



# Residential Decks and Landings



This handout is only a guide to residential decks and landings and may not contain all city ordinance requirements. All proposed work is subject to Zoning and Building Safety Code review.

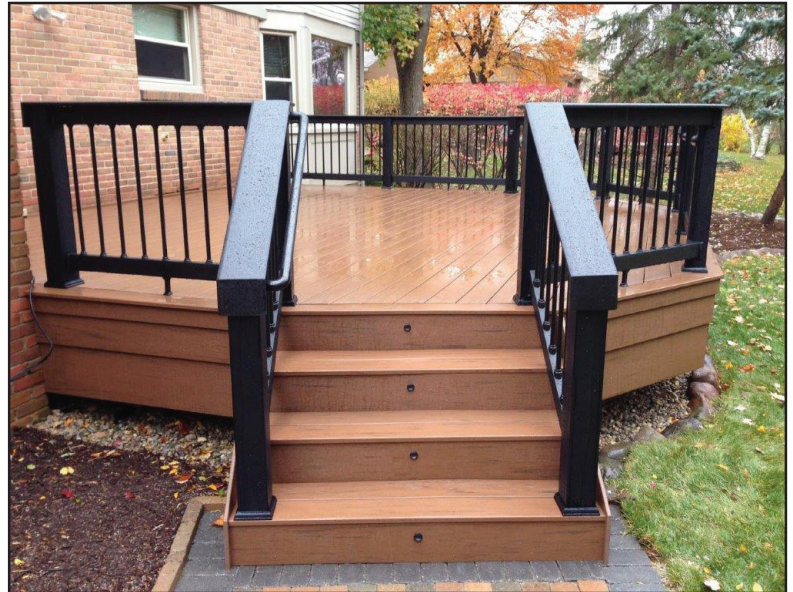
## Deck or Landing Building Permits

### When are building permits required?

Building permits are required for all decks and landings attached to a building or that are freestanding and more than 30 inches above the adjacent grade or not part of an accessible route (stairs or sidewalk).

Permits are strongly recommended (but not required) for freestanding decks or landings less than 30 inches above the adjacent grade or not part of an accessible route (stairs or sidewalk).

Part of any deck or landing may not be located on, under or above an easement, including drainage and utility easements often found along side and rear lot lines. This includes footings, overhangs/eaves, bumpouts, etc. If you do not have a survey, it is recommended that you check the following records for easements.



- Platted easements: You can find your property's legal description (addition name, lot and block) by entering your address at <http://bit.ly/3vvTy7L>, then find your addition name (plat) at <http://bit.ly/38VB2Mx> to see if there are any platted easements on your lot.
- Recorded easement: Easements may not be shown on the plat but separately recorded against your property. These should be listed on your title insurance policy from when you bought the property.

### Zoning ordinance regulations for residential decks:

- Decks and landings located in the rear yard are considered structures for the purposes of calculating rear yard structure coverage. See the "Rear Yard Coverage Limitations for Single-Family and Two-Family Dwellings" handout for more information.
  - Decks and landings attached to the principal structure must comply with the same minimum setback requirements as the principal structure, with some exceptions:
  - Front setback is typically 30 feet, except that attached decks need only be set back 20 feet from the front lot line if their cumulative encroachment into the 30 foot front setback does not exceed 240 square feet.
  - Rear setback is typically 30 feet, except that attached decks need only be set back 20 feet from the rear lot line if their cumulative encroachment into the 30 foot front setback does not exceed 240 square feet.
  - Side setback is typically 3 feet from the side lot line.
  - Side street setback is typically 10 feet from the side street lot line. Please note that the side street setback is typically only applicable to corner lots. In such cases, the lot line with the shorter street frontage is considered the front lot line and the lot line with the longer street frontage is considered the side street lot line. This rule applies no matter which way the house faces and no matter how the property is addressed.
- Freestanding decks or landings located in the rear yard are typically permitted within 3 feet of the rear or side lot lines.

## Building Code Requirements

**Total Load:** All decks shall be designed to support a total load of 50 lbs. per sq. ft. (40 lbs. live load, plus 10 lbs. dead load). Some deck designs may not support the addition of a screened or three-season porch. This should be considered when choosing materials and structural design.

