



INTERNATIONAL BOUNDARY & WATER COMMISSION  
**NUCLEAR GAUGE TEST RESULTS**  
ASTM D6938

Project: \_\_\_\_\_ Contract Number: \_\_\_\_\_

Contractor: \_\_\_\_\_ Date: \_\_\_\_\_

Laboratory: \_\_\_\_\_ Technician: \_\_\_\_\_

Gauge Manufacturer: \_\_\_\_\_ Model: \_\_\_\_\_ Serial Number: \_\_\_\_\_

Density Standard Reading (DSR): \_\_\_\_\_ Moisture Standard Reading (MSR): \_\_\_\_\_

Count Time Used for All Readings Listed Below: \_\_\_\_\_ *(Readings shall last at least 1 minute.)*

Unless gauge manufacturer allows less time, all gauges must be turned on for  
at least 10 minutes prior to use to warm up.

**ENSURE ALL RETESTS ARE CLEARLY MARKED.**

TEST #	LOCATION	LIFT/ELEV	TEST DEPTH (inch)	METHOD **	SOIL TYPE/ PROCTOR TEST ID#	WET DENSITY (pcf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	% COMPACT

\*\* Method A - Direct transmission      Method B - Backscatter

SOIL TYPE ID #	PROCTOR TEST ID # SOIL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	DENSITY REQUIRED (%)	MOISTURE REQUIRED (%)	MOISTURE CORRECTION Form 240

All test results provided on this form are considered preliminary until provided to the Government on company letterhead bearing a licensed engineer's seal and signature.

INTERNATIONAL BOUNDARY & WATER COMMISSION  
**NUCLEAR GAUGE TEST RESULTS**  
 ASTM D6938  
**CONTINUED**

Project: \_\_\_\_\_ Contract Number: \_\_\_\_\_  
 Contractor: \_\_\_\_\_ Date: \_\_\_\_\_  
 Laboratory: \_\_\_\_\_ Technician: \_\_\_\_\_

TEST #	LOCATION	LIFT/ELEV	TEST DEPTH (inch)	METHOD **	SOIL TYPE/ PROCTOR TEST ID#	WET DENSITY (pcf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	% COMPACT

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 www.ibwc.gov



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INSTRUCTIONS

Density Standard Reading (DSR): 1 Moisture Standard Reading (MSR): 1  
Count Time Used for All Readings Listed Below: 2 *(Readings shall last at least 1 minute.)*

TEST #	LOCATION	LIFT/ELEV	TEST DEPTH (inch)	METHOD **	SOIL TYPE/ PROCTOR TEST ID#	WET DENSITY (pcf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	% COMPACT
3	4	5	6	7	8	9	10	11	12

**1 - Density Standard Reading (DSR) and Moisture Standard Reading (MSR)**

Enter the readings recorded on IBWC Form 241.

**2 - Count Time**

Enter the time used to record all gauge readings.

**3 - Test #**

Test records shall be separated by material type. Each material type (e.g. levee embankment, crushed aggregate base, earthwork subgrade, concrete subgrade, and roadway aggregate) and subtype, if applicable, (e.g. clay 1, clay 2, aggregate mix 1, aggregate mix 2, etc.) shall have a unique identification number to be used throughout all test reports. For example, all density tests cannot simply be listed with a one-up number, regardless of material type. Density tests for materials such as levee embankment, crushed aggregate base, earthwork subgrade, concrete subgrade, and roadway aggregate shall be listed and numbered separately. Tests can be numbered with a material type prefix (e.g. LEV0001, CAB0001, SGE0001, SGC0001, or RD0001) or they can simply be provided with a description of the material type within the report, but each material type shall be numbered individually.

**4 - Location**

Provide description of testing location (e.g. levee, RCP subgrade, or roadway gravel), stationing, and if applicable, offset from centerline to provide sample location in the horizontal dimension.

**5 - Lift/Elevation**

For structures that have multiple lifts, provide description that will allow placement of sample location in the vertical dimension.

**6 - Test Depth (inches)**

Note depth of testing rod. For backscatter tests, leave blank or put 0.

**7 - Method of Testing**

Enter 'A' if direct transmission was used or 'B' if backscatter was used.

