Densified Sand Using Kango Hammer & Unit Measure

Verified By: T. WAGUESPACK **Date:** 4 OCT 2011

NEW SAND

Equipment: Unit Measure Small Rect. 1.0 cu ft

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with 4.1 x 5.5 in end plate, Scale # 121606

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	127.5	127.2	128.1
Weight of container empty	B	(lbs)	24.2	24.2	24.2
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.3	103.0	103.9
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)			
Average Weight (Mass) of Densified Sand		(lbs)	103.4		
Average Densified Unit Weight of Sand		(pcf)	107.21		

Action: **Repair** _____ **Replace** _____ **In Service** ✓

Remarks: _____

Form Orig. Date: 29 Sept 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: T WAGUESPACK **Date:** 4 OCT 2011

Equipment: Unit Measure - Sml Rect - 1.0 cu ft. CLEANED SAND (Check Vs New)

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with 4 in x 55 lb end plate, Scale # 121606

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	127.7	127.6	127.6
Weight of container empty	B	(lbs)	24.2	24.2	24.2
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.5	103.4	103.4
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	107.31	107.21	107.21
Average Weight (Mass) of Densified Sand		(lbs)	103.4		
Average Densified Unit Weight of Sand		(pcf)	107.24		

Action: Repair _____ Replace _____ In Service _____

Remarks: (Used Sand, Sieved) Check against New Sand

Form Orig. Date: 29 Sept 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: T. WAGUESPACK/V. WOODS **Date:** 6 OCT 2011

Equipment: Unit Measure Small Rect. - 1.0 cu ft.

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with 4"x5.5" end plate, Scale # 121606

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	127.7	127.6	127.4
Weight of container empty	B	(lbs)	24.2	24.2	24.2
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.5	103.4	103.2
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	107.31	107.21	107.0
Average Weight (Mass) of Densified Sand		(lbs)	103.37		
Average Densified Unit Weight of Sand		(pcf)	107.17		

Action: Repair _____ Replace _____ In Service ✓

Remarks: New Sand

Form Orig. Date: 29 Sept 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: T. WAGUESPACK / V. WOODS **Date:** 11 Oct 2011

Equipment: Unit Measure Small Rect. - 1.0 cu. ft.

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with 4" x 5.5" end plate, Scale # 121606

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	127.3	127.6	127.8
Weight of container empty	B	(lbs)	24.2	24.2	24.2
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.1	103.4	103.6
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	106.89	107.21	107.41
Average Weight (Mass) of Densified Sand		(lbs)	103.37		
Average Densified Unit Weight of Sand		(pcf)	107.17		

Action: Repair _____ Replace _____ In Service ✓

Remarks: Used & Sieved Sand

Form Orig. Date: 29 Sept 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: T. WAGUESPACK / V. WOODS **Date:** 12 OCT 2011

Equipment: Unit Measure Small Rect. - 1.0 cu ft

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with 4"x5.5" end plate, Scale # _____

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	127.7	127.9	128.0
Weight of container empty	B	(lbs)	24.2	24.2	24.2
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.5	103.7	103.8
Volume of Container	D	(cf)	.9645	.9645	.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	107.31	107.52	107.62
Average Weight (Mass) of Densified Sand		(lbs)	103.67		
Average Densified Unit Weight of Sand		(pcf)	107.49		

127.87
24.2
103.67

Action: Repair _____ Replace _____ In Service ✓

Remarks: USED SAND, Sieved

Form Orig. Date: 29 Sept 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: T. WAGUESPACK / V. WOODS **Date:** 13 OCT 2011

Equipment: Unit Measure Small Rect - 1.0 cu ft

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with 4 in x 5.5 in end plate, Scale # 121606

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	127.9	128.0	128.4
Weight of container empty	B	(lbs)	24.3	24.3	24.3
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.6	103.7	104.1
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	107.41	107.52	107.93
Average Weight (Mass) of Densified Sand		(lbs)	103.80		
Average Densified Unit Weight of Sand		(pcf)	107.62		

Action: **Repair** _____ **Replace** _____ **In Service** ✓

Remarks: Used & Sieved Sand

Form Orig. Date: 29 Sept 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: T. WAGUESPACK **Date:** 15 OCT 2011

Equipment: Unit Measure - Small Rect - 1.0 cu. ft.

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with 4 in x 5.5 in end plate, Scale # 121606

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	127.6	127.8	128.0
Weight of container empty	B	(lbs)	24.2	24.2	24.2
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.4	103.6	103.8
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	107.21	107.41	107.62
Average Weight (Mass) of Densified Sand		(lbs)	103.6		
Average Densified Unit Weight of Sand		(pcf)	107.41		

Action: **Repair** _____ **Replace** _____ **In Service** ✓

Remarks: Used Sand & Sieved

Form Orig. Date: 29 Sept 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: T. WAGUESPACK / V. WOODS **Date:** 17 OCT 2011

Equipment: Unit Measure Small Rect - 1.0 cu ft.

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with 4in x 5.5in end plate, Scale # 121606 ,

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	128.0	127.8	128.1
Weight of container empty	B	(lbs)	24.3	24.3	24.3
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.7	103.5	103.8
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	107.52	107.31	107.62
Average Weight (Mass) of Densified Sand		(lbs)	103.67		
Average Densified Unit Weight of Sand		(pcf)	107.48		

Action: **Repair** _____ **Replace** _____ **In Service** ✓

Remarks: Used SAND, Sieved

Form Orig. Date: 29 Sept 2011 Rev: 0

STA. 48+00 P.S.
All wood 1 of 1

Wood Volume Determination

Tested By: T. WAGUESPACK **Date:** 15 OCT 2011

Equipment Used: Small Rect. - 1.0 cu ft.

