


SCDOT

DRILLED SHAFT LOG (REV 06-03-02)

Project Name _____	Page	1	of	6
File No. _____	Bent No.	_____		
Contractor _____	Shaft No.	_____		
Completed By Contractor DS Foreman - _____	Date	/	/	Station
Reviewed By SCDOT Inspector - _____	Date	/	/	Offset

		Construction	Temporary	
Date Cased _____	Casing Type: _____	_____	_____	
Date Opened _____	Casing Dimension (OD): _____	_____	_____	
Date Poured _____	Bottom of Casing Elevation (FT) _____	_____	_____	
<p style="text-align: center;">Elevation (ft)</p> <div style="border: 1px solid black; height: 100%; width: 100%;"></div>	Top of Casing Elevation (FT) _____	_____	_____	
	Diameter of Rock Socket (IN) _____	_____	_____	
	Diameter of Shaft (IN) _____	_____	_____	
	Mud-line/Ground Surface Elevation (FT) _____	_____	_____	
	Wet & Dry Shaft Length (FT) _____	_____	_____	
	Rock Socket Length (FT) _____	_____	_____	
	Top of Shaft Elevation (FT) _____	_____	_____	
	Tip Elevation (FT) _____	_____	_____	
	Constructed Shaft Length (FT) _____	_____	_____	
	Testing/Other: _____	_____	_____	
	Volume of Concrete: _____	Theoretical (VT) CY _____	_____	_____
	OP = VP-VT = _____ UP = VT - VP= _____	Actual (VP) CY _____	_____	_____
	Reinforcement Cage Installed: _____	Type _____	_____	_____
	Duration of Pour (min) _____	_____	_____	_____
	Legend			
TOC	Top of Casing	<div style="border: 1px solid black; width: 20px; height: 10px; display: inline-block;"></div>	Sand	
TOG	Top of Ground	<div style="border: 1px solid black; width: 20px; height: 10px; display: inline-block;"></div>	Silt	
TOS	Top of Shaft	<div style="border: 1px solid black; width: 20px; height: 10px; display: inline-block;"></div>	Clay	
TOR	Top of Rock	<div style="border: 1px solid black; width: 20px; height: 10px; display: inline-block;"></div>	Rock	
BOC	Bottom of Casing	<div style="border: 1px solid black; width: 20px; height: 10px; display: inline-block;"></div>		
BOS	Bottom of Shaft	<div style="border: 1px solid black; width: 20px; height: 10px; display: inline-block;"></div>		
BOR	Bottom of Rock	<div style="border: 1px solid black; width: 20px; height: 10px; display: inline-block;"></div>		
 ← Water Level				
Completed by _____	_____			
Contractor _____	DS Foreman/Engineer			
Reviewed by _____	_____			
SCDOT _____	Inspector/Engineer			
Notes: _____	_____			
Shaft location variance at top: _____	_____			

HOW TO COMPLETE THE DRILLED SHAFT LOG



Project Name _____	Page _____ of _____
Project No. _____	Plan No. _____
Contract or _____	Sheet No. _____
Inspected By _____	Date / / _____
Approved By _____	Date / / _____

Date Cores _____	Coating Type _____
Date Opened _____	Coating Dimension _____
Date Poured _____	Bottom of Coating Elevation (ft) _____
Diameter (ft) 	Diameter of Rock Socket (in) _____
	Diameter of Overburden Shaft (in) _____
	Median Ground Surface Elevation (ft) _____
	Overburden Shaft Length (ft) _____
	Rock Socket Length (ft) _____
	Cut-off Elevation (ft) _____
	Top Elevation (ft) _____
	Constructed Shaft Length (ft) _____
	Reeling Cycle _____
	Volume of Concrete: Theoretical (cy) _____
Actual (cy) _____	
Reinforcement Cage Installed: Y/N _____	
Duration of Pour (min) _____	
Lenses: FOC Top of Coating <input type="checkbox"/> Sand FOG Top of Ground <input type="checkbox"/> Silt FOS Top of Shaft <input type="checkbox"/> Clay FOR Top of Rock <input type="checkbox"/> Rock BOC Bottom of Coating <input type="checkbox"/> BOS Bottom of Shaft <input type="checkbox"/>	Water Level _____ Inspected by: _____ Field Engineer Approved by: _____ Project Engineer Distribution _____

Fill in every blank on the form. If it does not apply put an "N/A" or a long dash.

Use pencil – but never erase. If you need to change something, strike a single line through the item and insert the correct information above it. If there is insufficient room to make a note, footnote the item and go to the bottom of the page, or use a separate page.

1. Heading:
 - Fill in before drilling starts.
 - Be sure to print your name and the start date of drilling.
 - The Geotechnical Engineer will sign approval line.
2. Shaft Data: - Fill in appropriate dates, elevations, and diameters.
3. Concrete Data: Record data from the Concrete Volumes form.
4. Construct Shaft Illustration using the symbols provided.
5. Fill in "Inspected by" and "Distribution".



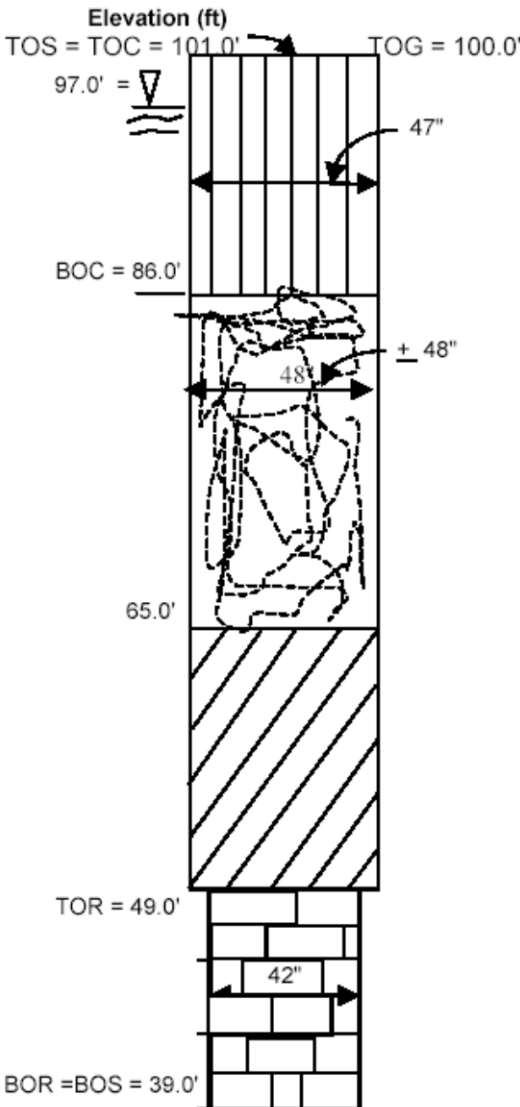
DRILLED SHAFT LOG (REV 06-03-02)
SAMPLE 1 Construction Casing

Project Name	Replace Bridge over Cooper Creek along US-322	Page	1	of	6
File No.	4.995	Bent No.	3		
Contractor	Drilled Shaft, Inc.	Shaft No.	3		
Completed By	DS Foreman - John Q. Doe	Date	06/05/02	Station	508 + 36
Reviewed By	Inspector - John Smith	Date	06/05/02	Offset	24 FT. Right

Date Cased 06/04/02
 Date Opened 06/04/02
 Date Poured 06/05/02

Casing Type:
 Casing Dimension (OD):
 Bottom of Casing Elevation (FT)
 Top of Casing Elevation (FT)
 Diameter of Rock Socket (IN)
 Diameter of Shaft (IN)
 Mud-line/Ground Surface Elev. (FT)
 Wet & Dry Shaft Length (FT)
 Rock Socket Length (FT)
 Top of Shaft Elevation (FT)
 Tip Elevation (FT)
 Constructed Shaft Length (FT)

Construction	Temporary
Steel	
48.0 IN.	
86.0 FT. msl	
101.0 FT. msl	
42.0 IN.	
37 Ft. @ +48.0 IN. & 15 FT. @ 47 IN.	
100.0 FT. msl	
52.0 FT.	
10.0 FT. @ 42IN.	
101.0 FT. msl	
39.0 FT. msl	
62.0 FT.	