**8 - Identification of Basis of Proctor Used**

Identify the soil used as the basis for the compaction determination. Details for the soil identified under Item 8 shall be listed under Items 13 through 19.

**9 - Wet Density (pcf)**

Recorded wet density in pounds per cubic foot.

**10 - Moisture Content (%)**

Recorded moisture content percentage. This value shall include the correction noted in Item 19.

**11 - Dry Density (pcf)**

Calculated dry density in pounds per cubic foot. This is usually  $(\text{wet density} / (\text{moisture content} + 100)) * 100$ .

**12 - Percent Compaction**

Calculated compaction percentage (Item 11/Item 15). Show to at least one decimal point.

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SOIL TYPE ID #	PROCTOR TEST ID # SOIL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	DENSITY REQUIRED (%)	MOISTURE REQUIRED (%)	MOISTURE CORRECTION Form 240
<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>

**13 - Soil Identification Number**

Provide an identification number for the soil or soil group being represented in Items 14 through 19.

**14 - Soil Description**

Provide description of soil. Include USCS and any other pertinent data. Include station limits for subgrade materials or other limiting factors for the soil noted. A single proctor test may be used or a soil type based upon a group of proctor tests may be identified. List the associated proctor test numbers, especially when the soil is an average of multiple proctors.

**15 - Maximum Dry Density (pcf)**

Identify the maximum dry density determined via proctor test.

**16 - Optimum Moisture Content (%)**

Identify the maximum moisture content determined via proctor test.

**17 - Density Required (%)**

List the required density for this material per the Contract documents. Typical is 95%.

**18 - Moisture Required (%)**

List the required moisture content range per the Contract documents. For example, levee embankment may be "0 to +3" while subgrade may be "+/- 2."

**19 - Gauge Moisture Correction**

Note calculated moisture correction for soil. Ensure that associated IBWC Form(s) 240 has been provided along with supporting laboratory tests.



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ASTM D6938

Project: Make Believe Levee Project Contract Number: 191BWC99C9999  
Contractor: ABC Excavation & Construction Date: 3/13/2023  
Laboratory: Precision Testing Lab Technician: John Smith  
Gauge Manufacturer: Troxler Model: 3411 Serial Number: 30911  
Density Standard Reading (DSR): 1765 Moisture Standard Reading (MSR): 682  
Count Time Used for All Readings Listed Below: 1 minute (*Readings shall last at least 1 minute.*)

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at least 10 minutes prior to use to warm up.**

**ENSURE ALL RETESTS ARE CLEARLY MARKED.**

TEST #	LOCATION	LIFT/ELEV	TEST DEPTH (inch)	METHOD **	SOIL TYPE/ PROCTOR TEST ID#	WET DENSITY (pcf)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	% COMPACT
LV0491	Levee Sta 1522+00 14' offset fm CL to LS	3	10"	A	BB004	127.9	21.6	106.3	99.6
LV0492	Levee Sta 15523+00 2' offset fm CL to RS	3	10"	A	BB004	125.7	20.5	105.2	98.6
SG 0316	Subgrade Sta 1600+50	subgrade	4"	A	PSG025	146.1	4.1	140.3	100.2
LV0493	Levee Sta 1506+00 20' offset fm CL to RS	4	10"	A	BB004	124.9	21.6	103.3	96.8
SG 0317	Subgrade Sta 1695+00	subgrade	10"	A	PSG028	118.0	16.3	101.7	97.0

\*\* Method A - Direct transmission      Method B - Backscatter

SOIL TYPE ID #	PROCTOR TEST ID # SOIL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	DENSITY REQUIRED (%)	MOISTURE REQUIRED (%)	MOISTURE CORRECTION Form 240
BB004	Borrow Pit Blend 4 Proctors 0033, 0043, 0044, 0052, 0067	106.7	19.8	95	0 to +3	1.03
PSG025	Poorly graded gravel w/silt & sand Proctors 0122, 0125 & 0128	140.0	5.8	95	+/- 2	0.96
PSG028	Fine sand with significant silt Proctors 0126 & 0129	104.8	16.4	95	+/- 2	0.83

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