

City of Mounds View, Minnesota

2401 Highway 10, Mounds View, MN 55112-1499
(763) 717-4020 * Fax: (763) 717-4019

Deck Construction Information Sheet

The following information must be submitted to the Community Development Department before a deck permit can be processed or approved:

1. Building Permit Application

Complete and sign a building permit application form. Forms are available in the Community Development office, or on our website. If you are having a contractor doing the work, they should be applying for the permit and must be licensed by the State of Minnesota.

2. Survey or Site Plan

Provide an updated plan of the property showing all property lines, existing buildings [with dimensions] and project address. Diagram the proposed building location, dimensions and proposed setbacks from property lines, existing buildings and all topographical features. A registered survey may be required.

3. Construction Documents

Two sets of floor plans of the deck showing the length and width of the deck, beam location, footing size and spacing, joist spacing, stair location, post size and type of lumber - pressure treated, redwood, cedar or other type of alternate material.

General Requirements:

1. Easements and Setbacks:

- ▶ No structures of any kind are allowed in easements.
- ▶ Decks may extend to within 5'-0" of any lot lines provided they do not extend above the height of the ground floor level of the existing structure.

2. Footings:

- ▶ Frost footings are required when the deck is to be attached to a structure that has frost footings.

- ▶ Concrete blocks a minimum of 4 inches thick and 12 inches in diameter or equivalent placed on grade must support decks within Manufactured Home Parks.

3. Framing:

- ▶ Floor joist spacing at 24 inches on center requires a 2-inch minimum decking, and floor joist spacing at 16 inches on center requires 1 inch minimum decking.
- ▶ All decks shall be designed to support a live load of 40 pounds per square foot.
- ▶ Header joists more than 6'-0" long and tail joists over 12'-0" long shall be supported by framing anchors such as approved joist hangers that are not reactive with the treated lumber.
- ▶ Joists shall not overhang beams by more than 2'-0" nor should beams overhang posts by more than 1'-0" unless the design is approved. At cantilevered beam ends, do not end-notch or miter-cut more than 25% of the beam depth.
- ▶ Any wood in contact with the ground must be listed for "ground contact."

4. Deck Guardrails:

- ▶ All decks 30 or more inches above grade require a guardrail. Such rails shall be a minimum of 36" high.
- ▶ Open guardrails on decks must have intermediate rails or an ornamental pattern such that a 4" diameter sphere cannot pass through.
- ▶ The triangular area formed at the intersection of the tread, riser and bottom of the guardrail may be such that a 6" diameter sphere cannot pass through.

5. Stairways/Stairway Guardrails & Handrails:

- ▶ Any stairway that has 4 or more risers and is 30" above grade requires a guardrail and continuous handrail. Such rails shall be a minimum of 36" high.

- ▶ All stairway guardrails may be between 34" and 38" high.
- ▶ Openings for required guardrails, on the sides of stair treads, shall not allow a sphere 4-3/8 inches to pass through.
- ▶ Stairways must not be less than 36 inches in width, with a 7-3/4-inch maximum rise and a 10-inch minimum run. The largest riser height or largest tread run must not exceed the smallest by more than 3/8 inch.
- ▶ Stairways less than 44 inches wide and having 4 or more risers must have a continuous handrail on one side. The grippable portion of the handrail must have cross-sectional dimensions of not less than 1 1/4" or more than 2". The guardrail may also serve as the handrail as long as **all** of the requirements for both the guardrail and the handrail are met.
- ▶ Handrail heights must be 34-38" above tread nosing.
- ▶ Handrail must return to wall at both ends.

6. Other Code Requirements:

- ▶ Exposed wood is required to be approved wood of natural resistance to decay or treated wood. Alternative decking material must be approved by Building Official.
- ▶ Minimum clearance to power lines is 10 feet.
- ▶ All Connections between the deck and the dwelling shall be weatherproofed.

Attached you will find the following diagrams:

- Deck Plan Example
- Joist Span Table
- Beam and Footing Sizes
- Handrail Details

Plan Review: the building official will review the plans to check that the deck meets the size and setback limits, and the structural design meets Building Code requirements.

Permit Issuance: After the plans have been approved, the City will call you when the permit is ready to be picked up. You will need to pay the permit fees if you have not already done so and get a copy of the permit from our office before work begins. You will receive an inspection record card and the approved plans. These must be present at the job site and available to the inspector for review and to record the inspections when done. If it is not available the inspection may need to be rescheduled and a re-inspection fee may be charged.

