Calibration of 4" Proctor Mold

Calibration of Proctor Mold			
Mold I. D. #: <u>4-1</u> Temperature of Water used for Calibration: <u>82°F</u> Unit Weight of Water: <u>Ib. / cu. Ft.</u>			
Weight of Baseplate,Weight of Baseplate,Weight of Baseplate,Mold Filled WithWeight ofEmpty Mold, andWater, and GlassWater to fillGlass Plate (grams)Plate (grams)Mold (grams)			
4574.3	5514.7		
$\begin{bmatrix} Volume of \\ Mold \\ (cu. ft.) \end{bmatrix} = \frac{Weight of Water to Fill Mold (grams)}{\begin{bmatrix} Unit Weight \\ of Water \\ (lb. / cu. ft.) \end{bmatrix}} \times [453.6 (grams / lb.)]$ $= \frac{()}{()} \times (453.6) = cu. Ft.$			
Remarks: Calibration Date: Test Operator: Supervisor and Date: Calibration Expiration Date:			



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APPENDIX A - (Continued)

Temperature	Unit Weight of Water
Temp °F	lbs/cu. Ft.
68	62.315
69	62.308
70	62.301
71	62.293
72	62.285
73	62.277
74	62.269
75	62.261
76	62.252
77	62.243
78	62.234
79	62.225
80	62.216
81	62.206
82	62.196
83	62.186
84	62.176
85	62.166
86	62.155



Calibration of Proctor Mold			1
Mold I. D. #: <u>4-1</u> Temperature of Water used for Calibration: <u>82°F</u> Unit Weight of Water: <u>62.196</u> Ib. / cu. Ft.			
Weight of Baseplate, Weight of Baseplate, Mold Filled WithWeight of Weight of Water, and GlassGlass Plate (grams)Plate (grams)Mold (grams)			
4574.3	5514.7	940.4 🗲	
 5514.7 (weight of Baseplate, Mold filled with Water, and Glass Pl 4574.3 (weight of Baseplate, Empty Mold, and Glass Plate) 940.4 			
$\begin{bmatrix} (lb. / cu. ft.) \end{bmatrix} = \frac{(940.4)}{(62.196) \times (453.6)} = _ cu. Ft.$			
Remarks:			
Calibration Date:			





Calibration of Proctor Mold			
X_Four Inch MoldSix Inch Mold			
Mold I. D. #: <u>4-1</u> Temperature of Water used for Calibration: <u>82°F</u> Unit Weight of Water: <u>62.196</u> lb. / cu. Ft.			
Weight of Baseplate, Weight of Baseplate, Mold Filled WithWeight of Weight of Water, and GlassGlass Plate (grams)Plate (grams)Mold (grams)			
4574.3	5514.7	940.4	
$ \begin{bmatrix} Volume of \\ Mold \\ (cu. ft.) \end{bmatrix} = \frac{Weight of Water to Fill Mold (grams)}{Unit Weight} \times [453.6 (grams / lb.)] $ $= \frac{(940.4)}{(62.196) \times (453.6)} = \frac{.0333}{CU. Ft.} $			
Remarks:			

Calibration of 6" Proctor Mold

Calibration of Proctor Mold			
Four Inch MoldX_Six Inch Mold			
Mold I. D. #:11 Temperature of Water used for Calibration:78 Unit Weight of Water:lb. / cu. Ft.			
Weight of Baseplate,Weight of Baseplate,Weight of Baseplate,Mold Filled WithWeight ofEmpty Mold, andWater, and GlassWater to fillGlass Plate (grams)Plate (grams)Mold (grams)		Weight of Water to fill Mold (grams)	
7064.5	9180.8		
$\begin{bmatrix} Volume of \\ Mold \\ (cu. ft.) \end{bmatrix} = \frac{Weight of Water to Fill Mold (grams)}{\begin{bmatrix} Unit Weight \\ of Water \\ (lb. / cu. ft.) \end{bmatrix}} \times [453.6 (grams / lb.)]$ $= \frac{()}{()} \times (453.6) = cu. Ft.$			
Remarks: Calibration Date: Test Operator: Supervisor and Date: Calibration Expiration Date:			



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APPENDIX A - (Continued)

Temperature	Unit Weight of Water
Temp °F	lbs/cu. Ft.
68	62.315
69	62.308
70	62.301
71	62.293
72	62.285
73	62.277
74	62.269
75	62.261
76	62.252
77	62.243
78	62.234
79	62.225
80	62.216
81	62.206
82	62.196
83	62.186
84	62.176
85	62.166
86	62.155



Calibration of Proctor Mold			
Four Inch MoldX_Six Inch Mold			
Mold I. D. #:11 Temperature of Water used for Calibration:78 ° F Unit Weight of Water: <u>62.234</u> lb. / cu. Ft.			
Weight of Baseplate, Weight of Baseplate, Mold Filled WithWeight of Weight of Water, and GlassGlass Plate (grams)Plate (grams)Mold (grams)			
7064.5	9180.8	2116.3 🗲	
Calculate: Weight of water to Fill Mold 9180.8 (weight of Baseplate, Mold filled with Water, and Glass Plate) $- \frac{7064.5}{7064.5}$ (weight of Baseplate, Empty Mold, and Glass Plate) = 2116.3 $= \frac{(2116.3)}{(2216.3)} = -$ cu. Ft.			
Remarks:			
Calibration Expiration Date:			







Calculation of Standard Sand and Sand Cone Apparatus

Date of Calibration:	_Test Operator:
I. D. No. of Mold used in calibration	:11
Volume of Mold used in calibration:	
Identification of Sand:	
Identification of Sand Cone Apparat	tus:

Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	
2	6631	9627	
3	6631	9630	

Average Weight of Sand to Fill Mold = _____grams

Density of Sand, $\mathbf{D}_{\mathbf{S}} = \frac{\text{Average Weight of Sand to Fill Mold}}{(453.6 \text{ grams / lb.}) \times (\text{Volume of Mold})}$

(453.6)×(

-= _____= lb./ft.³

Trial	Initial Wt. of	Final Wt. of	Wt. of Sand to Fill Funnel
No.	Apparatus (grams)	Apparatus (grams)	and Baseplate (grams)
1	6029	4508	
2	6031	4512	
3	6027	4508	

Average Weight of Sand to Fill Funnel and Baseplate = _____grams

Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funnel and Baseplate}}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$

= (453.6)×() = -----= ft.³

)

Remarks: _____ $I = D_s X V_{fb}$ _____

Supervisor and Date:

Calibration Expiration Date:

Date o	Date of Calibration:Test Operator:			
I. D. N	I. D. No. of Mold used in calibration: 11			
Volum	e of Mold used in calibratior			
Identif	ication of Sand:			
L Volur	Volume of Mold used in calibration			
	mold is used in the calls	Dration of the sand.	mold was calculated	
- and b	pring that volume over to	this form.		
2	6631	0627		
3	6631	9630		
	Average Weight	of Sand to Fill Mold =	grams	
	5 5			
	Density of Sand	Average Weight of Sand to	Fill Mold	
	Density of Sand,	$S^{-}(453.6\mathrm{grams}/\mathrm{lb.})\times(\mathrm{Volum})$	e of Mold)	
	=	$(453.6)\times()$ =	= lb./ft. ³	
Trial	Initial Wt. of	Final Wt. of	Wt. of Sand to Fill Funnel	
No.	Apparatus (grams)	Apparatus (grams)	and Baseplate (grams)	
1	6029	4508		
2	6031	4512		
3	6027	4508		
	Average Weight of Sand to Fill Funnel and Basenlate = grams			
		Average Weight of Sand to	o Fill Funnel and Baseplate	
Volume of Funnel and Baseplate, $V_{fb} = \frac{3}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$				
		(3)		
	=	=	$= ft.^{3}$	
		(453.6)×()		
Remar	ks: $I = D_s x V_{fb}$			

Supervisor and Date: _____

Calibration Expiration Date:



Date of Calibration:	Test Operator:	
I. D. No. of Mold used in calibration:	11	
Volume of Mold used in calibration:	.0	750
Identification of Sand:		
Identification of Sand Cone Apparatu	us:	

Trial	Wt. of Baseplate	Wt. of Basepla	e and	Wt. of Sand to Fill
No.	And Empty Mold (grams)	Mold Filled with Sa	ld (grams)	Mold (grams)
1	6631	9629		
2	6631	9627		
3	6631	9630		

Average Weight of Sand to Fill Mold =_____grams

Density of Sand, $\mathbf{D}_{\mathbf{S}} = \frac{\text{Average Weight of Sand to Fill Mold}}{(453.6 \text{ grams / lb.}) \times (\text{Volume of Mold})}$ $= \frac{\mathbf{V}_{\mathbf{S}}}{(453.6) \times (\mathbf{.0750})} = ----=$

(50) = ------= = lb./ft.³

Trial	Initial Wt. of	Final Wt. of	Wt. of Sand to Fill Funnel
No.	Apparatus (grams)	Apparatus (grams)	and Baseplate (grams)
1	6029	4508	
2	6031	4512	
3	6027	4508	

Average Weight of Sand to Fill Funnel and Baseplate = _____grams

Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funnel and Baseplate}}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$

= (453.6)×() = -----= ft.³

Remarks:_____ $I = D_s x V_{fb}$

Supervisor and Date: _____

Calibration Expiration Date:

Date of Calibration:	_Test Operator:
I. D. No. of Mold used in calibration	<u>: 11</u>
Volume of Mold used in calibration:	.0750
Identification of Sand:	
Identification of Sand Cone Apparat	tus:

	_		-			
Trial		Wt. of Baseplate	Wt. of	Baseplate and	Wt. of Sand to F	-ill
No.	And	Empty Mold (grams)	Mold (grams) Mold Filled with Sand (grams)		Mold (grams)	
		6631		9629	2998 🗲	
2		6631		9627		
3		6631		9630		

	Average Weight	of Sand to Fill Mold =	grams	
Three trials are run to determine the Wt. of Sand to Fill Mold For each trial, the weight of sand to fill the mold must be determined. Trial 1 = 9629 - <u>6631</u> = 2998				
Trial No.	Initial Wt. of Apparatus (grams)	Final Wt. of Apparatus (grams)	Wt. of Sand to Fill and Baseplate (g	Funnel rams)
1	6029	4508		
2	6031	4512		

Average Weight of Sand to Fill Funnel and Baseplate = _____grams

4508

2 3

6027

Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funnel and Baseplate}}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$

=	(453.6)×() =	$- = ft.^{3}$
Remarks: $\mathbf{I} = \mathbf{D}_{s} \mathbf{x} \mathbf{V}_{fb}$			
Supervisor and Date:			
Calibration Expiration Date:			

Date of Calibration:	_Test Operator:
I. D. No. of Mold used in calibration	:11
Volume of Mold used in calibration:	.0750
Identification of Sand:	
Identification of Sand Cone Apparat	tus:

Trial	Wt. of Baseplate		Wt. of Baseplate and	Wt. of Sand to Fill
No.	And Empty Mold (grams)		Mold Filled with Sand (grams)	Mold (grams)
1	6631		9629	2998
(2)	6631		9 627	2996 🧲
3		6631	9630	
		Average Weight	of Sand to Fill Mold =	grams
Three For 6 Trial 96 - <u>66</u> = 29	e trials a each tria 1 = 529 531 508	re run. I, the weight of Trial 2 = 9627 - <u>6631</u> = 2996	sand to fill the mold must be	e determined.
			Final W/A of	W/t. of Condita Fill Furnal
l rial	IN Appo	iliai VVI. Of	FINAL VVI. OT	vvi. of Sand to Fill Funnel
110.	Арра	6020	Apparatus (grams)	and basepiate (grams)
		0029	4000	
2		6031	4512	
3		6027	4508	

Average Weight of Sand to Fill Funnel and Baseplate = _____grams

Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funnel and Baseplate}}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$

 $= -------= ft.^{3}$ Remarks:_____ I = D_s x V_{fb} _____ Supervisor and Date: _____ Calibration Expiration Date:

Date of Calibration:	_Test Operator:		
I. D. No. of Mold used in calibration		11	
Volume of Mold used in calibration:		.0750	
Identification of Sand:			
Identification of Sand Cone Apparat	us:		

No.And Empty Mold (grams)Mold Filled with Sand (grams)Mold (grams)1663196292998	
1 6631 9629 2998	
2 6631 9627 2996	
3 6631 9630 2999	

Average Weight of Sand to Fill Mold = grams

For each trial, the weight of sand to fill the mold must be determined.

Trial 2 - Trial 3 -

Three trials are run.

9 - <u>6</u> = 2	629 9627 631 $- 6631$ 998 = 2996	9630 - <u>6631</u> = 2999	
Trial No.	Initial Wt. of Apparatus (grams)	Final Wt. of Apparatus (grams)	Wt. of Sand to Fill Funnel and Baseplate (grams)
1	6029	4508	
2	6031	4512	
3	6027	4508	

Average Weight of Sand to Fill Funnel and Baseplate = _____grams

Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funnel and Baseplate}}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$

 $= -------= ft.^{3}$ Remarks: _____ I = D_s x V_{fb} _____ Supervisor and Date: _____ Calibration Expiration Date:

Date of Calibration:	_Test Operator:
I. D. No. of Mold used in calibration:	r <u> </u>
Volume of Mold used in calibration:	.0750
Identification of Sand:	
Identification of Sand Cone Apparat	tus:

-					
Trial	Wt. of Bas	seplate	Wt. of Baseplate and	Wt. of Sand to Fill	
No.	And Empty Mo	old (grams)	Mold Filled with Sand (grams)	Mold (grams)	
1	663 ⁻	1	9629	2998	
2	663 ⁻	1	9627	2996	
3	663 ⁻	1	9630	2999	
Average Weight of Sand to Fill Mold =grams Density of Sand, $D_s = \frac{\text{Average Weight of Sand to Fill Mold}}{(453.6 \text{ grams / lb.}) \times (\text{Volume of Mold})}$ = (453.6)(,,,					
Trial	Aver	age Weig	ht of Sand to Fill Mold:	Wt. of Sand to Fill Funnel	
1 INO.	<u>App</u> 29	998		and Baseplate (grams)	
2		996		-	
2	+ 29	999		-	
5	= 89	993 ÷ 3 = 2	2997.666667		
	Avora			grame	
granis			yranis		
Volum	Volume of Funnel and Baseplate V_{re} = Average Weight of Sand to Fill Funnel and Baseplate				
Volum	$(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})$				

=	(453.6)×() =	$= ft.^{3}$
Remarks: $I = D_s x V_{fb}$			
Supervisor and Date: Calibration Expiration Date:			

 $----= ft.^{3}$

Date of Calibration:	_Test Operator:
I. D. No. of Mold used in calibration	r <u> </u>
Volume of Mold used in calibration:	.0750
Identification of Sand:	
Identification of Sand Cone Appara	tus:

Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	2998
2	6631	9627	2996
3	6631	9630	2999



Date of Calibration:	_Test Operator:_		
I. D. No. of Mold used in calibration	<u>.</u>	11	
Volume of Mold used in calibration:		.0750	
Identification of Sand:			
Identification of Sand Cone Apparatus:			

Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	2998
2	6631	9627	2996
3	6631	9630	2999

Average Weight of Sand to Fill Mold = ______grams

Density of Sand, $\mathbf{D}_{\mathbf{S}} = \frac{\text{Average Weight of Sand to Fill Mold}}{(453.6 \text{ grams / lb.}) \times (\text{Volume of Mold})}$



Average Weight of Sand to Fill Funnel and Baseplate = _____grams

Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funnel and Baseplate}}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$

(453.6))×()	- n.

Date of Calibration:	_Test Operator:
I. D. No. of Mold used in calibration	n:11
Volume of Mold used in calibration:	.0750
Identification of Sand:	
Identification of Sand Cone Apparat	tus:

Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	2998
2	6631	9627	2996
3	6631	9630	2999

Average Weight of Sand to Fill Mold = 2998 grams	
Density of Sand, $\mathbf{D}_{\mathbf{S}} = \frac{\text{Average Weight of Sand to Fill Mold}}{(453.6 \text{ grams / lb.}) \times (\text{Volume of Mold})}$	88.12463257
= <u>2998</u> (453.6) × (.0750 34.02	= lb./ft. ³
Trial No. A Divide: 2998 ÷ $34.02 = 88.12463257$ Wt. of S and B	Sand to Fill Funnel aseplate (grams)
2	
Average Weight of Sand to Fill Funnel and Baseplate =	_grams
Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funn}}{(453.6 \text{ grams / lb.}) \times (\text{Densite})}$	nel and Baseplate y of Sand)
= (453.6)×() =	- = ft. ³
Remarks: $I = D_s x V_{fb}$	

Supervisor and Date:	
Calibration Expiration Date:	

Date of Calibration:	_Test Operator:
I. D. No. of Mold used in calibration	n:11
Volume of Mold used in calibration:	.0750
Identification of Sand:	
Identification of Sand Cone Apparat	tus:

Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	2998
2	6631	9627	2996
3	6631	9630	2999

Average Weight of Sand to Fill Mold	= <u>2998</u> grams
5 5	

$=\frac{2998}{(453.6)\times(-0.750)} = \frac{88.1}{1000} = 10./\text{ft.}^3$	Density of Sand, $\mathbf{D}_{\mathbf{S}} = \frac{Aven}{(453.7)}$	erage Weight of Sand .6 grams / lb.) \times (Volu	Id to Fill Mold Iume of Mold)	7
$=\frac{2998}{(453.6)\times(0.0750)}=\frac{88.1}{1000}=10./\text{ft.}^3$			00.1240323	1
	$=\frac{2}{(453.6)\times(}$	<u>998</u> 0750) =-		

Trial No.	A	Round to one decimal place = $88.12463257 = 8$	8.1	nd to Fill Funnel eplate (grams)
1				
2				
3				

Average Weight of Sand to Fill Funnel and Baseplate = _____grams

Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funnel and Baseplate}}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$

= (453.6)×() = -----= ft.³

Remarks: _____ $I = D_s x V_{fb}$ _____

Supervisor and Date: _____

Calibration Expiration Date: __

Date of Calibration:	Test Operator:		
I. D. No. of Mold used in calibration:_		11	
Volume of Mold used in calibration:		.0750	
Identification of Sand:			
Identification of Sand Cone Apparatu	JS:		

Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	2998
2	6631	9627	2996
3	6631	9630	2999

Average Weight of Sand to Fill Mold = ______grams

Density of Sand, $\mathbf{D}_{\mathbf{S}} = \frac{\text{Average Weight of Sand to Fill Mold}}{(453.6 \text{ grams / lb.}) \times (\text{Volume of Mold})}$ 88.12463257