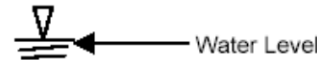
Testing/Other: Slurry, Slump, Air, Compression Cylinders, & CSL

Volume of Concrete:
 OP = VP - VT = 0.6 CY UP = VT - VP=
 Reinforcement Cage Installed:
 Duration of Pour (min)

Theoretical (VT) CY 27.2
 Actual (VP) CY 27.8
 Type Spiral
 100 Min.

Legend

TOC	Top of Casing		Sand
TOG	Top of Ground		Silt
TOS	Top of Shaft		Clay
TOR	Top of Rock		Rock
BOC	Bottom of Casing		
BOS	Bottom of Shaft		
BOR	Bottom of Rock		



Completed by _____
 Contractor DS Foreman/Engineer - John Q Doe
 Reviewed by _____
 SCDOT Inspector/Engineer - John Smith

Notes:
 Shaft location variance at top: 2" after plan station & 1" right.



DRILLED SHAFT LOG (REV 06-03-02)
SAMPLE 2 Temporary Casing

Project Name	Replace Bridge over Cooper Creek along US-322	Page	1	of	6
File No.	4.995	Bent No.	6		
Contractor	Drilled Shaft, Inc.	Shaft No.	3		
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/05/02	Station	508 + 36
Reviewed By SCDOT	Inspector - Jane Smith	Date	06/05/02	Offset	24 FT. Right

<p>Date Cased <u>06/04/02</u></p> <p>Date Opened <u>06/04/02</u></p> <p>Date Poured <u>06/05/02</u></p>	<p>Casing Type:</p> <p>Casing Dimension (OD):</p> <p>Bottom of Casing Elevation (FT)</p> <p>Top of Casing Elevation (FT)</p> <p>Diameter of Rock Socket (IN)</p> <p>Diameter of Shaft (IN)</p> <p>Mud-line/Ground Surface Elev. (FT)</p> <p>Wet & Dry Shaft Length (FT)</p> <p>Rock Socket Length (FT)</p> <p>Top of Shaft Elevation (FT)</p> <p>Tip Elevation (FT)</p> <p>Constructed Shaft Length (FT)</p> <p>Testing/Other: Slurry, Slump, Air, Compression Cylinders, & CSL</p> <p>Volume of Concrete:</p> <p>OP = VP-VT = <u>0.5 CY</u> UP = VT - VP =</p> <p>Reinforcement Cage Installed:</p> <p>Duration of Pour (min)</p>	<table border="1"> <thead> <tr> <th>Construction</th> <th>Temporary</th> </tr> </thead> <tbody> <tr> <td></td> <td>Steel</td> </tr> <tr> <td></td> <td>48.0 IN.</td> </tr> <tr> <td></td> <td>86.0 FT.</td> </tr> <tr> <td></td> <td>101.0 FT.</td> </tr> <tr> <td></td> <td>42.0 IN.</td> </tr> <tr> <td></td> <td>+ 48.0 IN.</td> </tr> <tr> <td></td> <td>100.0 FT. msl</td> </tr> <tr> <td></td> <td>51.0 FT.</td> </tr> <tr> <td></td> <td>10.0 FT.</td> </tr> <tr> <td></td> <td>100.0 FT. msl</td> </tr> <tr> <td></td> <td>39.0 FT. msl</td> </tr> <tr> <td></td> <td>61.0 FT.</td> </tr> </tbody> </table> <p>Type: <u>Welded Hoops</u></p> <p>100 Min.</p>	Construction	Temporary		Steel		48.0 IN.		86.0 FT.		101.0 FT.		42.0 IN.		+ 48.0 IN.		100.0 FT. msl		51.0 FT.		10.0 FT.		100.0 FT. msl		39.0 FT. msl		61.0 FT.
Construction	Temporary																											
	Steel																											
	48.0 IN.																											
	86.0 FT.																											
	101.0 FT.																											
	42.0 IN.																											
	+ 48.0 IN.																											
	100.0 FT. msl																											
	51.0 FT.																											
	10.0 FT.																											
	100.0 FT. msl																											
	39.0 FT. msl																											
	61.0 FT.																											

The diagram shows a vertical cross-section of the drilled shaft. At the top, the casing is shown with a diameter of 48 inches. The casing extends to an elevation of 101.0 feet (TOTC). Below the casing, the shaft is shown with a diameter of 42 inches. The shaft extends to an elevation of 39.0 feet (BOR). The rock socket is shown with a diameter of 42 inches and extends to an elevation of 39.0 feet. The ground surface is at an elevation of 100.0 feet (TOG). The water level is indicated by a triangle symbol at an elevation of 97.0 feet. The casing is shown with a diameter of 48 inches and a length of 65.0 feet. The shaft is shown with a diameter of 42 inches and a length of 61.0 feet. The rock socket is shown with a diameter of 42 inches and a length of 10.0 feet. The casing is shown with a diameter of 48 inches and a length of 65.0 feet. The shaft is shown with a diameter of 42 inches and a length of 61.0 feet. The rock socket is shown with a diameter of 42 inches and a length of 10.0 feet.

Legend

TOC	Top of Casing		Sand
TOG	Top of Ground		Silt
TOS	Top of Shaft		Clay
TOR	Top of Rock		Rock
BOC	Bottom of Casing		
BOS	Bottom of Shaft		
BOR	Bottom of Rock		

Water Level

Completed by	DS Foreman/Engineer - John Q Doe
Reviewed by	Inspector/Engineer - Jane Smith
Notes:	
Shaft location variance at top: 1" after plan station & 4" left. Called Bridge Construction Engineer prior to pour. Received verbal approval to cast concrete from BCE. Contractor told to submit letter covering this shaft variance.	

HOW TO COMPLETE THE DRILLED SHAFT EXCAVATION LOG



Project Name _____				Page _____ of _____	
Project No. _____				Date _____	
Contract No. _____				Sheet No. _____	
Inspected By _____				Date _____	
Approved By _____				Date _____	
Station _____				Sheet _____	
Notes _____				Notes _____	
Casing Information					
ID _____	OD _____	Top Elev. _____	Length _____	Soil Auger Diam. _____	Ground Surface Elev. _____
_____				Water Table Elev. _____	
_____				Reference Elev. _____	
_____				Drilling Mud _____	
Notes _____					
Depth	Elev.	Time	Soil Description and Notes		
			In		
			Out		
			In		
			Out		
			In		
			Out		
			In		
			Out		
			In		
			Out		
			In		
			Out		
			In		
			Out		
			In		
			Out		
			In		
			Out		
			In		
			Out		

Fill in every blank on the form. If it does not apply put an "N/A" or a long dash.

Use pencil – but never erase. If you need to change something, strike a single line through the item and insert the correct information above it. If there is insufficient room to make a note, footnote the item and go to the bottom of the page, or use a separate page.

1. **Heading:**
 - Fill in before drilling starts.
 - Be sure to print your name and the start date for drilling.
 - The Geotechnical Engineer will sign approval line.

