

**E' FOR DEGREES OF COMPACTION OF BEDDING
IN POUNDS PER SQUARE INCH**

SOIL TYPE BEDDING MATERIAL (INIFIED CLASSIFICATION SYSTEM ^a) (1)	DUMPED (2)	SLIGHT <85% PROCTOR <40% RELATIVE DENSITY (3)	MODERATE 85% - 95% PROCTOR 40% - 70% RELATIVE DENSITY (4)	HIGH >95% PROCTOR >70% RELATIVE DENSITY (5)
FINE-GRAINED SOILS (LL>50 ¹) SOILS WITH MEDIUM TO HIGH PLASTICITY CH, MH, CH-MH	NO DATA AVAILABLE, CONSULT A COMPETENT SOILS ENGINEER....SEE NOTE BELOW			
FINE-GRAINED SOILS (LL<50) SOILS WITH MEDIUM TO NO PLASTICITY CL, ML, ML-CL WITH LESS THAN 25% COARSE-GRAINED PARTICLES	50	200	400	1,000
FINE-GRAINED SOILS (LL<50) SOILS WITH MEDIUM TO NO PLASTICITY CL, ML, ML-CL WITH MORE THAN 25% COARSE-GRAINED PARTICLES COARSE-GRAINED SOILS WITH FINES GM, GC, SM, SC - CONTAINS MORE THAN 12% FINES	100	400	1,000	2,000
COARSE-GRAINED SOILS WITH LITTLE OR NO FINES GM, GC, SM, SP ² CONTAINS LESS THAN 12% FINES	200	1,000	2,000	3,000
CRUSHED ROCK	1,000	3,000	3,000	3,000
ACCURACY IN TERMS OF PERCENTAGE DEFLECTION ³	± 2	± 2	± 1	± 0.5

^a ASTM DESIGNATION D-2487. USBR DESIGNATION E-3

¹ LL = LIQUID LIMIT

² OR ANY BORDERLINE SOIL BEGINNING WITH ONE OF THESE SYMBOLS

³ FOR = 1% ACCURACY AND PREDICTED DEFLECTION OF 3% ACTUAL WOULD BE BETWEEN 2% AND 4%

NOTE: VALUES APPLICABLE ONLY FOR FILLS LESS THAN 50FT. (50M). TABLE DOES NOT INCLUDE ANY SAFETY FACTOR. FOR USE IN PREDICTING INITIAL DEFLECTIONS ONLY, APPROPRIATE DEFLECTION LAG FACTOR MUST BE APPLIED FOR LONG-TERM DEFLECTIONS. IF BEDDING FALLS ON THE BORDERLINE BETWEEN TWO COMPACTION CATEGORIES, SELECT LOWER E VALUE OR AVERAGE THE TWO VALUES. PERCENTAGE PROCTOR BASED ON LABORATORY MAXIMUM DRY DENSITY FROM TEST STANDARDS USING ABOUT 12,500 FT.-LB./CU.FT. (598.000 l/m) (ASTM D-698, AASHTO T-99, USBR DESIGNATION E-11). 1 PSI = 6.9kN/M²

NOTE: AN ACCEPTED CONSERVATION DESIGN VALUE BASED ON ASCE MANUAL 37 IS 700 PSI WITHOUT ADDITIONAL SOILS INFORMATION.

"SOIL REACTION FOR BURIED FLEXIBLE PIPE" BY AMSTER K. HOWARD. U.S. BUREAU OF RECLAMATION, DENVER, COLORADO. REPRINTED WITH PERMISSION FROM AMERICAN SOCIETY OF CIVIL ENGINEERS JOURNAL OF GEOTECHNICAL ENGINEERING DIVISION JANUARY 1977. PP. 33-42