 $=\frac{2998}{(453.6)\times(0.0750)}=\frac{88.1}{34.02}=1$ b./ft.³

Trial	Initial Wt. of	Final Wt. of	Wt. of Sand to Fill Funnel			
No.	Apparatus (grams)	Apparatus (grams)	and Baseplate (grams)			
	6029	4 508	1521			
2	6031	4512				
3	6027	4508				
Volum	Average Weight of Sand to Fill Funnel and Baseplate =grams Volume of Funnel and Baseplate, $V_{fb} = \frac{Average Weight of Sand to Fill Funnel and Baseplate}{(453.6 grams / lb.) \times (Density of Sand)}$					
Rema Supe	Three trials are run to determine the Wt. of Sand to Fill Funnel and Baseplate Trial 1 6029 - 4508 = 1521 Supe					

Calibration Expiration Date:

Date o	f Calibration:	Test Operator:					
I. D. N	I. D. No. of Mold used in calibration: 11						
Volum	Volume of Mold used in calibration:0750						
Identifi	cation of Sand:						
Identifi	Identification of Sand Cone Apparatus:						
Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill				

1110	TTL OF Budopiato	The of Bassplats and	
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	2998
2	6631	9627	2996
3	6631	9630	2999

2998 Average Weight of Sand to Fill Mold =____ grams

Density of Sand, $\mathbf{D}_{\mathbf{S}} = \frac{\text{Average Weight of Sand to Fill Mold}}{(453.6 \text{ grams / lb.}) \times (\text{Volume of Mold})}$ 88.12463257

2998 .0750 (34.02) (453.6)×(

= ______= lb./ft.³

Trial	Ini	tial Wt. of	F	inal Wt. of	Wt. of Sand to Fill Funnel
No.	Appar	atus (grams)	Appa	aratus (grams)	and Baseplate (grams)
1		6029		4508	1521
2	٢	6031		4512	1519 🗲 🚽
3		6027		4508	

Average Weight of Sand to Fill Furthel and Baseplate = _____grams

Volume of Funnel and Baseplate, $V_{fb} = \sqrt{verage Weight of Sand to Fill Funnel and Baseplate}$ $(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})$

Three trials are run to determine the Wt. of Sand to Fill Funnel and Baseplate Trial 1 Trial 2 6029 6031 Rema 4508 4512 = 1519Supe Calibration Expiration Date:

Date o	f Calibration:	Test Operator:					
I. D. N	o. of Mold used in calibratio	n:11					
Volum	Volume of Mold used in calibration:0750						
Identifi	cation of Sand:						
Identifi	Identification of Sand Cone Apparatus:						
Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill				
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)				

No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	2998
2	6631	9627	2996
3	6631	9630	2999

Average Weight of Sand to Fill Mold = ______grams

Density of Sand, $\mathbf{D}_{\mathbf{S}} = \frac{\text{Average Weight of Sand to Fill Mold}}{(453.6 \text{ grams / lb.}) \times (\text{Volume of Mold})}$ 88.12463257

3.1	= lb./ft. ³	

 $=\frac{2998}{(453.6)\times(.0750)}=\frac{88}{34.02}$

Trial	Initial Wt. of	Final Wt. of	Wt. of Sand to Fill Funnel
No.	Apparatus (grams)	Apparatus (grams)	and Baseplate (grams)
1	6029	4508	1521
2	6031	4512	1519
3	6027	4508	1519 🗲

Average Weight of Sand to Fill Funnel and Baseplate = _____grams

Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funnel and Baseplate}}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$

Three trials are run to determine the Wt. of Sand to Fill Funnel and Baseplate

	Trial 1	Trial 2	Trial 3	
Rema	6029	6031	∛ 6027	
i tema	- 4508	- 4512	- 4508 <	
	= 1521	= 1519	= 1519	
Supe				
Calib	ration Expiratio	n Date:		

Date o	f Calibration:	Test Operator:		
I. D. N	o. of Mold used in calibratio	n:11		
Volume	Volume of Mold used in calibration:0750			
Identifi	Identification of Sand:			
Identification of Sand Cone Apparatus:				
Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill	

That	WI. OI Daseplate	WI. OF Daseplate and	
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	2998
2	6631	9627	2996
3	6631	9630	2999

Average Weight of Sand to Fill Mold = _____ grams

Density of Sand, $\mathbf{D}_{\mathbf{S}} = \frac{\text{Average Weight of Sand to Fill Mold}}{(453.6 \text{ grams / lb.}) \times (\text{Volume of Mold})}$ 88.12463257

 $=\frac{2998}{(453.6)\times(.0750)}=$

88.1	$= lb./ft.^3$

Trial	Initial Wt. of	Final Wt. of	Wt. of Sand to Fill Funnel
No.	Apparatus (grams)	Apparatus (grams)	and Baseplate (grams)
1	6029	4508	1521
2	6031	4512	1519
3	6027	4508	1519

Average Weight of Sand to Fill Funnel and Baseplate grams

Volume of Funnel and Baseplate, V_{flo} Average Weight of Sand to Fill Funnel and Baseplate (453.6 grams / lb.) × (Density of Sand)

Average Weight of Sand to Fill Funnel and Baseplate

	1521 + 1519	n.
Rema	+ $\frac{1519}{4559} \div 3 = 1519.666667$	
Supe	rvisor and Date:	
· · · · ·		

Calibration Expiration Date:

Date of Calibration:	Test Operator:
I. D. No. of Mold used in calibratior	n:11
Volume of Mold used in calibration:	.0750
Identification of Sand:	
Identification of Sand Cone Appara	tus:

Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	2998
2	6631	9627	2996
3	6631	9630	2999

Average Weight of Sand to Fill Mold = ______grams

Density of Sand, $\mathbf{D}_{\mathbf{S}} = \frac{\text{Average Weight of Sand to Fill Mold}}{(453.6 \text{ grams / lb.}) \times (\text{Volume of Mold})}$ 88.12463257

 $=\frac{2998}{(453.6)\times(0.0750)}=\frac{88.1}{.02}=1$ b./ft.³

Trial	Initial Wt. of	Final Wt. of	Wt. of Sand to Fill Funnel
No.	Apparatus (grams)	Apparatus (grams)	and Baseplate (grams)
1	6029	4508	1521
2	6031	4512	1519
3	6027	4508	1519

Average Weight of Sand to Fill Funnel and Baseplate = 1520 < grams

Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funnel and Baseplate}}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$ = $\frac{1520}{(453.6)\times()} = -----= \text{ft.}^3$



Average Weight of Sand to Fill Funnel and Baseplate Remarl 1521 + 1519

+ 1519 Superv

= 4559 \div 3 = 1519.666667 Calibra

Rounded to nearest whole gram = 1519.666667 = 1520
Date of Calibration:	_Test Operator:		
I. D. No. of Mold used in calibration	:	11	
Volume of Mold used in calibration:		.0750	
Identification of Sand:			
Identification of Sand Cone Apparat	us:		

Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	2998
2	6631	9627	2996
3	6631	9630	2999

Average Weight of Sand to Fill Mold = _____ grams

Density of Sand, $\mathbf{D}_{\mathbf{S}} = \frac{\text{Average Weight of Sand to Fill Mold}}{(453.6 \text{ grams / lb.}) \times (\text{Volume of Mold})}$ 88.12463257

 $=\frac{2998}{(453.6)\times(0.0750)}=\frac{88.1}{3402}=16./\text{ft.}^3$

Trial	Initial Wt. of	Final Wt. of		Wt. of Sand to Fill Funnel
No.	Apparatus (grams)	Apparatus (grams)		and Baseplate (grams)
1	6029	4508		1521
2	6031	4512		1519
3	6027	4508		1519

Average Weight of Sand to Fill Funnel and Baserlate = 1520 grams

Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funnel and Baseplate}}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$

 $=\frac{1520}{(453.6)\times(88.1)}=-=ft.^3$

Remarks: $I = D_s x V_{fb}$
Supervisor and Date:
Calibration Expiration Date:

Date of Calibration:	_Test Operator:
I. D. No. of Mold used in calibration:	11
Volume of Mold used in calibration:	.0750
Identification of Sand:	
Identification of Sand Cone Apparate	JS:

Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	2998
2	6631	9627	2996
3	6631	9630	2999

Average Weight of Sand to Fill Mold = 2998 grams

Density of Sand, $\mathbf{D}_{\mathbf{S}} = \frac{\text{Average Weight of Sand to Fill Mold}}{(453.6 \text{ grams / lb.}) \times (\text{Volume of Mold})}$ 88.12463257

 $=\frac{2998}{(453.6)\times(0.0750)}=\frac{88.1}{34.02}=1$ b./ft.³

Trial	Initial Wt. of	Final Wt. of	Wt. of Sand to Fill Funnel
No.	Apparatus (grams)	Apparatus (grams)	and Baseplate (grams)
1	6029	4508	1521
2	6031	4512	1519
3	6027	4508	1519

Average Weight of Sand to Fill Funnel and Baseplate = 1520 grams

Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funnel and Baseplate}}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$

1520	ft 3
^(453.6) (88.1) ⁻ 39962.16	- 1.
Rema Calculate bottom of equation first to get it to one number 453.6 x 88.1 = 39962.16	

Date of Calibration:Test C	operator:
I. D. No. of Mold used in calibration:	11
Volume of Mold used in calibration:	.0750
Identification of Sand:	
Identification of Sand Cone Apparatus:	

Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	2998
2	6631	9627	2996
3	6631	9630	2999

Average Weight of Sand to Fill Mold = _____ grams

Density of Sand, $\mathbf{D}_{\mathbf{S}} = \frac{\text{Average Weight of Sand to Fill Mold}}{(453.6 \text{ grams / lb.}) \times (\text{Volume of Mold})}$ 88.12463257

 $=\frac{2998}{(453.6)\times(0.0750)}=\frac{88.1}{34.02}=1$ b./ft.³

Trial	Initial Wt. of	Final Wt. of	Wt. of Sand to Fill Funnel
No.	Apparatus (grams)	Apparatus (grams)	and Baseplate (grams)
1	6029	4508	1521
2	6031	4512	1519
3	6027	4508	1519

Average Weight of Sand to Fill Funnel and Baseplate = 1520 grams

Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funnel and Baseplate}}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$ 038035982 1520 (453.6)×(88.1 39962.16 = ft.³ Divide: 1520 ÷ 39962.16 = .038035982 Remarks: Supervisor and Dat Calibration Expiration Date:

Date of Calibration:	_Test Operator:	
I. D. No. of Mold used in calibratior	n:11	
Volume of Mold used in calibration	.0750	
Identification of Sand:		
Identification of Sand Cone Appara	tus:	

Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	2998
2	6631	9627	2996
3	6631	9630	2999

Average Weight of Sand to Fill Mold = _____ grams

Density of Sand, $\mathbf{D}_{\mathbf{S}} = \frac{\text{Average Weight of Sand to Fill Mold}}{(453.6 \text{ grams / lb.}) \times (\text{Volume of Mold})}$ 88.12463257

 $=\frac{2998}{(453.6)\times(...0750)}=\frac{88.1}{.02}=1$ b./ft.³

Trial	Initial Wt. of	Final Wt. of	Wt. of Sand to Fill Funnel
No.	Apparatus (grams)	Apparatus (grams)	and Baseplate (grams)
1	6029	4508	1521
2	6031	4512	1519
3	6027	4508	1519

Average Weight of Sand to Fill Funnel and Baseplate = 1520 grams

Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funnel and Baseplate}}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$.038035982 = <u>1520</u> (453.6)×(88.1) 39962.16 = ft.³ Remarks: Divide: 1520 ÷ 39962.16 = .038035982 Round to forth decimal place Supervisor and Dat Calibration Expiration = .038035982 = .0380

Date of Calibration:Test Operator:
I. D. No. of Mold used in calibration:11
Volume of Mold used in calibration:0750
Identification of Sand:
Identification of Sand Cone Apparatus:

Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	2998
2	6631	9627	2996
3	6631	9630	2999

Average Weight of Sand to Fill Mold = _____grams

Density of Sand D _	_ Average Weight of Sand to Fill Mold		
S s s s s s s s s	$(453.6 \text{grams} / \text{lb.}) \times (\text{Volume of Mold})$	88 1	

88.12463257

88.1 = lb./ft.³

2998 (453.6)×(.0750 3/

Trial	Initial Wt. of	Final Wt. of		Wt. of Sand to Fill Funnel
No.	Apparatus (grams)	Apparatus (grams)	Apparatus (grams)	
1	6029	4508		1521
2	6031	4512	/	1519
3	6027	4508		1519

Average Weight of Sand to Fill Funnel and Baseplate = <u>1520</u> grams

Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funnel and Baseplate}}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$

.038035982



USE CAPITAL LETTERS		TYPE PUR- POSE	TEST SIZE SIZE %
TEST NO.	SAMPLED BY	MO DAY YEAR	
SAMPLED	FROM	LIFT NO. RDWY	STATION
	PROJECT ENGINEER	/	IF MILEPOST, INPUT DECIMAL
	SUPERVISOR		
	REMARKS		

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9,	. 0	7	ĹВ
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	. 6	3	LB.
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)			•		LB.
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	.3	%
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	VE			•	%
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	. 6	9	LB.
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	. 4	8	LB.
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)			•		LB
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB
J. WEIGHT OF SAND TO FILLHOLE (H-I)					LB
K. DENSITY OF SAND		8	8	1	PCI
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$	ł				CF
M. WET DENSITY = $\left(\frac{A}{L}\right)$					PCI
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$					РС
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%
COMPACTION SPECIFICATION		1	00		%
PROCTOR DENSITY					
PROCTOR NUMBER					
				Α	
PROCTOR METHOD (A, C, D, OR 1)					1
PROCTOR METHOD (A, C, D, OR 1) O. SPECIFIC GRAVITY OF RETAINED #4	2	6	5	1	
PROCTOR METHOD (A, C, D, OR 1) O. SPECIFIC GRAVITY OF RETAINED #4 P. ABSORPTION OF RETAINED #4	2	. 6 0,	5	1 7	%
PROCTOR METHOD (A, C, D, OR 1) O. SPECIFIC GRAVITY OF RETAINED #4 P. ABSORPTION OF RETAINED #4 Q. OPTIMUM MOISTURE	2	6 0, 1	5 8	1 7 6	%
PROCTOR METHOD (A, C, D, OR 1) O. SPECIFIC GRAVITY OF RETAINED #4 P. ABSORPTION OF RETAINED #4 Q. OPTIMUM MOISTURE R. MAXIMUM DRY DENSITY	2	6 0, 1 2	5 8 1 2	1 7 6 7	% % PCI
PROCTOR METHOD (A, C, D, OR 1) O. SPECIFIC GRAVITY OF RETAINED #4 P. ABSORPTION OF RETAINED #4 Q. OPTIMUM MOISTURE R. MAXIMUM DRY DENSITY CORRECTION FOR RETAINED #4 (METHOD A OR ONE	2 1 -POI	6 0, 1 2	5 8 1 2	1 7 6 7	% % PC
PROCTOR METHOD (A, C, D, OR 1) O. SPECIFIC GRAVITY OF RETAINED #4 P. ABSORPTION OF RETAINED #4 Q. OPTIMUM MOISTURE R. MAXIMUM DRY DENSITY CORRECTION FOR RETAINED #4 (METHOD A OR ONE S. CORRECTED OPTIMUM MOISTURE	2 1 -POI	6 0, 1 2 NT C	5 8 1 2	1 7 6 7	% % PCI

a.	RETAINED ON #4 =	(<u> </u>) x	100	
ч.				100	

IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.

%

$$\mathsf{E} = \frac{[D \ (100 \ - \ a \,)] + a}{100}$$

b. WEIGHT OF MOLD & SOIL	1	3	. 8	9	LB.
c. WEIGHT OF MOLD		9	,4	7	LB.
d. WEIGHT OF COMPACTED SOIL (b-c)					LB.
e. VOLUME OF MOLD					CF
f. WET DENSITY (d / e)			-		PCF
g. MOISTURE CONTENT			9	.9	%
FAMILY OF CURVES IDENTIFICATION			&		
Q. OPTIMUM MOISTURE			-		%
R. MAXIMUM DRY DENSITY				•	PCF

TEST OPERATOR AND DATE

RESIDENT ENGINEER, PROJECT SUPERVISOR, OR LABMAN AND DATE

FOR METHOD A OR ONE POINT ONLY

$$S = \frac{[Q (100 - a)] + a}{100}$$
$$T = \frac{[R (100 - a)] + [(56.2) (a)(O)]}{100}$$

Sand Cone Density Calculation

	ORG NUMBER MATL	TYPE PUR- TE POSE L	AB SIZE SIZE %
TEST NO.	SAMPLED BY	MO DAY YEAR	
	PROJECT ENGINEER SUPERVISOR		
	REMARKS		

	9	. 0	7	ĹВ.
	3	. 6	3	LB.
				LB.
	1	0	.3	%
/E			•	%
1	5	. 6	9	LB.
	6	• 4	8	LB.
	I			LB.
	3	က	5	LB.
	I			LB.
	8	8	1	PCF
				CF
				PCF
				PCF
				%
	1	0	0	%
	/E 1	9 3 1 7 5 6 3 7 8 8 7 1	9 0 3 6 1 0 /E 7 1 5 6 6 4 3 3 4 3 3 6 4 8 8 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	9 0 7 3 6 3 1 0 3 1 5 6 9 1 5 6 9 6 4 8 3 3 5 8 8 1 9 0 7 1 5 6 3 3 5 8 8 1 9 0 1 1 0 0

a. RETAINED ON #4 = $\left(\frac{B}{A}\right) \times 100$

IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.

FOR METHOD A OR ONE POINT ONLY

%

F-	[D	(100	-	а)]	+	а
L-			100)			

ONE POINT PROCTOR (ARIZ 232)								
b. WEIGHT OF MOLD & SOIL	1	3.	.8	9	LB.			
c. WEIGHT OF MOLD		9	.4	7	LB.			
d. WEIGHT OF COMPACTED SOIL (b-c)					LB.			
e. VOLUME OF MOLD	-				CF			
f. WET DENSITY (d / e)					PCF			
g. MOISTURE CONTENT			9	9	%			
FAMILY OF CURVES IDENTIFICATION			&					
Q. OPTIMUM MOISTURE					%			
R. MAXIMUM DRY DENSITY					PCF			

PROCTOR DENSITY

PROCTOR NUMBER					
PROCTOR METHOD (A,C, D, OR 1)				А)-
O. SPECIFIC GRAVITY OF RETAINED #4	2	6	5	Н	
P. ABSORPTION OF RETAINED #4		0.	. 8	7	%
Q. OPTIMUM MOISTURE		1	1	6	%
R. MAXIMUM DRY DENSITY	1	2	2	.7	PCF
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	-POI	ΝТ С	NLY)	
S. CORRECTED OPTIMUM MOISTURE					%
T. CORRECTED MAXIMUM DRY DENSITY					PCF

This is the one-point proctor section of the form. A Method A one-point proctor was performed.



