

CITY OF BILLINGS

DECK SUBMITTAL WORKBOOK



The City of Billings Deck submittal workbook is intended to be used for single-level, attached or detached, square or rectangle shaped decks.

- Decks that are not square or rectangle in shape may require a design professional to draw the plans.
- Multi-level decks, depending on complexity, may require a design by a structural engineer. Multi-level deck plans, at minimum, are to be drawn by a design professional.

The City of Billings Deck Submittal Workbook is not suitable for:

Decks with hot tubs or decks with enclosed structures on a portion of the deck.

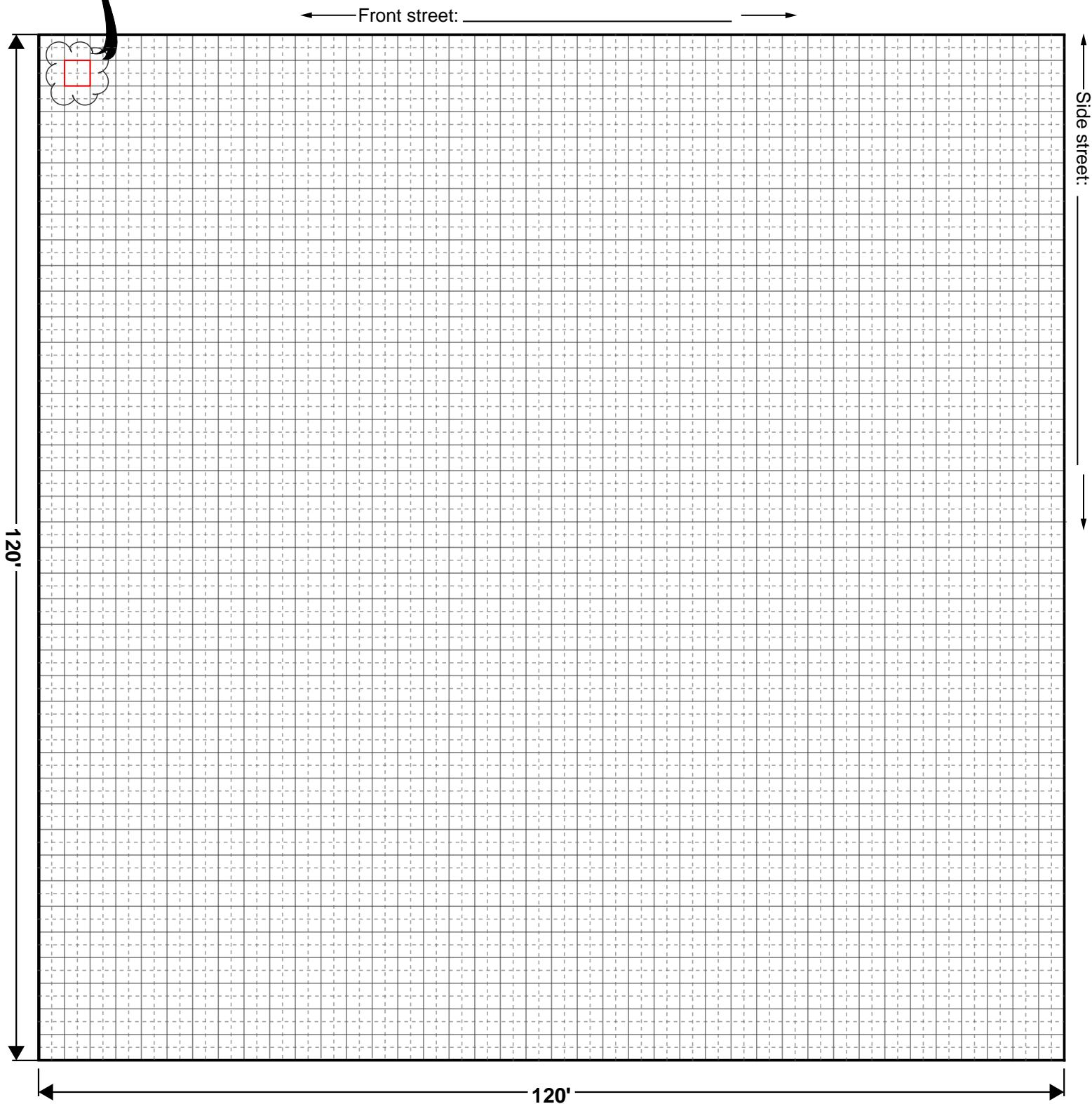
These decks are required to be designed by a structural engineer and SE stamped plans must be submitted for review in accordance with R301.1.3.

