LESSON TOPIC 12

SHORING

LESSON TOPIC 12

ENABLING OBJECTIVES

IDENTIFY the need for basic shoring structures and the materials used for their construction in accordance with NSTM 079 VOL 2, NWP 3-20.31, COMNAVSUFLANTINST 3541.1 and COMNAVSURPACINST 3541.4

IDENTIFY proper procedure, tools and equipment to construct shoring in accordance with NSTM 079 VOL 2, NWP 3-20.31, COMNAVSUFLANTINST 3541.1 and COMNAVSURPACINST 3541.4

LESSON TOPIC 12

ENABLING OBJECTIVES

LAYOUT and Construct I, H, and K Type Shoring structures given Shoring and a Shoring Kit in accordance with NSTM 079 VOL 2, NWP 3-20.31, COMNAVSUFLANTINST 3541.1 and COMNAVSURPACINST 3541.4

LESSON TOPIC 12

SHORING

Process of placing supports against, beneath or above damaged areas

Prevents additional sagging, bulging or metal fatigue

Temporary structure

LESSON TOPIC 12

SHORING

When to Shore

Good judgement is the best guide

Need indicated by:

[illegible] stanchions

LESSON TOPIC 12

TYPES OF SHORING

Direct Compression (I Type)

Pressure acting parallel to axis

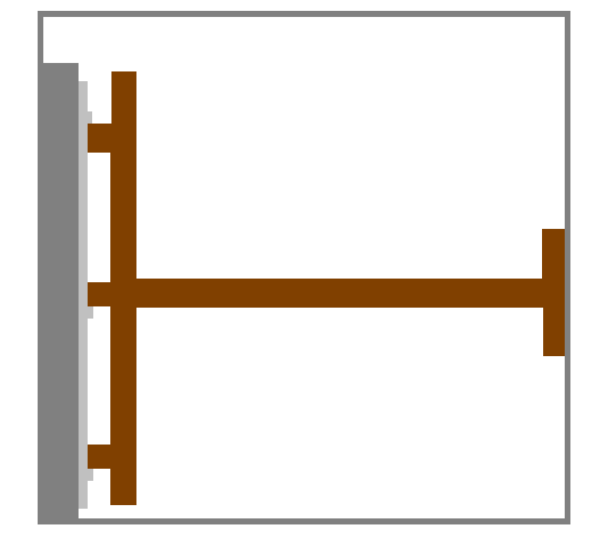
Simplest and strongest shoring structure

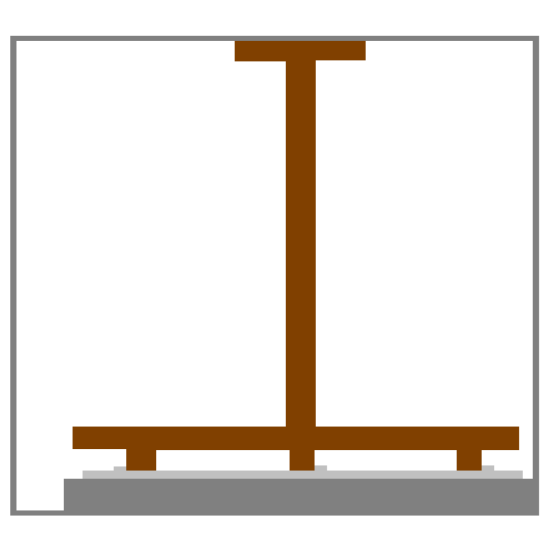
Vertical or Horizontal

LESSON TOPIC 12

TYPES OF SHORING

Direct Compression (I Type)





LESSON TOPIC 12

TYPES OF SHORING

Cross-Axial **(H-Type)**

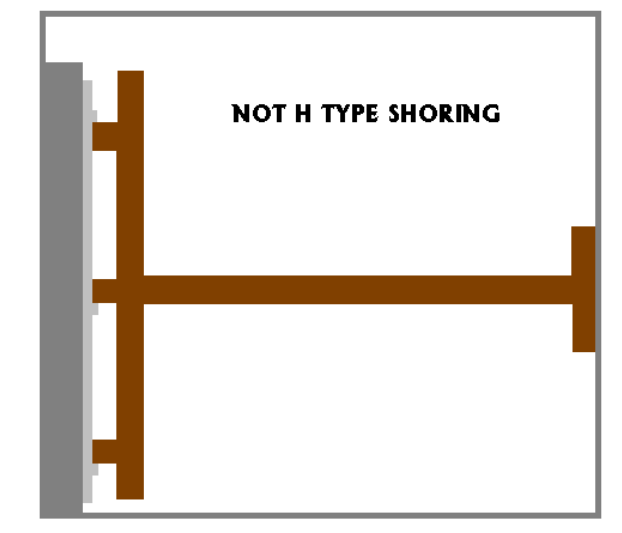
Pressure acting perpendicular to axis

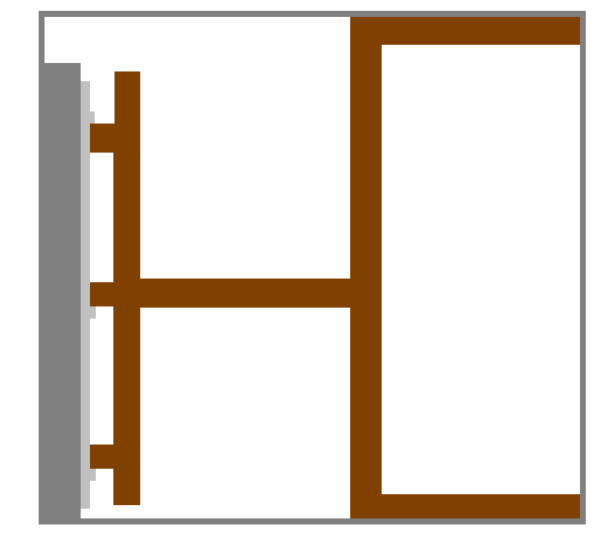
H-Type Shore will support only moderate pressure

LESSON TOPIC 12

TYPES OF SHORING

Cross-Axial **(H Type)**





LESSON TOPIC 12

TYPES OF SHORING

Triangulation **(K-Type)**

Both shores under direct compression

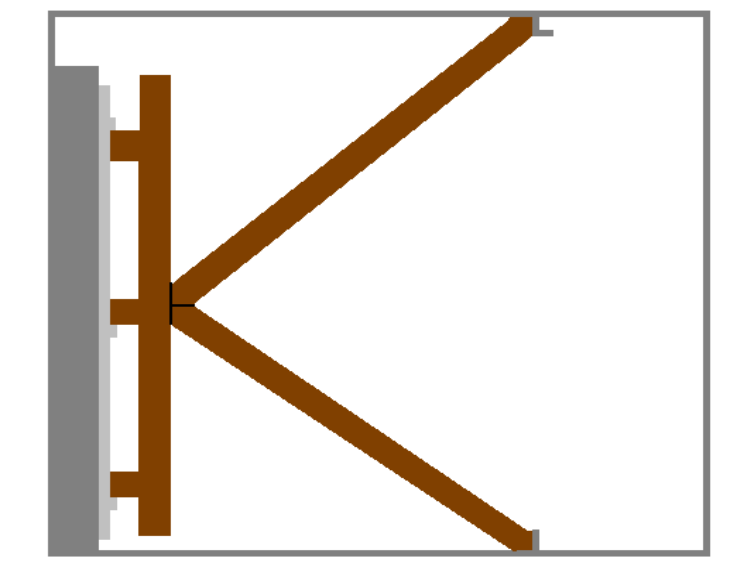
Ends cut a 90º angles

Installed at not more than 90º angle

LESSON TOPIC 12

TYPES OF SHORING

Triangulation (K Type)



LESSON TOPIC 12

SHORES

- Types
  - Wood Shores
  - Steel Shores

LESSON TOPIC 12

SHORES

Wood Shores

Portable Beam

Made of Soft Woods

LESSON TOPIC 12

- DOUGLAS FIR
- YELLOW PINE
- HEMLOCK
- SPRUCE

LESSON TOPIC 12

SHORES

Wood Shores

Treatment

Fire Resisting Chemicals

Fire Retardant Paint

LESSON TOPIC 12

SHORES

Wood Shores

Stowage

In lengths 16’ to 18’ long. Distributed throughout the ship in accessible areas above the waterline

LESSON TOPIC 12

SHORES

Wood Shores

Working length (Max)

30 times the minimum thickness of shore

LESSON TOPIC 12

SHORES

Steel Shore

Adjustable and Telescoping

Available in two sizes

LESSON TOPIC 12

3 FOOT to Maximum of 5 FOOT (Model 3-5)

20,000 pounds support when closed

12,000 pounds support when fully extended

LESSON TOPIC 12

6 FOOT to Maximum of 11 FOOT (Model (6-11)

20,000 pounds support when closed

6,000 pounds support when fully extended

LESSON TOPIC 12

SHORES

Steel Shore

Advantages

LESSON TOPIC 12

- Fire Proof
- Stronger than wood
- Minimum stowage space required
- Minimum time lost while constructing
- Will not slip or slide when welded
- Tighter than wood
- No wedges required when welded

LESSON TOPIC 12

SHORES

Steel Shore

Disadvantage

During welding of steel shores, heat and sparks are produced

LESSON TOPIC 12

WEDGES

Types

Wood

Steel

LESSON TOPIC 12

WEDGES

Wood Wedges

Made of Soft Wood

LESSON TOPIC 12

- DOUGLAS FIR
- YELLOW PINE

LESSON TOPIC 12

WEDGES

Wood Wedges

Tighten and hold shore in place

Rough cut and unpainted

Triangular side block

Rectangular butt

Width same as the shore being used

LESSON TOPIC 12

WEDGES

Wood Wedges

Length of wedge

Six times the Butt Thickness

LESSON TOPIC 12

WEDGES

Wood Wedges

Installation

- **Always Used in Pairs**
- **Width to Width of Shore**
- **Rough Side to Rough Side**
- **Driven in Simultaneously**

LESSON TOPIC 12

WEDGES

Steel Wedge

Primarily used for prying

LESSON TOPIC 12

SHOLES

A shole is a flat plate which may be placed under the end of a shore to distribute weight or pressure

LESSON TOPIC 12

SHOLES

- Types
  - Softwood
    - Douglas Fir or Yellow Pine
    - Thickness of at least 1 inch and a minimum of 8 inches wide

LESSON TOPIC 12

SHOLES

Types

Steel Plate

May be used with steel shores

Do not prefabricate

LESSON TOPIC 12

STRONGBACK

A bar or beam of wood or metal, often shorter than a shore, use to distribute weight or pressure, or serves as an anchor for a patch over a hole