USE CAPITAL LETTERS		PI	IB. TEST	
	ORG NUMBER MATL			SIZE SIZE %
TEST NO.	SAMPLED BY	MO DAY YE	AR	TIME MILITARY TIME
			IF MILE	POST, INPUT DECIMAL
ORIGINAL SOURCE		PROJECT NU	MBER	TRACS NUMBER
	REMARKS			

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9,	0	7	ĹВ.		
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	6	3	LB.		a. RETAINED ON #4 = $\left(\frac{B}{A}\right) \times 100$ %
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)			•		LB.		IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	3	%		FOR METHOD A OR ONE POINT ONLY
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	/E			•	%		$E = \frac{[D (100 - a)] + a}{100}$
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	. 6	9	LB.		ONE POINT PROCTOR (ARIZ 232)
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	4	8	LB.		b. WEIGHT OF MOLD & SOIL 1 3 8 9 LB.
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		1	•		LB.		c. WEIGHT OF MOLD 9,47 LB.
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.		d. WEIGHT OF COMPACTED SOIL (b-c)
J. WEIGHT OF SAND TO FILLHOLE (H-I)			•		LB.		e. VOLUME OF MOLD
K. DENSITY OF SAND		8	8	1	PCF	-	f. WET DENSITY (d / e)
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$	•				CF		g. MOISTURE CONTENT 999%
M. WET DENSITY = $\left(\frac{-A}{L}\right)$					PCF		FAMILY OF CURVES DENTIFICATION &
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$			1		PCF		Q. OPTIMUM MOISTURE %
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%		R. MAXIMUM DRY DENS TY
COMPACTION SPECIFICATION		1	0	0	%		
PROCTOR DENSITY		-	_		_		
PROCTOR NUMBER							
PROCTOR METHOD (A, C, D, OR 1)				Α			
O. SPECIFIC GRAVITY OF RETAINED #4	2	6	5	1			
P. ABSORPTION OF RETAINED #4		0	. 8	7	%	F	-or <u>e. volume of Wold</u> o back to the forr
Q. OPTIMUM MOISTURE		1	1	6	%	V	where the volume of the 4" Mold was
R. MAXIMUM DRY DENSITY	1	2	2	.7	PCF	C	calculated and bring that Volume over to
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	-POI	NT C	DNLY)		t	his form.
S. CORRECTED OPTIMUM MOISTURE					%		
T. CORRECTED MAXIMUM DRY DENSITY					PCF	-	100



		TVDE	PUR- T		7= %
TEST NO.	SAMPLED BY	MO DAY	YEAR	TIME	ILITARY TIME
SAMPLED	FROM	LIFT NO. RE	WY	STATION	
				+	
	PROJECT ENGINEER				AL
	SUPERVISON				
	REMARKS				

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	. 0	7	ĹВ.		
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	. 6	3	LB.		a. RETAINED C
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)			•		LB.		IF RET. ON #4 I
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	3	%		FO
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	/E			•	%	_	
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	. 6	9	LB.		ONE
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	. 4	8	LB.		b. WEIGHT OF
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)			•		LB.		c. WEIGHT OF
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.		d. WEIGHTOF
J. WEIGHT OF SAND TO FILLHOLE (H-I)					LB.	Γ	e. VOLUME OF
K. DENSITY OF SAND		8	8	1	PCF		f. WET DENSIT
L. VOLUME OF HOLE $\left(-\frac{J}{K}\right)$	f				CF		g. MOISTURE
M. WET DENSITY = $\left(\frac{-A}{L}\right)$					PCF		FAMILY OF C
N. DRYDENSITY = $\left(\frac{M}{100 + E}\right) \times 100$					PCF		Q. OPTIMUM N
$\boxed{\text{COMPACTION} = \left(\frac{N}{R}\right) \times 100 \text{OR} \left(\frac{N}{T}\right) \times 100}$					%		R. MAXIMUM D
COMPACTION SPECIFICATION		1	0	0	%	ļ	
PROCTOR DENSITY							
PROCTOR NUMBER							
PROCTOR METHOD (A, C, D, OR 1)				A			
O. SPECIFIC GRAVITY OF RETAINED #4	2	. 6	5	1	1	_	
P. ABSORPTION OF RETAINED #4		0	. 8	7	%	ŀ	-or <u>e. Vo</u>
Q. OPTIMUM MOISTURE		1	1	6	%	V	vhere the
R. MAXIMUM DRY DENSITY	1	2	2	7	PCF	C	alculate
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	-POI	NT C	NLY	()		t	his form.
S. CORRECTED OPTIMUM MOISTURE					%		
T. CORRECTED MAXIMUM DRY DENSITY				•	PCF	1	I
						•	

a. RETAINED ON #4 = $\left(\frac{B}{A}\right) X 100$					%				
FRET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.									
FOR METHOD A OR ONE POINT	ONL	Y							
E = [D (100 - a)] + a									
- 100	_	_	_	_					
ONE POINT PROCTOR (ARIZ	232	2)							
b. WEIGHT OF MOLD & SOIL	1	3	.8	9	LB.				
c. WEIGHT OF MOLD		9	.4	7	LB.				
d. WEIGHT OF COMPACTED SOIL (b-c)					LB.				
e. VOLUME OF MOLD	.0	3	3	3	R				
f. WET DENSITY (d / e)					PCF				
g. MOISTURE CONTENT			9	.9	%				
FAMILY OF CURVES IDENTIFICATION			&						
Q. OPTIMUM MOISTURE				•	%				
R. MAXIMUM DRY DENSITY				•	PCF				

For <u>e. Volume of Mold</u>go back to the form where the Volume of the 4" Mold was calculated and bring that Volume over to this form.

	ORG NUMBER MATL		PUR- POSE LAB	SIZE SIZE %
	SAMPLED BY			
ORIGINAL SOURCE	PROJECT ENGINEI SUPERVISOR			EPOST, INPUT DECIMAL TRACS NUMBER
	REMARKS	3		

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	0	7	ĹВ.	
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	6	3	LB.	a. RETAINED ON #4 = $\left(\frac{B}{A}\right) X 100$ %
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)			•		LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	.3	%	FOR METHOD A OR ONE POINT ONLY
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	/E			•	%	$E = \frac{[D_{-}(100 - a)] + a}{100}$
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	6	9	LB.	ONE POINT PROCTOR (ARIZ 232)
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	4	8	LB.	b. WEIGHT OF MOLD & SOIL 1 3 8 9 LB.
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)			•		LB.	
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.	d. WEIGHT OF COMPACTED SOIL (b-c)
J. WEIGHT OF SAND TO FILLHOLE (H-I)			•		LB.	e. VOLUME OF MOLD 0/333CF
K. DENSITY OF SAND		8	8	.1	PCF	f. WET DENSITY (d / e)
L. VOLUME OF HOLE $\left(-\frac{J}{K}\right)$	•				CF	g. MOISTURE CONTENT 9.9%
M. WET DENSITY = $\left(\frac{-A}{L}\right)$					PCF	FAMILY OF CURVES IDENTIFICATION &
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$				•	PCF	Q. OPTIMUM MOISTURE %
$COMPACTION = \left(\frac{N}{R}\right) x \ 100 OR \left(\frac{N}{T}\right) x \ 100$					%	R. MAXIMUM DRY DENSITY PCF
COMPACTION SPECIFICATION		1	0	0	%	
PROCTOR DENSITY						This is the one mint reactor section
PROCTOR NUMBER						of the forme A Motored Agence resist and store
PROCTOR METHOD (A, C, D, OR 1)				Α	1	of the form. A Mernod Hone-point proctor
O. SPECIFIC GRAVITY OF RETAINED #4	2	6	5	1		was performed.
P. ABSORPTION OF RETAINED #4		0	. 8	7	%	d. = b - c $13.89 - 9.47 = 4.42$
Q. OPTIMUM MOISTURE		1	1	6	%	
R. MAXIMUM DRY DENSITY	1	2	2	. 7	PCF	$Q \left[Q \left(100 - a \right) \right] + a$
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	POI	NT C	DNL	()		5=
S. CORRECTED OPTIMUM MOISTURE				•	%	[R(100 - a)] + [(56.2)(a)(O)]
T. CORRECTED MAXIMUM DRY DENSITY				ļ	PCF	T = [(1, (1, 0, 0), (2, 0)
	-	-	-			

	TTERS		ΜΔΤΙ	TVDE	PUR	TEST	017E	
			AB					
TEST NO.	LOT OR SUFFIX	SAMPLED BY	[MO	DAY YEAR			MILITARY
	SAMPLED FRO	M		LIFT NO.	RDWY		STATION	
ORIG	BINAL SOURCE	PROJECT E SUPER\	ENGINEER / VISOR	PF	ROJECT NUME	BER	TRACS	
		RE	MARKS					
				_				

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	0	7	ĹВ.		
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3.	6	3	LB.	a. RETAINED ON #4 = $\left(\frac{B}{A}\right) \times 100$	%
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)			_		LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.	
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	.3	%		
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	VE		_	8	%	$E = \frac{[D](100 - a)] + a}{100}$	
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	6	9	LB.	ONE POINT PROCTOR (ARIZ 232)	
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	. 4	8	LB.	b. WEIGHT OF MOLD & SOIL 1 3 8 9	LB.
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		-	-		LB.	c. WEIGHT OF MOLD 9,47	LB.
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	с С	5	LB.	d. WEIGHT OF COMPACTED SOIL (b-c)	LB.
J. WEIGHT OF SAND TO FILLHOLE (H-I)		I	-		LB.	e. VOLUME OF MOLD	CF
K. DENSITY OF SAND		8	8	1	PCF	f. WET DENSITY (d / e) 1 3 2 7	P
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$	•				CF	g. MOISTURE CONTENT	%
M. WET DENSITY = $\left(\frac{-A}{L}\right)$					PCF	FAMILY OF CURVES IDENTIFICATION &	
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$					PCF		%
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%	R. MAXIMUM DRY DENSITY	PCF
COMPACTION SPECIFICATION		1	0	0	%		
PROCTOR DENSITY							
PROCTOR NUMBER							
PROCTOR METHOD (A, C, D, OR 1)				A			
O. SPECIFIC GRAVITY OF RETAINED #4	2	6	5	1			
P. ABSORPTION OF RETAINED #4		0	, 8	7	c	¥ ¥	_
Q. OPTIMUM MOISTURE		1	1	, 6	t.	$= d \div e = 4.42 \div .0333 = 132.732732$	1
R. MAXIMUM DRY DENSITY	1	2	2	. 7	Ro	unded to one decimal place = 132. <u>7</u> 3	273
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	-POII	NT C	NLY)	= 1	32.7	
S. CORRECTED OPTIMUM MOISTURE					%	[B(100 - a)] + [(56.2)(a)(0)]	
				-			

USE CAPITAL LETTERS		PUB- TES	ST
			B SIZE SIZE %
TEST NO.	SAMPLED BY	MO DAY YEAR	
SAMPLED	FROM	LIFT NO. RDWY	STATION
	PROJECT ENGINEER	/ IF!	MILEPOST, INPUT DECIMAL
ORIGINAL SOURCE	SUPERVISOR	PROJECT NUMBER	TRACS NUMBER
	REMARKS		

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	0	7	ĹВ.					
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	6	3	LB.	a. RETAINED ON #4 = $\left(\frac{B}{A}\right) \times 100$ %				
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)			•		LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.				
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	3	%	FOR METHOD A OR ONE POINT ONLY				
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	VE			•	%	$E = \frac{[D]{(100 - a)] + a}}{100}$				
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	. 6	9	LB.	ONE POINT PROCTOR (ARIZ 232)				
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	4	8	LB.	b. WEIGHT OF MOLD & SOIL 1 3 8 9 LB.				
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)			•		LB.	c. WEIGHT OF MOLD 9,47 LB.				
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.	d. WEIGHT OF COMPACTED SOIL (b-c) 4.42 LB.				
J. WEIGHT OF SAND TO FILLHOLE (H-I)			•		LB.	e. VOLUME OF MOLD . 0 3 3 CF				
K. DENSITY OF SAND		8	8	1	PCF	f. WET DENSITY (d / e) / 1 3 2 7 PCF				
L. VOLUME OF HOLE $\left(-\frac{J}{K}\right)$	•				CF	g. MOISTURE CONTENT				
M. WET DENSITY = $\left(\frac{-A}{L}\right)$					PCF	FAMILY OF CURVES IDENTIFICATION				
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$					PCF	Q. OPTIMUM MOISTURE				
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%	R. MAXIMUM DRY DENSITY				
COMPACTION SPECIFICATION		1	0	0	%					
PROCTOR DENSITY										
PROCTOR NUMBER										
PROCTOR METHOD (A, C, D, OR 1)										
O. SPECIFIC GRAVITY OF RETAINED #4	2	6			۰, t	he Wat Density and the Maisture Contan				
P. ABSORPTION OF RETAINED #4		0		NUN Nro	νι ν	atted on the Earnily of Curves (next form)				
Q. OPTIMUM MOISTURE		1	Ċ	ii e	pi	oned on the Family of Curves (next 10m)				
R. MAXIMUM DRY DENSITY	1	2								
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	-POI	NT C	DNLY)		S= <u>100</u>				
S. CORRECTED OPTIMUM MOISTURE						[R(100 - a)] + [(56.2)(a)(O)]				
T. CORRECTED MAXIMUM DRY DENSITY				$T = - \frac{[\pi (100 - a)] + [(30.2) (a)(0)]}{100}$						
	~	-			-					



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they fall between. They fall between Curve H on the t and Curve I on the bottom.



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is away from the Top Curve. Use 10% increments.

The point (where the lines intersect) is approximately 50% away from Curve H.

(some variation in the percent away from the top curve is allowable. If you determine your point is 40% or 60% then that would be acceptable)

This is a blow up view. The top curve (H) is 0% and the bottom curve (I) is 100%. The green line is approximately 50% between the curves. The point where the lines intersect is approximately 50% away from the top curve (H).



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Α		141.8	6.6	F	129.3	9.7	К		117.0	13.5	Р	104.7	19.2	U	92.1	25.8
	10%	141.5	6.7	10%	129.0	9.8	1	0%	116.8	13.6	10%	104.5	19.3	10%	91.9	26.0
	20%	141.3	6.7	20%	128.8	9.9	2	0%	116.5	13.7	20%	104.2	19.4	20%	91.7	26.1
	30%	141.0	6.8	30%	128.5	9.9	3	0%	116.3	13.8	30%	104.0	19.5	30%	91.4	26.3
Γ	40%	140.7	6.8	40%	128.2	10.0	4	0%	116.0	13.9	40%	103.8	19.6	40%	91.2	26.4
—	50%	140.5	6.9	50%	128.0	10.1	5	0%	115.8	14.1	50%	103.6	19.8	50%	91.0	26.6
	60%	140.2	7.0	60%	127.7	10.2	6	0%	115.6	14.2	60%	103.3	19.9	60%	90.8	26.8
	70%	139.9	7.0	70%	127.4	10.3	7	0%	115.3	14.3	70%	103.1	20.0	70%	90.6	26.9
F	80%	139.6	7.1	80%	127.1	10.3	8	0%	115.1	14.4	80%	102.9	20.1	80%	90.3	27.1
	90%	139.4	7.1	90%	126.9	10.4	9	0%	114.8	14.5	90%	102.6	20.2	90%	90.1	27.2
в		139.1	7.2	G	126.6	10.5	L		114.6	14.6	Q	102.4	20.3	V	89.9	27.4
F	10%	138.8	7.3	10%	126.4	10.6	1	0%	114.3	14.7	10%	102.2	20.4	10%	89.7	27.6
\vdash	20%	138.5	7.3	20%	126.1	10.6	2	0%	114.1	14.8	20%	101.9	20.5	20%	89.4	27.8
	30%	138.3	7.4	30%	125.9	10.7	3	0%	113.8	15.0	30%	101.7	20.7	30%	89.2	28.0
	40%	138.0	7.5	40%	125.6	10.8	4	0%	113.6	15.1	40%	101.4	20.8	40%	88.9	28.2
\vdash	50%	137.7	76	50%	125.4	10.9	5	0%	113 3	15.2	50%	101.2	20.9	50%	88.7	28.5
\vdash	60%	137.4	76	60%	125.2	10.9	6	0%	113.0	15.3	60%	100.9	21.0	60%	88.5	28.7
	70%	137 1	77	70%	124.9	11 0	70	0%	112.8	15.4	70%	100.7	21.1	70%	88.2	28.9
┢─	80%	136.9	78	80%	124 7	11 1	8	0%	112.5	15.6	80%	100.4	21.3	80%	88.0	29.1
<u>├</u>	90%	126.6	7.0	90%	124.4	11 1	90	0%	112.3	15.7	90%	100.2	21.0	90%	87 7	29.3
c			Å	н	124 2	11 2	M		112.0	15.8	R	99.9	21.5	W	87.5	29.5
Ĕ	10%	136 1	180	10%	124.0	11.3	10	<u>n%</u>	111.8	15.9	10%	99.7	21.6	10%	87.3	29.6
F	20%	135.9	8.0	20%	123.7	11.3	20	0%	1115	16.0	20%	00.1	21.0	20%	87.0	20.0
┝─	30%	135.6	81	30%	123.5	11.0	- 30	0%	The r	oint	fell betv	veen C	urve	а Н & т		
-	40%	135.4	81	40%	123.2	11.5	4	0%	THO P							
-	50%	100.4	0.	50%	123.0	11.6	5	0%						<i>c</i>		
\vdash	60%	135.0	83	50%	120.0	11.0	6	0%	The e	estim	ated per	centag	je aw	ay from	the to	р
	70%	134.8	8.3	70%	122.5	11.0	70	0%	curv	/e (H)) is 50%					
⊢	80%	134 5	84	80%	122.0	11.8	- 80	0%								
<u> </u>	90%	134.3	84	90%	122.2	11.0	- 90	0%	This a	aives	a Maxir	num D	rv De	ensity of	123	0
				1 00 /0	121 7	11.0	N	0 70	and	$2 \Omega n^{-1}$	timum M	loistur	$- \int dt$	1 C		
F	10%	133.9	86	10%	121 5	12.0	1	0%	anu	a Op		ioisture		1.0		
-	20%	133.7	8.6	20%	121.0	12.0	20	0%	_							
⊢	30%	133.5	87	30%	121.0	12.1	3	0%	Repo	rt the	ese resu	lts on t	he			
	40%	133.3	87	40%	120.7	12.1		0%	Sand	Cor	e Densi	ity forr	n			
⊢	50%	133 1	88	50%	120.5	12.2	5	0%				-				
	60%	132.8	8.8	60%	120.0	12.0	6	0%								
h	70%	132.6	8.0	70%	120.0	12.7	70	0%								
⊢	80%	132.4	8.9	80%	119.8	12.0	80	0%								
┢──	90%	132.4	9 N	90%	119.5	12.0	9	0%	107 4	18.0	90%	94.9	24.2	90%	832	314
F	0070	132.0	9.0	.1	119.3	12.0	0		107 1	18.1	т	94.6	24 4	Y	83.0	31.5
-	10%	131 7	9.1	10%	119 1	12.7	1	<u>n%</u>	106.9	18.2	10%	94.0	24.5	10%	82.8	31.6
-	20%	131.5	91	20%	118.8	12.0	20	0%	106.6	18.3	20%	94 1	24.0	20%	82.6	31 7
	30%	131.2	9.7	30%	118.6	12.0	- 30	0%	106.4	18.4	30%	93.9	24.8	30%	82.0	31.8
┝─	40%	130.9	0.2 Q 3	40%	118 /	12.0	1	0%	106.1	18.5	40%	93.6	25.0	40%	82.7	31 0
\vdash	50%	130.9	9.5 Q 1	50%	118.2	13.0	-4(0%	105.1	18.7	50%	93.0	25.0	50%	82.2	32.0
┣	60%	130.4	Q 1	60%	117 0	13.7	6	0%	105.3	18.8	60%	Q3 1	25.1	60%	81 0	32.0
\vdash	70%	130.4	9.4	70%	117 7	13.2	70	0%	105.7	18.0	70%	92.0	25.4	70%	81 7	32.7
⊢	80%	120.0	9.5	80%	117 5	13.3	20	0%	105.4	10.0	80%	92.8	25.4	80%	81 5	32.2
\vdash	90%	129.0	9.0	90%	117.0	13.0		0%	10/ 0	10.0	90%	92.0	25.5	90%	81 2	32.0
╞╴	50 %	120.0	9.0	K 30 %	117.0	13.4	P	5 /0	104.9	10.1	11 30%	92.4	25.7	7	81 1	32.4
15		129.3	9.1	n l	117.0	13.5	Г		104.7	19.2	U	92.1	∠0.0	4	01.1	JZ.3

