



## CITY OF CASSELTON

### BUILDING DEPARTMENT



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WEST FARGO, ND 58078

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### GUIDELINE FOR BUILDING RESIDENTIAL DECKS

This handout is a guide only and does not contain all the requirements of the City of Casselton Building Code or City Ordinance.

**Building Permits** are required for all decks regardless of size, height above grade or if the deck is attached or unattached to a dwelling.

**Building Permit Fees** are based on the valuation of the construction project; this includes the materials and labor. If you will be doing the work yourself an estimate of labor cost shall be determined and included with the cost of materials.

Plan submittals shall be drawing to scale, neat and legible on suitable material. The plan submittal shall be of sufficient clarity to indicate the location, nature and extent of the work proposed.

Information required to be submitted along with your application for a building permit:

**SITE PLAN** – Drawing to scale shown lot dimensions, deck location and distances from property lines.

**PLAN VIEW** – Proposed deck size and location of stairs.

- Size, type and spacing of floor joists.
- Size and type of decking. (Plastic/composite decking must be approved before installing.)

**ELEVATIONS** – Size, type, location and spacing of posts, beams and headers.

- Height of structure from grade.
- Diameter and depth of footings.
- Joist hangers, flashing and fasteners.
- Guard height (if any) and spacing intermediate rails.
- Stair and handrail details.

Allow 1-2 business days for review of your plans; you will be contacted when your plans have been approved. Any omissions in the application and/or plans will result in a delay of the approval.

### DECK CONSTRUCTION GUIDELINES

1. **Setbacks** – Included with this guideline is Zoning Information with setback requirements for dwellings. All additions must conform to the current setback requirements regardless of the location of existing structure being added to. It is the permit holder's responsibility to locate and verify all property lines.
2. **Live Loads** – All deck floor systems must be designed to support a live load of 40 pounds per square foot.
3. **Footings** – Frost protected footings are not required but are recommended. Frost depth for the City of Casselton is 54 inches. Consideration should be made if the deck is intended to be enclosed in the future, if so then a frost protected footings will be required and may need to be designed by a Registered Professional Structural Engineer.

4. **Wood Required** – All exposed wood use in the construction of decks are required to be approved wood of natural resistance to decay (heartwood of redwood, cedar or black locust) or approved treated wood. This includes posts, beams, joists, decking, guards, stairs and rails. All lumber must bear the quality mark of an approved inspection agency. Plastic/composite decking must be approved before installing; materials must be installed and supports spaced on center per Evaluation Services Report. A copy of this report must be made available for the installer and inspector.
5. **Flashing** – All Connections between deck and dwelling must be flashed and weatherproof.
6. **Ledger Board** – Siding must be removed to allow this member to be properly fastened. Where supported by attachment to an exterior wall, decks shall be anchored to the primary building structure and designed for both vertical and lateral loads. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, deck must be self supporting. Fasteners must be long enough to penetrate framing members. Decks shall not be supported by cantilevered floor framing without specific engineering.
7. **Joist/beams** – Attached are design guideline to assist in determining the minimum size and spacing for floor joists and supporting beams. Joist with cantilevers which exceed 3 times the nominal depth of the joist will required structural engineering. Beams must not overhang posts by more than 12 inches unless designed by a Registered Professional Structural Engineer. Built-up beams (two or more members) are to be nailed together. A positive, mechanical connection between post and beam is required.
8. **Joist Hangers** – Joist framing into the side of a beam or ledger shall be supported by approved framing anchors such as joist hangers.
9. **Fasteners** – All fasteners shall be non-corrosive. Joist hangers and other framing anchors are to be installed with nails according to product manufacturer's instructions.
10. **Guards** – All open side of decks which are more than 30 inches above the grade or floor below, must be protected by a guard not less 36 inches in height. Open side of stairs with a total rise of more than 30 inches above the grade or floor below shall have guards not less than 34 inches in height measured vertical from the nose of the tread. Required guards shall have intermediate rails or ornamental closures that do not allow passage of a sphere 4 inches in diameter. The triangular openings formed by the riser and the bottom rail of a guard at the open side of a stairway may be of such size that a sphere of 6 inches in diameter cannot pass through.
11. **Stairs** – Stairways shall not be less than 36 inches in width. The maximum riser height shall be 8 inches (3/8 inch maximum variation in riser height) and the minimum tread depth shall be 9 inches (3/8 inch maximum variation in tread depths). Open risers are permitted, provided that the opening between treads does not permit the passage of a 4 inch diameter sphere. For minimum width stairs, a minimum of three stringers is required. If 5/8 inch decking material is used for treads, stringers shall be spaced a maximum of 16 inches on center.
12. **Handrails** – A handrail shall be provided on at least one side of all stairways having 4 or more risers. Handrails shall be placed not less than 34 inches or more than 38 inches above the nosing of the treads and be continuous the full length of the stairs. Handrails projecting from a wall or guardrail must have space of not less than 1 1/2 inches between the wall or guardrail and the handrail. The handgrip portion of handrails shall have a cross section of 1 1/4 inches minimum to 2 5/8 inches maximum in cross-sectional dimension and must have a smooth surface with no sharp corners.

