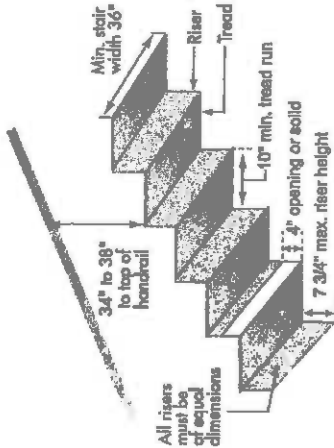


## Stairs and Handrails

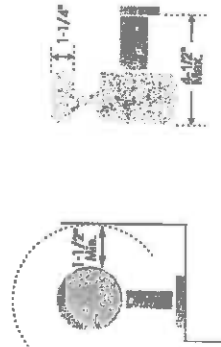
Stairs serving single family residences with four or more risers must have a handrail. The open side of the handrail needs to meet the standards for a guard rail (see 8).



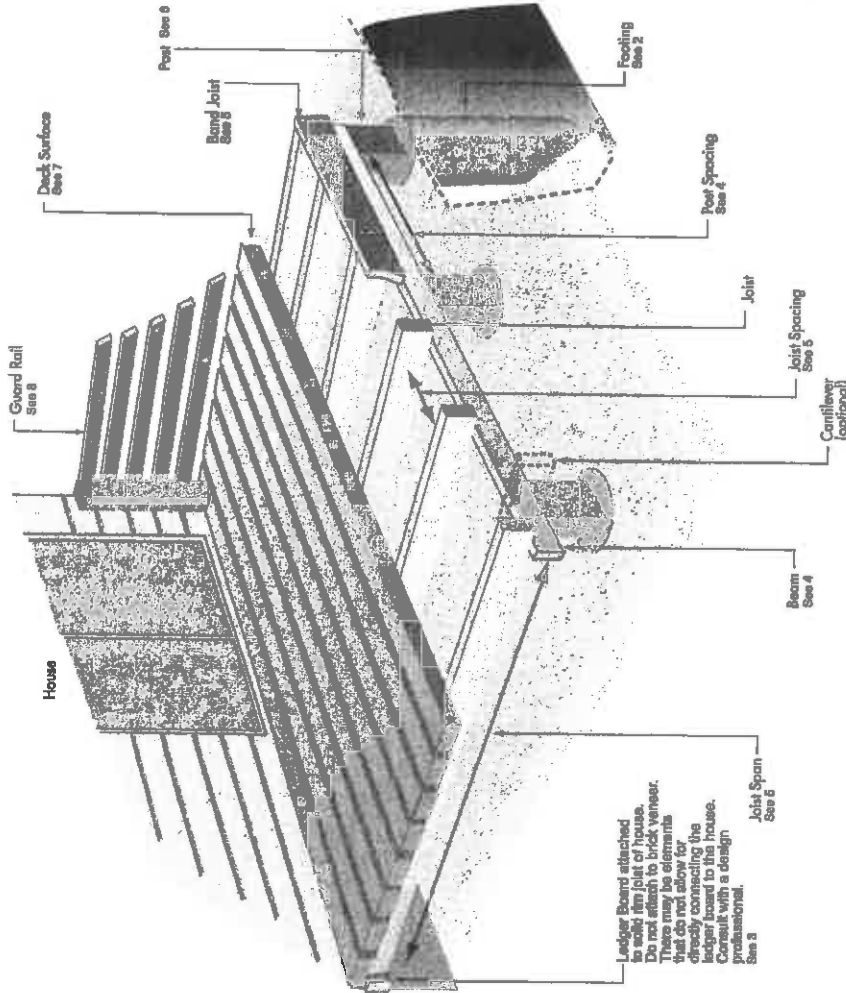
Other handrail shapes may be acceptable if they provide an equivalent gripping surface. Speak with an inspector first.



Handrail 1-1/4" minimum, 2" maximum, or equivalent gripping surface



## Not Acceptable Handrails

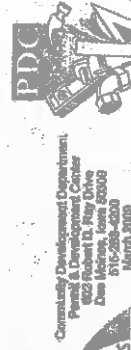


- Step 1: Design and Plan Your Deck
- Step 2: Find the Footing Size
- Step 3: Select Ledger and Bolt Size
- Note 1: Design is not intended for Hot Tube
- Note 2: Roofed deck requires additional structure loading
- Note 3: Steps adjacent to glazing have additional requirements
- Step 4: Find the Beam Size
- Step 5: Find the Joist Span
- Step 6: Find the Post Size
- Step 7: Find the Decking Material Span
- Step 8: Design the Railing

# DECKS

The City of Des Moines Permit & Development Center  
Guide to Building Single-Family Residential Decks  
Before you build. Notify Iowa One-Call  
of pending excavation for utility locates  
48 hours in advance, 1-800-282-6089

Decks governed by the IRC shall be evaluated as follows:  
Open, non-covered decks with a height from grade to upper  
to the finished floor deck not exceed 30" may be constructed up  
to the finished floor deck. Decks that exceed 30" in height or  
depth must be designed and constructed in accordance with the  
International Residential Code (IRC) and the International Building  
Code (IBC). Decks that exceed 30" in height or depth must also  
be designed for decks greater than 30" in height.  
Pending zoning approval, a deck greater than 30" in height  
may be constructed up to the finished floor deck. The deck  
must be designed in accordance with the IRC and the IBC. The  
height of the deck must be 6' to the property line using  
1" floor joist on the underside.



# 1 Design & Plan Your Deck

If you do not use a readymade design you will have to design a plan yourself.

First, draw a simple sketch of the deck—decking, rails, footings, posts and beams, then insert the dimensions. To save money, stick to standard lumber sizes and lengths to the fullest extent possible. For example, deck surface boards are usually stocked 2x4, 2x6 or 5/4 x 6 inches in 8, 10, 12, 14 and 16 foot lengths.