USE CAPITAL LETTERS		PUB-	TEST
			LAB SIZE SIZE %
TEST NO.	SAMPLED BY	MO DAY YEAR	
SAMPLED F	ROM	LIFT NO. RDWY	STATION
ORIGINAL SOURCE	PROJECT ENGINEER SUPERVISOR	PROJECT NUMBER	
	REMARKS		

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	. 0	7	ĹВ.	
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3.	. 6	3	LB.	a. RETA
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)					LB.	IF RET.
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	3	%	
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	/E		-	•	%	
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	. 6	9	LB.	
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	. 4	8	LB.	b. WEIC
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)					LB.	c. WEIG
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	က္	5	LB.	d. WEIC
J. WEIGHT OF SAND TO FILLHOLE (H-I)					LB.	e. VOLU
K. DENSITY OF SAND		8	8	1	PCF	f. WET
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$	•				CF	g. MOIS
M. WET DENSITY = $\left(\frac{-A}{L}\right)$				•	PCF	FAMI
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$			-		PCF	Q. OPT
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%	R. MAX
COMPACTION SPECIFICATION		1	0	0	%	1
PROCTOR DENSITY					_	
PROCTOR NUMBER						
PROCTOR METHOD (A, C, D, OR 1)				Α		
O. SPECIFIC GRAVITY OF RETAINED #4	2	. 6	5	1]	RESIDE
P. ABSORPTION OF RETAINED #4		0	, 8	7	%	
Q. OPTIMUM MOISTURE		1	1	6	%	FO
R. MAXIMUM DRY DENSITY	1	2	2	7	PCF	0
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	-POI	NT C	NLY)		S=
S. CORRECTED OPTIMUM MOISTURE					%	
T. CORRECTED MAXIMUM DRY DENSITY					PCF	T=

a.	RETAINED ON #4 =	$\left(\frac{B}{A}\right) \times 100$	
~			

IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.

%

$$\mathsf{E} = \frac{[D \ (100 \ -a)] + a}{100}$$

ONE POINT PROCTOR (ARIZ 232)

b. WEIGHT OF MOLD & SOIL	1	3	.8	9	LB.	
c. WEIGHT OF MOLD		9	.4	7	LB.	
d. WEIGHT OF COMPACTED SOIL (b-c)		4	4	2	LB.	
e. VOLUME OF MOLD	0	3	3	3	CF	
f. WET DENSITY (d / e)	1	3	2	7	PCF	
g. MOISTURE CONTENT			9	9	%	
FAMILY OF CURVES IDENTIFICATION		Η	&		5	50%
		1	1	6	%	
	1	2	3	0	PCF	

TEST OPERATOR AND DATE

RESIDENT ENGINEER, PROJECT SUPERVISOR, OR LABMAN AND DATE

FOR METHOD A OR ONE POINT ONLY

$$S = \frac{[Q (100 - a)] + a}{100}$$
$$T = \frac{[R (100 - a)] + [(56.2) (a)(O)]}{100}$$

	ORG NUMBER MATL	TYPE PUR- POSE	LAB SIZE SIZE %
TEST NO. LOT OR SUFFIX	SAMPLED BY	MO DAY YEAR	
SAMPLED) FROM		
ORIGINAL SOURCE	PROJECT ENGINEER SUPERVISOR	/ PROJECT NUMBE	IF MILEPOST, INPUT DECIMAL TRACS NUMBER
	REMARKS		

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9,	. 0	7	ĹВ.
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	. 6	3	LB.
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)			•		LB.
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	3	%
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	/E			•	%
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	. 6	9	LB.
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	. 4	8	LB.
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)			•		LB.
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.
J. WEIGHT OF SAND TO FILLHOLE (H-I)		1			LB.
K. DENSITY OF SAND		8	8	1	PCF
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$		_			CF
M. WET DENSITY = $\left(\frac{-A}{L}\right)$					PCF
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$					PCF
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%
COMPACTION SPECIFICATION		1	0	0	%

PROCTOR NUMBE	Lab Proctor Data					A			
O. SPECIFIC GRAVIT		7	2	. 6	5	1			
P. ABSORPTION OF F			0	. 8	7	%			
Q. OPTIMUM MOISTU		٢	1	1,	6	%			
R. MAXIMUM DRY DE		1	2	2	7	PCF			
CORRECTION FOR RETAINED #4 (METHOD A OR ONE ROINT ONLY)									
S. CORRECTED OPTI	MUM MOISTURE						%		
T. CORRECTED MAXI	MUM DRY DENSITY					•	PCF		

a. RETAINED ON #4 = $\left(\frac{B}{A}\right) X 100$

IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.

%

$$E = \frac{[D (100 - a)] + a}{100}$$

ONE POINT PROCTOR (ABIZ 232)									
	b. WEIGHT OF MOLD & SOIL	1	3	.8	9	LB.			
	c. WEIGHT OF MOLD		9	.4	7	LB.			
	d. WEIGHT OF COMPACTED SOIL (b-c)		4	4	2	LB.			
	e. VOLUME OF MOLD	0	3	3	3	CF			
	f. WET DENSITY (d / e)	1	3	2	7	PCF			
	g. MOISTURE CONTENT			9	9	%			
	FAMILY OF CURVES IDENTIFICATION		Η	&	I	Ę	50%		
	Q. OPTIMUM MOISTURE		1	1	6	%			
	B. MAXIMUM DBY DENSITY	1	2	3	0	PCF			

A one point proctor is run to verify the Lab Proctor data.

If the Maximum Dry Density from the one point proctor is within **1.0 pcf** of the Lab Proctor Maximum Dry Density then the Lab Proctor data is still valid. Any further calculations on this form requiring The Optimum Moisture and Maximum Dry Density will use the Lab Proctor Data.

(if on the Exam, you are not within 1.0 pcf of the Lab Maximum Dry Density, then carefully re-plot the family of curves.)

USE CAPITAL LETTERS	ER]	4		3	TYPE PUR- TEST POSE LAB SIZE	5		%		
TEST NO. SUFFIX SAMP	PLED	BY				MO DAY YEAR TIME	N	MILI TI	TARY ME		
Now we can calculate to det the Percent Compaction of c site.	ern	nin te:	ie st		KS	/ PROJECT NUMBER TRACS	T DECI S NUI	MAL MBE	:R		
A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	0	7	ĹВ.				<u> </u>		_
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3.	6	3	LB.	a. RETAINED ON #4 = $\left(\frac{B}{A}\right) \times 100$					%
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)		1	_	2	LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO FOR METHOD & OR ONE POINT (DNO DNLY	FUR ,	THER.		
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		T	0	.3	%	[D (100 - a)] + a					
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIEV	/E	_			%	L= 100					
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	6	9	LB.	ONE POINT PROCTOR (ARIZ	232) ~			
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	4	8	LB.	b. WEIGHT OF MOLD & SOIL	1	3	8	1 	.B.
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		-			LB.	c. WEIGHT OF MOLD		9	4	΄ ι 	.B.
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.	d. WEIGHT OF COMPACTED SOIL (b-c)		4	4 2	<u>2</u> ı	_B.
J. WEIGHT OF SAND TO FILLHOLE (H-I)		-			LB.	e. VOLUME OF MOLD	0	3	3 3		<u>ж</u>
K. DENSITY OF SAND		8	8	.1	PCF	f. WET DENSITY (d / e)	1	3	2 7	<u>Р</u>	CF
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$					CF	g. MOISTURE CONTENT			9.9) (%
M. WET DENSITY = $\left(\frac{A}{L}\right)$				•	PCF	FAMILY OF CURVES IDENTIFICATION		H	&	\perp	_50%
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$					PCF	Q. OPTIMUM MOISTURE		1	1.6)	%
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%	R. MAXIMUM DRY DENSITY	1	2	3.0	P	CF
COMPACTION SPECIFICATION		1	0	0	%						
PROCTOR DENSITY					1						_
PROCTOR NUMBER						TEST OPERATOR AND DATE					
PROCTOR METHOD (A, C, D, OR 1)				Α							_
O. SPECIFIC GRAVITY OF RETAINED #4	2.	6	5	1		RESIDENT ENGINEER, PROJECT SUPERVISOR, O	R LA	BMA	N AND	DAT	E
P. ABSORPTION OF RETAINED #4		0	8	7	%						
Q. OPTIMUM MOISTURE		1	1	. 6	%	FOR METHOD A OR ONE POINT	ONI	LY			
R. MAXIMUM DRY DENSITY	1	2	2	.7	PCF	S_{-} [Q(100 - a)] + a					
CORRECTION FOR RETAINED #4 (METHOD A OR ONE-	POIN	іт о	NLY)		3= <u> </u>					
S. CORRECTED OPTIMUM MOISTURE					%	= [$R(100 - a)$] + [(56.2) (a)	a)(<i>O</i>)	1			
T. CORRECTED MAXIMUM DRY DENSITY					PCF	T = 1000000000000000000000000000000000000	- <u>,(</u> -)	<u>.</u>			

USE CAPITAL LETTERS	ER]			3	TYPE PUR- TEST POSE LAB SIZE SIZE %
	PLEC) BY		· •	_	
	PRC	JEC		NGIN	EER	
	2	OPE		301		
			REN	MAR	ĸs	
			_			
				_		
		$\begin{array}{c} \end{array} \end{array}$				C = 9.07 - 3.63
A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	, 0	7	ĹВ.	C = 5.44
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	. 6	3	LB.	100 %
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)		5	4	4	LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	.3	%	[D (100 - a)] + a
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIEV	/E	-			%	$E = \frac{100}{100}$
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	. 6	9	LB.	ONE POINT PROCTOR (ARIZ 232)
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	. 4	8	LB.	b. WEIGHT OF MOLD & SOIL I 3.0 9 LB.
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		•	•		LB.	
		3	3	D	LB.	
		0	Q	1	LB.	
$\frac{J}{J}$	•	0	0	╸╸	PCF	
$M. \text{ WET DENSITY} = \left(\frac{A}{R}\right)$				<u> </u>		FAMILY OF CURVES IDENTIFICATION H & 1 50%
N. DRY DENSITY = $\left(\frac{M}{100 - E}\right) \times 100$				[PCF	Q. OPTIMUM MOISTURE 1 1 6 %
$\frac{100 + E}{N} \times 100 \text{ OR } \left(\frac{N}{T}\right) \times 100$					%	R. MAXIMUM DRY DENSITY 1 2 3 0 PCF
COMPACTION SPECIFICATION		1	0	0	%	
PROCTOR DENSITY				•		
PROCTOR NUMBER						TEST OPERATOR AND DATE
PROCTOR METHOD (A, C, D, OR 1)				Α		
O. SPECIFIC GRAVITY OF RETAINED #4	2	. 6	5	1		RESIDENT ENGINEER, PROJECT SUPERVISOR, OR LABMAN AND DATE
P. ABSORPTION OF RETAINED #4		0	, 8	7	%	
Q. OPTIMUM MOISTURE		1	1	6	%	FOR METHOD A OR ONE POINT ONLY
R. MAXIMUM DRY DENSITY	1	2	2	7	PCF	S_{-} [Q(100 - a)] + a
CORRECTION FOR RETAINED #4 (METHOD A OR ONE-	POI		NLY	()		100
S. CORRECTED OPTIMUM MOISTURE					%	T [R (100 - a)] + [(56.2) (a)(O)]
T. CORRECTED MAXIMUM DRY DENSITY				•	PCF	$I = \frac{1}{100}$

USE CAPITAL LETTERS	ER				-	TYPE PUR- TEST POSE LAB SIZE SIZE %
			P	\ E	3	
TEST NO. SUFFIX SAMF	PLED	BY				MO DAY YEAR TIME LIFT NO. RDWY STATION
ORIGINAL SOURCE PROJECT ENGINEER / SUPERVISOR REMARKS				$a = (B \div A) \times 100$ $a = (3.63 \div 9.07) \times 100$		
A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	0	7	ĹВ.	
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3.	6	3	LB.	a. RETAINED ON #4 = $\left(\frac{B}{A}\right) \times 100$ 4 0 %
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)		5.	4	4	LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	3	%	FOR METHOD A OR ONE POINT ONLY
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIEV	/E			-	%	$E = \frac{D}{100} (100 - a) + a}{100}$
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5.	6	9	LB.	ONE POINT PROCTOR (ARIZ 232)
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6.	4	8	LB.	b. WEIGHT OF MOLD & SOIL 1 3 8 9 LB.
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		•			LB.	c. WEIGHT OF MOLD 9,47 LB.
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.	d. WEIGHT OF COMPACTED SOIL (b-c) 4.4 2 LB.
J. WEIGHT OF SAND TO FILLHOLE (H-I)		•			LB.	e. VOLUME OF MOLD 0 3 3 CF
K. DENSITY OF SAND		8	8	1	PCF	f. WET DENSITY (d / e) 1 3 2 7 PCF
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$					CF	g. MOISTURE CONTENT 9,9%
M. WET DENSITY = $\left(\frac{A}{l}\right)$					PCF	FAMILY OF CURVES IDENTIFICATION H & I 509
N. DRY DENSITY = $\left(\frac{M}{100 + F}\right) \times 100$					PCF	Q. OPTIMUM MOISTURE 1 1 6 %
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%	R. MAXIMUM DRY DENSITY 1 2 3 0 PCF
COMPACTION SPECIFICATION		1	0	0	%	
PROCTOR DENSITY	I					
PROCTOR NUMBER						TEST OPERATOR AND DATE
PROCTOR METHOD (A, C, D, OR 1)				Α		
O. SPECIFIC GRAVITY OF RETAINED #4	2.	6	5	1		RESIDENT ENGINEER, PROJECT SUPERVISOR, OR LABMAN AND DATE
P. ABSORPTION OF RETAINED #4		0,	8	7	%	
Q. OPTIMUM MOISTURE		1	1	6	%	FOR METHOD A OR ONE POINT ONLY
R. MAXIMUM DRY DENSITY	1	2	2	7	PCF	[Q(100 - a)] + a
CORRECTION FOR RETAINED #4 (METHOD A OR ONE-	POIN		NLY)		$S = \frac{100}{100}$
S. CORRECTED OPTIMUM MOISTURE				1	%	[B(100 - 2)] + [(56 2)(2)(0)]
T. CORRECTED MAXIMUM DRY DENSITY					PCF	$T = \frac{[7 (100 - a)] + [(30.2) (a)(0)]}{100}$

	BER	-		MATI	<u> </u>	PUR- TEST	
			A	\ E	3		
TEST NO. LOT OR SUFFIX SAM	PLEC) BY					
SAMPLED FROM					6	The formula for E is here	
ORIGINAL SOURCE SU						Fill in the information for each letter and hen do the calculation. Nork inside the () first then the [] 100 - 40 = 60 $50 \times 10.3 = 618$	
					- 6	518 + 40 = 658	
					6	$558 \div 100 = 6.58$	
					F	Rounded to one decimal place = 6.6	
	-		-		r -		
A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	.0	7			-
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3.	. 6	3	LB.	a. RETAINED ON #4 = $\left(\frac{-A}{A}\right) \times 100$ 4 0 9	6
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)		ರ 1	• 4	4 2	LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GONO FORTHER.	
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE	VE	1	6	. J 6	%	$E_{=} \frac{[D (100 - a)] + a}{[D (100 - a)] + a}$	-
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	6	9	70 I B	ONE POINT PROCTOR (ARIZ 232)	
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	. 4	8	LD.	b. WEIGHT OF MOLD & SOIL 1 3 8 9 L	в.
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)					LB.	C. WEIGHT OF MOLD 9,47 L	В.
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.	d. WEIGHT OF COMPACTED SOIL (b-c) 4.4 2 L	в.
J. WEIGHT OF SAND TO FILLHOLE (H-I)			9		LB.	e. VOLUME OF MOLD .0 3 3 3 c	F
K. DENSITY OF SAND		8	8	1	PCF	f. WET DENSITY (d / e) 1 3 2 7 P	CF
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$	•				CF	g. MOISTURE CONTENT 999 9	6
M. WET DENSITY = $\left(\frac{A}{L}\right)$					PCF	FAMILY OF CURVES IDENTIFICATION	_50%
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$					PCF	Q. OPTIMUM MOISTURE	%
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%	R. MAXIMUM DRY DENSITY 1 2 3 0 P	CF
		1	0	0	%		
						TEST OPERATOR AND DATE	-
				Λ			
	2	6	5	A 1		RESIDENT ENGINEER, PROJECT SUPERVISOR, OR LABMAN AND DATI	T
		0	8	7	%		
Q. OPTIMUM MOISTURE	<u> </u>	1	1	6	%	FOR METHOD A OR ONE POINT ONLY	
R. MAXIMUM DRY DENSITY					· · ·		
COBRECTION FOR RETAINED #4 (METHOD & OR ONE-POI			2	.7	PCF	[Q(100 - a)] + a	
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	1 -POI	2 NT 0	2 NLY	.7)	PCF	$S = \frac{[Q(100 - a)] + a}{100}$	
CORRECTION FOR RETAINED #4 (METHOD A OR ONE S. CORRECTED OPTIMUM MOISTURE	1 -POI	2 NT 0	2, NLY	. 7)	PCF	$S = \frac{[Q(100 - a)] + a}{100}$ $[B(100 - a)] + [(56.2)(a)(0)]$	