LESSON TOPIC 12

TOOLS

Hand and Powered

LESSON TOPIC 12

- Hand Lantern
- Tapes and Folding Rules
- Carpenter's Square
- Measuring Batten
- Saws, Mauls, Hammers, Sledges
- Cutting Outfit
- Welding Machine

LESSON TOPIC 12

MEASURE SHORING

Measuring (Shoring) Batten

LESSON TOPIC 12

- Easiest and Quickest
- Adjustable
- 90 Degree angle at both ends
- Take Diagonal Measruements
- May lose Accuracy

LESSON TOPIC 12

MEASURE SHORING

Carpenter's Square

Used for all measurements

(When not utilizing the Shoring Batten)

Use requires training

LESSON TOPIC 12

MEASURE SHORING

Carpenter's Square

Parts of the Carpenter's Square

Tongue

Heel

Body

LESSON TOPIC 12

MEASURE SHORING

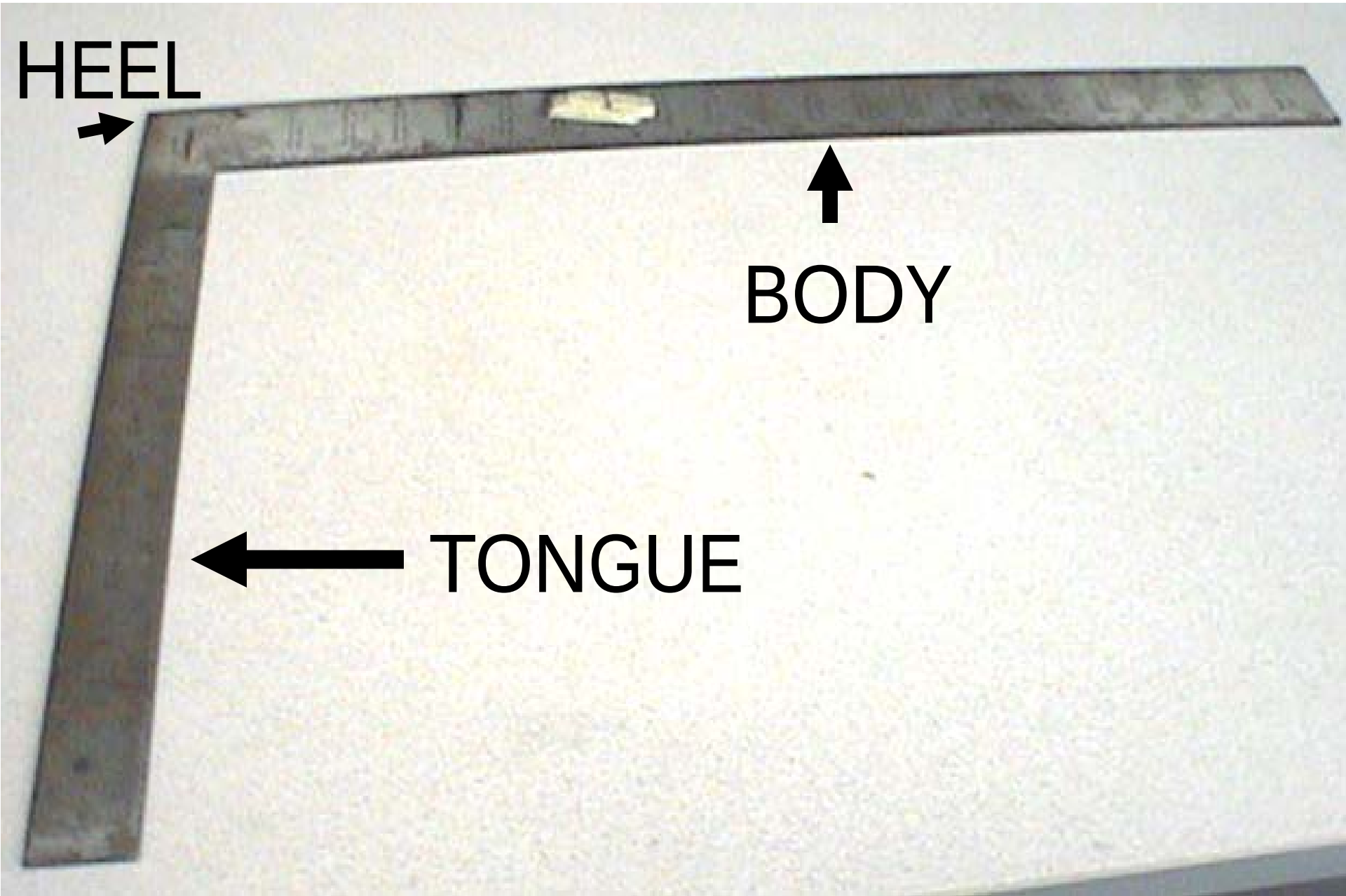
Carpenter's Square

Parts of the Carpenter's Square

The Carpenter's Square is divided in 1/12 and 1/16 of an inch.

Always use the side that is divided into 1/12 of an inch

Carpenters square



LESSON TOPIC 12

ALWAYS HOLD THE TONGUE OF THE CARPENTER'S SQUARE IN THE LEFT HAND

LESSON TOPIC 12

MEASURE SHORING

Measurements (3 needed)

RISE: **Measurement from the deck or overhead to the center of damage.**

LESSON TOPIC 12

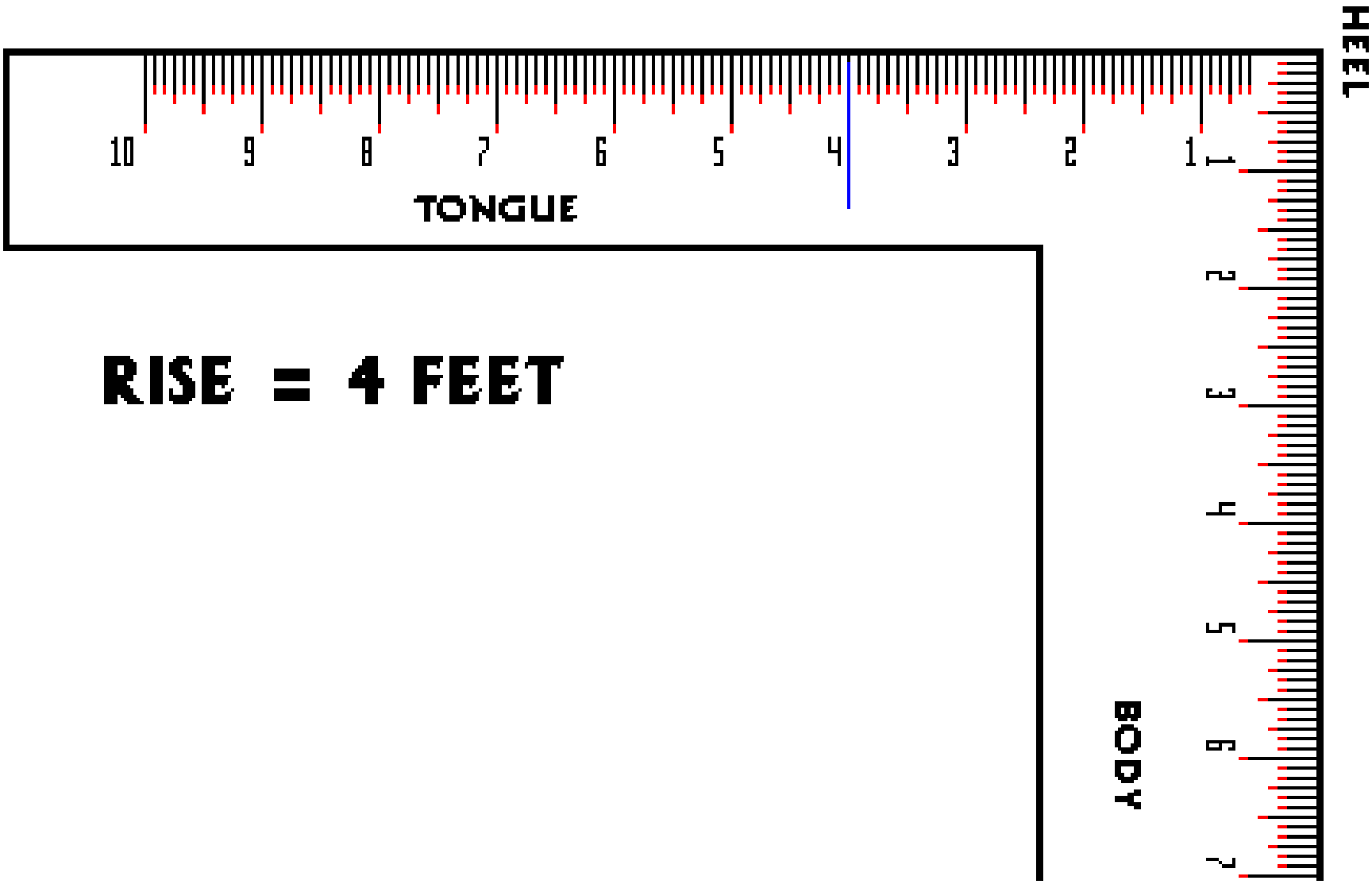
LESSON TOPIC 12

MEASURE SHORING

Measurements (3 needed)

RISE: Measurement from the deck or overhead to the center of damage.