SITE PLAN

SCALE
3'
1'-6"

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 all structures; existing house and proposed deck.

This will be a very broad view of the lot, house, and deck. Use the page 3 to draw a detailed plan view of the deck. See example on page 8.



PLAN VIEW

Use the grid below to provide a plan view of the deck and wall of the house the deck is connected to.

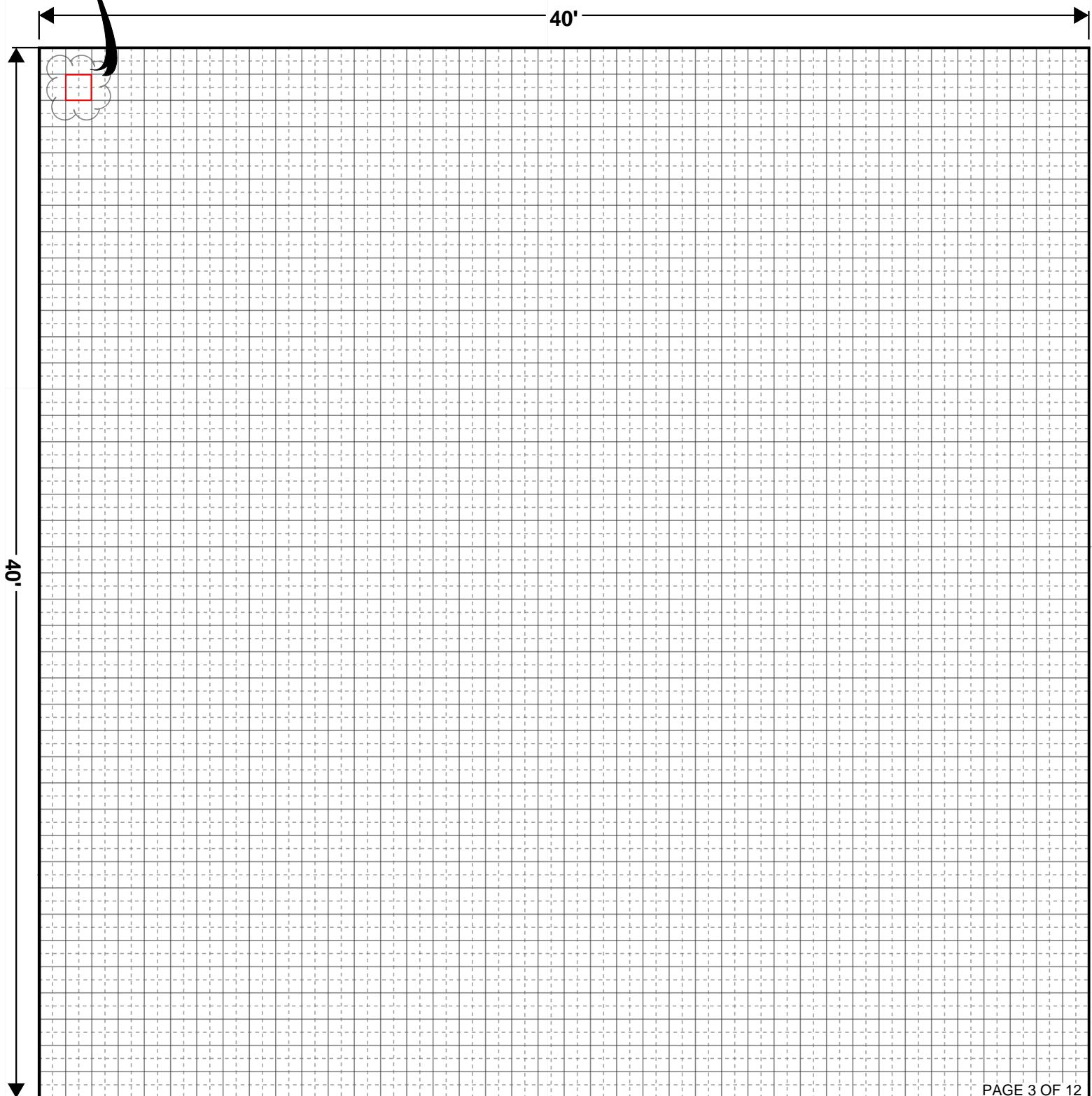
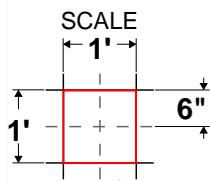
Show the location of stair(s). If there are stairs, show the landing(s).