Inspections:

- ▶ A footing inspection **BEFORE** any concrete is poured.
- ▶ A framing inspection is required for decks less than 30 inches high.
- ▶ A final inspection is also needed.

You need to call for an inspection when you are at each of these steps. You need to call at least 48 hours prior to when you want the inspection.

CALL FOR INSPECTIONS: 763-717-4020

When you call, make sure you tell us:

- name
- address of the property
- type of inspection needed
- building permit #
- daytime phone number

Please remember if you are doing digging of any kind, call Gopher State One Call for utility locations at (651) 454-0002 or MN toll free at 1-800-252-1166. This is not an option—it's the law!

If you have questions about the information in this handout, please contact the Building Official at (763) 717-4024 or the Community Development Administrative Assistant (763) 717-4020. You can also e-mail your questions to permits@ci.mounds-view.mn.us.

The City also has permit applications available on our website at www.ci.mounds-view.mn.us

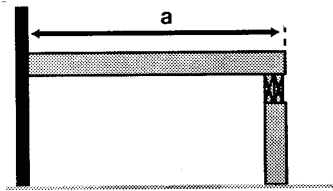
Joist Span

Based on No. 2 or better wood grades.
(Design Load = 40#LL + 10#DL, Deflection= L/360)

	Ponderosa Pine			Southern Pine			Western Cedar		
	12"OC	16"OC	24"OC	12"OC	16"OC	24"OC	12"OC	16"OC	24"OC
2x6	9-2	8-4	7-0	10-9	9-9	8-6	9-2	8-4	7-3
2x8	12-1	10-10	8-10	14-2	12-10	11-0	12-1	11-0	9-2
2x10	15-4	13-3	10-10	18-0	16-1	13-5	15-5	13-9	11-3
2x12	17-9	15-5	12-7	21-9	19-0	15-4	18-5	16-0	13-0

Sample Calculations for Using Joist Span, Beam Size and Footing Size Tables

CASE I SOLUTION:



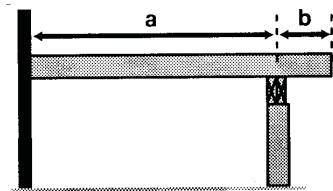
Refer to tables for joist, beam and footing size requirements.

Example: $a = 12'$; Post Spacing = 8'

Use the **Joist Span** table to find the acceptable joist sizes for a 12' span, 2x8s at 12" O.C., 2x10s at 16" O.C. or 2x12s at 24" O.C.

Use the **Beam and Footing Sizes** table and find the 8' post spacing column. With a 12' deck span, the beam may be either two 2x8s or two 2x10s, depending on wood used. Depending on the type of soil, the footing diameter at the base must be a minimum of 12", 10" or 9" for the corner post and 17", 14" or 12" for all intermediate posts.

CASE II SOLUTION:



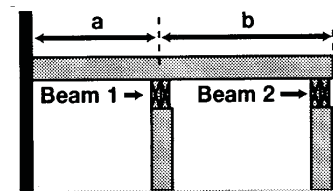
Use "a" to determine joist size and " $a + 2b$ " to determine beam and footing sizes. The length of "b" is restricted by both the length of "a" and the size of the joists.

Example: $a = 8'$, $b = 2'$, Post Spacing = 10'

Refer to the **Joist Span** table. For an 8' joist span, either 2x8s at 24" O.C. or 2x6s at 16" O.C. are acceptable.

For sizing the beam, use a joist length of 12' ($8' + 4'$) and a post spacing of 10'. The **Beam and Footing Sizes** table indicates that the beam may be either two 2x10s or two 2x12s, depending on wood used. Depending on the type of soil, the footing diameter at the base must be a minimum of 15", 12" or 11" for the corner post and 20", 17" or 15" for all intermediate posts. Note that because of the 2' cantilever all footing sizes were increased by 1" as required by footnote 2 at the end of the table.