Reading goes on the Tongue


10
9
8
7
6
5
4
3
2
1
TONGUE
HEEL
1
2
3
4
5
6
7
BODY
RISE = 4 FEET

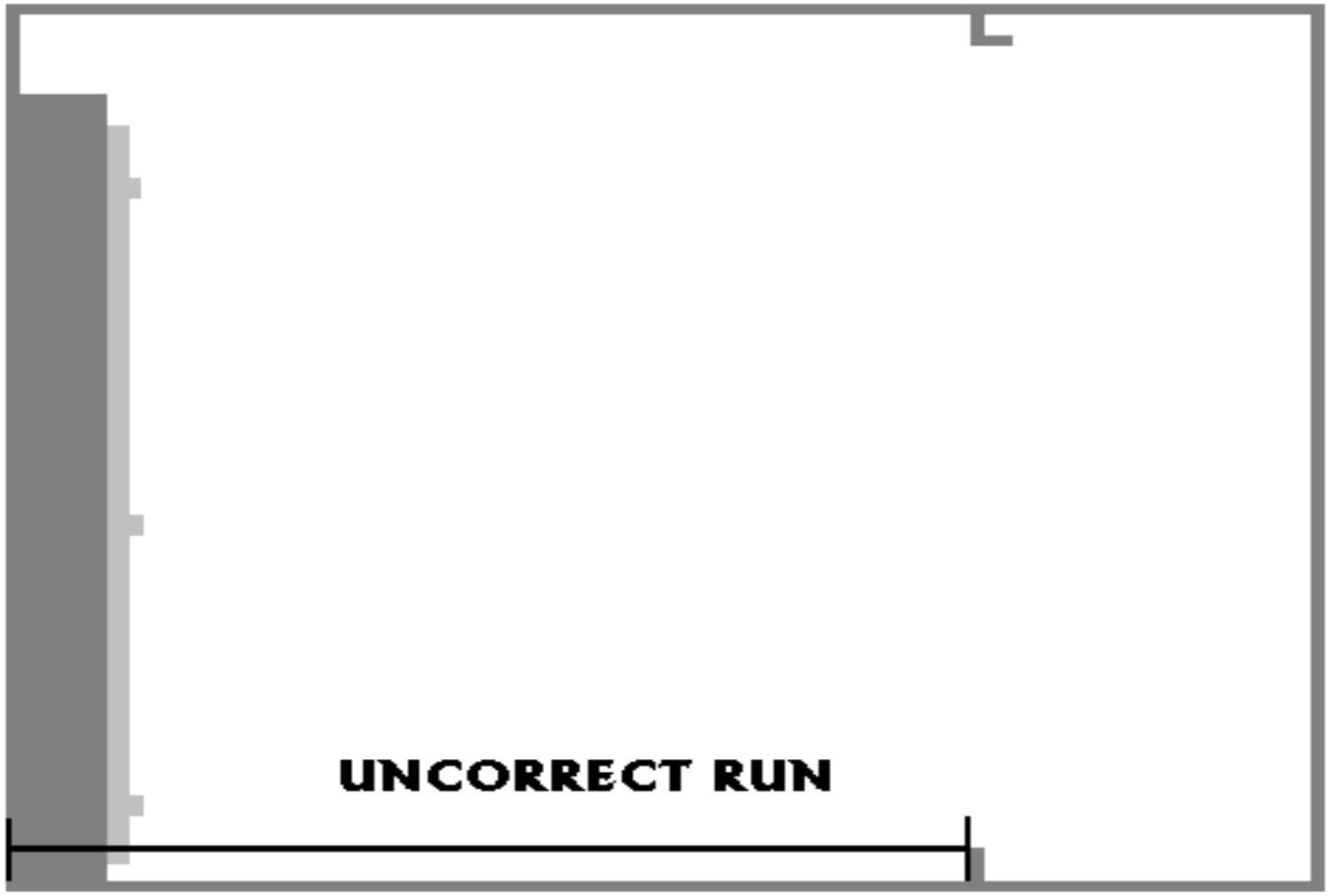
LESSON TOPIC 12

MEASURE SHORING

Measurements (3 needed)

UNCORRECTED RUN: **Measurement from the bulkhead to the anchor point**

LESSON TOPIC 12



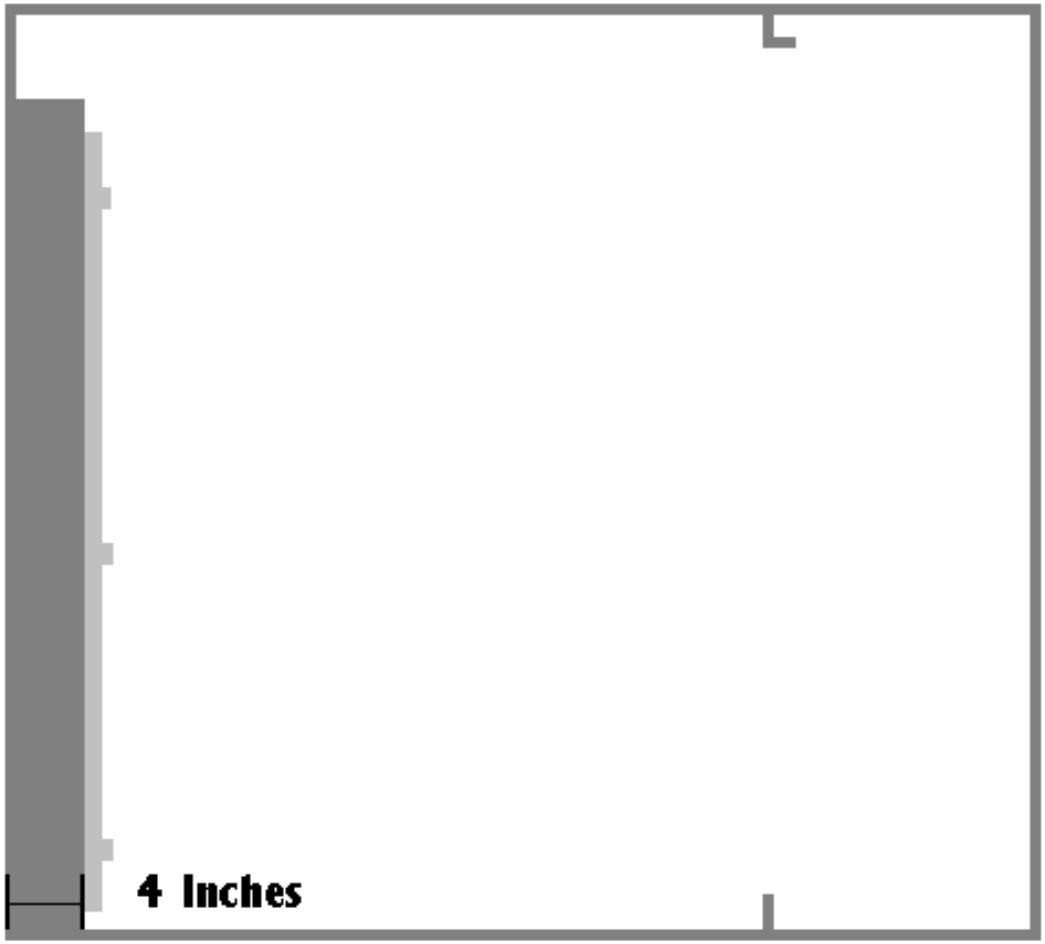
LESSON TOPIC 12

MEASURE SHORING

Measurements (3 needed)

CORRECTED RUN: **Measurement from the bulkhead to the anchor point compensating for thickness of (strongbacks, wedges, etc.)**

LESSON TOPIC 12



LESSON TOPIC 12

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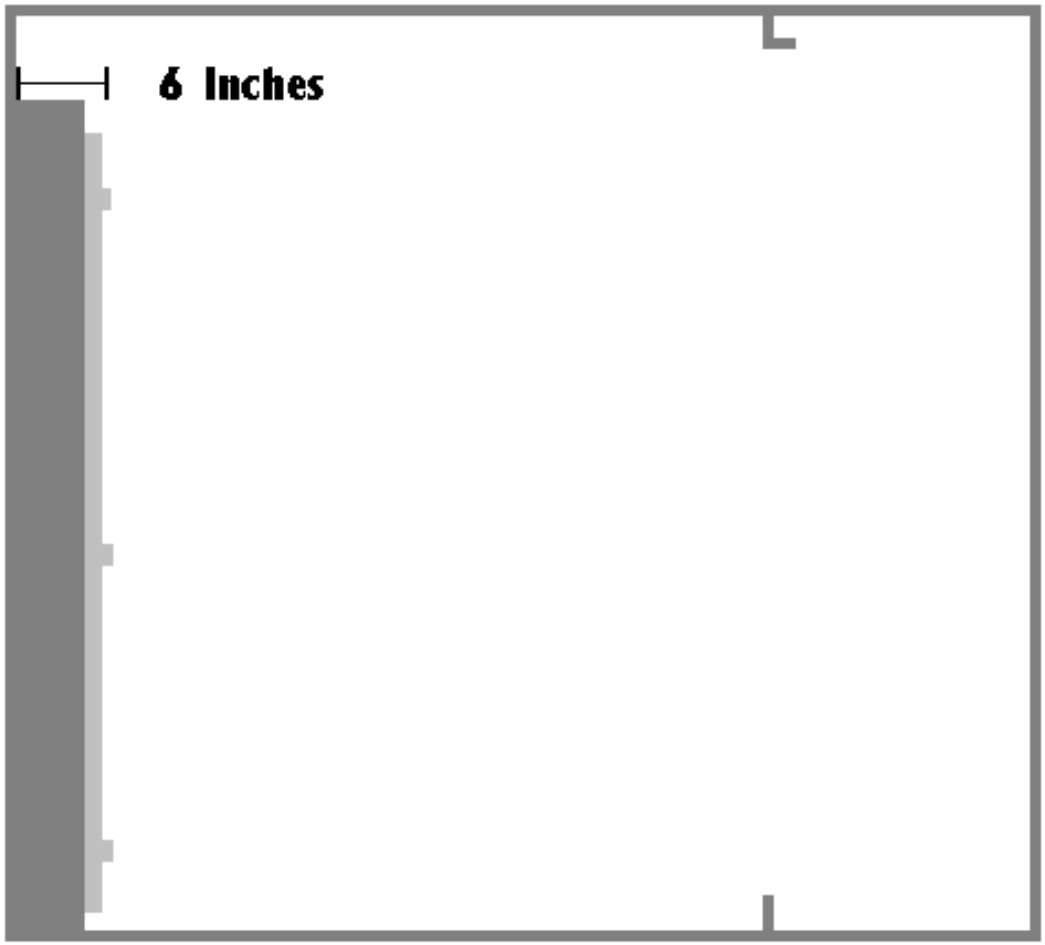