USE CAPITAL LETTERS		PUR-	TEST
			LAB SIZE SIZE %
TEST NO.	SAMPLED BY	MO DAY YEAR	
SAMPLED F	ROM	LIFT NO. RDWY	STATION
			IF MILEPOST, INPUT DECIMAL
ORIGINAL SOURCE			R TRACS NUMBER
	REMARKS		

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	0	7	ĹВ.	
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	6	3	LB.	a. RETAINED ON #4 = $\left(\frac{B}{A}\right) \times 100$ 4 0 %
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)		5	- 4	4	LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	3	%	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	VE		6	6	%	$F_{=} \frac{[D_{-}(100 - a)] + a}{[D_{-}(100 - a)] + a}$
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	6	9	LB.	$\mathbf{F} = \mathbf{F} - \mathbf{G} \qquad \mathbf{H} \mathbf{Z} 232 \mathbf{M}$
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	4	8	LB.	H = 15.69 - 6.48 $1 3 8 9 LB.$
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		9	- 2	1	LB.	H = 9.21 9.4 7 LB.
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	-3	5	LB.	4.4 2 LB.
J. WEIGHT OF SAND TO FILLHOLE (H-I)			•		LB.	
K. DENSITY OF SAND		8	8	1	PCF	f. WET DENSITY (d / e) 1 3 2 7 PCF
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$	•				CF	g. MOISTURE CONTENT 9 9 9
M. WET DENSITY = $\left(\frac{-A}{L}\right)$				•	PCF	FAMILY OF CURVES IDENTIFICATION H & I 50°
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$					PCF	Q. OPTIMUM MOISTURE 1 1 6 %
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%	R. MAXIMUM DRY DENSITY 1 2 3 0 PCF
COMPACTION SPECIFICATION		1	0	0	%	
PROCTOR DENSITY					_	
PROCTOR NUMBER						TEST OPERATOR AND DATE
PROCTOR METHOD (A, C, D, OR 1)				A		
O. SPECIFIC GRAVITY OF RETAINED #4	2	6	5	1		RESIDENT ENGINEER, PROJECT SUPERVISOR, OR LABMAN AND DATE
P. ABSORPTION OF RETAINED #4		0	. 8	7	%	
Q. OPTIMUM MOISTURE		1	1	6	%	FOR METHOD A OR ONE POINT ONLY
R. MAXIMUM DRY DENSITY	1	2	2	7	PCF	[Q(100 - a)] + a
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	-POII	ит с	DNLY	()		S=
S. CORRECTED OPTIMUM MOISTURE					%	- [B(100 - a)] + [(56.2) (a)(O)]
T. CORRECTED MAXIMUM DRY DENSITY				•	PCF	$T = \frac{100}{100}$

ISE CAPITAL LETTERS		PUR- TEST
		$\square \square \square \square \square \square \square \square$
TEST NO.	SAMPLED BY	MO DAY YEAR TIME MILITARY TIME
SAMPLEI) FROM	LIFT NO. RDWY STATION
ORIGINAL SOURCE	PROJECT ENGINEER SUPERVISOR	IF MILEPOST, INPUT DECIMAL
	REMARKS	
<u> </u>		
	· · · · · · · · · · · · · · · · · · ·	

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	0	7	ĹВ.	
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	. 6	3	LB.	a. RETAINED ON #4 = $\left(\frac{B}{A}\right) X 100$ 4 0 %
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)		5	- 4	4	LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	.3	%	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	VE		6	6	%	$E = \frac{[D] (100 - a)] + a}{100}$
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	. 6	9	LB.	ONE POINT PROCTOR (ARIZ 232)
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	4	8	LB.	b. WEIGHT OF MOLD & SOIL 1 3 8 9 LB.
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		9	- 2	1	ΙВ	→ I = H _ I
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.	
J. WEIGHT OF SAND TO FILLHOLE (H-I)		5	-8	6	LB.	
K. DENSITY OF SAND		8	8	1	PCF	J = 5.80
L. VOLUME OF HOLE $\left(-\frac{J}{K}\right)$	•				CF	9 9 %
M. WET DENSITY = $\left(\frac{-A}{L}\right)$				•	PCF	FAMILY OF CURVES IDENTIFICATION H & I 50
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$				•	PCF	Q. OPTIMUM MOISTURE
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%	R. MAXIMUM DRY DENSITY 1 2 3 0 PCF
COMPACTION SPECIFICATION		1	0	0	%	
PROCTOR DENSITY					_	
PROCTOR NUMBER						TEST OPERATOR AND DATE
PROCTOR METHOD (A, C, D, OR 1)			_	Α]	
O. SPECIFIC GRAVITY OF RETAINED #4	2	. 6	5	1]	RESIDENT ENGINEER, PROJECT SUPERVISOR, OR LABMAN AND DATE
P. ABSORPTION OF RETAINED #4		0	. 8	7	%	
Q. OPTIMUM MOISTURE		1	1	6	%	FOR METHOD A OR ONE POINT ONLY
R. MAXIMUM DRY DENSITY	1	2	2	. 7	PCF	Q = [Q(100 - a)] + a
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	-POII	NT C	DNL	()		5=
S. CORRECTED OPTIMUM MOISTURE					%	[R(100 - a)] + [(56.2)(a)(O)]
T. CORRECTED MAXIMUM DRY DENSITY				•	PCF	$T = \frac{1}{100}$

SE CAPITAL LETTERS		PUR- TEST
		TYPE POSE LAB SIZE SIZE %
TEST NO.	SAMPLED BY	MO DAY YEAR TIME
SAMPLED	FROM	LIFT NO. RDWY STATION
ORIGINAL SOURCE	PROJECT ENGINEEF SUPERVISOR	R / IF MILEPOST, INPUT DECIMAL PROJECT NUMBER TRACS NUMBER
	REMARKS	

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	0	7	ĹВ.	
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	6	3	LB.	a. RETAINED ON #4 = $(\frac{B}{A}) \times 100$ 4 0 %
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)		5	4	4	LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	.3	%	
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	VE		6	6	%	$E = \frac{[D (100 - a)] + a}{100}$
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	6	9	LB.	ONE POINT PROCTOR (ARIZ 232)
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	4	8	LB.	b. WEIGHT OF MOLD & SOIL 1 3 8 9 LB.
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		9	- 2	1	LB.	
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.	$I = I \div K$ 4 2 LB.
J. WEIGHT OF SAND TO FILLHOLE (H-I)		5	-8	6	LB.	$L = 5.86 \div 88.1$ 3 3 cF
K. DENSITY OF SAND		8	8	1	PCF	$L = 0.00 \div 00.1$ $L = 0.000 \pm 00.1$ $2 \cdot 7 \text{ pcf}$
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$	-0	6	6	5	CF	$L = .000515323 \qquad 9.9 \%$
M. WET DENSITY = $\left(\frac{-A}{L}\right)$				•	PCF	
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$					PCF	= .0665 1 6 %
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%	R. MAXIMUM DRY DENSITY 1 2 3 0 PCF
COMPACTION SPECIFICATION		1	0	0	%	
PROCTOR DENSITY					_	
PROCTOR NUMBER						TEST OPERATOR AND DATE
PROCTOR METHOD (A, C, D, OR 1)				Α		
O. SPECIFIC GRAVITY OF RETAINED #4	2	6	5	1		RESIDENT ENGINEER, PROJECT SUPERVISOR, OR LABMAN AND DATE
P. ABSORPTION OF RETAINED #4		0	. 8	7	%	
Q. OPTIMUM MOISTURE		1	1	6	%	FOR METHOD A OR ONE POINT ONLY
R. MAXIMUM DRY DENSITY	1	2	2	7	PCF	[Q(100 - a)] + a
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	-POI	NT C	DNL	()		S=
S. CORRECTED OPTIMUM MOISTURE					%	- [B(100 - a)] + [(56.2) (a)(O)]
T. CORRECTED MAXIMUM DRY DENSITY				•	PCF	T = 1000000000000000000000000000000000000

	ORG NUMBER MATL	TYPE PUR- TEST POSE LAB	SIZE SIZE %
TEST NO. LOT OR SUFFIX	SAMPLED BY	MO DAY YEAR	TIME MILITARY TIME STATION
ORIGINAL SOURCE	PROJECT ENGINEER SUPERVISOR	/ IF MIL / PROJECT NUMBER	EPOST, INPUT DECIMAL
	REMARKS		

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	0	7	ĹВ.	
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	6	3	LB.	a. RETAINED ON #4 = $\left(\frac{B}{A}\right) \times 100$ 4 0 %
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)		5	4	4	LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	3	%	10.3 40 40
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	VE		6	6	%	$E = \frac{10 (100 - 4) + 4}{100}$
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	6	9	LB.	ONE POINT PROCTOR (ARIZ 232)
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	4	8	LB.	b. WEIGHT OF MOLD & SOIL 1 3 8 9 LB.
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		9	- 2	1	LB.	c. WEIGHT OF MOLD 9,47 LB.
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.	d. WEIGHT OF COMPACTED SOIL (b-c) 4 4 2 LB.
J. WEIGHT OF SAND TO FILLHOLE (H-I)		5	-8	6	IВ	
K. DENSITY OF SAND		8	8	1	PCF	$W = A \div L$ $2 \cdot 7 \text{ PCF}$
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$	0	6	6	5	CF	$M = 9.07 \div .0665$ 9.9%
M. WET DENSITY = $\left(\frac{A}{L}\right)$	1	3	6	4	PCF	M = 136.3909774
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$				•	PCF	
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%	= 136.4 3 0 PCF
COMPACTION SPECIFICATION		1	0	0	%	
PROCTOR DENSITY						
PROCTOR NUMBER						TEST OPERATOR AND DATE
PROCTOR METHOD (A, C, D, OR 1)				Α]	
O. SPECIFIC GRAVITY OF RETAINED #4	2	6	5	1		RESIDENT ENGINEER, PROJECT SUPERVISOR, OR LABMAN AND DATE
P. ABSORPTION OF RETAINED #4		0	8	7	%	
Q. OPTIMUM MOISTURE		1	1	6	%	FOR METHOD A OR ONE POINT ONLY
R. MAXIMUM DRY DENSITY	1	2	2	7	PCF	[Q(100 - a)] + a
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	-POI	NT С	DNL	()		S=
S. CORRECTED OPTIMUM MOISTURE					%	[B(100 - a)] + [(56.2)(a)(0)]
T. CORRECTED MAXIMUM DRY DENSITY				•	PCF	$T = \frac{100}{100}$

		TYPE PUR- TES POSE LA	BT B SIZE SIZE %
	SAMPLED BY		
ORIGINAL SOURCE	PROJECT ENGINEER		STATION HILEPOST, INPUT DECIMAL TRACS NUMBER
	REMARKS		

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	0	7	ĹВ.	
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	6	3	LB.	a. RETAINED ON #4 = $\left(\frac{B}{A}\right) \times 100$ 4 0 %
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)		5	4	4	LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	3	%	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	VE		6	6	%	$E = \frac{[D] (100 - a)] + a}{100}$
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	6	9	LB.	ONE POINT PROCTOR (ARIZ 232)
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	4	8	LB.	b. WEIGHT OF MOLD & SOIL 1 3 8 9 LB.
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		9	- 2	1	LB.	
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE	\square	3	3	5	LB.	→N = (M ÷ (100 + E)) x 100
J. WEIGHT OF SAND TO FILLHOLE (H-I)		5	8	6	LB.	N = (136.4 ÷ (100 + 6.6)) x 100
K. DENSITY OF SAND		8	8	1	PCF	N = (136.4 ÷ 106.6) x 100
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$	10	6	6	5	CF	N = 1.279549719 x 100 <u>%</u>
M. WET DENSITY = $\left(\frac{A}{I}\right)$	1	3	6	4	PCF	N = 127.954971950
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100^{-1}$	1	2	8	0	PCF	Rounded to 1 decimal place <u>%</u>
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%	= 128.0
COMPACTION SPECIFICATION		1	0	0	%	
PROCTOR DENSITY					_	
PROCTOR NUMBER						TEST OPERATOR AND DATE
PROCTOR METHOD (A, C, D, OR 1)				А		
O. SPECIFIC GRAVITY OF RETAINED #4	2	6	5	1		RESIDENT ENGINEER, PROJECT SUPERVISOR, OR LABMAN AND DATE
P. ABSORPTION OF RETAINED #4		0	. 8	7	%	
Q. OPTIMUM MOISTURE		1	1	6	%	FOR METHOD A OR ONE POINT ONLY
R. MAXIMUM DRY DENSITY	1	2	2	.7	PCF	[Q(100 - a)] + a
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	-POI	NT	ONLY)		S=
S. CORRECTED OPTIMUM MOISTURE					%	- [R (100 - a)] + [(56.2) (a)(O)]
T. CORRECTED MAXIMUM DRY DENSITY					PCF	$l = \frac{1}{100}$
					_	

	ORG NUMBER MATL	TYPE PUR- 1 POSE	LAB SIZE SIZE %
TEST NO.	SAMPLED BY	MO DAY YEAR	
	PROJECT ENGINEER		IF MILEPOST, INPUT DECIMAL TRACS NUMBER
	REMARKS		[

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	0	7	ĹВ.	
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	6	3	LB.	a. RETAINED ON #4 = $(\frac{B}{A}) \times 100$ 4 0 %
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)		5	- 4	4	LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	.3	%	
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	٧E		6	-6	%	$E = \frac{[D (100 - a)] + a}{100}$
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	. 6	9	LB.	
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	4	8	LB.	For calculating the % compaction
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		9	- 2	1	LB.	there are
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.	two formulas. (N ÷ R) x 100 or
J. WEIGHT OF SAND TO FILLHOLE (H-I)		5	-8	6	LB.	$(N \div T) \times 100$. The only time
K. DENSITY OF SAND		8	8	1	PCF	(N ÷ R) x 100 is used, is when there
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$	-0	6	6	5	CF	is less than 10% <u>retained on the #4</u>
M. WET DENSITY = $\left(\frac{-A}{L}\right)$	1	3	6	4	PCF	<u>sieve</u> . This sample has 40% retained [%]
N. DRY DENSITY = $\left(\frac{M}{180 - E}\right)$ 100	1	2	8	0	PCF	so we have to use (N ÷ T) x 100. We
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%	have to calculate T and we also have
COMPACTION SPECIFICATION		1	0	0	%	to calculate S.
PROCTOR DENSITY						
PROCTOR NUMBER]	TEST OPERATOR AND DATE
PROCTOR METHOD (A, C, D, OR 1)				A		
O. SPECIFIC GRAVITY OF RETAINED #4	2	6	5	1		RESIDENT ENGINEER, PROJECT SUPERVISOR, OR LABMAN AND DATE
P. ABSORPTION OF RETAINED #4		0	. 8	7	%	
Q. OPTIMUM MOISTURE		1	1	6	%	FOR METHOD A OR ONE POINT ONLY
R. MAXIMUM DRY DENSITY	1	2	2	.7	PCF	[Q(100 - a)] + a
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	-POI	NT (DNL	()		S=
S. CORRECTED OPTIMUM MOISTURE				•	%	[B(100 - a)] + [(56.2)(a)(O)]
T. CORRECTED MAXIMUM DRY DENSITY				•	PCF	$T = \frac{1}{100}$

USE CAPITAL LETTERS	ORG NUMBER MATL	TYPE PUR- TI POSE L	EST AB SIZE SIZE %
TEST NO.	SAMPLED BY	MO DAY YEAR	
SAMPLEI	D FROM		
ORIGINAL SOURCE	PROJECT ENGINEER / SUPERVISOR		
	REMARKS		

		-				
A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	0	7	ĹВ.	
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	6	3	LB.	a. RETAINED ON #4 = $\left(\frac{B}{A}\right) \times 100$ 4 0 %
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)		5	4	4	LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	3	%	
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	VE		6	6	%	$E = \frac{[D] (100 - a)] + a}{100}$
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	6	9	LB.	ONE POINT PROCTOR (ARIZ 232)
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	• 4	8	LB.	b. WEIGHT OF MOLD & SOIL 1 3 8 9 LB
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		9	2	1	LB.	c. WEIGHT OF MOLD 9,47 LB
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.	d. WEIGHT OF COMPACTED SOIL (b-c) 4.4 2 LB.
J. WEIGHT OF SAND TO FILLHOLE (H-I)		5	8	6	LB.	e. VOLUME OF MOLD 0 3 3 CF
K. DENSITY OF SAND		8	8	1	PCF	f. WET DENSITY (d / e) 1 3 2 7 POF
L. VOLUME OF HOLE $\left(-\frac{J}{K}\right)$	-0	6	6	5	CF	The formulas for calculating S and T
M. WET DENSITY = $\left(\frac{-A}{L}\right)$	1	3	6	4	PCF	are to the right. Fill in the information $\frac{100}{100}$
N. DRY DENSITY = $\left(\frac{M}{180 + E}\right) \times 100$	1	2	8	0	PCF	for each letter and then calculate
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%	Make sure to use the Lab proctor
COMPACTION SPECIFICATION		1	0	0	%	information
PROCTOR DENSITY					_	
PROCTOR NUMBER						
PROCTOR METHOD (A, C, D, OR 1)				Α		
O. SPECIFIC GRAVITY OF RETAINED #4	2	6	5	1	-	BESIDENT ENGINEER, PROJECT SUPERVISOR, OR LABMAN AND DATE
P. ABSORPTION OF RETAINED #4		0	. 8	7	%	
Q. OPTIMUM MOISTURE		1	1	6	%	FOR METHOD A OR ONE POINT ONLY
R. MAXIMUM DRY DENSITY	1	2	2	.7	RCF	$\int_{[Q(100 - a)]}^{11.6} + a$
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	-POI	ΝТ С	DNLY	()		
S. CORRECTED OPTIMUM MOISTURE					%	\rightarrow 122.7 40 \swarrow 40 2.651 $\square [B(100 - a)] + [(56 2)(a)(0)]$
T. CORRECTED MAXIMUM DRY DENSITY					PCF	
						-

	ORG NUMBER MATL	TYPE PUR- POSE	TEST SIZE SIZE %
TEST NO.	SAMPLED BY	MO DAY YEAR	
SAMPLED	FROM	LIFT NO. RDWY	STATION
	PROJECT ENGINEER /		IF MILEPOST, INPUT DECIMAL
ORIGINAL SOURCE	SUPERVISOR	PROJECT NUMBER	TRACS NUMBER
	REMARKS		