2. **Casing:**
 - Measure Length (L) in the field.
 - Surveyor provides Top of Casing elevation (TE).
 - Compute bottom elevation (BE): $TE-L=BE$

3. **Site Data**
 - Soil Auger diameter – measure and record in inches.
 - Ground surface elev. – provided by surveyor.
 - Water table elev. – measure w/tape in hole before slurry is introduced (if applicable).
 - Water table may need to be estimated from seepage in dry hole method.
 - Reference Elevation – provided by surveyor.
 - Drill mud – If used, complete the "**Slurry Inspection Log**"; compare to Installation Plan

4. **Depth/Elevation:**
 - Depth (D) can be measured by:
 - 1) Contractor has kelly bar marked (spot checking only)
 - 2) Weighted tape (for accurate measurements)
 Reference elevation is always known; i.e., template, top of casing, or top of ground.

 - Elevation (E) – compute $TE-D=E$
 - Enter Depth/Elev. For EVERY change in the soil/rock condition.

5. **Time:**
 - May use military or 24 hour clock. Be consistent and correct! Remember that shaft drilling can occur over several days, so be sure to mark date changes.

6. **Material:**
 - Use this form to record all activity during shaft excavation. Label all major soil strata.



**DRILLED SHAFT EXCAVATION LOG (REV 06-03-02)
SAMPLE 1 Construction Casing**

Project Name	Replace Bridge over Cooper Creek along US-322	Page	2	of	6
File No.	4.995	Bent No.	3		
Contractor	Drilled Shaft, Inc.	Shaft No.	3		
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/03/02	Station	508 + 36
Reviewed By SCDOT	Inspector - John Smith	Date	06/03/02	Offset	24 Ft. Right

Note: Preaugering not allowed when using construction casing.

Casing Information: Construction <input checked="" type="checkbox"/> Temporary <input type="checkbox"/>					Soil Auger Diam.	46"
ID	OD	Top Elev.	Length	Bot. Elev.	Rock Core Diam.	42"
47"	48"	101.0 MSL	15'	86.0 MSL	Ground Surface Elev.	100.0 MSL
					Water Table Elev.	97.0 MSL
					Reference Elev.	101.0 MSL
					Drilling Mud	Slurry
Notes	Switched to 42" Rock Core @ 52.0' (49.0' MSL) at 1:50 pm.					

Depth (Feet)	Elev. (Ft. MSL)	Time		Soil Description and Notes
1.0	100.0	7:30 am	In	Tan Silty Sand
15.0	86.0	9:00 am	Out	Tan Silty Sand
15.0	86.0	9:10 am	In	Dark Tan Sand
36.0	65.0	11:30 am	Out	Dark Tan Sand
36.0	65.0	11:40 am	In	Dense Silty Sand (PWR) w/Mica
52.0	49.0	1:30 pm	Out	Dense Silty Sand (PWR) w/Mica
52.0	49.0	1:50 pm	In	Very Dense Rock (Granite)
61.0	40.0	4:50 pm	Out	Very Dense Rock (Granite)
61.0	40.0	7:15 am	In	Very Dense Rock (Granite) Continued drilling from previous day
62.0	39.0	7:30 am	Out	Very Dense Rock (Granite) Continued drilling from previous day
			In	
			Out	
			In	
			Out	
			In	
			Out	
			In	
			Out	



**DRILLED SHAFT EXCAVATION LOG (REV 06-03-02)
SAMPLE 2 Temporary Casing**

Project Name	Replace Bridge over Cooper Creek along US-322	Page	2	of	6
File No.	4,995	Bent No.			6
Contractor	Drilled Shaft, Inc.	Shaft No.			3
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/03/02	Station	508 + 36
Reviewed By SCDOT	Inspector - Jane Smith	Date	06/03/02	Offset	24 Ft. Right

Note: Preaugering not allowed when using construction casing.

Casing Information: Construction _____ Temporary <u>X</u>					Soil Auger Diam.	46"
ID	OD	Top Elev.	Length	Bot. Elev.	Rock Core Diam.	42"
47"	48"	101.0 MSL	15'	86.0 MSL	Ground Surface Elev.	100.0 MSL
					Water Table Elev.	97.0 MSL
					Reference Elev.	101.0 MSL
					Drilling Mud	Slurry
Notes	Switched to 42" Rock Core @ 52.0' (49.0' MSL) at 1:50 pm.					

Depth (Feet)	Elev. (Ft. MSL)	Time		Soil Description and Notes
1	100.0	7:30 am	In	Tan Silty Sand
15.0	86.0	9:00 am	Out	Tan Silty Sand
15.0	86.0	9:10 am	In	Dark Tan Sand
36.0	65.0	11:30 am	Out	Dark Tan Sand
36.0	65.0	11:40 am	In	Dense Silty Sand (PWR) w/Mica
52.0	49.0	1:30 pm	Out	Dense Silty Sand (PWR) w/Mica
52.0	49.0	1:50 pm	In	Very Dense Rock (Granite)
61.0	40.0	4:50 pm	Out	Very Dense Rock (Granite)
61.0	40.0	7:15 am	In	Very Dense Rock (Granite) Continued drilling from previous day
62.0	39.0	7:30 am	Out	Very Dense Rock (Granite) Continued drilling from previous day
			In	
			Out	
			In	
			Out	
			In	
			Out	
			In	
			Out	



SLURRY INSPECTION LOG (REV 06-03-02)

Project Name			
File Number			
Bent No.	Shaft No.	Brand	Type
Water Source: *		Mineral Type	Proportions
Date of Initial Hydration	/ /	Additives	
	Time		

TEST PROPERTIES

Sampling	Before Introduction of Slurry	First 8 Hours During Construction **				Additional Testing		At End of Excavation	Before Concreting Test 1	Before Concreting Test 2
		Test 1	Test 2	Test 3	Test 4	Test 1	Test 2			
Date:										
Time:										
Test Depth at Levels:	Holding Tank						At Bottom	At Bottom	At Bottom	
Density										
Viscosity										
% Sand										
pH										
Cake / Filtrate	N/A									

Notes: * Salt water shall not be used to hydrate the slurry or stabilize the excavation.

** A minimum of 4 sets of tests shall be made during the first 8 hours of slurry use. Slurry sampling and testing shall be observed by the Engineer. When the results show consistent behavior, the testing frequency may be decreased to 1 set every 4 hours of slurry use.

Contractor DS Foreman:	Date: / /	Page 3	of 6
SCDOT Inspector:	Date: / /		

HOW TO COMPLETE THE SLURRY INSPECTION LOG

SLURRY INSPECTION LOG

Project No. _____	1	Composition:	Brand	Type	Proportions
Drilled Shaft No. _____		Mineral Type			
Start Location _____		Additives			
Water Source: " _____					

TEST PROPERTIES

Sampling	Before Introduction of Slurry	First 8 Hours During Construction *				Additional Testing		At End of Excavation	Before Concreting Test 1	Before Concreting Test 2
		Test 1	Test 2	Test 3	Test 4	Test 1	Test 2			
Date:										
Time:										
Properties	Test Depth at Level:		3					At Bottom	At Bottom	At Bottom
Density										
Viscosity										
% Sand										
pH										
Cake / Filtrate										

Notes: * A minimum of 4 sets of tests shall be made during the first 8 hours of slurry use. Slurry sampling and testing shall be observed by the Engineer. When the results show consistent behavior, the testing frequency may be decreased to 1 set every 4 hours of slurry use.