KANGO HAMMER - 638S w/ 4 in x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		1.04
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.1
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.60
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		99.86
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0348
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 48+06 CL
All WOOD → 1 of 2

Wood Volume Determination

Tested By: T. WAGUESPACK **Date:** 15 OCT 2011

Equipment Used: Small Rect - 1.0 cu. ft.
KANGO HAMMER - 6385 w/ 4 in x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		6.3
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		116.8
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.60
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		86.30
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1611
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 48+00 CL
ALL WOOD- 2 of 2

Wood Volume Determination

Tested By: T. WAGUESPACK **Date:** 15 OCT 2011

Equipment Used: Small Rect. - 1.0 cu.ft.
KANGO HAMMER - 638S w/ 4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		4.8
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		118.3
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.60
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		89.30
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1331
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

TOTAL WOOD = 0.1611 + 0.1331 = 0.2942

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 90+00 C/L 4 Oct 2011

(New Sand)

Objection (1)

Container wt. - 24.2 #

Wt. Wood (obj) = 5.2 #

(e) TOT. Wt Cont. + Wd + Sand = 119.0 #

(f) 107.21 x .9645 = 103.4 #

(g) 119.0 - 24.2 - 5.2 # = 89.6 #

(h) $\frac{103.4 - 89.6}{107.21}$ = 0.1290 ft³ Vol of Wd.

Den = 40.31 pcf

Wood (2)

Wt Wood = 2001.9 g = 4.41 #

Cont. + wood + sand = 117.8 #

(f) 107.21 x .9645 = 103.4 #

(g) 117.8# - 24.2# - 4.41# = 89.19 #

(h) $\frac{103.4 - 89.19}{107.21}$ = 0.1325 ft³ Vol of Wd.

Den = 33.28 pcf

1361.4

Wood (3)

Wt Wood 1287.5 g = 3.15 #

Cont. + wood + sand = 120.8 #

(f) = 103.4 #

(g) 120.8 - 24.2 - 3.15 = 93.45 #

(h) $\frac{103.4 - 93.45}{107.21}$ = 0.0928 ft³

Den = 33.94 pcf

OBJ = 0.129 ft³, Other Wd = 0.2253 ft³,

OBJ + Other Wd = 0.3543 ft³

STA. 123+59 F.S. 0-1.2'
OBJ. WOOD 1&1

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 6 OCT 2011

Equipment Used: RECT. CONTAINER - 1.0 cu ft.

KANGO HAMMER - 638S w/ 4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2 #
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.17 pcf
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		11.7 #
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		116.7 #
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.37 #
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		80.8 #
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.2106
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 123+59 - F.S. 0-1.2'
Non OBJ Wbat - 1 of 2

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 17 OCT 2011

Equipment Used: Small Rect. - 1.0 cu ft.
KANGO HAMMER - 6385 w/ 4 in X 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.48
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		6.2
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		118.2
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.67
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		87.7
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1486
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

STA. 123+59 F.S. 0-1.2'
NON OBJ Wood - 2 of 2 **Wood Volume Determination**

Tested By: T. WAGUESPACK / V. WOODS **Date:** 17 Oct 2011

Equipment Used: Small Rect. - 1.0 cu ft.
KANGO HAMMER - 6385 w/4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.48
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		4.9
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		120.2
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.67
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		91.0
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1179
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

Tot NON OBJ WD = 0.1486 + 0.1179 = 0.2665

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 123+59 F.S. 1.2-S.O.C
OBJ. Wood 1 of 1

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 17 Oct 2011

Equipment Used: Small Rect- 1.0 cu ft
KANGO HAMMER -6385 w/ 4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.48
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		9.2
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		116.7
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.67
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		83.2
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1905
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 123+59 F.S. 12-5.0'
Non OBS Wood, 1 of 3

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 13 OCT 2011

Equipment Used: Small Rect. -1.0 cu ft.
KANGO Hammer-6385 w/ 4 in x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		3.7
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		122.1
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		94.1
(h)	Volume of Wood	cu.ft.	|(f) – (g)| / (c)		0.0901
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 123+59 FS. 12-5.0'
NON OBT WL 2 of 3

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 13 OCT 2011

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER-638S w/ 4 in x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		3.2
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		121.3
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		93.8
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0929
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA - 123+59 F.S. 1.2-5.0'
NON OBJ. WOOD - 3 of 3 **Wood Volume Determination**

Tested By: T. WAGUESPACK/V. WOODS **Date:** 17 OCT 2011

Equipment Used: Small Rect - 1.0 cu ft.

KANGO HAMMER - 638S w/4in x 5.5in END PLATE

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.48
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		0.81
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		126.7
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.67
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		101.59
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0194
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

TOT NON OBJ WOOD = 0.0901 + 0.0929 + 0.0194
= 0.2024

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: (366.3g)

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 140+00
OBJ. WOOD 1 of 2

Wood Volume Determination

Tested By: T. WAGUESPACK/WOODS **Date:** 6 OCT 2011

Equipment Used: Rect. CONTAINER - 1.0 cu ft

KANGO HAMMER - 638 S w/4 in x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2 #
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.17 pcf
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		7.5 #
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		120.7 #
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.37
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		89.0
(h)	Volume of Wood	cu.ft.	|(f) – (g)| / (c)		0.1341
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 140400
OBS. WOOD 2 of 2

Wood Volume Determination

Tested By: T. WAGNESPACK/V. WOODS **Date:** 6 Oct 2011

Equipment Used: RECT. CONTAINER - 1.0 cu.ft.