All residential construction shall meet the minimum requirements of the City of Casselton Building Code which encompasses the 2006 International Residential Code as adopted by Ordinance 248 with amendments as listed in Ordinance 255 of the City of Casselton.

## REQUIRED INSPECTIONS

1. **Framing/Final** – In most instances the framing can be inspected at the final inspection. If your deck is less than 3 feet above the ground, a separate framing inspection will be required before the decking is installed.

It shall be the responsibility of the permit holder to notify the Building Department when work is ready to be inspected. No work shall commence until the inspection is complete and approved.

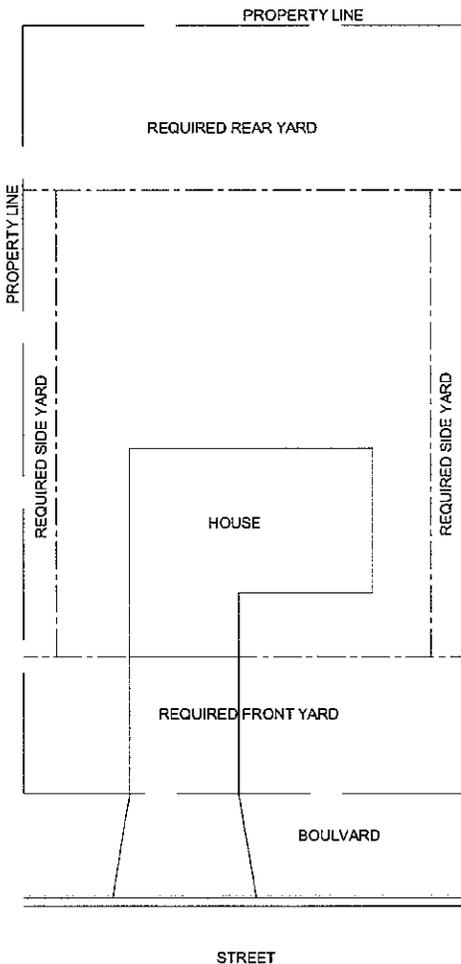
## Casselton Zoning Information

RESIDENTIAL		YARD REQUIREMENTS						
		MINIMUM LOT SIZE		MINIMUM SETBACKS (FT.)			MAXIMUM LOT COVERAGE (%)	MAXIMUM HEIGHT (FT.)
		AREA (SQ. FT.)	WIDTH (FT.)	FRONT YARD	REAR YARD	SIDE YARD		
ZONING DISTRICT	<b>A- AGRICULTURE</b>							
	FARM USE	14520	75	25	-	8 (1)	60	-
	NON-FARM USE	14520	75	25	-	8 (1)	60	-
	<b>RL- Large Family Residential</b>							
	ONE-FAMILY	13500	90	25	25	8 (1)	40	-
	<b>RM- Mixed Use Residential</b>							
	ONE-FAMILY	9750	75	25	25	8 (1)	50	-
	TWO-FAMILY	5200	40	25	25	8 (1)	50	-
	<b>RH- High Density Residential</b>							
	ONE-FAMILY	10000	8712	25	25	8 (1)	60	-
<b>RHM- Mobile Home Park District</b>								
ONE-FAMILY	5000	50	25 (2)	25	10	65	-	