** Salt water shall not be used to hydrate the slurry _____ the excavation.

4

Contractor Representative: _____ **5** _____ Date: / /

State Inspector: _____ Date: / /

1. Heading: - Fill in before drilling starts.
- The Project Resident Engineer will sign approval line.
2. Slurry Data: - Fill in appropriate brands, types, and proportion.
3. Test Data: - Record test data as the testing Inspector performs the tests.
- Note the depth at which the samples were obtained.
- Make sure that a minimum of 4 tests are performed within the first 8 hours of slurry use.
4. Notes: Record any unusual events or results.
5. Fill in "Contractor Representative" and "State Inspector".

Fill in every blank on the form. If it does not apply put an "N/A" or a long dash.

Use pencil – but never erase. If you need to change something, strike a single line through the item and insert the correct information above it. If there is insufficient room to make a note, footnote the item and go to the bottom of the page, or use a separate page.



**SLURRY INSPECTION LOG (REV 06-03-02)
SAMPLE 1 Construction Casing**

Project Name Replace Bridge over Cooper Creek along US-322

File Number 4.995

Bent No. 3 Shaft No. 3

Water Source: * Hydrant (City water)

Date of Initial Hydration 06/03/02 Time 9:00 am

Composition:	Brand	Type	Proportions
Mineral Type	Augua Gel	Bentonite	1400 LBS / 5000 GAL
Additives			

TEST PROPERTIES

Sampling	Before Introduction of Slurry	First 8 Hours During Construction **				Additional Testing		At End of Excavation	Before Concreting Test 1	Before Concreting Test 2
		Test 1	Test 2	Test 3	Test 4	Test 1	Test 2			
Date:	06/04/02	06/04/02	06/04/02	06/04/02	06/04/02		06/05/02	06/05/02	06/05/02	
Time:	11:00 am	1:30 pm	2:30 pm	4:00 pm	5:00 pm		7:30 am	8:15 am	9:20 am	
Test Depth at Levels:	Holding Tank	50 FT	53 FT	58 FT	60 FT		At Bottom	At Bottom	At Bottom	
Density	65	67.1	67.3	65.8	66.3		69.1	66.1	66.3	
Viscosity	33	37	38	36	37		42	38	37	
% Sand	0%	3%	4%	2%	2.5%		10%	2%	2%	
pH	10	9	9	9	9		9	10	10	

Notes: * Salt water shall not be used to hydrate the slurry or stabilize the excavation.

** A minimum of 4 sets of tests shall be made during the first 8 hours of slurry use. Slurry sampling and testing shall be observed by the Engineer. When the results show consistent behavior, the testing frequency may be decreased to 1 set every 4 hours of slurry use.

Note: Side of shaft caked. Cleaned shaft sides.

Contractor DS Foreman: John Q. Doe

Date: 06/05/02

SCDOT Inspector: John Smith

Date: 06/05/02

Page 3 of 6



**SLURRY INSPECTION LOG (REV 06-03-02)
SAMPLE 2 Temporary Casing**

Project Name Replace Bridge over Cooper Creek along US-322

File Number 4.995

Bent No. 6 Shaft No. 3

Water Source: * Hydrant (City water)

Date of Initial Hydration 06/03/02 Time 9:00 am

Composition:	Brand	Type	Proportions
Mineral Type	Augua Gel	Bentonite	1400 LBS / 5000 GAL
Additives			

TEST PROPERTIES

Sampling	Before Introduction of Slurry	First 8 Hours During Construction **				Additional Testing		At End of Excavation	Before Concreting Test 1	Before Concreting Test 2
		Test 1	Test 2	Test 3	Test 4	Test 1	Test 2			
Date:	06/04/02	06/04/02	06/04/02	06/04/02	06/04/02		06/05/02	06/05/02	06/05/02	
Time:	11:00 am	1:30 pm	2:30 pm	4:00 pm	5:00 pm		7:30 am	8:15 am	9:20 am	
Test Depth at Levels:	Holding Tank	50 FT	53 FT	58 FT	60 FT		At Bottom	At Bottom	At Bottom	
Density	65	67.1	67.3	65.8	66.3		69.1	66.1	66.3	
Viscosity	33	37	38	36	37		42	38	37	
% Sand	0%	3%	4%	2%	2.5%		10%	2%	2%	
pH	10	9	9	9	9		9	10	10	

Notes: * Salt water shall not be used to hydrate the slurry or stabilize the excavation.

** A minimum of 4 sets of tests shall be made during the first 8 hours of slurry use. Slurry sampling and testing shall be observed by the Engineer. When the results show consistent behavior, the testing frequency may be decreased to 1 set every 4 hours of slurry use.

Note: Side of shaft caked. Cleaned shaft sides.

Contractor DS Foreman: John Q. Doe

Date: 06/05/02

SCDOT Inspector: Jane Smith

Date: 06/05/02

Page 3 of 6



DRILLED SHAFT INSPECTION LOG (REV 06-03-02)

Project Name	_____	Page	4	of	6
File No.	_____	Bent No.	_____		
Contractor	_____	Shaft No.	_____		
Completed By Contractor	DS Foreman - _____	Date	_____	Station	_____
Reviewed By SCDOT	Inspector - _____	Date	_____	Offset	_____

Type of Drilling Fluid	_____	Shaft Plumbness Check/4'	_____
DS Location Variance at Top	_____	Rebar Cage: Proper # Vert. Bars	_____
Bottom Cleanout Method	_____	Proper # Horiz. Bars	_____
Time/Date Final Cleanout	_____	Side Spacers	_____
Shaft Bottom Elev.	_____	Bottom Spacers	_____
Est. Shaft Bottom Dia.	_____	Ties & Connections	_____

* Based on Compass Direction

Inspected By: _____	Visual _____	Sounding _____	N *	Test just prior to placing Rebar cage <input type="checkbox"/> (inches)
Time Test Started _____				Test just prior to placing concrete <input type="checkbox"/> (inches)
Time Test Finished _____				* Direction
Time Test Started _____				
Time Test Finished _____				

**Note: 50% of base shall have < 1/2 Inch of sediment.
No area of shaft bottom shall be more than 1 1/2 Inches.**

Notes	Comments/Recommendations
_____	_____
_____	_____
_____	_____

Results: _____	Satisfactory	DS Foreman _____	Time _____	Date _____
_____	Unsatisfactory	SCDOT Inspector _____		

NOTE: Specification Tolerances - Location Variance at Top = 3 inches Max. Vertical (Plumbness) = 1 inch per 4 Ft. Max.

HOW TO COMPLETE THE DRILLED SHAFT INSPECTION LOG



Fill in every blank on the form. If it does not apply put an "N/A" or a long dash.

Use pencil – but never erase. If you need to change something, strike a single line through the item and insert the correct information above it. If there is insufficient room to make a note, footnote the item and go to the bottom of the page, or use a separate page.

1. **Heading:**
 - Fill in before drilling starts.
 - Be sure to print your name and the start date of drilling.
 - The Project Resident Engineer or designated representative will sign approval line.

2. **Shaft Status:**

Drill Fluid Check – Responsibility of Contractor. Record density check performed by Contractor or Inspector.

Type of Drill Fluid – record	
a)	Natural
b)	Mineral (commercial)
c)	Plain water
Remember: Polymer slurry not allowed	

 - Bottom Cleanout Method: Observe and record equipment type (i.e., cleanout bucket, air lift, submersible pump, etc.). Must match Installation Plan.
 - Time/Date Final Cleanout: Record when last cleanout performed prior to rebar cage placement.
 - Shaft Bottom Elevation – Use weighted tape to measure; record.
 - Estimate Shaft Bottom Diameter – record auger diameter.