Stairs require a concrete landing as wide as the stairs and 36" in the direction of travel.

Stairs with 4 or more risers require a handrail. Show the handrail.

Decks 30" or more above grade need guarding. Show the guards.

See example Plan View on page 9.



FLUSH BEAM DECK WORKSHEET FILL OUT COMPLETELY

Check mark deck type

Flush beam deck

Stairs

Yes

No

Guards

Yes

No

Flush beam deck
with mid-joist span beam

Stair width:
36" minimum.

Pre-made
guard Brand:

Deck height
above grade:

decks over 30" above
grade requires guards

Number
of risers:

4 or more risers
require a handrail

Site made.
guard material:

material the guards
will be constructed from

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

Species of wood: _____

Ledger size: **2** x x ft

joist spacing for engineered decking products
according to manufacturers specifications

Beam size: x x ft

Species of wood: _____

Glulam LVL

Decking size: x

joist spacing for engineered decking products
according to manufacturers specifications

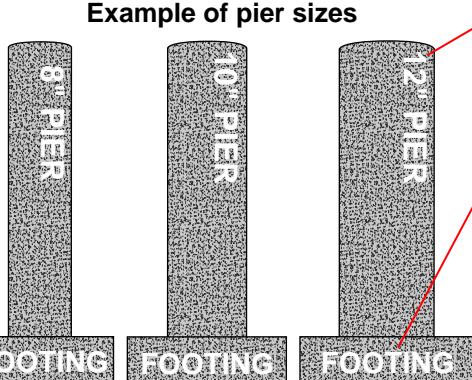
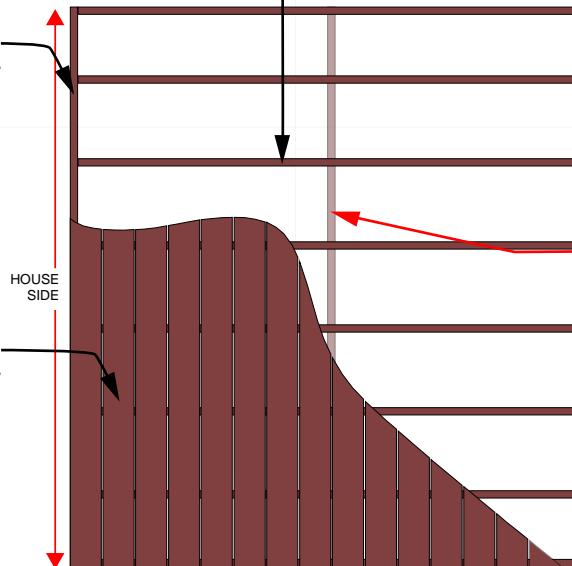
Beam size: x x ft

only fill in IF there is a mid-joist span beam deck

Species of wood: _____

Glulam LVL

Post size: x



Example of pier sizes

18" x 6"

20" x 6"

22" x 6"

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

CANTILEVER DROPPED BEAM DECK WORKSHEET

FILL OUT COMPLETELY

Check mark deck type

Cantilever dropped beam deck

Cantilever dropped beam deck with mid-joist span beam

Deck height above grade:

decks over 30" above grade requires guards

Stairs

Yes

No

Stair width:

36" minimum.