KANGO HAMMER - 6385 w/ 4 in. x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2 #
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.17 #
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		5.9 #
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		121.2 #
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.37
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		91.1 #
(h)	Volume of Wood	cu.ft.	|(f) – (g)| / (c)		0.1145
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(OBS) Tot Vol Wood (1+2) 0.2486 ft^3

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: Largest Piece

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 140+00 F.S.
NONOBJ. WD – 142

Wood Volume Determination

Tested By: T. WAGUESPACK/V. WOODS **Date:** 17 OCT 2011

Equipment Used: Small Rect. – 1.0 cu ft.

Kango Hammer – 638S w/4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.48
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		5.8
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		117.2
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.67
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		87.1
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1542
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 140+00 F.S.
NON OBS WOOD - 2 of 2

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 17 OCT 2011

Equipment Used: Small Rect. - 1.0 cu. ft.

KANGO HAMMER - 638 S w/ 4 in x 5.5 in END Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.48
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		4.9
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		118.9
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.67
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		89.7
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1300
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

Total NON OBS. WD = 0.1542 + 0.1300
= 0.2842

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 145+00 PS
OBJ. Wood 202

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 11 OCT 2011

Equipment Used: Small Rect. Container - 1.0 cu. ft.
KANGO HAMMER 6385 w/ 4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.17
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		3.2
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		122.6
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.37
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		95.2
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0762
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

OBJ. TOTAL STA 145+00 = 0.2476 ft³

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 145+00 PS
OBJ. WOOD 1 of 2

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 11 Oct 2011

Equipment Used: Small Rect. Container - 1.0 cu ft.

KANGO HAMMER -6385 w/ 4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.17
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		9.1
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		118.3
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.37
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		85.0
(h)	Volume of Wood	cu.ft.	|(f) – (g)| / (c)		0.1714
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

STA. 145+00 P.S.
NON OBJ. WD - 1 of 2

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 17 OCT 2011

Equipment Used: Small Rect. - 1.0 cu ft.
KANGO HAMMER-638S w/ 4.in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.48
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		6.0
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		115.9
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.67
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		85.6
(h)	Volume of Wood	cu.ft.	|(f) – (g)| / (c)		0.1681
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 145+00 P.S.
NON OBJ. Wood 2of2 **Wood Volume Determination**

Tested By: T. WAGUESPACK / V. WOODS **Date:** 17 OCT 2011

Equipment Used: Small Rect. 1.0 cu ft.
KANGO HAMMER -638S w/ 4in x 5.5in END Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.48
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		4.6
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		117.9
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.67
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		89.0
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1365
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

TOT. NON OBJ = 0.1681 + 0.1365 = 0.3046

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 150+00 CL 0-3'
ALL WOOD 1 of 3

Wood Volume Determination

Tested By: T. WAGUESPACK **Date:** 15 Oct 2011

Equipment Used: Small Recr. - 1.0 cu. ft.
KANGO HAMMER 638S w/ 4 in x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		6.2
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		110.3
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.60
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		79.90
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.2207
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: (Wood appears to be @ low moisture)

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 150+00 CL 0-3'
ALL WOOD - 2 of 3

Wood Volume Determination

Tested By: T. WAGUESPACK **Date:** 15 OCT 2011

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4 in x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		3.2
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		118.1
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.60
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		90.70
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1201
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: (wood appears to be @ low moisture)

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 150+00 CL 0-3'
All Wood - 3 of 3

Wood Volume Determination

Tested By: T. WAGUESPACK **Date:** 15 OCT 2011

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4in. x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		1.5
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		122.9
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.60
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		97.2
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0596
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

ALL WOOD = 0.2207 + 0.1201 + 0.0596 = 0.4004

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: (Wood appears to be @ low moisture)

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 150+00 3-6'
OBJ. WOOD 1 of 1

Wood Volume Determination

Tested By: T. WAGVESPACK / V. WOODS **Date:** 6 OCT 2011

Equipment Used: RECT. CONTAINER - 1.0 cu ft

KANGO HAMMER - 638S w/ 4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2 #
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.17 pcf
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		8.4 #
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		119.6 #
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.37
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		87.0 #
(h)	Volume of Wood	cu.ft.	|(f) – (g)| / (c)		0.1527
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: Wood was cut to fit CONTAINER

Form Orig. Date: 5 Oct 2011 Rev: 0

STA - 150+00 ℄ 3-6'
NON OBS. Wood - 1 of 2

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 17 OCT 2011

Equipment Used: Small Rect - 1.0 cu ft
KANGO Hammer - 638S w/ 4 in x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.48
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		7.4
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		115.6
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.67
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		83.9
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1839
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 150+00 ℄ 3-6'
NON OBJ. Wood - 2 of 2 **Wood Volume Determination**

Tested By: T. WAGUESPACK / N. WOODS **Date:** 17 OCT 2011

Equipment Used: Small Rect. - 1.0 cu ft.
KANGO Hammer - 6385 w/ 4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.48
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		6.4
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		116.1
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.67
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		85.4
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1700
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

TOT NON OBJ = 0.1839 + 0.1700 = 0.3539

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 160+00 F.S.
All wood - 1 of 1