3. **Cage Check:**
 - Reinforcing cage usually checked by others.
 - Proper number of Vertical bars – count and record # of vertical bars in hole; compare to plan.
 - Epoxy – you should never see coated rebar

4. **Shaft Cleanliness:** – check procedure being used, record
 - 1) Using S.I.D., visually inspect the shaft bottom in each of a minimum of 5 locations as shown on form.
 - 2) Using a weighted tape, sound the shaft in each of a minimum of 5 locations as shown on form. "Feel" for hard bottom – it translates to clean hole. Remember specifications.

5. **Record Results:**

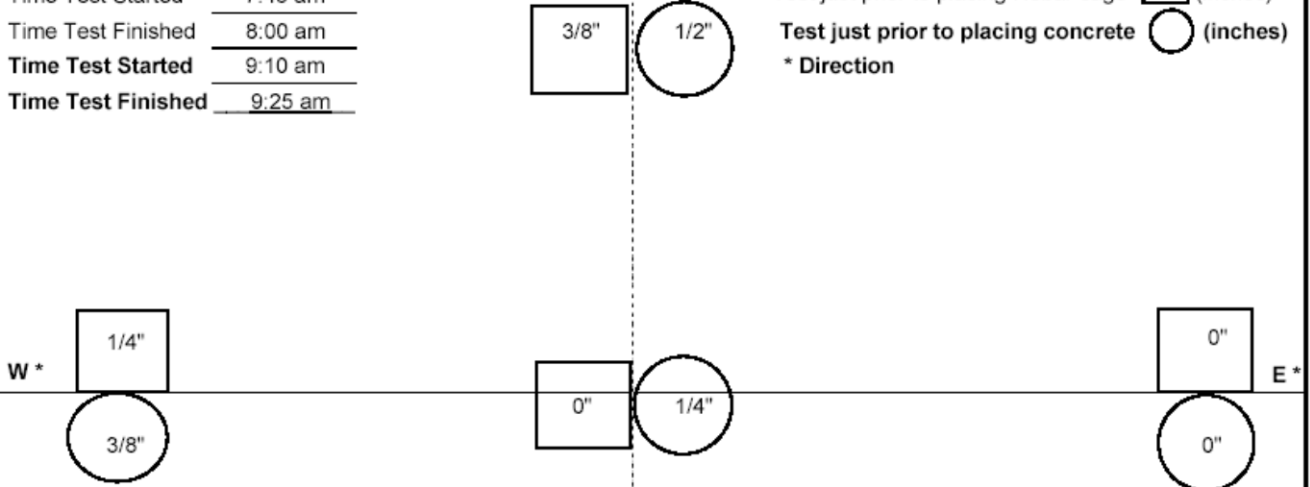


DRILLED SHAFT INSPECTION LOG (REV 06-03-02)
SAMPLE 1 Construction Casing

Project Name	<u>Replace Bridge over Cooper Creek along US-322</u>	Page	<u>4</u>	of	<u>6</u>
File No.	<u>4.995</u>	Bent No.	<u>3</u>		
Contractor	<u>Drilled Shaft, Inc.</u>	Shaft No.	<u>3</u>		
Completed By Contractor	<u>DS Foreman - John Q. Doe</u>	Date	<u>06/05/02</u>	Station	<u>508 + 36</u>
Reviewed By SCDOT	<u>Inspector - John Smith</u>	Date	<u>06/05/02</u>	Offset	<u>24 FT. Right</u>

Type of Drilling Fluid	<u>Bentonite</u>	Shaft Plumbness Check/4'	<u>1/2 In. per 4 Ft.</u>
DS Location Variance at Top	<u>2" After Sta. & 1" Right</u>	Rebar Cage: Proper # Vert. Bars	<u>16 EA # 36 Bars</u>
Bottom Cleanout Method	<u>Airlift</u>	Proper # Horiz. Bars	<u># 19 Bar @ 4 3/8" Spiral</u>
Time/Date Final Cleanout	<u>7:45 am on 06/05/02</u>	Side Spacers	<u>4 EA every 10 Ft.</u>
Shaft Bottom Elev.	<u>39.0 msl</u>	Bottom Spacers	<u>16 EA @ 6" Length</u>
Est. Shaft Bottom Dia.	<u>42 Inches</u>	Ties & Connections	<u>Checked and okay.</u>

Inspected By:	<u>JQD</u>	Visual	<u> </u>	Sounding	<u>X</u>	N *	* Based on Compass Direction
Time Test Started	<u>7:45 am</u>						
Time Test Finished	<u>8:00 am</u>						
Time Test Started	<u>9:10 am</u>						
Time Test Finished	<u>9:25 am</u>						



Note: 50% of base shall have < 1/2 Inch of sediment.
No area of shaft bottom shall be more than 1 1/2 Inches.

Notes	Comments/Recommendations
<u>80% area < 1/2", first test okay.</u>	<u>Rebar cage placed & concrete ordered after first test.</u>
<u>60% area < 1/2", second test okay.</u>	<u>Concrete placed after second test was okay.</u>

Results:	<u>X</u>	Satisfactory	DS Foreman	<u>John Q Doe</u>	
	<u> </u>	Unsatisfactory	SCDOT Inspector	<u>John Smith</u>	Time <u>9:25 am</u> Date <u>06/05/02</u>

NOTE: Specification Tolerances - Location Variance at Top = 3 inches Max. Vertical (Plumbness) = 1 inch per 4 Ft. Max.



DRILLED SHAFT INSPECTION LOG (REV 06-03-02)
SAMPLE 2 Temporary Casing

Project Name	<u>Replace Bridge over Cooper Creek along US-322</u>	Page	<u>4</u>	of	<u>6</u>
File No.	<u>4.995</u>	Bent No.	<u>6</u>		
Contractor	<u>Drilled Shaft, Inc.</u>	Shaft No.	<u>3</u>		
Completed By Contractor	<u>DS Foreman - John Q. Doe</u>	Date	<u>06/05/02</u>	Station	<u>508 + 36</u>
Reviewed By SCDOT	<u>Inspector - Jane Smith</u>	Date	<u>06/05/02</u>	Offset	<u>24 FT. Right</u>

Type of Drilling Fluid	<u>Bentonite</u>	Shaft Plumbness Check/4'	<u>1/2 In. per 4 Ft.</u>
DS Location Variance at Top	<u>1" Before Sta. & 4" Left**</u>	Rebar Cage: Proper # Vert. Bars	<u>16 EA # 36 Bars</u>
Bottom Cleanout Method	<u>Airlift</u>	Proper # Horiz. Bars	<u># 19 W Hoops @ 7 IN.</u>
Time/Date Final Cleanout	<u>7:45 am on 06/05/02</u>	Side Spacers	<u>4 EA every 10 Ft.</u>
Shaft Bottom Elev.	<u>39.0 msl</u>	Bottom Spacers	<u>16 EA @ 6" Length</u>
Est. Shaft Bottom Dia.	<u>42 Inches</u>	Ties & Connections	<u>Checked and okay.</u>

Inspected By:	<u>JQD</u>	Visual	<u> </u>	Sounding	<u>X</u>	N *	* Based on Compass Direction
Time Test Started	<u>7:45 am</u>						Test just prior to placing Rebar cage <input type="checkbox"/> (inches)
Time Test Finished	<u>8:00 am</u>						Test just prior to placing concrete <input type="checkbox"/> (inches)
Time Test Started	<u>9:10 am</u>						* Direction
Time Test Finished	<u>9:25 am</u>						

W *	<input type="checkbox"/> 1/4"	<input type="checkbox"/> 1/2"	<input type="checkbox"/> 1/2"	N *
	<input type="checkbox"/> 3/8"	<input type="checkbox"/> 0"	<input type="checkbox"/> 1/4"	
		<input type="checkbox"/> 0"	<input type="checkbox"/> 1/4"	E *
		<input type="checkbox"/> 1/2"	<input type="checkbox"/> 1"	S *

Note: 50% of base shall have < 1/2 Inch of sediment.	
No area of shaft bottom shall be more than 1 1/2 Inches.	
Notes	Comments/Recommendations
<u>60% area < 1/2", first test okay.</u>	<u>Rebar cage placed & concrete ordered after first test.</u>
<u>60% area < 1/2", second test okay.</u>	<u>Concrete placed after second test was okay.</u>
	<u>** - See note on Page 1.</u>

Results:	<u>X</u> Satisfactory	DS Foreman	<u>John Q Doe</u>
	Unsatisfactory	SCDOT Inspector	<u>Jane Smith</u>
		Time	<u>9:25 am</u>
		Date	<u>06/05/02</u>

NOTE: Specification Tolerances - Location Variance at Top = 3 inches Max. Vertical (Plumbness) = 1 inch per 4 Ft. Max.