Guards

Yes

No

Pre-made guard Brand:

manufacturer of the guards

Site made guard material:

material the guards will be constructed from

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

Species of wood:

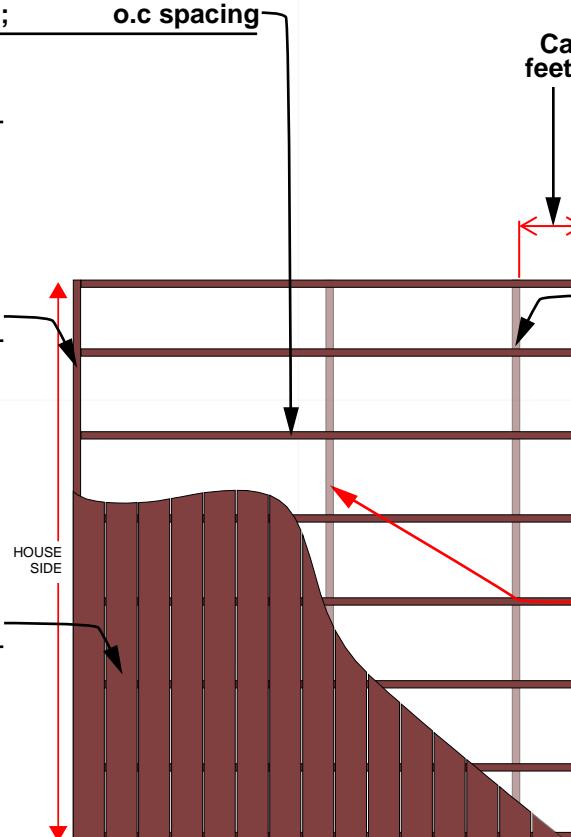
Ledger size: **2** x x ft

joist spacing for engineered decking products according to manufacturers specifications

Decking size: x

joist spacing for engineered decking products according to manufacturers specifications

Post size: x



Beam size: x x ft

Species of wood:

Glulam LVL

Beam size: x x ft

Species of wood:

Glulam LVL

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

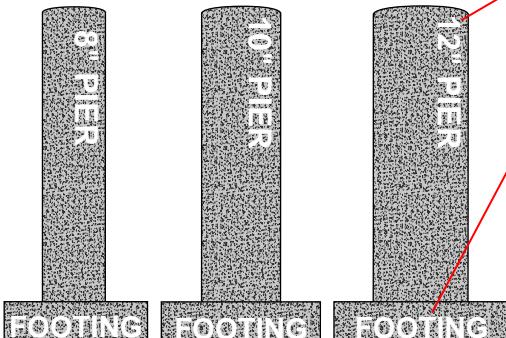
Pier (G) size:

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

Example of pier sizes



18" x 6"

20" x 6"

22" x 6"

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

TRIBUTARY AREA WORKSHEET

Use the grid below to draw a plan view of the outline of your deck. Draw in all posts.

