

# 8' x 8' Microshelter Design Plans

7/19/2021

Questions/comments?  
Contact Jeff Loyer @ 360-819-2520

**Microshelter goal is to provide a sturdy shelter for ~\$1400 that is “better than a tent”, to:**

- Improve living conditions for the houseless, making their existence bearable by being superior to tents in:
  - Durability
  - Weather resistant roofing (protects against snow, rain, wind, etc.)
  - Rodent resistance
  - Security (has a locking door)
- Replace unsightly, flimsy tents and tarps with tidy structures
- Be cost effective – replace \$300 tents with durable \$1400 structures
- Be moveable
  - Can be disassembled and reassembled
  - Light and small enough to be moved in a pickup
- Provide temporary, moveable structures which don't require permits. They will be built and painted off-site, and then assembled on-site.
- Build and assembly can be proliferated, require no special materials or tools (basic carpentry only)

The Microshelters are 8'x8' or 8'x12' in size and consist of 6 panels, each constructed independently, and then assembled. The Microshelter is painted, disassembled, transported to the site, then reassembled.

“Micropods” can be constructed and added to the side of the Microshelters for added storage.

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# Microshelter Build/Assembly Hints

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## Microshelter Build/Assembly hints

- Build floor first, then build other panels on it, using floor as a template to make the framing roughly square
- Use plywood factory edges to make walls square since we're assembling them together
- Plywood factory edges meet in middle of walls
- Plywood overlaps of 1 1/2" are intentional so a 2x4 can be used to check overlap
- Cut hinge side of window and door openings first and attach hinges. Then cut most of the opening, leaving a little bit to hold the windows and door in place until the walls are raised.
- Only drive 1<sup>st</sup> 8 plywood corner nails 1/2-way, then check all overlaps before driving any all the way
- Use chalk lines to center plywood nails – missed nails show on the inside
- Plywood nails:
  - Floor and roof: 6" apart on edges, 12" elsewhere
  - Walls: 8" apart on edges, 16" elsewhere
- Use construction adhesive on walls between plywood and 2x4's
- Lean roof against S side of building (N end up), and slide onto rafter supports
- Nail ripped plywood to N&S ends of roof to provide a little more overhang
- Notch window frame 1x2's and deadbolt mounts on table saw before building party
- Drill deadbolt mount using 1 3/4" hole saw before building party
- Put gasket material between pod and wall
- Put caulk between pod roof and wall

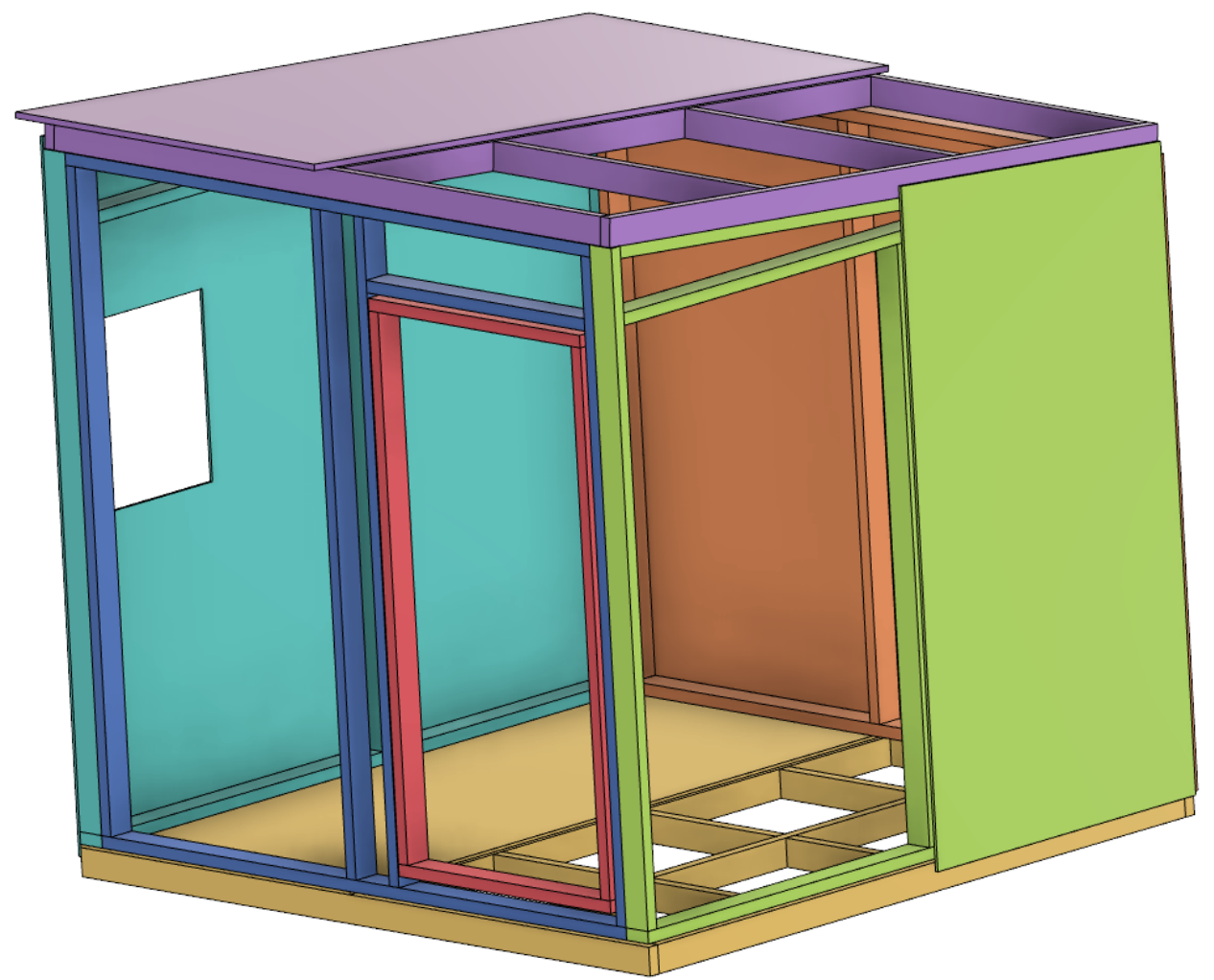
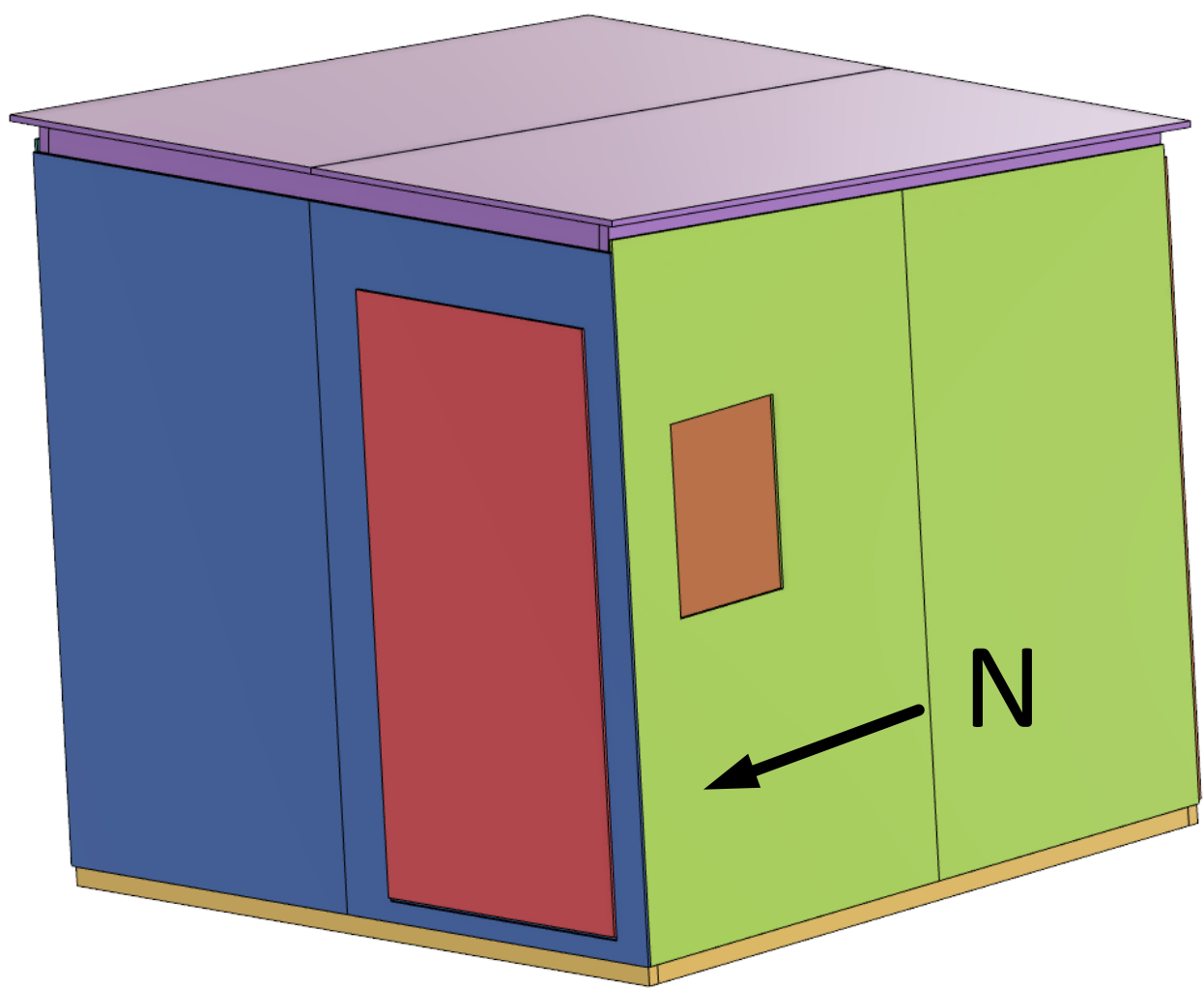
# Microshelter Build/Assembly Teams & Tools

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## Microshelter Build/Assembly Teams and Tools

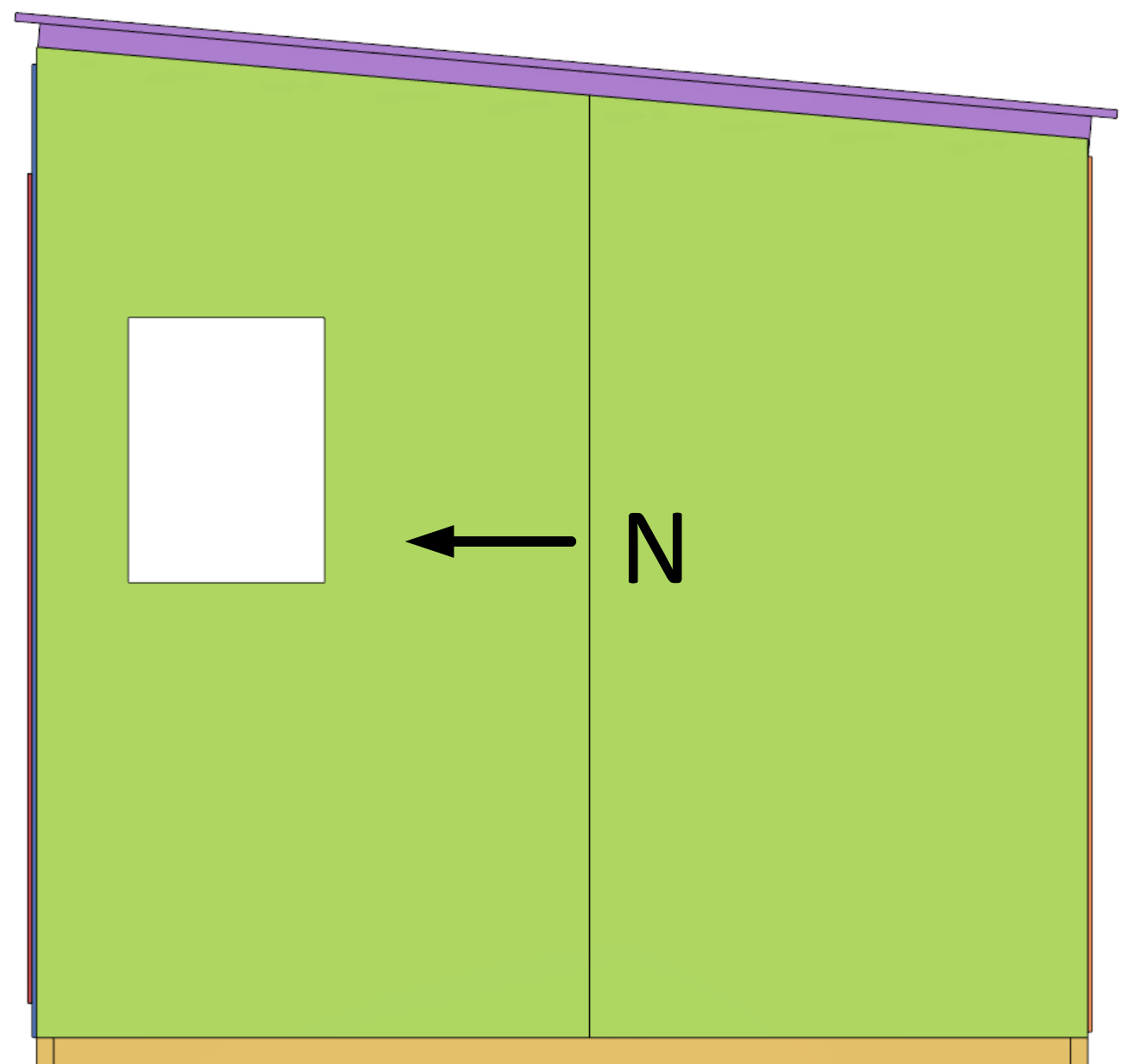
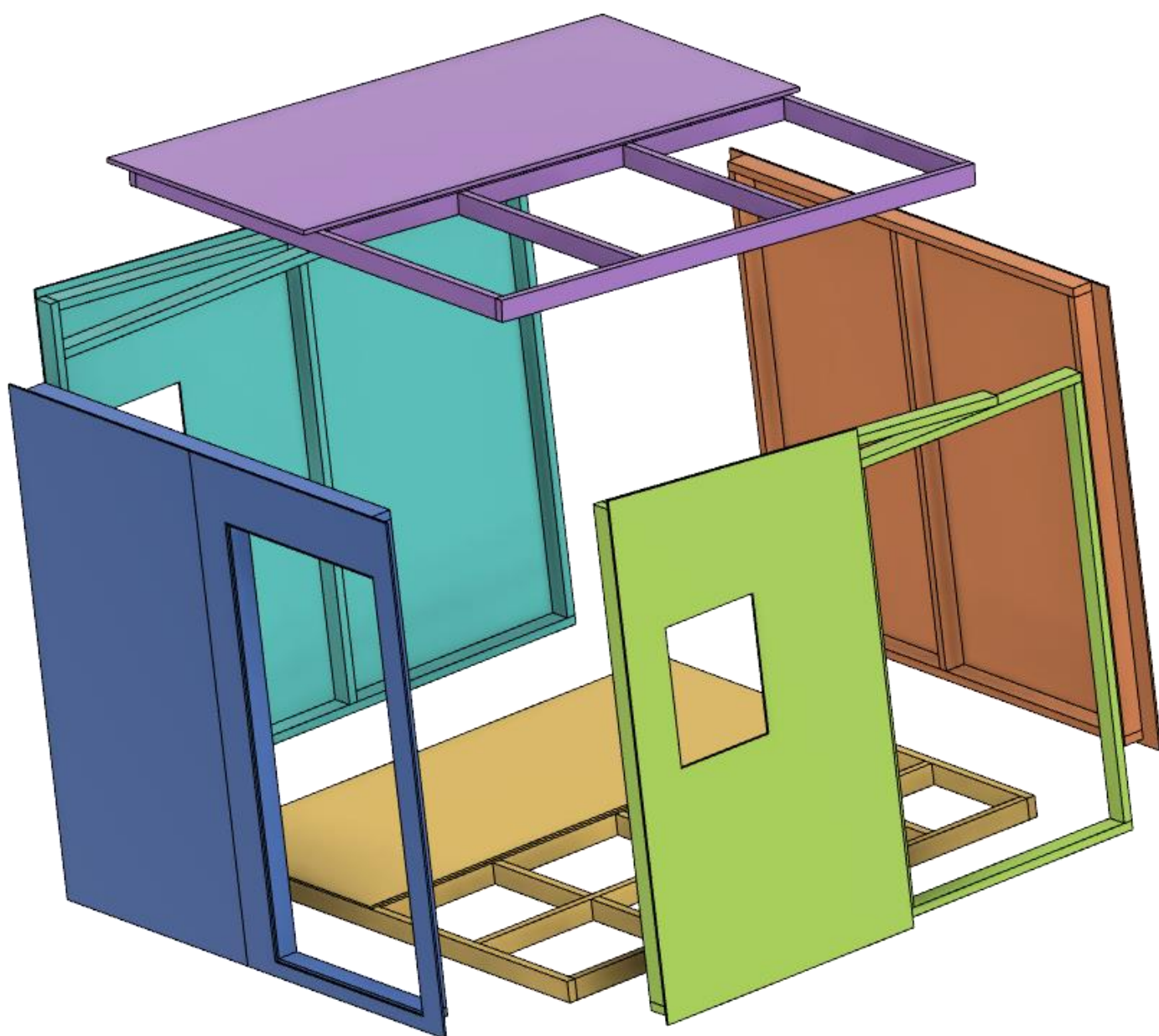
(in addition to standard hammer, tape measure, pencil, etc.)

- Miter Saw – cut and label 2x4's
  - Miter (“Chop”) saw
  - Sharpie to label 2x4's
- Panel Framing – build 2x4 structures
  - Speed square
  - Framing nail gun and nails
  - Drill and 3/4" bit for N wall
- Panel Plywood – Cut plywood
  - Circular saw
  - Long straightedge (narrow plywood, 1x2?)
  - Sharpie to label plywood, windows, and door
- Panel Assembly
  - Chalk line
  - Roofing nail gun and 1 1/4" galv. roofing nails
  - 6" & 8" measurement gauges
- Roofing
  - Long straightedge (narrow plywood, 1x2?)
  - Utility knife
  - Putty knife, rags, lacquer thinner or mineral spirits
  - Roofing nail gun and 1 1/4" galv. roofing nails
  - Tin snips
- Hardware attachment (deadbolt, eye bolts, hinges, latches, etc.)
  - Table saw for notching window trim and deadbolt mount
  - Drill and bits, including 1 3/4" diameter hole saw for deadbolt
  - Phillips driver
  - Trim nailer
  - Hardware
  - Small screws for hinges
  - Angle grinder
  - Reciprocating saw w/ wood and metal blades
- Painting:
  - Rollers
  - Brushes
  - Paint tray and liners
  - Paint stirrers
  - Can opener
  - Funnels for 1 and 5 gallon cans
  - Knee pads
  - Rubber mallet
  - Large channel locks for opening 5 gallon cans
  - 1 gallon plastic bags to store used brushes and rollers overnight
  - Rags
  - Water for cleanup
  - grubby clothes 😊
- Building Assembly
  - Step ladder
  - Impact driver w/ T30 bit for lag screws
  - Cordless drill w/ T25 and Phillips bits
  - 8' long clamps, or 2 1/2" to 3" wood screws and driver to temporarily clamp and hold walls (removed after lag screws are in place)
  - Angle grinder to grind off any exposed nails
  - Sawzall and circular saw to fix interference on door or windows
  - Sledge hammer, pry bar
  - 2-1/2" screws, sinkers, roofing nails
  - Smoke alarm, plexiglass windows
  - Caulking and gasket material if installing pod
  - Dowels and Johnson bar if building might need to be moved