DRILLED SHAFT CONCRETE PLACEMENT LOG (REV 06-03-02)

Project Name _____ Page 5 of 6
 File No. _____ Bent No. _____
 Contractor _____ Shaft No. _____
 Completed By Contractor DS Foreman - Date _____ Station _____
 Reviewed By SCDOT Inspector - Date _____ Offset _____

Placement Method _____ Tremie _____ Volume in Pump Truck _____ # _____ ID _____ Length _____ Volume _____
 _____ Pumped _____ Pump Truck Lines _____
 De-airing Method _____ Relief Valve _____ Pump Truck _____
 _____ Plug _____
 _____ Cap _____

 Total Volume in Lines + Pump Truck $\Sigma =$ _____

Reference Elev. _____
 Shaft Top Elev. _____ Time First Truck Batched: _____
 Top of Rock Elev. _____ Depth of Water Per Hr. Inside Shaft (Dry Hole Check) _____
 Shaft Bottom Elev. _____ Rebar Cage Top Elev. At Start - _____ At Finish _____

Truck No.	Concrete Volume	Arrival Time	Start Time	Finish Time	Tremie Depth	Depth To Concrete	Notes

_____ Concrete Volume Delivered | Total Placement Time (Temp. Casing Removed) _____

T Casing Removal**	OD	Top Elev.	Bot. Elev.	Start	Finish	Rebar Cage Centered*	YES	NO
						Rebar Cage Re-centered		

Notes * If no, then re-center rebar cage. ** If unable to remove temporary casing, then call Bridge Construction Office.

HOW TO COMPLETE THE DRILLED SHAFT CONCRETE PLACEMENT LOG

DRILLED SHAFT CONCRETE PLACEMENT LOG							
Project Name: _____				Page _____ of _____			
Project No.: _____				Pier No.: _____			
Contractor: _____				Sheet No.: _____			
Inspected By: _____				Date: / /		Station: _____	
Approved By: _____				Date: / /		Sheet: _____	
Placement Method:	Frame		Volume in Lines	P	ID	Length	Volume
Deairing Method:	Pumped						
	Relief Valve						
	Frame Plug						
	Frame Cap						
			Total Volume in Lines				I
Reference Elev.							
Shell Top Elev.			Depth to Water Inside		OD Casing at Shell		
Top of Rebar Elev.							
Shell Bottom Elev.			Rebar Cage Top Elev. At Shell		At Finish		
Truck No.	Concrete Volume	Arrival Time	Start Time	Finish Time	Frame Depth	Depth to Concrete	Notes
Concrete Volume Delivered		Placement Time (Casing Removed)					
Casing Removal	OD	Top Elev.	Ref. Elev.	Start	Finish	Rebar Cage Confirmed	Concrete Finished
Notes: _____							

Fill in every blank on the form. If it does not apply put an “N/A” or a long dash.

Use pencil – but never erase. If you need to change something, strike a single line through the item and insert the correct information above it. If there is insufficient room to make a note, footnote the item and go to the bottom of the page, or use a separate page.

1. Heading:
 - Fill in before drilling starts.
 - Be sure to print your name and the start date of drilling.
 - The Project Resident Engineer or designated representative will sign approval line.
2. Indicate correct “Placement” and “Deairing” method.
3. Compute and fill in Concrete Volumes: $V = (\pi d^2 / 4) \times L$
4. Fill in as much as possible prior to pour.
5. Record Truck number and amount of concrete.
6. Time:
 - May be military or standard clock. Be consistent and correct.
 - Watch for date changes on late night pours.
7. Depths:
 - Tremie embedment may be measured by markings on the tremie. Depth to concrete may be measured by weighted tape.
8. Notes:
 - Record any unusual events or items.
9. Casing/Rebar Data:
 - The rebar cage fabrication will normally be performed on-site. Observe the lifting to make sure deformation or damage does not occur (especially to CSL tubes). Check that the correct cage is being used. Check reinforcing steel diagram against the actual cage to be sure cage is correct. When the cage is being placed, observe the spacing to assure the cage is set to the proper elevation.



DRILLED SHAFT CONCRETE PLACEMENT LOG (REV 06-03-02)
SAMPLE 1 Construction Casing

Project Name	Replace Bridge over Cooper Creek along US-322		Page	5	of	6
File No.	4.995		Bent No.	3		
Contractor	Drilled Shaft, Inc.		Shaft No.	3		
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/05/02	Station	508 + 36	
Reviewed By SCDOT	Inspector - John Smith	Date	06/05/02	Offset	24 FT. Right	

Placement Method	<input type="checkbox"/> Tremie	Volume in Pump Truck	#	ID	Total Length	Volume
	<input checked="" type="checkbox"/> Pumped	Pump Truck Lines (6" x 10')	17	6"	170'	1.2 CY
De-airing Method	<input type="checkbox"/> Relief Valve	Pump Truck				0.2 CY
	<input checked="" type="checkbox"/> Plug					
Total Volume in Lines + Pump Truck					Σ =	1.4 CY
Reference Elev.	101.0 msl		Time First Truck Batched: 9:10 am			
Shaft Top Elev.	101.0 msl		Depth of Water Per Hr. Inside Shaft (Dry Hole Check): NA - Slurry used.			
Top of Rock Elev.	49.0 msl		Rebar Cage Top Elev. At Start - 108.0 msl At Finish - 108.0 msl			
Shaft Bottom Elev.	39.0 msl					

Truck No.	Concrete Volume	Arrival Time	Start Time	Finish Time	Tremie/ Pump Lines Total Length	Depth To Concrete from Casing Top	Notes
17	9.0 CY	9:20 am	9:25 am	9:40 am	160 FT	41.0 FT	Removed 10' of pump line.
22	9.0 CY	9:30 am	9:45 am	10:00 am	160 FT	21.7 FT	Removed 20' of pump line.
8	9.0 CY	9:40 am	10:05 am	10:20 am	130 FT	2.4 FT	Removed 20' of pump line.
17	4.0 CY	10:30 am	10:35 am	10:50 am	120 FT	0	Waste 2.0 CY (Removing pump lines and overflow.)

<u>31.0 CY</u> Concrete Volume Delivered	Total Placement Time (Temp. Casing Removed)	<u>100 Min.</u>
--	---	-----------------

T Casing Removal**	OD	Top Elev.	Bot. Elev.	Start	Finish	Rebar Cage Centered*	YES	NO
	NA						X	

Notes * If no, then re-center rebar cage. ** If unable to remove temporary casing, then call Bridge Construction Office.