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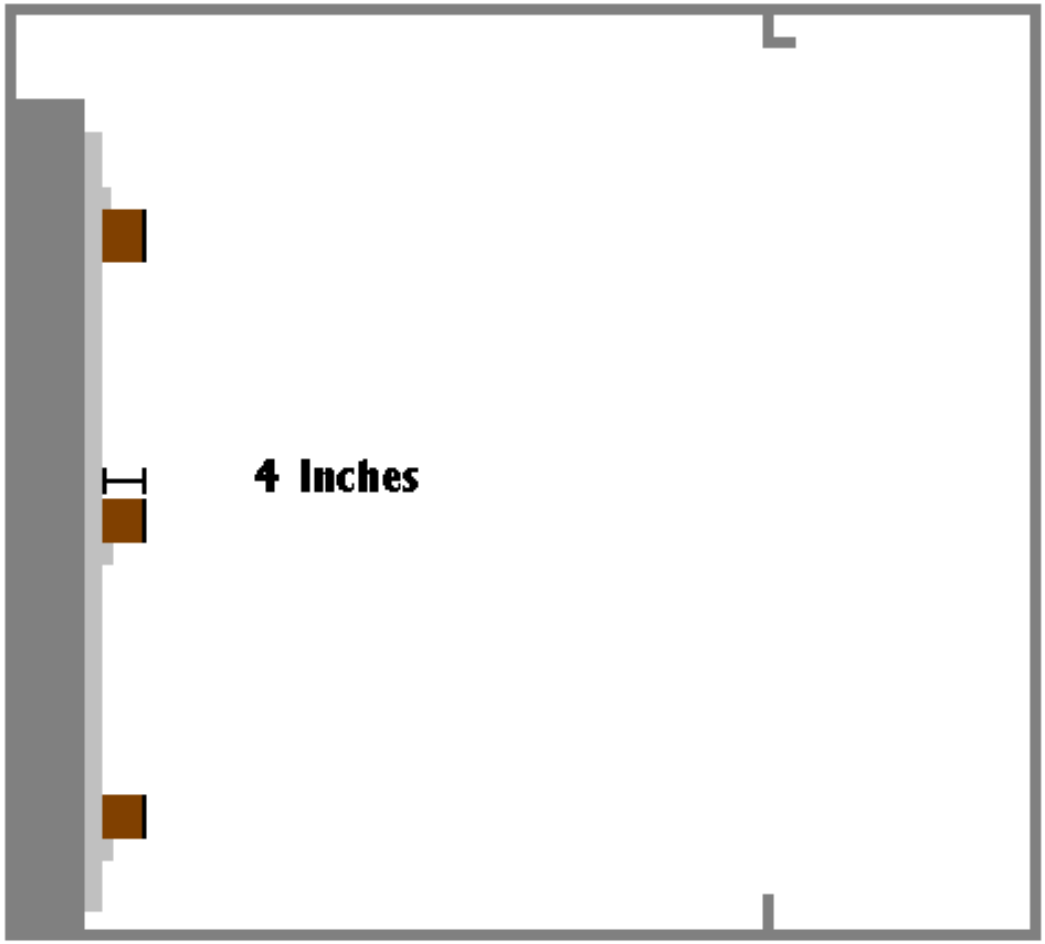
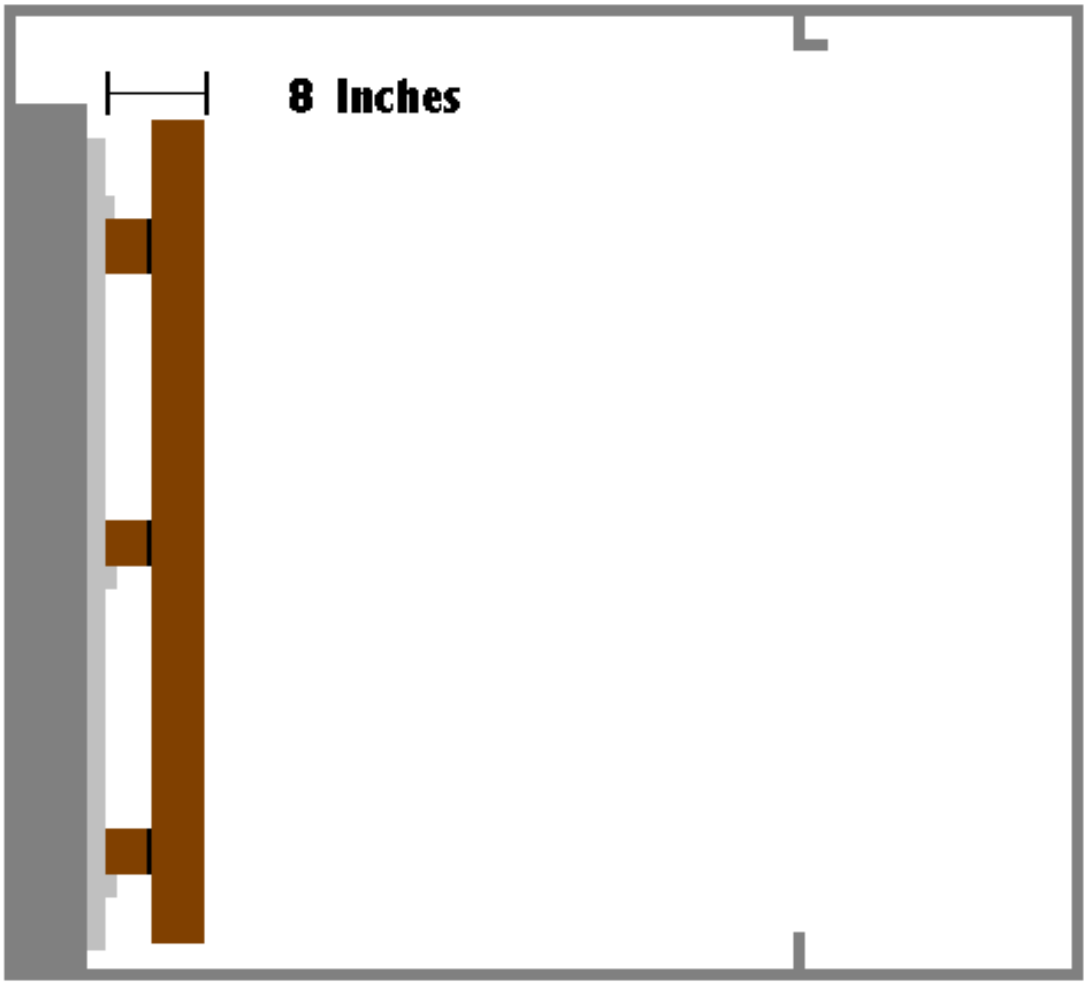


LESSON TOPIC 12



LESSON TOPIC 12

LESSON TOPIC 12

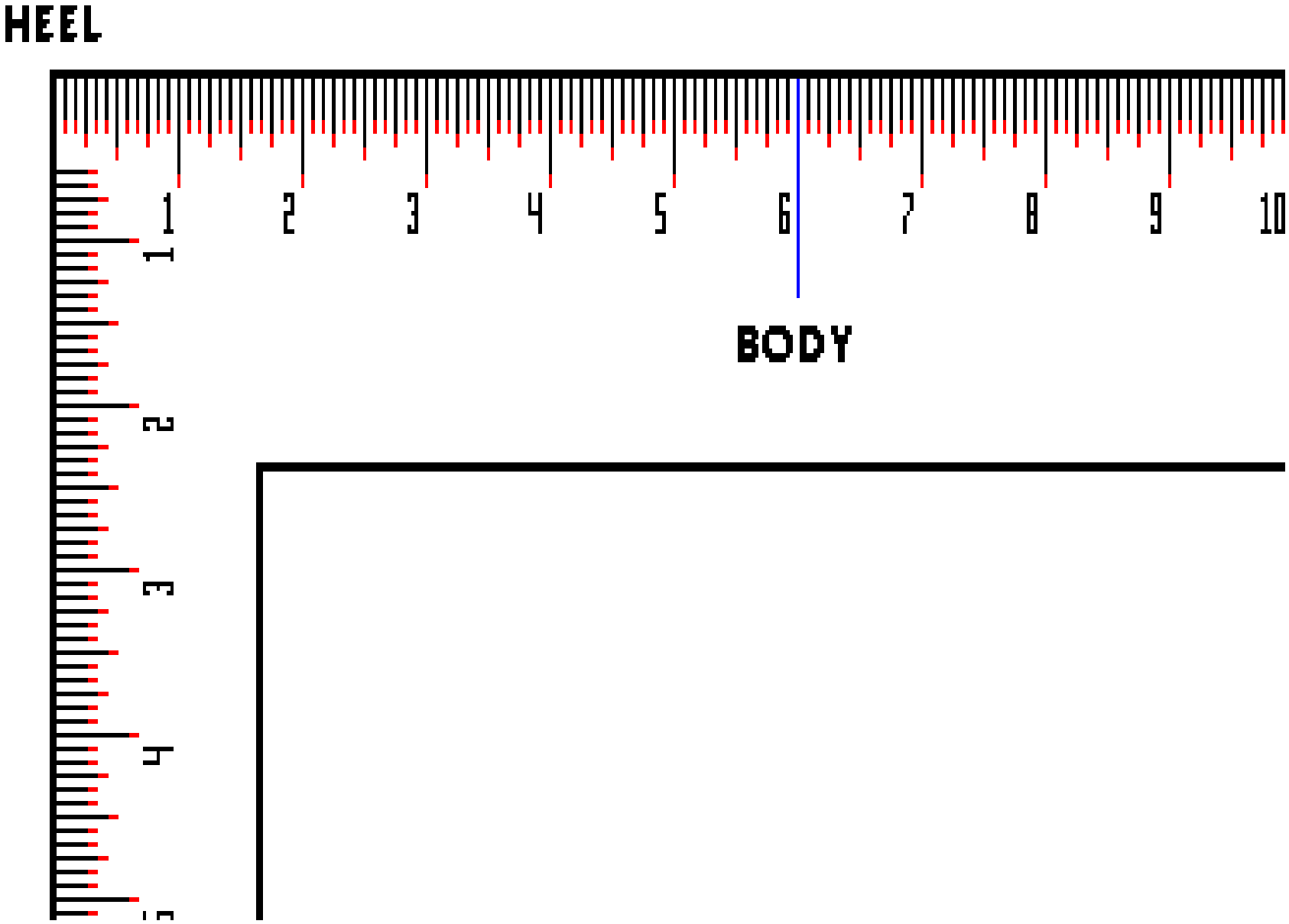
LESSON TOPIC 12

MEASURE SHORING

Measurements (3 needed)

CORRECTED RUN: Measurement from the bulkhead to the anchor point compensating for thickness of (strongbacks, wedges, etc.)

