

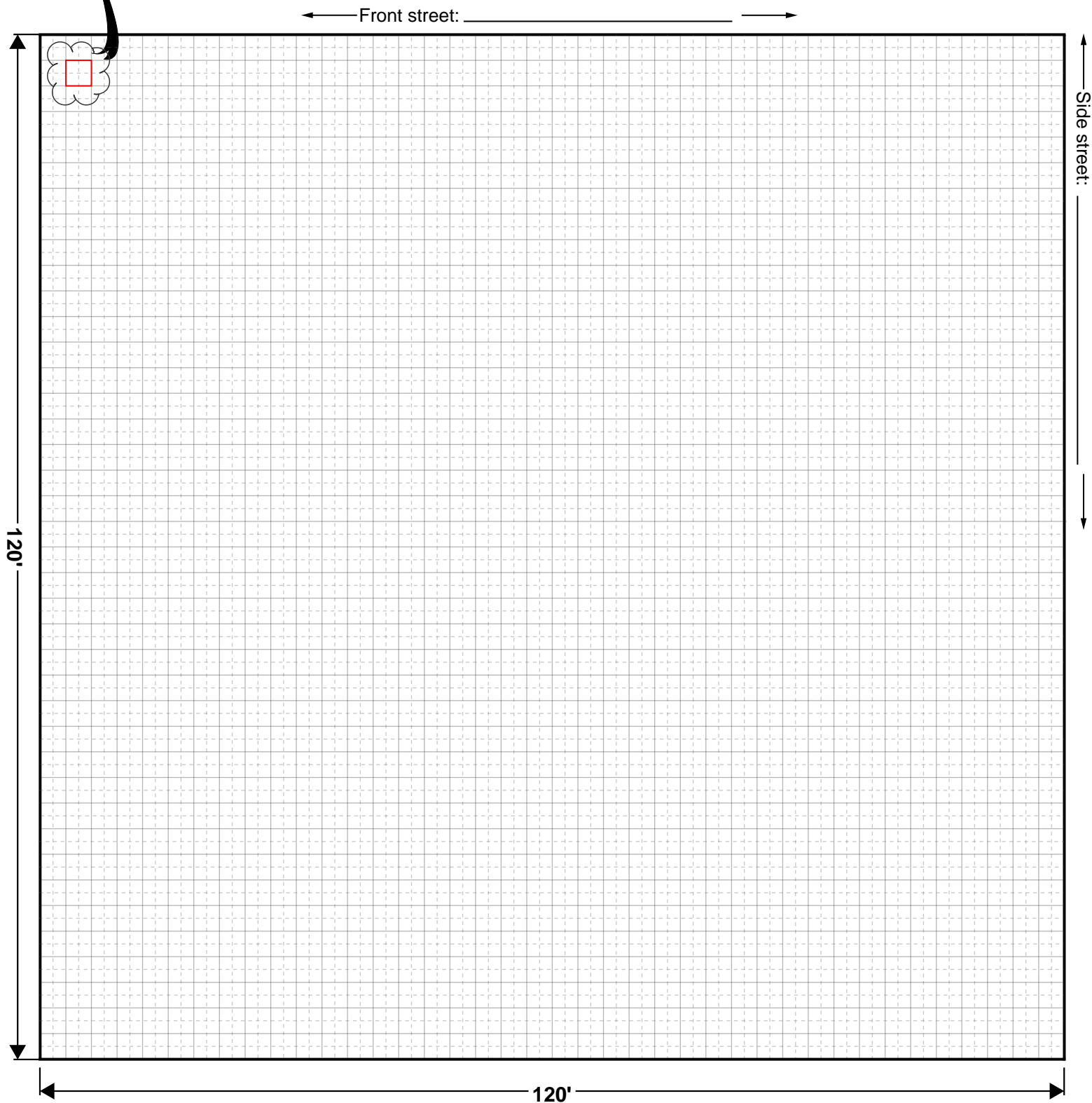
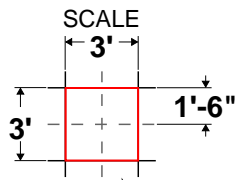
CITY OF BILLINGS
COVERED PATIO/CARPORT SUBMITTAL WORKBOOK



SITE PLAN

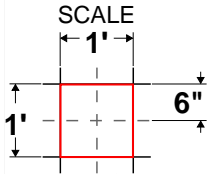
1. Show lot lines.
2. Show setbacks from all property lines (5' is typical; check with Planning for information on setbacks).
3. Show all structures - existing and proposed.
4. Show width and length of the proposed patio cover/carport.

This will be a very broad view of the lot, house, and covered patio/carport. Use page 3 to draw a detailed plan view of the covered patio/carport. See example on page 9.



