

# UDC Non-Compliances

(AKA The Good, Bad, and the Ugly)

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Department of Safety and

Professional Services

Presentation Courtesy of Dennis Jensen

Building Inspector City of DePere

# The Top 40



# Why Have Codes?



# Because of This and That



# And That and This.....



Source: Unknown

# How About Those Lag Screws? Did They Follow the New Deck Code?



# What's Wrong With this Picture?





# SPS.320.09 (9) (d).

- *Building permit must be posted properly at the building site.*
- SPS 320.09 (9) (d). The Wisconsin uniform building permit shall be posted in a conspicuous place at the dwelling site.

# SPS 321.125 Soil Erosion Control



**321.125(1)(b) Land disturbing construction activities**, except those activities necessary to implement erosion or sediment control practices, **may not begin until the sediment control practices are in place** for each area to be disturbed in accordance with the approved plan.

# SPS 321.125 (2)

## Mandated Practices



Storm Drain Inlet Protection For  
Construction Sites Tech Std. (1060)

# Tracking Pad

## DNR Tech St. (1057)



# Improper Tracking Drive and Lack of Sediment Control

**Tech Std. (1057) Criteria:** Tracking drive shall be 3 to 6 inch stone, 12 inches in depth and 50 feet minimum length or to the foundation.

**321.125(1)b)(c):** Sediment control shall be in place prior to land disturbance, and maintained until the site is stabilized.

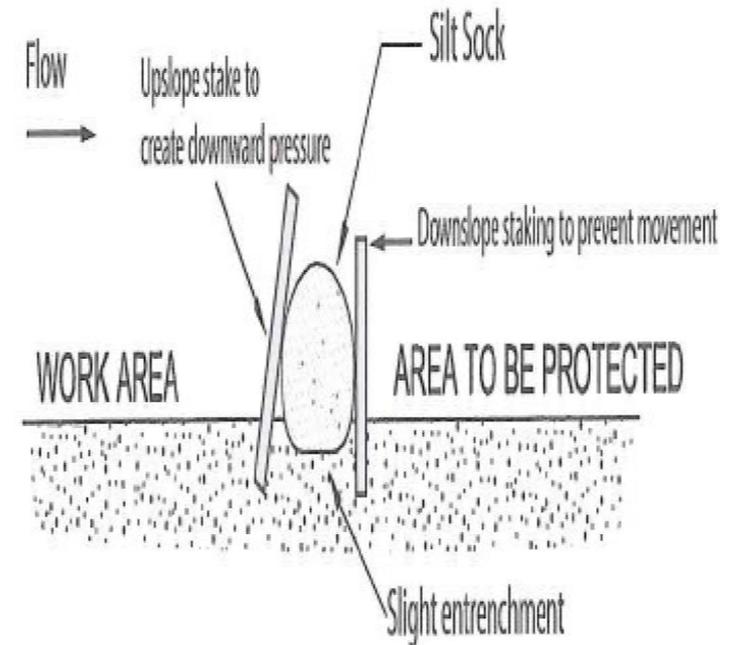


**SPS. 321.125**

# *Manufactured Perimeter Control and Slope Interruption Products (1071)*



## 4. Installation for higher risk of run off



# Prevent or Reduce Sediment Discharge to Adjacent Waters of the State (Including Wetlands) and to Drainageways That Flow Off-Site



# Foundations & Basements

- Drainage & Grade SPS. 321.12
- Excavations SPS. 321.13
- Footings SPS. 321.15
- Frost Protection SPS. 321.16
- Drain Tiles SPS. 321.17
- Foundations SPS. 321.18
- Concrete Floors SPS. 321.20

# SPS 321.02

## Loads and Materials



MAY 10, 1991

SUBJECT: FOOTING DESIGN  
EVALUATION

CONSTRUCTION

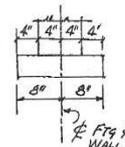
DEAR SIR,

ATTACHED IS AN ENGINEERING CALCULATION ON YOUR PROJECT YOU ASKED US TO RESPOND TO. WE SEE NO REASON THIS IS NOT ACCEPTABLE. IN THE EVENT THERE ARE ANY QUESTIONS PLEASE FEEL FREE TO CALL.



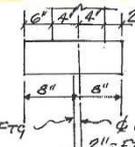
MAY 7, 1991

(Use) THE TYPE OF FOOTING YOU DESCRIBE IS CALLED AN ECCENTRIC LOADED FOOTING, THAT IS THE CENTER OF WALL DOES NOT COINCIDE WITH THE CENTER OF THE FOOTING, WHICH IS KNOWN AS A CONCENTRIC LOADED FOOTING.

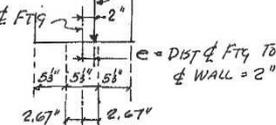


IDEAL COND.  
(CONCENTRIC FTG.)

UNIF. SOIL BRG. PRESSURE → If FTG. WIDTH CHANGES SO DOES  $F_1$  &  $F_2$ .



