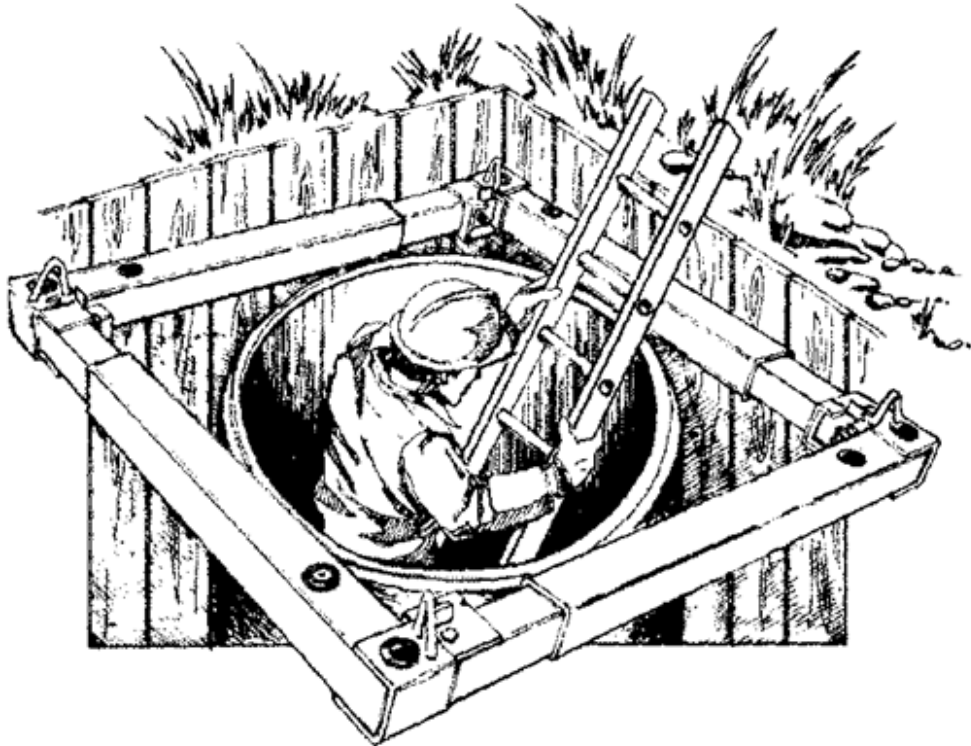


# TABULATED DATA

## MANHOLE BRACES



**SPEED**  **SHORE**<sup>®</sup>

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# WARNING

## EXCAVATION PROCEDURES MAY BE VERY DANGEROUS

- A TRAINED *COMPETENT PERSON* SHALL: SUPERVISE ALL EXCAVATION OPERATIONS, ENSURE THAT ALL PERSONNEL ARE WORKING IN SAFE CONDITIONS, AND HAVE THOROUGH KNOWLEDGE OF THIS TABULATED DATA. THE *COMPETENT PERSON* SHALL HAVE THE AUTHORITY TO STOP WORK WHEN IT IS UNSAFE FOR WORKERS TO ENTER AN EXCAVATION.
- ALL PERSONNEL SHALL BE TRAINED IN CORRECT EXCAVATION PROCEDURES, PROPER USE OF THE PROTECTIVE SYSTEM AND ALL SAFETY PRECAUTIONS.
- EXCAVATIONS AND PROTECTIVE SYSTEMS SHALL BE INSPECTED AT LEAST DAILY AND WHENEVER THERE IS A CHANGE OF SOIL, WATER OR OTHER JOB SITE CONDITIONS.
- ALL LIFTING AND PULLING EQUIPMENT, INCLUDING CABLES, SLINGS, CHAINS, SHACKLES AND SAFETY HOOKS SHALL BE EVALUATED FOR SUITABILITY AND CAPACITY, AND SHALL BE INSPECTED FOR DAMAGE OR DEFECTS PRIOR TO USE.
- ALL INSTALLATION AND REMOVAL OF SHORING AND SHIELDING SHALL BE FROM ABOVE GROUND ONLY.
- DO NOT ALLOW PERSONNEL TO ENTER AN EXCAVATION THAT IS NOT PROPERLY SHORED, SHIELDED OR SLOPED.
- PERSONNEL SHALL ALWAYS WORK WITHIN THE SHORING AND SHIELDING. PERSONNEL SHALL NOT STAND ON THE EDGE OF AN UNSHORED EXCAVATION.
- ALL PERSONNEL SHALL ENTER AND EXIT EXCAVATIONS ONLY WITHIN SHIELDED OR SHORED AREAS.