Wood Volume Determination

Tested By: T. WAGNESPACK **Date:** 15 OCT 2011

Equipment Used: Small Rect - 1.0 cu ft,
KANGO HAMMER 638S w/4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		5.5
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		118.0
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.60
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		88.30
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1424
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA: 170+00 P/S
OBJ. WOOD 1 of 1

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 6 OCT 2011

Equipment Used: CONTAINER RECT. - 1.0 cu ft

KANGO HAMMER - 6385 w/ 4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2 #
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.17 #/ft³
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		1152.69 2.54 #
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		124.2 #
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.37
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		97.46
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0551
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 170+00 P.S.
NON OBJ. WOOD 1 of 5 **Wood Volume Determination**

Tested By: T. WAGUESPACK / V. WOODS **Date:** 13 OCT 2011

Equipment Used: Small Rect. - 1.0 cu ft.
KANGO HAMMER - 638S w/ 4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		6.4
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		116.4
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.80
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		35.70
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1682
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 170+00 P.S.
Non OBJ. Wood 2 of 5

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 13 OCT 2011

Equipment Used: RECT (Small) - 1.0 cu ft.

KANGO Hammer - 6385 w/ 4 in x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		6.7
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		116.3
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.80
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		85.30
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1719
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 170+00 R.S.
NON OBJ. WD. 3 of 5

Wood Volume Determination

Tested By: T. WAGUESPACK / V. Woods **Date:** 13 OCT 2011

Equipment Used: Small Rect – 1.0 cu ft
KANGO HAMMER - 6385 w/4 in x 5.5 in END Plates

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		7.1
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		117.0
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		85.6
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1691
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 170+00 P.S.
NON OBJ LIN 4 of 5

Wood Volume Determination

Tested By: T. WAGUESPACK / N. WOODS **Date:** 13 OCT 2011

Equipment Used: Small Rect - 1.0 cu ft.
KANGO HAMMER - 6385 w/4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		2.43
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		6.3
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		116.2
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		85.6
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1691
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 170+00
NON OBJ. WD. 5 of 5

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 13 OCT 2011

Equipment Used: Small Rect. - 1.0 cu ft.
KANGO HAMMER - 638S w/ 4.in × 5.5in END Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.3
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		2.9
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		122.0
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		94.8
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0836
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

TOT NON OBJ. WOOD = 0.1682 + 0.1719 + 0.1691 + 0.1691 + 0.0836
= 0.7619 cu. ft.

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 170+00 CL
OBJ WOOD - 1+2

Wood Volume Determination

Tested By: T. WAGUESPACK/V. WOODS **Date:** 11 OCT 2011

Equipment Used: Small Rect. Container - 1.0 cu ft.
Kango Hammer - 638 S w/ 4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.17
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		7.4
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		121.2
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.37
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		89.6
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1285
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 170+00 ℄
OBJ WOOD - 2 of 2

Wood Volume Determination

Tested By: T. WAGUESMACK / V. WOODS **Date:** 11 OCT 2011

Equipment Used: Small RECT CONTAINER - 1.0 cu ft
KANGO HAMMER - 638S w/ 4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.17
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		7.6
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		118.6
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.37
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		86.8
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1546
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

OBJ. TOTAL for 170+00 ℄ = 0.2831 ft³

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA - 170+00 CL
WOOD (Non OBJ.) 1 of 5

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 12 OCT 2011

Equipment Used: Small Rect. - 1.0 cu. ft.

KANGO HAMMER - 6385 w/ 4 in x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.49
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		8.0
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		111.9
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.67
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		79.70
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.2230
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

TOTAL NON-OBJ WOOD = 1.0493 ft³

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 170+00 ℄L
WOOD (NON-OBJ.) 2 of 5

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 12 OCT 2011

Equipment Used: Small Rect. - 1.0 cu ft
KANGO HAMMER - 6385 w/ 4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.49
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		7.2
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		114.8
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.67
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		72.27
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.2921
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 170+00 CL
Wood (NON OBJ) 3 of 5

Wood Volume Determination

Tested By: T. WAGUESPACK / V. WOODS **Date:** 12 OCT 2011

Equipment Used: Small Rect. - 1.0 cu ft
KANGO HAMMER - 6385 w/ 4 in x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.49
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		7.7
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		115.0
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.67
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		83.10
(h)	Volume of Wood	cu.ft.	|(f) – (g)| / (c)		0.1914
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 170+00 ℄
Wood (NON-OBJ) 4 of 5

Wood Volume Determination

Tested By: T. WAGUESPACK **Date:** 12 OCT. 2011

Equipment Used: Small Rect. - 1.0 cu ft
KANGO HAMMER - 6385 w/ 4 in x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.49
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		7.3
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		114.7
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.67
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		83.20
(h)	Volume of Wood	cu.ft.	|(f) – (g)| / (c)		0.1905
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 170+00 ℄
Wood (NON-OBJ.) 5 of 5

Wood Volume Determination

Tested By: T. WAGUESPACK **Date:** 12 OCT 2011

Equipment Used: Small Rect. - 1.0 cu ft
KANGO HAMMER - 638S w/ 4 in x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.49
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		5.2
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		116.7
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.67
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		87.30
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1523
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

" All NON-OBJ. WOOD = 0.2230 + 0.2921 + 0.1914 + 0.1905 + 0.1523 = 1.0493 ft³

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: WAGUESPACK/GAVRILESCU **Date:** 1 Dec 11

Equipment: Unit Measure Small Rect- 1.0 cu ft

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with 4in x 5.5in end plate, Scale # 121606

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	127.6	127.8	127.9
Weight of container empty	B	(lbs)	24.2	24.2	24.2
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.4	103.6	103.7
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	107.21	107.41	107.52
Average Weight (Mass) of Densified Sand		(lbs)	103.6		
Average Densified Unit Weight of Sand		(pcf)	107.38		

Action: **Repair** _____ **Replace** _____ **In Service** ✓

Remarks: New Sand

Form Orig. Date: 29 Sept 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: WAGUESPACK/GAVRILESCU **Date:** 2 Dec 11

Equipment: Unit Measure Small Rect. 1.0 cu ft.

