reviewed and used in the preparation of these plans and shall be located on the title page of submitted drawings.

- (a) 2012 International Residential Code
- (b) 2012 Illinois Energy Conservation Code
- (c) 2012 International Fuel Gas Code
- (d) 2012 International Mechanical Code
- (e) 2012 International Plumbing Code
- (f) 2006 International Electric Code (Administrative section only)
- (g) 2014 National Electric Code (N.E.C.)
- (h) Illinois State Plumbing Code, Current Edition
- (i) Naperville Building Code Amendments, Title V

4) TABLE 301.2(1) CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA

Add the table as adopted by the city to the plans presented for review

CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA										
Ground Snow Load	Wind Speed (mph)	Seismic Design Category	Subject to damage from			Winter Design Temp	Ice Barrier Underlayment Required	Flood Hazards	Air Freezing Index	Mean Annual Temp
			Weathering	Frost Line Depth	Termites					
30	90/3 second wind gust	B	Severe	42"	Moderate	-1 °F	Yes	Refer To Local Ordinances	1635	48.7°F

5) **TABLE R405.1 SOIL CLASSIFICATION**

Soils must be classified according to the chart adopted and specified on the title page of these plans. City of Naperville requires soil test results to validate any soils valued over 1500#.

***Submit "soil test" result or design piers (isolated footings) to 1500# soil bearing capacity

6) **TABLE R301.5 MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS**

Add the table as the minimums used in the design presented for review

TABLE R301.5 MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS (in pounds per square foot)	
Attics with limited storage	20
Attics without storage	10
Attics Habitable	30
Decks	40
Exterior balconies	60
Guardrails and handrails	200
Rooms other than sleeping rooms	40
Sleeping rooms	30
Stairs	40

7) **NMC #320.2 VISITABILITY - AMENDMENT**

Wall reinforcement: Provide wood blocking within the wall framing in one first floor bath. Blocking must be located 33 inch to 36 inch above the finished floor in all walls adjacent to toilet, shower stall or bathtub.

*** Place note on drawings

8) **NMC #320.2 VISITABILITY - AMENDMENT**

Interior doors. All accessible first floor doorways shall provide a minimum clear opening of 32" with the door open ninety degrees, measured between the face of the door and the opposite stop.

*** Place note on drawings

9) **R502.12 DRAFTSTOPPING REQUIRED**

Provide note for requirement of draft-stopping and approved materials to be used in accordance with section R302.12. *** Place note on drawings

10) **R502.13 FIREBLOCKING**

Provide note for required fire-blocking and approved materials to be used in accordance with section R302.11. *** Place note on drawings

11) **R613.1 WINDOW INSTALLATION INSTRUCTIONS**

Instructions must be on site for inspections. Leave window stickers on until U.A. value is validated by inspector and approved on energy certificate.

**Place note on drawings

12) **R401.2 REQUIREMENTS POINT LOADS**

Note kips for all major point loads on plans. All loads must be transferred to the foundation. All point loads must be indicated with kips noted on all piers.

13) TABLE R402.2 - MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF CONCRETE

Specify the compressive strength of concrete for basement slabs, garage floor slabs and exterior slabs.

TYPE OR LOCATION OF CONCRETE CONSTRUCTION	MINIMUM SPECIFIED COMPRESSIVE STRENGTH (f _c)
	Weathering Potential
	Severe
Basement walls, foundations and other concrete not exposed to the weather	2,500
Basement slabs and interior slabs on grade, except garage floor slabs	2,500
Basement walls, foundation walls, exterior walls and other vertical concrete work exposed to the weather	3,000
Porches, carport slabs and steps exposed to the weather, and garage floor slabs	3,500 (air-entrained)

14) ACI STANDARD 332-10 or 318-11

For both reinforced and plain concrete walls; vertical and/or horizontal reinforcement shall be provided in accordance with these reference standards or engineered with calculations or per above prescriptive code.

15) TABLE R403.1.1 MINIMUM WIDTH OF CONCRETE FOOTINGS -

All exterior walls shall be supported on continuous footings. . . which shall be of sufficient design to accommodate all loads according to Section R301 and to transmit the resulting loads to the soil within the limitations as determined from the character of the soil. Footings shall be supported on undisturbed natural soils or engineered fill.

16) R403.1.1 AND TABLE 401.4.1 MINIMUM SIZE OF FOOTING -

Size of footings and supporting piers and columns shall be based on the tributary load and soil pressure in accordance with table R401.4.1.

R1001.2 Footings and foundations: "Footings for masonry fireplaces and their chimneys shall be constructed . . . 12" thick and extend 6" beyond . . ."

17) TABLE R404.1.2(8) CONCRETE FOUNDATION WALLS

Place this at each foundation wall, with any change of height, width or backfill. All areas the same, place one with (TYP) designated. Table has limitations, if design of wall exceeds table, calculations shall be submitted to provide validity of the design.

- _____ Thickness of Walls
- _____ Maximum height of wall
- _____ Maximum height of unbalanced backfill-
- _____ Backfill material CL (clay/dirt) GW (gravel/granular)
- _____ Minimum vertical reinforcement size and spacing
- _____ Minimum horizontal reinforcement size and spacing.