CASE III SOLUTION:

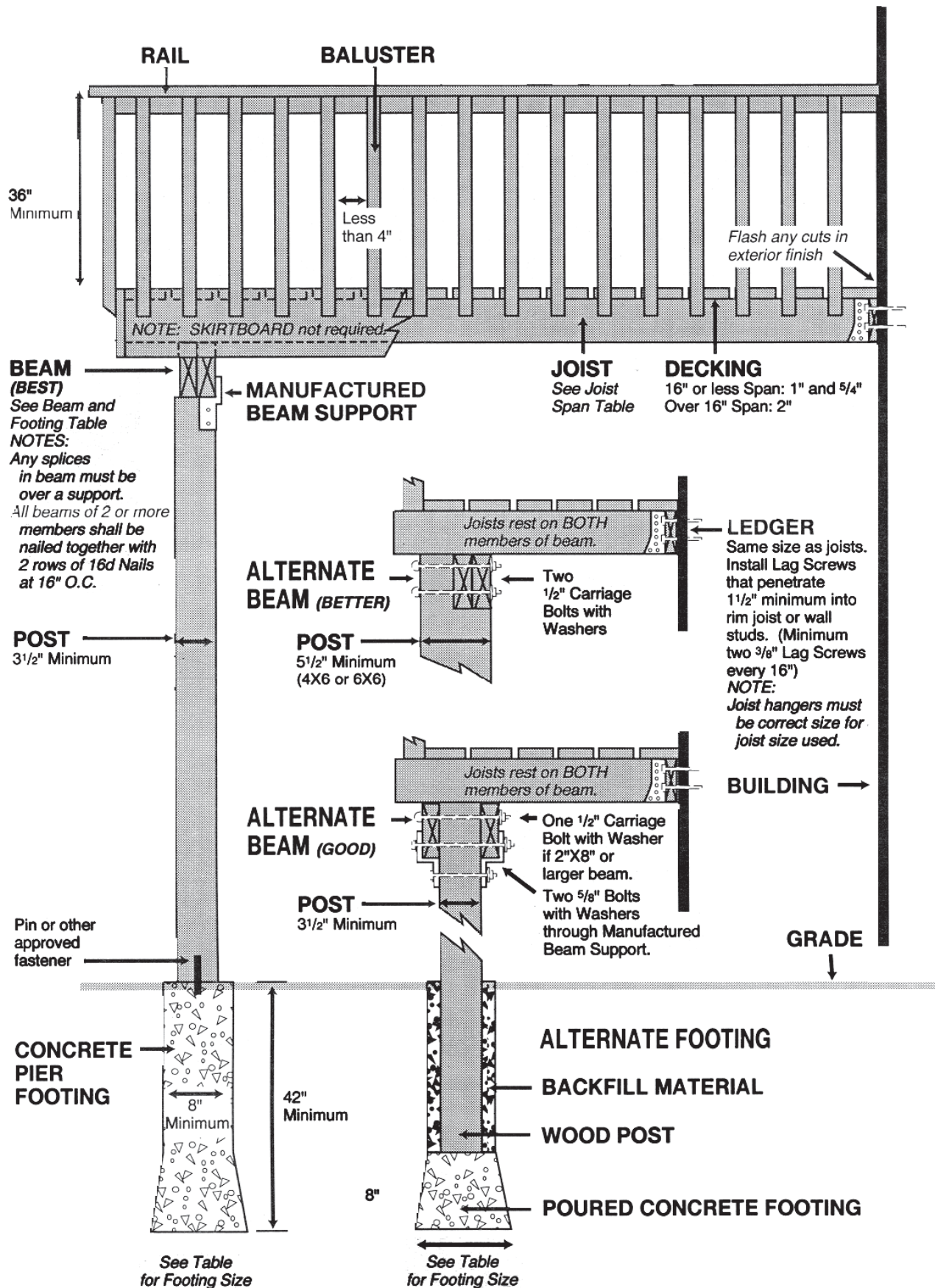


Use "a" or "b", whichever is greater, to determine joist size. Use " $a + b$ " to determine the size of Beam 1 and the post footing size for the posts supporting Beam 1. Use joist length "b" to determine both the size of Beam 2 and the post footing size for the posts supporting Beam 2.

Example: $a = 6'$, $b = 7'$, Post Spacing = 9'