DRILLED SHAFT CONCRETE PLACEMENT LOG (REV 06-03-02)
SAMPLE 2 Temporary Casing

Project Name	Replace Bridge over Cooper Creek along US-322		Page	5	of	6
File No.	4.995		Bent No.	6		
Contractor	Drilled Shaft, Inc.		Shaft No.	3		
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/05/02	Station	508 + 36	
Reviewed By SCDOT	Inspector - Jane Smith	Date	06/05/02	Offset	24 FT. Right	

Placement Method	<input type="checkbox"/> Tremie	Volume in Pump Truck	#	ID	Total Length	Volume
	<input checked="" type="checkbox"/> Pumped	Pump Truck Lines (6" x 10')	17	6"	170'	1.2 CY
De-airing Method	<input type="checkbox"/> Relief Valve	Pump Truck				0.2 CY
	<input checked="" type="checkbox"/> Plug					
Total Volume in Lines + Pump Truck						$\Sigma =$ 1.4 CY
Reference Elev.	101.0 msl					
Shaft Top Elev.	100.0 msl					
Top of Rock Elev.	49.0 msl					
Shaft Bottom Elev.	39.0 msl					
	Time First Truck Batched: 9:10 am					
	Depth of Water Per Hr. Inside Shaft (Dry Hole Check): NA - Slurry used.					
	Rebar Cage Top Elev. At Start - 108.0 msl At Finish - 108.0 msl					

Truck No.	Concrete Volume	Arrival Time	Start Time	Finish Time	Tremie/ Pump Lines Total Length	Depth To Concrete from Casing Top	Notes
17	9.0 CY	9:20 am	9:25 am	9:40 am	160 FT	41.0 FT	Removed 10' of pump line.
22	9.0 CY	9:30 am	9:45 am	10:00 am	160 FT	21.7 FT	Removed 20' of pump line.
8	9.0 CY	9:40 am	10:05 am	10:20 am	130 FT	2.4 FT	Removed 20' of pump line.
17	4.0 CY	10:30 am	10:35 am	10:50 am	120 FT	0	Waste 2.0 CY (Removed the temporary casing, pump lines and concrete overflow.)

<u>31.0 CY</u> Concrete Volume Delivered	Total Placement Time (Temp. Casing Removed)	<u>100 Min.</u>
--	---	-----------------

	OD	Top Elev.	Bot. Elev.	Start	Finish	Rebar Cage Centered*	Rebar Cage Re-centered	YES	NO
T Casing Removal**	48"	101.0 msl	85.0 msl	10:25 am	10:35 am				X

Notes * If no, then re-center rebar cage. ** If unable to remove temporary casing, then call Bridge Construction Office.



DRILLED SHAFT CONCRETE VOLUMES LOG (REV 06-03-02)

Project Name _____	Page <u>6</u> of <u>6</u>	
File No. _____	Bent No. _____	
Contractor _____	Shaft No. _____	
Completed By Contractor <u>DS Foreman -</u>	Date <u> / /</u>	Station _____
Reviewed By SCDOT <u>Inspector -</u>	Date <u> / /</u>	Offset _____

Concreting Curve

Depth
(ft)

Concrete Volume Placed (cy)

Volume Delivered	VD	_____ cy
Volume In Pump Truck + Lines	VPTL	_____ cy
Volume of CSL Tubes	VCSLT	_____ cy
Wastage	VW	_____ cy
Volume Placed	VP	_____ cy
= VD-VPTL-VCSLT-VW =		
Theoretical Volume	VTh	_____ cy
Over Pour (VP-VTh \geq 1.00)	OP	_____ cy
Under Pour (VP-VTh < 1.00)	UP	_____ cy

HOW TO COMPLETE THE DRILLED SHAFT CONCRETE VOLUMES LOG



DRILLED SHAFT CONCRETE VOLUMES LOG

Project Name _____	1	Page _____ of _____
Project No. _____		Pier No. _____
Contractor _____		Shaft No. _____
Inspected By _____		Date ____/____/____
Approved By _____		Date ____/____/____

	2	
Top of Shaft		
Depth (ft)		Trouble Territory!
Bottom of Shaft		Theoretical Line

Concrete Volume Placed (cy)	
Volume Delivered	VD _____ cy
Volume in Losses	VL _____ cy
Volume of CSL Tubing	VT _____ cy
Wastage	WN _____ cy
Volume Placed	VP _____ cy
= VD-VL-VT-WN =	
Theoretical Volume	VTh _____ cy
Overpour (VP-VTh)	OP _____ cy

Fill in every blank on the form. If it does not apply put an "N/A" or a long dash.

Use pencil – but never erase. If you need to change something, strike a single line through the item and insert the correct information above it. If there is insufficient room to make a note, footnote the item and go to the bottom of the page, or use a separate page.

1.	Heading:	-Fill in <u>before</u> drilling starts. -Be sure to print your name and the start date of drilling. -The Project Resident Engineer or designated representative will sign approval line.
2.	Concrete curve:	-compute Theoretical Volume of Concrete based on shaft size: $V_{th} = (\pi d^2 / 4) \times L$ -locate points based on known cubic yards of concrete placed at measured "bottom" depth. - must be plotted during concrete placement.

Note: Plotted line should closely parallel Theoretical line.
There is a problem if:

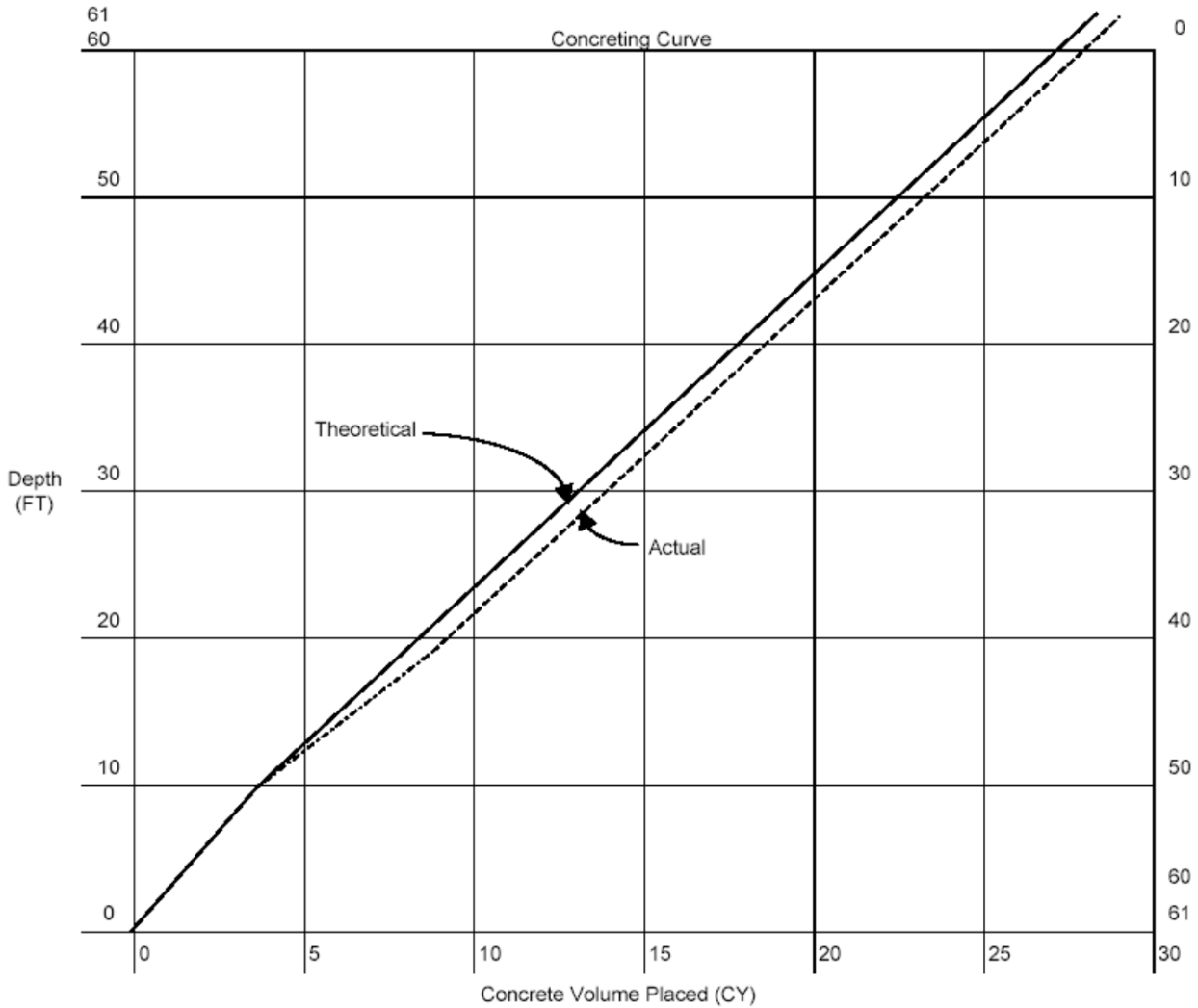
- a point plots way above or below the Theoretical line and/or
- there is a significant rise or fall in an otherwise straight line (change in slope of line).