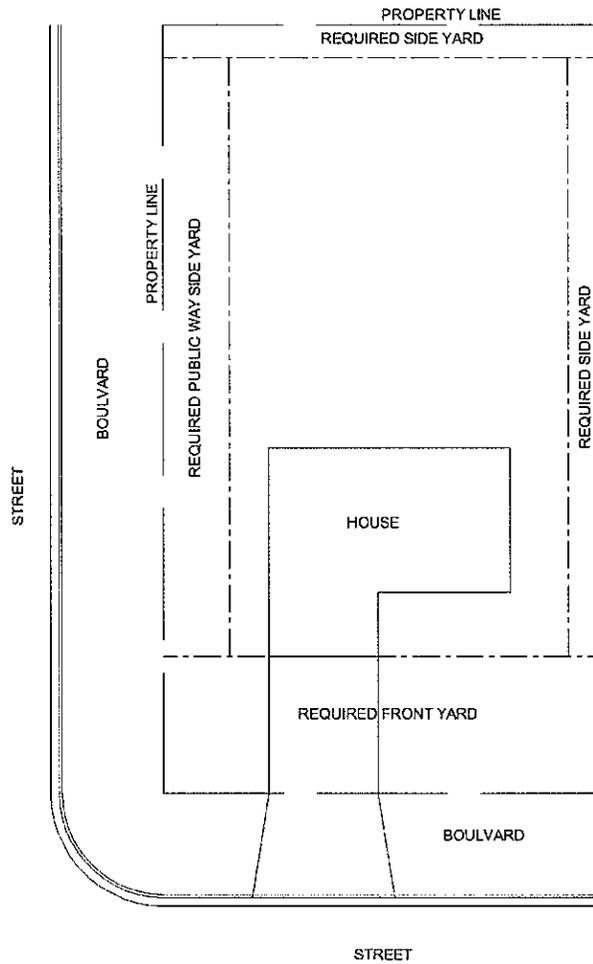
- (1) Side yard setbacks for corner lots is 10 feet
- (2) Front yard setback on private road is 10 feet

To determine your property zoning district refer to the Zoning Map or contact the Casselton Building Department at 281-0597 or the Casselton Auditor's office at 701-347-4861.

The following sheets are only provided as reference to assist you in drafting your plans for your deck.