PLAN VIEW

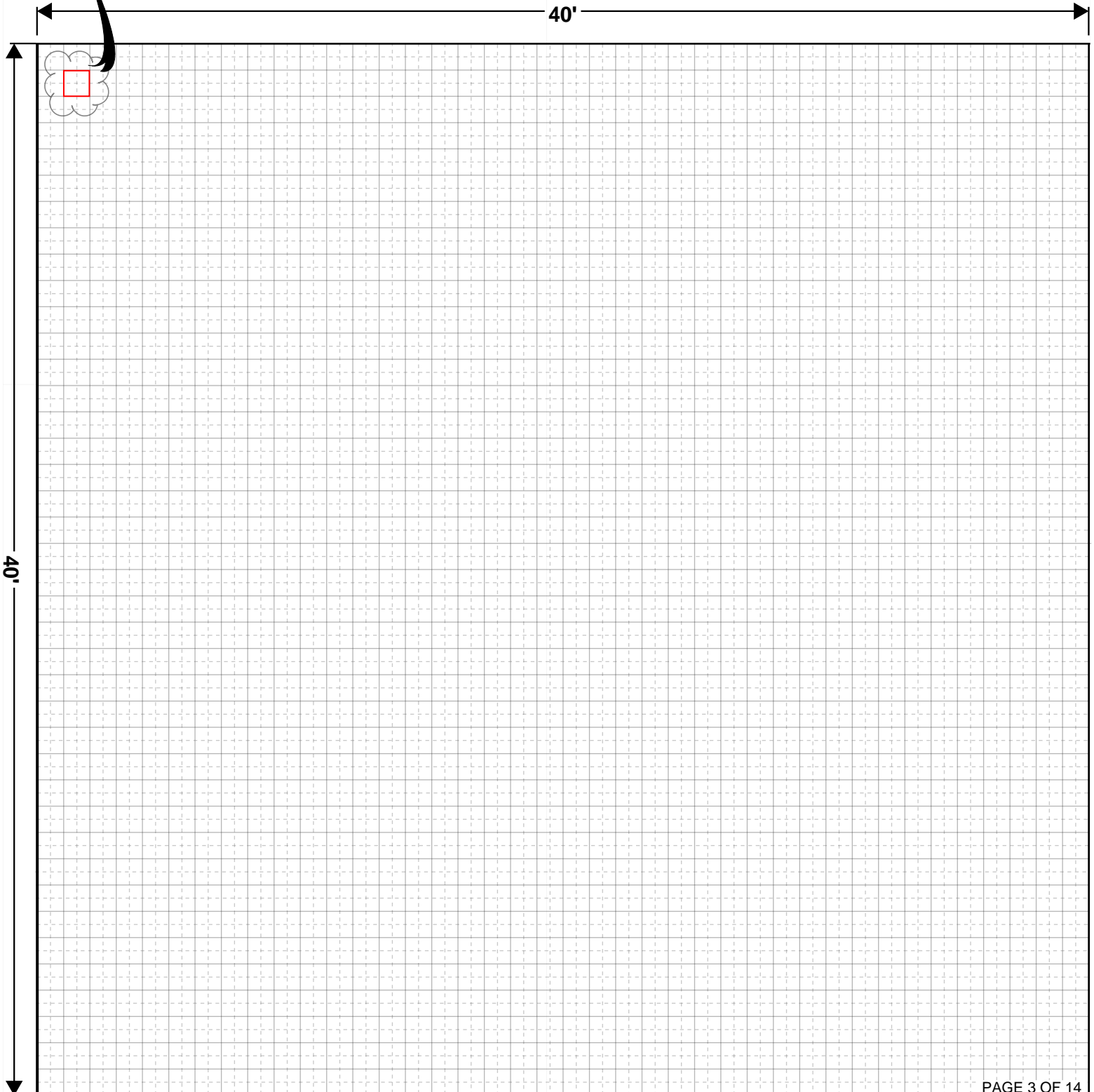
Use the grid below to provide a plan view of the covered patio/carport and wall of the house the covered patio/carport is connected to. The plan view of the covered patio/carport should be large enough to almost cover the entire area below. See example on page 10.



Show the location of the beam and label it.

Show the location of all posts and label them. Include the distance between each post.

Show the ledger or the top plate of the exterior wall. Fill out page 5 if the covered patio/carport is bearing on a ledger connected to the house. Fill out page 6 if the covered patio/carport is bearing on the exterior wall.



COVERED PATIO/CARPORT WORKSHEET

FILL OUT COMPLETELY

Beam size: x ft

Species of wood:

Glulam ☐ LVL ☐

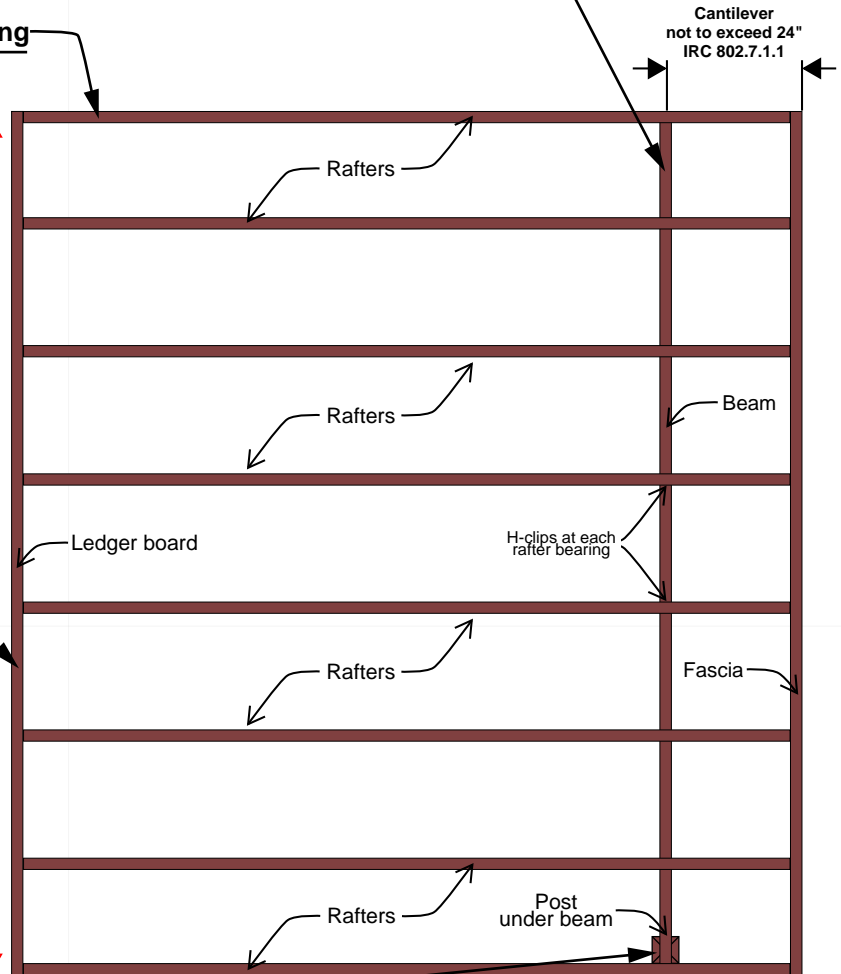
Rafter size: **2** x x ft; o.c spacing

Species of wood:

Ledger size: **2** x x ft

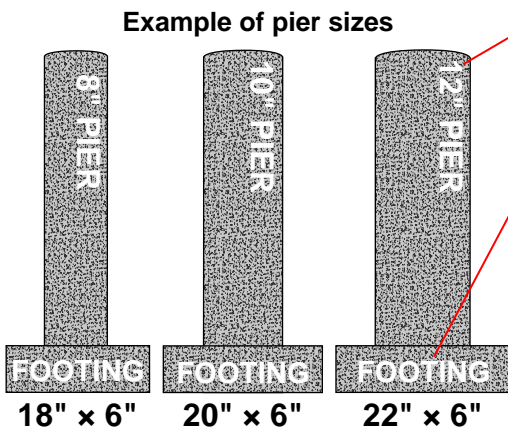
Do not fill out the ledger size if the patio cover/carport will be bearing on the exterior wall

