

# MOISTURE AND DENSITY DETERMINATION

## NUCLEAR METHOD

**DISTRIBUTION:** Construction Engineer, Area Density Specialist, Density Technology Unit (Lansing).

DATE	CONTROL SECTION ID	JOB NUMBER	ROUTE NUMBER or STREET	GAUGE NUMBER	
DENSITY INSPECTOR		CERTIFICATION NUMBER	DENSITY INSPECTOR PHONE NUMBER	CONSTRUCTION ENG. (MDOT)	ASST. CON. ENG/CONSULTANT ENG.

TEST			DETERMINATION OF IN-PLACE DENSITY								LOCATION OF TEST				
ORIGINAL 1	RECHECK 2	TEST DEPTH inch 3	COUNTS (MC) 4	COUNTS (DC) 5	DRY DENSITY PCF 6	WET DENSITY PCF 7	MOISTURE PCF 8	MOISTURE % 9	MAX DENSITY PCF 10	PERCENT OF COMPACTION 11	STATION 12	DISTANCE FROM CL ft		DEPTH BELOW PLAN GRADE ft 15	ITEM OF WORK 16
												LEFT 13	RIGHT 14		

TEST NUMBER A	MOISTURE % B	VOLUME MOLD CU. FT. C	DETERMINATION OF MAXIMUM DENSITY (SOIL & HMA)							OPTIMUM MOISTURE % J	NOTE: To convert (g) to (lbs.): Wt. (g) ÷ 453.59 = Wt. (lbs.)
			WET SOIL + MOLD g D	MOLD g E	WET SOIL g F	WET SOIL lbs G	COMPACTED SOIL WET PCF H	MAX DENSITY PCF I			

REMARKS

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20/10 Weights	1st	2nd	DENSITY INSPECTOR'S APPROVAL STAMP	AGENCY/COMPANY
3rd	4th	5th		

## DENSITY REQUIREMENTS

	MINIMUM % OF COMPACTION	ITEM OF WORK	SPEC. BOOK SECTION
<b>Roadway Earthwork</b>			
Subgrade for HMA Base, Aggregate Base and Concrete Widening	95.0	SG	205.03 E or F
Earth Excavation where material does NOT meet Sand Subbase Requirements	95.0	CN	205.03 G
Earth Excavation where material does meet Sand Subbase Requirements	95.0	CS	205.03 G
<b>Embankments</b>			
Sound Earth	95.0	SE	205.03 H.4
Regular	95.0	E	205.03 H.4.a
Structure Embankment - Original Ground	95.0	OG	205.03 I.1
Abutments with Piling – within the limits for Structure Embankment as shown on the plans	95.0	AP	205.03 I.2.a
Abutments without Piling – within the limits for Structure Embankment as shown on the plans	100.0	AN	205.03 I.2.b
<b>Backfill</b>			
Foundation Backfill for Bridges, Pump Stations, Retaining Walls and Culverts (other than pipe)	100.0	FB	206.03 B.2.a
Backfill for Bridges, Culverts, Sewers, Water Main, Manholes, Catch Basins, Edge Drains and Subgrade Undercuts	95.0	B	Various
<b>Pavement Structure</b>			
Subbase	95.0	S	301.03
Subbase for Slope Paving	90.0	SP	813.03 A
Aggregate Base - used under Concrete Pavement	95.0	SS	302.03 A
Aggregate Base - used under HMA Pavement	98.0	AB	302.03 A
Aggregate Base – sleeper slab footprint and approach area	98.0	SLA	302.03 A
OGDC – used under Concrete and HMA Pavement	95.0	OGDC	303.03
OGDC – sleeper slab footprint and approach area	95.0	SLO	303.03
OGDC – used under Concrete and HMA Pavement (recycled material)	95.0	OGR	303.03
OGDC – sleeper slab footprint and approach area (recycled material)	95.0	SLOR	303.03
Crushed Concrete Aggregate Base – used under Concrete Pavement (recycled material)	95.0	CAC	302.03 A
Crushed Concrete Aggregate Base – used under HMA Pavement (recycled material)	98.0	CAB	302.03 A
HMA Aggregate Base - pulverized HMA used under HMA Pavement (recycled material)	98.0	BAB	305.03 C
Trenching – under concrete pavement	95.0	TC	307.03 A
Trenching – under HMA pavement	98.0	TB	307.03 A
Shoulders – Class I	98.0	SAA	307.03 C
Shoulders – Class II and III	95.0	SA	307.03 C
HMA Stabilization	98.0	BS	
HMA Paving – Base Course	92.0*	BB	
HMA Paving – Leveling Course	92.0*	BL	Special Provision
HMA Paving – Top Course	92.0*	BT	

See JMF (form 1911) for Gmm value for target density value.  $TMD = Gmm \times 62.4$

\*Minimum % compaction of JMF TMD