**INTERIOR LOT**



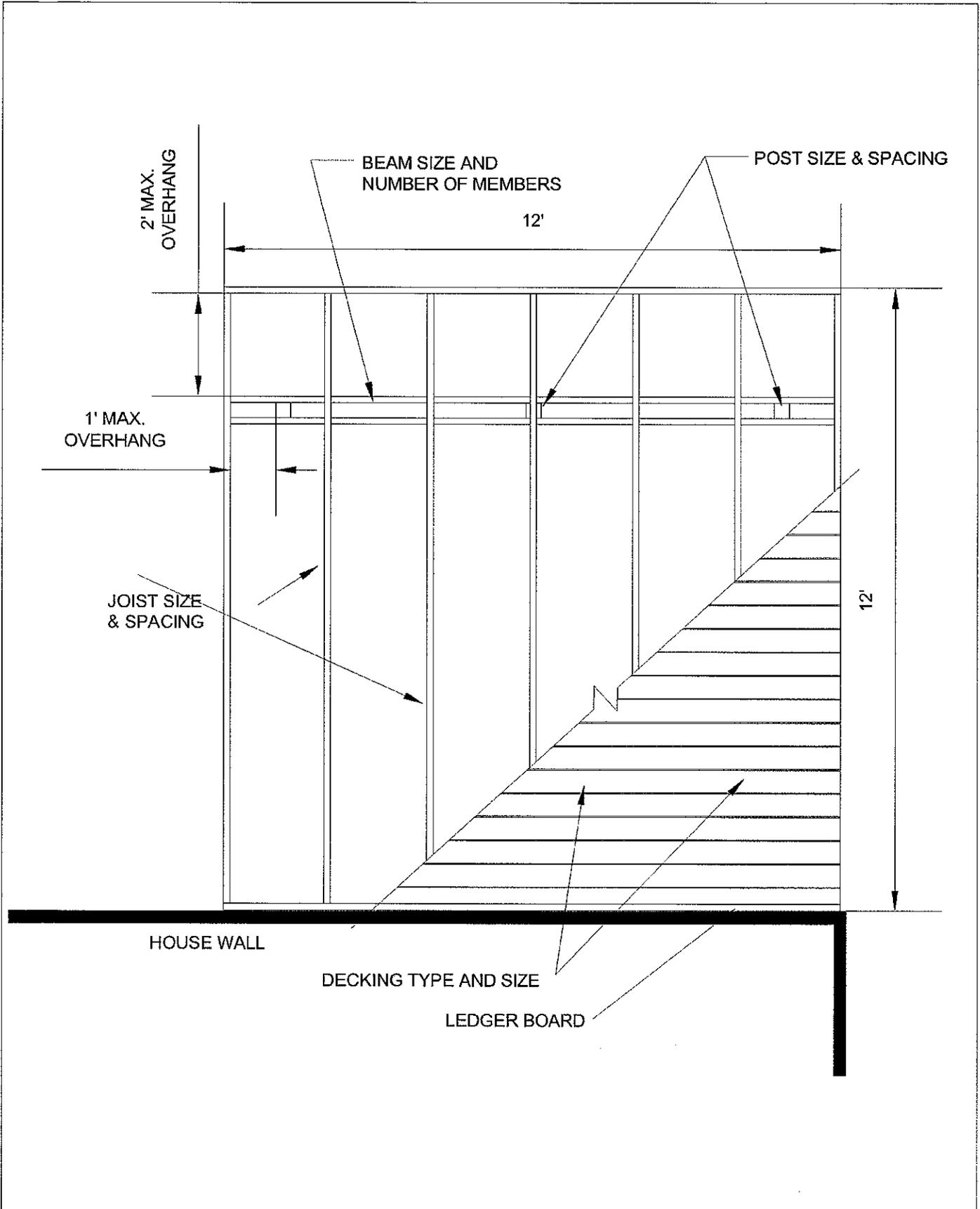
**CORNER LOT**

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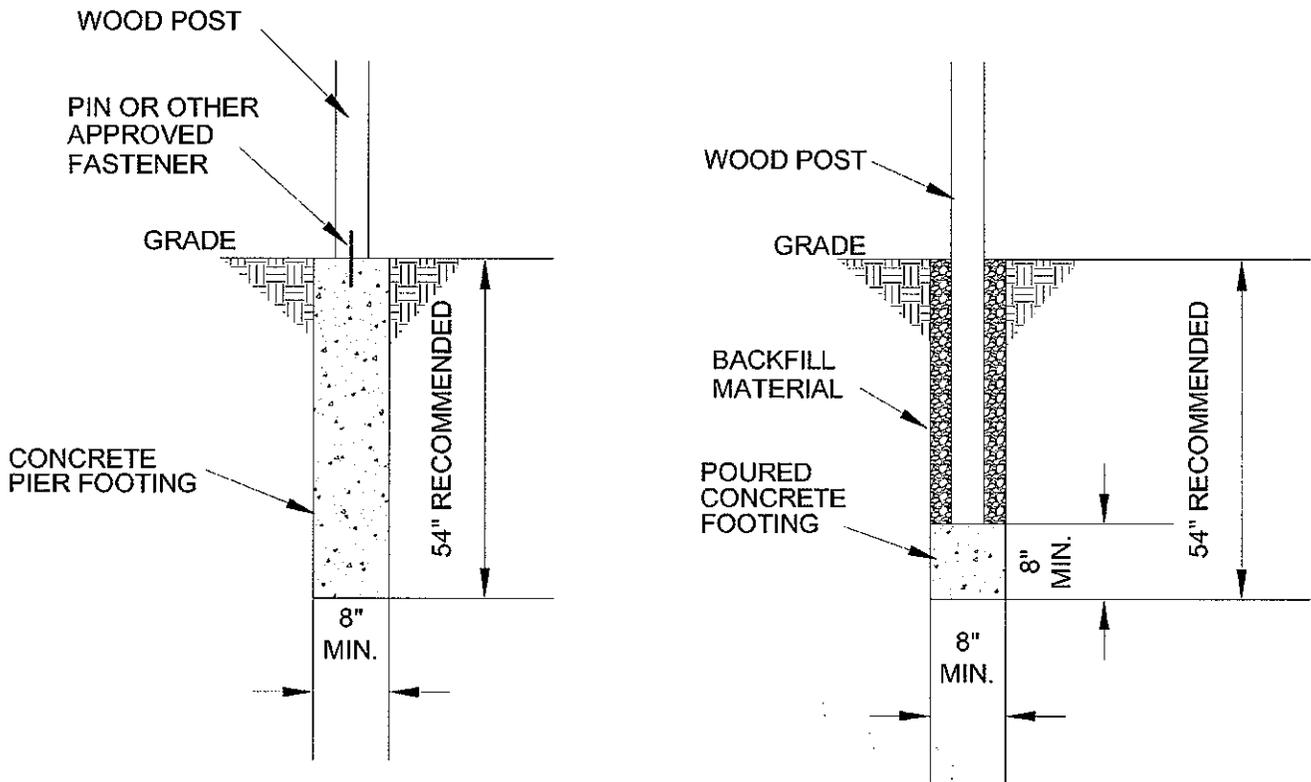
**REQUIRED YARD REQUIREMENTS**

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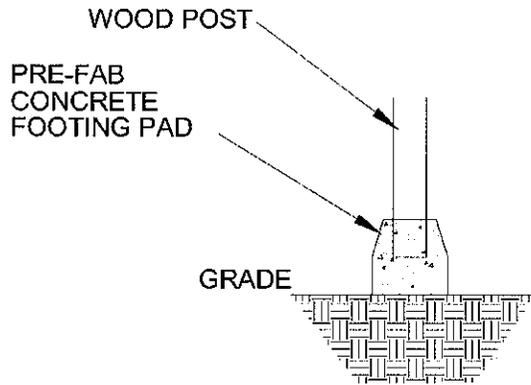




City of Casselton Casselton, ND 58012	TYPICAL DECK FLOOR PLAN	DATE	REVISED	CH'D BY	DRAWING
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		DRAWN BY	PROJ. NO.	SCALE	OF
		MAH		N.I.S.	1