HOUSE SIDE



Post size: x

COVERED PATIO/CARPORT TOP-DOWN VIEW



Example of pier sizes

Example of footing sizes

Pier (A) size:

Footing (A) size: x

bottom of pier or footing at 42" below grade

Pier (B) size:

Footing (B) size: x

bottom of pier or footing at 42" below grade

Pier (C) size:

Footing (C) size: x

bottom of pier or footing at 42" below grade

Pier (D) size:

Footing (D) size: x

bottom of pier or footing at 42" below grade

Pier (E) size:

Footing (E) size: x

bottom of pier or footing at 42" below grade

Pier (F) size:

Footing (F) size: x

bottom of pier or footing at 42" below grade

Pier (G) size:

Footing (G) size: x

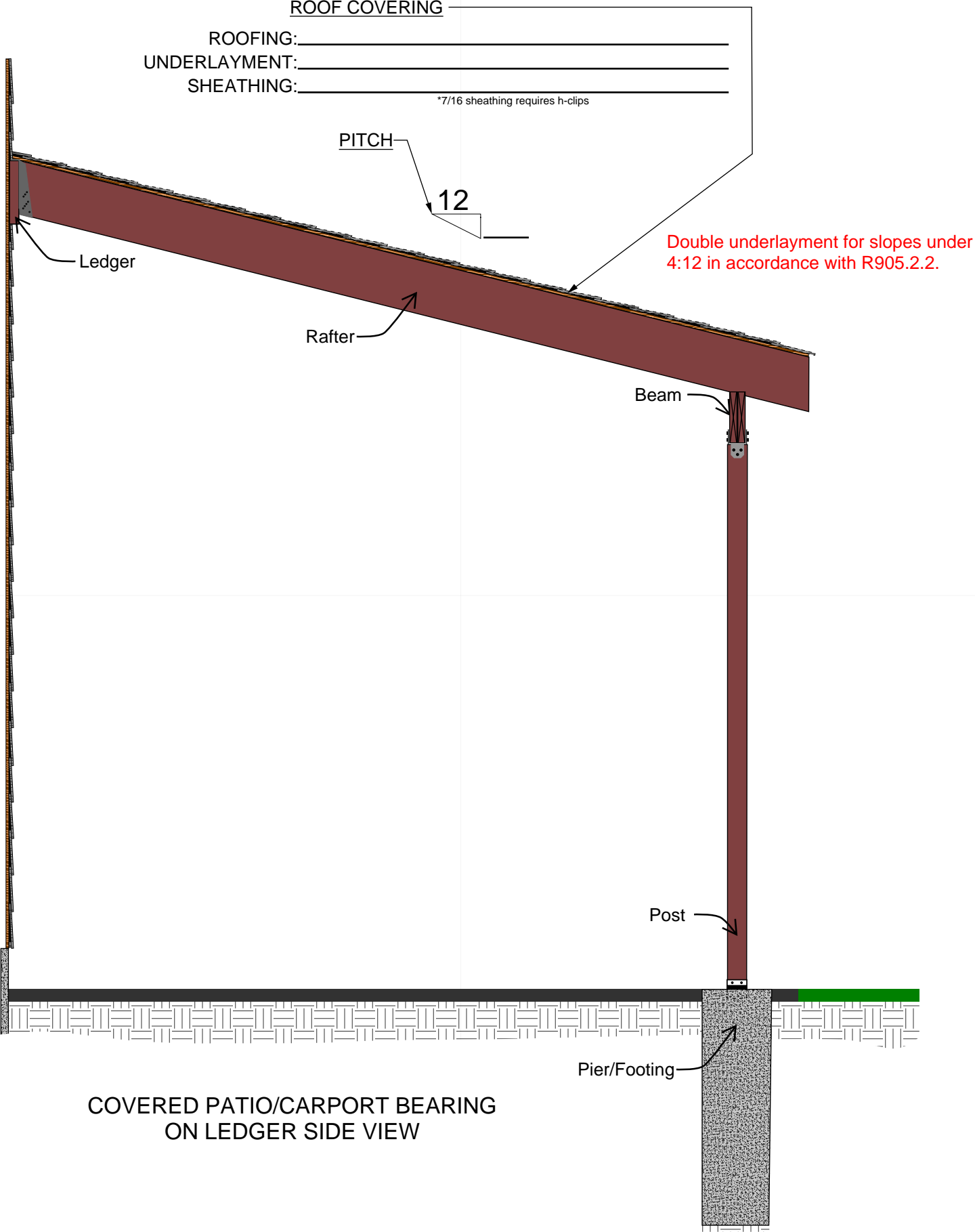
bottom of pier or footing at 42" below grade

Pier (H) size:

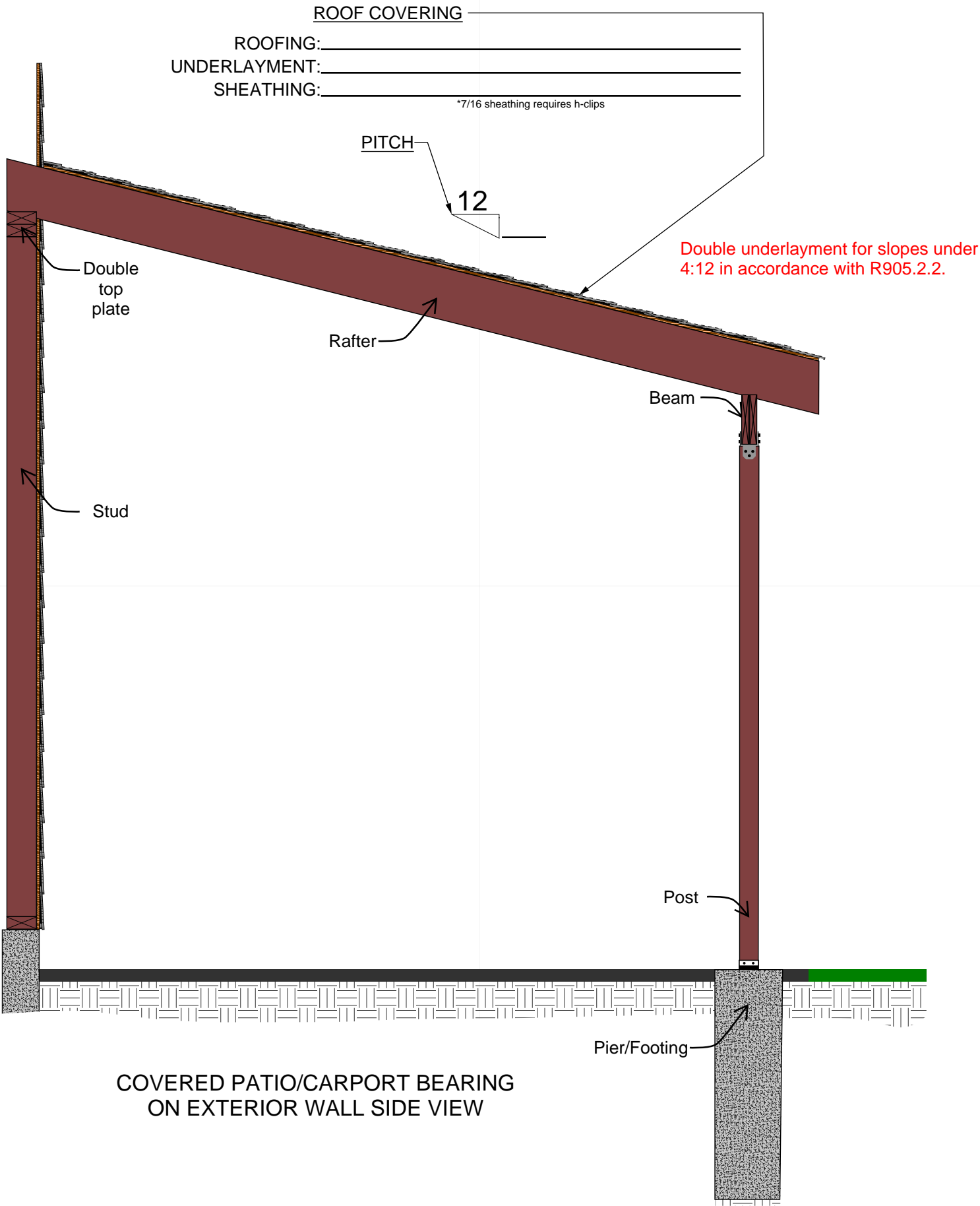
Footing (H) size: x

bottom of pier or footing at 42" below grade

COVERED PATIO/CARPORT ROOF COVERING BEARING ON LEDGER WORKSHEET



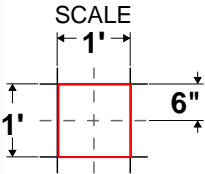
COVERED PATIO/CARPORT ROOF COVERING BEARING ON EXTERIOR WALL WORKSHEET



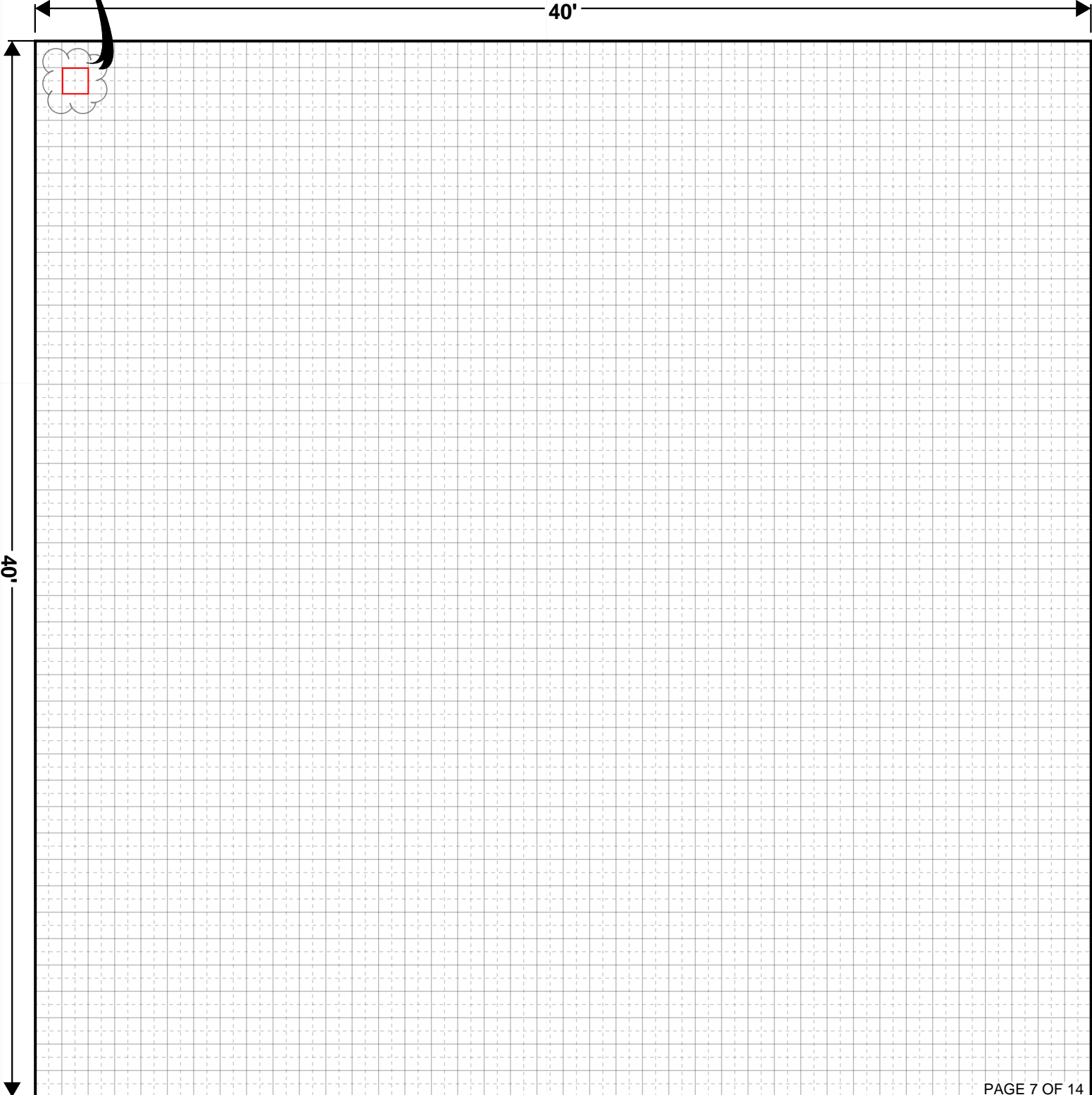
COVERED PATIO/CARPORT BEARING ON EXTERIOR WALL SIDE VIEW

TRIBUTARY AREA WORKSHEET

Use the grid below to draw a plan view of the outline of your covered patio/carport. Draw in all posts. Find the middle point from the face of the ledger/exterior wall to the posts. Find the middle point from the center of each post to the center of the next closest post. Outline the tributary areas. Calculate the square footage of each tributary area. Note the footing size on page 4. If more than one footing size is needed, label each post with the footing size it needs or put a letter next to the post corresponding to the footing size on page 4 (example, Footing size (A), Footing size (B), etc). Multiple posts with the same footing size can have the same footing label. Footing sizing is on page 8. See example on page 13 & 14.