2" = FTG. ECCENTRICITY =  $e$   
FTG. LOAD =  $W$   
UNIF. SOIL BRG. PRESSURE



SOIL PRESSURE UNDER FTG.  
ECCENTRIC LOADED FTG.

$$FTG. PRESS. F_2 = W \left(1 + \frac{6e}{L}\right) = \left(1 + \frac{6 \times 2}{16}\right) W = 1.75W$$

$$F_1 = W \left(1 - \frac{6e}{L}\right) = 0.25W$$

FOOTING WIDTH  $L$

IF THE UNIFORM SOIL PRESSURE IS 2000 PSF THAT IS TOT. WALL LOAD / FTG. WIDTH FOR THE SAME FOOTING ECCENTRIC LOADED BY 2" THE MAX SOIL PRESSURE WOULD BE 3500 PSF, THAT IS  $2000 \times 1.75$  AND THE MIN OF 500 PSF THAT IS  $2000 \times 0.25$  IF ECCENTRICITY IS LESS THAN 2" SAY 1.5" THEN  $F_2 = 3125$  PSF  $F_1 = 1075$  PSF

IF THE ECCENTRICITY IS EQUAL TO 2.67" OR DIST WALL TO FACE OF FTG IS 1.33" THEN THE FTG. PRESSURE IS TRIANGULAR THAT IS  $F_2 = 4000$  PSF &  $F_1 = 0$ .  
I ONLY USE 2000 PSF AS AN EXAMPLE. NORMALLY THE SOIL PRESSURE FOR RESIDENCE IS MUCH LESS THEREBY DECREASING THE MAX SOIL PRESSURE. SAY THE SOIL PRESSURE IS 1500 PSF, THEN THE MAX  $F_2 = 2625$  PSF WHICH IS LESS THAN 3000 PSF ALLOW. SOIL BRG VALUE AND ECCENTRICITY OF FTG IS ACCEPTABLE.  
REMEMBER THIS ONLY WORKS FOR A 16" FTG.

# SPS 321.02 (3) (d)

**SPS 321.02 (3) (d) Note: Concrete construction in one- and two-family dwellings should meet the standards established in ACI 332.**

**Construction means, materials, or methods not addressed in ACI 332 should meet the standards established in ACI 318.**



# Rough Framing Inspection





Source: City of DePere

# SPS 321.22 (4)(a) 2.

- *Not providing proper bearing surface for beams & girders.*
- *(4)(a)2. Bearing and end configuration.*  
*Beams and girders:* Beams and girders made of sawn lumber shall have a bearing surface on their supports of at least 3 inches parallel to the beam or girder and at least as wide as the beam or girder.
- *(b) Engineered wood products:* Bearing surface for engineered wood products shall be in accordance with the manufacturer's instructions.



Source: City of DePere

# SPS 321.22 (4) c.

- *Joist overlapping on the beam and extending past greater than the depth of the joist and not providing proper nailing at the overlap.*
- c. The tail end of a floor joist may not extend past the edge of a beam by more than the depth of the joist.

# SPS 321.22 (3) (b).

- **(3) *Girders and Beams* (b).** Wood girders and beams shall be fitted at the posts or column. Adjoining ends shall be fastened to each other to transfer horizontal loads across the joint. Beams shall also be fastened to the posts with framing anchors, angle clips or the equivalent.



Source: City of DePere

# SPS 321.25 (6) (5)

- *Jack post placement not set so that the adjustment mechanism is disabled.*
- (5). Posts and columns that use a height adjustment mechanism shall have the mechanism embedded in concrete or permanently disabled after installation.

# SPS 321.25 (6)

- (6) Posts And Columns 3 & 4.
- 3. Posts and columns shall be restrained at the top and bottom to resist displacement.
- 4. All columns shall be positively attached to the beams they support using clips, straps or saddles.



Source: City of DePere

# SPS 321.22 (4) (2).

- *Beams resting on concrete without moisture break for engineered beam material and improper shim material.*
- SPS 321.22 (4) (2) Solid sawn built up beams or engineered lumber ( i.e. LVL, PSL, LSL) shall bear directly on concrete beam pocket, 3 inches of bearing with a moisture break between beam material and concrete. Shim material shall be steel, high density plastic or similar material.



09/18/2017 13:30



Source: City of DePere



Source: City of DePere

# SPS 321.22 (3) (d)

- *No lateral restraint to beams at columns and ends with a depth of greater than 11 ¼ inches.*
- (3) Girders and Beams
- (d). Lateral restraint for all wood beams shall be provided at all columns using saddle or other approved connection where the beam meets one of the following conditions:
  - 1. The beam is restrained at both ends.
  - 2. The beam is more than 11.25 inches deep using actual measurement.



Source: City of DePere

**Bearing wall carrying 1 story load**

# SPS 321.02 (3)

- *Not providing sheathing or compression blocking to one side of the basement bearing wall.*
- *SPS 321.02 (3) & adopted NDS.*

# Gypsum board added to one side of the bearing wall



09/26/2017 10:54



Source: City of DePere

# SPS 321.25 (6) (2).

- *Not placing bearing wall or column over the middle 1/3 of the footing.*
- (2). Posts and columns shall bear directly over the middle 1/3 of a footing.