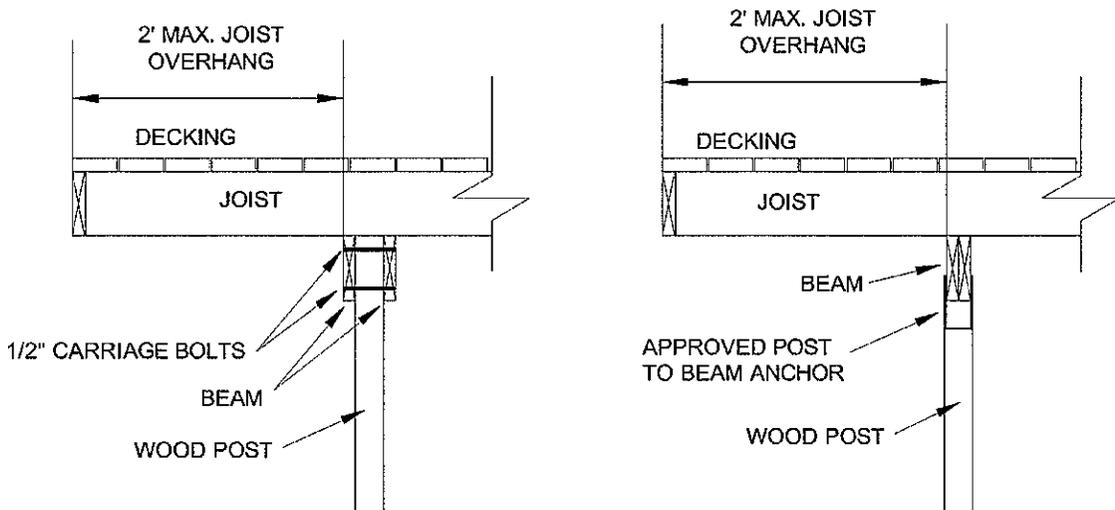


### FROST PROTECTED

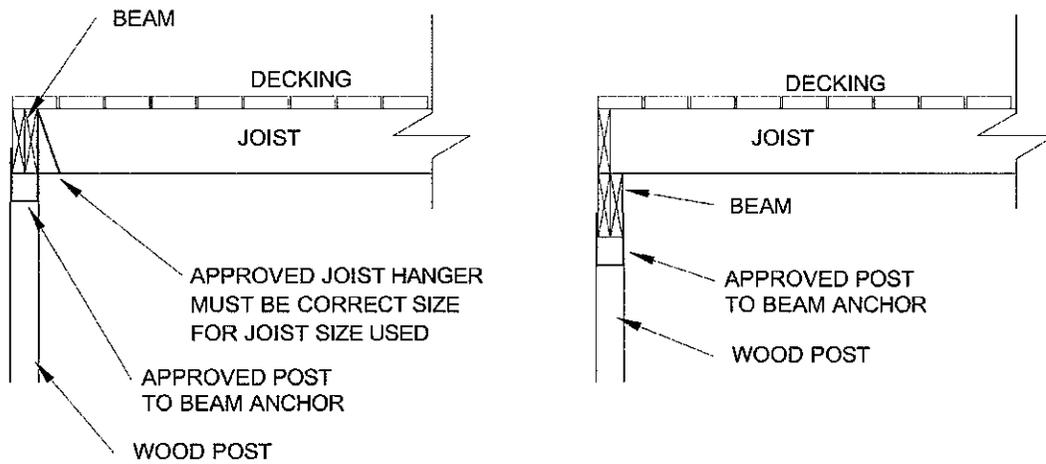


### NON-FROST PROTECTED

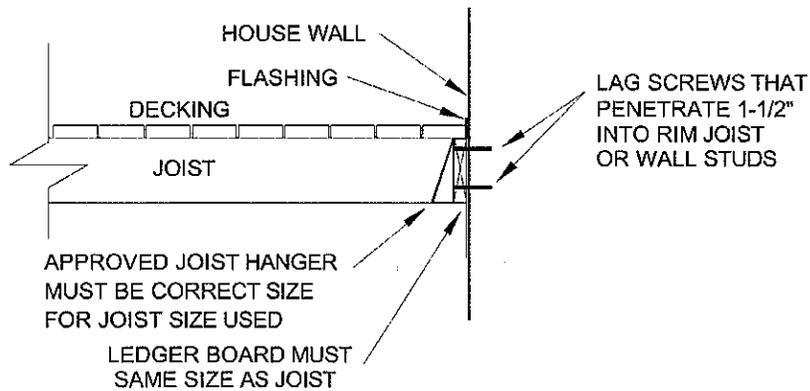
City of Casselton Casselton, ND 58012	TYPICAL DECK FOUNDATION PLAN	DATE	REVISED	CH'D BY	DRAWING
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**TYPICAL CANTILEVERED SUPPORT**