### Materials

- Decks, landings and balconies exposed to weather will be constructed of approved wood with natural resistance to decay, such as redwood and cedar. Ledger beams will be fastened to the building structure using ½-inch diameter lag screws or approved fasteners.
- Pressure-preservative-treated wood will comply with the American Wood Preservers Association UI Standard based on exposure (exterior) and use (above ground or ground contact). The lumber must bear the quality mark (stamp or end tag) of an approved inspection agency. Designers, builders and homeowners will verify that appropriate hardware (hangers, nails, brackets) is used with the particular treatment of the lumber.
- Plastic and composite materials proposed for posts, beams, joists, decking and railings require submittal with the permit application of product specific ICC-ES evaluation reports, or of test reports from an approved testing agency, for review and approval by the building official. Decks using unapproved materials will not receive final approval and may require removal of unapproved materials.
- All exposed connections between the deck and the building structure will be flashed. Flashing materials will be corrosion resistant and compatible with other deck material.

### Footings and Piers

- Frost footings are required for decks and landings attached to a building or structure that has frost footings. All frost footings will be a minimum of 42 inches below finished grade.
- Individual concrete or masonry piers shall project a minimum of 6 inches above finished grade, and project 8 inches above finished grade when supporting cedar or redwood. Cylindrical concrete pier diameters will be listed on the "Beam and Footing Sizes Table." Minimum concrete pier diameter will be 8 inches.

### Joists and Framing

- Wood joists within 18 inches of finished grade or wood beams within 12 inches of finished grade and their supports shall be redwood, cedar or an approved decay-resistant material.
- Floor joist spacing at 24 inches on center requires 2 x decking. Spacing at 16 inches on center permits 1 x decking.
- Joists should not overhang (cantilever) beams by more than 2 ft. and beams should not overhang posts by more than 1 ft.
- Header beams and joists that frame into ledgers or beams must be supported by approved framing anchors (joist hangers) of appropriate size.

## Required Permit Application Information

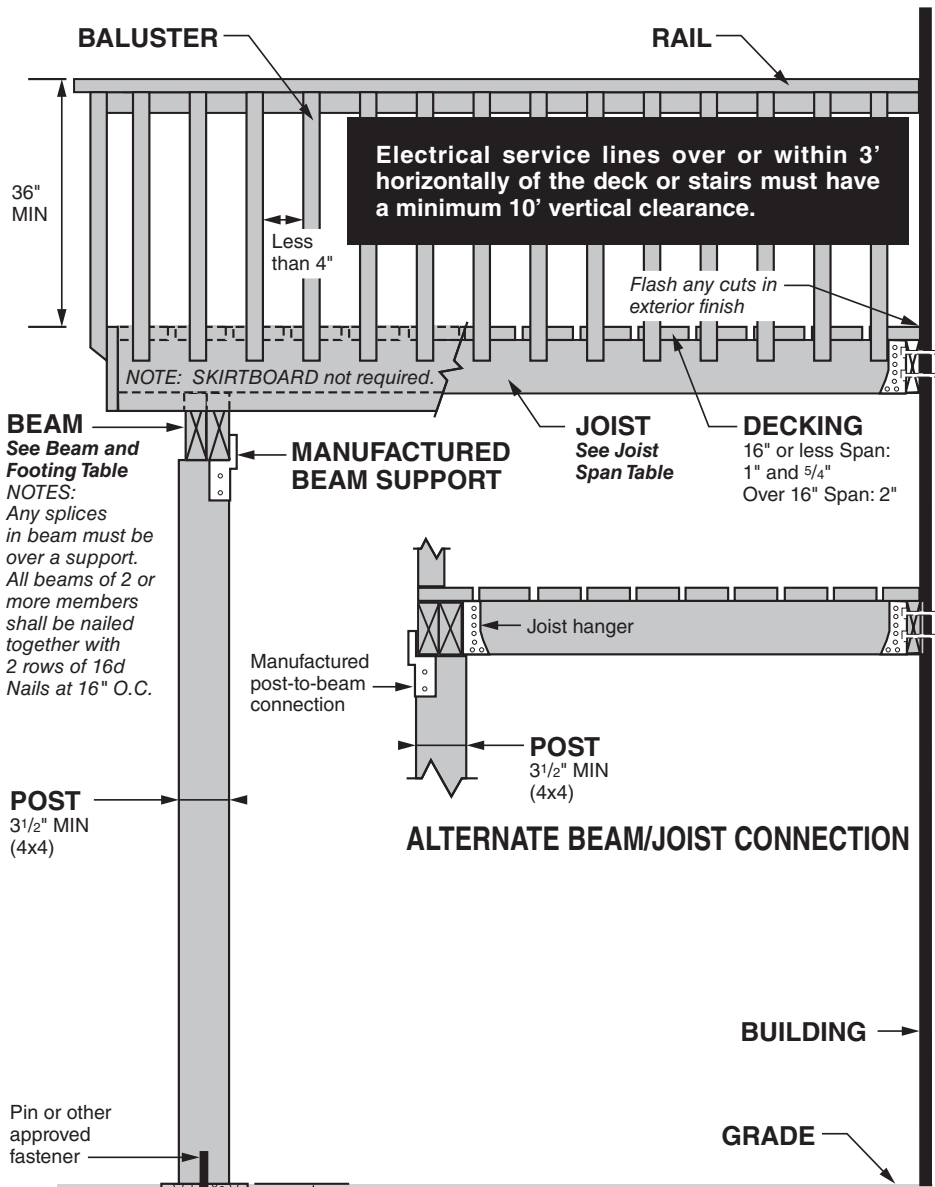
- City of Crystal building permit application
- Two copies of a Certificate of Survey or two copies of a site plan drawn to scale, indicating:
  - Lot dimensions.
  - Location and dimensions of existing structure(s), including all buildings, sheds, garages, decks, patios, sidewalks and driveways.
  - Location and dimensions of the proposed structure(s).
  - Setback measurements from property lines (see site plan drawing).
- Two copies of a floor plan, drawn to scale, showing the design of proposed structure(s) and type of materials being used for construction of the structure(s), including:
  - Size and spacing of floor joists.
  - Size of decking.
  - Size, location and spacing of posts.
  - Size of headers.
  - Type of lumber to be used.
- Two copies of a rear or side elevation of the proposed structure, including:
  - Height of structure from grade.
  - Diameter and depth of footings.
  - Guardrail height, if any.
  - Spacing of intermediate rails.