# SPS 321.02 (3) (f).

- *Cutting or notching in the engineered beams and columns.*
- (f). Engineered structural components shall be used in accordance with structural analysis or with load tables supplied by the manufacturer, provided those load tables were developed using structural analysis or load testing.
- No notching or cutting of engineered beams. Repair documents shall be required.



## SPS 321.22 (9) (a).

- *Replace missing bridging where removed from the joist cavity for conventional wood joists.*
- (a). Sawn lumber. Bridging shall be provided for sawn lumber framing at intervals not exceeding 8 feet where the nominal depth to thickness ratio is greater than 4 to 1.



Source: City of DePere

## SPS 321.18 (1) (d) 2.

- *Not providing foundation lateral restraint blocking in first joist space and box sill.*
- 2. a. Where floor framing is parallel to the foundation wall, solid blocking or bridging shall be installed in at least the first joist adjacent space at a spacing of no more than 32 inches on center.



Source: City of DePere

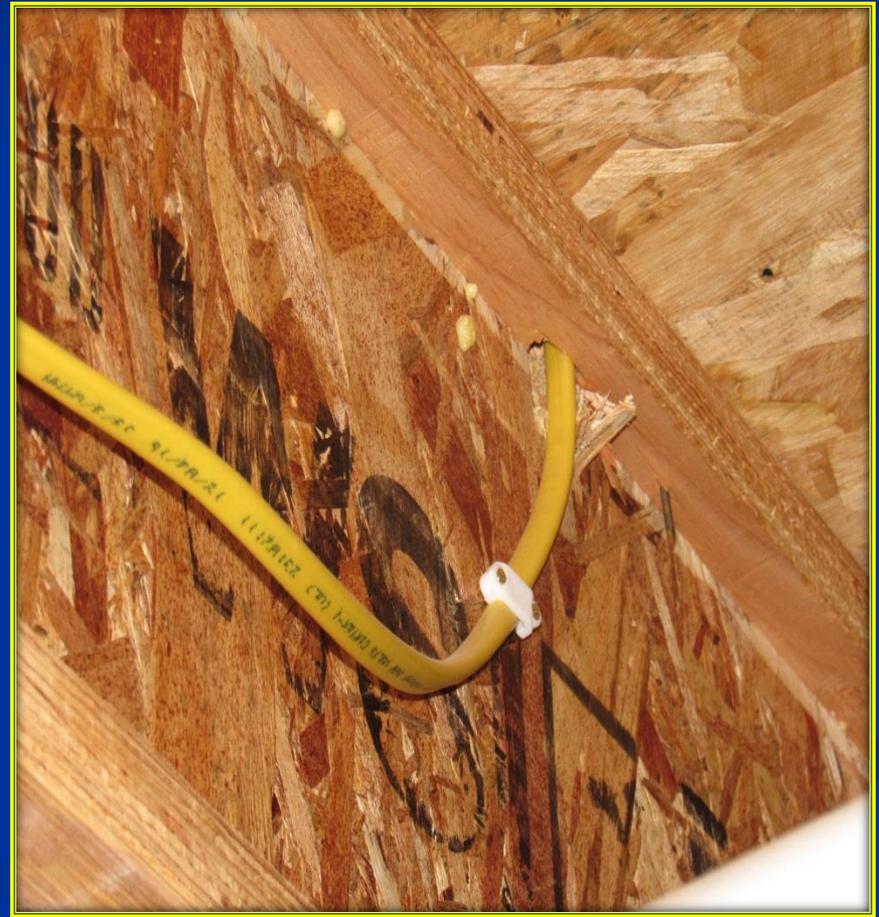
# Holes Bored in Engineered I-Joist



# Cut Top Flange Equals Compromised Joist



Source: City of DePere



Source: City of DePere

# 321.22(5) Notching and Boring

**(c) *Engineered wood products.*** Notching or boring of engineered wood products shall be done in accordance with the manufacturer's instructions provided those instructions were developed through structural analysis or product testing.