NOTE: Ground screws are acceptable. Include the data sheet from the ground screw manufacturer. Highlight the model (if multiple models are on one data sheet) and submit the data sheet with the plans.



COVERED PATIO/CARPORT FOOTING SIZE

The City of Billings will evaluate the footing size for a covered patio/carport the same way a deck footing size would be evaluated. Both a deck and covered patio/carport have identical snow, wind, and gravity loads that will be exerted on them. Therefore, the footing size for a covered patio/carport will use the same table as footings for decks.

TABLE R507.3.1 MINIMUM FOOTING SIZE FOR DECKS

NO SOILS REPORT

LIVE OR GROUND SNOW LOAD (psf)	TRIBUTARY AREA (ft²)	LOAD-BEARING VALUE OF SOILS (psf)		
		1,500		
		SIDE OF A SQUARE FOOTING (inches)	DIAMETER OF A ROUND FOOTING (inches)	THICKNESS (inches)
50	5	7	8	6
	20	11	13	6
	40	15	17	6
	60	19	21	6
	80	21	24	8
	100	24	27	9
	120	26	30	10
	140	28	32	11
	160	30	34	12

Interpolated Table R507.3.1 to common round concrete form size

TRIBUTARY AREA (square feet)	DIAMETER OF ROUND FOOTING (inches)	THICKNESS (inches)
5	8	6
11	10	6
17	12	6
25	14	6
35	16	6
45	18	6
55	20	6
67	22	6
80	24	8
93	26	9
106	28	10

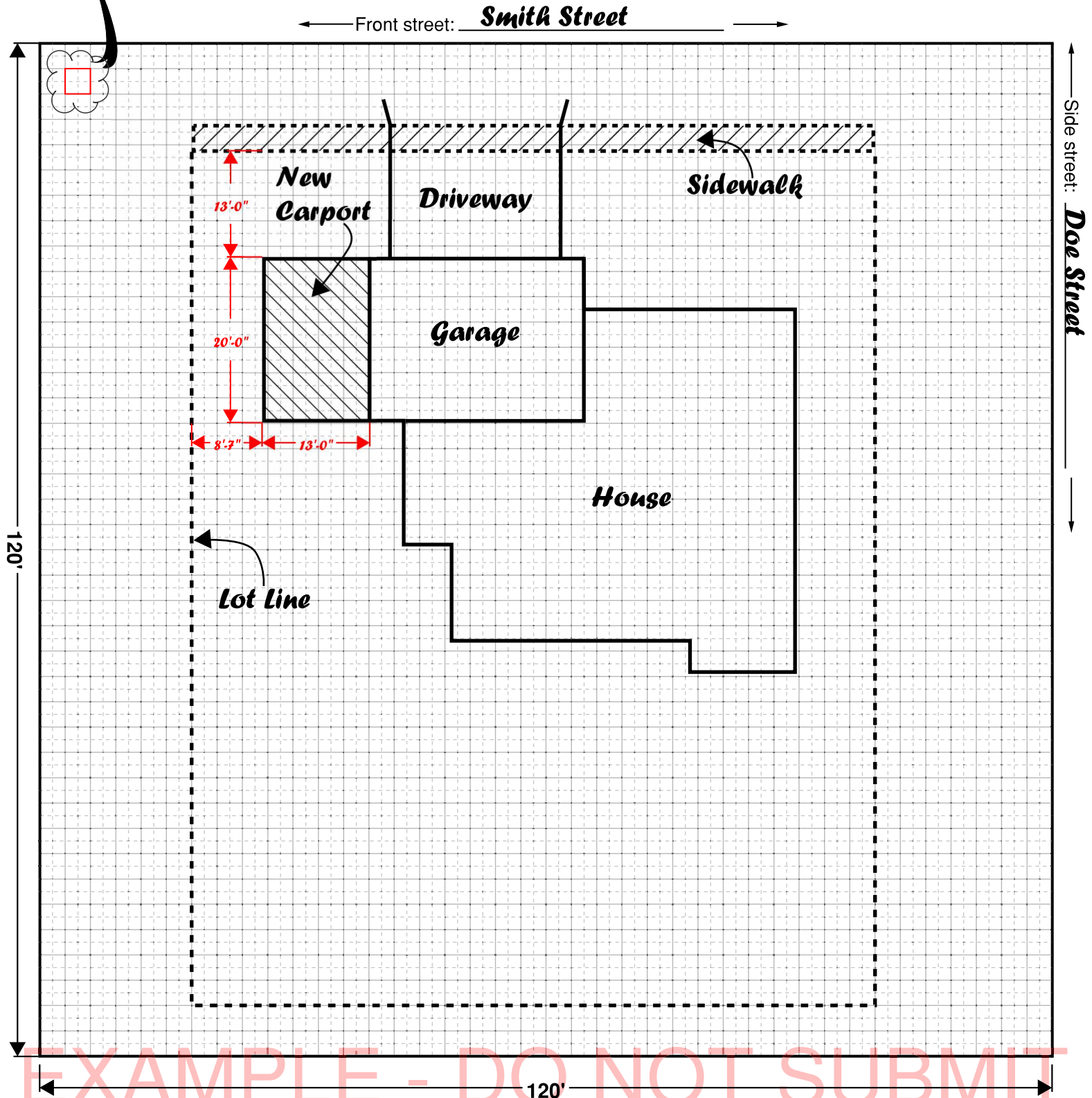
NEED SOILS REPORT

NEED SOILS REPORT

LIVE OR GROUND SNOW LOAD (psf)	TRIBUTARY AREA (ft²)	LOAD-BEARING VALUE OF SOILS (psf)			LOAD-BEARING VALUE OF SOILS (psf)		
		2,000			≥ 3,000		
		SIDE OF A SQUARE FOOTING (inches)	DIAMETER OF A ROUND FOOTING (inches)	THICKNESS (inches)	SIDE OF A SQUARE FOOTING (inches)	DIAMETER OF A ROUND FOOTING (inches)	THICKNESS (inches)
50	5	7	8	6	7	8	6
	20	10	11	6	8	9	6
	40	13	15	6	11	13	6
	60	16	18	6	13	15	6
	80	19	21	6	15	17	6
	100	21	23	7	17	19	6
	120	23	26	8	19	21	6
	140	25	28	9	20	23	7
	160	26	30	10	21	24	8