## 3-D Drawings

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# Picture

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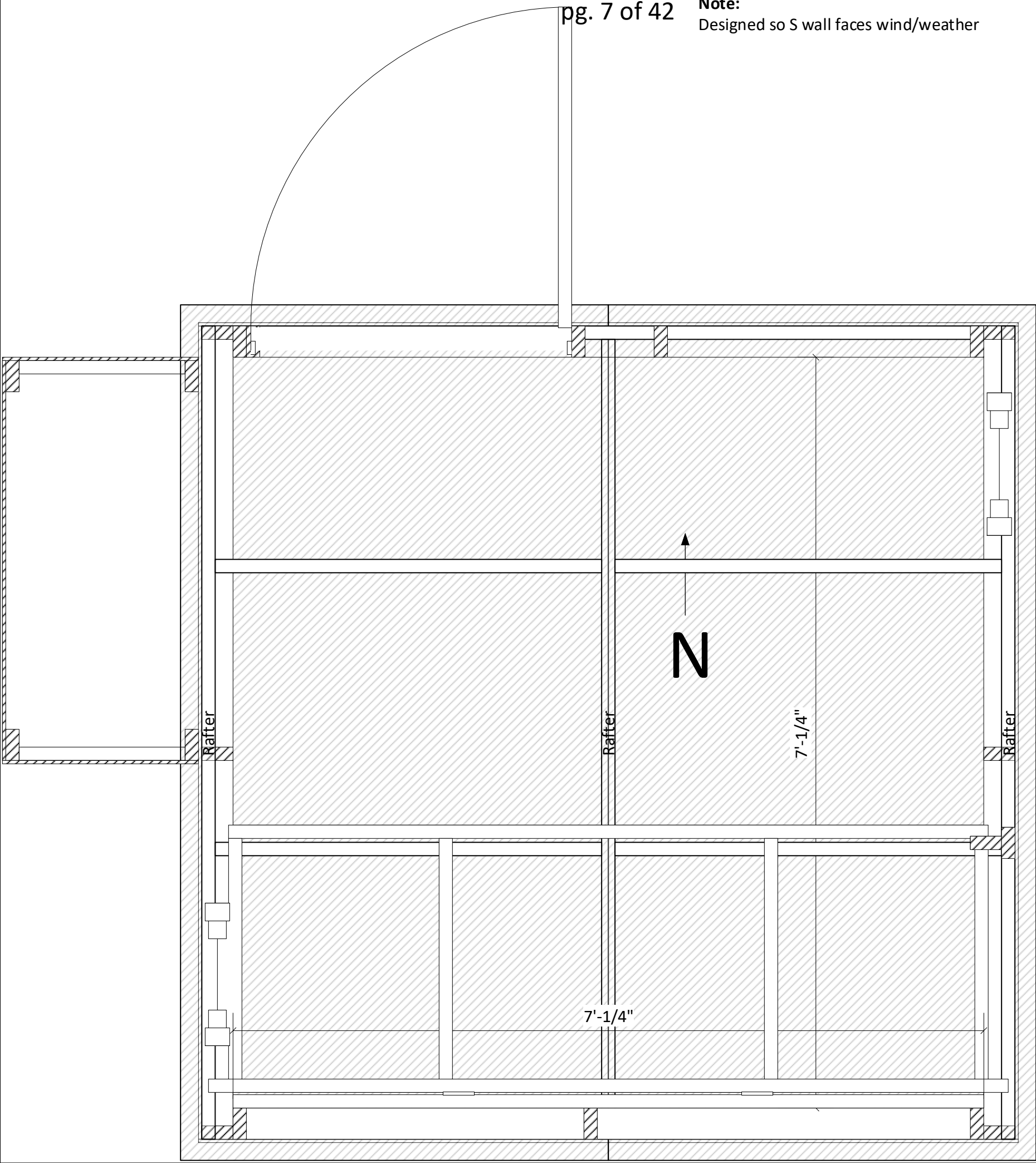


# Top View

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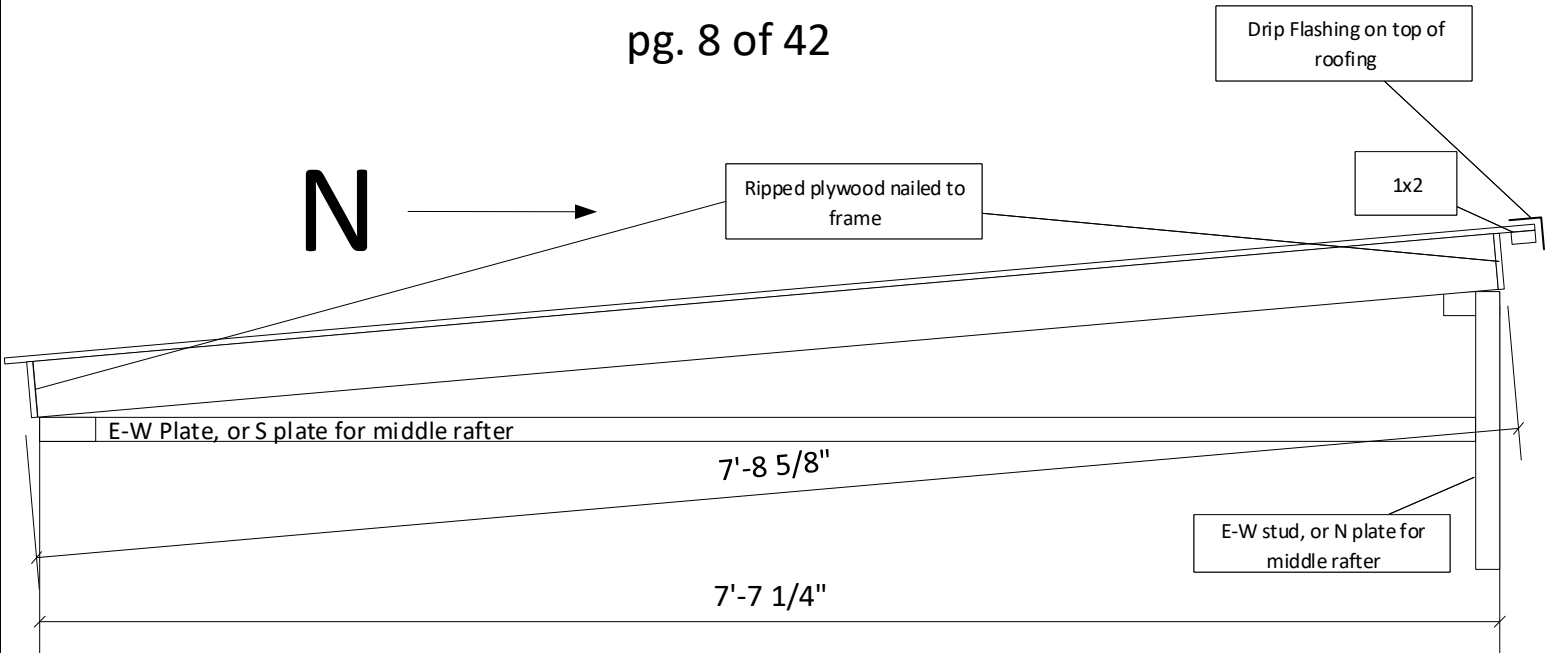
**Note:**  
Designed so S wall faces wind/weather



# Rafters @ 5° (1"/foot)

(3)

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# Roof

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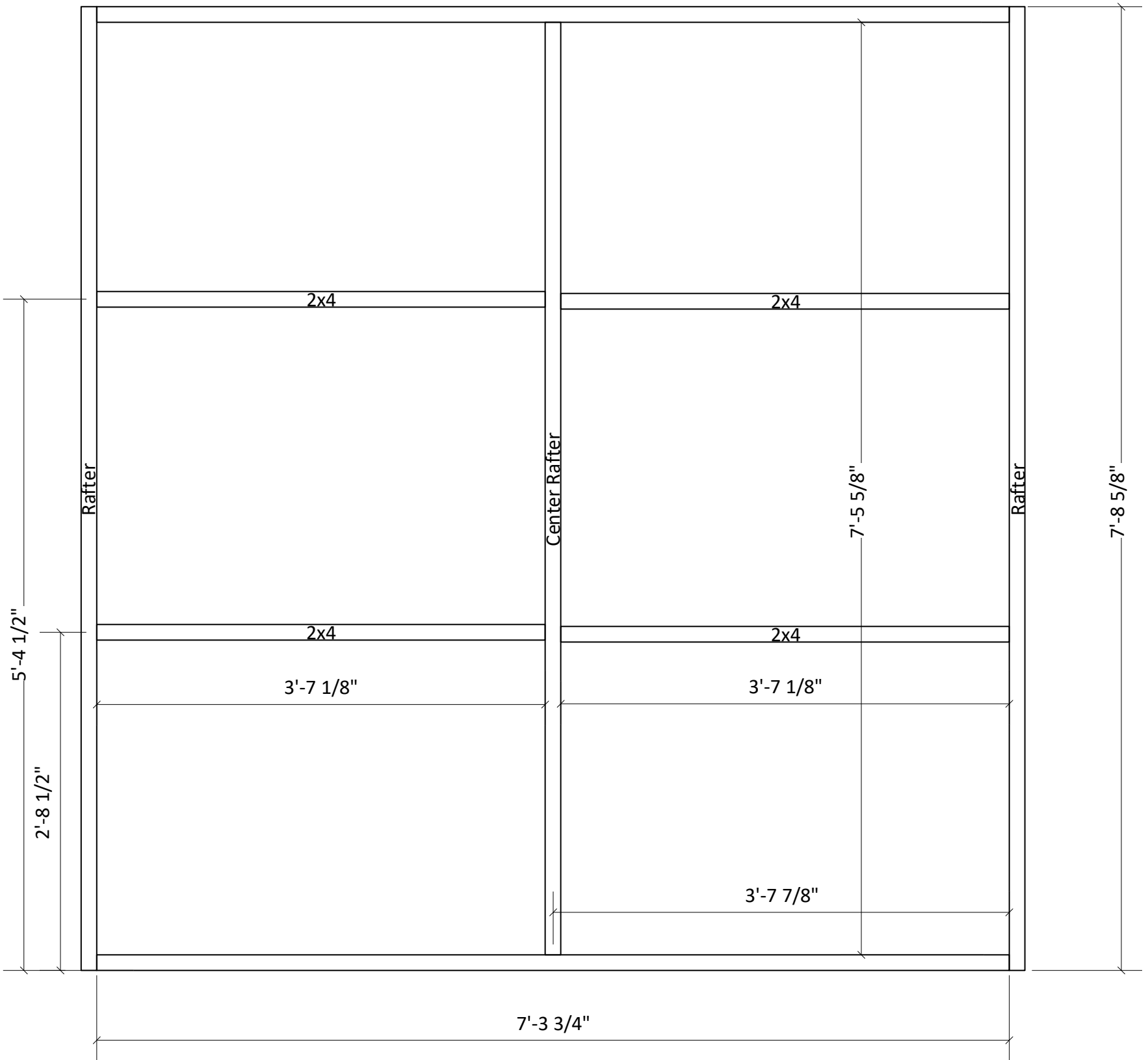
## Materials:

- (7) 8' 2x4's
- (2) 4'x8'x3/8" plywood CDX plywood
- (1) 8' 1x2
- 72 ft<sup>2</sup> rolled roofing (1 square)
- Rolled roofing (lap) cement
- Roofing nails
- 8' Drip Flashing

## Cut List:

- (2) 7'-8 5/8" 2x4's, rafters
- (1) 7'-5 5/8" 2x4, center rafter
- (2) 7'-3 3/4" 2x4, framing
- (4) 3'-7 1/8" 2x4's, framing
- (2) 4'x8'x3/8" CDX plywood, roof
- (1) 8' 1x2
- (2) 8'-2" x 36" rolled roofing
- (1) 8'-2" x 33" rolled roofing
- Ripped plywood on N&S ends

## Framing



# Roof

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## Materials:

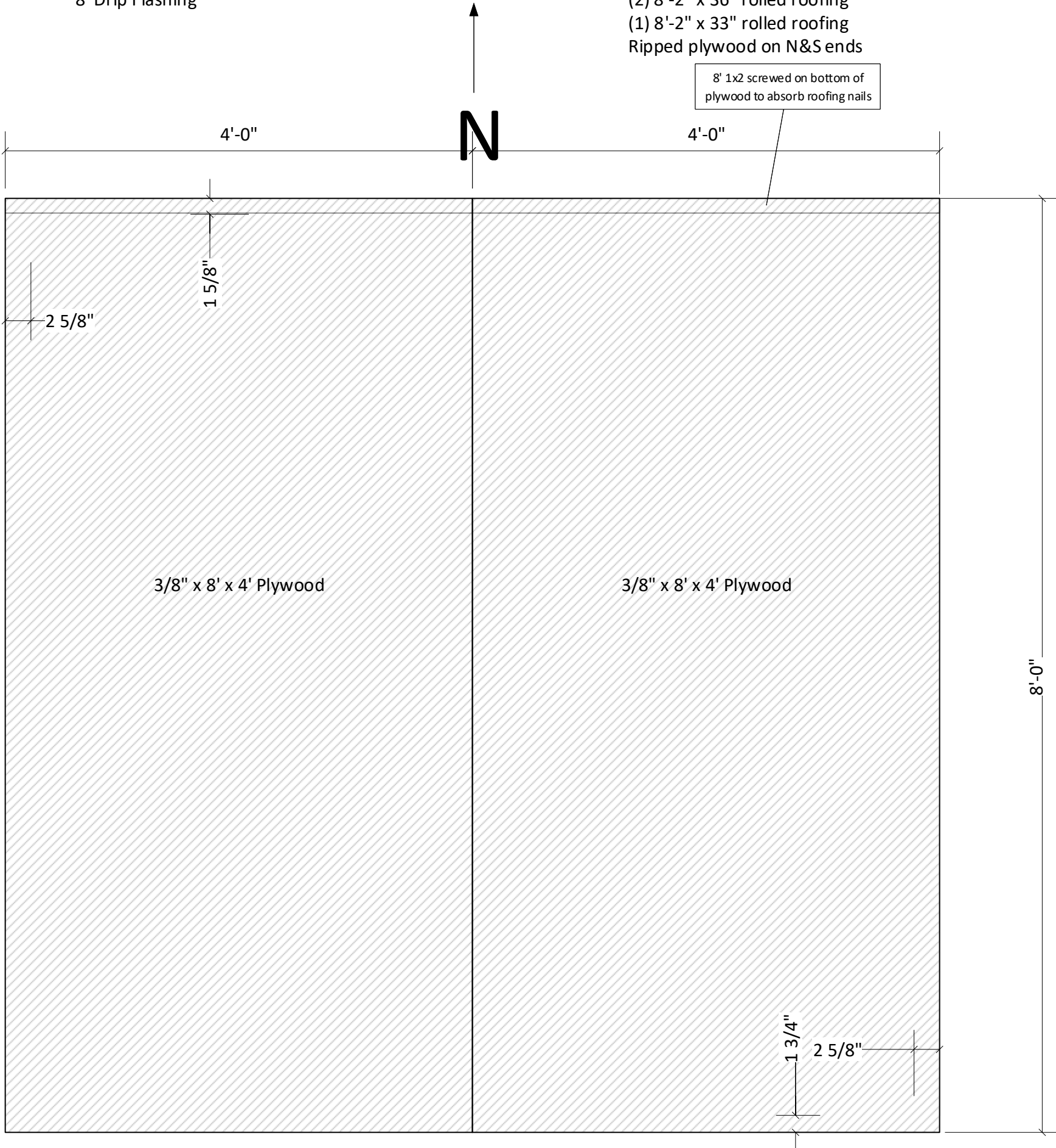
- (7) 8' 2x4's
- (2) 4'x8'x3/8" plywood CDX plywood
- (1) 8' 1x2
- 72 ft<sup>2</sup> rolled roofing (1 square)
- Rolled roofing (lap) cement
- Roofing nails
- 8' Drip Flashing

## Plywood

## Cut List:

- (2) 7'-8 5/8" 2x4's, rafters
- (1) 7'-5 5/8" 2x4, center rafter
- (2) 7'-3 3/4" 2x4, framing
- (4) 3'-7 1/8" 2x4's, framing
- (2) 4'x8'x3/8" CDX plywood, roof
- (1) 8' 1x2
- (2) 8'-2" x 36" rolled roofing
- (1) 8'-2" x 33" rolled roofing
- Ripped plywood on N&S ends

8' 1x2 screwed on bottom of plywood to absorb roofing nails



# Roof

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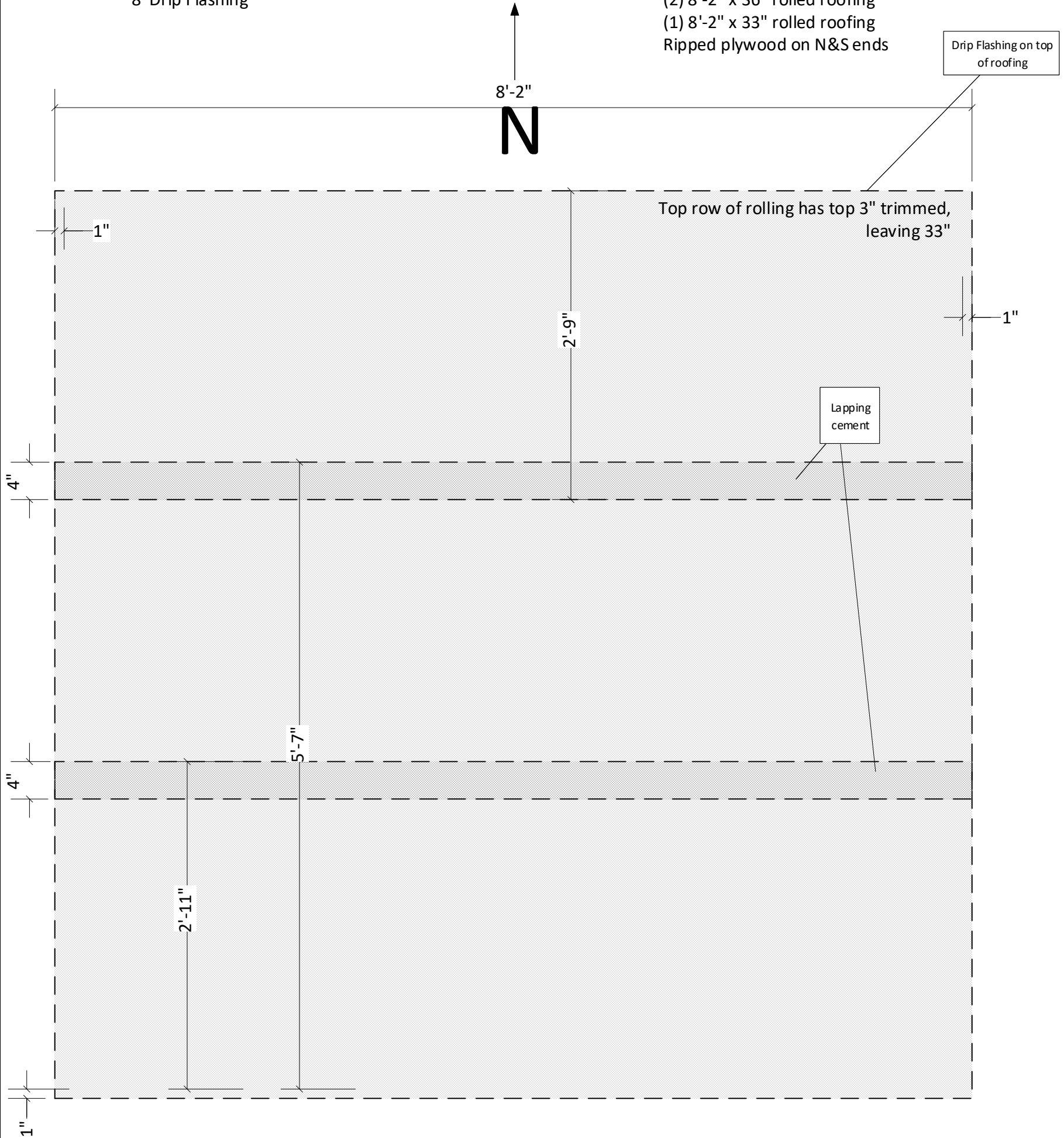
## Materials:

- (7) 8' 2x4's
- (2) 4'x8'x3/8" plywood CDX plywood
- (1) 8' 1x2
- 72 ft<sup>2</sup> rolled roofing (1 square)
- Rolled roofing (lap) cement
- Roofing nails
- 8' Drip Flashing

## Rolled Roofing

## Cut List:

- (2) 7'-8 5/8" 2x4's, rafters
- (1) 7'-5 5/8" 2x4, center rafter
- (2) 7'-3 3/4" 2x4, framing
- (4) 3'-7 1/8" 2x4's, framing
- (2) 4'x8'x3/8" CDX plywood, roof
- (1) 8' 1x2
- (2) 8'-2" x 36" rolled roofing
- (1) 8'-2" x 33" rolled roofing
- Ripped plywood on N&S ends