12/15/2016



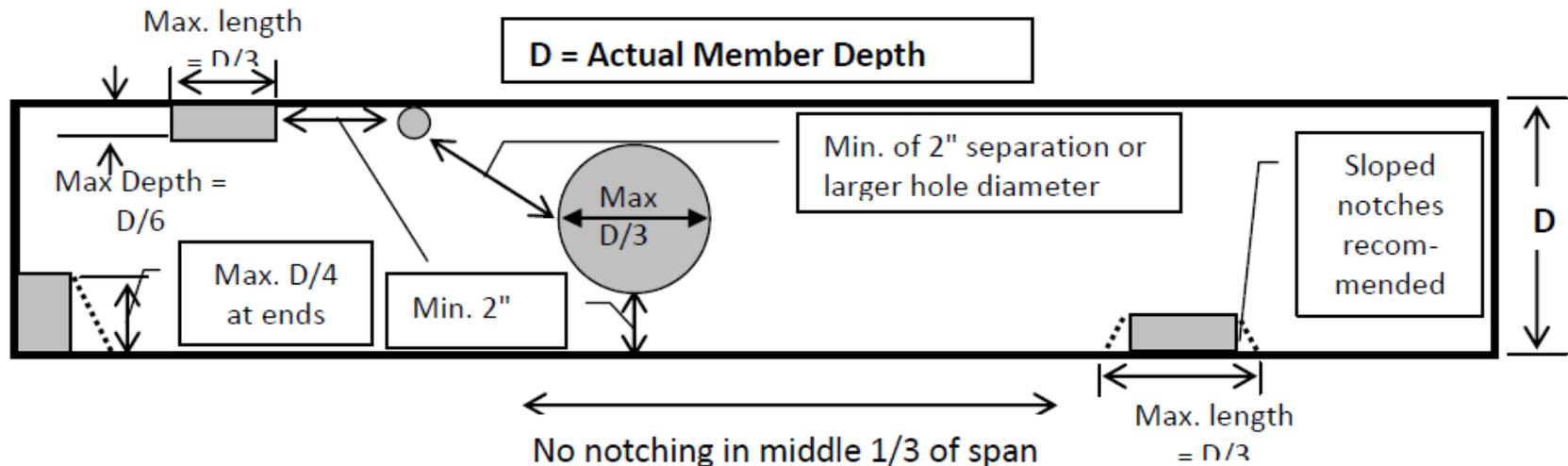
# SPS 321.22 (5) (a)

- (a). *Notching of floor joists.* 1. Notches located in the top or bottom of floor joists shall not have a depth exceeding  $1/6$  the depth of the joist, shall not have a length exceeding  $1/3$  the joist depth nor be located in the middle  $1/3$  of the span of the joist.
- 2. Where floor joists are notched on the ends, the notch shall not exceed  $1/4$  depth of the joists. Notched over supports may extend the full bearing width of the support.

# SPS 321.22 (5) Code Commentary

## 321.22(5) Notching & Boring of Joists

Holes & Notches in Sawn Joists and Rafters (D = Actual Member Depth)			
Member Size	Maximum Hole Diameter or Notch Length = D/3	Maximum Edge-Hole Diameter or Notch Depth (except at ends) = D/6	Maximum End Notch = D/4
2x6	1-3/4"	7/8"	1-3/8"
2x8	2-3/8"	1-1/4"	1-7/8"
2x10	3"	1-1/2"	2-3/8"
2x12	3-3/4"	1-7/8"	2-7/8"





Source: City of DePere

# Overlap distance of top plate

# SPS 321.25 (2)(a) 1. & 2.

- *Top plates not extending or overlapping bottom top plate by two stud spaces*
- (2)(a) Top plates.
- 1. Studs at bearing walls shall be capped with double top plates.
- 2. End joints in double top plates shall be offset at least 2 stud spaces.



# SPS 321.22 (10).

- *Anchor bolts not located in the center 1/3 of the sill plate and or missing nut and washer.*
- SPS 321.22 (10) (a). The center of any anchor bolt shall be set back from the side edge of the sill plate by a distance of at least 4 times the diameter of the bolt.

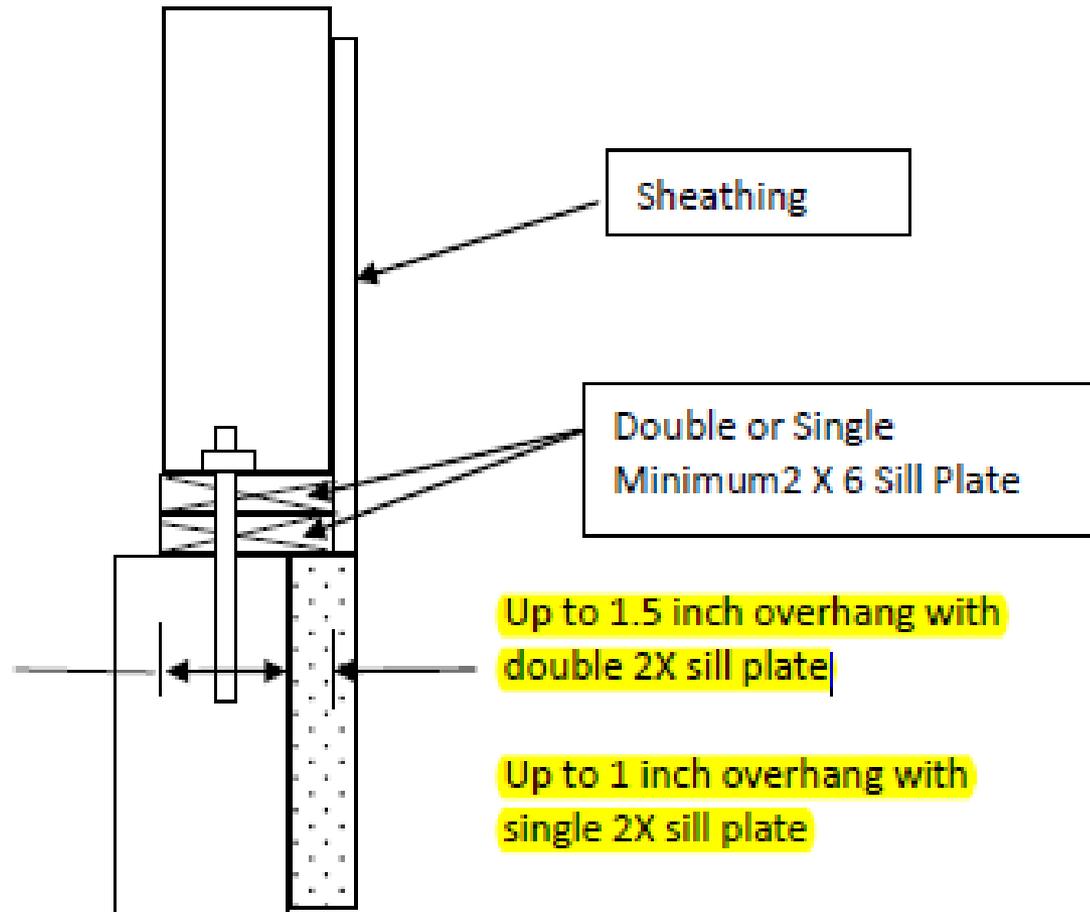
# SPS 321.25 (2m)(b) Bottom Plate Overhangs