18) **TABLE R404.1.2(1) MINIMUM HORIZONTAL REINFORCEMENT FOR CONCRETE BASEMENT WALLS_{a, b}**

MAXIMUM UNSUPPORTED HEIGHT OF BASEMENT WALL (feet)	LOCATION OF HORIZONTAL REINFORCEMENT
≤8	One No. 4 bar within 12 inches of the top of the wall story and one No. 4 bar near mid-height of the wall story.
≥8	One No. 4 bar within 12 inches of the top of the wall story and one No. 4 bar near third points in the wall story.

19) **R506.2.3 VAPOR RETARDER – Amended by State Of Illinois Radon Mitigation Code.**

A vapor retarder is required in basements and garage floors. A 6 mil polyethylene or approved vapor retarder with joints lapped not less than ~~6 inches~~ 12 inches.

20) **32-2b;422.160 Illinois Administration Code “Radon Mitigation Code”**

<http://www.ilga.gov/commission/jcar/admincode/032/032004220001600R.html>

See attached “Passive Sub-Slab Depressurization (SSD) System illustration.

21) **R407.3 COLUMNS, STRUCTURAL REQUIREMENTS**

Columns shall be restrained to prevent lateral displacement at the bottom end. This is inclusive of all support members interior or exterior. Provide detail and/or approved connector.

22) **R310.1 EMERGENCY ESCAPE AND RESCUE OPENINGS**

Basements, habitable attics and every sleeping room shall have at least one operable emergency and rescue opening. Specify depth of window from grade level to sill of window opening.

23) **R310.2 WINDOW WELLS**

The horizontal dimension of a window well shall provide a minimum net clear area of 9 square feet with a minimum horizontal projection and width of 36 inches.

24) **R310.2.1 LADDER AND STEPS**

Window wells with a vertical depth greater than 44 inches below the ground level shall be equipped with a permanently affixed ladder or steps. Ladders or rungs shall have an inside width of at least 12 inches, shall project at least 3 inches from the wall and shall be spaced not more than 18 inches on center.

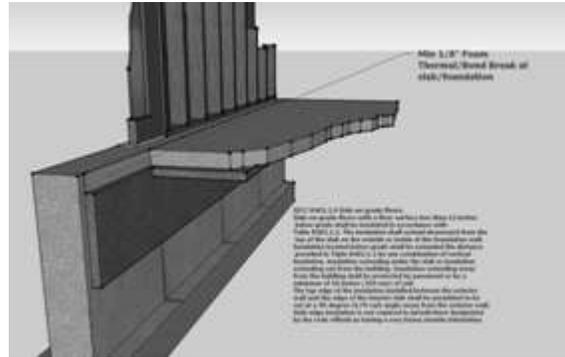
25) **R316.4 FOAM PLASTIC – Thermal Barrier**

Foam plastics shall be separated from the interior of a building by an approved thermal barrier of gypsum wallboard or a material that is tested. . .

26) R402.2.9 Slab-on-grade floors.

Slab-on-grade floors with a floor surface less than 12 inches below grade shall be insulated in accordance with Table R402.1.1

The insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the



distance provided in Table R402.1.1. by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building.

27) R408.1 UNDER FLOOR SPACE – VENTILATION

The under floor space between the bottom of the floor joists and the earth under any building, except basements, shall have ventilation openings through foundation walls or exterior walls.

This is the same for porches and decks with closed sides below decking.

28) IECC R402.2.8 BASEMENT WALLS:

Walls associated with conditioned basements shall be insulated from the top of the basement wall down to 4 feet (1219 mm) below grade or to the basement floor, whichever is less. Walls associated with unconditioned basements shall meet this requirement unless the floor overhead is insulated in accordance with Sections R402.1.1 and R402.2.7.

29) R601.1 APPLICATION

Detail a complete wall section to provide control of the design and construction of all walls and partitions for this design.

30) R502.1 GENERAL

All floor framing members shall be labeled as to species, spacing, grade and load requirements. Show direction, size and spacing on plan.

31) R502.6.2 JOIST FRAMING -

Joists framing into the side of a wood girder shall be supported by approved framing anchors or on ledger strips . . . Provide a list of anchors (manufacturer's name and size) and specify locations where these anchors shall be used.

32) R502.3.3 FLOOR CANTILEVERS

Floor cantilever spans shall not exceed the nominal depth of the wood floor joist. floor cantilevers constructed in accordance with table R502.3.3(1) shall be permitted when supporting a light-frame bearing wall and roof only. Floor cantilevers supporting an exterior balcony are permitted to be constructed in accordance with table R502.3.3(2). Braced wall section support R602.10.9

33) R501.3 Fire protection of floors.

Floor assemblies, ..., shall be provided with a 1/2-inch (12.7 mm) gypsum wallboard membrane, 5/8-inch (16 mm) wood structural panel membrane, or equivalent on the underside of the floor framing member.

Exceptions:

1. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section P2904, NFPA13D, or other approved equivalent sprinkler system.
2. Floor assemblies located directly over a crawl space not intended for storage or fuel-fired appliances.
3. Portions of floor assemblies can be unprotected when complying with the following:
 - 3.1. The aggregate area of the unprotected portions shall not exceed 80 square feet per story
 - 3.2. Fire blocking in accordance with Section R302.11.1 shall be installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.
4. Wood floor assemblies using dimension lumber or structural composite lumber equal to or greater than 2-inch by 10-inch (50.8 mm by 254 mm) nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.