EXAMPLE - DO NOT SUBMIT

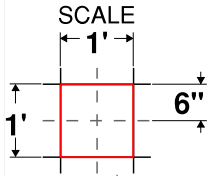
- This will be a very broad view of the lot, house, and covered patio/carport. Use page 3 to draw a detailed plan view of the covered patio/carport.



EXAMPLE - DO NOT SUBMIT

PLAN VIEW

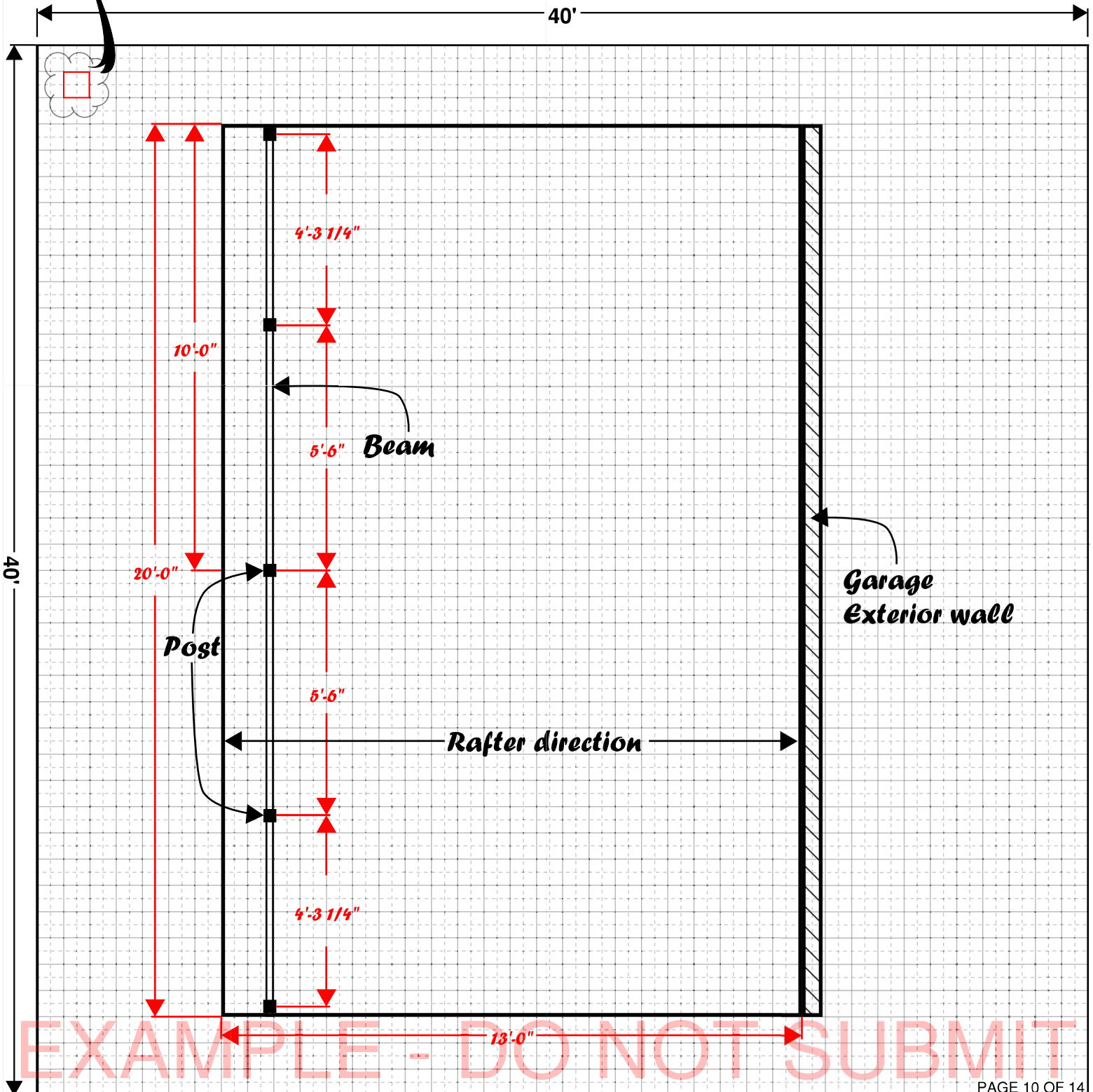
Use the grid below to provide a plan view of the covered patio/carport and wall of the house the covered patio/carport is connected to. The plan view of the covered patio/carport should be large enough to almost cover the entire gridded area.



Show the location of the beam and label it.

Show the location of all posts and label them. Include the distance between each post.

Show the ledger or the top plate of the exterior wall. Fill out page 5 if the covered patio/carport is bearing on a ledger connection to the house. Fill out page 6 if the covered patio/carport is bearing on the exterior wall.