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with _____ end plate, Scale # 121606

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	127.4	127.3	127.5
Weight of container empty	B	(lbs)	24.2	24.2	24.2
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.2	103.1	103.3
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	107.00	106.89	107.10
Average Weight (Mass) of Densified Sand		(lbs)	103.1		
Average Densified Unit Weight of Sand		(pcf)	106.89		

Action: Repair _____ Replace _____ In Service ✓

Remarks: USED SAND & SIEVED

Form Orig. Date: 29 Sept 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: WAGUESPACK/WOODS **Date:** 7 Dec 11

Equipment: Unit Measure - Small Rect. - 1.0 cu.ft.

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with 4'in x 5.5'in end plate, Scale # 121606

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	127.8	127.8	127.8
Weight of container empty	B	(lbs)	24.2	24.2	24.2
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.6	103.6	103.6
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	107.41	107.41	107.41
Average Weight (Mass) of Densified Sand		(lbs)	103.6		
Average Densified Unit Weight of Sand		(pcf)	107.41		

Action: **Repair** _____ **Replace** _____ **In Service** ✓

Remarks: New SAND

Form Orig. Date: 29 Sept 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: WAGUESPACK / WOODS **Date:** 8 Dec 11

Equipment: Unit Measure - Small Rect- 1.0 cu.ft.

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with 4 1/2 x 5.5 1/2 end plate, Scale # 121606 ,

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	127.7	127.8	127.9
Weight of container empty	B	(lbs)	24.2	24.2	24.2
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.5	103.6	103.7
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	107.31	107.41	107.52
Average Weight (Mass) of Densified Sand		(lbs)	103.6		
Average Densified Unit Weight of Sand		(pcf)	107.41		

Action: Repair _____ Replace _____ In Service ✓

Remarks: New SAND

Form Orig. Date: 29 Sept 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: WAGUESPACK **Date:** 10 Dec 11

Equipment: Unit Measure - Small Rect. - 1.0 cu ft.

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with _____ end plate, Scale # 121606 , _____

Verification Procedure: In-house Procedure _____

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	128.1	128.0	127.9
Weight of container empty	B	(lbs)	24.2	24.2	24.2
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.9	103.8	103.7
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	107.72	107.62	107.52
Average Weight (Mass) of Densified Sand		(lbs)	103.8		
Average Densified Unit Weight of Sand		(pcf)	107.62		

Action: **Repair** _____ **Replace** _____ **In Service** ✓

Remarks: Sieved Sand

Form Orig. Date: 29 Sept 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: WAGUESPACK/WOODS **Date:** 12 Dec 11

Equipment: Unit Measure Small Rect - 1.0 cu ft

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with 4.1in x 5.5in end plate, Scale # 121606

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	127.9	128.0	128.0
Weight of container empty	B	(lbs)	24.2	24.2	24.2
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.7	103.8	103.8
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	107.52	107.62	107.62
Average Weight (Mass) of Densified Sand		(lbs)	103.77		
Average Densified Unit Weight of Sand		(pcf)	107.59		

Action: **Repair** _____ **Replace** _____ **In Service** ✓

Remarks: New Sand

Form Orig. Date: 29 Sept 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: WAGUESPACK **Date:** 13 Dec 11

Equipment: Unit Measure Small Rect. ~ 1.0 cu ft.

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with 4in x 5.5in end plate, Scale # 121606

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	127.9	128.1	128.0
Weight of container empty	B	(lbs)	24.2	24.2	24.2
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.7	103.9	103.8
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	107.52	107.72	107.62
Average Weight (Mass) of Densified Sand		(lbs)	103.8		
Average Densified Unit Weight of Sand		(pcf)	107.62		

Action: Repair _____ Replace _____ In Service ✓

Remarks: Sieved SAND

Form Orig. Date: 29 Sept 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: WAGUESPACK **Date:** 21 Dec 11

Equipment: Unit Measure - Small Rect. - 1.0 cu. ft.

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with 4in x 5.5in end plate, Scale # 121606

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	128.0	127.9	128.1
Weight of container empty	B	(lbs)	24.2	24.2	24.2
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.8	103.7	103.9
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	107.62	107.52	107.72
Average Weight (Mass) of Densified Sand		(lbs)	103.8		
Average Densified Unit Weight of Sand		(pcf)	107.62		

Action: **Repair** _____ **Replace** _____ **In Service** ✓

Remarks: Sieved Sand

Form Orig. Date: 29 Sept 2011 Rev: 0

Densified Sand Using Kango Hammer & Unit Measure

Verified By: WAGUESPACK **Date:** 30 Dec 11

Equipment: Unit Measure Small Recr. -1.0 cu.ft.