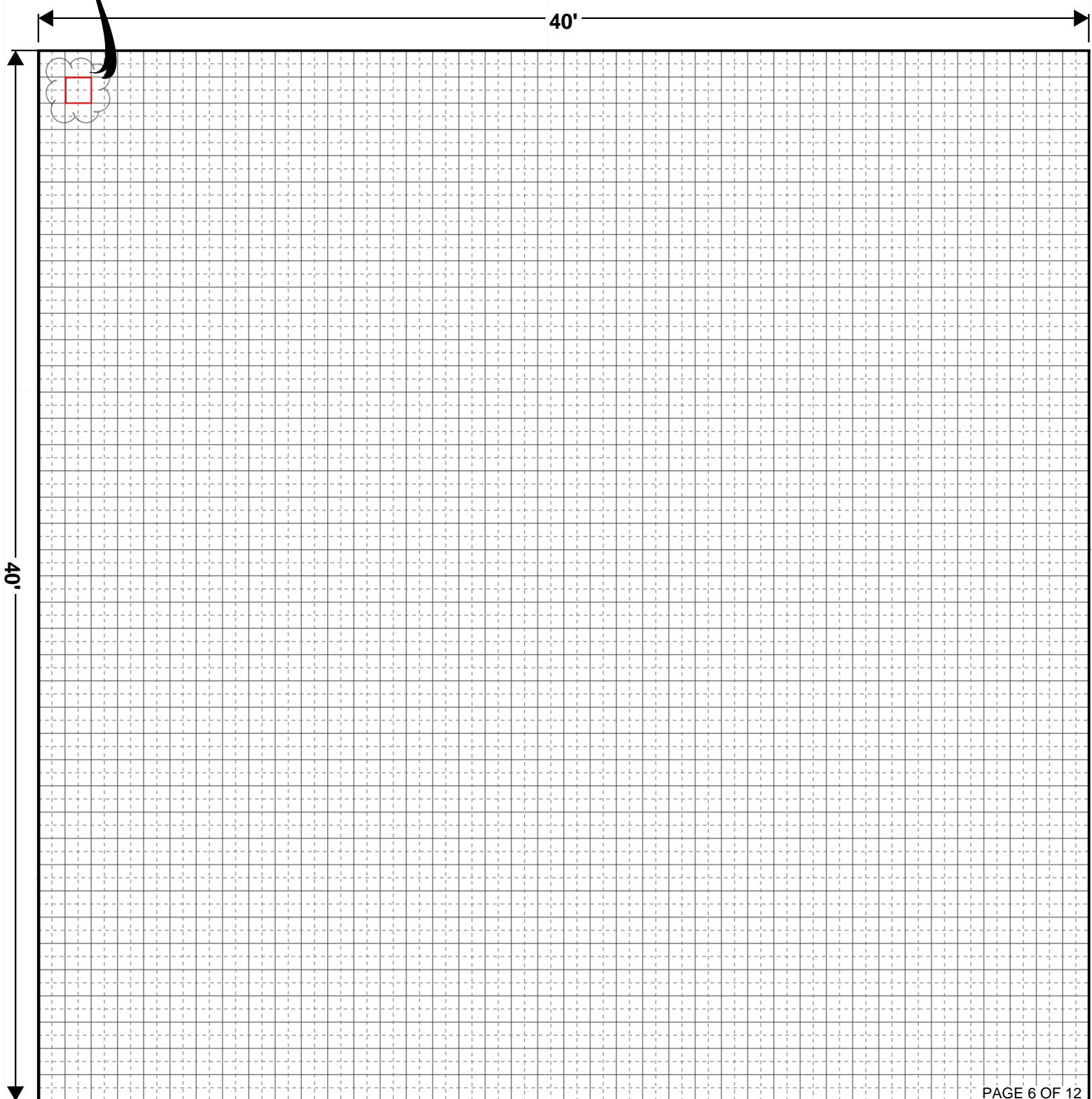
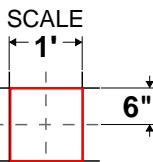
Find the middle point from the face of the ledger to the posts (see examples on page 5, 12, 18, & 25 of the City of Billings Deck Construction Guide).

Find the middle point from the center of each post to the center of the next closest post (see examples on page 7, 14, 19, & 26 of the City of Billings Deck Construction Guide).

Outline the tributary areas. Calculate the square footage of each tributary area. Using page 30 of the City of Billings Deck Construction Guide, find the footing size for 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.

See example on page 11.



DECK FOOTING SIZE

TABLE R507.3.1 MINIMUM FOOTING SIZE FOR DECKS
NO SOILS REPORT

LIVE OR GROUND SNOW LOAD (psf)	TRIBUTARY AREA (ft ²)	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

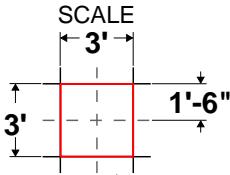
TRIBUTARY AREA (square feet)	DIAMETER OF ROUND FOOTING (inches)	THICKNESS (inches)
5	8	6
11	10	6
17	12	6
25	14	6
35	16	6
45	18	6
55	20	6
67	22	6
80	24	8
93	26	9
106	28	10

LIVE OR GROUND SNOW LOAD (psf)	TRIBUTARY AREA (ft ²)	NEED SOILS REPORT			NEED SOILS REPORT		
		LOAD-BEARING VALUE OF SOILS (psf)			LOAD-BEARING VALUE OF SOILS (psf)		
		2,000			≥ 3,000		
50	5	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)
	20	7	8	6	7	8	6
	40	10	11	6	8	9	6
	60	13	15	6	11	13	6
	80	16	18	6	13	15	6
	100	19	21	6	15	17	6
	120	21	23	7	17	19	6
	140	23	26	8	19	21	6
	160	25	28	9	20	23	7