# 321.25(2m)(b)4.

## DWG from Code Commentary

3.75" min. when  
using 1/2" dia. anchor  
bolt with max. hole  
dia. of 9/16". Min. 7"  
concrete embedment





07/21/2016 13:49

# SPS 321.25 (2) (b)

- *Top plates of bearing walls that are notched out greater than half the depth of the member*
- (b).1. When piping or ductwork is placed in an exterior wall or an interior load-bearing wall, such that at least half of the top plate is removed, the plate shall be reinforced with a **steel angle 2 inches by 2 inches by 20 gauge thick.**



# SPS 321.25 (2) (b)

- 2. The steel angle shall span the gap and extend at least to the midpoint of the adjacent stud spaces.
- 20 gauge: just under 1/16" thick

# FRAMING ABUTTING MASONRY CHIMNEY



Source: City of DePere



Source: City of DePere

# SPS 321.30 (9) (a)

- *Not providing proper clearances around masonry fireplaces and chimneys.*
- SPS 321.30 (9) (a). **The minimum clearance** between combustibles and masonry chimneys which have any portion located within the exterior wall of the dwelling **shall be 2 inches**. The minimum clearance between combustibles and masonry chimneys which have **all parts completely outside the dwelling**, exclusive of soffit/cornice, **shall be 1 inch**.



# Point load blocking under header column





01/12/2016 12:17

# SPS 321.02 (1)

- **(1) Design load.** Every dwelling shall be designed to support the actual dead load, live loads and wind loads acting upon it without exceeding the allowable stresses of the material. The construction of buildings and structures shall result in a system that provides a complete load path capable of transferring all loads from point of origin through the load-resisting elements to the foundation.