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	0	7	ĹВ.		
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	6	3	LB.	a. RETAINED ON #4 = $(\frac{B}{A}) \times 100$ 4 0 %	
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)		5	- 4	4	LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.	
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	3	%		
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	VE		6	6	%	$E = \frac{[D] (100 - a)] + a}{100}$	
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	. 6	9	LB.	ONE POINT PROCTOR (ARIZ 232)	
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	4	8	LB.	b. WEIGHT OF MOLD & SOIL 1 3 8 9 LB.	
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		9	- 2	1	LB.	c. WEIGHT OF MOLD $9 4 7 _{\text{LB.}}$	
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.	d. WEIGHT OF COMPACTED SOIL (b-c) 4+4 2 LB.	
J. WEIGHT OF SAND TO FILLHOLE (H-I)		5	-8	6	LB.	e. VOLUME OF MOLD 0 3 3 CF	
K. DENSITY OF SAND		8	8	1	PCF	f. WET DENSITY (d / e) 1 3 2 7 PCF	
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$	-0	6	6	5	CF	Calculate S. Work inside the () first	
M. WET DENSITY = $\left(\frac{-A}{L}\right)$	1	3	6	4	PCF	then the [].	<mark>30%</mark>
N. DRY DENSITY = $\left(\frac{M}{180 + E}\right) \times 100$	1	2	8	0	PCF	S = 100 - 40 = 60	
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%	$60 \times 11.6 = 696$	
COMPACTION SPECIFICATION		1	0	0	%	696 + 40 = 736	
PROCTOR DENSITY						$726 \pm 100 = 7.26$	
PROCTOR NUMBER	1					$730 \div 100 = 7.30$	
PROCTOR METHOD (A, C, D, OR 1)				Α]	Rounded to T decimal place = 7.4	
O. SPECIFIC GRAVITY OF RETAINED #4	2	6	5	1	1		
P. ABSORPTION OF RETAINED #4		0	. 8	7	%		
Q. OPTIMUM MOISTURE		1	1	6	%	FOR METHOD A OR ONE POINT ONLY	
R. MAXIMUM DRY DENSITY	1	2	2	. 7	PCF	$\begin{bmatrix} 11.6 & 40 & 40 \\ [Q(100 - a)] + a \end{bmatrix}$	
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	-POI	ΝТ (DNLY	()		100	
S. CORRECTED OPTIMUM MOISTURE			7	4	%	$A_{122.7} = A_{0} = A_{0} = 2.651$ $B_{100} = A_{1} + [(56.2) (a)(O)]$	
T. CORRECTED MAXIMUM DRY DENSITY				•	PCF		

USE CAPITAL LETTERS	ORG NUMBER MATL	TYPE PUR- TES POSE LAB	SIZE SIZE %
TEST NO.	SAMPLED BY	MO DAY YEAR	
	PROJECT ENGINEER SUPERVISOR		LEPOST, INPUT DECIMAL TRACS NUMBER
	REMARKS		

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	0	7	ĹΒ.		_
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	6	3	LB.	a. RETAINED ON #4 = $(\frac{B}{A}) \times 100$ 4 0 %]
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)		5	- 4	4	LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.	
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	3	%	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	VE		6	6	%	$E = \frac{[D (100 - a)] + a}{100}$	
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	6	9	LB.	ONE POINT PROCTOR (ARIZ 232)	
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	4	8	LB.	b. WEIGHT OF MOLD & SOIL 1 3 8 9 LB.	
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		9	- 2	1	LB.	Calculate T Work inside the () first	
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.	then the [] Work each side of the +	
J. WEIGHT OF SAND TO FILLHOLE (H-I)		5	-8	6	LB.	sign apportably than add than	
K. DENSITY OF SAND		8	8	1	PCF	sign separately then add then	
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$	0	6	6	5	CF		
M. WET DENSITY = $\left(\frac{-A}{L}\right)$	1	3	6	4	PCF	I = 100 - 40 = 60	0%
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$	1	2	8	0	PCF	$60 \times 122.7 = 7362$	
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$					%	work the other side of the + sign	
COMPACTION SPECIFICATION		1	0	0	%	56.2 x 40 x 2.651 = 5959.448	
PROCTOR DENSITY						Add together	
PROCTOR NUMBER						7362 + 5959.448 = 13321.448	
PROCTOR METHOD (A, C, D, OR 1)				Α		13321.448 ÷ 100 = 133.21448	
O. SPECIFIC GRAVITY OF RETAINED #4	2	. 6	5	1		Rounded to 1 decimal place = 133.2	
P. ABSORPTION OF RETAINED #4		0	. 8	7	%		
Q. OPTIMUM MOISTURE		1	1	. 6	%	44.0 40 40	
R. MAXIMUM DRY DENSITY	1	2	2	.7	PCF	$ \begin{bmatrix} 40 & 40 \\ [Q(100 - a)] + a \end{bmatrix} $	
CORRECTION FOR RETAINED #4 (METHOD A OR ONE	-POI	NT C	DNLY	0			
S. CORRECTED OPTIMUM MOISTURE			7	4	%	[R(100 - a)] + [(56.2)(a)(O)]	
T. CORRECTED MAXIMUM DRY DENSITY	1	3	3	2	PCF		
ARIZONA DEPARTMENT OF TRANSPORTATION SAND CONE DENSITY (ARIZ 230)

	ORG NUMBER MATL	TYPE PUF	R- TEST E LAB <u>SIZE SIZE %</u>
TEST NO.	SAMPLED BY		
	PROJECT ENGINEER		
	REMARKS		

		a	Ω	7	·-		
A. TOTAL WEI WEIGHT OF MATERIAL FROM THE HOLE		9		/	LB.		
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3	. 6	3	LB.	a. RETAINED ON #4 = $\left(\frac{B}{A}\right) \times 100$ 4 0 %	
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)		5	4	4	LB.	IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.	
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	.3	%	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SI	EVE		6	-6	%	$E = \frac{[D] (100 - a)] + a}{100}$	
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	6	9	LB.	ONE POINT PROCTOR (ARIZ 232)	
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	4	8	LB.	b. WEIGHT OF MOLD & SOIL 1 3 8 9 LB.	
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		9	- 2	1	LB.	Now we can calculate the	
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	3	5	LB.	% Compaction using $(N \div T) \times 100$	
J. WEIGHT OF SAND TO FILLHOLE (H-I)		5	-8	6	LB.	$\frac{1}{2}$ compaction = 129.0 \div 122.2	
K. DENSITY OF SAND		8	8	1	PCF	% compaction = $120.0 \div 135.2$	
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$	-0	6	6	5	CF	= .960960961	
M. WET DENSITY = $\left(\frac{A}{L}\right)$	1	3	6	4	PCF	$.960960961 \times 100 = 96.0960961$	0%
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$	1	2	8	-0	PCF	Rounded to the whole number	
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$			9	6	%	= 96	
COMPACTION SPECIFICATION		1	0	0	%		
PROCTOR DENSITY							
PROCTOR NUMBER						TEST OPERATOR AND DATE	
PROCTOR METHOD (A, C, D, OR 1)				Α]		
O. SPECIFIC GRAVITY OF RETAINED #4	2	, 6	5	1	1	RESIDENT ENGINEER, PROJECT SUPERVISOR, OR LABMAN AND DATE	
P. ABSORPTION OF RETAINED #4		0	. 8	7	%		
Q. OPTIMUM MOISTURE		1	1	6	%	FOR METHOD A OR ONE POINT ONLY	
R. MAXIMUM DRY DENSITY	1	2	2	.7	PCF	$\begin{bmatrix} 11.6 & 40 & 40 \\ Q & [Q (100 - a)] + a \end{bmatrix}$	
CORRECTION FOR RETAINED #4 (METHOD A OR ON	E-POI	INT (DNL	<i>(</i>)		$S = \frac{100}{100}$	
S. CORRECTED OPTIMUM MOISTURE			7	4	%	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
T. CORRECTED MAXIMUM DRY DENSITY	1	3	3	2	PCF	$T = \frac{100 - 2000 - 2000}{100}$	

ARIZONA DEPARTMENT OF TRANSPORTATION SAND CONE DENSITY (ARIZ 230)

USE CAPITAL LETTERS	ORG NUMBER MATL	TYPE PUR- POSE	LAB SIZE SIZE %
	SAMPLED BY		
ORIGINAL SOURCE	PROJECT ENGINEER SUPERVISOR		IF MILEPOST, INPUT DECIMAL
	REMARKS		

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	. 0	7	ĹВ.
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE	3.	. 6	3	LB.	
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)		5	4	4	LB.
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE		1	0	.3	%
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIEV	Е		6	6	%
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	. 6	9	LB.
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	. 4	8	LB.
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		9	2	1	LB.
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE		3	က္	5	LB.
J. WEIGHT OF SAND TO FILLHOLE (H-I)		5	8	6	LB.
K. DENSITY OF SAND		8	8	1	PCF
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$	0	6	6	5	CF
M. WET DENSITY = $\left(\frac{-A}{L}\right)$	3	6	4	PCF	
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$	1	2	8	0	PCF
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$				6	%
COMPACTION SPECIFICATION		1	0	0	%
PROCTOR DENSITY					_
PROCTOR NUMBER					
PROCTOR METHOD (A, C, D, OR 1)				А	
O. SPECIFIC GRAVITY OF RETAINED #4	2	. 6	5	1	
P. ABSORPTION OF RETAINED #4		0	, 8	7	%
Q. OPTIMUM MOISTURE		1	1	, 6	%
R. MAXIMUM DRY DENSITY 1				.7	PCF
CORRECTION FOR RETAINED #4 (METHOD A OR ONE-	POI	NT C	DNLY	')	
S. CORRECTED OPTIMUM MOISTURE			7	4	%
T. CORRECTED MAXIMUM DRY DENSITY	1	S	3	2	PCF

a. RETAINED ON #4 = $\left(\frac{B}{A}\right) X 100$		4	0	%
--	--	---	---	---

IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.

$$E = \frac{\begin{bmatrix} 10.3 & 40 & 40 \\ D & (100 & -a) \end{bmatrix} + a}{100}$$

ONE POINT PROCTOR (ARIZ	232	2)		
	>	0	0	Т

b. WEIGHT OF MOLD & SOIL	1	3	8	9	LB.	
c. WEIGHT OF MOLD		9	4	7	LB.	
d. WEIGHT OF COMPACTED SOIL (b-c)		4	4	2	LB.	
e. VOLUME OF MOLD	0	3	3	3	CF	
f. WET DENSITY (d / e)	1	3	2	7	PCF	
g. MOISTURE CONTENT			9	9	%	
FAMILY OF CURVES IDENTIFICATION	_	Η	&	I	5	50%
Q. OPTIMUM MOISTURE		1	1	6	%	
R. MAXIMUM DRY DENSITY	1	2	3	0	PCF	

TEST OPERATOR AND DATE

RESIDENT ENGINEER, PROJECT SUPERVISOR, OR LABMAN AND DATE



Blank Forms

Calibration of Proctor Mold						
X_Four Inch MoldSix Inch Mold						
Mold I. D. #: <u>4-1</u> Temperature of Water used for Calibration: <u>82°F</u> Unit Weight of Water: <u>Ib. / cu. Ft.</u>						
Weight of Baseplate, Empty Mold, and Glass Plate (grams)	Weight of Baseplate, Mold Filled With Water, and Glass Plate (grams)	Weight of Water to fill Mold (grams)				
4574.3	5514.7					
$\begin{bmatrix} Volume of \\ Mold \\ (cu. ft.) \end{bmatrix} = \frac{Weight of Water to Fill Mold (grams)}{\begin{bmatrix} Unit Weight \\ of Water \\ (lb. / cu. ft.) \end{bmatrix} \times [453.6 (grams / lb.)]$ $= \frac{()}{()} + (453.6) = -() + (453.6) = -() + (100)$						
Remarks:						

Calibration of Proctor Mold						
Four Inch MoldX_Six Inch Mold						
Mold I. D. #: Temperature of Wat Unit Weight of Wate	Mold I. D. #:11 Temperature of Water used for Calibration:78 Unit Weight of Water:lb. / cu. Ft.					
Weight of Baseplate, Empty Mold, and Glass Plate (grams)	Weight of Baseplate, Mold Filled With Water, and Glass Plate (grams)	Weight of Water to fill Mold (grams)				
7064.5	9180.8					
$\begin{bmatrix} Volume of \\ Mold \\ (cu. ft.) \end{bmatrix} = \frac{Weight of Water to Fill Mold (grams)}{\begin{bmatrix} Unit Weight \\ of Water \\ (lb. / cu. ft.) \end{bmatrix}} \times [453.6 (grams / lb.)]$ $= \frac{()}{()} \times (453.6) = cu. Ft.$						
Remarks: Calibration Date: Test Operator: Supervisor and Date: Calibration Expiration Date:						

CALIBRATION OF DENSITY SAND AND SAND CONE APPARATUS **ARIZ 229** (A Modification of AASHTO T 191)

Date of Calibration:	_Test Operator:
I. D. No. of Mold used in calibration	:11
Volume of Mold used in calibration:	
Identification of Sand:	
Identification of Sand Cone Apparat	tus:

Trial	Wt. of Baseplate	Wt. of Baseplate and	Wt. of Sand to Fill
No.	And Empty Mold (grams)	Mold Filled with Sand (grams)	Mold (grams)
1	6631	9629	
2	6631	9627	
3	6631	9630	

Average Weight of Sand to Fill Mold = _____grams

Density of Sand, $\mathbf{D}_{\mathbf{S}} = \frac{\text{Average Weight of Sand to Fill Mold}}{(453.6 \text{ grams / lb.}) \times (\text{Volume of Mold})}$

(453.6)×(

-= _____= lb./ft.³

Trial	Initial Wt. of	Final Wt. of	Wt. of Sand to Fill Funnel
No.	Apparatus (grams)	Apparatus (grams)	and Baseplate (grams)
1	6029	4508	
2	6031	4512	
3	6027	4508	

Average Weight of Sand to Fill Funnel and Baseplate = _____grams

Volume of Funnel and Baseplate, $V_{fb} = \frac{\text{Average Weight of Sand to Fill Funnel and Baseplate}}{(453.6 \text{ grams / lb.}) \times (\text{Density of Sand})}$

= (453.6)×() = -----= ft.³

Remarks: _____ $I = D_s X V_{fb}$ _____

Supervisor and Date:

Calibration Expiration Date:

)

ARIZONA DEPARTMENT OF TRANSPORTATION SAND CONE DENSITY (ARIZ 230)

	TYPE PUR- TE POSE L/	ST AB SIZE SIZE %
SAMPLED BY		
PROJECT ENGINEER SUPERVISOR		MILEPOST, INPUT DECIMAL TRACS NUMBER
REMARKS		

A. TOTAL WET WEIGHT OF MATERIAL FROM THE HOLE		9	. 0	7	ĹВ.			
B. WET WEIGHT OF MATERIAL RETAINED ON THE #4 SIEVE		3.	. 6	3	LB.			
C. WET WEIGHT OF MATERIAL PASSING THE #4 SIEVE (A-B)					LB.			
D. MOISTURE OF THE MATERIAL PASSING THE #4 SIEVE	1	0	.3	%				
E. MOIST. CORRECTED FOR MATERIAL RETAINED ON THE #4 SIE	/E			•	%			
F. WEIGHT OF SAND & APPARATUS BEFORE FILLING HOLE	1	5	. 6	9	LB.			
G. WEIGHT OF SAND & APPARATUS AFTER FILLING HOLE		6	. 4	8	LB.			
H. WEIGHT OF SAND TO FILL HOLE AND CONE (F-G)		-	1		LB.			
I. WEIGHT OF SAND TO FILL CONE AND BASE PLATE					LB.			
J. WEIGHT OF SAND TO FILLHOLE (H-I)			•		LB.			
K. DENSITY OF SAND					PCF			
L. VOLUME OF HOLE $\left(\frac{J}{K}\right)$					CF			
M. WET DENSITY = $\left(\frac{A}{L}\right)$				PCF				
N. DRY DENSITY = $\left(\frac{M}{100 + E}\right) \times 100$				PCF				
$COMPACTION = \left(\frac{N}{R}\right) \times 100 OR \left(\frac{N}{T}\right) \times 100$				%				
COMPACTION SPECIFICATION	1	0	0	%				
PROCTOR DENSITY					_			
PROCTOR NUMBER								
PROCTOR METHOD (A, C, D, OR 1)				Α				
O. SPECIFIC GRAVITY OF RETAINED #4	2	. 6	5	1]			
P. ABSORPTION OF RETAINED #4		0	, 8	7	%			
Q. OPTIMUM MOISTURE		1	1	6	%			
R. MAXIMUM DRY DENSITY	1	2	2	.7	PCF			
CORRECTION FOR RETAINED #4 (METHOD A OR ONE-POINT ONLY)								
S. CORRECTED OPTIMUM MOISTURE					%			
T. CORRECTED MAXIMUM DRY DENSITY					PCF			

a. RETAINED ON #4 = $\left(\frac{B}{A}\right) \times 100$

IF RET. ON #4 IS MORE THAN 50% (60% IF AB), GO NO FURTHER.