EXAMPLE - DO NOT SUBMIT

SITE PLAN

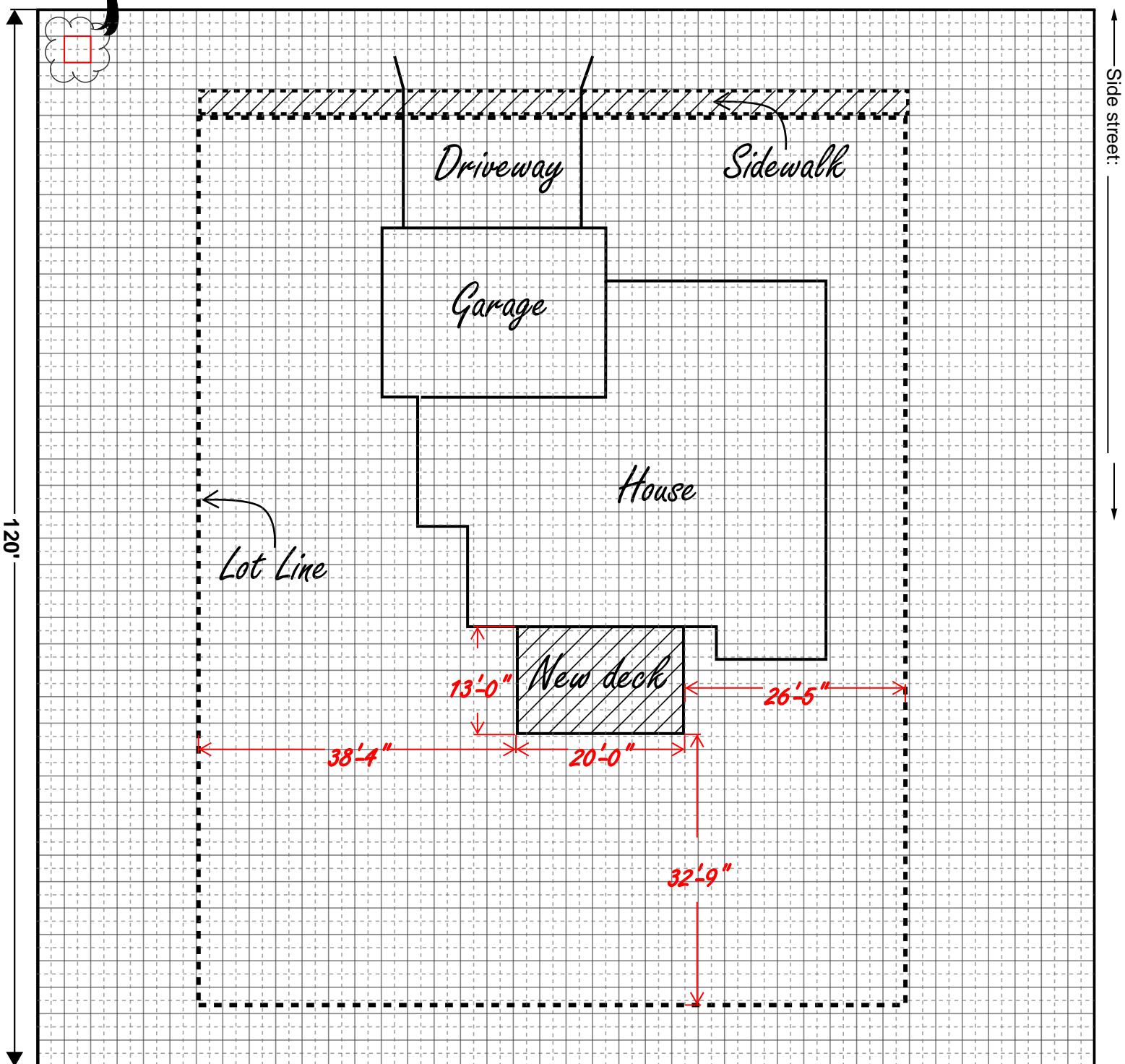
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2. Show setbacks from all property lines (5' is typical; check with Planning for information on setbacks).
3. Show all structures - existing and proposed.
4. Show width and length of all structures; existing house and proposed deck.



This will be a very broad view of the lot, house, and deck. Use the page 3 to draw a detailed plan view of the deck.