34) R502.11.1 WOOD FLOOR TRUSS DESIGN

Truss design drawings must be submitted (2 copies) signed and sealed by a structural engineer and/or truss manufacturer, with installation information regarding backing, hangers, blocking, etc.

35) DESIGN CRITERIA DETAIL SPECIES AND GRADES

****Add table of acceptable spans for joists and rafters found in your design..

(Tables below are **EXAMPLES**: provide “like” table for ALL lumber in design)

Table R502.3.1(2)		Floor Joist Spans- Residential Living Areas [Live load=40psf]							
Joist Spacing	Species & Grade	DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
		2×6	2×8	2×10	2×12	2×6	2×8	2×10	2×12
Maximum Floor Joist Spans									
12	Hem-fir#2	10-0	13-2	16-10	20-4	10-0	13-1	16	18-6
	Spruce-pine-fir#2	10-3	13-6	17-3	20-7	10-3	13-3	16-3	18-10
16	Hem-fir#2	9-1	12-0	15-2	17-7	8-11	11-4	13-10	16-1
	Spruce-pine-fir#2	9-9	12-10	16-1	18-10	9-6	12-4	14-8	17-2
Table R502.3.1(1)		Floor Joist Spans – Residential Sleeping Areas [Live load=30psf]							
12	Hem-fir#2	DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
		11-0	14-6	18-6	22-6	11-0	14-4	17-6	20-4
	Spruce-pine-fir#2	11-3	14-11	19-0	23-0	11-3	14-7	17-9	20-7
16	Hem-fir#2	10-0	13-2	16-10	19-8	9-10	12-5	15-2	17-7
	Spruce-pine-fir#2	10-9	14-2	18-0	21-1	10-5	13-6	16-1	18-10

- 36) **DECKS:**
Plans for decks shall indicate dimensions for joist, headers, ledger boards, handrail, guardrails and stairs. Two elevations of deck are required. ***Please provide all the above and the required compatible hardware (i.e. hangers, post-beam connector, post-pier connector, etc...***
- 37) **R302.6 GARAGE SEPARATION REQUIRED -**
The garage shall be separated from the residence; if the separation is a floor-ceiling assembly, the structure supporting the separation shall also be protected by not less than ½ “ gypsum board or equivalent. Habitable rooms above the garage shall be separated by not less than a 5/8“ type X gypsum board or equivalent.
- 38) **R302.5.1 OPENING PROTECTION**
“ . . . openings between the garage and residence shall be equipped with solid wood doors not less than 1 3/8 inches in thickness, solid or honeycomb core steel doors not less than 1 3/8 inches thick, or 20-minute fire-rated doors with closer.
- 39) **R308.4 SAFETY GLAZING -**
All windows or doors in locations where safety glazing is required must be noted on the plans. **Identify on floor plans and on the elevations.** A general note referring to this code section will not be acceptable.
- 40) **R310.1.4 EMERGENCY ESCAPE AND RESCUE OPENINGS**
Emergency escape and rescue openings shall be operational from the inside of the room "without the use of keys, or special knowledge". 5.7 square foot (Exception: Grade floor 5sf) minimum opening, 24" min. height and 20" min. width.
***Label all required egress windows on floor plans and on the “elevations” to include opening square footage of the window.
- 41) **R311.3 LANDINGS AT DOOR**
There shall be a floor or landing on each side of each exterior door. See exceptions and provide that detail.

- 42) **R313.2 One- and two-family dwellings automatic fire systems.**
 Changed to read as: An automatic residential fire sprinkler system shall be installed in one- and two-family *dwellings*.
 Exceptions:
 1. An automatic residential fire sprinkler system shall not be required for *additions, alterations or* accessory structures to existing buildings that are not already provided with an automatic residential sprinkler system.
 2 An automatic residential fire sprinkler system shall not be required for new construction when all the following apply:
 1. Underside of all interior stairs are protected with at least .5 inches gypsum board or equal.
 2. Each one- and two-family dwelling unit has at least 2 means of egress.
- 43) **R602.9 CRIPPLE WALLS**
 Provide a section drawing detailing height of wall. Cripple walls with a stud height less than 14 inches (356 mm) shall be sheathed on at least one side with a wood structural panel that is fastened to both the top and bottom plates in accordance with Table R602.3(1),
- 44) **R602.10.11 CRIPPLE WALL BRACING**
 Cripple walls shall be constructed in accordance with Section R602.9 and braced in accordance with this section. Cripple walls shall be braced with the length and method of bracing used for the wall above in accordance with table R602.10.3(1) and R602.10.3(2), and the applicable adjustments factors . . .”
- 45) **R602.10.1 BRACED WALL LINES:**
 For the purpose of determining the amount and location of bracing required in each story level of the building, *braced wall lines* shall be designated as straight lines in the building plans placed in accordance of this section.
R602.12 Simplified wall bracing. Buildings meeting all of the conditions listed in items 1-8 shall be permitted to be braced in accordance with this section. . . “
- 46) **R602.10 WALL BRACING**
 Must provide a diagram for each floor, each elevation defining method of wall bracing, header sizes required, in accordance with this section. Review table R602.10.4 “Bracing Methods”.
- 47) **R311.7 TREADS AND RISERS**
 Plans must specify tread width and riser height for interior and exterior stairs.
- 48) **R311.7.5 PROFILE**
 A nosing not less than $\frac{3}{4}$ inch (19 mm) but not more than $1\frac{1}{4}$ inch (32 mm) shall be provided on stairways with solid risers. Risers shall be vertical or sloped from the underside of the leading edge of the tread above at an angle not more than 30 degrees (0.51 radii) from the vertical. Exceptions: 1. A nosing is not required where the tread depth is a minimum of 11 inches (279 mm).