SPEED SHORE'S "MANUFACTURER'S TABULATED DATA" IS A GENERAL SET OF GUIDELINES AND TABLES TO ASSIST THE *COMPETENT PERSON* IN SELECTING A SAFETY SYSTEM AND THE PROPER SHORING OR SHIELDING EQUIPMENT. THE *COMPETENT PERSON* HAS SOLE RESPONSIBILITY FOR JOB SITE SAFETY AND THE PROPER SELECTION AND INSTALLATION AND REMOVAL OF THE SHORING OR SHIELDING EQUIPMENT.

THIS TABULATED DATA IS NOT INTENDED TO BE USED AS A JOB SPECIFIC EXCAVATION SAFETY PLAN, BUT SHALL BE USED BY THE *COMPETENT PERSON* TO SUPPLEMENT HIS TRAINING, HIS EXPERIENCE AND HIS KNOWLEDGE OF THE JOB CONDITIONS AND SOIL TYPE.



SPEED SHORE  
TABULATED DATA

## 1.0 SCOPE

- 1.1 Speed Shore's Tabulated Data complies with the O.S.H.A. standards as stated in the Code of Federal Regulations 29, Part 1926, Subpart P - Excavations, Section 1926.652(c)(2). This data shall only be used by the contractor's *competent person* in the selection of Speed Shore Manhole Braces, spacing, size of sleeves and sheeting requirements. The *competent person* shall be experienced and knowledgeable in trenching and excavation procedures, soil identification and in the use of Manhole Braces.
- 1.2 All personnel involved in the installation, removal and use of Manhole Braces shall be trained in their use and advised of appropriate safety procedures. All operating instruction must be followed.
- 1.3 This data is based in whole or in part, upon requirements stated in CFR 29, Part 1926 and applicable portions of CFR 29, Part 1910. The *competent person* shall know and understand the requirements of those parts before using this data.
- 1.4 Whenever there is a variance between this Tabulated Data and CFR 29, Part 1926, Subpart P - Excavations, this Tabulated Data shall take precedence. Whenever a topic or subject is not contained in this Tabulated Data, the *competent person* shall refer to CFR 29, Part 1926, Subpart P - Excavations.
- 1.5 Tables MHB-2 shall be used only in excavations with soil conditions as noted. For other soil and excavation conditions and depths, site-specific engineered designs are required. Contact Speed Shore Corporation for assistance
- 1.6 This Tabulated Data is applicable for standard products manufactured exclusively by Speed Shore and may only be used with Speed Shore manufactured products. Any modification or repair of Speed Shore products not specifically authorized by Speed Shore Corporation voids this data.
- 1.7 This data refers to the Code of Federal Regulations, 29, Parts 1910 and 1926. In states that have their own state O.S.H.A. refer to similar regulations in the current construction rules published by the state office of Occupational Health and Safety.

## 2.0 DEFINITIONS (RE: CFR 29, Part 1926.32 Definitions) - RESTATED FOR EMPHASIS

- 2.1 1926.32 (f) "competent person" means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees; and who has authorization to take prompt corrective measures to eliminate them.
- 2.2 1926.32 (p) "Shall" means mandatory.

## 3.0 SOIL CLASSIFICATIONS

- 3.1 In order to use the data presented in Table MHB-2 the soil type, or types, in which the excavation is cut must first be determined by the *competent person* according to the O.S.H.A. soil classifications as set forth in CFR 29, Part 1926, Subpart P, Appendix A.
- 3.2 Table MHB-2 is also for use in soil Type A, B, C, and C-60 soil (see 3.3 for definition).
- 3.3 Type C-60 soil is a moist, cohesive soil or a moist dense granular soil, which does not fit into Type A or Type B classifications, and is not flowing or submerged. This material can be cut with near vertical sidewalls and will stand unsupported long enough to allow the Vertical Shores to be properly installed. The *competent person* must monitor the excavation for signs of deterioration of the soil as indicated by, but not limited to, freely seeping water or flowing soil entering the excavation around or below the sheeting. An alternate design for less stable Type C soil will be required where there is evidence of deterioration.