Page scale not used

← Front street: *Smith Street* →



EXAMPLE - DO NOT SUBMIT

EXAMPLE - DO NOT SUBMIT

PLAN VIEW

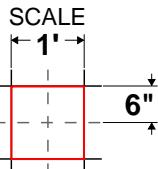
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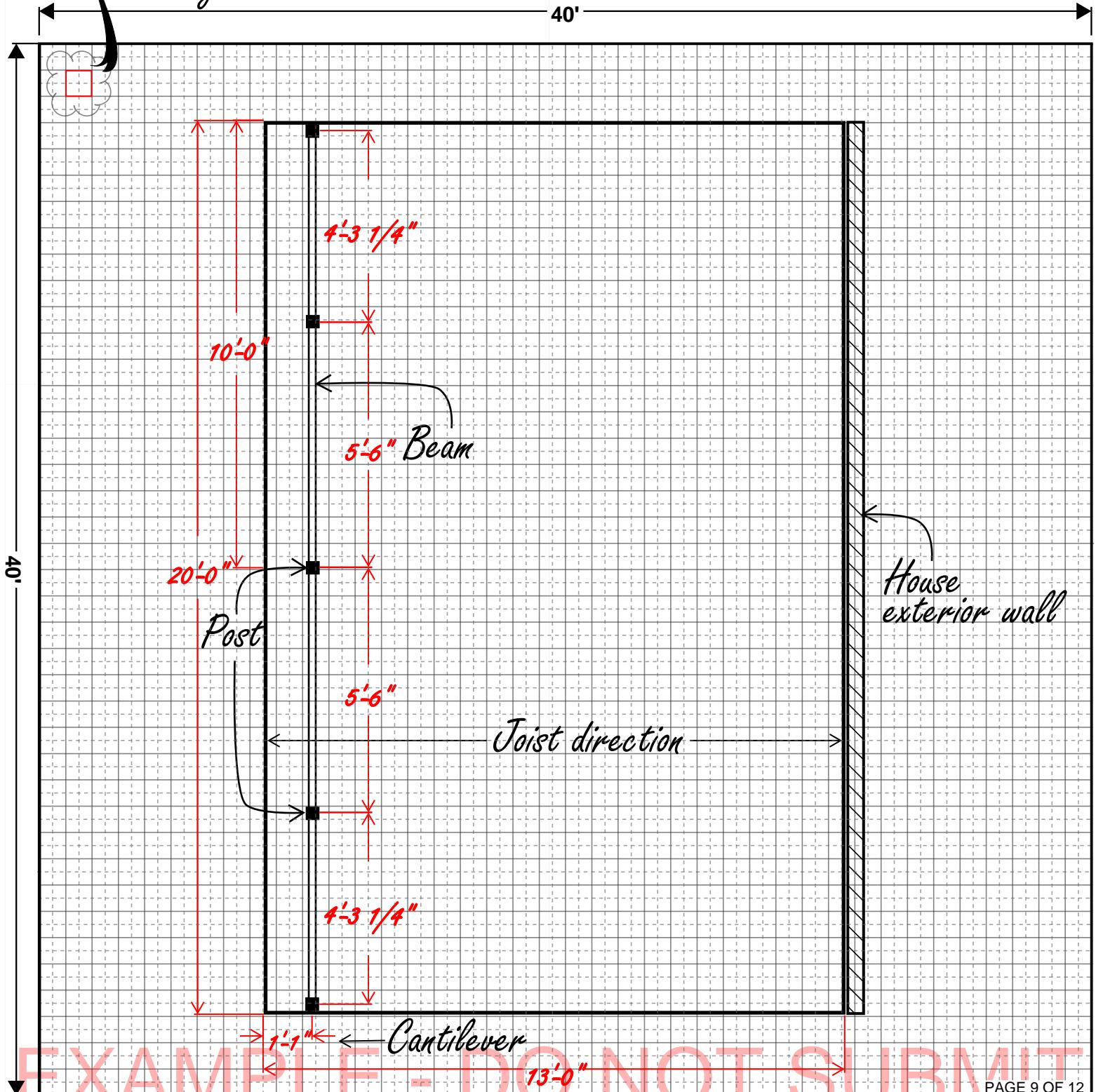
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EXAMPLE - DO NOT SUBMIT