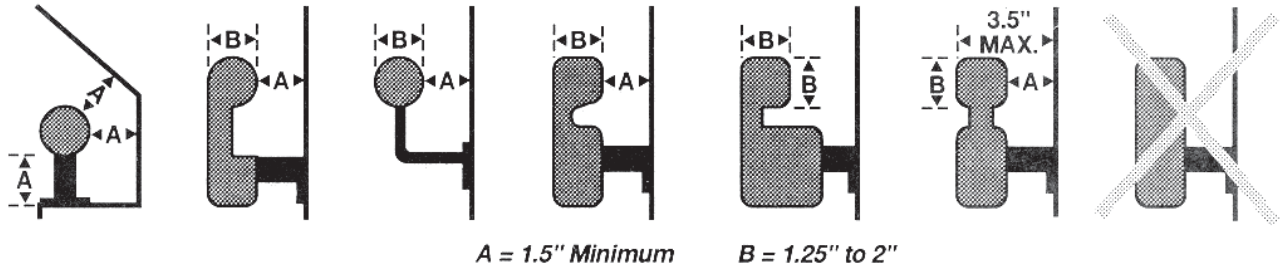
Joist size is determined by using the longest span joist (7'). The **Joist Span** table indicates that 2x6s at 24" O.C. would be adequate for this span.

For Beam 1 and footings, use a joist length of 13' ($6' + 7'$) and a post spacing of 9'. The **Beam and Footing Sizes** table indicates that the beam may be two 2x10s or two 2x12s, depending on the wood used. Depending on the type of soil, the footing diameters for Beam 1 posts shall be 13", 11" or 9" for the corner (outside) post and 19", 15" or 13" for all intermediate posts. For Beam 2 and footings use a joist length of 7' and post spacing of 9'. The beam may be two 2x8s or two 2x10s, depending on wood used. Depending on the type of soil, the footing diameters for Beam 2 shall be 10", 8" or 7" for the corner posts, and 14", 11" or 10" for all intermediate posts.

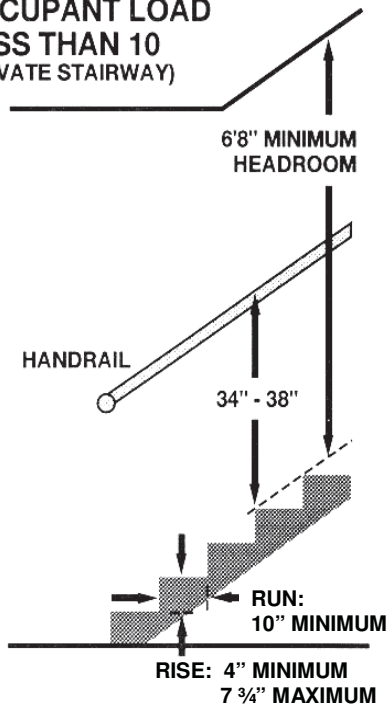


HANDRAIL DETAILS

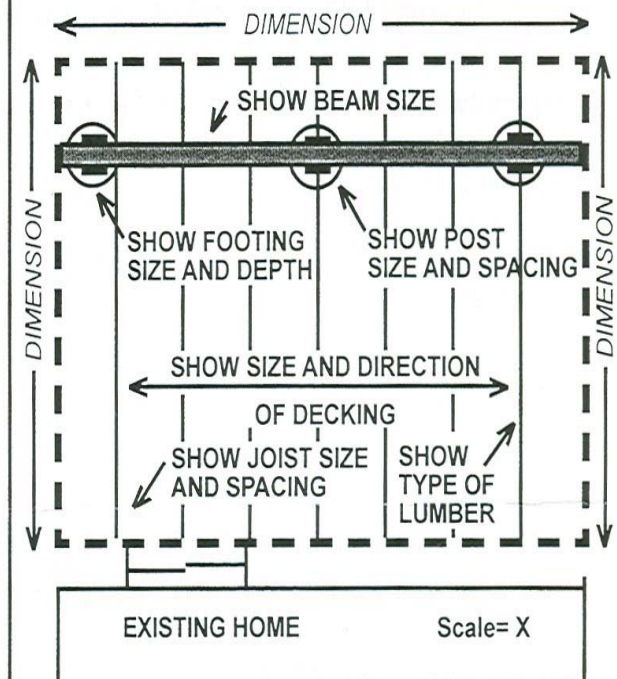
Other shapes may be acceptable if they provide equivalent gripping service.