**TYPICAL END SUPPORT**

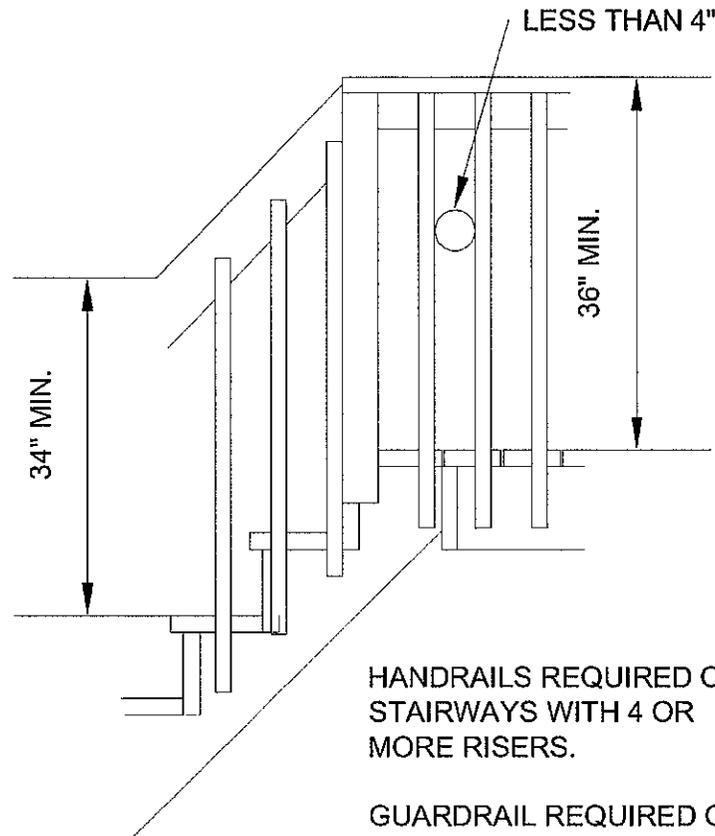


**TYPICAL HOUSE SUPPORT**

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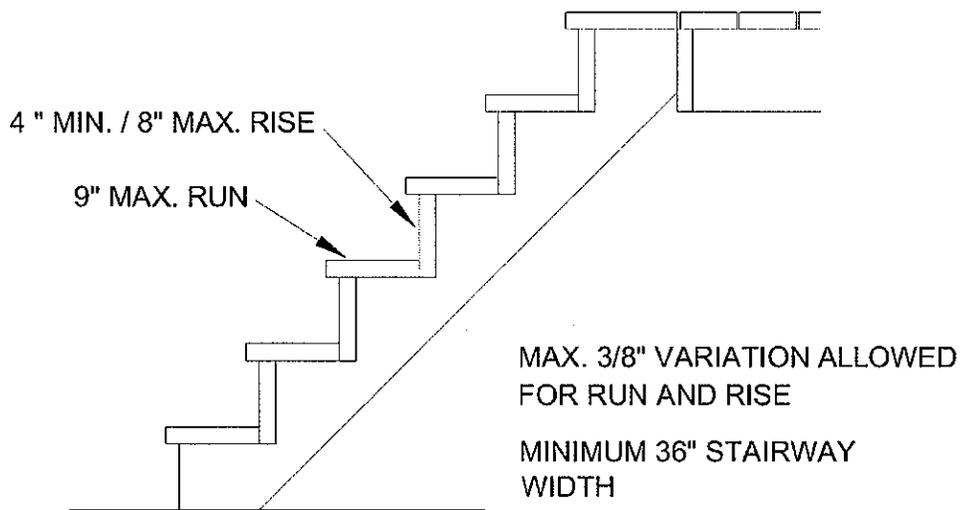
TYPICAL DECK SUPPORT AND  
CONNECTION DETAILS

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HANDRAILS REQUIRED ON STAIRWAYS WITH 4 OR MORE RISERS.

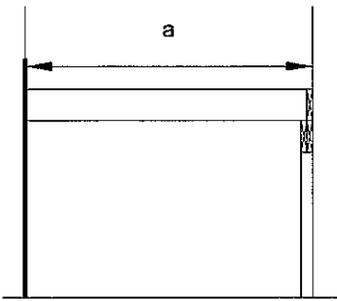
GUARDRAIL REQUIRED ON STAIRWAYS WITH A TOTAL RISE OF 30" OR MORE.