Identification No. _____ **Verification Frequency:** Daily (in use)

Previous Verification Date: _____ **Next Due Date:** _____

Verification Equipment Used: Kango Hammer Type 638S with 4in x 5.5in end plate, Scale # 121606

Verification Procedure: In-house Procedure

Density Sand Supply		Ottowa Sand from Durham Geo			
Measurement of Densified Sand in a Calibrated Unit Measure		Units	Trial #1	Trail #2	Trial #3
Weight of container filled with densified sand	A	(lbs)	128.0	127.9	127.9
Weight of container empty	B	(lbs)	24.2	24.2	24.2
Weight of densified sand used to fill container	C = (A – B)	(lbs)	103.8	103.7	103.7
Volume of Container	D	(cf)	0.9645	0.9645	0.9645
Densified Unit Weight of Sand	C (lbs) / D	(pcf)	107.62	107.52	107.52
Average Weight (Mass) of Densified Sand		(lbs)	103.73		
Average Densified Unit Weight of Sand		(pcf)	107.55		

Action: **Repair** _____ **Replace** _____ **In Service** ✓

Remarks: Sieved Sand

Form Orig. Date: 29 Sept 2011 Rev: 0

STA. 1+41 FS. 0-1.1'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 7-Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		1.90
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.4
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.6
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		99.3
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0400
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 1+41 FS. 1.1-2.1
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 7 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		4.64
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		124.6
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.6
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		95.8
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0730
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 4+42 P.S. Wedge
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/ Date: 30 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ Mass of Measure (b) (lbs): _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.55
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		1.70
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		123.5
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.73
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		97.6
(h)	Volume of Wood	cu.ft.	|(f) – (g)| / (c)		0.0570
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: WOOD CUT TO RUN TEST

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 4+42 RS EL. 4.5-3.5
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 2 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. END Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		106.89
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		3.17
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		122.2
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.10
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		94.83
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0774
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: WOOD+FOIL = 3.29 # FOIL = 0.123 Δ = 3.17 (WOD)

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 4+42 RS. EL. 3.5 -2.5
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 2 DEC 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. END Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		106.89
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		6.22
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		122.4
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.10
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		91.98
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1040
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 21+95' 2-3'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 7 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		1.27
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		124.5
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.6
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		99.0
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0425
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 21+95 5-6'
OBJ

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 7 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		1.63
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		124.7
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.6
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		98.9
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0440
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 27+25 F.S. 2-3'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 2 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. END Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		106.89
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		1.02
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		126.0
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.10
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		100.78
(h)	Volume of Wood	cu.ft.	|(f) – (g)| / (c)		0.0217
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 29+50 F.S. 2-3'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 2 DEC 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. END Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		106.89
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		0.98
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		126.0
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.10
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		100.82
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0213
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 37+23 PS 1-2'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 2 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. END Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		106.89
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		1.39
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.9
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.10
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		100.31
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0261
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 40+51 FS 0-1'
OBJ. 1 of 2

Wood Volume Determination

Tested By: WAGUESPACK/ Date: 21 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ Mass of Measure (b) (lbs): _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		5.21
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		116.5
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		87.09
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1553
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TESTS

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 40+51 FS 0-1'
OBJ. 2 of 2

Wood Volume Determination

Tested By: WAGUESPACK / Date: 21 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ Mass of Measure (b) (lbs): _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		2.80
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		121.3
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		94.30
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0883
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TESTS

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 40+51 2-3'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 2 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. END PLATE

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		106.89
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		2.29
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.0
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.10
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		98.51
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0429
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 70+00 CL 2-3'
OBJ

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 2 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. END PLATE

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		106.89
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		0.49
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.5
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.10
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		100.81
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0214
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 71+39 PS. 0-1'
OBJ

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 8 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		1.94
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		121.5
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.6
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		95.36
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0767
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TEST

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 97+00 0-1'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 1 DEC 11

Equipment Used: Small Rect. – 1.0 cu. ft.
KANGO Hammer – 638S w/4 in x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.38
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		1.37
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		124.0
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.57
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		98.43
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0479
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 97+00 1-2'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 2 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. END PLATE

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		106.89
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		0.59
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.3
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.10
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		100.51
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0242
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 97+00 CL 2-3'
OBJ

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 12 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.59
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		4.91
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		118.2
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.77
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		89.09
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1364
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TEST

Form Orig. Date: 5 Oct 2011 Rev: 0

STA - 97+00 34'
OBJ. ②

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 1 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.38
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		3.10
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		122.6
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.57
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		95.30
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0770
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 104+51 0-1'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 1 DEC 11

Equipment Used: Small Rect. -1.0 cu ft
KANGO HAMMER-638S w/4in. x 5.5 in END PLATE

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.38
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		0.98
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.6
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.57
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		100.42
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0293
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 104+51 1-2'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 1 Dec 11

Equipment Used: Small Rect. - 1.0 cu.ft.
KANGO HAMMER-638S w/ 4in. x 5.5in END PLATE

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.38
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		0.85
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		126.4
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.57
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		101.35
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0207
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 104+51 2-3'
OBJ 4pcs

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 2 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. END Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		106.89
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		6.98
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		119.3
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.10
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		88.12
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1401
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: (Broke one Piece to fit)

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 104+51 3-4'
OBJ 2PCS

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 1 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4in. x 5.5in END Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.38
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		2.78
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		123.1
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.57
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		96.12
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0694
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 108+18 P.S. 0-1'
OBJ. 1 of 3