OCCUPANT LOAD LESS THAN 10 (PRIVATE STAIRWAY)



SAMPLE FLOOR PLAN



Beam and Footing Sizes

Based on No. 2 or better Ponderosa Pine and Southern Pine
(Treated for weather and/or ground exposure)

		Post Spacing										
		4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
Joist Length	6'	Southern Pine Beam Ponderosa Pine Beam	1-2x6 1-2x6	1-2x6 1-2x6	1-2x6 1-2x8	2-2x6 2-2x8	2-2x6 2-2x8	2-2x6 2-2x8	2-2x8 2-2x10	2-2x8 2-2x10	2-2x10 2-2x12	2-2x10 2-2x12
		Corner Footing Intermediate Footing	6 5 4 9 8 7	7 6 5 10 8 7	7 6 5 10 9 7	8 7 6 11 9 8	9 7 6 12 10 9	9 7 6 13 10 9	10 8 7 14 11 10	10 8 7 14 12 10	10 9 7 15 12 10	11 9 8 15 13 11
	7'	Southern Pine Beam Ponderosa Pine Beam	1-2x6 1-2x6	1-2x6 1-2x6	1-2x6 1-2x8	2-2x6 2-2x8	2-2x6 2-2x8	2-2x8 2-2x10	2-2x8 2-2x10	2-2x10 2-2x10	2-2x10 2-2x12	2-2x10 3-2x10
		Corner Footing Intermediate Footing	7 5 5 9 8 7	7 6 5 10 8 7	8 7 6 11 9 8	9 7 6 12 10 9	9 8 7 13 11 9	10 8 7 14 11 10	10 8 7 15 12 10	11 9 8 15 13 11	11 9 8 16 13 11	12 10 9 17 14 12
	8'	Southern Pine Beam Ponderosa Pine Beam	1-2x6 1-2x6	1-2x6 2-2x6	2-2x6 2-2x8	2-2x6 2-2x8	2-2x8 2-2x10	2-2x8 2-2x10	2-2x10 2-2x10	2-2x10 2-2x10	2-2x10 3-2x10	2-2x12 3-2x12
		Corner Footing Intermediate Footing	7 6 5 10 8 7	8 6 6 11 9 8	9 7 6 12 10 9	9 8 7 13 11 9	10 8 7 14 11 10	10 8 7 15 12 10	11 9 8 16 13 11	11 9 8 16 13 12	12 10 9 17 14 12	13 10 9 18 15 13
	9'	Southern Pine Beam Ponderosa Pine Beam	1-2x6 1-2x6	1-2x6 2-2x6	2-2x6 2-2x8	2-2x6 2-2x8	2-2x8 2-2x10	2-2x8 2-2x10	2-2x10 3-2x10	2-2x10 3-2x10	2-2x12 3-2x10	2-2x12 3-2x12
		Corner Footing Intermediate Footing	7 6 5 10 9 7	8 7 6 12 10 8	9 7 6 13 10 9	10 8 7 14 11 10	10 9 7 15 12 10	11 9 8 16 13 11	12 10 8 17 14 12	12 10 9 17 14 12	13 10 9 18 15 13	13 11 9 19 15 13
	10'	Southern Pine Beam Ponderosa Pine Beam	1-2x6 1-2x6	1-2x6 2-2x6	2-2x6 2-2x8	2-2x6 2-2x8	2-2x8 2-2x10	2-2x8 2-2x10	2-2x10 3-2x10	2-2x12 3-2x10	2-2x12 3-2x12	3-2x10 3-2x12
		Corner Footing Intermediate Footing	8 6 6 11 9 8	9 7 6 12 10 9	10 8 7 14 11 10	10 8 7 15 12 10	11 9 8 16 13 11	12 10 8 17 14 12	12 10 9 18 15 13	13 11 9 18 15 13	14 11 10 19 16 14	14 12 10 20 16 14
	11'	Southern Pine Beam Ponderosa Pine Beam	1-2x6 2-2x6	2-2x6 2-2x6	2-2x6 2-2x8	2-2x6 2-2x8	2-2x8 2-2x10	2-2x8 2-2x12	2-2x10 3-2x10	2-2x12 3-2x10	2-2x12 3-2x12	3-2x10 3-2x12
		Corner Footing Intermediate Footing	8 7 6 12 9 8	9 7 6 13 11 9	10 8 7 14 12 10	11 9 8 15 12 10	12 9 8 16 13 11	12 10 9 17 14 12	13 11 9 17 14 12	14 11 10 18 15 13	14 12 10 19 16 14	15 12 10 20 16 14
	12'	Southern Pine Beam Ponderosa Pine Beam	1-2x6 2-2x6	2-2x6 2-2x6	2-2x6 2-2x8	2-2x6 2-2x10	2-2x8 2-2x10	2-2x10 2-2x12	2-2x10 3-2x12	2-2x12 3-2x12	3-2x10 3-2x12	3-2x10 Eng Bm
		Corner Footing Intermediate Footing	9 7 6 12 10 9	10 8 7 14 11 10	10 9 7 15 12 10	11 9 8 16 13 11	12 10 9 17 14 12	13 10 9 18 15 13	14 11 10 19 16 14	14 12 10 20 16 14	15 12 10 21 17 15	15 13 11 22 18 15