EXAMPLE - DO NOT SUBMIT

COVERED PATIO/CARPORT WORKSHEET

FILL OUT COMPLETELY

Beam size: 2 x 10 x 20 ft

Species of wood: Southern pine

Glulam ☐

LVL ☐

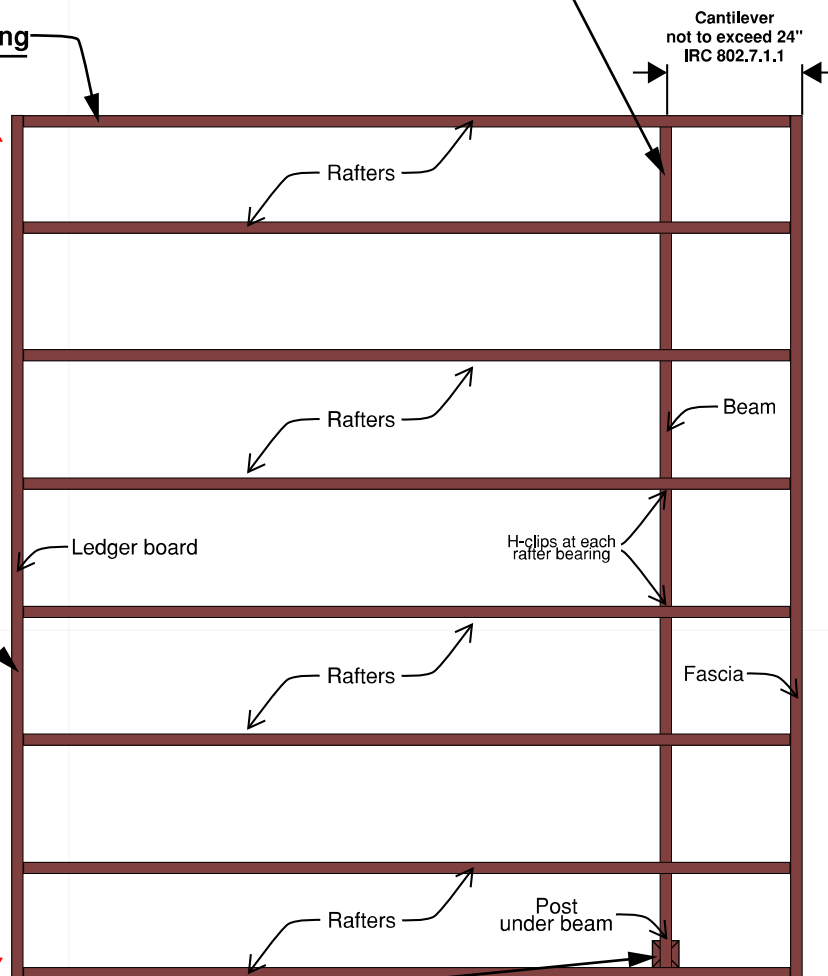
Rafter size: 2 x 8 x 16 ft; 16 o.c spacing

Species of wood: Southern pine

Ledger size: 2 x x ft

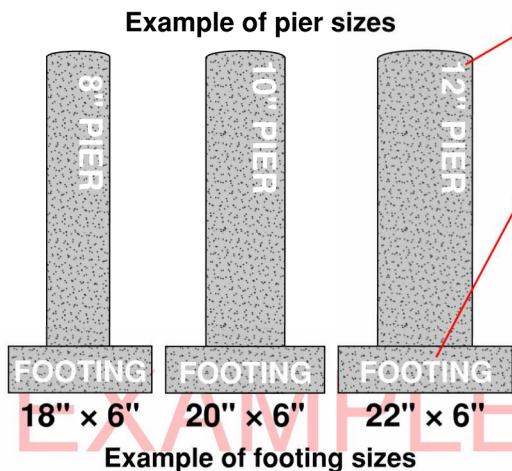
Do not fill out the ledger size if the patio cover/carport will be bearing on the exterior wall

HOUSE SIDE



COVERED PATIO/CARPORT TOP-DOWN VIEW

Post size: 4 x 4



Pier (A) size: 8"

Footing (A) size: 12" dia. x 6" thick
bottom of pier or footing at 42" below grade

Pier (B) size: 8"

Footing (B) size: 16" dia. x 6" thick
bottom of pier or footing at 42" below grade

Pier (C) size: 8"

Footing (C) size: 18" dia. x 6" thick
bottom of pier or footing at 42" below grade

Pier (D) size:

Footing (D) size: x
bottom of pier or footing at 42" below grade

Pier (E) size:

Footing (E) size: 10" dia. x 6" thick
bottom of pier or footing at 42" below grade

Pier (F) size:

Footing (F) size: x
bottom of pier or footing at 42" below grade

Pier (G) size:

Footing (G) size: x
bottom of pier or footing at 42" below grade

Pier (H) size:

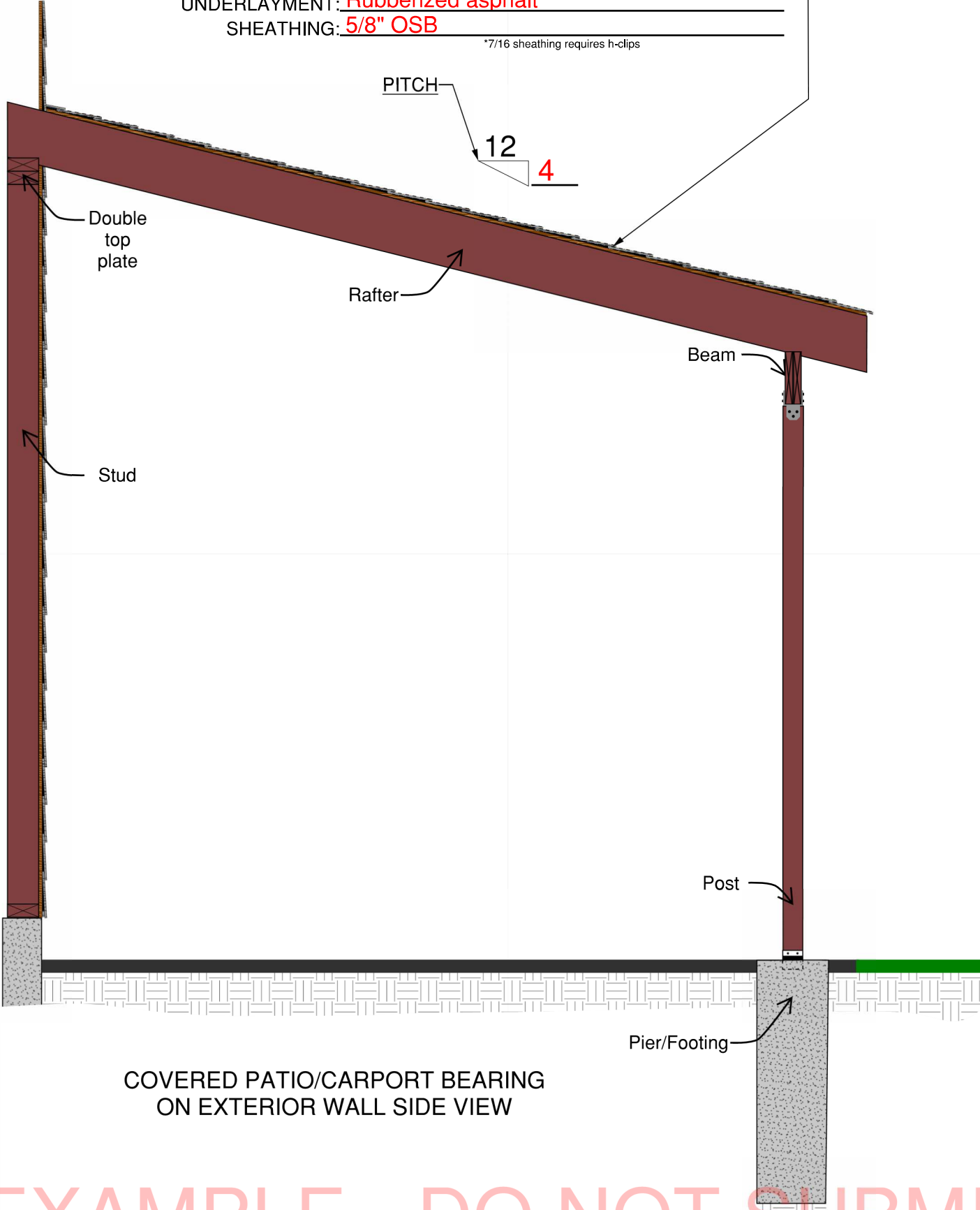
Footing (H) size: x
bottom of pier or footing at 42" below grade