# Roof

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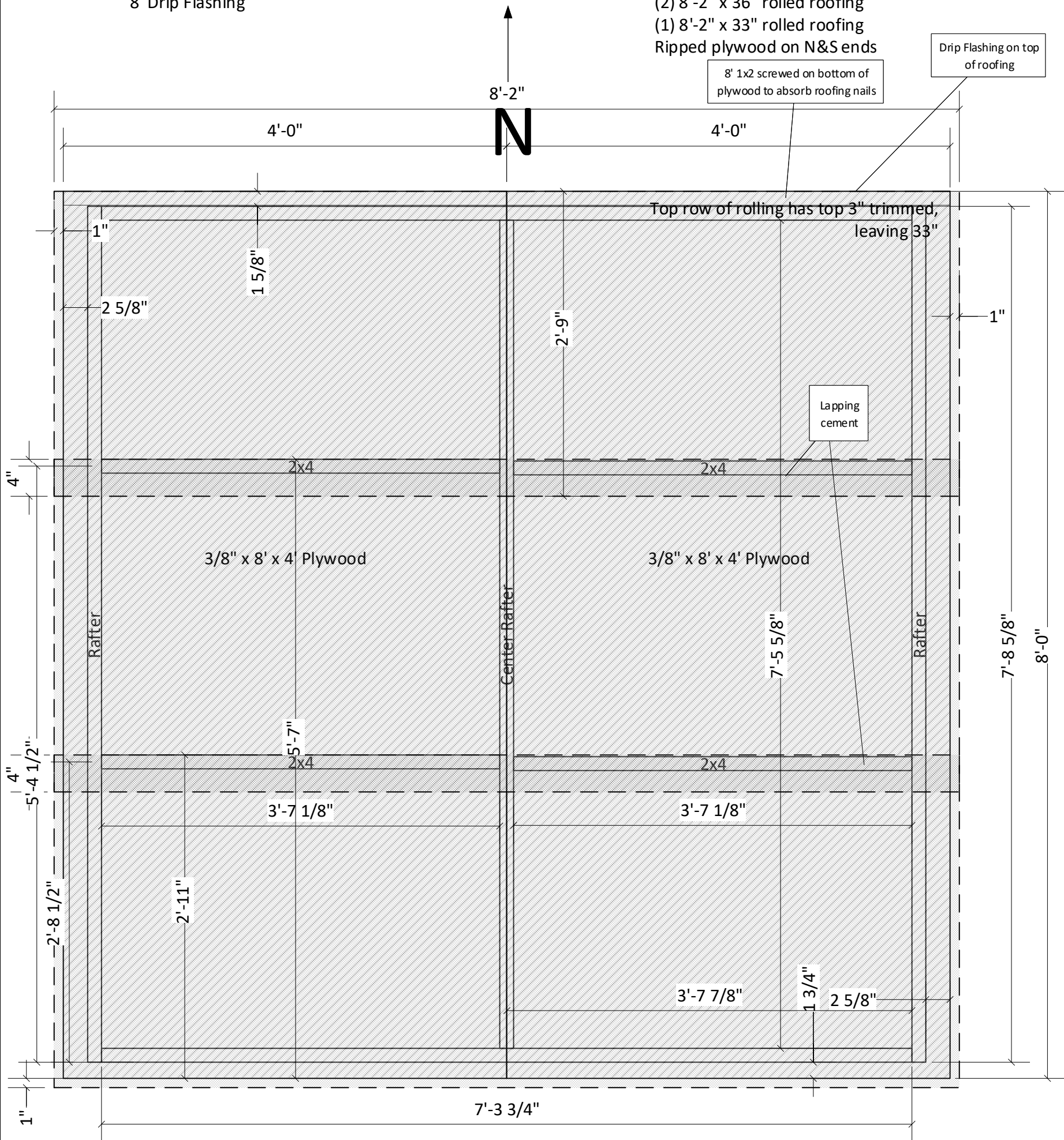
## Materials:

- (7) 8' 2x4's
- (2) 4'x8'x3/8" plywood CDX plywood
- (1) 8' 1x2
- 72 ft<sup>2</sup> rolled roofing (1 square)
- Rolled roofing (lap) cement
- Roofing nails
- 8' Drip Flashing

## Cut List:

- (2) 7'-8 5/8" 2x4's, rafters
- (1) 7'-5 5/8" 2x4, center rafter
- (2) 7'-3 3/4" 2x4, framing
- (4) 3'-7 1/8" 2x4's, framing
- (2) 4'x8'x3/8" CDX plywood, roof
- (1) 8' 1x2
- (2) 8'-2" x 36" rolled roofing
- (1) 8'-2" x 33" rolled roofing
- Ripped plywood on N&S ends

(all)



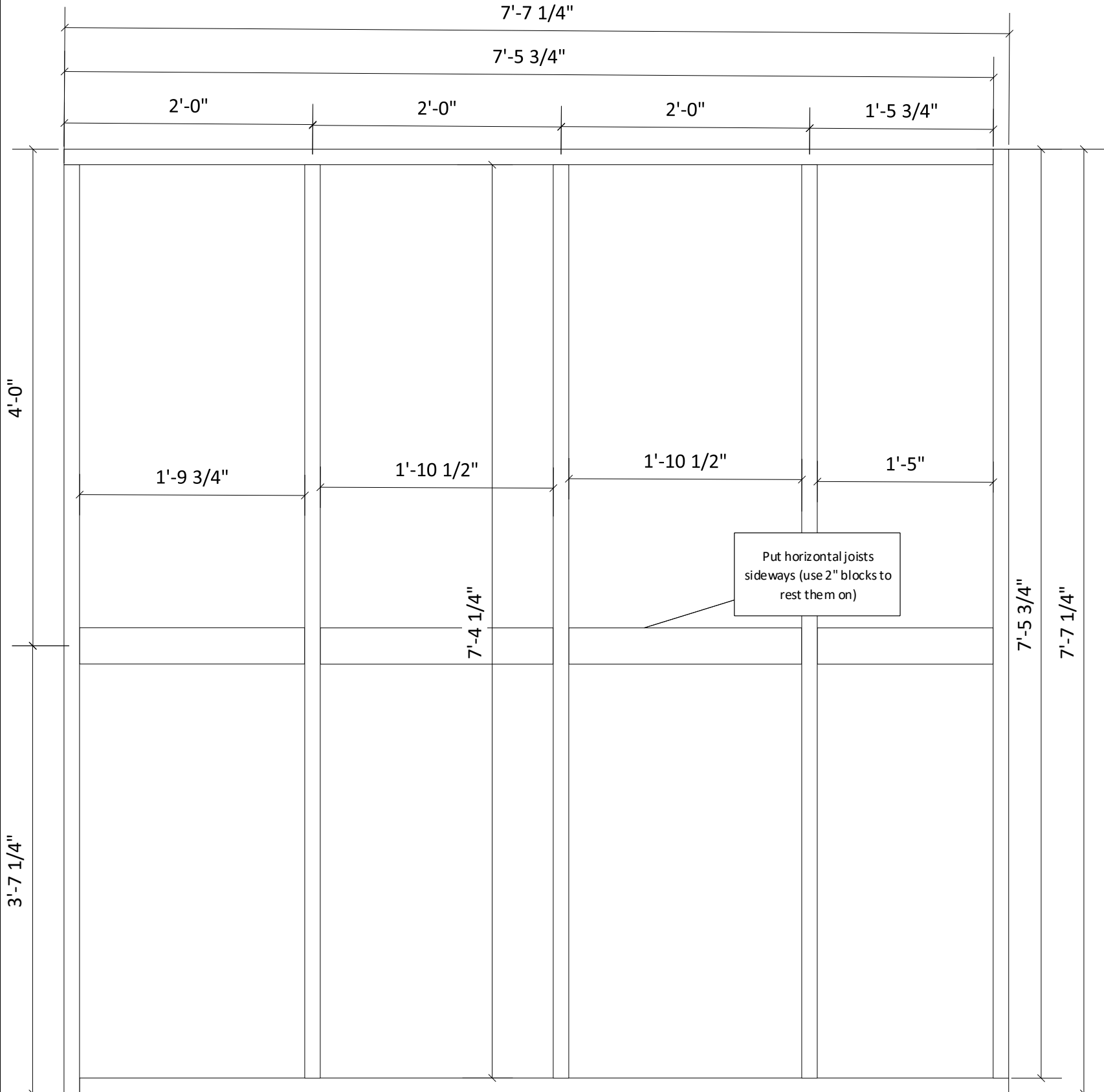
- Materials:**  
 (3 ½) 16' 2x4's, pressure treated  
 (1) 8' 2x4's  
 (2) 4' x 8' x 1/2" CDX plywood

# Floor

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## Framing

- Cut List:**  
 (4) 7'-5 3/4" 2x4's, pressure treated  
 (3) 7'-4 1/4" 2x4's, pressure treated  
 (1) 1'-9 3/4" 2x4  
 (2) 1'-10 1/2" 2x4  
 (1) 1'-5" 2x4  
 (1) 4' x 7'-7 1/4" 1/2" plywood  
 (1) 3'-7 1/4" x 7'-7 1/4" 1/2" plywood



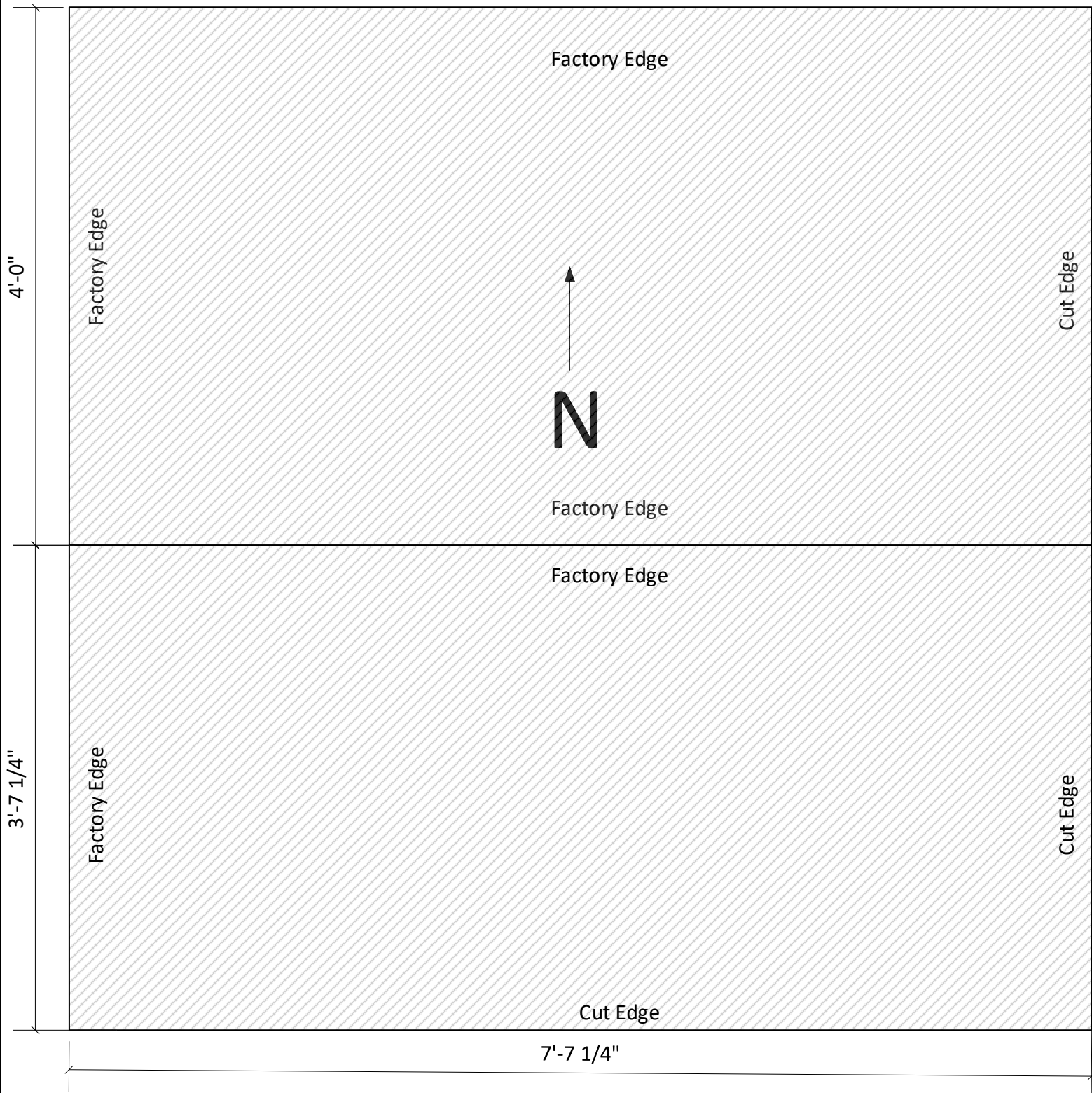
- Materials:**  
 (3 ½) 16' 2x4's, pressure treated  
 (1) 8' 2x4's  
 (2) 4' x 8' x 1/2" CDX plywood

# Floor

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## Plywood

- Cut List:**  
 (4) 7'-5 3/4" 2x4's, pressure treated  
 (3) 7'-4 1/4" 2x4's, pressure treated  
 (1) 1'-9 3/4" 2x4  
 (2) 1'-10 1/2" 2x4  
 (1) 1'-5" 2x4  
 (1) 4' x 7'-7 1/4" 1/2" plywood  
 (1) 3'-7 1/4" x 7'-7 1/4" 1/2" plywood



# Floor

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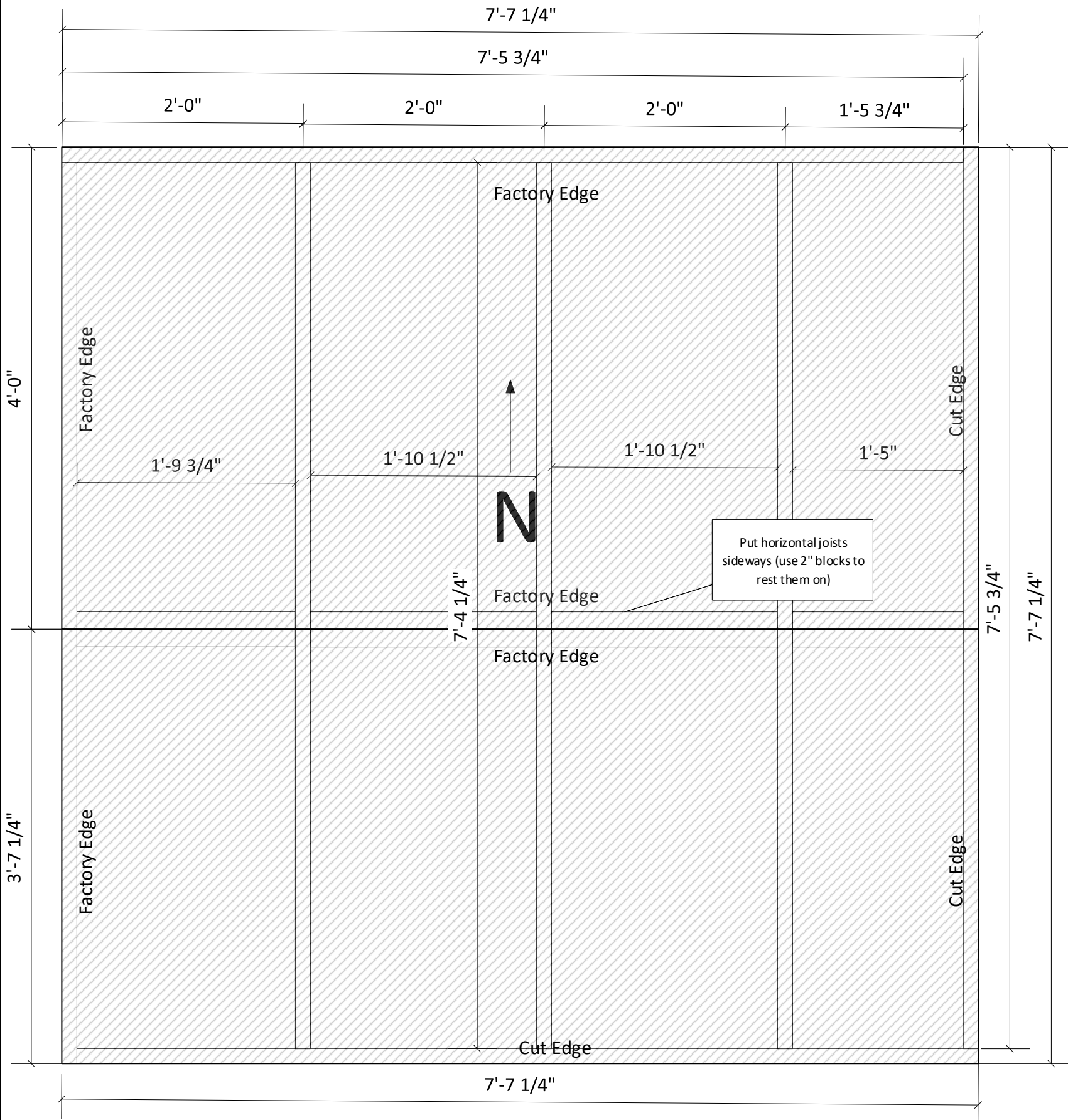
(all)

## Materials:

- (3 ½) 16' 2x4's, pressure treated
- (1) 8' 2x4's
- (2) 4' x 8' x 1/2" CDX plywood

## Cut List:

- (4) 7'-5 3/4" 2x4's, pressure treated
- (3) 7'-4 1/4" 2x4's, pressure treated
- (1) 1'-9 3/4" 2x4
- (2) 1'-10 1/2" 2x4
- (1) 1'-5" 2x4
- (1) 4' x 7'-7 1/4" 1/2" plywood
- (1) 3'-7 1/4" x 7'-7 1/4" 1/2" plywood



**Materials:**

- (1) 12' 2x4's
- (4) 8' 2x4's
- (2) 4'x8'x3/8" CDX plywood
- (1) 18" x 24" plexiglass window
- (2) hinges for window
- (1) eyebolt and hook for window

# W Wall

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(all)

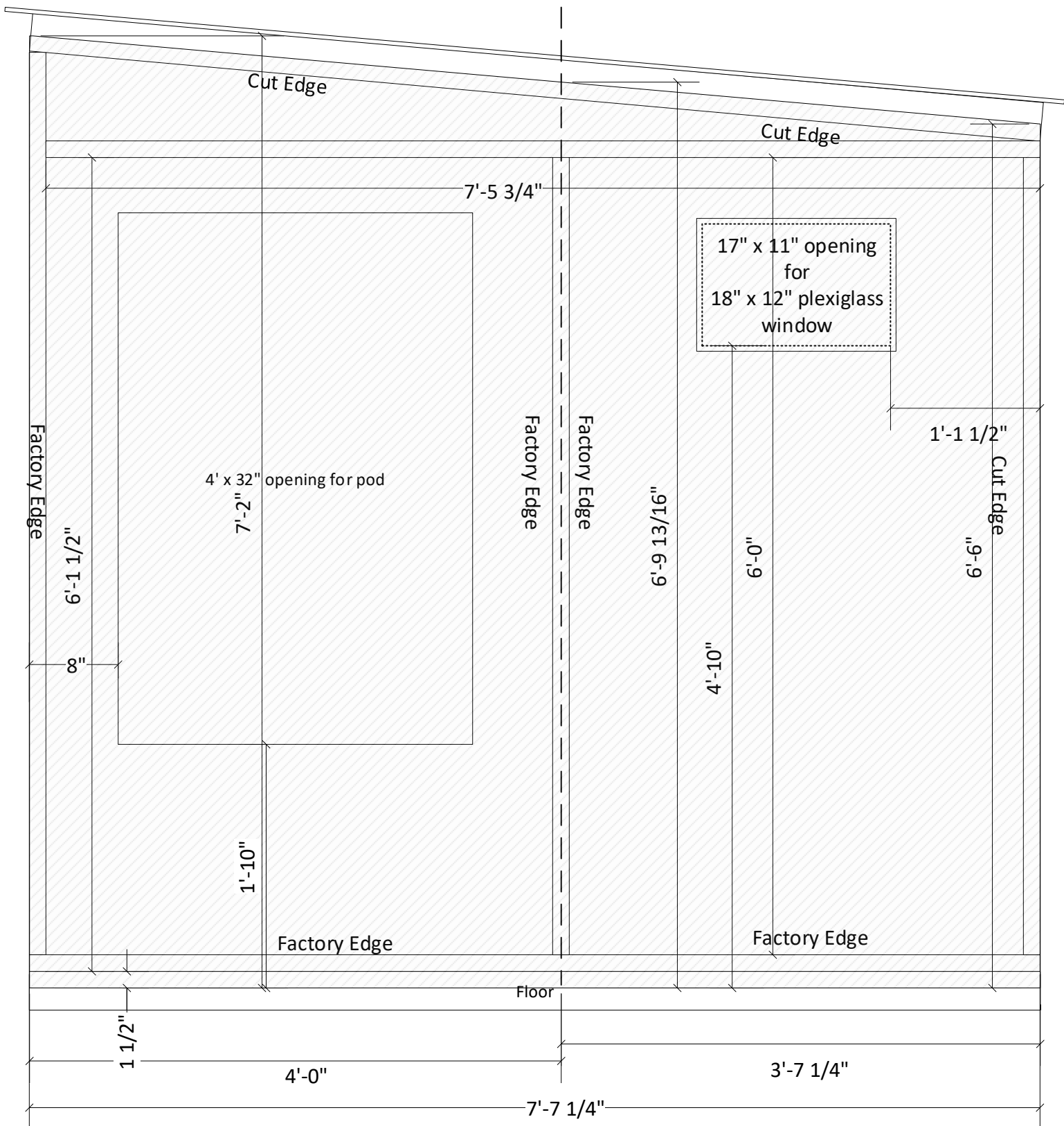
**Cut List:**

- (2) 6' 2x4's, vertical studs
- (1) 6'-9 1/2" 2x4, vertical stud
- (1) 7'-5 3/4" 2x4, top plate
- (1) 7'-7 1/4" 2x4, sill
- (1) 6'-2" 2x4, **w/ 5° cut**, rafter support
- (1) 4' x 6'-9 13/16" x 7'-2" x 3/8" plywood, wall  
>> Cut opening for pod <<
- (1) 3'-7 1/4" x 6'-6" x 6'-9 13/16" x 3/8" plywood, wall  
>> Attached hinge and cut out window <<

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**Assembly:**

Assemble w/ C-side inwards (best mold control)  
 Cut hinge side of window, attach hinges, then cut most of window





**Materials:**

- (1) 12' 2x4's
- (4) 8' 2x4's
- (2) 4'x8'x3/8" CDX plywood
- (1) 18" x 24" plexiglass window
- (2) hinges for window
- (1) eyebolt and hook for window