	13'	Southern Pine Beam Ponderosa Pine Beam	1-2x6 2-2x6	2-2x6 2-2x6	2-2x6 2-2x8	2-2x8 2-2x10	2-2x8 2-2x12	2-2x10 2-2x12	2-2x10 3-2x12	2-2x12 3-2x12	3-2x10 3-2x12	3-2x12 Eng Bm
		Corner Footing Intermediate Footing	9 7 6 13 10 9	10 8 7 14 12 10	11 9 8 15 13 11	12 10 8 17 14 12	13 10 9 18 15 13	13 11 9 19 15 13	14 12 10 20 16 14	15 12 10 21 17 15	15 13 11 22 18 15	16 13 11 23 19 16
	14'	Southern Pine Beam Ponderosa Pine Beam	1-2x6 2-2x6	2-2x6 2-2x8	2-2x6 2-2x8	2-2x8 2-2x10	2-2x10 2-2x12	2-2x10 3-2x10	2-2x12 3-2x12	3-2x10 3-2x12	3-2x12 Eng Bm	3-2x12 Eng Bm
		Corner Footing Intermediate Footing	9 8 7 13 11 9	10 8 7 15 12 10	11 9 8 16 13 11	12 10 9 17 14 12	13 11 9 18 15 13	14 11 10 20 16 14	15 12 10 21 17 15	15 13 11 22 18 15	16 13 11 23 18 16	17 14 12 24 19 17
	15'	Southern Pine Beam Ponderosa Pine Beam	2-2x6 2-2x6	2-2x6 2-2x8	2-2x8 2-2x8	2-2x8 2-2x10	2-2x10 3-2x10	2-2x12 3-2x10	2-2x12 3-2x12	3-2x10 3-2x12	3-2x12 Eng Bm	Eng Bm Eng Bm
		Corner Footing Intermediate Footing	10 8 7 14 11 10	11 9 8 15 12 11	12 10 8 17 14 12	13 10 9 18 15 13	14 11 10 19 16 14	14 12 10 20 17 14	15 12 11 21 17 15	16 13 11 22 18 16	17 14 12 23 19 17	18 15 13 24 20 17
	16'	Southern Pine Beam Ponderosa Pine Beam	2-2x6 2-2x6	2-2x6 2-2x8	2-2x8 2-2x10	2-2x8 2-2x10	2-2x10 3-2x10	2-2x12 3-2x10	2-2x12 3-2x12	3-2x10 3-2x12	3-2x12 Eng Bm	Eng Bm Eng Bm
		Corner Footing Intermediate Footing	10 8 7 14 11 10	11 9 8 16 13 11	12 10 9 17 14 12	13 11 9 18 15 13	14 11 10 20 16 14	15 12 10 21 17 15	16 13 11 22 18 16	16 13 12 23 19 16	17 14 12 24 20 17	18 15 13 25 21 18

Notes:

- Joist length is total length of joist, including any cantilevers.
- When joist extends (cantilevers) beyond support beam by 18" or more, add 1" to footing dimensions shown.
- Requirements for future 3-season porches or screen porches:
 - Increase corner footing size shown by 90%.
 - Increase center footing size shown by 55%.
 - Locate all footings at extremities of deck (no cantilevers).
 - Beam sizes indicated need not be altered.

- All footing sizes above are base diameters (in inches) and are listed for THREE SOIL TYPES:

	CLAY	SAND	GRAVEL
Corner Footing	10	8	7
Intermediate Footing	14	11	10

Deck Maintenance

Every exterior stairway, deck, porch, and balcony, and all appurtenances attached thereto, shall be maintained structurally sound and in good repair with proper anchorage capable of supporting the loads imposed. This includes verifying the footing capacity.

Exterior wood must be protected, treated or decay resistant wood. Alternative materials must be approved by the building official.

Replacement handrails, guardrails and stairs must meet the requirements of the current Building Code. Alternative methods must be approved by the Building Official prior to construction.

Before any maintenance or reconstruction occurs, a building permit shall be obtained from the City of Mounds View.

This information is a guide to the most common questions and problems. It is not intended nor shall it be considered a complete set of requirements.