FOR METHOD A OR ONE POINT ONLY

%

$$\mathsf{E} = \frac{[D \ (100 \ - \ a \)] + a}{100}$$

b. WEIGHT OF MOLD & SOIL	1	3	. 8	9	LB.
c. WEIGHT OF MOLD		9	,4	7	LB.
d. WEIGHT OF COMPACTED SOIL (b-c)					LB.
e. VOLUME OF MOLD					CF
f. WET DENSITY (d / e)			-		PCF
g. MOISTURE CONTENT			9	.9	%
FAMILY OF CURVES IDENTIFICATION			&		
Q. OPTIMUM MOISTURE			-		%
R. MAXIMUM DRY DENSITY				•	PCF

TEST OPERATOR AND DATE

RESIDENT ENGINEER, PROJECT SUPERVISOR, OR LABMAN AND DATE

FOR METHOD A OR ONE POINT ONLY

$$S = \frac{[Q (100 - a)] + a}{100}$$
$$T = \frac{[R (100 - a)] + [(56.2) (a)(O)]}{100}$$



A 141.8 6.6 F 129.3 9.7 K 117.0 13.6 P 104, 14.5 6.7 105, 141.0 6.8 30% 116.8 3.6 106, 13.8 30% 104.2 19.4 20%, 11.2 116.3 13.8 30% 104.0 19.5 30%, 11.6 31.3 30%, 104.0 19.5 30%, 11.2 20%, 11.6 13.8 30%, 104.0 19.5 30%, 11.2 20%, 11.5 14.1 50%, 103.8 19.6 40%, 91.2 20%, 11.2 20%, 11.5 14.4 50%, 103.8 19.6 40%, 90.8 22 20%, 13.9 9.7 70%, 12.7 10.2 60%, 11.5 14.4 80%, 10.2 20.1 80%, 90.8 22 20%, 13.8 10.4 80%, 10.2 20.1 80%, 80.3 22 20%, 13.8 10.4 80%, 10.2 20.1 80%, 80.7 22 20.4 80%, 80.7 22 20%, 13.8 10.4 80%, 10.2 20.3 90%, 80.1 22 20%, 13.8 10.2 20.3 90%, 90.8 22 20.3 </th <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>-</th> <th></th> <th>_</th> <th></th> <th></th> <th></th> <th></th> <th>-</th> <th></th> <th></th>							-		_					-		
10% 141.5 6.7 10% 129.0 9.8 10% 116.5 13.7 20% 144.1 6.7 20% 128.2 9.9 20% 116.5 13.7 20% 104.0 19.5 30% 91.4 2 40% 140.7 6.8 30% 128.2 10.0 40% 116.5 13.7 20% 104.0 19.5 30% 91.4 2 60% 102.7 10.2 60% 115.3 14.3 70% 103.1 20.0 70% 90.6 2 90% 102.9 20.1 80% 90.6 2 90% 90.6 2 90% 102.1 114.8 14.5 90% 102.8 20.2 90% 90.7 2 90% 102.1 114.6 14.4 80% 102.9 20.1 80% 90.2 2 90% 90.7 2 90% 103.1 10.4 80.8 2 2 90% 103.1 10.0 90	Α	141.8	6.6	F	129.3	9.7	К		117.0	13.5	Р	104.7	19.2	U	92.1	25.8
20% 141.3 6.7 20% 114.5 13.7 20% 104.2 19.4 20% 114.3 33.8 30% 104.0 91.7 2 30% 140.7 6.8 30% 128.5 99 30% 115.8 14.0 13.8 30% 104.0 19.5 30% 104.0 19.5 30% 104.0 19.5 30% 104.0 19.5 30% 104.0 19.5 30% 104.0 19.5 30% 104.0 19.6 90.6 90.8 2 30% 139.4 7.0 70% 127.4 10.3 80% 114.3 14.5 90% 102.2 20.4 100% 90.6 90.7 20 90% 104.8 105.0 102.2 20.4 108.0 89.7 2 20% 103.4 7.5 20% 89.7 2 20% 104.7 20.7 30% 89.7 2 20% 104.7 20.7 30% 89.7 2	10%	141.5	6.7	10%	129.0	9.8	1	10%	116.8	13.6	10%	104.5	19.3	10%	91.9	26.0
30% 141.0 6.8 30% 128.5 9.9 30% 116.0 13.8 30% 104.0 19.5 30% 91.4 2 40% 140.5 6.9 50% 128.0 10.0 40% 115.8 14.4 50% 103.6 19.8 50% 91.2 2 60% 140.5 6.9 50% 122.0 10.7 102.4 115.3 14.3 70% 103.1 20.0 70% 90.6 2 90% 139.6 7.1 80% 127.1 10.3 70% 114.8 14.4 80% 102.2 20.9 80% 90.3 2 90% 138.6 7.3 10% 128.6 10.5 114.8 14.6 20% 107.1 20.5 80% 89.4 2 30% 103.7 20.5 20% 89.4 2 30% 113.6 15.3 60% 101.7 20.7 30% 88.9 2 20% <td< th=""><th>20%</th><th>141.3</th><th>6.7</th><th>20%</th><th>128.8</th><th>9.9</th><th>2</th><th>20%</th><th>116.5</th><th>13.7</th><th>20%</th><th>104.2</th><th>19.4</th><th>20%</th><th>91.7</th><th>26.1</th></td<>	20%	141.3	6.7	20%	128.8	9.9	2	20%	116.5	13.7	20%	104.2	19.4	20%	91.7	26.1
40% 140.7 6.8 40% 128.2 10.0 40% 116.8 14.2 103.6 19.8 60% 91.2 2 60% 140.2 7.0 60% 127.7 10.2 60% 115.6 14.2 60% 103.3 19.9 60% 90.8 2 70% 139.9 7.0 70% 127.4 10.3 70% 115.3 14.4 80% 103.1 19.9 60% 90.8 2 90% 139.4 7.1 90% 126.4 10.0 10% 114.8 14.4 80% 102.2 20.4 89.9 2 20% 138.8 7.3 20% 126.4 10.0 10% 113.8 15.0 30% 101.2 20.7 89.9 2 20% 133.8 15.7 40% 113.0 15.1 40% 101.1 20.8 40% 88.9 2 20% 137.7 7.6 60%	30%	141.0	6.8	30%	128.5	9.9	3	30%	116.3	13.8	30%	104.0	19.5	30%	91.4	26.3
50% 140.5 6.9 50% 128.0 10.1 50% 115.8 14.1 50% 103.3 19.8 50% 90.8 2 60% 139.9 7.0 70% 127.1 10.3 60% 115.3 14.3 70% 103.1 12.0 70% 90.6 2 80% 139.1 7.1 80% 127.1 10.3 80% 115.1 14.4 80% 102.6 20.9 80% 90.3 2 90% 139.1 7.2 C 126.6 10.5 L 114.8 14.4 20.0 102.6 20.4 10% 89.7 2 10% 138.5 7.3 20% 125.1 10.6 20% 113.1 15.0 30% 101.7 20.5 20.8 88.7 2 10% 138.5 7.3 20% 125.2 10.0 50% 112.8 15.4 70% 100.7 12.1 60% 88.7 <th< th=""><th>40%</th><th>140.7</th><th>6.8</th><th>40%</th><th>128.2</th><th>10.0</th><th>4</th><th>10%</th><th>116.0</th><th>13.9</th><th>40%</th><th>103.8</th><th>19.6</th><th>40%</th><th>91.2</th><th>26.4</th></th<>	40%	140.7	6.8	40%	128.2	10.0	4	10%	116.0	13.9	40%	103.8	19.6	40%	91.2	26.4
60% 140.2 7.0 60% 127.4 10.3 70% 115.3 14.3 70% 103.1 20.0 70% 90.6 2 80% 139.6 7.1 80% 127.1 10.3 80% 115.1 14.4 80% 102.9 20.1 80% 90.3 2 90% 139.4 7.1 90% 126.9 10.4 90% 114.8 14.4 60% 102.4 20.2 90% 90.3 2 10% 138.8 7.3 10% 126.4 10.6 10% 114.3 14.7 10% 102.4 20.3 V 89.9 2 20% 138.8 7.5 40% 126.4 10.6 50% 113.3 15.2 60% 101.7 20.7 70% 88.2 2 40% 13.6 15.1 40% 10.0 12.1 60% 10.2 12.0 60% 88.2 2 60% 88.2 2 <th>50%</th> <th>140.5</th> <th>6.9</th> <th>50%</th> <th>128.0</th> <th>10.1</th> <th>5</th> <th>50%</th> <th>115.8</th> <th>14.1</th> <th>50%</th> <th>103.6</th> <th>19.8</th> <th>50%</th> <th>91.0</th> <th>26.6</th>	50%	140.5	6.9	50%	128.0	10.1	5	50%	115.8	14.1	50%	103.6	19.8	50%	91.0	26.6
TO% 139.9 7.0 70% 115.3 14.3 70% 103.1 20.0 70% 90.6 2 80% 139.4 7.1 80% 127.1 10.3 80% 115.1 14.4 80% 102.2 20.0 80% 90.3 2 90% 139.4 7.1 80% 126.6 10.8 114.8 14.4 90% 102.2 20.4 108.8 90% 89.9 2 10% 138.8 7.3 20% 126.1 10.6 20% 114.1 14.8 20% 101.2 20.5 20% 89.9 2 30% 135.5 7.3 20% 125.9 10.0 30% 113.3 15.2 60% 101.2 20.8 89.9 2 40% 137.7 7.6 60% 125.2 10.9 60% 113.0 15.3 60% 100.1 21.1 80% 80.7 21.1 80% 80.7 21.1	60%	140.2	7.0	60%	127.7	10.2	6	\$0%	115.6	14.2	60%	103.3	19.9	60%	90.8	26.8
80% 139.6 7.1 80% 127.1 10.3 80% 115.1 14.4 80% 102.9 20.1 80% 90.1 2 90% 139.1 7.2 G 126.6 10.5 L 114.8 14.6 Q 102.4 20.3 V 89.9 Z 10% 138.8 7.3 10% 125.6 10.6 10% 114.3 14.6 Q 100.4 100.4 20.4 10% 89.9 Z 20% 138.3 7.3 20% 125.1 10.6 20% 113.8 15.0 30% 101.7 20.5 20% 89.9 Z 40% 138.3 7.4 30% 125.1 10.7 30% 113.5 15.1 40% 101.7 20.5 50% 88.7 2 20% 137.4 7.6 60% 122.1 11.0 70% 112.8 15.4 70% 100.2 21.1 70% 88.0 </th <th>70%</th> <th>139.9</th> <th>7.0</th> <th>70%</th> <th>127.4</th> <th>10.3</th> <th>7</th> <th>70%</th> <th>115.3</th> <th>14.3</th> <th>70%</th> <th>103.1</th> <th>20.0</th> <th>70%</th> <th>90.6</th> <th>26.9</th>	70%	139.9	7.0	70%	127.4	10.3	7	70%	115.3	14.3	70%	103.1	20.0	70%	90.6	26.9
90% 139.4 7.1 90% 128.9 10.4 90% 114.8 14.5 90% 102.6 20.2 90% 89.7 2 10% 138.8 7.3 10% 126.4 10.6 10% 114.1 14.7 10% 102.6 20.3 W 89.7 2 20% 138.5 7.3 20% 125.9 10.7 30% 113.8 15.0 30% 10.7 20.7 30% 89.7 2 30% 138.0 7.4 30% 125.6 10.8 40% 113.6 15.1 40% 101.4 20.8 40% 88.9 2 60% 137.7 7.6 60% 125.2 10.9 60% 113.0 15.3 60% 100.7 21.1 60% 88.2 2 90% 136.7 7.7 60% 125.7 10.7 10.2 21.0 80% 88.2 21.4 80% 88.2 21.4 80% <td< th=""><th>80%</th><th>139.6</th><th>7.1</th><th>80%</th><th>127.1</th><th>10.3</th><th>8</th><th>30%</th><th>115.1</th><th>14.4</th><th>80%</th><th>102.9</th><th>20.1</th><th>80%</th><th>90.3</th><th>27.1</th></td<>	80%	139.6	7.1	80%	127.1	10.3	8	30%	115.1	14.4	80%	102.9	20.1	80%	90.3	27.1
B 139.1 7.2 G 126.6 10.5 L 114.6 14.6 Q 102.4 20.3 V 89.9 2 10% 138.8 7.3 10% 126.4 10.6 10% 114.3 14.7 10% 102.4 20.3 V 89.4 2 20% 138.3 7.4 30% 125.9 10.7 30% 113.8 15.0 30% 101.4 20.7 30% 89.2 2 40% 137.7 7.6 60% 125.2 10.9 60% 113.0 15.3 60% 100.7 21.1 60% 88.7 2 60% 137.4 7.6 60% 124.7 11.1 80% 112.3 15.7 60% 100.7 21.1 70% 88.2 2 60% 136.6 7.8 90% 124.4 11.1 90% 112.3 15.7 90% 100.4 21.4 90% 87.5 2	90%	139.4	7.1	90%	126.9	10.4	9	0%	114.8	14.5	90%	102.6	20.2	90%	90.1	27.2
10% 138.8 7.3 10% 126.4 10.6 10% 114.3 14.7 10% 102.2 2.0.4 10% 89.7 2 20% 138.5 7.4 20% 126.1 10.6 20% 114.1 14.8 20% 10.7 20.5 20% 88.7 2 30% 138.5 7.4 30% 125.6 10.8 40% 113.6 15.1 40% 101.4 20.8 40% 88.9 2 60% 137.7 7.6 60% 122.1 10.9 60% 113.0 15.3 60% 100.7 21.0 60% 88.5 2 70% 137.1 7.7 70% 124.9 11.0 70% 112.8 15.4 70% 100.7 21.1 80% 88.5 2 90% 136.6 7.8 80% 124.1 11.1 80% 110.2 15.7 80% 100.2 21.0 80% 87.7 2 00% 135.0 8.0 20% 13.1 15.0 10.7	в	139.1	7.2	G	126.6	10.5	L		114.6	14.6	Q	102.4	20.3	v	89.9	27.4
20% 138.5 7.3 20% 126.1 10.6 20% 114.1 14.8 20% 101.9 20.5 20% 89.4 2 30% 138.0 7.5 40% 125.9 10.7 30% 113.8 15.0 30% 101.1 20.5 20% 88.9 2 60% 137.7 7.6 60% 125.4 10.9 60% 113.3 15.2 50% 101.2 20.9 60% 88.7 2 60% 137.4 7.7 6 60% 125.4 10.0 15.3 60% 100.7 21.1 70% 88.2 2 70% 136.9 7.8 80% 124.7 11.1 80% 112.5 15.6 80% 100.4 21.3 80% 88.7 2 01% 136.1 8.0 10% 124.2 11.2 15.9 90% 100.4 21.5 80% 87.5 2 00% 135.1 </th <th>10%</th> <th>138.8</th> <th>7.3</th> <th>10%</th> <th>126.4</th> <th>10.6</th> <th>1</th> <th>0%</th> <th>114.3</th> <th>14.7</th> <th>10%</th> <th>102.2</th> <th>20.4</th> <th>10%</th> <th>89.7</th> <th>27.6</th>	10%	138.8	7.3	10%	126.4	10.6	1	0%	114.3	14.7	10%	102.2	20.4	10%	89.7	27.6
30% 138.3 7.4 30% 125.9 10.7 30% 113.8 15.0 30% 101.7 20.7 30% 89.2 2 40% 138.0 7.5 40% 125.6 10.8 40% 113.6 15.7 40% 101.2 20.9 50% 88.7 2 60% 137.4 7.6 60% 125.2 10.9 60% 113.0 15.3 60% 100.9 21.0 60% 88.7 2 60% 137.4 7.6 60% 125.2 10.9 60% 112.8 15.4 70% 100.7 21.1 80% 88.0 2 90% 136.6 7.8 90% 124.4 11.1 90% 112.3 15.7 90% 100.2 21.4 90% 87.3 2 10% 135.8 10.9 123.7 11.3 20% 111.5 16.0 20% 99.7 21.6 00% 87.3 2 <th< th=""><th>20%</th><th>138.5</th><th>7.3</th><th>20%</th><th>126.1</th><th>10.6</th><th>2</th><th>20%</th><th>114.1</th><th>14.8</th><th>20%</th><th>101.9</th><th>20.5</th><th>20%</th><th>89.4</th><th>27.8</th></th<>	20%	138.5	7.3	20%	126.1	10.6	2	20%	114.1	14.8	20%	101.9	20.5	20%	89.4	27.8
40% 138.0 7.5 40% 125.6 10.8 40% 113.6 1.5.1 40% 101.4 20.8 40% 88.9 2 60% 137.7 7.6 60% 125.2 10.9 60% 113.0 15.2 60% 100.9 21.0 60% 88.5 2 60% 137.1 7.7 70% 124.9 11.0 70% 112.8 15.6 60% 100.0 21.1 70% 88.2 2 80% 136.9 7.8 80% 124.4 11.1 80% 112.5 15.6 80% 100.4 21.3 80% 88.0 2 90% 136.1 8.0 124.7 11.3 10% 111.8 15.9 90.9 21.6 10% 87.3 2 10% 135.1 8.0 20% 123.7 11.3 20% 111.3 16.1 30% 90.4 21.7 20% 86.5 2 30%	30%	138.3	7.4	30%	125.9	10.7	3	30%	113.8	15.0	30%	101.7	20.7	30%	89.2	28.0
50% 137.7 7.6 50% 126.4 10.9 50% 113.3 15.2 50% 101.1 20.9 50% 88.7 2 60% 137.4 7.7 60% 125.2 10.9 60% 113.0 15.3 60% 100.9 21.0 60% 88.5 2 70% 137.4 7.7 70% 124.9 11.0 70% 112.8 15.4 70% 100.0 21.1 70% 88.2 2 90% 136.6 7.8 90% 124.1 11.1 80% 112.5 15.6 80% 100.2 21.4 90% 87.7 2 20% 135.9 8.0 20% 123.7 11.3 20% 111.5 16.0 20% 99.9 21.6 10% 87.5 2 30% 135.2 8.0 20% 123.7 11.3 20% 111.0 16.2 20% 99.9 21.6 10% 86.8 <th< th=""><th>40%</th><th>138.0</th><th>7.5</th><th>40%</th><th>125.6</th><th>10.8</th><th>4</th><th>10%</th><th>113.6</th><th>15.1</th><th>40%</th><th>101.4</th><th>20.8</th><th>40%</th><th>88.9</th><th>28.2</th></th<>	40%	138.0	7.5	40%	125.6	10.8	4	10%	113.6	15.1	40%	101.4	20.8	40%	88.9	28.2
60% 137.4 7.6 60% 125.2 10.9 60% 113.0 15.3 60% 100.7 21.0 60% 88.5 2 70% 137.1 7.7 70% 124.9 11.0 70% 112.8 15.4 70% 100.7 21.3 80% 88.0 2 80% 136.9 7.8 80% 124.7 11.1 80% 112.3 15.7 70% 100.7 21.3 80% 88.0 2 90% 136.6 7.8 90% 124.4 11.1 90% 112.3 15.7 90% 100.2 21.4 90% 87.7 22 10% 135.1 8.0 20% 123.7 11.3 20% 111.5 10.6 99.9 21.5 W 87.5 22 30% 135.6 8.1 30% 123.7 11.3 20% 111.5 10.6 99.9 21.5 86.8 22.1 50% 86.5 <	50%	137.7	7.6	50%	125.4	10.9	5	50%	113.3	15.2	50%	101.2	20.9	50%	88.7	28.5