# W Wall

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## Framing

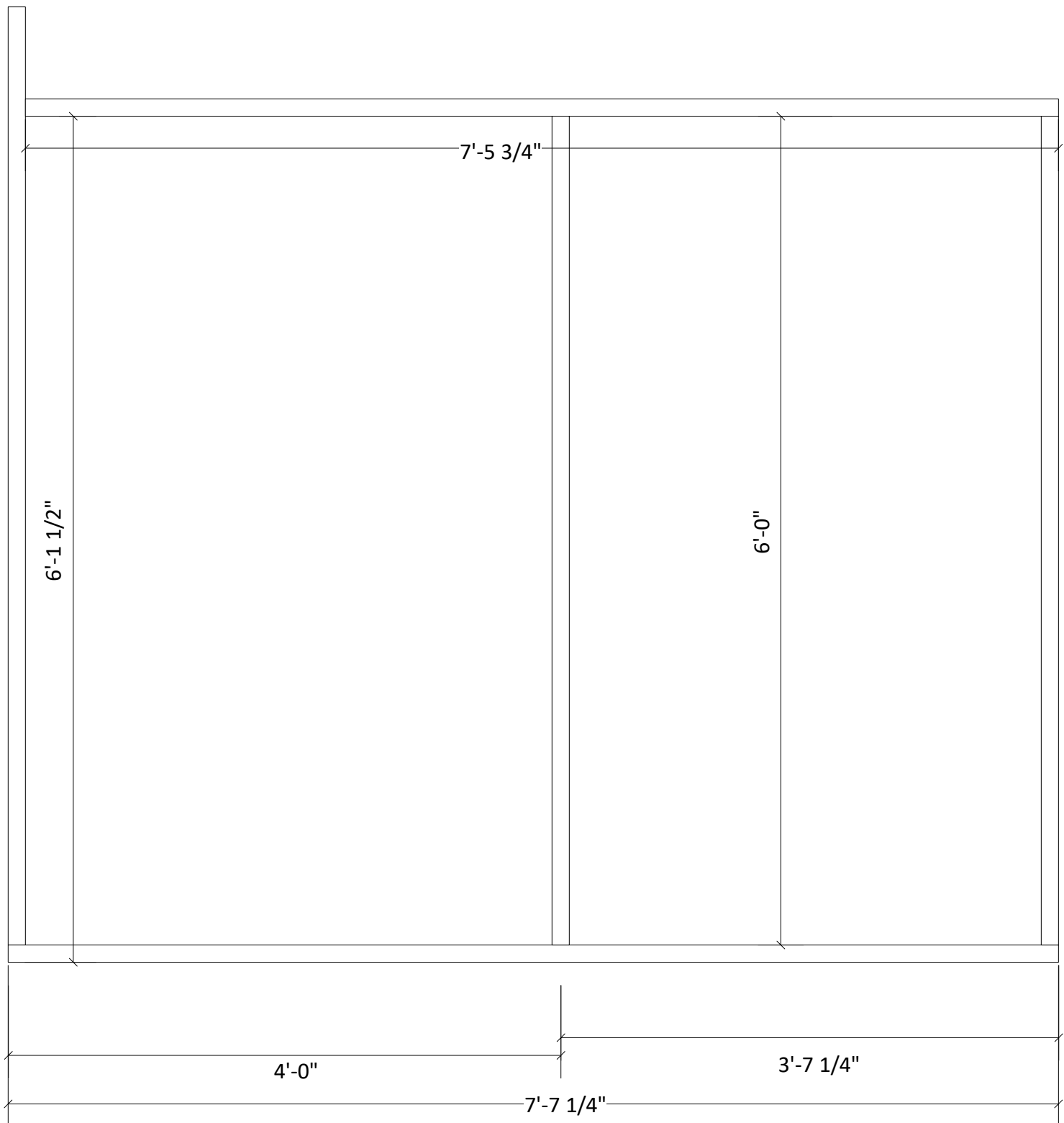
**Cut List:**

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- (1) 7'-5 3/4" 2x4, top plate
- (1) 7'-7 1/4" 2x4, sill
- (1) 6'-2" 2x4, **w/ 5° cut**, rafter support
- (1) 4' x 6'-9 13/16" x 7'-2" x 3/8" plywood, wall  
>> Cut opening for pod <<
- (1) 3'-7 1/4" x 6'-6" x 6'-9 13/16" x 3/8" plywood, wall  
>> Attached hinge and cut out window <<

7/19/2021

**Assembly:**

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**Materials:**

- (1) 12' 2x4's
- (4) 8' 2x4's
- (2) 4'x8'x3/8" CDX plywood
- (1) 18" x 24" plexiglass window
- (2) hinges for window
- (1) eyebolt and hook for window

# W Wall

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## Plywood

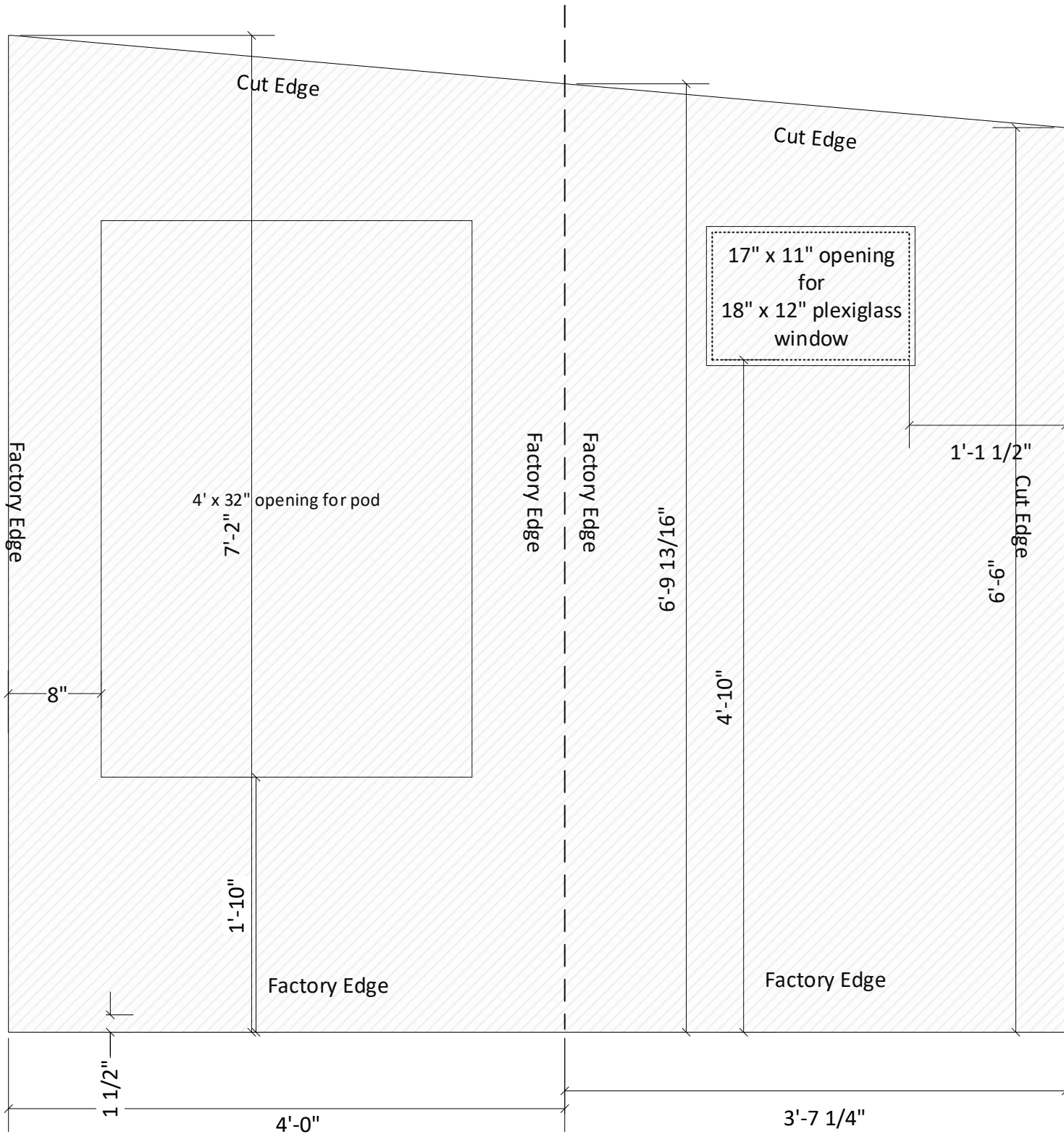
**Cut List:**

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- (1) 6'-9 1/2" 2x4, vertical stud
- (1) 7'-5 3/4" 2x4, top plate
- (1) 7'-7 1/4" 2x4, sill
- (1) 6'-2" 2x4, w/ 5° cut, rafter support
- (1) 4' x 6'-9 13/16" x 7'-2" x 3/8" plywood, wall  
>> Cut opening for pod <<
- (1) 3'-7 1/4" x 6'-6" x 6'-9 13/16" x 3/8" plywood, wall  
>> Attached hinge and cut out window <<

7/19/2021

**Assembly:**

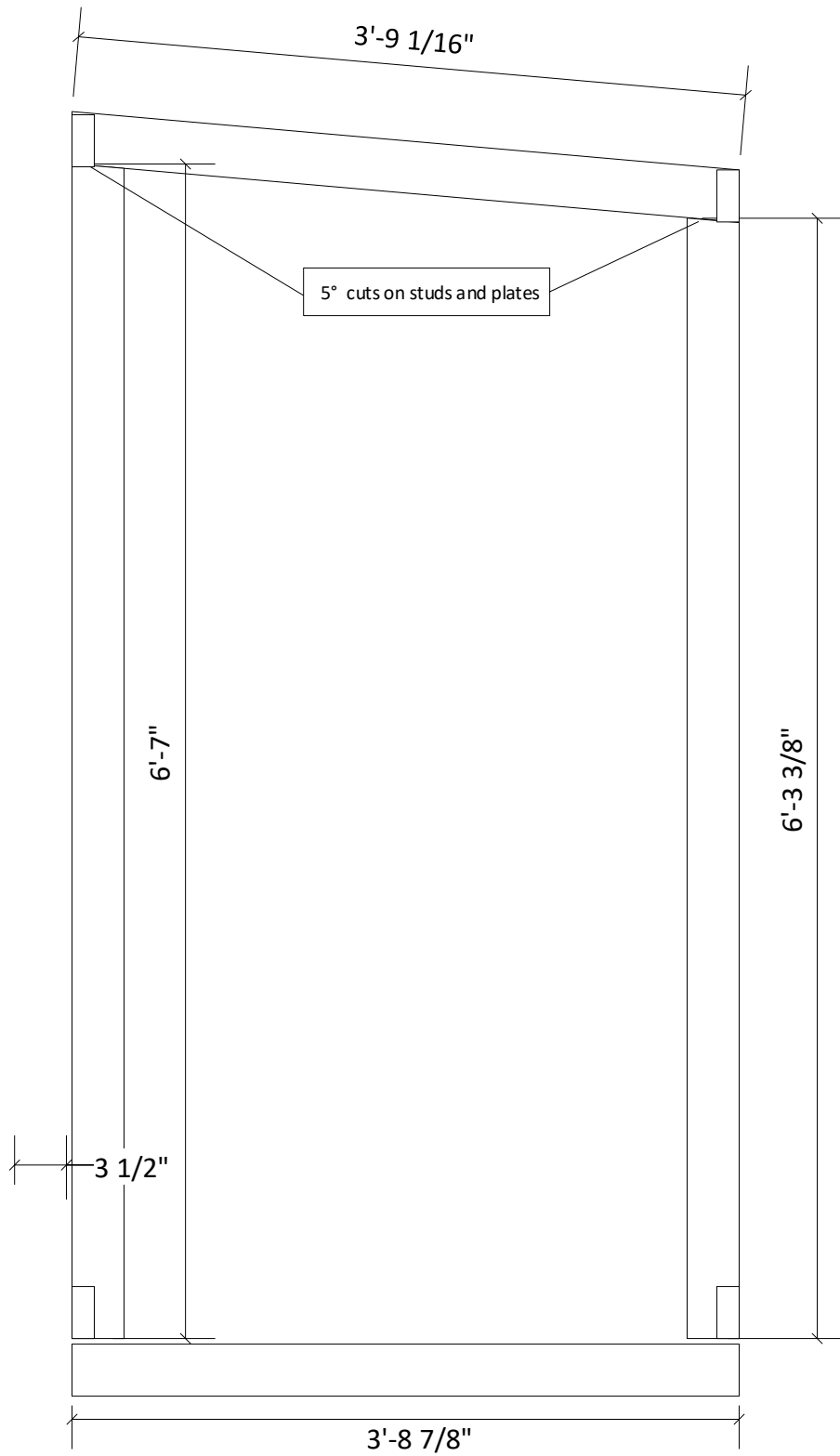
Assemble w/ C-side inwards (best mold control)  
 Cut hinge side of window, attach hinges, then cut most of window



# W Wall

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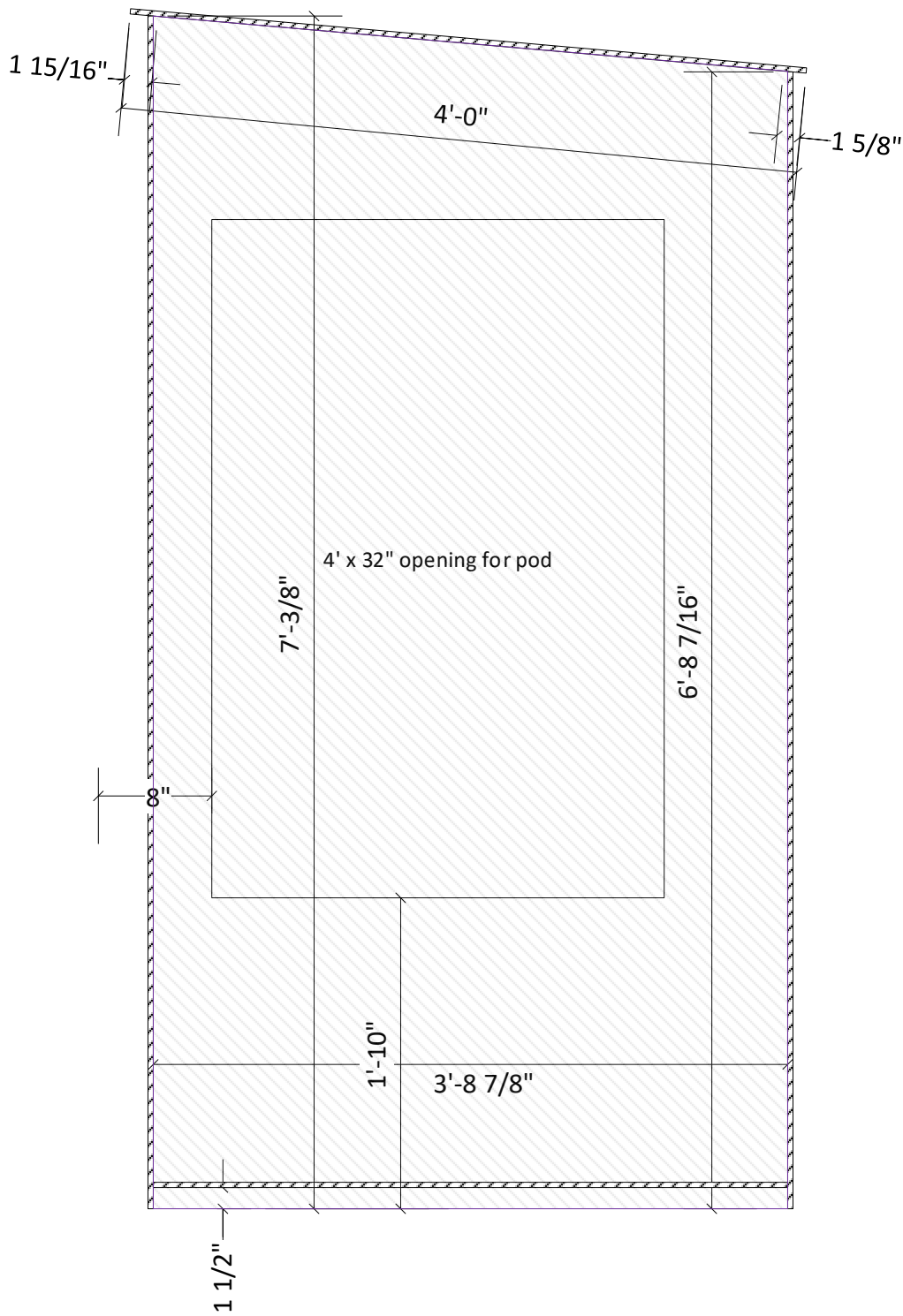
## Pod W Framing



# W Wall

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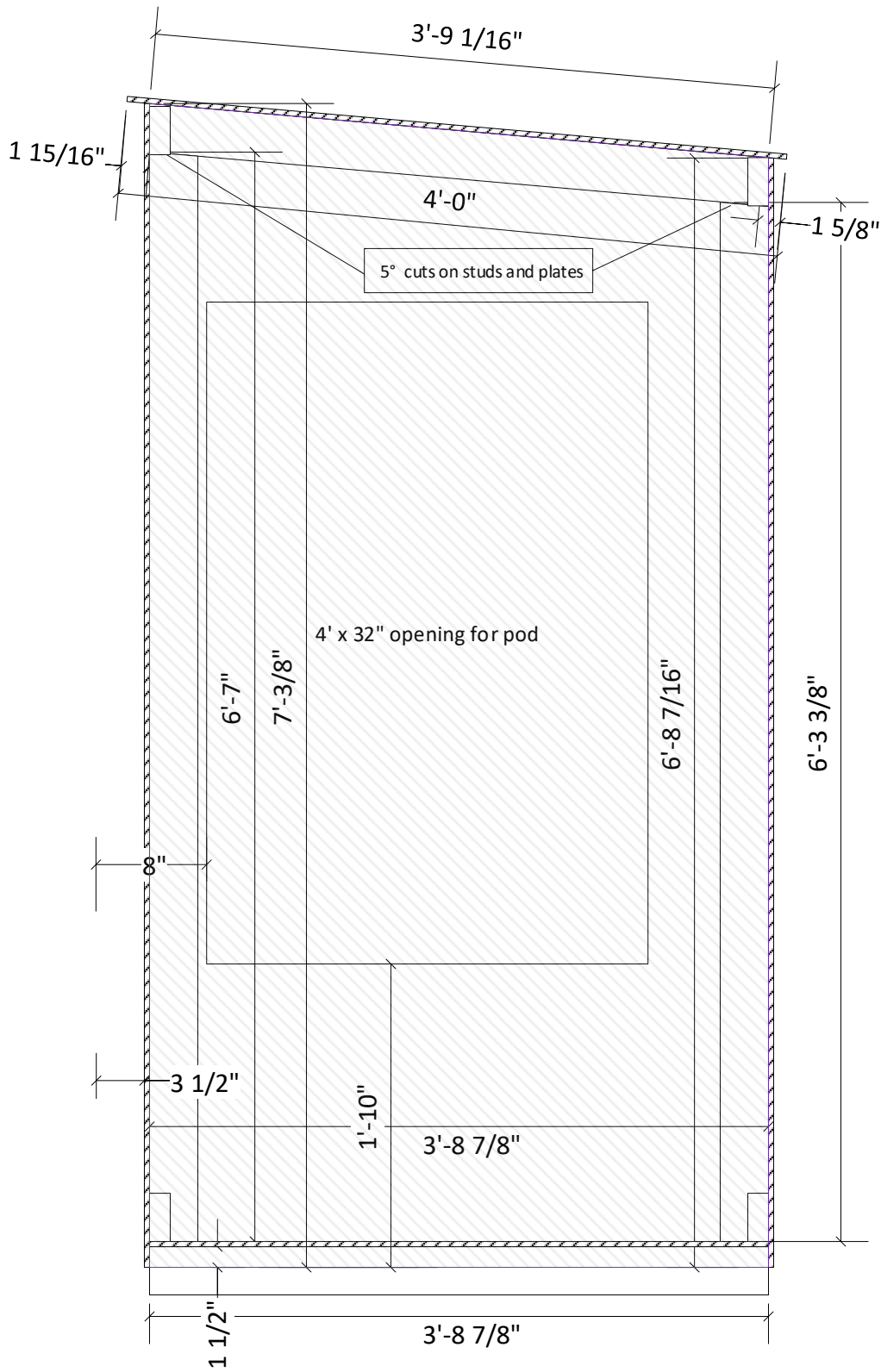
Pod W Plywood