Reading goes on the Body

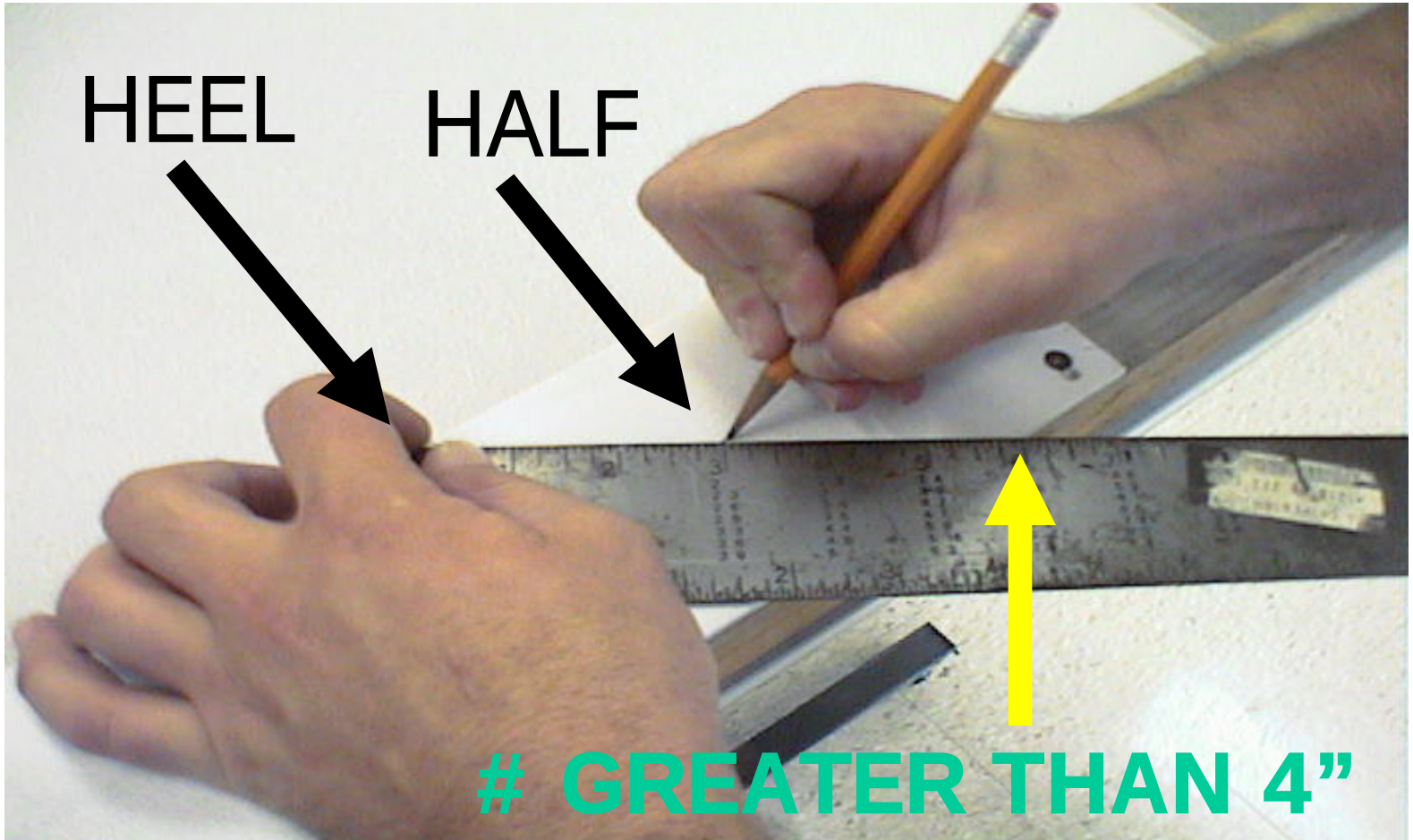

HEEL
1
2
3
4
5
6
7
8
9
10
BODY
1
2
3
4

Layout of the Shore:

Find the center of the shore using the Carpenter's Square

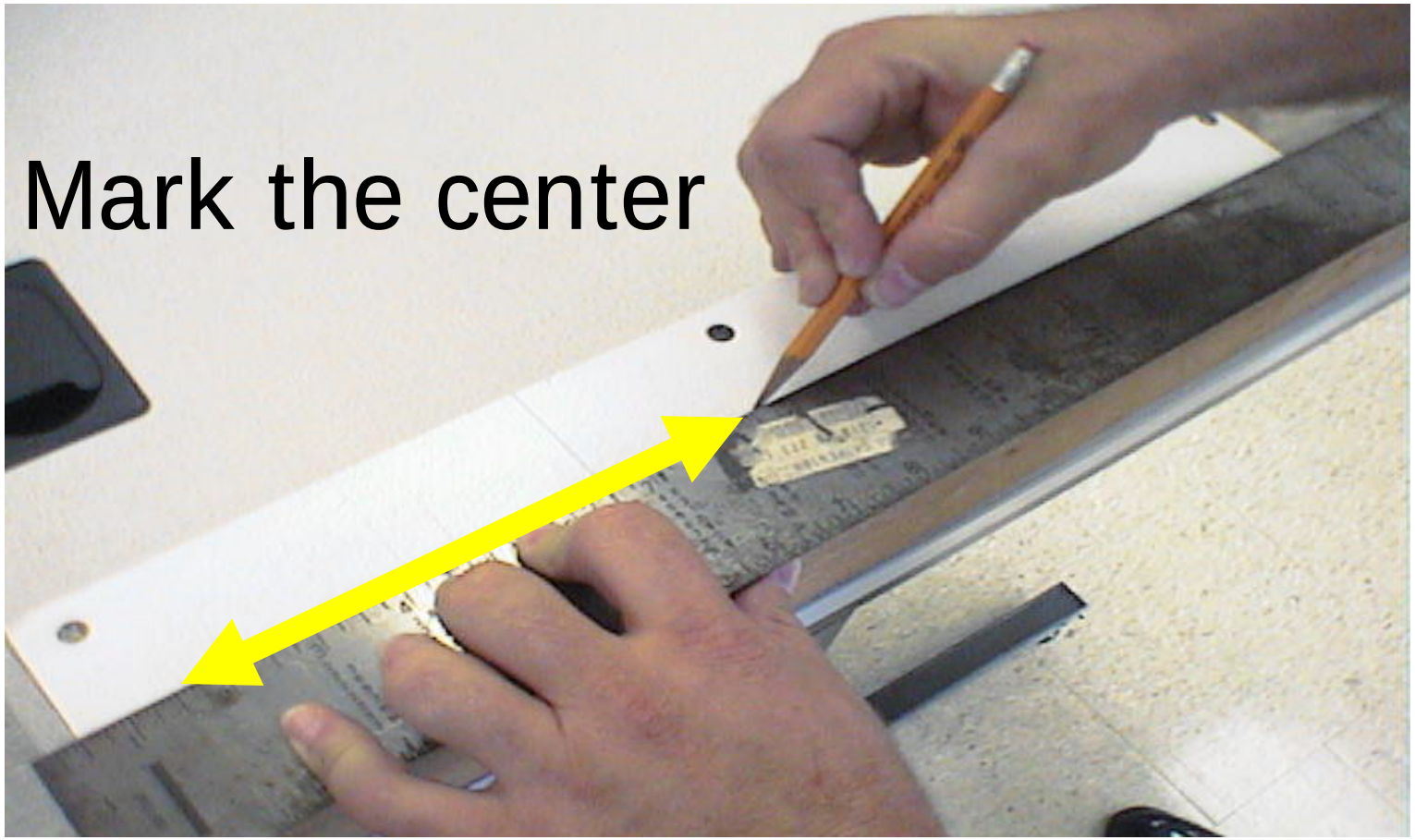
Layout of K type shoring

- Find the center line



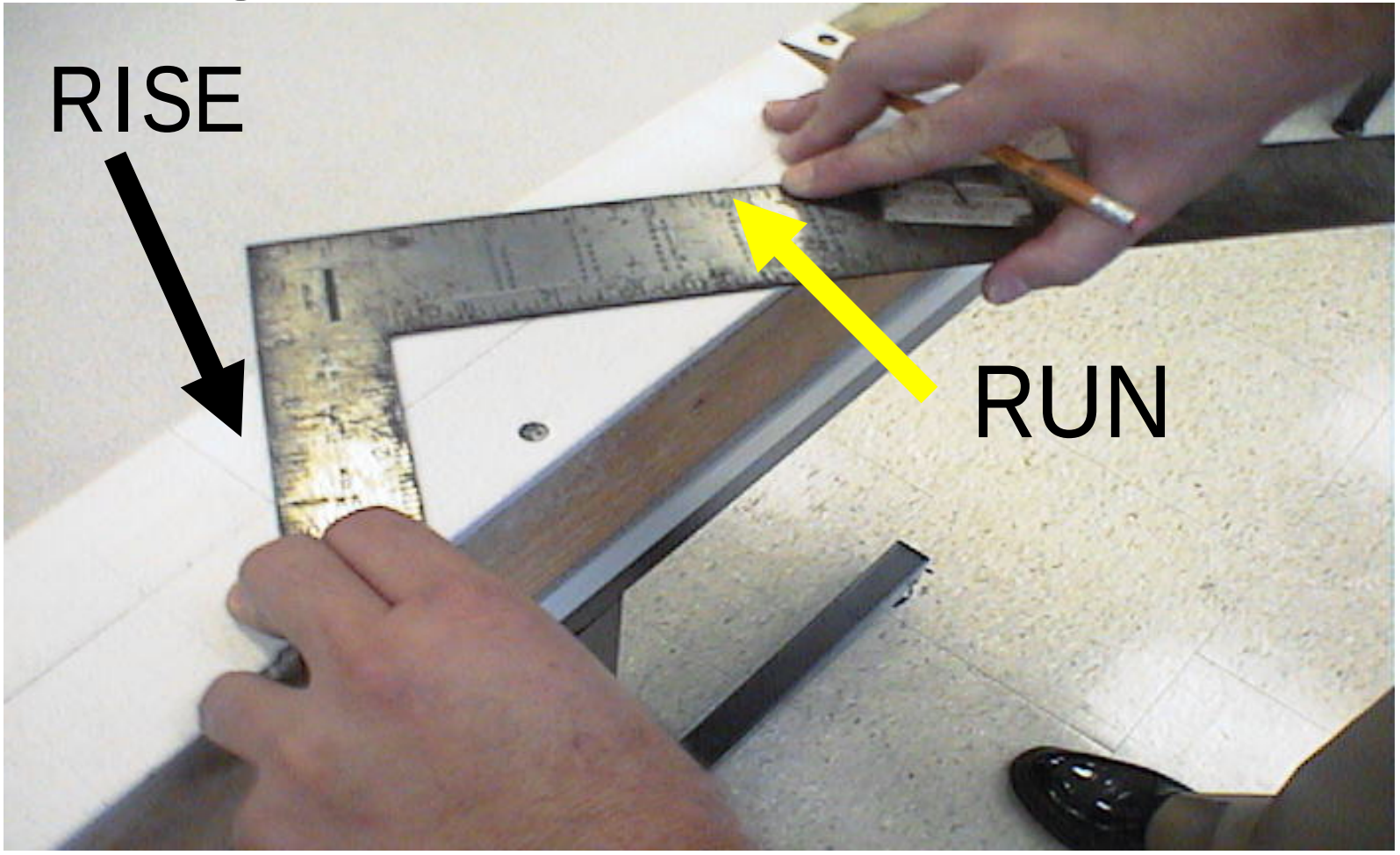
Layout of K type shoring

- Center line



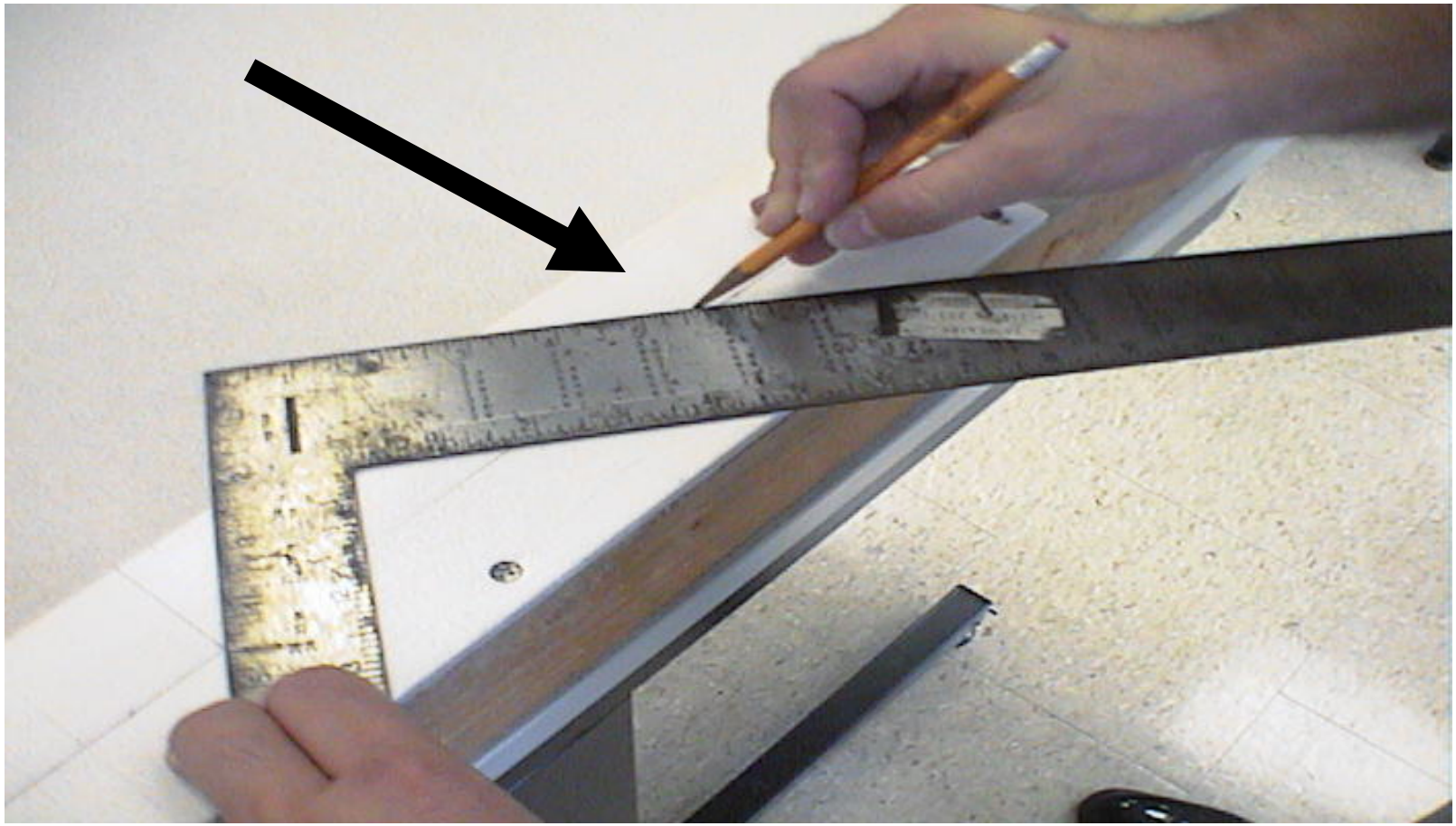
Layout of K type shoring

- Marking the Rise & Run



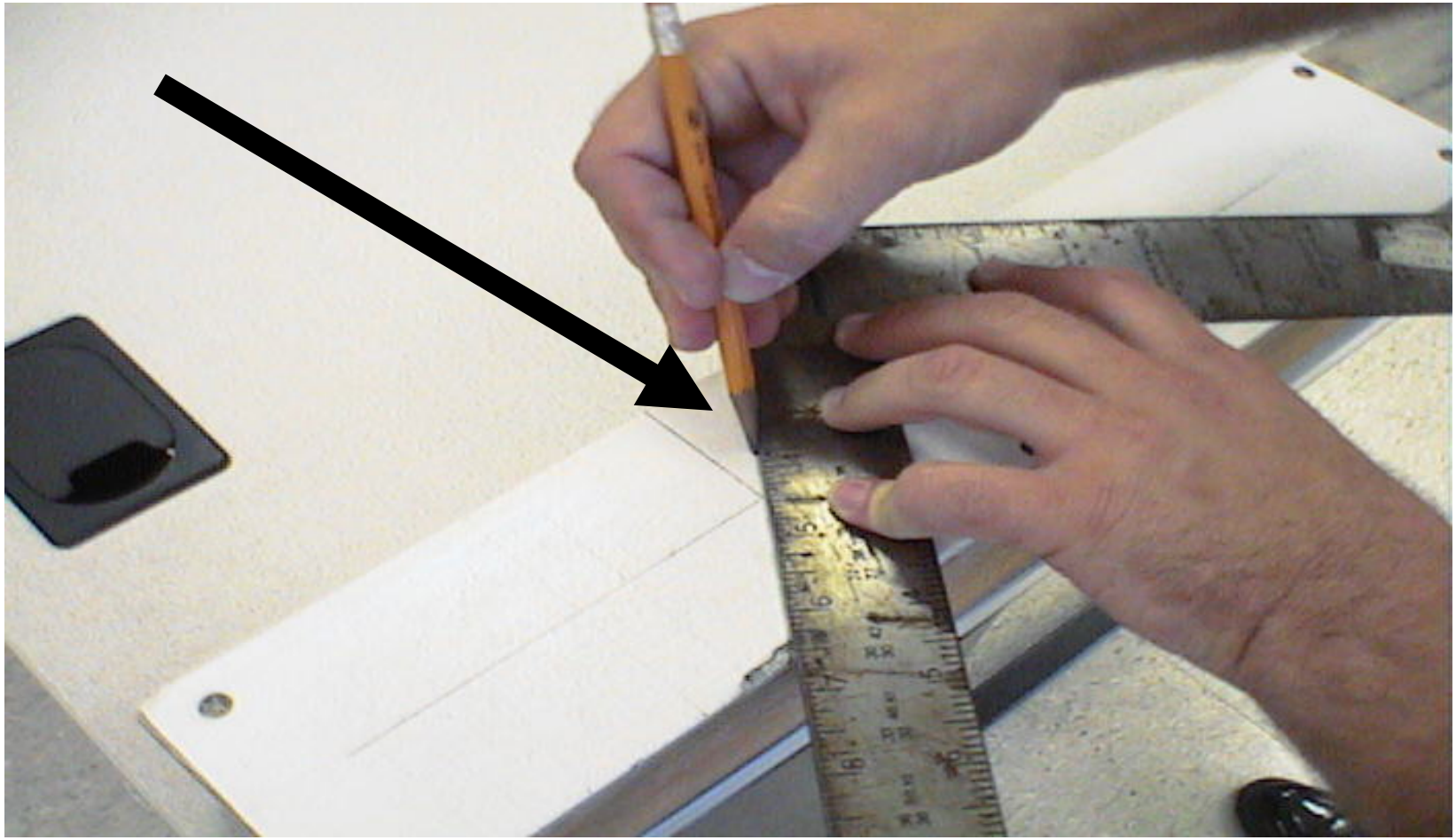
Layout of K type shoring

- Marking the shore for the length



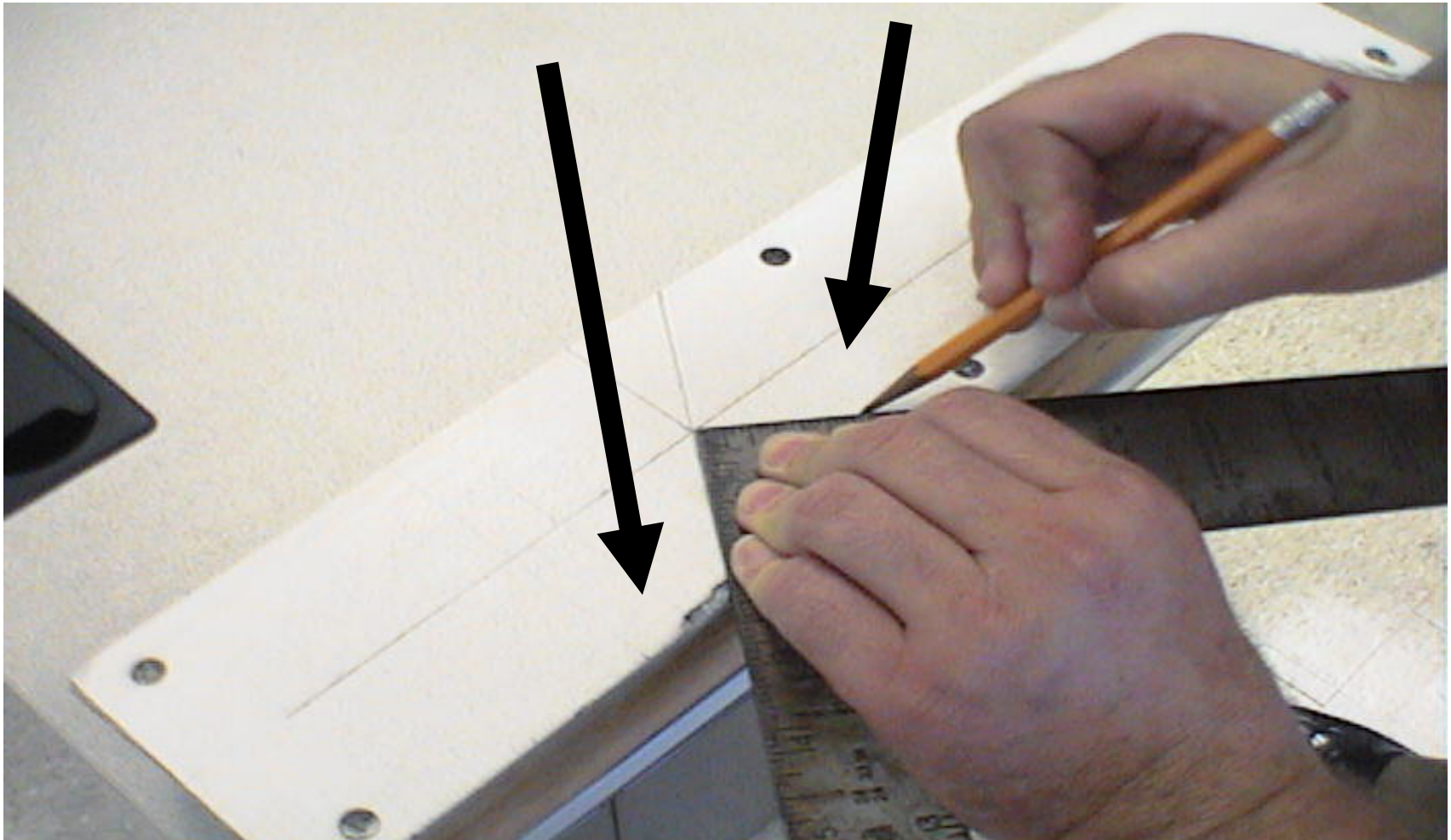
Layout of K type shoring

- Mark front of square



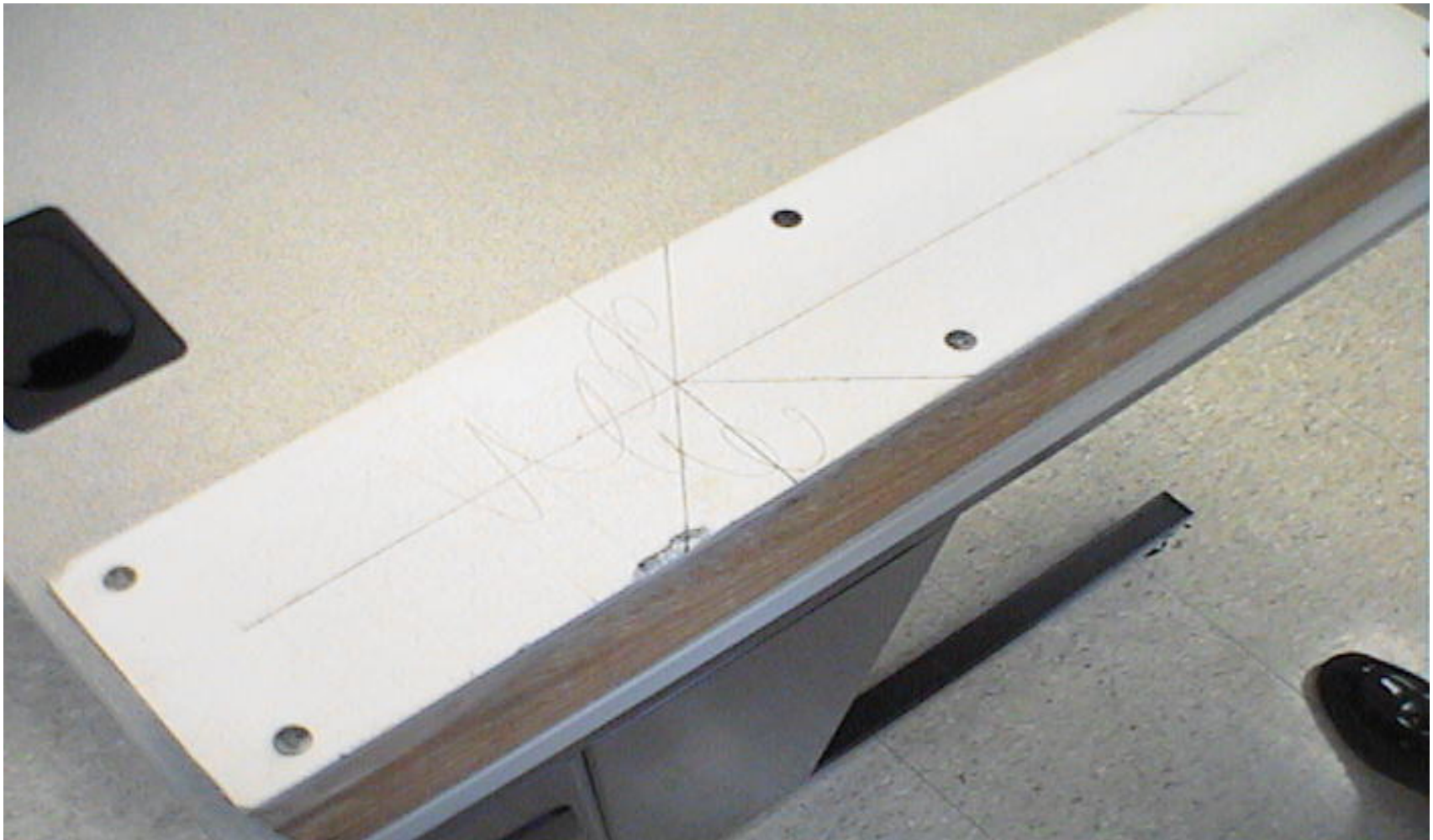
Layout of K type shoring

- Slide square down & mark outside



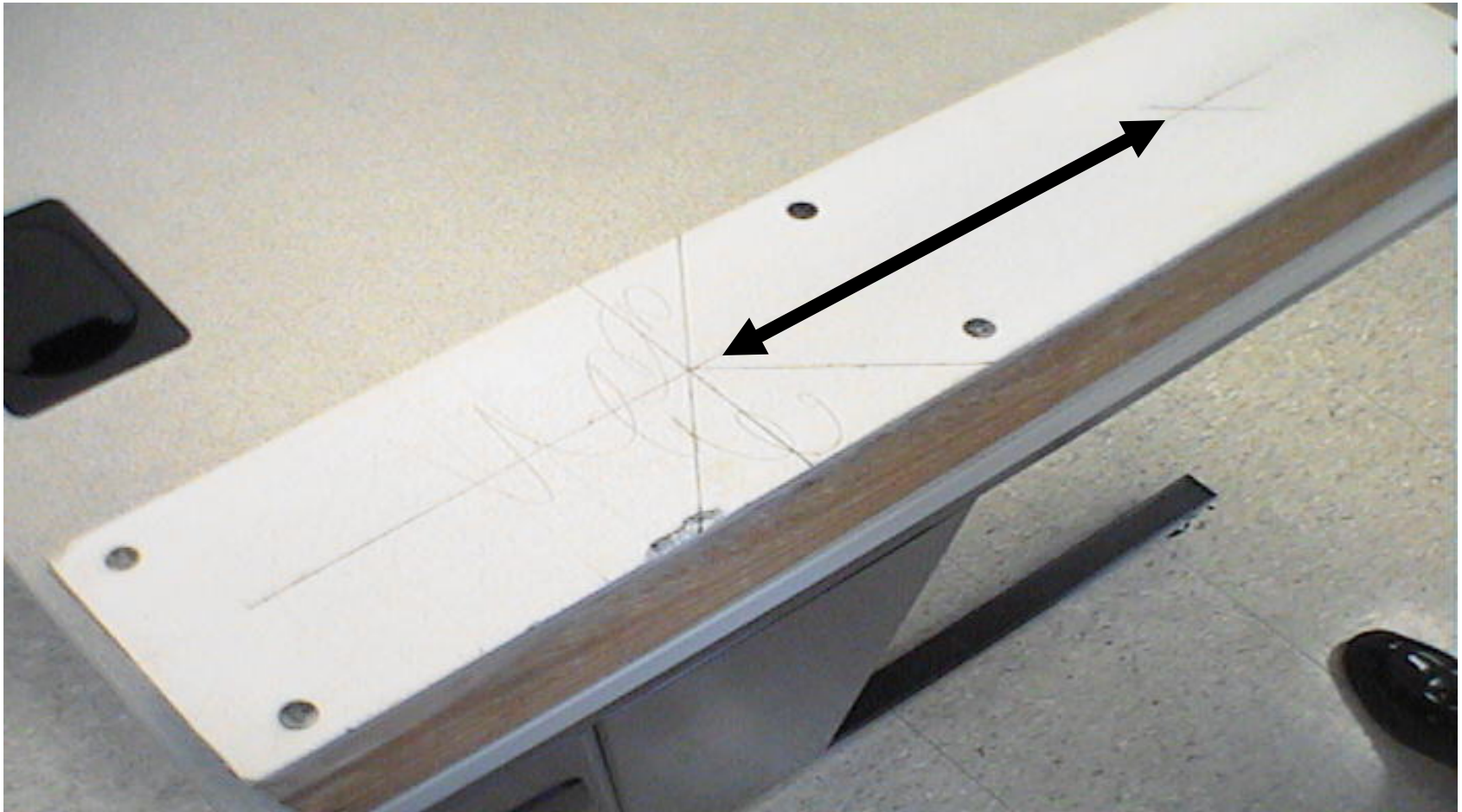