Wood Volume Determination

Tested By: WAGUESPACK/ **Date:** 30 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.55
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		4.62
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		116.4
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.73
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		87.58
(h)	Volume of Wood	cu.ft.	|(f) – (g)| / (c)		0.1502
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TESTS

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 108+18 P.S.
OBJ. 2 of 3

Wood Volume Determination

Tested By: WAGUESPACK/ Date: 30 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ Mass of Measure (b) (lbs): _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.55
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		6.14
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		120.1
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.73
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		89.76
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1299
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: WOOD CUT TO RUN TESTS

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 108+18 R.S.
OBJ. 3 of 3

Wood Volume Determination

Tested By: WAGUESPACK/ Date: 30 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ Mass of Measure (b) (lbs): _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.55
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		3.48
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		119.2
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.73
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		91.52
(h)	Volume of Wood	cu.ft.	|(f) – (g)| / (c)		0.1135
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TESTS

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 109+30 RS. Wedge
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 1 Dec 11

Equipment Used: Small Rect. - 1.0 cu ft.
KANGO Hammer - 638S w/ 4 in. x 5.5 in Eno Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.38
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		1.96
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.1
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.57
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		98.94
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0431
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 109+30 PS EL. 5.7-4.5
OBJ. ②

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 8 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		2.84
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		124.2
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.6
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		97.16
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0600
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 120+39 RS. 0-1' (#1)
OBJ. 1 of 2

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 8 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		5.02
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		121.7
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.6
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		92.48
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1035
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: cut wood to RUN TEST

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 120+39 PS, O-1' (#4)
OBJ (2 of 2)

Wood Volume Determination

Tested By: WAGUESPACK / ~~WOODS~~ SANDERS **Date:** 10 Dec 11

Equipment Used: Small Rect - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		4.29
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		120.1
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		91.61
(h)	Volume of Wood	cu.ft.	|(f) – (g)| / (c)		0.1133
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TEST

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 120+39 1-2'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 1 Dec 11

Equipment Used: Small Rect. - 1.0 cu.ft.
KANGO Hammer - 638S w/ 4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.38
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		1.87
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		126.2
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.57
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		100.13
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0320
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 120+39 @ 2-3'
OBS

Wood Volume Determination

Tested By: WAGUESPACK / ~~WOODS~~ SANDERS **Date:** 10 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		6.88
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		116.5
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		85.42
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1708
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft. 6.88 # T
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TEST (Mostly 2"x6")

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 120+39 P.S 3-4'
OFJ.

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 8 Dec 11

Equipment Used: Small Rect - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		2.23
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.1
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.6
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		98.67
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0459
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TEST

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 121+46 0-1'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 8 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		2.44
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		123.8
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.6
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		97.16
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0600
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TEST

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 121+46 P.S. 1-2'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 2 DEC 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. END PLATE

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		106.89
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		3.73
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.6
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.10
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		97.67
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0508
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 136+07 0-1'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 1 DEC 11

Equipment Used: Small Rect.- 1.0 cu.ft.
KANGO HAMMER-638 S w/ 4 in. x 5.5 in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.38
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		4.86
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		121.2
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.57
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		92.14
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1064
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 154+50 FS 2-3'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/ Date: 21 Dec

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ Mass of Measure (b) (lbs): _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		8.36
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		115.8
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		83.24
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1910
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TEST

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 154+50 FS. 3-4'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 7 Dec 11

Equipment Used: Small Rect - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		1.25
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.4
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.6
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		100.0
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0335
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 154+50 FS 4-5'
OBJ. 1 of 2

Wood Volume Determination

Tested By: WAGUESPACK/ Date: 21 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ Mass of Measure (b) (lbs): _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		7.35
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		116.0
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		84.45
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1798
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TESTS

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 154+50 FS 4-5'
OBS. 2 of 2

Wood Volume Determination

Tested By: WAGUESPACK / Date: 21 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ Mass of Measure (b) (lbs): _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		4.19
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		117.9
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		89.51
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1328
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TESTS

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 162+50 CL 3-4'
OBJ

Wood Volume Determination

Tested By: WAGUESPACK/WOODS Date: 7 Dec 11

Equipment Used: Small Rect - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ Mass of Measure (b) (lbs): _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		3.00
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		124.7
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.6
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		97.5
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0568
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 162+50 4-5'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/WOODS Date: 7 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ Mass of Measure (b) (lbs): _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		3.13
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.2
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.6
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		97.9
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0533
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 165+08 PS 1-2'
OBS. 1 of 1

Wood Volume Determination

Tested By: WAGUESPACK/ Date: 13 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ Mass of Measure (b) (lbs): _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		7.83
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		112.5
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		80.47
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.2168
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TEST

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 166+90 CL 1-2'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 7 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		0.84
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		123.6
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.6
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		98.6
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0469
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 166+90 2-3'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 1 Dec 11

Equipment Used: Small Rect. 1.0 cu ft.
KANGO HAMMER -6385 w/ 4.in x 5.5.in END Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.38
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		0.86
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.3
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.57
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		100.24
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0310
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 166+90 3-4'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 1 DEC 11

Equipment Used: Small Rect. - 1.0 cu.ft.
KANGO HAMMER-638S w/4in. x 5.5in END Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.38
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		3.45
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		123.3
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.57
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		95.65
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0738
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 192+08 PS. 2-3'
OBJ. 1 of 2

Wood Volume Determination

Tested By: WAGUESPACK / Date: 13 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ Mass of Measure (b) (lbs): _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		4.24
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		118.6
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		90.16
(h)	Volume of Wood	cu.ft.	|(f) – (g)| / (c)		0.1267
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TEST