Use treated southern yellow pine. If other materials are desired please use an appropriate pressure treated material.

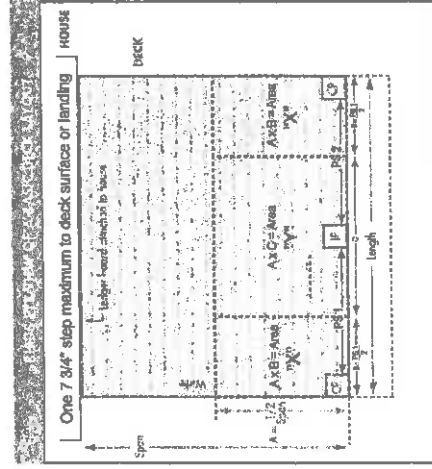
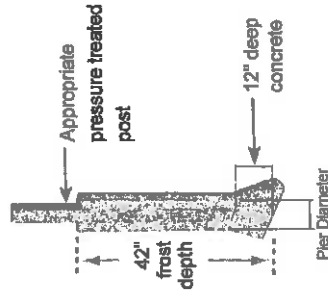
Now, layout and find the measurements for your deck. Use the example of a basic deck design on the next panel as a reference.

If you have any questions call The Permit and Development Center Monday through Friday, 7:30 a.m. to 4:30 p.m. at 283-4200.

## 2 Find the Footing Size

\*Area <sup>sq</sup>ft =

|                           |              |
|---------------------------|--------------|
| 4-10 Square feet or less  | use 8" Pier  |
| 11-20 Square feet or less | use 10" Pier |
| 21-30 Square feet or less | use 12" Pier |
| 31-40 Square feet or less | use 14" Pier |
| 41-50 Square feet or less | use 16" Pier |
| 51-60 Square feet or less | use 18" Pier |



## 3 Ledger and Bolt Size

On Cover Specifications for 877 Item-First or Southern Pine deck ledger attached to SFR or a 1" thick board joist.

| Connection Detail                                   | 8"  | 10" | 12" | 14" | 16" | 18" |
|-----------------------------------------------------|-----|-----|-----|-----|-----|-----|
| 1/2" Lag screws with 15/32" anchoring               | 30" | 23" | 18" | 15" | 11" | 10" |
| 1/2" bolts with 15/32" anchoring and 1/2" steel rod | 30" | 25" | 20" | 16" | 12" | 10" |



## 4 Find the Beam Size

To find the beam size to rest the joist on, refer to the chart below along with your deck design. 2 Bolt/Beam Post.

| If the distance between posts:   | Use:             |
|----------------------------------|------------------|
| is less than or equal to 4 feet  | (2) 2 x 6        |
| is more than 4' or less than 6'  | (2) 2 x 8        |
| is more than 6' or less than 8'  | (2) 2 x 10       |
| is more than 8' or less than 10' | (2) 2 x 12       |
| is greater than 10 feet          | Consult Designer |



## 6 Find the Post Size

To find the appropriate post size, use the chart below for each post. Attach with approved connectors or backfill with stone and dirt.

| Height in feet | Load area supported by post                    |
|----------------|------------------------------------------------|
| up to 6        | 48 sq ft 72 sq ft 96 sq ft 120 sq ft 144 sq ft |
| up to 8        | 4 x 4 4 x 4 6 x 6 6 x 6 6 x 6                  |
| up to 10       | 6 x 6 6 x 6 6 x 6 6 x 6 6 x 6                  |

Over 10' - consult designer  
Vertical loads figured on concentric along axis. No lateral loads considered.



## 7 Decking Material Span

Next you need to determine the appropriate deck surface material. Shrinkage will occur when treated materials dries out. To ensure the spacing will be no more than 1/4" between boards AFTER the material dries out, install deck surface boards tightly together — with no more than 1/8" spacing.

| Material Size | Joist Spacing                       |
|---------------|-------------------------------------|
| Laid Flat     | 5/4 x 4 1x6 5/4 x 6 16/24"          |
| Laid on Edge  | 2 x 4 16/24" 2 x 6 16/24" 2 x 4 48" |

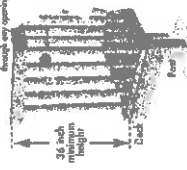


## 8 Design the Railing

The last step is to design the railing. Use the table below to assist you. A guard railing is REQUIRED if the decking surface is more than 30 inches above the ground measured 30" out from deck surface/edge.

| Distance Between Posts | Post Size   | Cap Size    |
|------------------------|-------------|-------------|
| 2 ft to 3 ft           | 2 x 4       | 2 x 4       |
| 3 ft to 4 ft           | 2 x 4 4 x 4 | 2 x 4 2 x 6 |
| 4 ft to 6 ft           | 2 x 6 4 x 4 | 2 x 6       |

Side rails can be nominal 1" or 2" number of varying widths



## 5 Find the Joist Span

To find the joist size and span, use the chart below. Notice that the span allowed by different joist sizes is dependent on 16 inch or 24 inch spacing between joist. Attach each joist to the ledger board that is attached to the house and rest the other end on the beam.

| Joist Size in inches | Max Joist Spacing | Your Deck Span        |
|----------------------|-------------------|-----------------------|
| 2 x 6                | 16" o/c 24" o/c   | 8 ft 2 in 8 ft 2 in   |
| 2 x 8                | 16" o/c 24" o/c   | 10 ft 6 in 10 ft 6 in |
| 2 x 10               | 16" o/c 24" o/c   | 13 ft 8 in 13 ft 8 in |
| 2 x 12               | 16" o/c 24" o/c   | 16 ft 8 in 16 ft 8 in |