COVERED PATIO/CARPORT ROOF COVERING BEARING ON EXTERIOR WALL WORKSHEET

ROOF COVERING

ROOFING: Asphalt composite shingles
UNDERLAYMENT: Rubberized asphalt
SHEATHING: 5/8" OSB

*7/16 sheathing requires h-clips

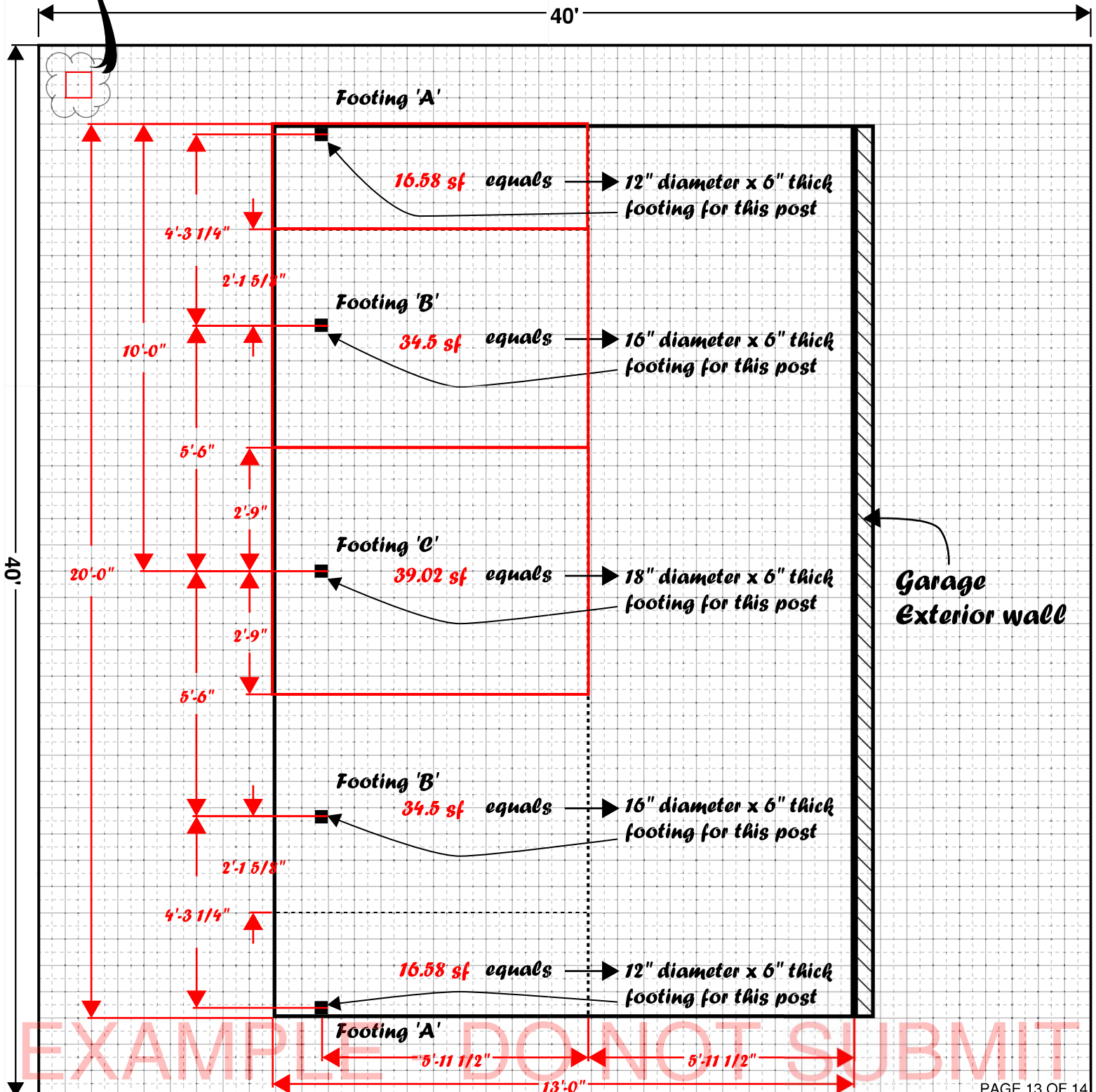
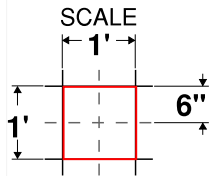


COVERED PATIO/CARPORT BEARING ON EXTERIOR WALL SIDE VIEW

EXAMPLE - DO NOT SUBMIT

TRIBUTARY AREA WORKSHEET

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Interpolated Table R507.3.1 to common round concrete form size

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17	12	6
25	14	6
35	16	6
45	18	6
55	20	6
67	22	6
80	24	8
93	26	9
106	28	10

Round footing size up to next tributary area size.

Footing 'A' = 16.58 sq ft. Round to 17 sq ft. Footing size = 12" diameter x 6" thick

Footing 'B' = 34.5 sq ft. Round up to 35 sq ft. Footing size = 16" diameter x 6" thick.

Footing 'C' = 39.02 sq ft. Round up to 40 sq ft. Footing size = 18" diameter x 6" thick.