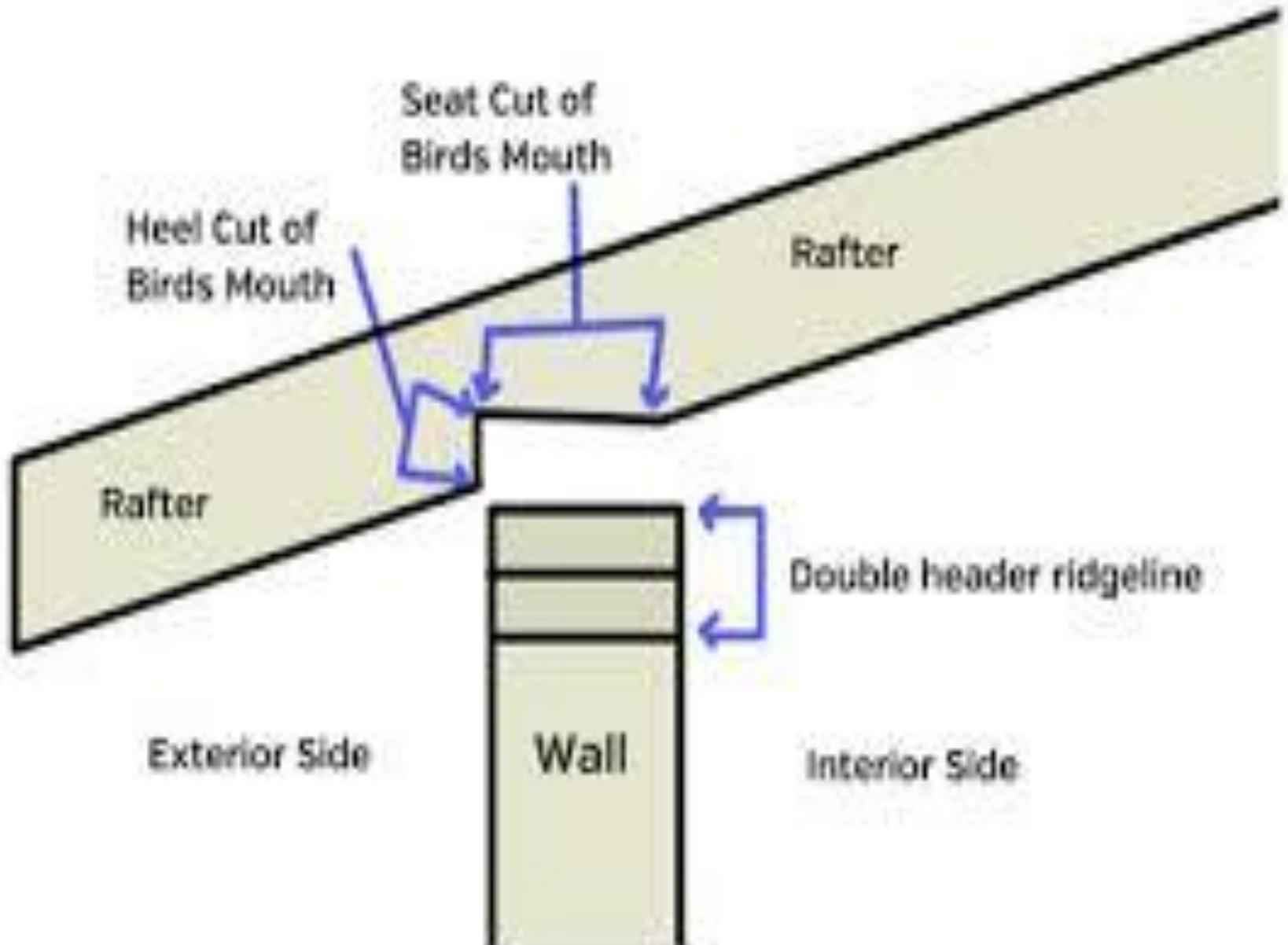


Source: City of DePere

# Errors: Can You Count 'Em?

# SPS 321.27 (8) (b) 3.

- *Improper construction of rafter seat-cut notches (“bird-mouth”).*
- (b) Notching. 3. Birds-mouth cuts may not exceed  $1/3$  the depth of the rafter unless the seat cut bears fully on the wall plate.