- 49) **R311.7.8. HANDRAILS**
Handrails shall be provided on at least one side of each continuous run of treads or flight with four or more risers. Handrails are to be labeled for each set of stairs. R311.7.8.2 Continuity . . . Handrails shall “return” to . . . wall or support.
- 50) **R311.7.8.3. HANDRAIL GRIP SIZE -**
Handrails shall be of either “Type 1 or Type 2” or provide equivalent grasp-ability. Provide cross-section detail or sectional (wafer) cut of handrail to validate “graspability”.
- 51) **R312.1 GUARDS AND FALL PROTECTION**
a) Porches, balconies, ramps or raised floor surfaces located more than 30 inches above the floor or grade below shall have guards not less than 36 inches in height. Open sides of stairs with a total rise of more than 30 inches above the floor or grade below shall have guards not less than 34 inches (864 mm) in height measured vertically from the nosing of the treads.
b) Porches and decks which are enclosed with insect screening shall be equipped with guards where the walking surface is located more than 30 inches (762 mm) above the floor or grade below.
c) R312.1. Opening limitations: 4” sphere passing through (4 3/8” on stairs)
- 52) **R312.2.1. WINDOW SILLS -**
Where the opening of an operable window is located more than 72 inches above the finished grade, the lowest part of the clear opening shall be a minimum of 24 inches. see code section. a window guard will have to be placed on these windows that does not allow a 4 inch sphere to pass.
*** Measure each window from the floor line and specify this height on EACH ELEVATION AT EACH WINDOW of the house. If window is located less than 24 inches, submit the manufacturer’s name and item (description) of the window guard to be installed. Exception; Fixed windows and windows adjacent to roofs.
- 53) **R703.7.3 LINTELS**
Specify size of lintels for all openings.
- 54) **R703.7.5 AND 703.7.6 FLASHING AND WEEP REQUIREMENTS**
Provide a section detailing weeps and flashing at the top of all window and door openings, above foundation wall, chimney locations, etc.
- 55) **R703.7.1/703.7.3 MASONRY ON WOOD CONSTRUCTION**
Provide a section drawing and calculations on plans detailing what method will be used in this area for support.

56) R802.3 FRAMING DETAILS

Provide a complete roof framing plan. Label all ridge and valley rafters, designate any lay-overs. Include table for acceptable rafter spans (Example)

Table R802.5.1(3)		Rafter Spans – Ground Snow Load 30psf – Ceiling <u>not attached</u> to rafters									
Rafter Spacing	Species & Grade	DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
		2x4	2x6	2x8	2x10	2x12	2x4	2x6	2x8	2x10	2x12
Maximum Rafter Spans (feet - inches)											
12	Hem-fir#2	8-10	13-7	17-2	21-0	24-4	8-4	12-2	15-4	18-9	21-9
	Spruce-pine-fir#2	9-1	13-9	17-5	21-4	24-8	8-5	12-4	15-7	19-1	22-1
16	Hem-fir#2	8-0	11-9	14-11	18-2	21-1	7-2	10-6	13-4	16-3	18-10
	Spruce-pine-fir#2	8-2	11-11	15-1	18-5	21-5	7-3	10-8	13-6	16-6	19-2
Table R802.5.1(5)		Rafter Spans – Ground Snow Load 30psf – Ceiling attached to rafters									
12	Hem-fir#2	8-0	12-7	16-7	21-0	24-4	8-0	12-2	15-4	18-9	21-9
	Spruce-pine-fir#2	8-3	12-11	17-0	21-4	24-8	8-3	12-4	15-7	19-1	22-1
16	Hem-fir#2	7-3	11-5	14-11	18-2	21-1	7-2	10-6	13-4	16-3	18-10
	Spruce-pine-fir#2	7-6	11-9	15-1	18-5	21-5	7-3	10-8	13-6	16-6	19-2

57) R802.4 ALLOWABLE CEILING JOIST SPANS

Provide size, direction, species and grade of all ceiling joists. Provide table of span limitations.

58) R802.5.1(2) RAFTER REDUCTIONS -

Show calculations on roof framing plan for reductions in the span of roof rafters when tray or cathedral ceilings are constructed.

59) R802.10.1 ROOF/CEILING CONSTRUCTION: TRUSS DESIGN DRAWINGS

Truss design drawings must be submitted (2 copies) signed and sealed by structural engineer with required information (backing, bridging, anchoring etc.).

60) R802.11.1 ROOF TIE-DOWN UPLIFT RESISTANCE -

Specify manufacturer's name and item number for tie-downs per table R802.11.

61) R806.1 VENTILATION REQUIRED

Provide total net free ventilating area and designate on roof framing the size, number, type and location of vents.

62) R807.1 ATTIC ACCESS

Show attic access spaces for all attic space('s) with a minimum 30" vertical height and area of 30 square feet. The rough-framed opening shall not be less than 22 inches by 30 inches and shall be located in a hallway or other readily accessible location.