# W Wall

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## Pod W Framing



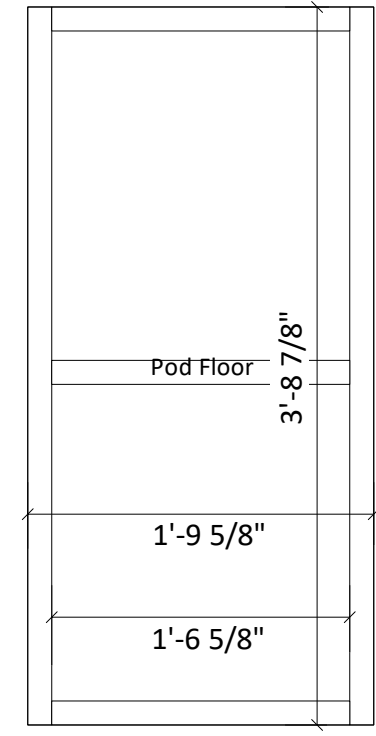
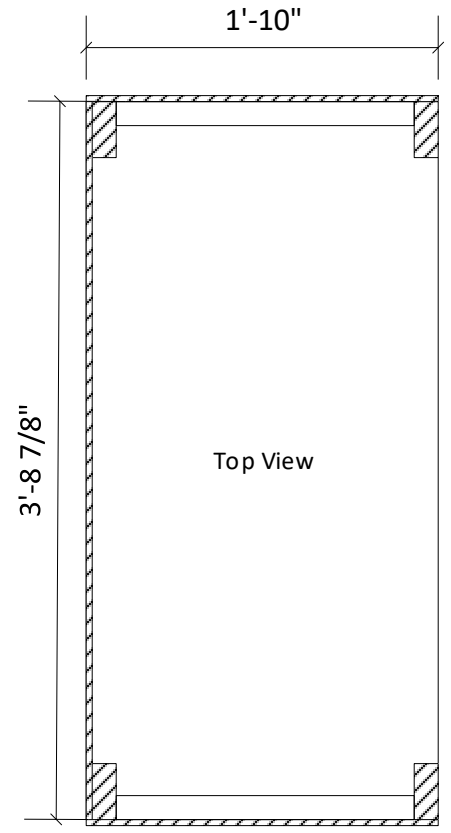
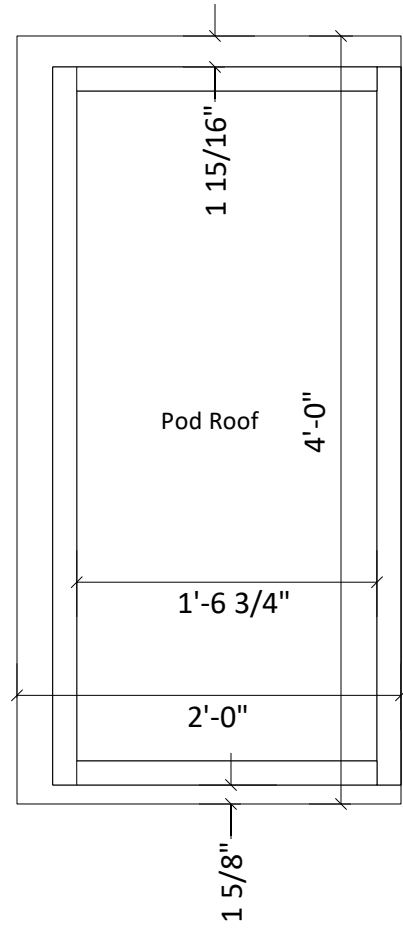
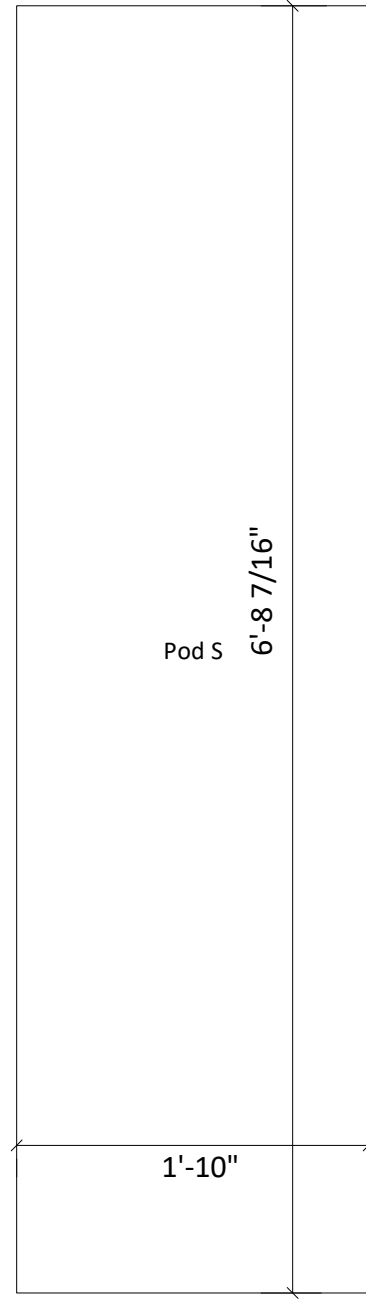
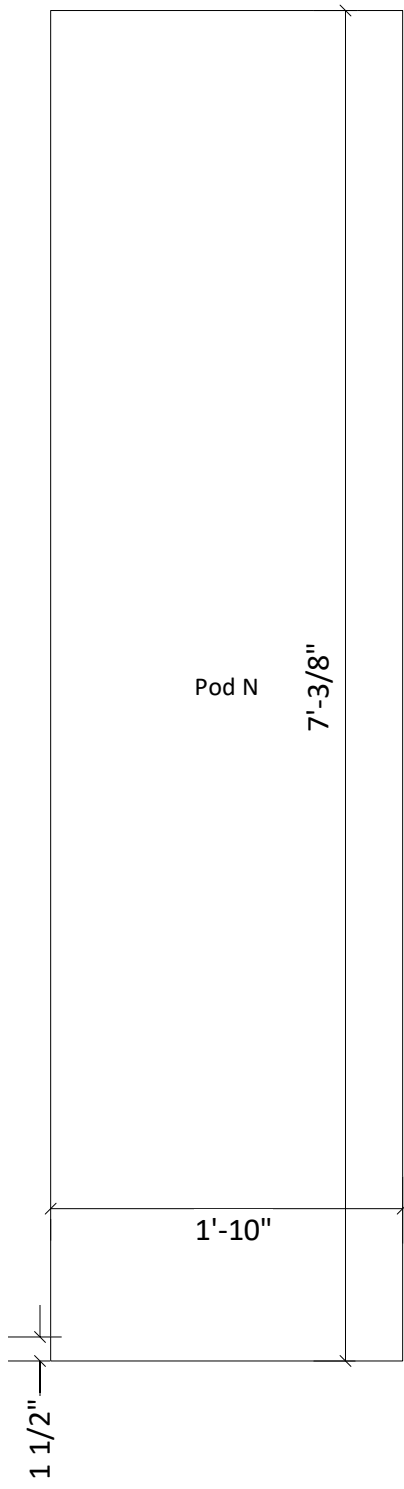
Materials:  
(2) 4'x8'x3/8" CDX plywood

# Pod S, N, Roof, Floor

## Plywood

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**Materials:**

- (1) 12' 2x4's
- (4) 8' 2x4's
- (2) 4'x8'x3/8" CDX plywood
- (1) 18" x 24" plexiglass window
- (2) hinges for window
- (1) eyebolt and hook for window

**E Wall**  
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**Framing**

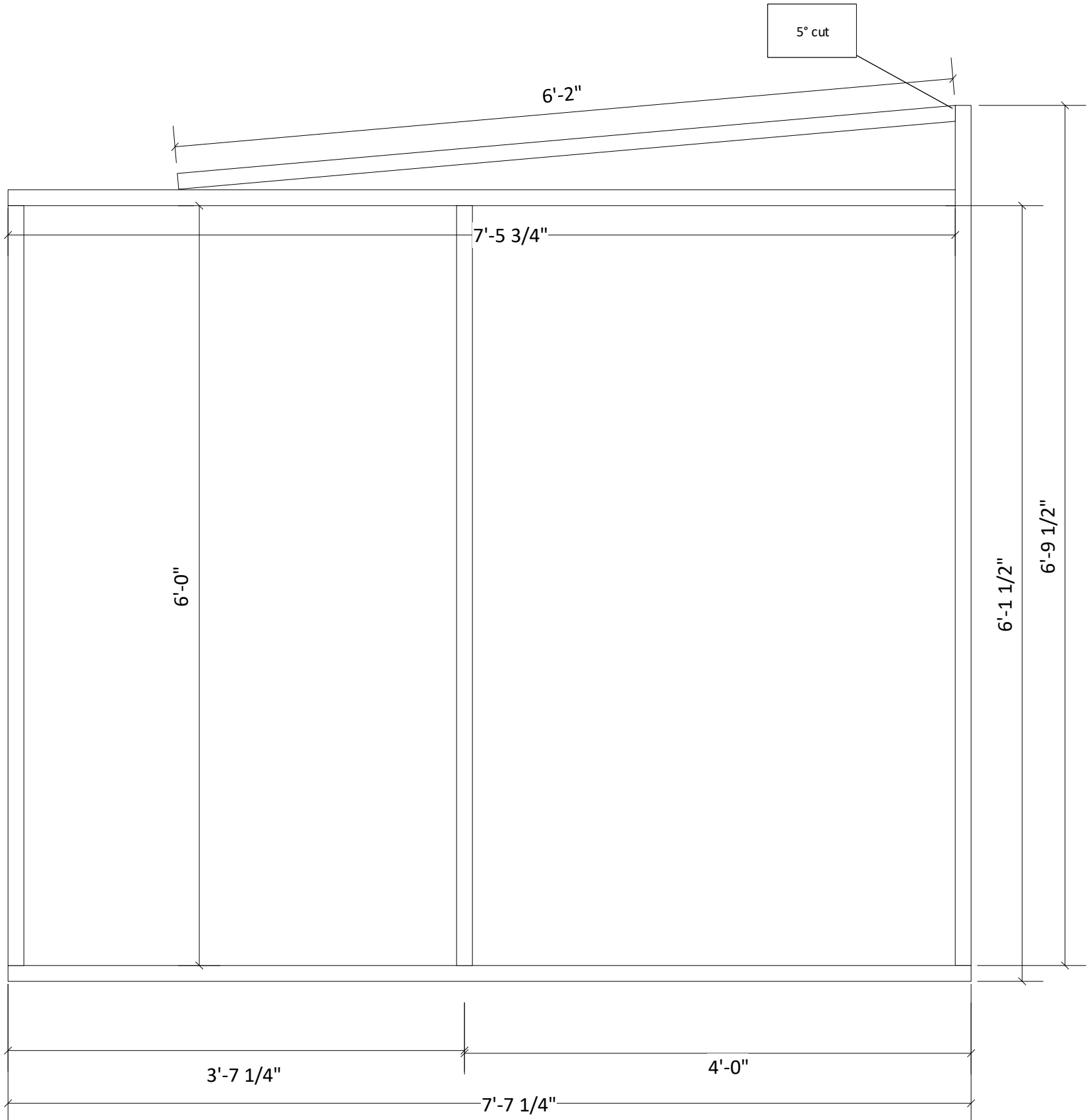
**Cut List:**

- (2) 6' 2x4's, vertical studs
- (1) 6'-9 1/2" 2x4, vertical stud
- (1) 7'-5 3/4" 2x4, top plate
- (1) 7'-7 1/4" 2x4, sill
- (1) 6'-2" 2x4, **w/ 5° cut**, rafter support
- (1) 4' x 6'-9 13/16" x 7'-2" x 3/8" plywood, wall  
 >> Attached hinges and cut out window <<
- (1) 3'-7 1/4" x 6'-6" x 6'-9 13/16" x 3/8" plywood, wall

7/19/2021

**Assembly:**

Assemble w/ C-side inwards (best mold control)  
 Cut hinge side of window, attach hinges, then cut most of window



**Materials:**

- (1) 12' 2x4's
- (4) 8' 2x4's
- (2) 4'x8'x3/8" CDX plywood
- (1) 18" x 24" plexiglass window
- (2) hinges for window
- (1) eyebolt and hook for window

**E Wall**  
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**Plywood**

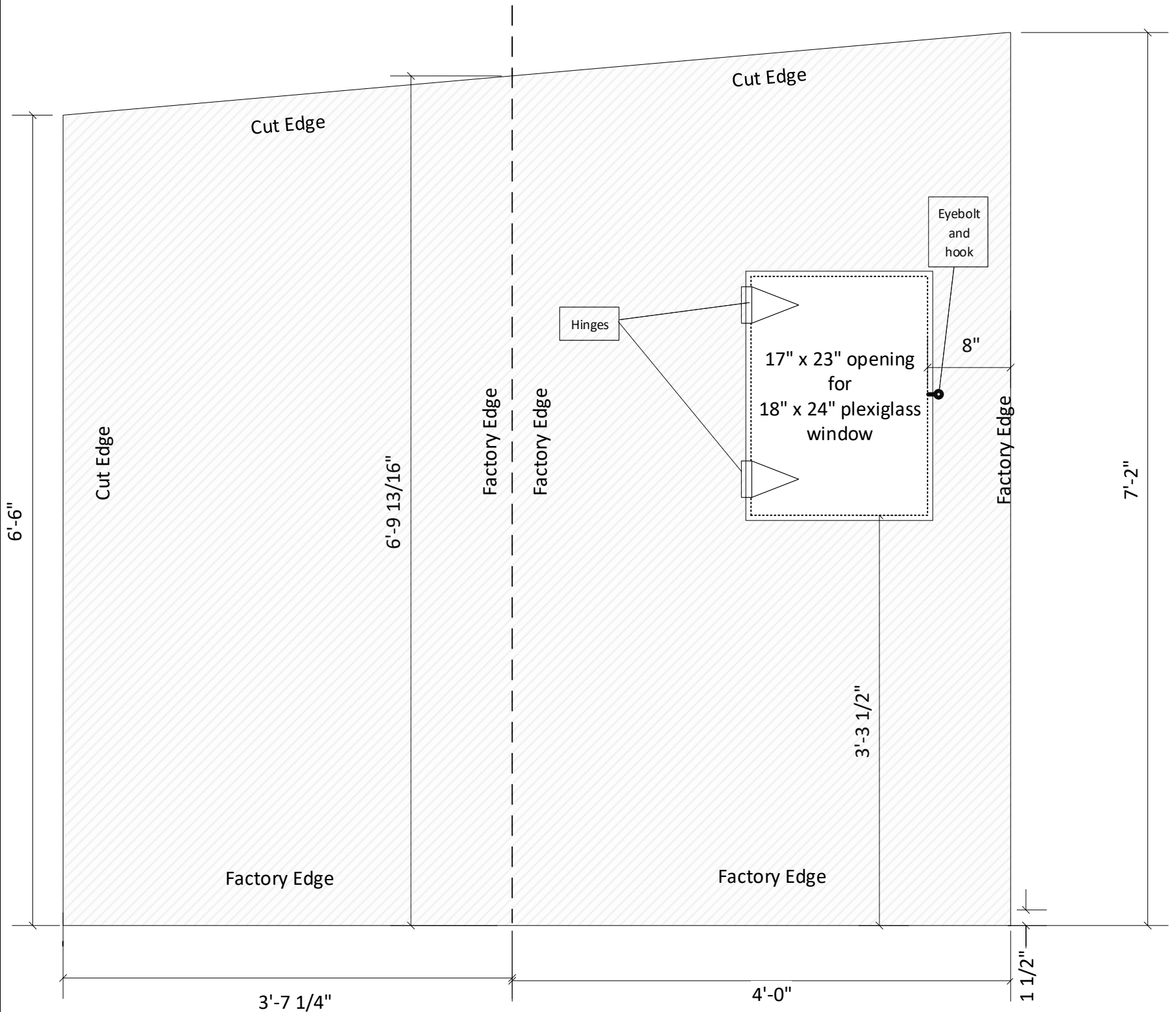
**Cut List:**

- (2) 6' 2x4's, vertical studs
- (1) 6'-9 1/2" 2x4, vertical stud
- (1) 7'-5 3/4" 2x4, top plate
- (1) 7'-7 1/4" 2x4, sill
- (1) 6'-2" 2x4, **w/ 5° cut**, rafter support
- (1) 4' x 6'-9 13/16" x 7'-2" x 3/8" plywood, wall  
 >> Attached hinges and cut out window <<
- (1) 3'-7 1/4" x 6'-6" x 6'-9 13/16" x 3/8" plywood, wall

7/19/2021

**Assembly:**

Assemble w/ C-side inwards (best mold control)  
 Cut hinge side of window, attach hinges, then cut most of window





**Materials:**

- (1) 12' 2x4's
- (4) 8' 2x4's
- (2) 4'x8'x3/8" CDX plywood
- (1) 18" x 24" plexiglass window
- (2) hinges for window
- (1) eyebolt and hook for window

# E Wall

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(all)

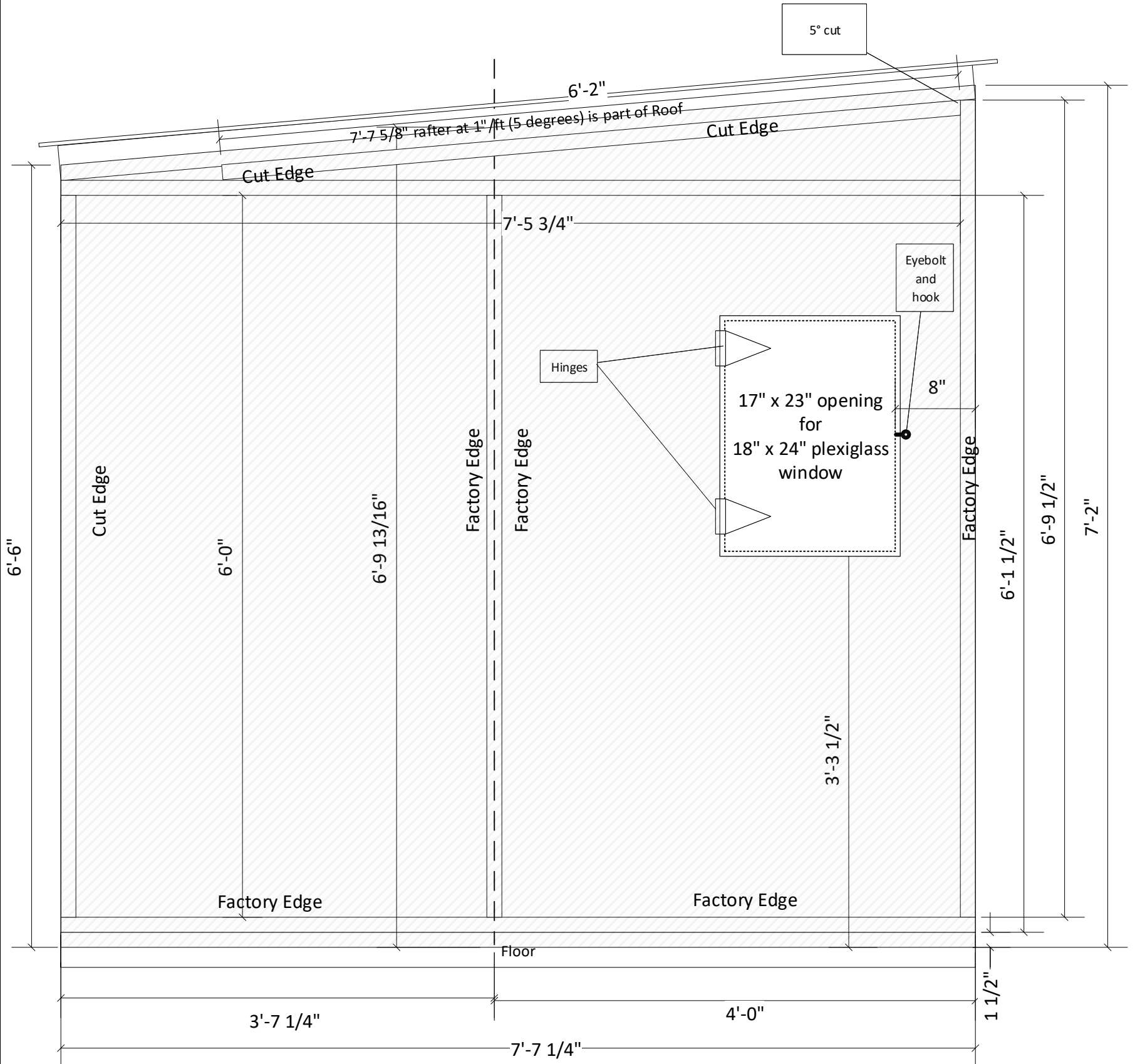
**Cut List:**

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- (1) 6'-9 1/2" 2x4, vertical stud
- (1) 7'-5 3/4" 2x4, top plate
- (1) 7'-7 1/4" 2x4, sill
- (1) 6'-2" 2x4, **w/ 5° cut**, rafter support
- (1) 4' x 6'-9 13/16" x 7'-2" x 3/8" plywood, wall  
    >> Attached hinges and cut out window <<
- (1) 3'-7 1/4" x 6'-6" x 6'-9 13/16" x 3/8" plywood, wall

7/19/2021

**Assembly:**

Assemble w/ C-side inwards (best mold control)  
 Cut hinge side of window, attach hinges, then cut most of window