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 179+08 PS 2-3'
OBJ 2 of 2

Wood Volume Determination

Tested By: WAGUESPACK/ Date: 13 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ Mass of Measure (b) (lbs): _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		4.08
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		120.1
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		91.82
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1113
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TEST

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 174400 1.5-2'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 1 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. END Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.38
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		2.41
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.5
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.57
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		98.89
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0436
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 174+00 CL 2-3'
OBJ

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 12 Dec 11

Equipment Used: Small Rect - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.59
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		5.48
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		120.0
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.77
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		90.32
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1250
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TEST

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 174+00 ℄ 3'3 4'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 2 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. END Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		106.89
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		3.32
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		123.7
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.10
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		96.18
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0647
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA- 179+80 0-1'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 1 Dec 11

Equipment Used: Small Rect. - 1.0 cu.ft.
KANGO HAMMER - 638S W/ 4in x 5.5in End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.38
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		3.78
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		123.6
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.57
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		95.62
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0740
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 179+80 ℄ 1'-2'
OBJ. 1 of 2

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 12 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.59
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		6.67
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		115.0
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.77
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		84.13
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1825
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TEST

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 179+80 @ 1-2'
OBS. 2 of 2

Wood Volume Determination

Tested By: WAGUESPACK / Date: 13 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/ 4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ Mass of Measure (b) (lbs): _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.62
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		4.36
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		120.8
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.8
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		92.24
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1074
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: Broke wood to Run Test - (ADD RESULTS to 12 Dec Run)

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 179+80 2-3'
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 1 Dec 11

Equipment Used: Small Rect. - 1.0 cu.ft.
KANGO HAMMER - 638S w/ 4in x 5.5in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.38
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		2.35
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.1
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.57
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		98.55
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0468
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 179+80, 3-4'
OBJ. 4 pcs 4L
1 of 2

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 7 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		5.86
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		119.9
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.6
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		89.8
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1281
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 179+80 3-4'
OBJ. 2 of 2
(IPC)

KIM LABEL

Wood Volume Determination

Tested By: WAGUESPACK / GAVRILESCU **Date:** 1 DEC 11

Equipment Used: Small Rect. - 1.0 cu.ft.
KANGO Hammer - 638S w/4in x 5.5in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.38
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		3.55
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		123.8
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.57
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		96.05
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0700
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 180+01 PS. 1.5-2'
(187 offset)
OBJ.

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 8 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.
KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.41
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		4.19
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		120.1
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.6
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		91.71
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.1107
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT SAMPLE to RUN TEST

Form Orig. Date: 5 Oct 2011 Rev: 0

STA 180+01 2.5-3'
OBJ.
(1)

Wood Volume Determination

Tested By: WAGUESPACK/GAVRILESCU **Date:** 1 Dec 11

Equipment Used: Small Rect. - 1.0 cu. FT.
KANGO Hammer - 638S w/ 4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: **In House Wood Volume Determination Procedure**

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.38
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		2.50
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		125.20
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.57
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		98.50
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.0472
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: _____

Form Orig. Date: 5 Oct 2011 Rev: 0

STA. 180+01 PS 18' OFFSET 3-3.5
OBJ.
(2)

Wood Volume Determination

Tested By: WAGUESPACK/WOODS **Date:** 12 Dec 11

Equipment Used: Small Rect. - 1.0 cu. ft.

KANGO HAMMER - 638S w/4 in. x 5.5 in. End Plate

Volume Measure (a) (cu.ft.): _____ **Mass of Measure (b) (lbs):** _____

Verification Procedure: In House Wood Volume Determination Procedure

(a)	Volume of Measure	cu.ft.	Determined annually ASTM C29 paragraph 8		0.9645
(b)	Mass of Measure	lbs.	Determined annually ASTM C29 paragraph 8		24.2
(c)	Average Densified Sand in Measure	pcf	Minimum 2 determinations from Step 4) of Procedure		107.59
(d)	Mass of Sample Wood	lbs.	As-received moist wood weight		9.45
(e)	Densified Sand, Wood, and Measure	lbs.	Step 5) of Procedure		113.5
(f)	Densified Sand Mass Only (no wood)	lbs.	(c) X (a)		103.77
(g)	Densified Sand Mass Only (with wood)	lbs.	(e) – (b) – (d)		79.85
(h)	Volume of Wood	cu.ft.	[(f) – (g)] / (c)		0.2223
(i)	Volume Excavated Hole	cu.yds.	(i) X 27	cu.ft.	
(j)	Volume of Wood	%	100 x (h) / (i)		

(a) Selected Measure Volume => cubic feet (cu.ft.)
(b) Selected Measure Mass (weight) => pounds (lbs.)
(c) Average mass per unit volume of densified sand only => pound/cubic feet (pcf)
(d) Mass of Sample Wood Pieces => lbs
(e) Determined densified sand, wood, & measure mass => lbs
(f) Densified sand only mass (no wood) = (c) x (a) => lbs
(g) Densified sand only mass (with wood) = (e) – (b) – (d) => lbs
(h) Volume of wood (from densified sand test) = [(f) – (g)] / (c) => cu.ft.
(i) Volume of excavated hole ***(determined)*** => cu.yds. x 27 => cu.ft.
(j) % tested volume wood = 100 x (h) / (i) => %

Remarks: CUT WOOD TO RUN TEST

Form Orig. Date: 5 Oct 2011 Rev: 0