IECC 402.2.3 Access Hatches and Doors:

Access door from conditioned spaces to unconditioned spaces shall be weather-stripped and insulated to a level equivalent to the insulation on the surrounding surfaces.

63) NMC R703.9.3 AMENDMENT: EIFS (EXTERIOR INSULATION FINISH SYSTEM)

The registered design professional shall submit the name of the special inspection company that will certify and report that proper installation was accomplished in the application of the EIFS system. This statement shall be prepared by the design professional and submitted before any occupancy will be approved.

64) R905 REQUIREMENTS FOR ROOF COVERINGS

Supply information for roof coverings, i.e., (underlayment, shingle weight etc).

- 65) **R905.2.7.1 ICE PROTECTION (ASPHALT SHINGLES)**
Ice protection must be shown on plans for all roof slopes: (extend from eave's edge to a point at least 24" inside the exterior wall line of the building).
- 66) **R905.2.8.5 DRIP EDGE**
A detail showing drip edge flashing shall be provided. Locate at eaves and gables of shingle roofs
- 67) **R1001.1 FIREPLACE AND CHIMNEY DETAILS**
Provide a complete section detail for chimney and fireplace from the foundation to chimney cap.
- 68) **R1003.9 TERMINATION**
Show height and distance of chimney from roof.
- 69) **R1003.20 CHIMNEY CRICKETS**
Provide cricket or specify distance of less than 30" on width of chimney at roof connection
- 70) **R1004 FACTORY-BUILT CHIMNEYS**
Provide manufacturers specifications for all pre-fabricated fireplace units on site for inspections. **Review response can be "will comply"
- 71) **R1006 EXTERIOR AIR SUPPLY**
Specify outside combustion air. Specify size of vents required and show location.
- 72) **R315 CARBON MONOXIDE DETECTORS**
Carbon monoxide detectors are required within 15 feet of each bedroom or sleeping room. In new construction, required carbon monoxide detectors shall receive their primary power from the building wiring.
- 73) **R314 SMOKE ALARMS/ DETECTORS**
Detectors are required within 15 feet of each bedroom or sleeping room. In new construction, required detectors shall receive their primary power from the building wiring.
- 74) **R302.10 INSULATION**
Insulation materials installed within floor-ceiling assemblies, crawl spaces and attics shall have a flame-spread index not to exceed 25 with an accompanying smoke-developed index not to exceed 450 when tested in accordance with ASTM E-84. Exception: `1. . . . provided that the facing is installed in substantial contact with the unexposed surface of the ceiling, floor or wall finish.
- 75) **M1307.3 ELEVATION OF IGNITION SOURCE**
Appliances shall be elevated not less than 18" above the floor in the garage.
- 76) **M1307.3.1 PROTECTION FROM IMPACT**
Appliances located in garage or carport shall be protected from impact from automobiles.

77) IECC Table 402.1.1 INSULATION AND FENESTRATION REQUIREMENTS

Table 402.1.1 (N1102.1.1) Insulation and Fenestration Requirements by Component ^a									
Climate Zone	Fenestration U-Factor ^b	Skylight ^b U-Factor	Ceiling R-Value	Wall R-Value	Mass Wall R-Value	Floor R-Value	Basement ^c Wall R-Value	Slab ^d R-Value & Depth	Crawlspace ^c Wall R-Value
5	.32	.55	49	20 or 13+5 ^h	13/17	30 ^e	15/19	10,2ft	15/19
Removed Column "Glazed Fenestration SHGC – NR (Not Required)" a) R-values are minimums. U-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed R-value of the insulation shall not be less than the R-value specified in the table. b) The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration. . . .> c) "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall. d) R-5 shall be added to the required slab edge R-values for heated slabs. . . .> e) There are no SHGC requirements in the Marine zone. f) Basement wall insulation not required in warm humid> g) Or insulation sufficient to fill the framing cavity, R-19 minimum. h) First value is cavity insulation, second is continuous insulation or insulated siding., so "13+5" means R-13 cavity insulation plus R-5 continuous insulation or insulated siding. . If structural sheathing covers 40 percent or less of the exterior, continuous insulation R-value shall be permitted to be reduced by no more than R-3 in the locations where structural sheathing is used-to maintain a consistent total sheathing thickness. i) The second R-value applies when more than half the insulation is on the interior of the mass wall j) For impact rated fenestration>									

78) IECC 405. SIMULATED PERFORMANCE ALTERNATIVE –

Compliance with this section requires that the mandatory provisions identified in Section R401.2 be met. Section R401.2 "Projects shall comply with sections identified as "Mandatory" AND with either sections identified as "prescriptive" or the performance approach.

79) IECC 405.3 PERFORMANCE BASE COMPLIANCE:

Compliance, based on simulated energy performance requires that a proposed residence (proposed design) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the standard reference design. See Exception regarding – BTU per square foot of *conditioned floor area* shall be permitted to be substituted for the energy cost.

80) R402.4.1.2 Testing.

The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding 5 air changes per hour (ACH) in Climate Zones 4 and 5. The building or dwelling unit shall be provided with a whole-house mechanical ventilation system as designed in accordance with Section R403.5. Testing shall be conducted with a blower door at a pressure of 0.2 inches w. g. (50 Pascals). When required by the code official, a testing shall be conducted by an approved third party. A written report of the results of the test, indicating the ACH, shall be signed by the party conducting the test and provided to the code official. Testing shall be performed at any time after all penetrations of the building thermal envelope have been sealed.