- 3.4 Water flowing into an excavation, from either above or below ground, will cause a decrease in the stability of the soil. Therefore, the *competent person* shall take action to prevent water from entering the excavation and promptly remove any water that accumulates in the excavation. Closer monitoring of the soil is required under wet conditions, particularly in the less cohesive (weaker) soil conditions. A small amount of water, or flowing conditions, may downgrade the soil classification to a less stable classification. A large amount of water, or flowing conditions, may downgrade all soils to O.S.H.A. Type C. Speed Shore shoring and shielding systems may be used safely in wet conditions when the excavation is monitored by the competent person. Example: When repairing a leak in utility lines, it is often difficult or even impossible, to keep water out of the excavation.

#### 4.0 PRESENTATION OF INFORMATION

- 4.1 Information is presented in tabular form in Table MHB-2. Table MHB-2 presents the maximum allowable depth that the Manhole Braces may be used in O.S.H.A. Type A, B, Type C-60 and C soils (Type C-60 soil is defined in Note 3.3).
- 4.2 Table MHB-2 is not considered adequate when loads imposed by structures or by stored material adjacent to the trench weigh in excess of the load imposed by 3 feet of soil surcharge. The term "adjacent" as used here means the area within a horizontal distance from the edge of the trench equal to the depth of the trench.
- 4.3 The column, "Model" lists the leg length of the long side. For models with unequal leg lengths find the maximum depth for the longest leg.

#### 5.0 BASIS AND LIMITATIONS OF THE DATA

- 5.1 Maximum excavation depth is 25 feet.
- 5.2 The following sheeting materials, or approved equal, may be used.
- 5.2.1 Aluminum: Speed Shore's Aluminum Sheeting
  - 5.2.2 Timber: 2x6 (S4S) Douglas Fir with a minimum bending strength ( $F_b$ ) of 1,500 p.s.i. or Oak with a  $F_b$  of 850 p.s.i.
  - 5.2.3 Steel: 1/2 inch or thicker Steel Plate
  - 5.2.4 Plywood:
    - 3/4 inch Finn Form
    - 3/4 inch Omni Form
    - 3/4 inch Combi Exterior Plywood
    - 3/4 inch 14 Ply Artic White Birch
    - 3/4 inch Plyform American Plywood Association, Plyform, B - B, Class I Exterior
    - 3/4 inch HDO American Plywood Association, High Density Overlay, Exterior
    - 1 1/8 inch CDX
    - Two sheets of 3/4 inch thick CDX Plywood
- 5.3 Sheeting shall extend to the top the excavation and down within 2 feet of the bottom of the excavation.
- 5.4 The spacings are measured from center to center of the members.
- 5.5 The center line of the top Manhole Brace shall be a minimum of 1 foot and a maximum of 4 feet below the top of the excavation.
- 5.6 The center line of the bottom Manhole Brace shall be a maximum of 4 feet above the bottom of the excavation.
- 5.7 A minimum of 2 Manhole Brace rings are required for excavations over 6 feet deep. One Manhole Brace ring is required for excavations less than 6 feet deep.
- 5.8 The ends of each Manhole Brace leg must bear firmly against the sheeting, which must bear on firm soil or a solid and stable filler to distribute the cylinder load to the face of the excavation.
- 5.9 The faces of the excavation must be cut near vertical and straight.
- 5.10 All corners of the Manhole Braces shall be connected vertically with a safety chains to adequately maintain the Manhole Braces in alignment. Safety chains shall connect the top Manhole Brace to the sheeting.