TRIBUTARY AREA WORKSHEET

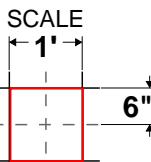
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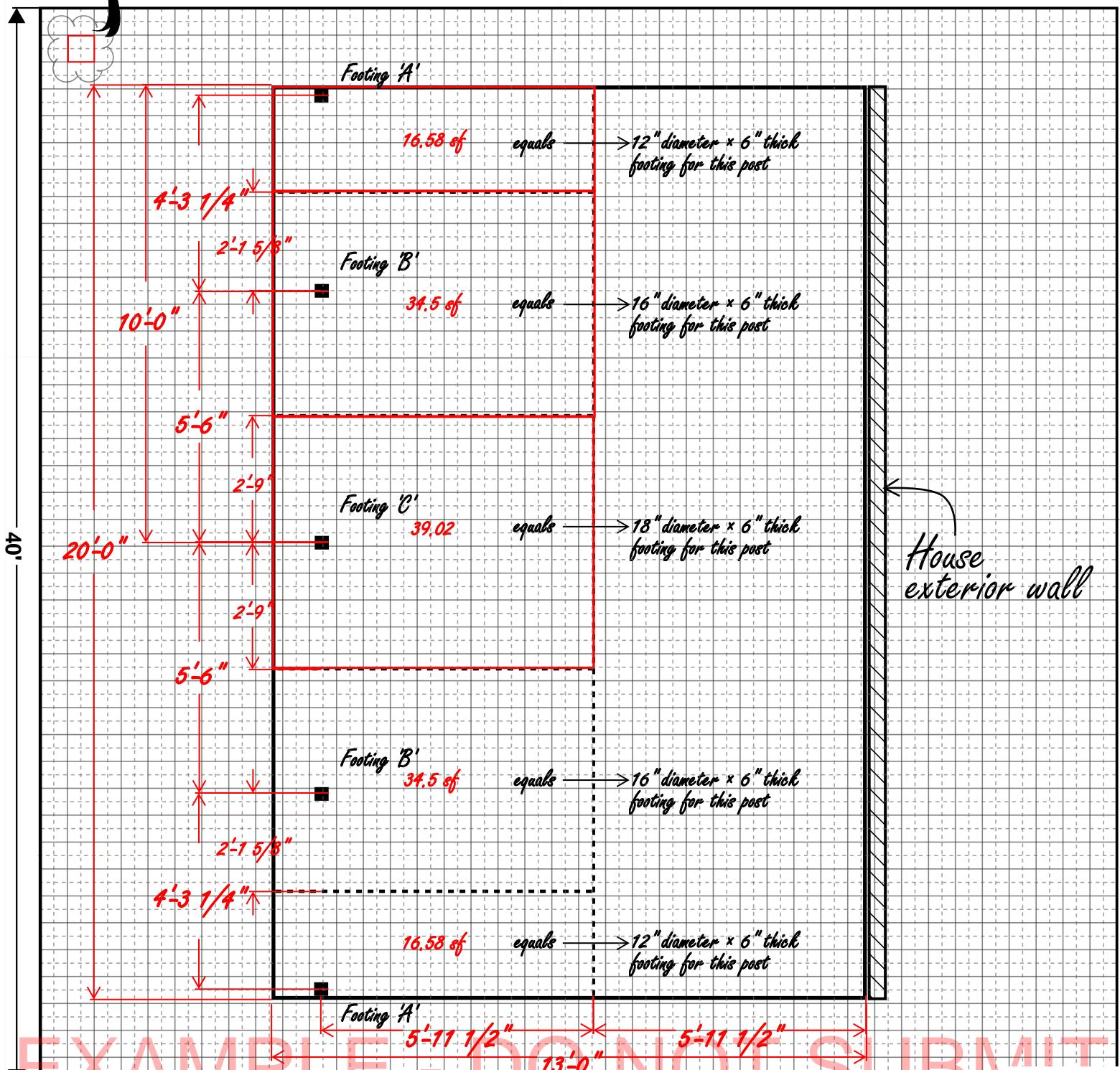
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Multiple posts with the same footing size can have the same footing label.



Page scale not used

40'



EXAMPLE - DO NOT SUBMIT

DECK FOOTING SIZE

TABLE R507.3.1 MINIMUM FOOTING SIZE FOR DECKS
NO SOILS REPORT

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		1,500		
		SIDE OF A SQUARE FOOTING (inches)	DIAMETER OF A ROUND FOOTING (inches)	THICKNESS (inches)
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→ 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

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 45 sq ft. Footing size = 18" diameter x 6" thick.

EXAMPLE - DO NOT SUBMIT