81) R402.4.1.1 Installation.

The components of the building thermal envelope as listed in Table R402.4.1.1 shall be installed in accordance with the manufacturer’s instructions and the criteria listed in Table R402.4.1.1, as applicable to the method of construction. Where required by the code official, an approved third party shall inspect all components and verify compliance.

**TABLE R402.4.1.1
AIR BARRIER AND INSULATION INSTALLATION**

COMPONENT	CRITERIA ^a
Air barrier and thermal barrier	A continuous air barrier shall be installed in the building envelope. Exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed. Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier sealed. Access openings, drop down stair or knee wall doors to unconditioned attic spaces shall be sealed.
Walls	Corners and headers shall be insulated and the junction of the foundation and sill plate shall be sealed. The junction of the top plate and top of exterior walls shall be sealed. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Knee walls shall be sealed.
Windows, skylights and doors	The space between window/door jambs and framing and skylights and framing shall be sealed.
Rim joists	Rim joists shall be insulated and include the air barrier.
Floors (including above-garage and cantilevered floors)	Insulation shall be installed to maintain permanent contact with underside of subfloor decking. The air barrier shall be installed at any exposed edge of insulation.
Crawl space walls	Where provided in lieu of floor insulation, insulation shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.
Narrow cavities	Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be air tight, IC rated, and sealed to the dry wall.
Plumbing and wiring	Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower/tub on exterior wall	Exterior walls adjacent to showers and tubs shall be insulated and the air barrier installed separating them from the showers and tubs.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air sealed boxes shall be installed.
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or dry wall.
Fireplace	An air barrier shall be installed on fireplace walls. Fireplaces shall have gasketed doors.

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC -400.

82) 2012 Illinois Energy Conservation Code:

As the 2012 International Energy Code adapted by “The Board (Illinois Capitol Development Board) as recommended by the Illinois Energy Conservation Council’s modifications.

- a) R101.5 COMPLIANCE. *Residential buildings* shall meet the provisions of the Illinois Energy Conservation Code. Minimum compliance shall be demonstrated by the submission of
 - i. Compliance certificates generated by the U.S. Department of Energy’s RESCheck code compliance tool; or
 - ii. Other comparable compliance materials that meet or exceed, as determined by the AHJ, U.S. Department of Energy’s RESCheck code compliance tool; or
- b) R401.3 CERTIFICATE [Mandatory]: A permanent certificate shall be posted on or in the electrical distribution panel (Naperville electrical inspector will provide when electrical service inspection is completed; which provides the R-values of the insulation installed, the U-factors, and the types and efficiencies of heating, cooling and service water heating equipment. This must be completed by the builder or registered design professional.
- c) TABLE 402.1.1 INSULATION AND FENESTRATION Criteria [Prescriptive].
The *building thermal envelope* shall meet the requirements of table R402.1.1
- d) 402.4 AIR LEAKAGE [Mandatory] :The *Building thermal envelope* shall comply with IMR402.4.1.2.
- e) 403.1.1 PROGRAMMABLE THERMOSTAT [Mandatory]: One programmable thermostat for each separate heating and cooling system. Initially programmed Max 70° heat and not lower than 78° cooling.
- f) R402.4.2 Fireplaces. New wood burning fireplaces shall have tight-fitting dampers and combustion air.
- g) R403.2.2. SEALING [Mandatory]: Ducts, air handlers, and filter boxes shall be sealed. Duct tightness test – not required if ducts within *building thermal envelope*.
- h) R403.2.3 BUILDING CAVITIES [Mandatory]: Building framing cavities shall not be used as ducts or plenums.
- i) R403.3 MECHANICAL SYSTEM PIPING. >105° or <55° insulate Min. R3
 - R403.4.1. Circulating hot water systems[Mandatory] Pump not in use switch off.
 - R403.4.2 Hot water pipe insulation [Prescriptive] R-3
- i) IMR403.5. MECHANICAL VENTILATION [Mandatory] The building shall be provided with ventilation that meets the requirements of this section per Table IMR403.5.6 (1). Outdoor air intakes and exhaust shall have automatic or gravity dampers. . .
- j) 404.1 LIGHTING EQUIPMENT [Mandatory]: A minimum of 75 percent of the lamps in permanently installed lighting fixtures shall have high-efficacy lamps.

*Blower Door Test: The contractor or homeowner can contract a Third Party Certified Service to provide this blower door test. .

**Duct Tightness Test: The contractor or homeowner can contract a Third Party Certified Service to provide this duct tightness test.