**Materials:**

- (1 ½) 12' 2x4's
- (2) 8' 2x4's
- (2) 4'x8'x3/8" CDX plywood

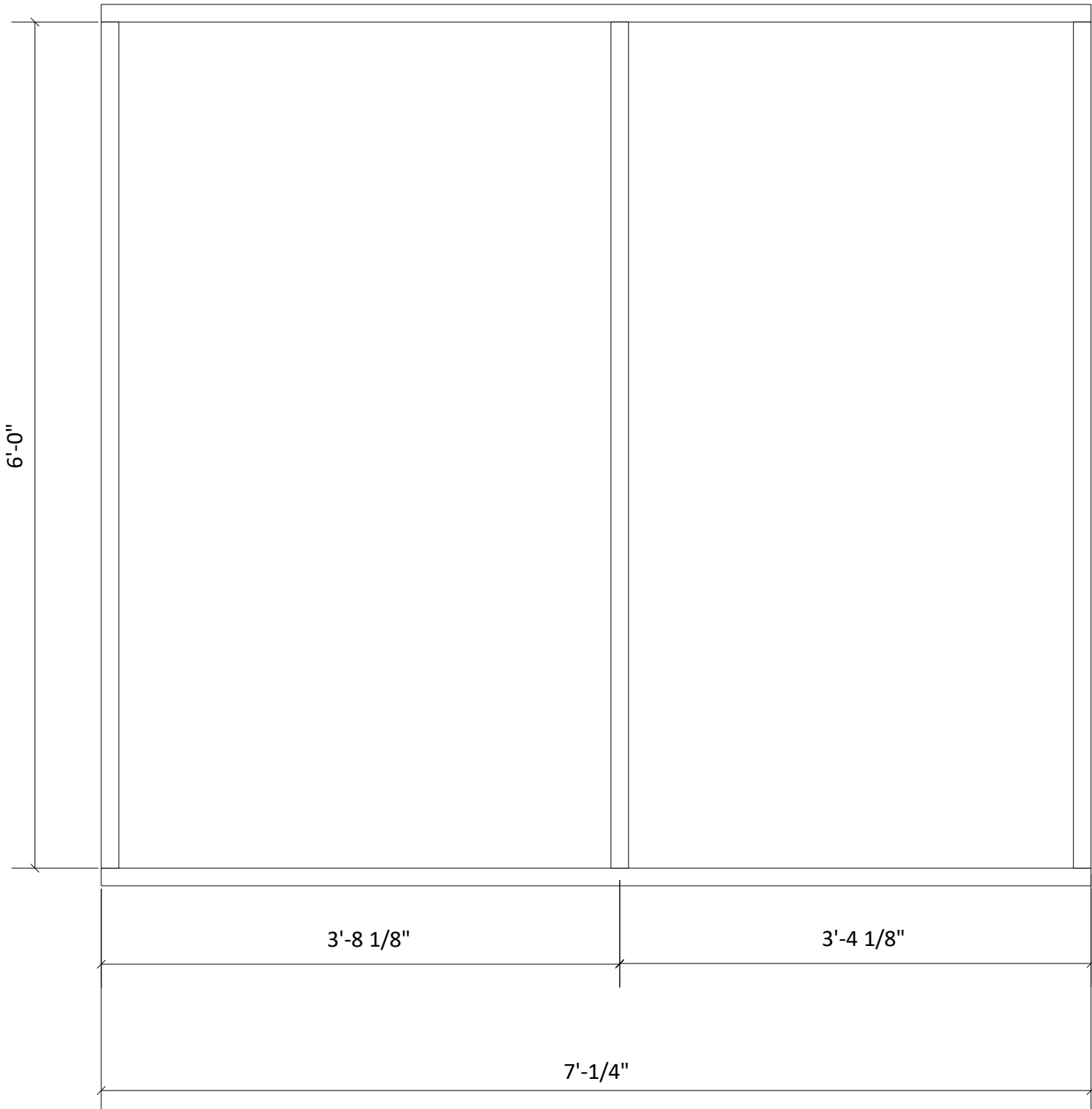
# S Wall

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**Cut List:**

- (3) 6' 2x4's, vertical studs from 12'ers 7/19/2021
- (2) 7'- 1/4" 2x4's, plate & sill
- (1) 4' x 6'-4 1/4" x 3/8" plywood, wall
- (1) 3'-8" x 6'-4 1/4" x 3/8" plywood, wall

## Framing



**Materials:**

- (1 1/2) 12' 2x4's
- (2) 8' 2x4's
- (2) 4'x8'x3/8" CDX plywood

# S Wall

pg. 27 of 42

**Cut List:**

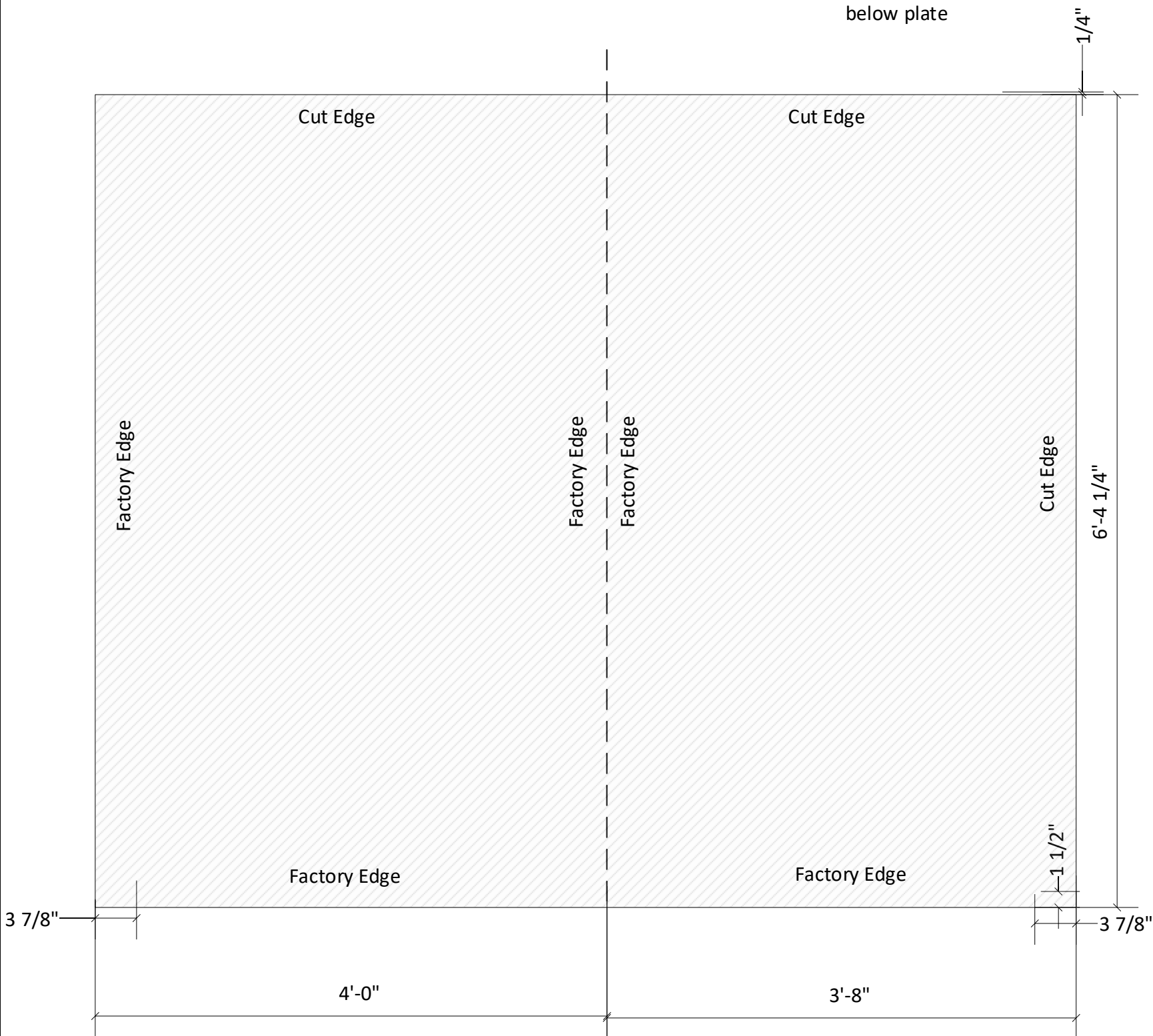
- (3) 6' 2x4's, vertical studs from 12'ers 7/19/2021
- (2) 7'- 1/4" 2x4's, plate & sill
- (1) 4' x 6'-4 1/4" x 3/8" plywood, wall
- (1) 3'-8" x 6'-4 1/4" x 3/8" plywood, wall

## Plywood

**Assembly:**

Assemble w/ C-side inwards (best mold control)

Note that  
plywood is 1/4"  
below plate



**Materials:**

- (1 1/2) 12' 2x4's
- (2) 8' 2x4's
- (2) 4'x8'x3/8" CDX plywood

# S Wall

pg. 28 of 42

**Cut List:**

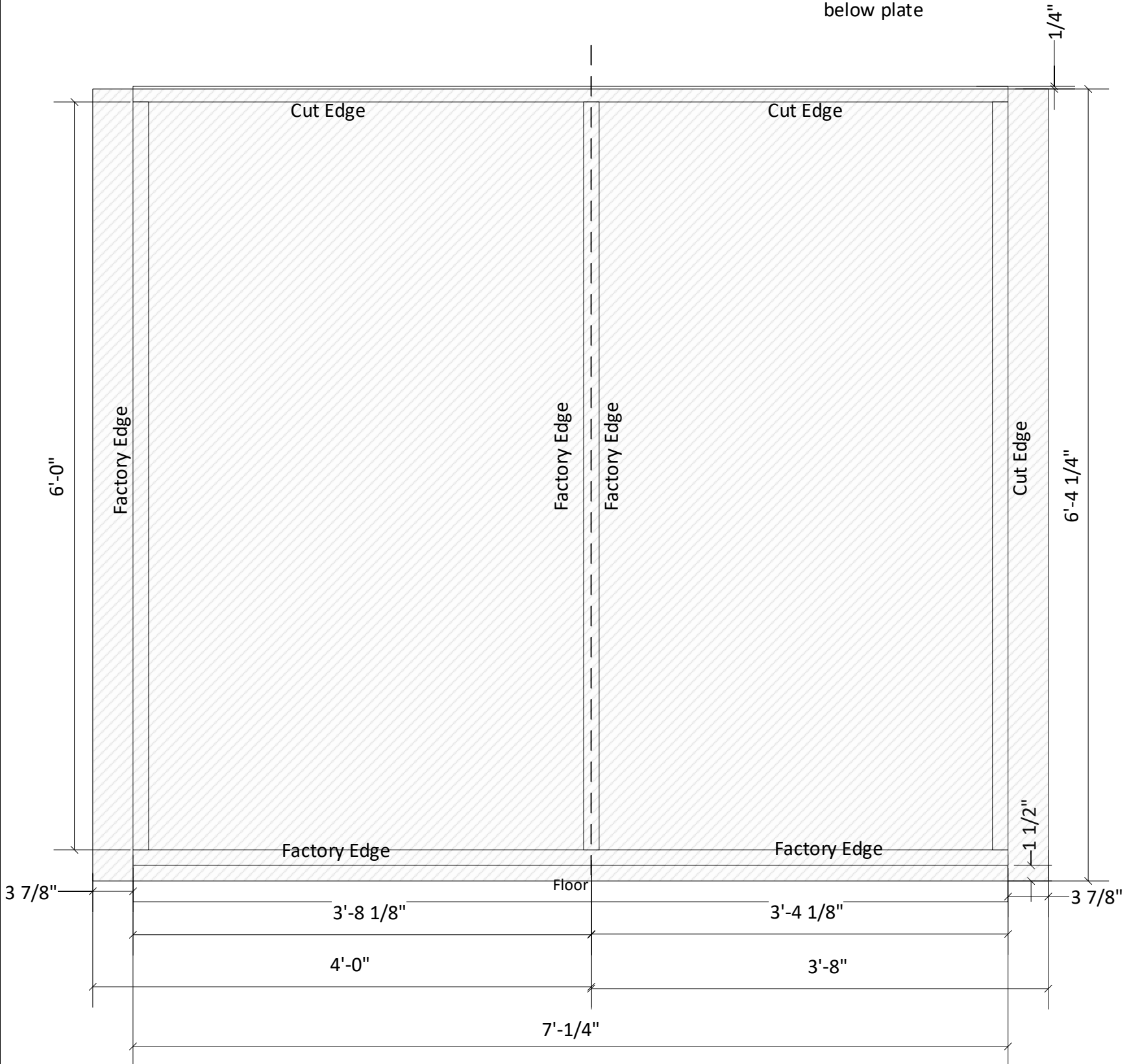
- (3) 6' 2x4's, vertical studs from 12'ers 7/19/2021
- (2) 7'- 1/4" 2x4's, plate & sill
- (1) 4' x 6'-4 1/4" x 3/8" plywood, wall
- (1) 3'-8" x 6'-4 1/4" x 3/8" plywood, wall

(all)

**Assembly:**

Assemble w/ C-side inwards (best mold control)

Note that  
plywood is 1/4"  
below plate



**Materials:**

- (7) 8' 2x4's
- (2) 12' 2x4
- (2) 4'x8'x3/8" CDX plywood

# N Wall

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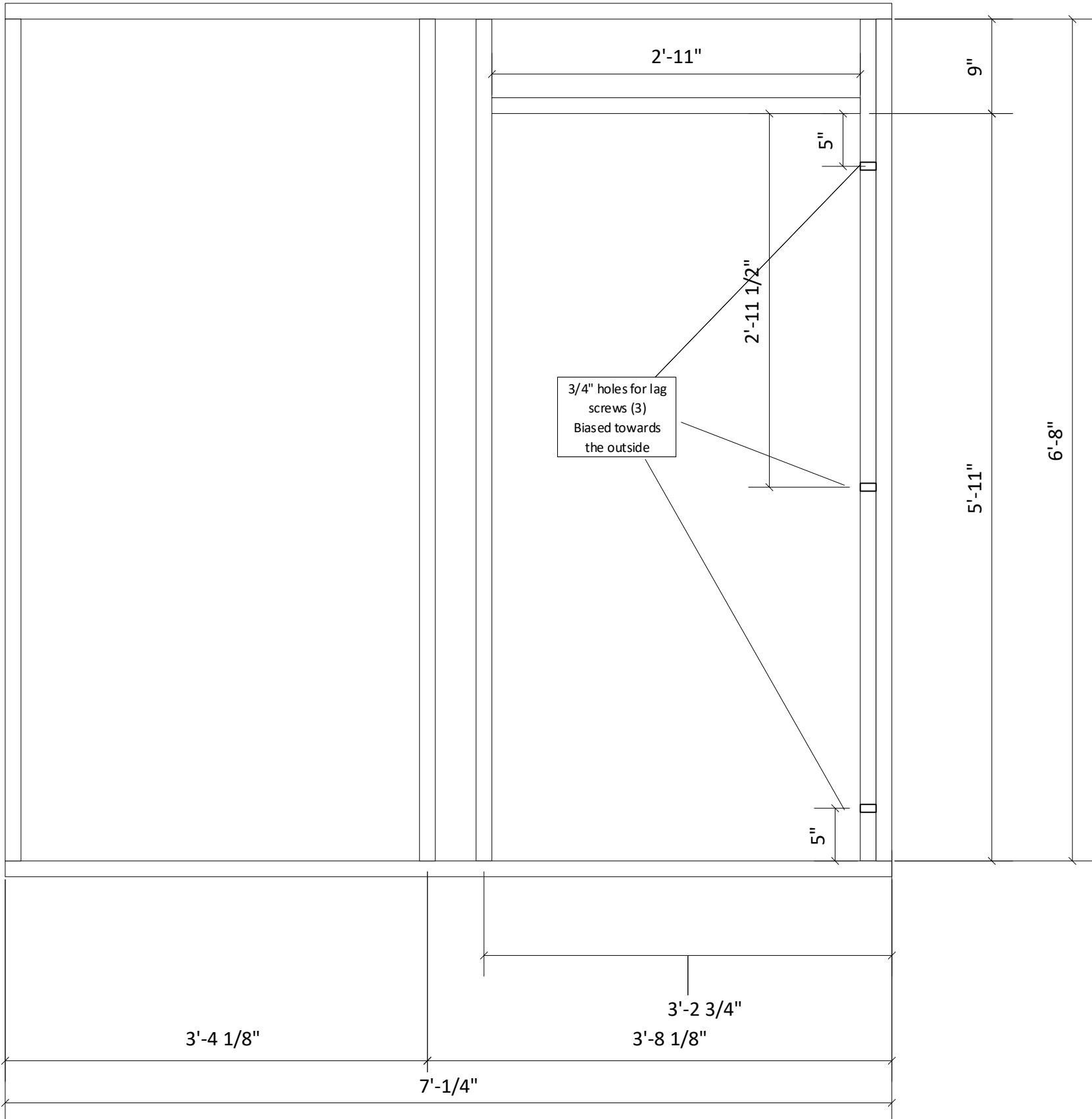
## Framing

**Cut List:**

- (5) 6'-8" 2x4's, vertical studs, 1 drilled 7/19/2021
- (2) 7'- 1/4" 2x4's, plate and sill
- (1) 2'-11" 2x4, plate above door
- (2) 5'-6" 2x4's, door, 1 w/ 3 3/4" x 1 5/8" notch
- (2) 2'-10" 2x4's, door
- (1) 4' x 7' 1/4" x 3/8" plywood, wall
- (1) 3'-8" x 7' 1/4" x 3/8" plywood, wall

**Assembly:**

Cut door w/ 2 blades before nailing plywood so nails don't interfere  
 After cutting out door, label and set aside to be reattached w/ hinges  
 Assemble w/ C-side inwards (best mold control)



**Materials:**

- (7) 8' 2x4's
- (2) 12' 2x4
- (2) 4'x8'x3/8" CDX plywood

# N Wall

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## Plywood

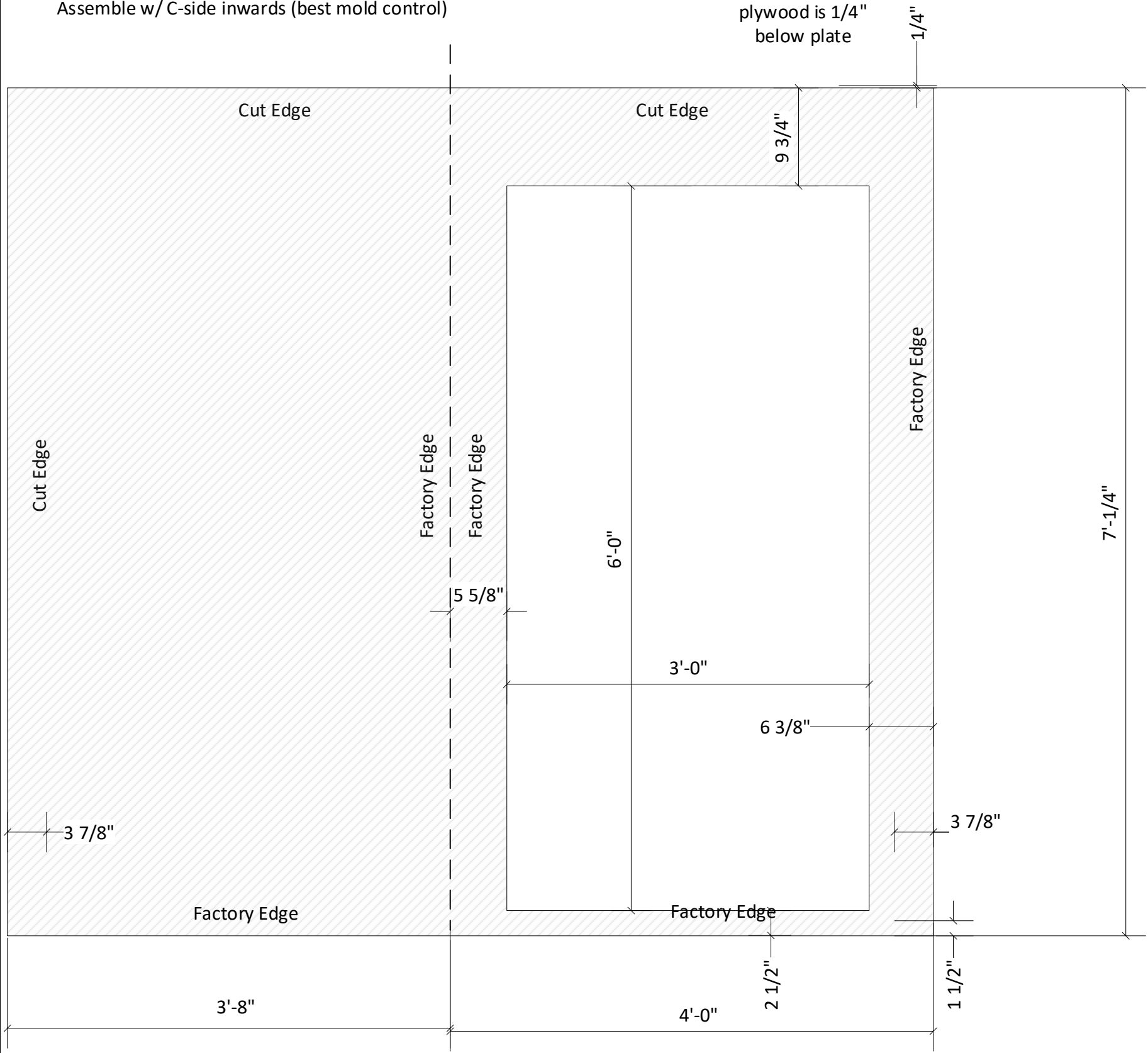
**Cut List:**

- (5) 6'-8" 2x4's, vertical studs, 1 drilled 7/19/2021
- (2) 7'- 1/4" 2x4's, plate and sill
- (1) 2'-11" 2x4, plate above door
- (2) 5'-6" 2x4's, door, 1 w/ 3 3/4" x 1 5/8" notch
- (2) 2'-10" 2x4's, door
- (1) 4' x 7' 1/4" x 3/8" plywood, wall
- (1) 3'-8" x 7' 1/4" x 3/8" plywood, wall