### Stairways

- If a stairway is provided, it must be no less than 36 inches in width. Stairways may be constructed having a 7 ¾ inch maximum rise (height) and a 10 inch minimum run (length). The dimensions of any one tread run or riser may not vary from the dimensions of any other tread run and rise by more than ¾ inches.
- Stairway illumination is required by the code.
- Open risers are permitted, provided the opening between the treads does not permit the passage of a 4 inch diameter sphere.

### Guards and Handrails

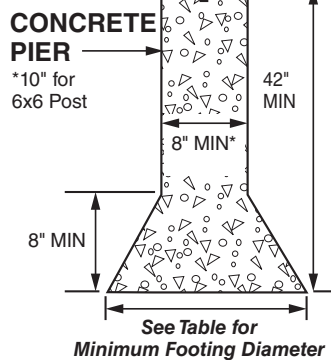
- Decks, landings, ramps, balconies and porches greater than 30 inches above grade will be protected by a guard no less than 36 inches in height. Openings in guards will be less than 4 inches. Openings for the required guards on the sides of the stair treads will be less than 4 3/8 inches.
- Handrails are required on all stairways having four or more risers. All required handrails shall be 1 ¼ inches minimum in diameter and not greater than 2 inches maximum.
- Handrails shall be placed not less than 34 inches or more than 38 inches above the nosing of the stair treads. Handrails shall be continuous the full length of stairs from a point directly above the top riser of a flight to a point directly above the lowest riser of the flight.
- Handrail ends must be returned to a wall or post.
- The handrail grip must have a smooth surface with no sharp corners; edges shall have a minimum radius of ¼ inch.
- Handrails adjacent to a wall shall have a space not less than 1½ inches between the wall and the handrail.



**BEAM**  
See Beam and Footing Table  
**NOTES:**  
Any splices in beam must be over a support. All beams of 2 or more members shall be nailed together with 2 rows of 16d Nails at 16" O.C.

**POST**  
3 1/2" MIN (4x4)

Pin or other approved fastener



**Electrical service lines over or within 3' horizontally of the deck or stairs must have a minimum 10' vertical clearance.**

Less than 4"

Flash any cuts in exterior finish

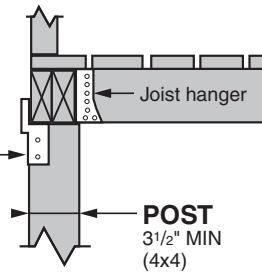
NOTE: SKIRTBOARD not required.