## 6.0 INSPECTION

- 6.1 The *competent person* must evaluate the soils to assure the rated capacity of the Manhole Braces is not exceeded by the lateral pressure of the soil. Soils shall be evaluated in accordance with Part 3.0.
- 6.2 The *competent person* shall monitor all phases of the assembly, installation and use of this product to evaluate and eliminate methods, which could endanger employees utilizing this product.
- 6.3 Daily inspections of the Manhole Braces and accessories must be performed by the *competent person* and deficiencies corrected.
- 6.4 Inspections shall be conducted as necessary for hazards associated with water accumulation, changing soil conditions, or changing site weather conditions.

## 7.0 EXAMPLE TO ILLUSTRATE THE USE OF TABLE MHB-2:

Problem: Design a trench safety system using Speed Shore Manhole Braces system for a square shaft-type excavation with an opening 13 feet x 13 feet and 10 feet deep in C-60 soil (see note 3.3 for definition).

Study table MHB-2 and read down column "Span." Select a minimum-maximum range of 11 to 14 feet so that the Manhole Brace system retains additional stroke capability past the 13 feet dimension. Read left and find a 3 inch hydraulic cylinder size and model "3-MHB-6-11". Read right under column C-60 and determine that the maximum depth for this model is 11 feet, therefore adequate for this job.

Conclusion: Model "3-MHB-6-11" is selected. Install first Manhole Brace within 2 feet of the top of the shaft and the second Manhole Brace four feet below the top Manhole Brace. Note the bottom Manhole Brace will be four feet above the bottom of the excavation. Note 5.1 requires timber, plywood or equal sheeting. Model "3-MHB-8-11" will also shore the excavation.



TABLE MHB-2

MODEL	CYL. DIA.  INCH	SPAN  FEET		MAXIMUM DEPTH OF EXCAVATION (FEET)					
				4 FT. O.C. VERT SPACING			3 FT. O.C. SPACING		
		MIN.	MAX	A&B	C-60	C	A&B	C-60	C
<i>2" CLY WITH 4" BOX TUBING OVERSLEEVE</i>									
2-MHB-4-5	2	5	8	25	20	10	25	25	12
2-MHB-4-6	2	6	9	25	20	10	25	25	12
2-MHB-4-7	2	7	10	25	20	10	25	25	12
<i>3" CLY WITH 6" BOX TUBING OVERSLEEVE</i>									
3-MHB-6-6	3	6	9	25	25	12	25	25	16
3-MHB-6-7	3	7	10	25	25	12	25	25	16
3-MHB-6-8	3	8	11	25	25	12	25	25	16
3-MHB-6-9	3	9	12	19	14	7	25	20	9
3-MHB-6-10	3	10	13	17	13	6	23	18	8
3-MHB-6-11	3	11	14	15	11	5	21	16	7
3-MHB-6-12	3	12	15	14	10	-	19	14	6
3-MHB-6-13	3	13	16	13	9	-	17	13	5
3-MHB-6-14	3	14	17	11	8	-	15	11	-
3-MHB-6-15	3	15	18	9	7	-	13	10	-
3-MHB-6-16	3	16	19	8	6	-	12	9	-
3-MHB-6-17	3	17	20	7	5	-	10	8	-
<i>3" CLY WITH 8" BOX TUBING OVERSLEEVE</i>									
3-MHB-8-8	3	8	11	25	25	18	25	25	20
3-MHB-8-9	3	9	12	25	25	16	25	25	20
3-MHB-8-10	3	10	13	25	25	14	25	25	19
3-MHB-8-11	3	11	14	25	25	12	25	25	16
3-MHB-8-12	3	12	15	25	23	10	25	25	14
3-MHB-8-13	3	13	16	25	20	9	25	25	12
3-MHB-8-14	3	14	17	23	17	8	25	23	11
3-MHB-8-15	3	15	18	20	15	7	25	20	10
3-MHB-8-16	3	16	19	18	13	6	24	18	8
3-MHB-8-17	3	17	20	16	12	5	21	16	7
3-MHB-8-18	3	18	21	14	10	-	19	14	-
3-MHB-8-19	3	19	22	12	9	-	16	12	-
3-MHB-8-20	3	20	23	11	8	-	15	11	-
3-MHB-8-21	3	21	24	10	7	-	14	10	-

(Note1: For unequal legs lengths in rectangular Manhole Braces see explanation Note 4.3.)