**Assembly:**

Cut door w/ 2 blades before nailing plywood so nails don't interfere  
 After cutting out door, label and set aside to be reattached w/ hinges  
 Assemble w/ C-side inwards (best mold control)

Note that  
 plywood is 1/4"  
 below plate



**Materials:**

- (7) 8' 2x4's
- (2) 12' 2x4
- (2) 4'x8'x3/8" CDX plywood

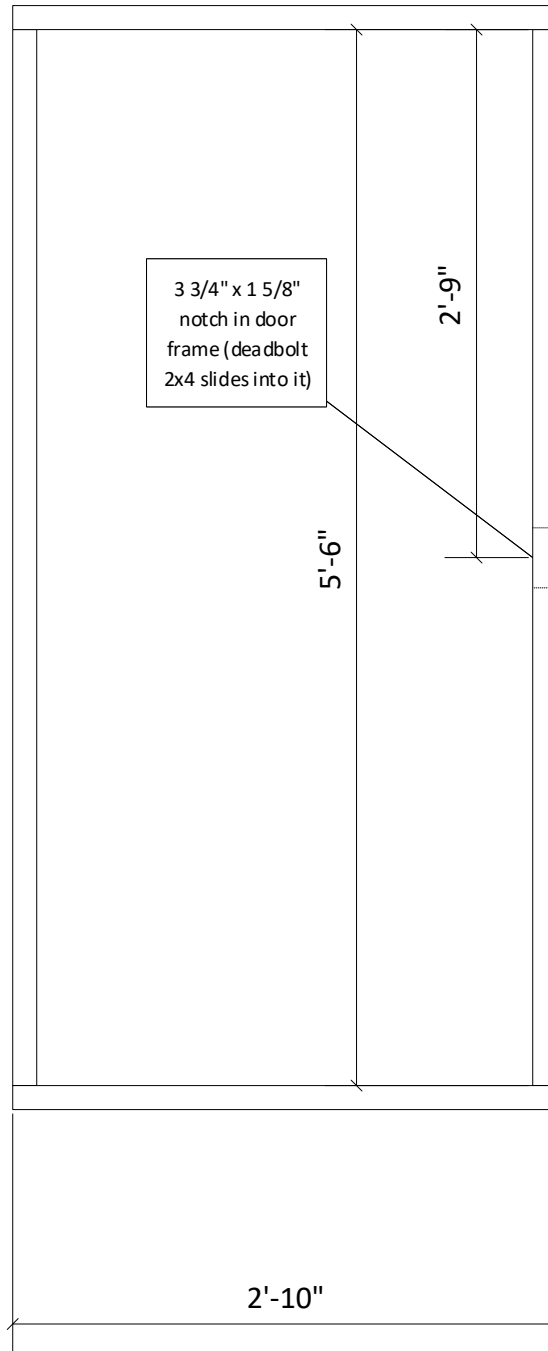
# N Wall

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## Door Frame

**Cut List:**

- (5) 6'-8" 2x4's, vertical studs, 1 drilled 7/19/2021
- (2) 7'- 1/4" 2x4's, plate and sill
- (1) 2'-11" 2x4, plate above door
- (2) 5'-6" 2x4's, door, 1 w/ 3 3/4" x 1 5/8" notch
- (2) 2'-10" 2x4's, door
- (1) 4' x 7' 1/4" x 3/8" plywood, wall
- (1) 3'-8" x 7' 1/4" x 3/8" plywood, wall



**Materials:**

- (7) 8' 2x4's
- (2) 12' 2x4
- (2) 4'x8'x3/8" CDX plywood

# N Wall

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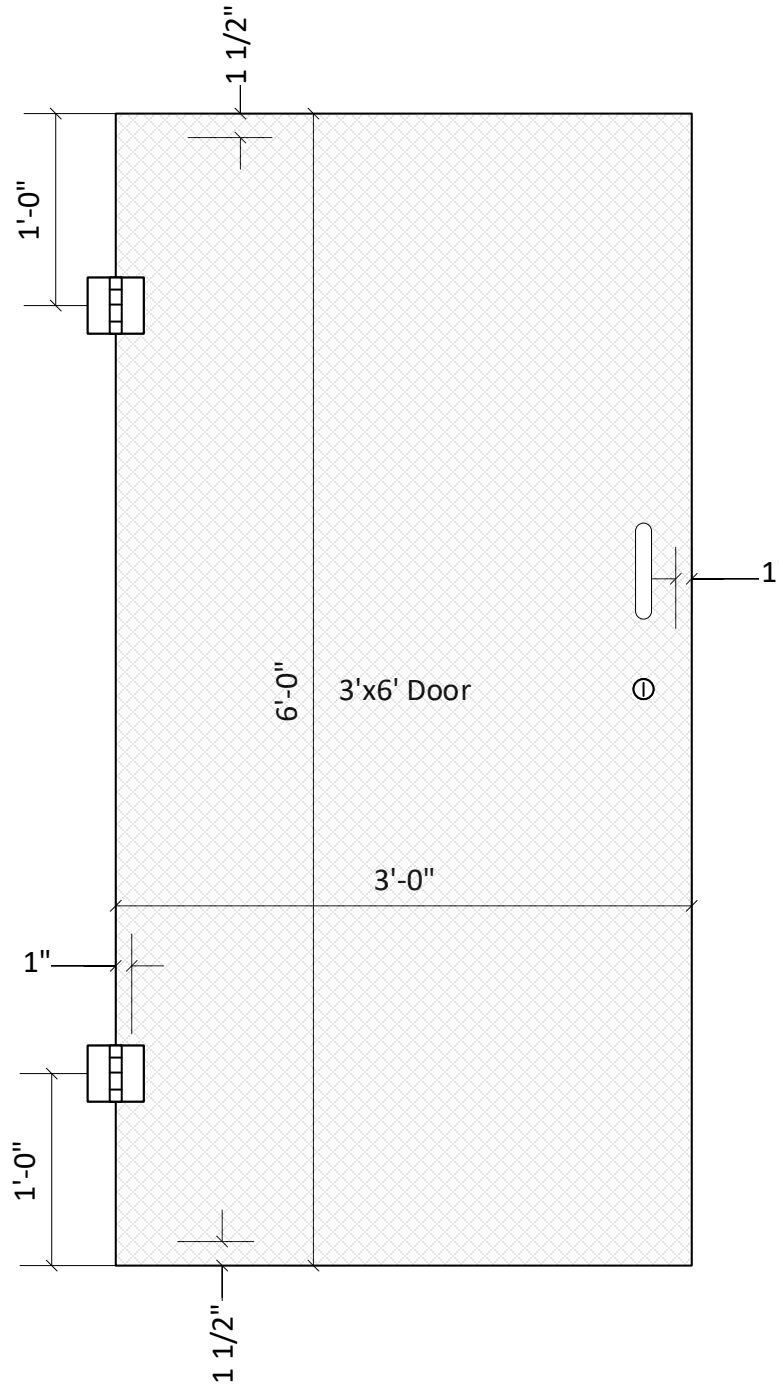
## Door

**Cut List:**

- (5) 6'-8" 2x4's, vertical studs, 1 drilled 7/19/2021
- (2) 7'- 1/4" 2x4's, plate and sill
- (1) 2'-11" 2x4, plate above door
- (2) 5'-6" 2x4's, door, 1 w/ 3 3/4" x 1 5/8" notch
- (2) 2'-10" 2x4's, door
- (1) 4' x 7' 1/4" x 3/8" plywood, wall
- (1) 3'-8" x 7' 1/4" x 3/8" plywood, wall

**Assembly:**

Cut door w/ 2 blades before nailing plywood so nails don't interfere  
 After cutting out door, label and set aside to be reattached w/ hinges  
 Assemble w/ C-side inwards (best mold control)





**Materials:**

- (7) 8' 2x4's
- (2) 12' 2x4
- (2) 4'x8'x3/8" CDX plywood

# N Wall

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(all)

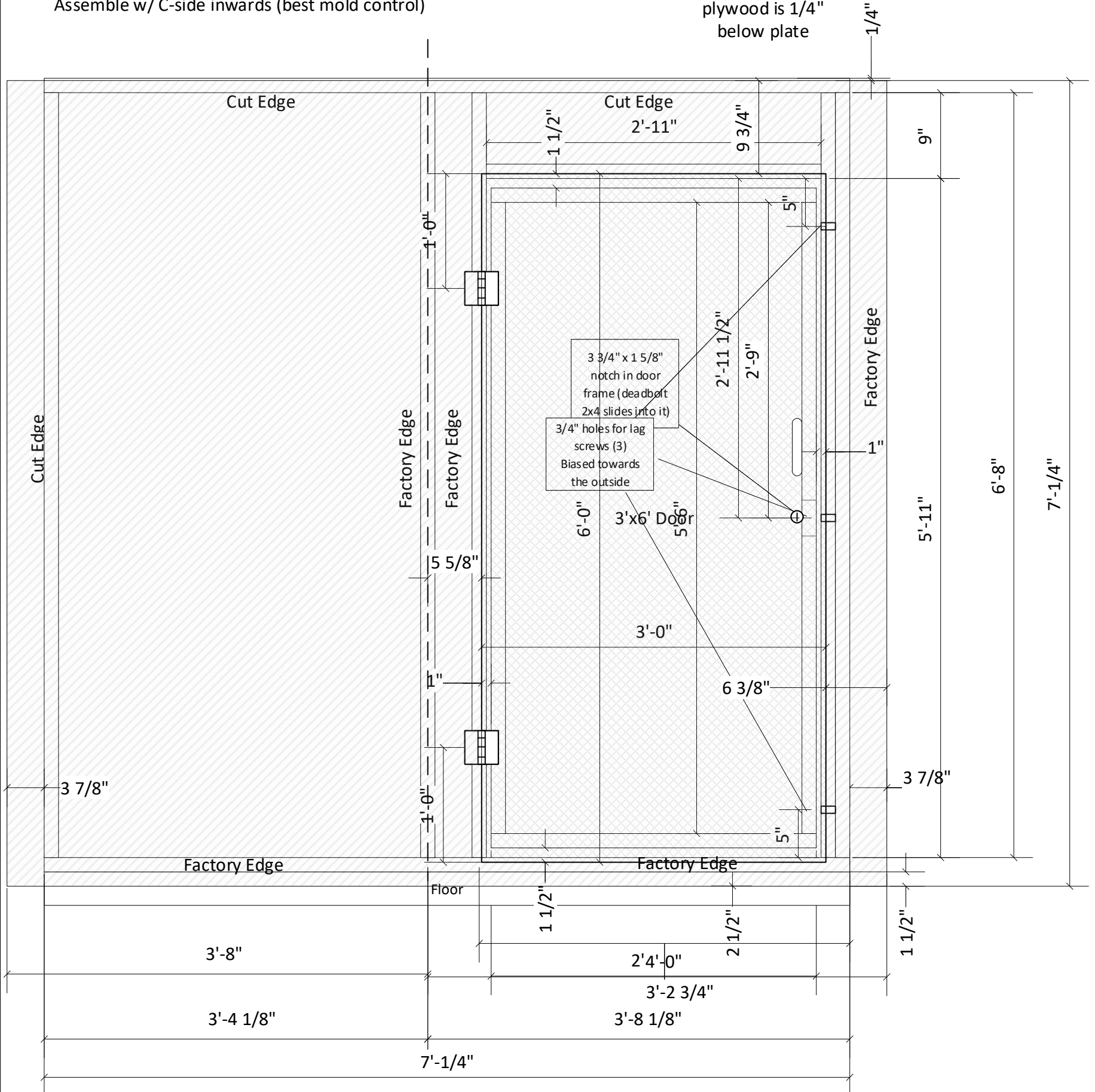
**Cut List:**

- (5) 6'-8" 2x4's, vertical studs, 1 drilled 7/19/2021
- (2) 7'-1/4" 2x4's, plate and sill
- (1) 2'-11" 2x4, plate above door
- (2) 5'-6" 2x4's, door, 1 w/ 3 3/4" x 1 5/8" notch
- (2) 2'-10" 2x4's, door
- (1) 4' x 7' 1/4" x 3/8" plywood, wall
- (1) 3'-8" x 7' 1/4" x 3/8" plywood, wall

**Assembly:**

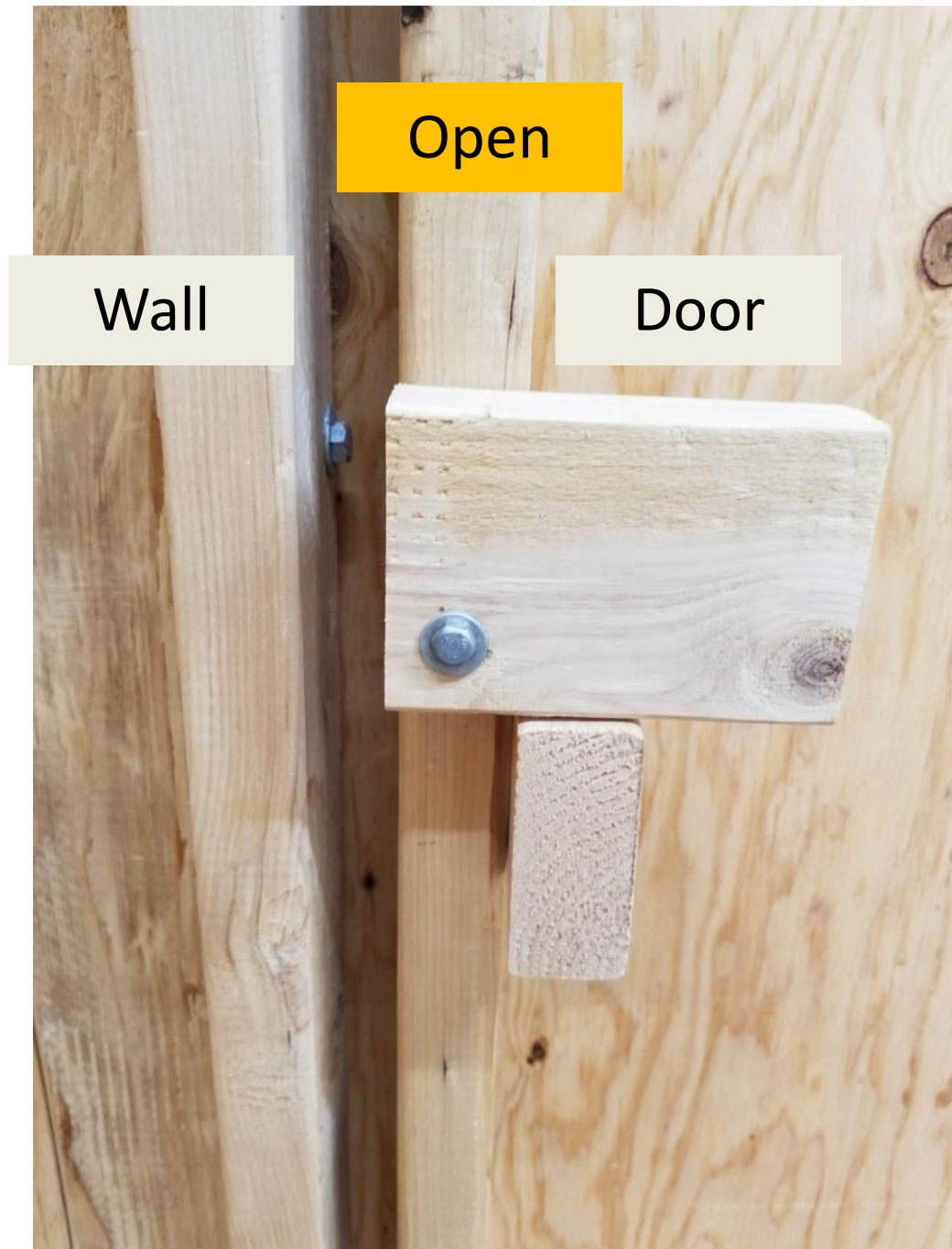
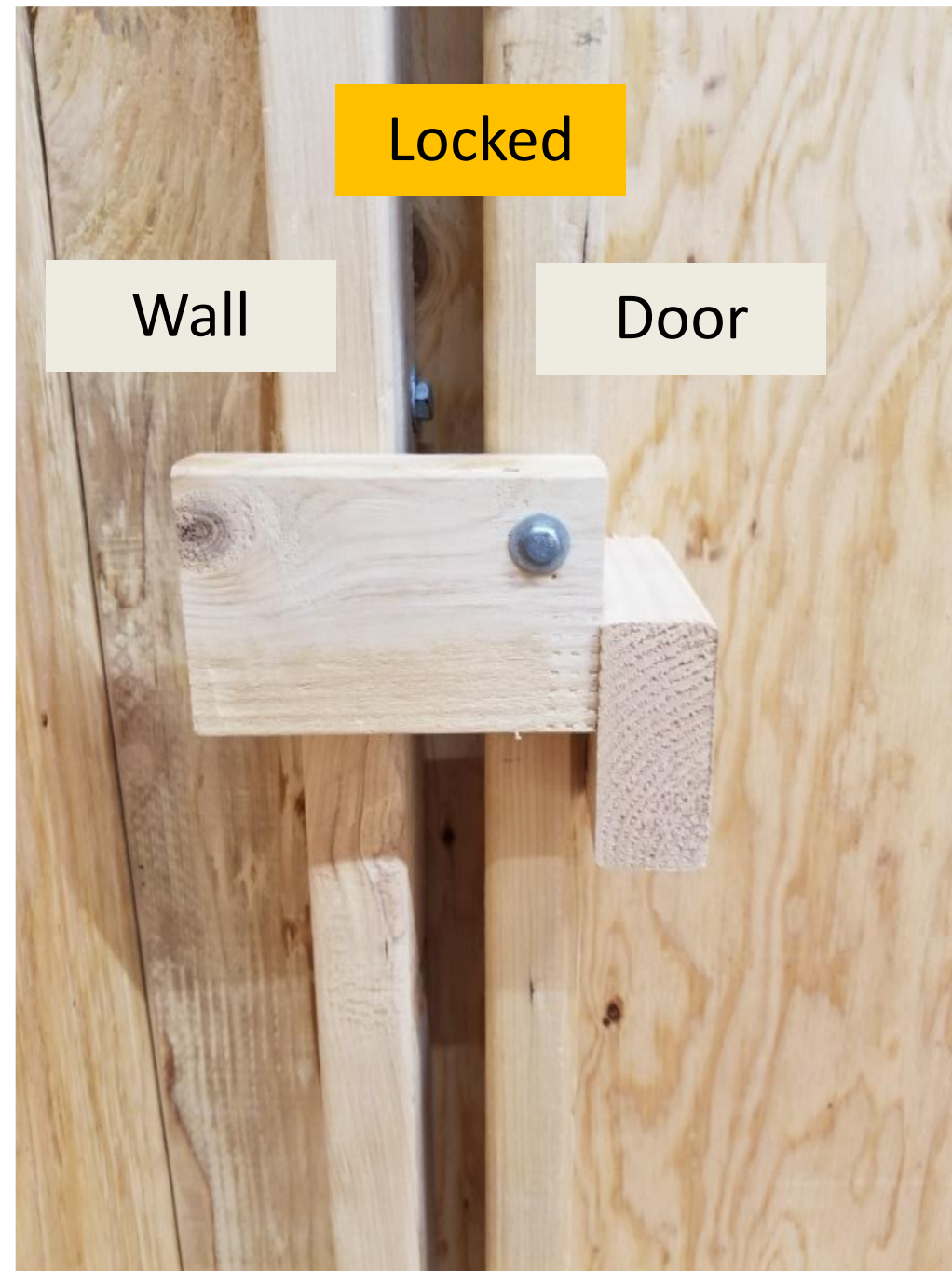
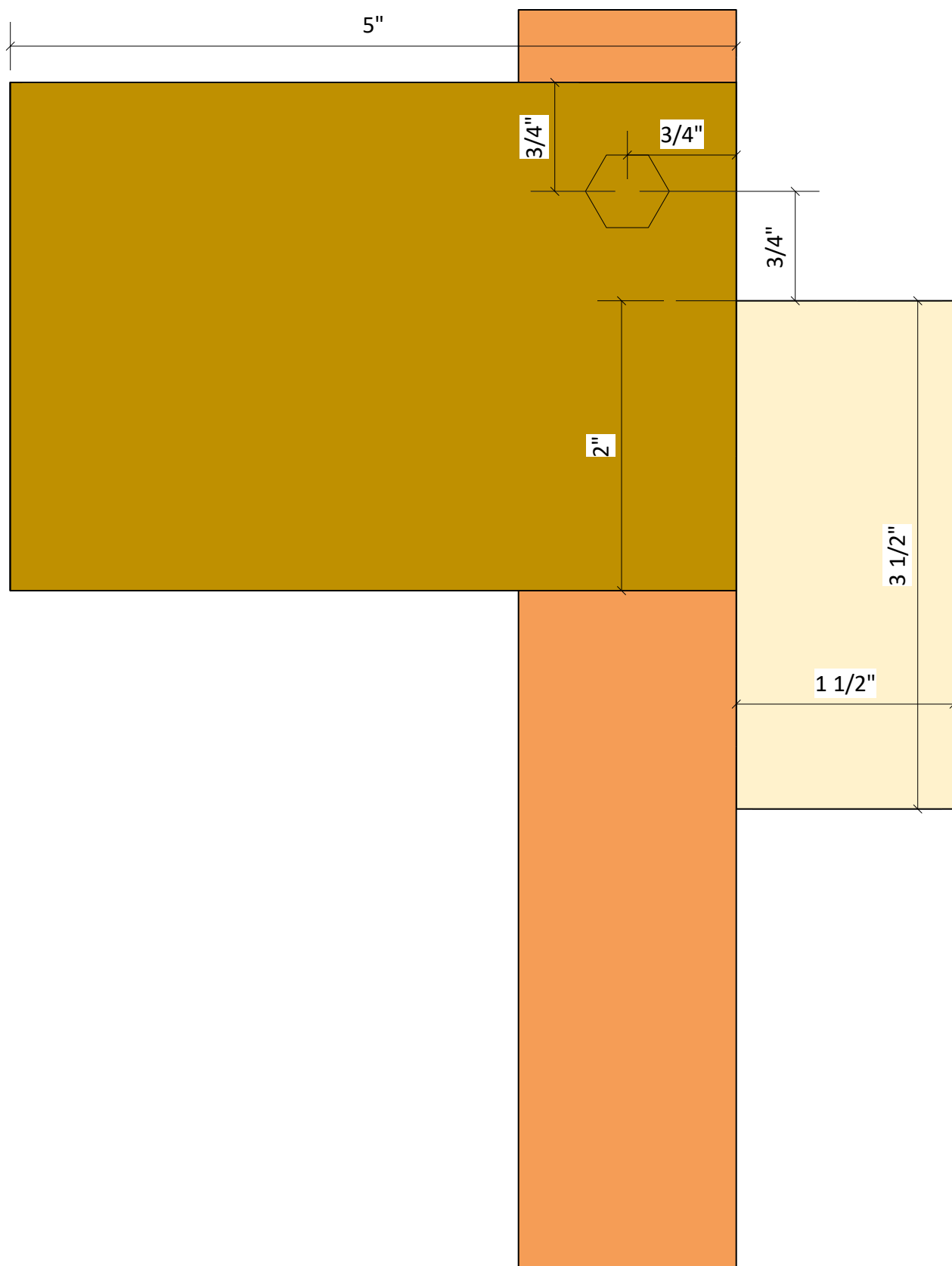
Cut door w/ 2 blades before nailing plywood so nails don't interfere  
 After cutting out door, label and set aside to be reattached w/ hinges  
 Assemble w/ C-side inwards (best mold control)