**MANUFACTURED BEAM SUPPORT**

**JOIST**  
See Joist Span Table

**DECKING**  
16" or less Span: 1" and 5/4"  
Over 16" Span: 2"

Manufactured post-to-beam connection



**ALTERNATE BEAM/JOIST CONNECTION**

**BUILDING**

**GRADE**

**Ledgers**

Ledgers shall be the same size as the deck joists (min 2x6.) Install lag screws that penetrate a minimum of 1 1/2" into rim joist or wall studs. (Minimum two 1/2" lag screws every 16". Drill 5/16" hole in rim joist and 1/2" hole in ledger.)

*Note 1: Joist hangers must be correct size for joist size used. Fill all holes with approved joist hanger nails.*

*Note 2: Ledgers (decks) shall not be attached to brick, masonry, stone, hollow masonry or cantilevered portions of building.*

*Note 3: Ledgers that are attached to I-Joists, floor trusses or concrete block shall be reviewed and approved prior to permit issuance.*

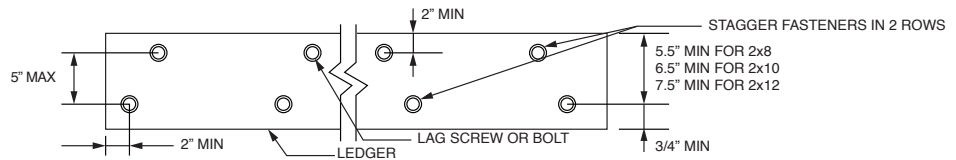
*Note 4: Flashing shall be corrosion-resistant metal or approved non-metallic material.*

*Note 5: Lateral resistance devices shall be approved manufactured products.*

**PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS/RIM JOISTS**

MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS				
	TOP EDGE	BOTTOM EDGE	ENDS	ROW SPACING
Ledger <sup>a</sup>	2 inches <sup>d</sup>	3/4 inch	2 inches <sup>b</sup>	1 5/8 inches <sup>b</sup>
Band Joist <sup>c</sup>	3/4 inch	2 inches	2 inches <sup>b</sup>	1 5/8 inches <sup>b</sup>

- a. Lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger.
- b. Maximum 5".
- c. For engineered rim joists, the manufacturer's recommendations shall govern.
- d. The minimum distance from top row of lag screws or bolts to the top edge of the ledger.



**Placement of lag screws and bolts in ledgers**

## FOOTINGS

Required footing sizes are determined by calculation the area of the deck supported by each footing. Loads shall be assumed to be equally shared between the supporting elements. Don't overlook cantilevers.

Deck footings should be sized according to the following table. Footings must extend at least 42 inches below grade (the frost line) except for decks that are not connected to a dwelling. **The minimum compressive strength of concrete used for deck footings is 5,000 psi.**

Minimum Footing Size for Decks (1,500 psf soils) - Not for use with Hot Tubs				
Live Load(b) (psf)	Tributary Area (sq. ft.)	1,500(a)		
		Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness (inches)
40	20	12	12	6
	40	14	16	6
	60	17	19	6
	80	20	22	7
	100	22	25	8
	120	24	27	9
	140	26	29	10
	160	28	31	11

## JOISTS

**DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft. - in.)**

SPECIES	Size	Allowable Joist Span (b)			Maximum Cantilever (c, f)		
		Spacing of Deck Joists			Spacing of Deck Joists with Cantilevers (a) (inches)		
		12	16	24	12	16	24
Southern Pine	2 x 6	9-11	9-0	7-7	1-3	1-4	1-6
	2 x 8	13-1	11-10	9-8	2-1	2-3	2-5
	2 x 10	16-2	14-0	11-5	3-4	3-6	2-10
	2 x 12	18-0	16-6	13-6	4-6	2-4	3-4
Douglas Fir-Larch (d) Hem-Fir (d) Spruce-Pine-Fir (d)	2 x 6	9-6	8-8	7-2	1-2	1-3	1-5
	2 x 8	12-6	11-1	9-1	1-11	2-1	2-3
	2 x 10	15-8	13-7	11-1	3-1	3-5	2-9
	2 x 12	18-0	15-9	12-10	4-6	3-11	3-3
Redwood Western Cedars Ponderosa Pine (e) Red Pine (e)	2 x 6	8-10	8-0	7-0	1-0	1-1	1-2
	2 x 8	11-8	10-7	8-8	1-8	1-10	2-0
	2 x 10	14-11	13-0	10-7	2-8	2-10	2-8
	2 x 12	17-5	15-1	12-4	3-10	3-9	3-1

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

(a) No. 2 grade with wet service factor.