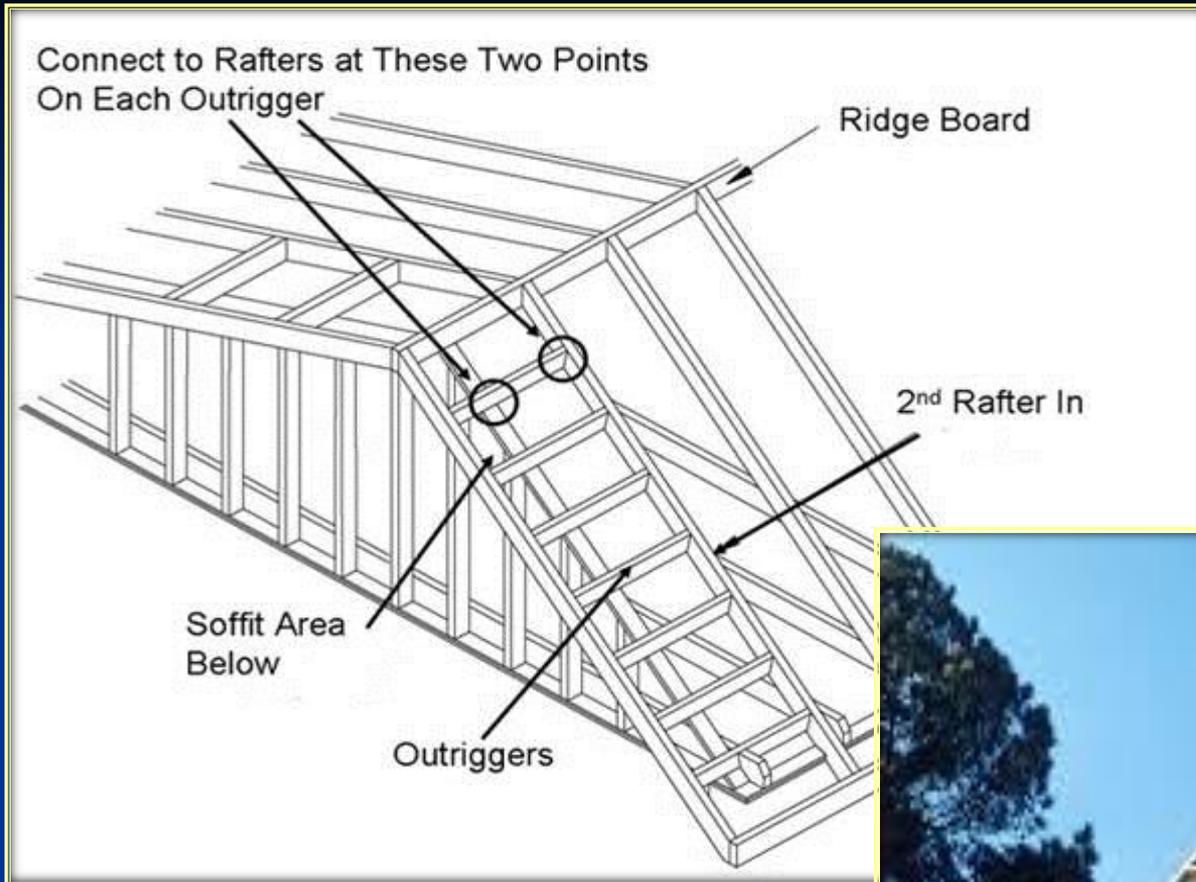
# Gable Extended Overhangs





# SPS 321.27 (4) (e).

- *Not providing proper rake line look-out ladder construction when the roof deck overhang is greater than 1-foot. SPS 321.27 (4) (e). Overhangs at gable end walls of more than 12 inches shall be provided with ladders which extend into the structure a distance of no less than the length of the overhang. The ladders shall be fastened to the wall. The interior end of each ladder shall be attached to a rafter or truss with a hanger.*



Source: City of DePere



Source: City of DePere

# Truss Clips?



# SPS 321.27 (3) (b).

- (3) *Uplift and Suction Forces*
- (b). *Anchorage* 1. Roof framing members spanning more than 6-feet measured from the outermost edge of the roof shall be permanently fastened to the top plate of load bearing walls using engineered clips, straps or hangers.



Source: City of DePere

# SPS 321.24 Exterior Covering

# SPS 321.24 (4)

- (4) **Water-Resistive Barrier Requirements. (a). General.** Exterior walls of wood or metal frame construction shall be provided with a water resistive barrier from the highest point to the bottom of the permanent weather resistant covering.