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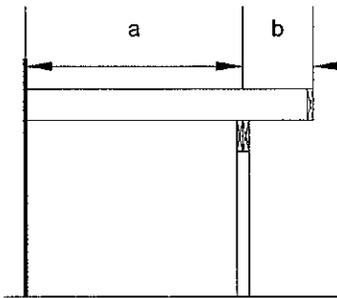
TYPICAL DECK STAIR AND  
GUARDRAIL DETAILS

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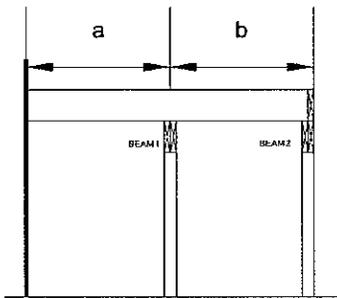
**Case I Solution:** Refer to table for joist and beam sizes

**EXAMPLE:**  $a = 12'$ , Post Spacing = 8' Refer to the span table. Joist size may be either 2x8's 12" O.C. or 2x10's 16" O.C. Beam size may be either 3 - 2x8's or 2 - 2x 10's



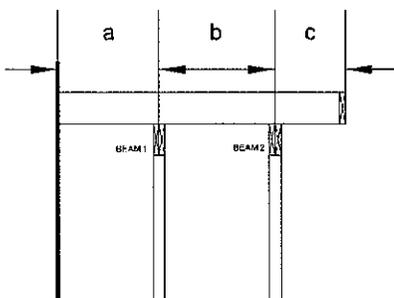
**Case II Solution:** Use "a" for joist size and "a" + "b" to determine beam size (The length of "b" is restricted by both the length of "a" and the size of the joists).

**EXAMPLE:**  $a = 8'$ ,  $b = 2'$ , Post Spacing = 10'  
Find the joist size required by looking under 8' on the table. Joist length is indicated as 2x6's 16" O.C. or 2x8's 24" O.C. For sizing the beam, use a joist length of 10' ( $8' + 2' = 10'$ ) and a post spacing of 10'. The table indicates that 4 - 2x8's or 3 - 2x10's are required for the beam.



**Case III Solution:** Use "a" or "b", whichever is greater, to determine joist size. Use "a" + "b" to determine the size of Beam No. 1 and use joist length "b" to determine the size of Beam No. 2

**EXAMPLE:**  $a = 6'$ ,  $b = 7'$ , Post Spacing = 9' The joist length (7') is determined by the longest span joist, ("b"). The table indicates that 2x6's 16" O.C., or 2x8's 24" O.C. are required for a 7' span. For Beam No. 1, use joist length of 13' ( $6' + 7' = 13'$ ) and post spacing of 9'. The table indicates that 3 - 2x10's or 2 - 2x12's are required for Beam No. 1. For Beam No. 2 use joist length of 7' with a post spacing of 9'. The table indicates that 4 - 2x6's or 3 - 2x8's are required for Beam No. 2.



**Case IV Solution:** Use "a" or "b", whichever is greater, to determine joist size. Use "a" + "b" to determine the size of Beam No. 1 and "b" + "c" to determine the size of Beam No. 2. (The length of "c" is restricted by both the length of "b" and the size of the joist).

**EXAMPLE:**  $a = 7'$ ,  $b = 8'$ , Post Spacing = 12'  
The longest joist span is 8'; therefore, the table indicates that 2x6's 16" O.C. or 2x8's 24" O.C. are required. For Beam No. 1, use joist length of 15' ( $7' + 8' = 15'$ ) and post spacing of 12'. The table indicates that 3 - 2x12's are required for Beam No. 1. For Beam No. 2 use joist length of 10' ( $8' + 2' = 10'$ ) and post spacing of 12'. The table indicates that 3 - 2x10's or 3 - 2x12's are required for Beam No. 2.

**NOTES:** Post size must be adequate to provide full beam bearing, i.e., one-member and two-member beams must be placed on a 4x4 post, three-member beams must be placed on 4x6 or 6x6 posts, and four-member beams must be placed on 8x8 posts.

Most of the boxes in this table contain two optional means of support. Wood members may be increased above those indicated in the table, but in no event may lesser members be used .

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DECK DESIGN EXAMPLES FOR  
DETERMINING JOIST AND BEAM SIZE

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