(b) Live load = 40 psf, dead load = 10 psf, L/Δ = 360.

(c) Live load = 40 psf, dead load = 10 psf, L/Δ = 360. at main span, L/Δ = 180 at cantilever with 220-pound point load applied to end.

(d) Includes incising factor.

(e) Northern species with no incising factor.

(f) Cantilevered spans not exceeding the nominal depth of the joist are permitted.

## DECK BEAMS

Construction beams using two or more 2-inch nominal pieces of lumber. Nail beams together using 10d nails at 32 inches o.c. along each edge of the beam and staggered. A spacer may be used to fir the beam to a 3 1/2-inch width. Beams should be installed with any arch or crown facing up. Attachments to columns should be with post caps designed for such use. Splices must occur over columns.

DECK BEAM SPAN LENGTHS (a, b, g) (feet - inches)								
SPECIES (c)	SIZES (d)	Deck Joist Span Less Than or Equal To: (ft.)						
		6	8	10	12	14	16	18
Southern Pine	1 - 2 x 6	4-11	4-0	3-7	3-3	3-0	2-10	2-8
	1 - 2 x 8	5-11	5-1	4-7	4-2	2-10	3-7	3-5
	1 - 2 x 10	7-0	6-0	5-5	4-11	4-7	4-3	4-0
	1 - 2 x 12	8-3	7-1	6-4	5-10	5-5	5-0	4-5
	2 - 2 x 6	6-11	5-11	5-4	4-10	4-6	4-3	4-0
	2 - 2 x 8	8-9	7-7	6-9	6-2	5-9	5-4	5-0
	2 - 2 x 10	10-4	9-0	8-0	7-4	6-9	6-0	6-0
	2 - 2 x 12	10-2	10-7	9-5	8-7	8-0	7-6	7-0
	3 - 2 x 6	8-2	7-5	6-8	6-1	5-8	5-3	5-0
	3 - 2 x 8	10-10	9-6	8-6	7-9	7-2	6-8	6-4
	3 - 2 x 10	13-0	11-3	10-0	9-2	8-6	7-11	7-6
	3 - 2 x 12	15-3	13-3	11-10	10-9	10-0	9-4	8-10
Douglas-Fir-Larch (e) Hem-Fir (e) Spruce-Pine-Fir (e) Redwood Western Cedars Ponderosa Pine (f) Red Pine (f)	3 x 6 or 2 - 2 x 6	5-5	4-8	4-2	3-10	3-6	3-0	2-9
	3 x 8 or 2 - 2 x 8	6-10	5-11	5-4	4-10	4-6	4-1	3-8
	3 x 10 or 2 - 2 x 10	8-4	4-3	6-6	5-11	5-6	5-1	4-8
	3 x 12 or 2 - 2 x 12	9-8	8-3	7-6	6-10	6-4	5-11	5-7
	4 x 6	6-5	5-6	4-11	4-6	4-2	3-11	3-8
	4 x 8	8-5	7-3	6-6	5-11	5-6	5-2	4-10
	4 x 10	9-11	8-7	7-8	7-0	6-6	6-1	5-8
	4 x 12	11-5	9-11	8-10	8-1	7-6	7-0	6-7
	3 - 2 x 6	7-4	6-8	6-0	5-6	5-1	4-9	4-6
	3 - 2 x 8	9-8	8-6	7-7	6-11	6-5	6-0	5-8
	3 - 2 x 10	12-0	10-5	9-4	8-6	7-10	7-4	6-11
	3 - 2 x 12	13-11	12-1	10-9	9-10	9-1	8-6	8-1

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

(a) Live load = 40 psf, dead load = 10 psf, L/Δ = 360. at main span, L/Δ = 180 at cantilever with 220-pound point load applied to end.

(b) Beams supporting deck joists from one side only.

(c) No. 2 grade with wet service factor.