# Required Flashing Plus... Counter-flashing



Source: City of DePere



Source: City of DePere

# Proper method of sealing penetrations.

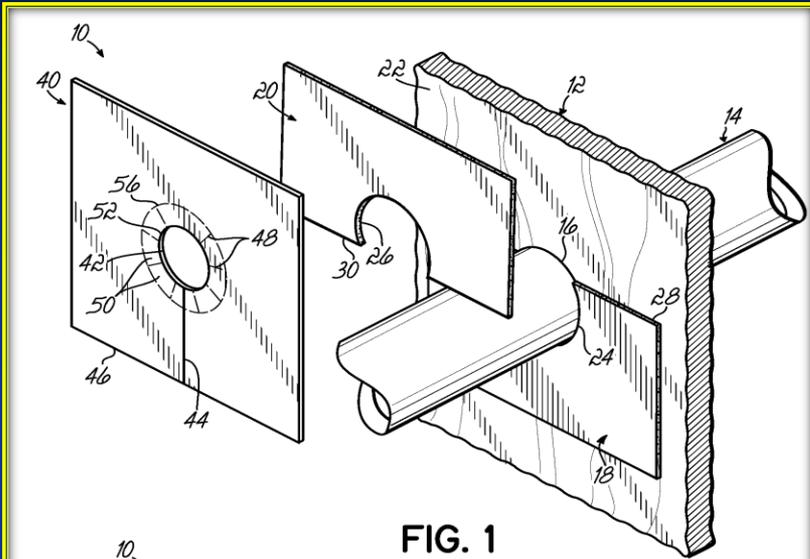


FIG. 1

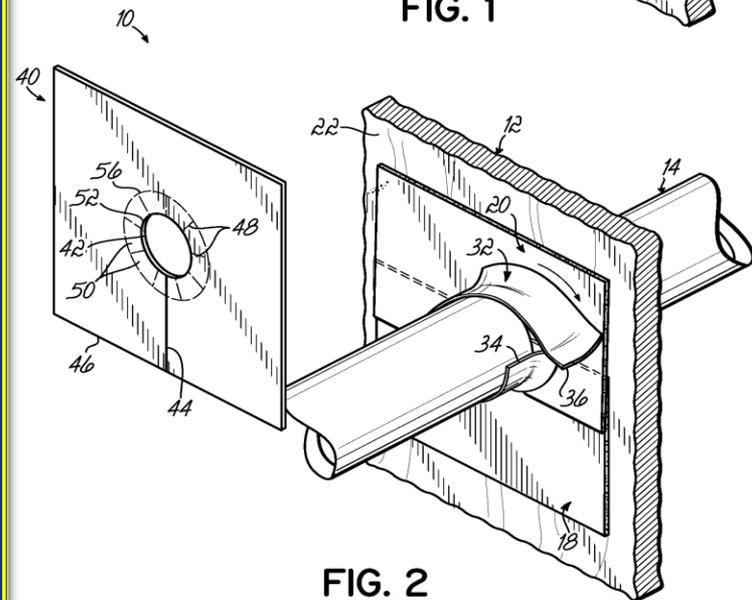


FIG. 2



Source: City of DePere

Source: City of DePere

# Improper Flashing Repercussions



# SPS 321.24 (3) (d) (e) & (f).

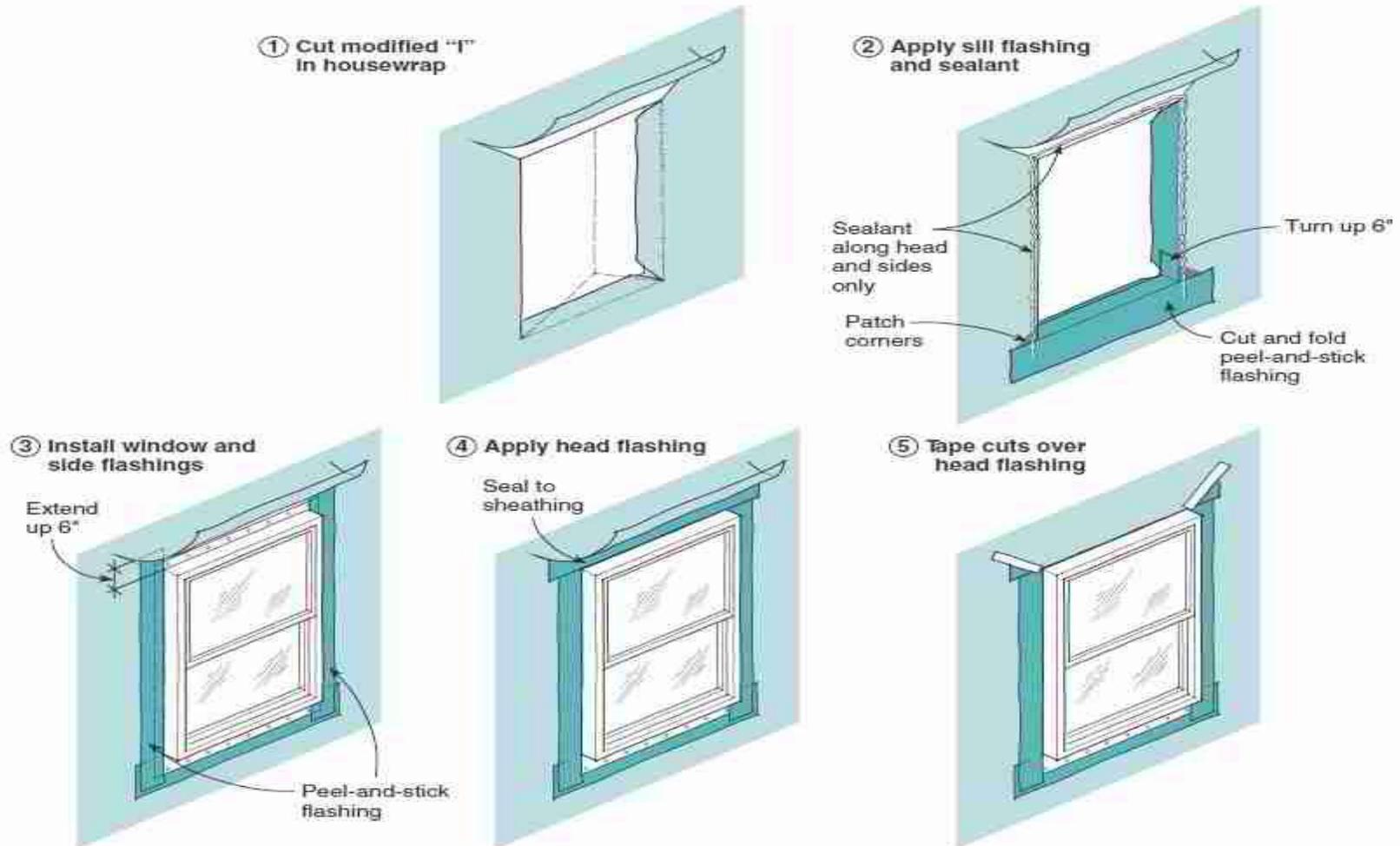
- *Improper flashing and counter flashing at windows, doors and roof flashing at wall and rooflines and kick-out flashing at roof eave and sidewall.*
- SPS 321.24 (3) (d) (e) & (f). (d) 1. Flashing shall be provided at all the following locations: At the top of all exterior door and window openings, unless using self-flashing windows that provide at least one inch of flashing around the opening, including corners. 2. At the intersection of chimneys. 3. Under and at the ends of masonry, wood or metal copings and sills. 4. Above all projected trim. 5. Where porches, decks or stairs attach to a wall or floor assembly of wood frame construction

# Proper Flashing Method



# Window Flashing Detail

FIGURE 3-13 Installing Flange-Type Windows Over Sheathing Wrap.



The critical components for a weatherproof installation are the head flashing and sill pan. When the siding is installed, do not seal the horizontal joints above and below the window, which must be left open so trapped water can drain freely.

# THANK YOU

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