Layout of K type shoring

- Finished product



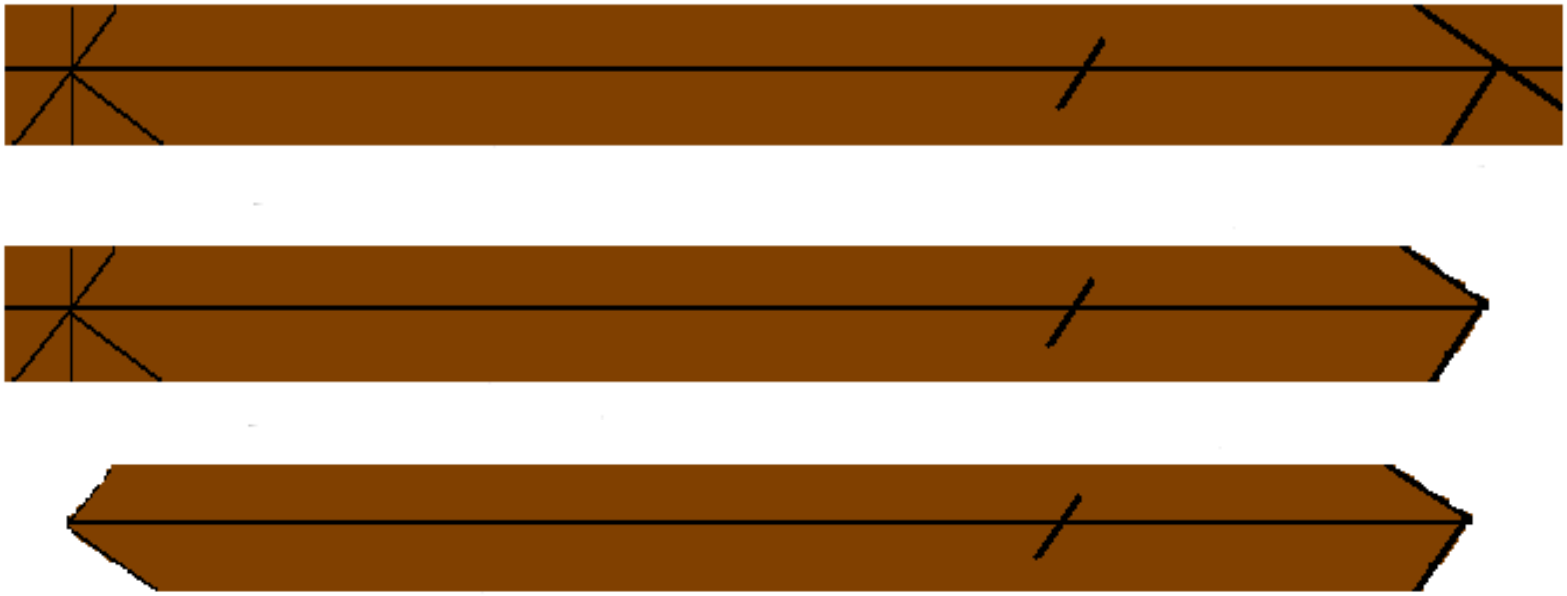
Layout of K type shoring

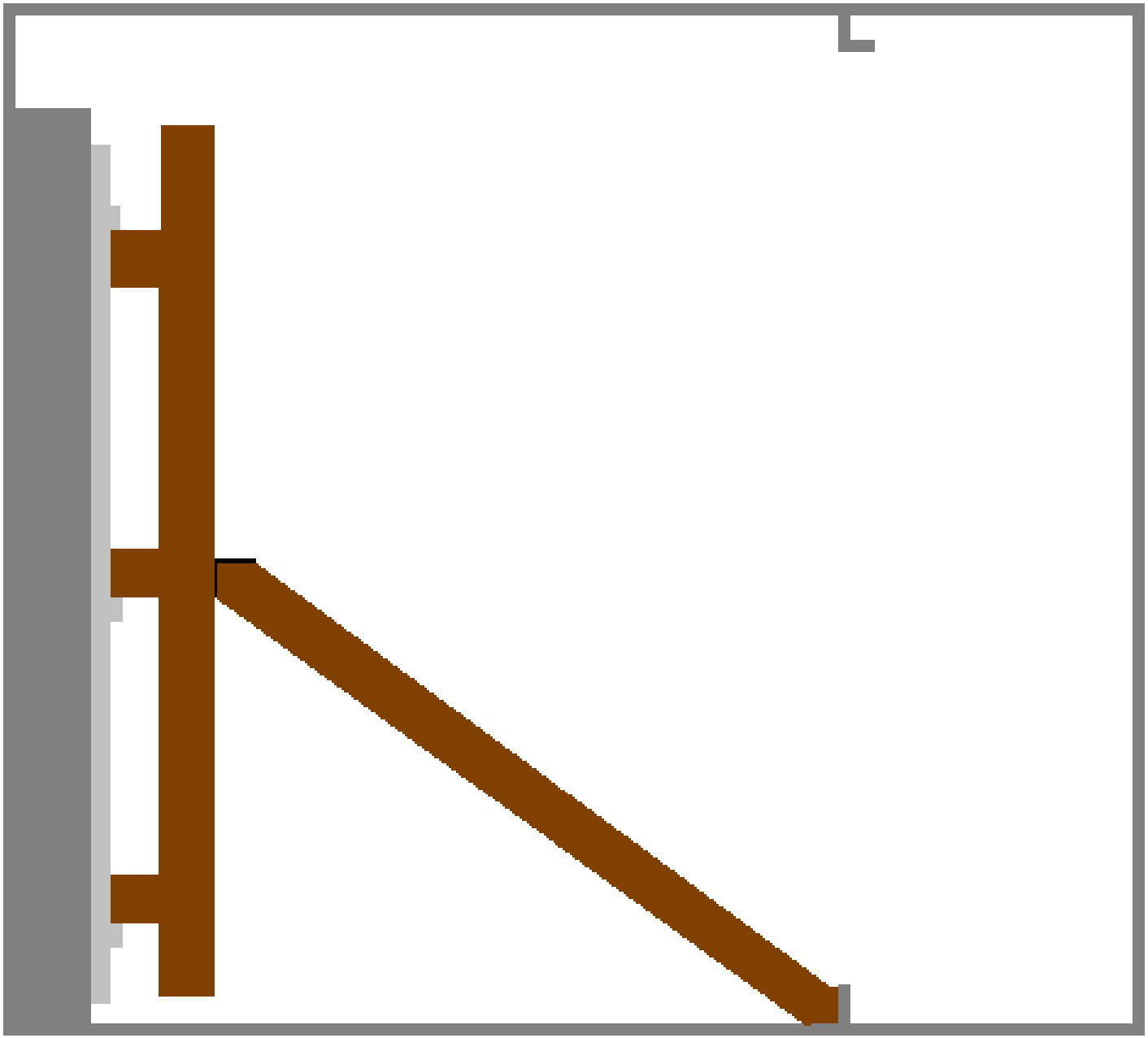
- Length of shore

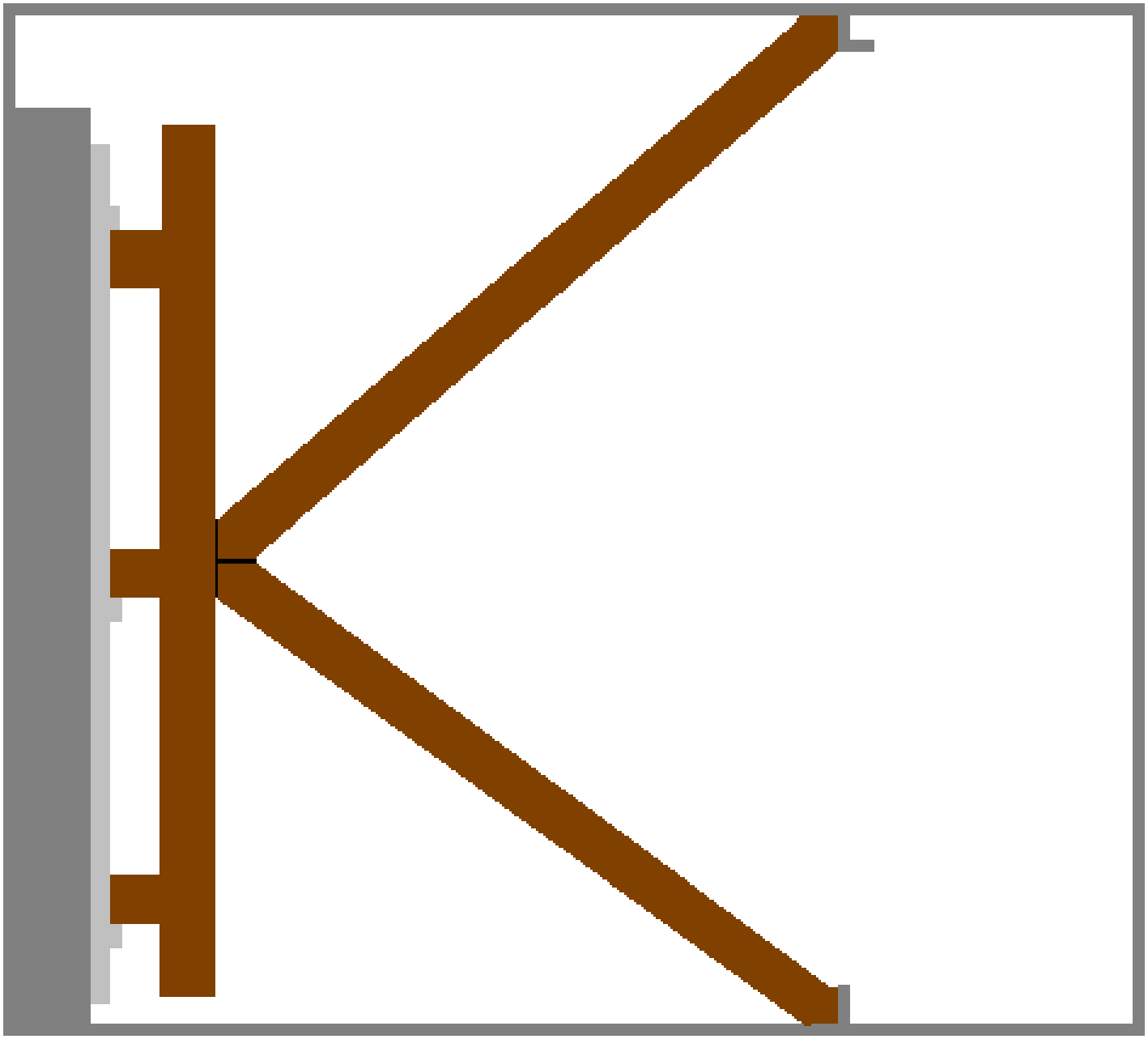


Transfer of measurements from the square to the shore

Once the overall length of the shore is determined, measure out the length and proceed to layout the second half of the shore.







LESSON TOPIC 12

Review and Summary

LESSON TOPIC 12

ENABLING OBJECTIVES

IDENTIFY the need for basic shoring structures and the materials used for their construction in accordance with NSTM 079 VOL 2, NWP 3-20.31, COMNAVSUFLANTINST 3541.1 and COMNAVSURPACINST 3541.4

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LESSON TOPIC 12

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LESSON TOPIC 12

Review and Summary

What is shoring?

Process of placing supports against, beneath or above damaged areas

LESSON TOPIC 12

Review and Summary

When do you shore?

- **Good judgement is the best guide**
- **Need indicated**
- **When in doubt, always shore**

LESSON TOPIC 12

Review and Summary

What are the 3 Types of Shoring?

Direct Compression

Cross Axial

Triangulation

LESSON TOPIC 12

Review and Summary

What is the working length of a shore?

30 times the minimum thickness of the shore