(d) Beam depth shall be greater than or equal to depth of joists with a flush beam condition.

(e) Includes incising factor.

(f) Northern species with no incising factor.

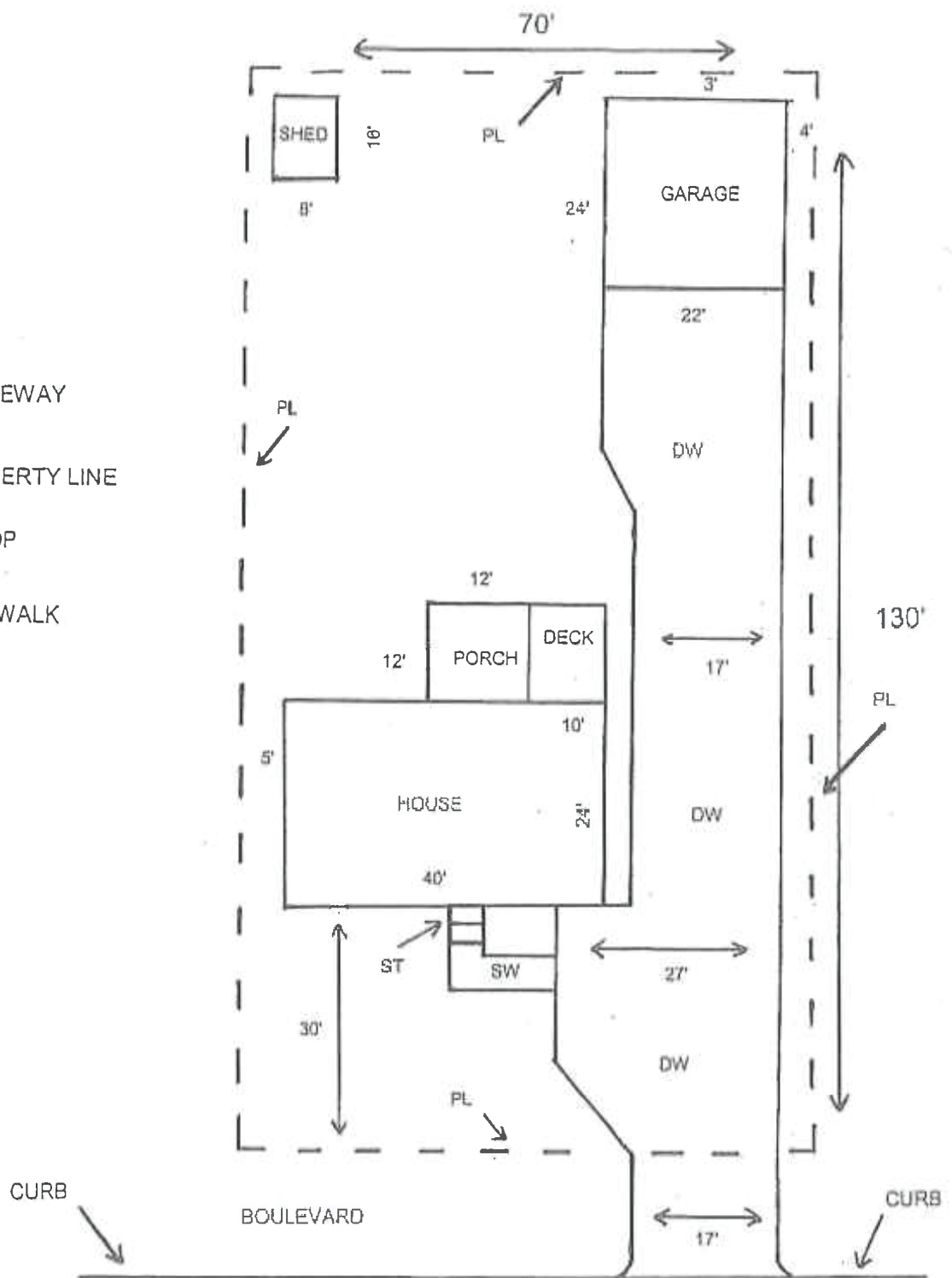
(g) Beam cantilevers are limited to the adjacent beam's span divided by 4.

DW = DRIVEWAY

PL = PROPERTY LINE

ST = STOOP

SW = SIDEWALK



NORTH →

STREET

SCALE 1" = 20'

### SAMPLE SITE PLAN