DRILLED SHAFT CONCRETE VOLUMES LOG (REV 06-03-02)

SAMPLE 1 Construction Casing

Project Name	Replace Bridge over Cooper Creek along US-322	Page	6	of	6
File No.	4.995	Bent No.	3		
Contractor	Drilled Shaft, Inc.	Shaft No.	3		
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/05/02	Station	508 + 36
Reviewed By SCDOT	Inspector - John Smith	Date	06/05/02	Offset	24 FT. Right

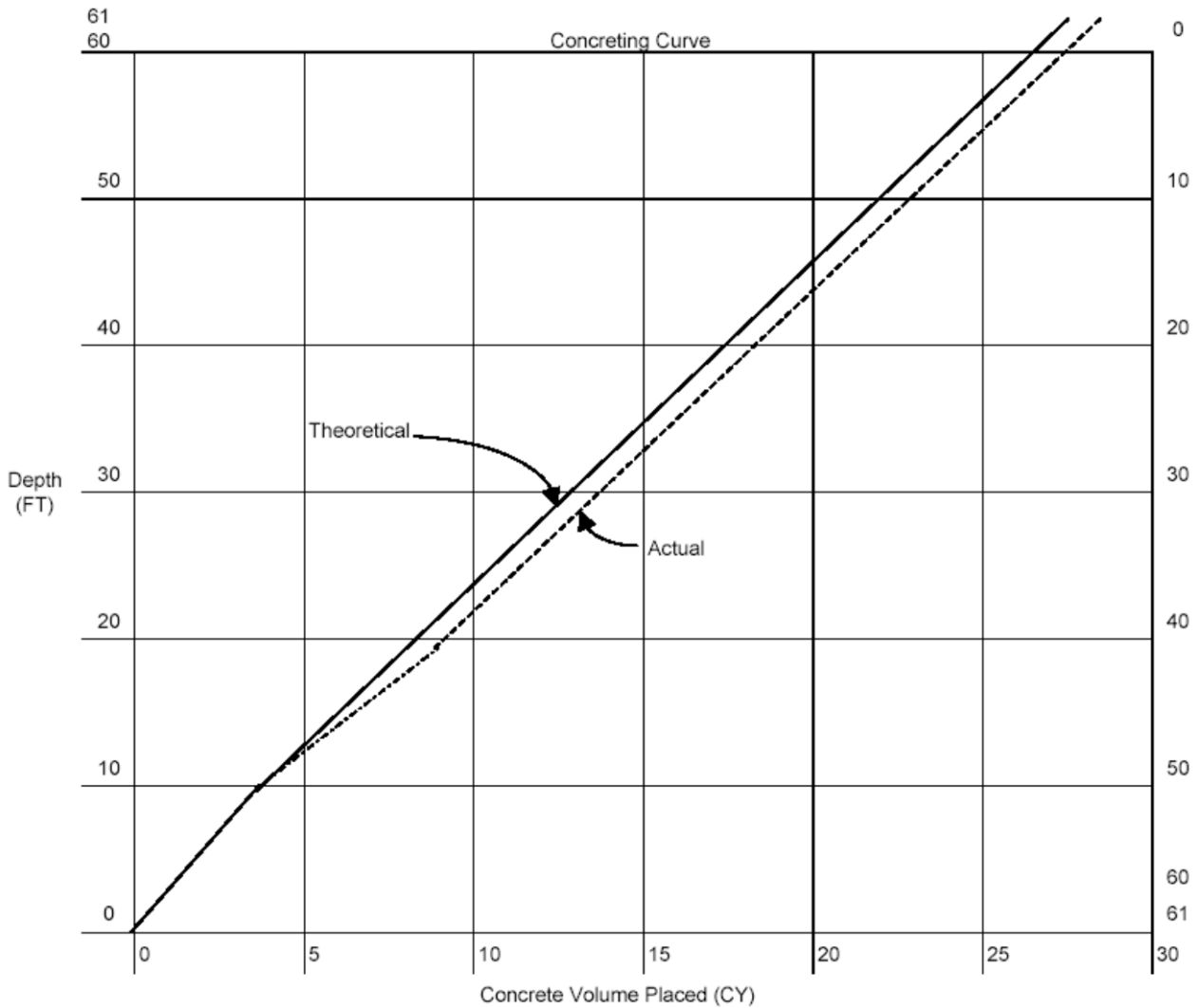


Volume Delivered	VD	31.0	CY
Volume In Pump Truck + Lines	VPTL	-1.4	CY - Volume left in pump truck and lines.
Volume of CSL Tubes	VCSLT	+0.2	CY
Wastage	VW	-2.0	CY - Removed pump lines and concrete overflow.
Volume Placed	VP	27.8	CY
= VD-VPTL-VCSLT-VW =			
Theoretical Volume	VTh	27.2	CY
Over Pour (VP-VTh \geq 1.00)	OP	0.6	CY
Under Pour (VP-VTh < 1.00)	UP	NA	CY



DRILLED SHAFT CONCRETE VOLUMES LOG (REV 06-03-02)
SAMPLE 2 Temporary Casing

Project Name	<u>Replace Bridge over Cooper Creek along US-322</u>	Page	<u>6</u>	of	<u>6</u>
File No.	<u>4.995</u>	Bent No.	<u>6</u>		
Contractor	<u>Drilled Shaft, Inc.</u>	Shaft No.	<u>3</u>		
Completed By Contractor	<u>DS Foreman - John Q. Doe</u>	Date	<u>06/05/02</u>	Station	<u>508 + 36</u>
Reviewed By SCDOT	<u>Inspector - Jane Smith</u>	Date	<u>06/05/02</u>	Offset	<u>24 FT. Right</u>



Volume Delivered	VD	<u>31.0</u>	CY
Volume In Pump Truck + Lines	VPTL	<u>-1.4</u>	CY - Volume left in pump truck and lines.
Volume of CSL Tubes	VCSLT	<u>+0.2</u>	CY
Wastage	VW	<u>-2.0</u>	CY - Removed pump lines and concrete overflow.
Volume Placed	VP	<u>27.8</u>	CY
= VD-VPTL-VCSLT-VW =			
Theoretical Volume	VTh	<u>27.3</u>	CY
Over Pour (VP-VTh => 1.00)	OP	<u>0.5</u>	CY
Under Pour (VP-VTh < 1.00)	UP	<u>NA</u>	CY