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C 136.3 7.9 H 124.2 11.2 M 112.0 15.8 R 99.9 21.5 W 87.5 2 10% 136.1 8.0 10% 124.0 11.3 10% 111.5 16.0 20% 99.9 21.6 10% 87.3 2 20% 135.6 8.1 30% 123.5 11.4 30% 111.5 16.0 20% 99.9 21.9 30% 86.8 2 30% 135.6 8.1 40% 123.2 11.5 40% 111.3 16.2 40% 98.9 22.0 40% 86.5 2 50% 135.2 8.1 40% 122.7 11.6 60% 110.8 16.4 50% 98.4 22.2 60% 86.3 3 60% 134.3 8.4 90% 122.5 11.7 70% 110.3 16.6 70% 97.9 22.5 80% 85.3 3	90%	136.6	78	90%	124.4	11 1	9	0%	112.3	15.7	90%	100.2	21.4	90%	87 7	29.3
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30% 135.6 8.1 30% 123.5 11.4 30% 111.3 16.1 30% 99.2 21.9 30% 86.8 22 40% 135.4 8.1 40% 123.2 11.5 40% 111.0 16.2 40% 98.9 22.0 40% 86.5 22 50% 135.2 8.2 50% 123.0 11.6 50% 110.8 16.4 50% 98.4 22.1 50% 86.3 33 60% 134.8 8.3 60% 122.7 11.6 60% 110.1 16.7 60% 98.4 22.2 60% 86.5 33 70% 134.8 8.4 90% 122.0 11.8 80% 110.1 16.7 80% 97.7 22.6 90% 85.3 33 90% 133.7 8.6 10% 121.7 11.9 N 109.6 16.9 97.4 22.7 X 85.0 33 90% 133.7 8.6 10% 121.7 12.0 10% 109.4	20%	135.9	8.0	20%	123.7	11.3	2	20%	111.5	16.0	20%	99.4	21.7	20%	87.0	29.7
40% 135.4 8.1 40% 123.2 11.5 40% 111.0 16.2 40% 98.9 22.0 40% 86.5 2 50% 135.2 8.2 50% 123.0 11.6 50% 110.8 16.4 50% 98.7 22.1 50% 86.3 3 60% 135.0 8.3 60% 122.7 11.6 60% 110.6 16.5 60% 98.4 22.2 60% 86.0 3 70% 134.8 8.3 70% 122.5 11.7 70% 110.3 16.6 70% 98.2 22.3 70% 85.5 3 90% 134.5 8.4 90% 122.0 11.8 90% 109.8 16.8 90% 97.7 22.6 90% 85.3 3 90% 133.7 8.6 10% 121.2 12.0 10% 109.4 17.0 10% 97.7 22.6 90% 84.8 3 20% 133.7 8.6 10% 121.2 12.0 10% <td< th=""><th>30%</th><th>135.6</th><th>8.1</th><th>30%</th><th>123.5</th><th>11.4</th><th>3</th><th>30%</th><th>111.3</th><th>16.1</th><th>30%</th><th>99.2</th><th>21.9</th><th>30%</th><th>86.8</th><th>29.8</th></td<>	30%	135.6	8.1	30%	123.5	11.4	3	30%	111.3	16.1	30%	99.2	21.9	30%	86.8	29.8
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60% 135.0 11.6 60% 110.6 16.5 60% 98.4 22.2 60% 86.0 3 70% 134.8 8.3 70% 122.5 11.7 70% 110.6 16.5 60% 98.4 22.2 60% 86.0 3 80% 134.5 8.4 80% 122.7 11.8 80% 101.1 16.7 80% 97.9 22.5 80% 85.5 3 90% 134.3 8.4 90% 122.0 11.8 90% 109.8 16.8 90% 97.7 22.6 80% 85.5 3 10% 133.9 8.6 10% 121.7 11.9 N 109.6 16.9 S 97.4 22.7 X 85.0 3 10% 133.7 8.6 10% 121.1 12.1 10% 109.4 17.0 10% 97.1 22.9 10% 84.4 3 20% 133.7	50%	135.2	82	50%	123.0	11.6	5	50%	110.8	16.4	50%	98.7	22.1	50%	86.3	30.0
Tork Tork <th< th=""><th>60%</th><th>135.0</th><th>8.3</th><th>60%</th><th>122.7</th><th>11.6</th><th>6</th><th>\$0%</th><th>110.6</th><th>16.5</th><th>60%</th><th>98.4</th><th>22.1</th><th>60%</th><th>86.0</th><th>30.1</th></th<>	60%	135.0	8.3	60%	122.7	11.6	6	\$0%	110.6	16.5	60%	98.4	22.1	60%	86.0	30.1
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30% 133.5 8.7 30% 121.0 12.1 30% 108.9 17.3 30% 96.6 23.2 30% 84.4 30 40% 133.3 8.7 40% 120.7 12.2 40% 108.6 17.4 40% 96.6 23.2 30% 84.4 30 50% 133.1 8.8 50% 120.5 12.3 50% 108.4 17.5 50% 96.0 23.6 50% 84.0 3 60% 132.8 8.8 60% 120.3 12.4 60% 108.1 17.6 60% 95.7 23.7 60% 83.8 3 70% 132.6 8.9 70% 120.0 12.5 70% 107.9 17.7 70% 95.4 23.9 70% 83.6 3 80% 132.4 8.9 80% 119.5 12.6 90% 107.4 18.0 90% 94.9 24.2 90% 83.2 3 90% 131.7 9.1 10% 119.1 12.8 10% <	20%	133 7	8.6	20%	121.2	12.1	2	20%	109 1	17.1	20%	96.8	23.0	20%	84.6	30.7
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50% 133.1 8.8 50% 120.5 12.3 50% 108.4 17.5 50% 96.0 23.6 50% 84.0 3 60% 132.8 8.8 60% 120.3 12.4 60% 108.1 17.6 60% 95.7 23.7 60% 83.8 3 70% 132.6 8.9 70% 120.0 12.5 70% 107.9 17.7 70% 95.4 23.9 70% 83.6 3 80% 132.4 8.9 80% 119.8 12.5 80% 107.6 17.9 80% 95.2 24.1 80% 83.4 3 90% 132.2 9.0 90% 119.5 12.6 90% 107.4 18.0 90% 94.9 24.2 90% 83.2 3 10% 131.7 9.1 119.3 12.7 0 107.1 18.1 T 94.6 24.4 Y 83.0 3 20% 131.5 9.1 20% 118.8 12.9 20% 106.6 18.	40%	133.3	8.7	40%	120.7	12.2	4	10%	108.6	17.4	40%	96.3	23.4	40%	84.2	30.9
60% 132.8 8.8 60% 120.3 12.4 60% 108.1 17.6 60% 95.7 23.7 60% 83.8 3 70% 132.6 8.9 70% 120.0 12.5 70% 107.9 17.7 70% 95.4 23.9 70% 83.6 3 80% 132.4 8.9 80% 119.8 12.5 80% 107.6 17.9 80% 95.2 24.1 80% 83.4 3 90% 132.2 9.0 90% 119.5 12.6 90% 107.4 18.0 90% 94.9 24.2 90% 83.2 3 E 132.0 9.0 J 119.3 12.7 O 107.1 18.1 T 94.6 24.4 Y 83.0 3 10% 131.7 9.1 10% 119.1 12.8 10% 106.6 18.3 20% 94.1 24.7 20% 82.6 3 30% 131.2 9.2 30% 106.6 18.3 20% 94.1	50%	133.1	8.8	50%	120.5	12.3	5	50%	108.4	17.5	50%	96.0	23.6	50%	84.0	31.0
70% 132.6 8.9 70% 120.0 12.5 70% 107.9 17.7 70% 95.4 23.9 70% 83.6 3 80% 132.4 8.9 80% 119.8 12.5 80% 107.6 17.9 80% 95.2 24.1 80% 83.4 3 90% 132.2 9.0 90% 119.5 12.6 90% 107.4 18.0 90% 94.9 24.2 90% 83.2 3 E 132.0 9.0 J 119.3 12.7 O 107.1 18.1 T 94.6 24.4 Y 83.0 3 10% 131.7 9.1 10% 119.1 12.8 10% 106.9 18.2 10% 94.4 24.5 10% 82.8 3 20% 131.5 9.1 20% 118.8 12.9 20% 106.6 18.3 20% 94.1 24.7 20% 82.6 3 30% 131.2 9.2 30% 106.4 18.4 30% 93.9	60%	132.8	8.8	60%	120.3	12.4	6	<u>60%</u>	108.1	17.6	60%	95.7	23.7	60%	83.8	31.1
80% 132.4 8.9 80% 119.8 12.5 80% 107.6 17.9 80% 95.2 24.1 80% 83.4 3 90% 132.2 9.0 90% 119.5 12.6 90% 107.4 18.0 90% 94.9 24.2 90% 83.2 3 E 132.0 9.0 J 119.3 12.7 O 107.1 18.1 T 94.6 24.4 Y 83.0 3 10% 131.7 9.1 10% 119.1 12.8 10% 106.9 18.2 10% 94.4 24.5 10% 82.8 3 20% 131.5 9.1 20% 118.8 12.9 20% 106.6 18.3 20% 94.1 24.7 20% 82.6 3 30% 131.2 9.2 30% 118.6 12.9 30% 106.4 18.4 30% 93.9 24.8 30% 82.4 3 40% 130.9 9.3 40% 118.2 13.1 50% 105.9 <th>70%</th> <th>132.6</th> <th>8.9</th> <th>70%</th> <th>120.0</th> <th>12.5</th> <th>7</th> <th>70%</th> <th>107.9</th> <th>17.7</th> <th>70%</th> <th>95.4</th> <th>23.9</th> <th>70%</th> <th>83.6</th> <th>31.2</th>	70%	132.6	8.9	70%	120.0	12.5	7	70%	107.9	17.7	70%	95.4	23.9	70%	83.6	31.2
90% 132.2 9.0 90% 119.5 12.6 90% 107.4 18.0 90% 94.9 24.2 90% 83.2 3 E 132.0 9.0 J 119.3 12.7 O 107.1 18.1 T 94.6 24.4 Y 83.0 3 10% 131.7 9.1 10% 119.1 12.8 10% 106.9 18.2 10% 94.4 24.5 10% 82.8 3 20% 131.5 9.1 20% 118.8 12.9 20% 106.6 18.3 20% 94.1 24.7 20% 82.6 3 30% 131.2 9.2 30% 118.6 12.9 30% 106.4 18.3 20% 94.1 24.7 20% 82.6 3 30% 131.2 9.2 30% 118.6 12.9 30% 106.4 18.4 30% 93.9 24.8 30% 82.4 3 40% 130.7 9.4 50% 118.2 13.1 50% 105.9 <th>80%</th> <th>132.4</th> <th>8.9</th> <th>80%</th> <th>119.8</th> <th>12.5</th> <th>8</th> <th><u>80%</u></th> <th>107.6</th> <th>17.9</th> <th>80%</th> <th>95.2</th> <th>24.1</th> <th>80%</th> <th>83.4</th> <th>31.3</th>	80%	132.4	8.9	80%	119.8	12.5	8	<u>80%</u>	107.6	17.9	80%	95.2	24.1	80%	83.4	31.3
E 132.0 9.0 J 119.3 12.7 O 107.1 18.1 T 94.6 24.4 Y 83.0 3 10% 131.7 9.1 10% 119.1 12.8 10% 106.9 18.2 10% 94.4 24.5 10% 82.8 3 20% 131.5 9.1 20% 118.8 12.9 20% 106.6 18.3 20% 94.1 24.7 20% 82.6 3 30% 131.2 9.2 30% 118.6 12.9 30% 106.4 18.3 20% 94.1 24.7 20% 82.6 3 40% 130.9 9.3 40% 118.4 13.0 40% 106.1 18.5 40% 93.6 25.0 40% 82.2 3 50% 130.7 9.4 50% 118.2 13.1 50% 105.9 18.7 50% 93.4 25.1 50% 82.1 3 </th <th>90%</th> <th>132.2</th> <th>9.0</th> <th>90%</th> <th>119.5</th> <th>12.6</th> <th>9</th> <th>0%</th> <th>107.4</th> <th>18.0</th> <th>90%</th> <th>94.9</th> <th>24.2</th> <th>90%</th> <th>83.2</th> <th>31.4</th>	90%	132.2	9.0	90%	119.5	12.6	9	0%	107.4	18.0	90%	94.9	24.2	90%	83.2	31.4
10% 131.7 9.1 10% 119.1 12.8 10% 106.9 18.2 10% 94.4 24.5 10% 82.8 3 20% 131.5 9.1 20% 118.8 12.9 20% 106.6 18.3 20% 94.1 24.7 20% 82.6 3 30% 131.2 9.2 30% 118.6 12.9 30% 106.4 18.4 30% 93.9 24.8 30% 82.4 3 40% 130.9 9.3 40% 118.4 13.0 40% 106.1 18.5 40% 93.6 25.0 40% 82.2 3 50% 130.7 9.4 50% 118.2 13.1 50% 105.9 18.7 50% 93.4 25.1 50% 82.1 33 60% 130.4 9.4 60% 117.9 13.2 60% 105.7 18.8 60% 93.1 25.2 60% 81.9 33 70% 130.1 9.5 70% 117.7 13.3 70% <	E	132.0	9.0	J	119.3	12.7	o		107.1	18.1	т	94.6	24.4	Y	83.0	31.5
20% 131.5 9.1 20% 118.8 12.9 20% 106.6 18.3 20% 94.1 24.7 20% 82.6 3 30% 131.2 9.2 30% 118.6 12.9 30% 106.4 18.3 20% 94.1 24.7 20% 82.6 3 40% 130.9 9.3 40% 118.4 13.0 40% 106.1 18.5 40% 93.6 25.0 40% 82.2 3 50% 130.7 9.4 50% 118.2 13.1 50% 105.9 18.7 50% 93.4 25.1 50% 82.1 33 60% 130.4 9.4 60% 117.9 13.2 60% 105.7 18.8 60% 93.1 25.2 60% 81.9 33 70% 130.1 9.5 70% 117.7 13.3 70% 105.4 18.9 70% 92.9 25.4 70% 81.7 33 80% 129.8 9.6 80% 117.5 13.3 80%	- 10%	131.7	9.1	10%	119.1	12.8	- 1	0%	106.9	18.2	. 10%	94.4	24.5	. 10%	82.8	31.6
30% 131.2 9.2 30% 118.6 12.9 30% 106.4 18.4 30% 93.9 24.8 30% 82.4 3 40% 130.9 9.3 40% 118.4 13.0 40% 106.1 18.5 40% 93.6 25.0 40% 82.2 3 50% 130.7 9.4 50% 118.2 13.1 50% 105.9 18.7 50% 93.4 25.1 50% 82.1 3 60% 130.4 9.4 60% 117.9 13.2 60% 105.7 18.8 60% 93.1 25.2 60% 81.9 3 70% 130.1 9.5 70% 117.7 13.3 70% 105.4 18.9 70% 92.9 25.4 70% 81.7 3 80% 129.8 9.6 80% 117.5 13.3 80% 105.2 19.0 80% 92.6 25.5 80% 81.5 3 90% 129.6 9.6 90% 117.2 13.4 90% <td< th=""><th>20%</th><th>131.5</th><th>9.1</th><th>20%</th><th>118.8</th><th>12.9</th><th>2</th><th>20%</th><th>106.6</th><th>18.3</th><th>20%</th><th>94.1</th><th>24.7</th><th>20%</th><th>82.6</th><th>31.7</th></td<>	20%	131.5	9.1	20%	118.8	12.9	2	20%	106.6	18.3	20%	94.1	24.7	20%	82.6	31.7
40% 130.9 9.3 40% 118.4 13.0 40% 106.1 18.5 40% 93.6 25.0 40% 82.2 3 50% 130.7 9.4 50% 118.2 13.1 50% 105.9 18.7 50% 93.4 25.1 50% 82.1 33 60% 130.4 9.4 60% 117.9 13.2 60% 105.7 18.8 60% 93.1 25.2 60% 81.9 33 70% 130.1 9.5 70% 117.7 13.3 70% 105.4 18.9 70% 92.9 25.4 70% 81.7 33 80% 129.8 9.6 80% 117.5 13.3 80% 105.2 19.0 80% 92.6 25.5 80% 81.5 33 90% 129.6 9.6 90% 117.2 13.4 90% 104.9 19.1 90% 92.4 25.7 90% 81.3 33	30%	131.2	9.2	30%	118.6	12.9	3	30%	106.4	18.4	30%	93.9	24.8	30%	82.4	31.8
50% 130.7 9.4 50% 118.2 13.1 50% 105.9 18.7 50% 93.4 25.1 50% 82.1 33 60% 130.4 9.4 60% 117.9 13.2 60% 105.7 18.8 60% 93.1 25.2 60% 81.9 33 70% 130.1 9.5 70% 117.7 13.3 70% 105.4 18.9 70% 92.9 25.4 70% 81.7 33 80% 129.8 9.6 80% 117.5 13.3 80% 105.2 19.0 80% 92.6 25.5 80% 81.5 33 90% 129.6 9.6 90% 117.2 13.4 90% 104.9 19.1 90% 92.4 25.7 90% 81.3 33	40%	130.9	9.3	40%	118.4	13.0	4	10%	106 1	18.5	40%	93.6	25.0	40%	82.2	31.9
60% 130.4 9.4 60% 117.9 13.2 60% 105.7 18.8 60% 93.1 25.2 60% 81.9 33 70% 130.1 9.5 70% 117.7 13.3 70% 105.4 18.9 70% 92.9 25.4 70% 81.7 33 80% 129.8 9.6 80% 117.5 13.3 80% 105.2 19.0 80% 92.6 25.5 80% 81.5 33 90% 129.6 9.6 90% 117.2 13.4 90% 104.9 19.1 90% 92.4 25.7 90% 81.3 33	50%	130.7	94	50%	118.2	13.1	5	50%	105.9	18.7	50%	93.4	25.1	50%	82.1	32.0
70% 130.1 9.5 70% 117.7 13.3 70% 105.4 18.9 70% 92.9 25.4 70% 81.7 33 80% 129.8 9.6 80% 117.5 13.3 80% 105.2 19.0 80% 92.6 25.5 80% 81.5 33 90% 129.6 9.6 90% 117.2 13.4 90% 104.9 19.1 90% 92.4 25.7 90% 81.3 33	60%	130.4	94	60%	117.9	13.2		SO%	105.7	18.8	60%	93 1	25.2	60%	81.9	32.1
80% 129.8 9.6 80% 117.5 13.3 80% 105.2 19.0 80% 92.6 25.5 80% 81.5 33 90% 129.6 9.6 90% 117.2 13.4 90% 104.9 19.1 90% 92.4 25.7 90% 81.3 33	70%	130 1	9.5	70%	117 7	13.3	7	0%	105.4	18.9	70%	92.9	25.4	70%	81.7	32.2
90% 129.6 9.6 90% 117.2 13.4 90% 104.9 19.1 90% 92.4 25.7 90% 81.3 3	80%	129.8	9.6	80%	117.5	13.3	8	80%	105.2	19.0	80%	92.6	25.5	80%	81.5	32.3
	90%	129.6	9.6	90%	117.2	13.4	9	0%	104 9	19.1	90%	92.4	25.7	90%	81.3	32.4
F 129.3 9.7 K 117.0 13.5 P 104.7 19.2 U 92.1 25.8 Z 81.1 33	F	129.3	9.7	K	117.0	13.5	P	- 10	104.7	19.2	U	92.1	25.8	Z	81.1	32.5