- 83) M1502.4.4 CLOTHES DRYER LENGTH LIMITATIONS**
Show location of dryer vent run. Provide total run distance and size of each bend.
M1502.4.4.1 Specified Length: Code limitation is thirty-five feet (35') including five feet (5') for each 90 degree bend and two feet six inches (2'6") for each 45 degree bend.
M1502.4.4.2 Manufacturers instructions: provide manufacturer's installation instructions. Dryer must be installed at the time of the final inspection.
- 84) IECC 403.6 EQUIPMENT SIZING (MANDATORY)**
Heating and cooling equipment shall be sized in accordance with Section M1401.3 of the International Residential Code.
M1401.3 SIZING: Heating and cooling equipment shall be sized based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies. Submit the Manual J with ACCA equipment sizing (Manual "S") and ACCA duct sizing (Manual "D" per M1602-M1603).
***Submit manufacturer, model of all hvac equipment that satisfies the requirements shown in Manual J.
- 85) M1602 AND M1603 RETURN AIR AND SUPPLY AIR**
Duct systems serving heating, cooling and ventilation equipment shall be installed in accordance with the provisions of this section and ACCA Manual D or other approved methods.
- 86) M1601 DUCT CONSTRUCTION**
Provide a detail indicating location and size of trunk lines for both supply and returns for each furnace to be installed according to the Manual J form submitted. List R values of insulation for any ducts outside conditioned space.
- 87) IECC 403.2.1 DUCT. INSULATION (PRESCRIPTIVE)**
Supply ducts in attics shall be insulated to a minimum of R-8; All other ducts shall be insulated to a minimum R6.
- 88) M1301 GENERAL MECHANICAL SYSTEM REQUIREMENTS**
Indicate the size and location of additional H.V.A.C. equipment. This includes all exhaust, and make-up, combustion and fresh air requirements.
- 89) M1503.4 Makeup air required.**
Exhaust hood systems capable of exhausting in excess of 400 cubic feet per minute shall be provided with makeup air at a rate approximately equal to the exhaust air rate. Such makeup air systems shall be equipped with a means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system.
** See Naperville exceptions allowing a "CAZ test" for compliance.
- 90) R403.5.3 Whole-house Mechanical Ventilation System.**
Whole-house mechanical ventilation systems shall be designed in accordance with Sections R403.5.4 through R403.5.6.

91) **R403.5.4 System Design.**

The whole-house ventilation system shall consist of one or more supply or exhaust fans, or a combination, and associated ducts and controls. Local exhaust or supply fans are permitted to serve as such a system. Outdoor air ducts connected to the return side of an air handler shall be considered to provide supply ventilation.

92) **R403.5.5 System Controls.**

The whole-house mechanical ventilation system shall be provided with controls that enable manual override.

93) **R403.5.6 Mechanical Ventilation Rate.**

The whole house mechanical ventilation system shall provide outdoor air at a continuous rate of not less than that determined in accordance with Table R403.5.6(1).

Exception: The whole-house mechanical ventilation system is permitted to operate intermittently when the system has controls that enable operation for not less than 25 percent of each 4-hour segment and the ventilation rate prescribed in **Table R403.5.6(1)** is multiplied by the factor determined in accordance with **Table R403.5.6(2)**.

TABLE R403.5.6(1)
CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION
SYSTEM AIRFLOW RATE REQUIREMENTS

DWELLING UNIT FLOOR AREA (square feet)	NUMBER OF BEDROOMS				
	0 - 1	2 - 3	4 - 5	6 - 7	> 7
	Airflow in CFM				
< 1,500	30	45	60	75	90
1,501 - 3,000	45	60	75	90	105
3,001 - 4,500	60	75	90	105	120
4,501 - 6,000	75	90	105	120	135
6,001 - 7,500	90	105	120	135	150
> 7,500	105	120	135	150	165

For SI: 1 square foot = 0.0929 m², 1 cubic foot per minute = 0.0004719 m³/s.

TABLE R403.5.6(2)
INTERMITTENT WHOLE-HOUSE MECHANICAL
VENTILATION RATE FACTORS^{a, b}

Run-Time Percentage In Each 4-Hr Segment	25%	33%	50%	66%	75%	100%
Factor ^a	4	3	2	1.5	1.3	1.0

^a For ventilation system run time values between those given, the factors are permitted to be determined by interpolation.

^b Extrapolation beyond the table is prohibited.

- 94) G2407.1 (304.1) COMBUSTION AIR: General.**
G2407.5 (304.5) Indoor combustion air.
The required volume of indoor air shall be determined in accordance with Section G2407.5.1 or G2407.5.2, except that where the air infiltration rate is known to be less than 0.40 air changes per hour (ACH), Section G2407.5.2 shall be used.
G2407.5.1 (304.5.1) Standard method.
The minimum required volume shall be 50 cubic feet per 1,000 Btu/h (4.8 m³/kW).
G2407.5.2 (304.5.2) Known air-infiltration-rate method.
Where the air infiltration rate of a structure is known, the minimum required volume shall be determined as follows:
For appliances other than fan assisted, calculate volume using Equation 24-1.
For fan-assisted appliances, calculate volume using Equation 24-2.
Supply BTU'S of installed furnace(s) and water heater(s) according to the Manual J provided. Determine volume required and show size(s) of openings and show location on mechanical plans IF outside air is required;
Show calculations of method used.
- 95) ILLINOIS STATE PLUMBING CODE 2004 SCOPE**
Prepare and submit a water service fixture count based on Appendix A, Table M of the 2004 Illinois State Plumbing Code.
- 96) PLUMBING RISER DIAGRAM:**
Submit a riser diagram detailing all plumbing fixtures. (all shower heads, proposed rough-in plumbing, etc). Size line and meter according to the Illinois Plumbing Code 2004 Table N using total fixture count.
- 97) P2720.1 ACCESS TO PUMP – WHIRLPOOL TUBS**
Provide access panel to the pump for repair or replacement.
- 98) R309.3 FLOOR SURFACE - NMC AMENDMENT**
Provide 6” curb at the service door or construct garage floor 6” lower than adjoining floor. A 6” curb shall be provided around a garage stairwell.
- 99) R309.3.1 FLOOR DRAINS**
An oil interceptor shall be required if a floor drain is installed in the floor of a garage. Required if/when
- 100) NMC #320.2 VISITABILITY - AMENDMENT**
Switch requirements. Wall switches on the first floor shall be located at a height not to exceed 48 inches above the finished floor. Measure from the floor to the center of the switch.
*** Place note on drawings
- 101) NMC #320.2 VISITABILITY - AMENDMENT**
Receptacles on the first floor shall be located at a height of not less than 15” above the finished floor. Measure from the floor to the center of the receptacle.
*** Place note on drawings