Note that plywood is 1/4" below plate



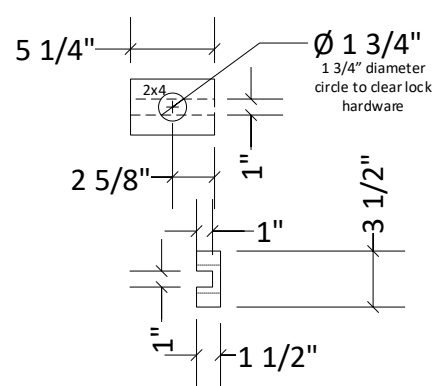
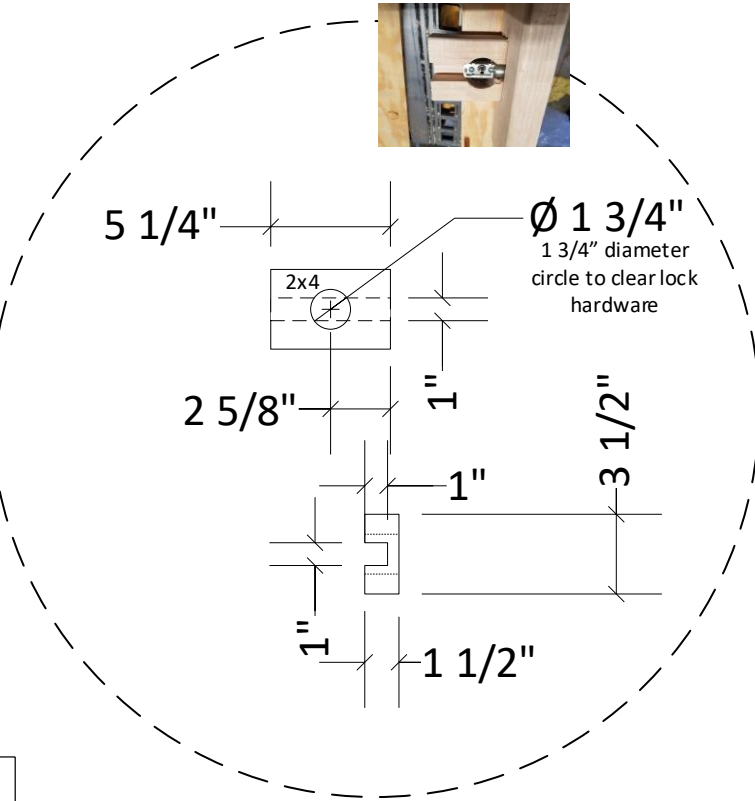
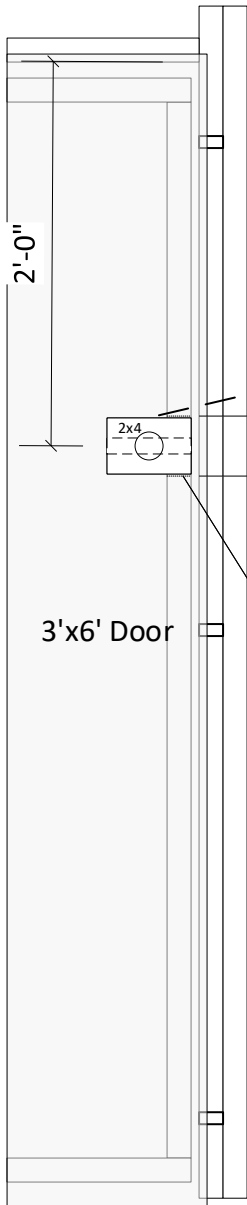
# Door latch from (2) 5" 2x4's and lag screw/washer

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# Deadbolt Mount

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# Window Frame

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## Materials:

(1.5) Trim Board Primed Finger-Joint (Common: 1 in. x 2 in. x 8 ft.; Actual: 3/4" x 1 1/2")

## Trim manufacture:

Remove 1/2 of trim material to make room for plexiglass

(see figure a)

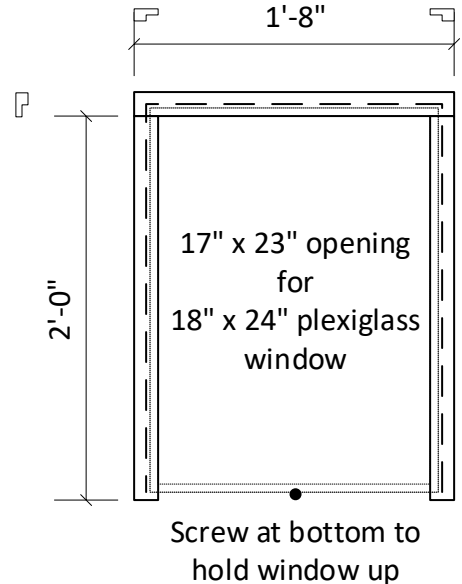
Nail or screw trim around window, flush w/ opening

Slide window up from bottom

Hold window in place w/ screw at bottom



Fig. a: Side view of  
trim w/ 1/2 removed



# 7'-1 1/4" x 2'-6" Folding (Murphy) Bed Frame

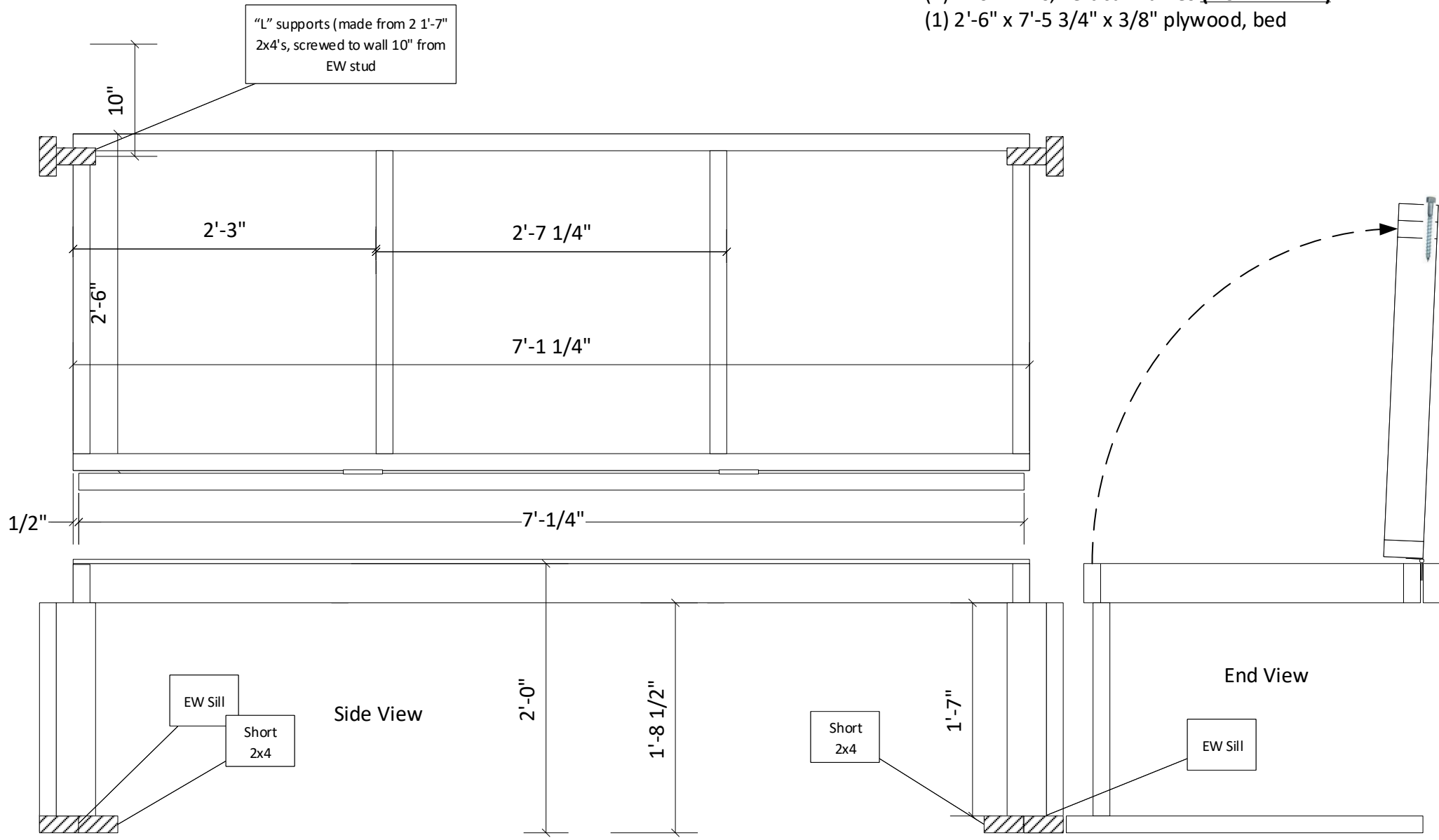
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## Materials:

- (4) 8' 2x4's
- (1) 12' 2x4
- (2) 4'x8'x3/8" CDX plywood

## Cut List:

- (1) 7'-4" 2x4's, mount
- (2) 7'-5 3/4" 2x4's, horizontal frames
- (4) 1'-7" 2x4's, legs
- (4) 2'-6" 2x4's, vertical frames **(from 12' 2x4)**
- (1) 2'-6" x 7'-5 3/4" x 3/8" plywood, bed



# Costs

7/19/2021

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## Materials List for 5 Microshelters w/ bed (Lowe's, retail)

#	Parts Descriptions	Each	Extra	Total	Lowe's item #	Actual Description	Price ea.	Total Price	Comments
1	16' 2x4's, pressure treated	3.5		18	476213	Severe Weather 2-in x 4-in x 16-ft Premium Pressure Treated Lumber	\$ 22.37	\$ 402.66	
2	8' 2x4	28.5		143	7033	2-in x 4-in x 8-ft Douglas Fir Pre-Cut Stud (Common); 1.5-in x 3.5-in x 92-5/8-in (Actual)	\$ 7.96	\$ 1,138.28	
3	12' 2x4's	6.25		32	130744	2-in x 4-in x 12-ft Douglas Fir Lumber (Common); 1.5-in x 3.5-in x 12-ft (Actual)	\$ 15.12	\$ 483.84	
4	4'x8'x3/8" CDX plywood	11		55	12181	3/8 Cat Ps1-09 Square Structural Douglas Fir Sheathing, Application as 4 x 8	\$ 50.03	\$ 2,751.65	
5	4'x8'x5/8" (or 1/2") CDX plywood	2		10	12178	19/32 Cat Ps1-09 Square Structural Douglas Fir Sheathing, Application as 4 x 8	\$ 71.27	\$ 712.70	
6	1x2x8' Trim	2.5		13	1408	1-in x 2-in x 8-ft Whitewood Board	\$ 3.39	\$ 44.07	
7	Construction adhesive	0.25		2	44906	LIQUID NAILS LN-901 HEAVY DUTY 11-oz	\$ 2.98	\$ 5.96	
8	72 ft^2 rolled roofing	0.75		4	10285	Owens Corning 3-ft W x 36-ft L 100-sq ft Shasta White Roll Roofing	\$ 42.98	\$ 171.92	\$40/100ft (1 square), need 72
9	Rolled roofing adhesive	3		15	12011	BLACK JACK 3.6-Quart Fibered Waterproofing Cement Roof Sealant	\$ 13.68	\$ 205.20	Enough for 5 shelters
10	8' Drip Edge Flashing	1		5	3429684	Gibraltar Building Products 2-in x 10-ft White Galvanized Steel Drip Edge	\$ 4.78	\$ 23.90	
11	5 gallon semi gloss exterior paint (2 coats)	0.5		3	936263	Valspar SeasonFlex Ultra White/Base1 Semi-Gloss Exterior Tintable Paint (5-Gallon), "Cream in my Coffee" Tint	\$ 143.00	\$ 429.00	400 ft/gallon, need 320*2=640, enough for 2 shelters
12	1 gallon Patio & Floor paint (2 coats)	0.5		3	123265	Valspar Tintable Satin Exterior Porch and Floor Paint (1-Gallon)	\$ 29.98	\$ 89.94	400 ft/gallon, need 64*2 = 128, enough for 2 shelters
13	Paint roller covers	0.3		2	1021449	Purdy Contractor 1st 3-Pack 9-in x 3/8-in Knit Polyester Paint Roller Cover	\$ 7.98	\$ 15.96	Enough for several shelters
14	Paint brushes	0.3		2	1035775	Project Source 3-Pack Utility Polyester Flat and Angle 3-in Paint Brush Set	\$ 9.48	\$ 18.96	Enough for several shelters
15	Paint roller pan covers	0.3		2	1060890	Valspar 3-Pack 15.5-in x 9.25-in Paint Tray Liner	\$ 2.58	\$ 5.16	Enough for several shelters
16	(2) 18" x 24" plexiglass window	2		10	78778	OPTIX 0.08-in T x 18-in W x 24-in L Clear Acrylic Sheet	\$ 14.48	\$ 144.80	
17	21°, 3" x .120" Framing nails, exterior, galv., 1,000 pcs	0.3		2	126174	Metabo HPT (was Hitachi Power Tools) 3-in 21-Degree Pneumatic Framing Nails (1000-Count)	\$ 32.48	\$ 64.96	Enough for several shelters
18	1-1/4" Roofing nails, 7200	0.2		1	688873	Metabo HPT (was Hitachi Power Tools) 1-1/4-in 15-Gauge Electro-Galvanized Steel Pneumatic Roofing Nails (7200-Count)	\$ 35.98	\$ 35.98	Enough for 5 shelters
19	#10 x 3-1/8" lag screws	0.127		1	2886388	GRK #10 x 3-1/8-in Climatek-coated Polymer Round Washer Exterior Multi-Material Screws (236-Count)	\$ 45.21	\$ 45.21	236, enough for 8 shelters (30 screws each)
20	Hinges for door and bed, 12-pack	0.33		2	352846	Gatehouse Satin Nickel 5/8-in Radius Mortise Door Hinge (12-Pack)	\$ 25.48	\$ 50.96	Enough for 4 shelters w/ beds, 6 w/o
21	(4) Hinges for windows	2		10	308971	Gatehouse 2-1/2-in Zinc Mortise Door Hinge (2-Pack)	\$ 2.78	\$ 27.80	
22	(2) eyebolts and hook for windows (pkg of 2)	1		5	330641	Blue Hawk Steel Gate Hook and Eye (2-Pack)	\$ 1.28	\$ 6.40	
23	Eyebolt and hook for bed	1		5	58432	Blue Hawk Steel Gate Hook and Eye	\$ 1.28	\$ 6.40	Spring loaded catch to prevent accidental opening
24	Deadbolt	1		5	806902	Kwikset Security 600 Deadbolt Series Satin Chrome with SmartKey Single Cylinder Deadbolt	\$ 17.28	\$ 86.40	Deadbolt + handle replaces hasp
25	Handle for door	1		5	308985	Gatehouse Home Hardware Zinc-Plated Screen/Storm Door Pull Handle	\$ 3.48	\$ 17.40	Handle can be made from 2x4 (see plan)
26	Smoke and Carbon Monoxide Detector	1		5	986241	First Alert Smoke and Carbon Monoxide Detector	\$ 37.48	\$ 187.40	
								\$ 7,172.91	Pre-tax Total

# shelters Bed?

5 Yes

Total price per shelter: \$ 1,434.58

Price for materials for only one shelter: \$ 1,344.91

Price for materials for several shelters: \$ 442.39

# Pod Costs

7/19/2021

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## Materials List for 5 Micropods (Lowe's, retail)

#	Parts Descriptions	Each	Extra	Total	Lowe's item #	Actual Description	Price ea.	Total Price	Comments
1	8' 2x4's, pressure treated	1.25		7	476163	2-in x 4-in x 8-ft #2 Square Pressure Treated Lumber	\$ 10.27	\$ 71.89	
3	8' 2x4	9		45	7033	2-in x 4-in x 8-ft Douglas Fir Pre-Cut Stud (Common); 1.5-in x 3.5-in x 92-5/8-in (Actual)	\$ 7.96	\$ 358.20	
5	4'x8'x3/8" CDX plywood	2.5		13	12181	3/8 Cat Ps1-09 Square Structural Douglas Fir Sheathing, Application as 4 x 8	\$ 50.03	\$ 650.39	
								\$ 1,080.48	Pre-tax Total

# shelters

5

Total price per pod: \$ 216.10





# Microshelter “Aftermarket Improvements”

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Suggested Microshelter “Aftermarket Improvements” that community groups might want to donate:

- Micropods. Design included in plans, about \$300 in materials
- Insulation for the roof (1st insulation priority)
  - a. One panel with 1.5” insulation and 20 pins would cost ~\$66 w/ tax
- Insulation for the walls
  - a. One Microshelter (5 panels, 1.5” insulation, 100 pins) would cost ~\$240
- “Porch”: a sheet of plywood over the door to provide a covered outside area
- Shelves, possibly including a mini attic
- Wall covering (sheetrock or equivalent)
- Passive (desiccant) dehumidifiers
- Bedding materials
- Caulking
- Coat racks
- Better flooring (linoleum, carpeting, etc.)
- Battery (or solar?) powered ceiling light
- Curtains

# Revision History

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6/5/21:

- 1) Added 8'x12' option
- 2) Adjusted formulas for weights and costs spreadsheets
- 3) Some cleanup, including moving deadbolt to center of door

6/10/21, 6/11/21:

- 1) Minor cleanups on both (8'x8', 8'x12') versions
- 2) Increased bed size to 4' wide for 8'x12' version

6/15/21: Fixed dimensions on 1p5 roof

6/25/21:

- 1) Removed 8' x 8' justification & door handle
- 2) Modified beds to sit on supports screwed to walls
- 3) Added construction adhesive to walls
- 4) Added plywood to roof ends for a little more overhang
- 5) Small fixes during prototype build

7/9/21:

- 1) Added pod to W wall
- 2) Moved window of W wall
- 3) E wall is now separate from W wall

7/18/21: Small edits, bed is now integral part of design