102) NEC 210.52I

Foyers more than 60 sqft, not part of a hallway, any wall space of 36" or more require an outlet.

103) NEC 210.8A(2)

All 125v 15 and 20 amp outlets in garage must be GFI protected.

104) NEC 210.8A(7)

All 125v 15 and 20 amp outlets within 6 ft of sinks (except kitchens) must be GFI protected.

105) NEC 210.8A(5)

All 125v 15 and 20 amp outlets in unfinished basement must be GFI protected.

106) ELECTRIC SERVICE LOAD CALCULATION SHEET

BASED ON THE 2006 NEC ARTICLE 220 – FEEDER AND SERVICE LOAD CALCULATIONS.

- ◆ Go on-line to: <http://www.naperville.il.us/loadcalculator.aspx>
- ◆ Near the top of the sheet you will see "Security Warning" Macros have been disabled."
- ◆ Hit the "Options" button next to it, then check the circle that states "Enable this content". The calculations will not be complete if you do not enable macros.
- ◆ Email completed document to felstrupt@naperville.il.us if unable to work macros.

107) NEC 250.52 Grounding Electrodes.

(A) Electrodes Permitted for Grounding.

Concrete-Encased Electrode. An electrode encased by at least 50 mm (2 in.) of concrete, located within and near the bottom of a concrete foundation or footing that is in direct contact with the earth, consisting of at least 6.0 m (20 ft) of one or more bare or zinc galvanized or other electrically conductive coated steel reinforcing bars or rods of not less than 13 mm (1/2 in.) in diameter, or consisting of at least 6.0 m (20 ft) of bare copper conductor not smaller than 4 AWG. Reinforcing bars shall be permitted to be bonded together by the usual steel tie wires or other effective means.

**Steel Reinforcement (minimum #4 rebar – 20' in length) in footing requires the attachment of a "Uffer" to the electrical service disconnect with a minimum #4 copper wire.

Make-up Air Exception Worksheet

Required test for new kitchen exhaust fans over 400 CFM

Worst Case Depressurization Test

This test procedure measures the pressure in the Combustion Appliance Zone (CAZ) and provides visual evidence of **spillage potential**. If there are any vented combustion appliances that use indoor air to vent combustion gases and which are not classified as a category 3 or 4 according to NFPA standard 54, then a worst case depressurization test shall be performed using the following protocol.

1. Check the combustion appliance zone for the presence of flammable or explosive material near a combustion source.
2. Visually inspect venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion or other deficiencies that could cause an unsafe condition.
3. Inspect burners and crossovers for blockage and corrosion.
4. Inspect furnace heat exchangers for cracks, openings or excessive corrosion.
5. Close all the exterior doors and windows of the home.
6. Close fireplace damper(s) if fireplace is present.
7. Close any interior doors between the CAZ and the remainder of the house, ensuring that all vented appliances and exhaust fans have been turned off.
8. Measure the baseline pressure difference between the CAZ with respect to (WRT) outside (ambient)
9. Turn on all exhaust fans in the home (kitchen range hood, bath exhaust, clothes dryer, etc.) that exhaust air outside the building envelope.
10. Record pressure in CAZ with respect to Outside (wrt).
11. Turn on the air handler. Record pressure in CAZ with respect to outside. If air handler makes the CAZ more positive (or less negative), turn it off. If the air handler is kept on, close interior doors to any rooms that have no return registers.
12. Record net change in pressure difference within the CAZ WRT outside between baseline and worst case depressurization conditions.

“**Spillage potential**” – Complete #1 - #12 above, activate natural draft appliance and allow to run and check/verify with smoke pencil or equivalent if the appliance is drafting. Vented appliances, regardless of type, that spill flue gases for more than 60 seconds after startup, fail the spillage test

CAZ Depressurization Limits

Venting Condition Limit (Pascals)

Orphan natural draft water heater (including outside chimneys)	-2
Natural draft boiler or furnace commonly vented with water heater	-3
Natural furnace with vent damper vented with water heater	-5
Individual natural draft boiler or furnace	-5
Mechanically assisted draft furnace vented with water heater	-5
Fan assisted draft furnace alone, or fan assisted DHW alone	-15

Base Line Pressure (wrt outside) _____ pa

Lowest CAZ pressure recorded (wrt outside) _____pa

CAZ pressure limits (based on appliances in CAZ) _____pa

Print Company Name _____

Print Name _____

Signature _____

Date:_____