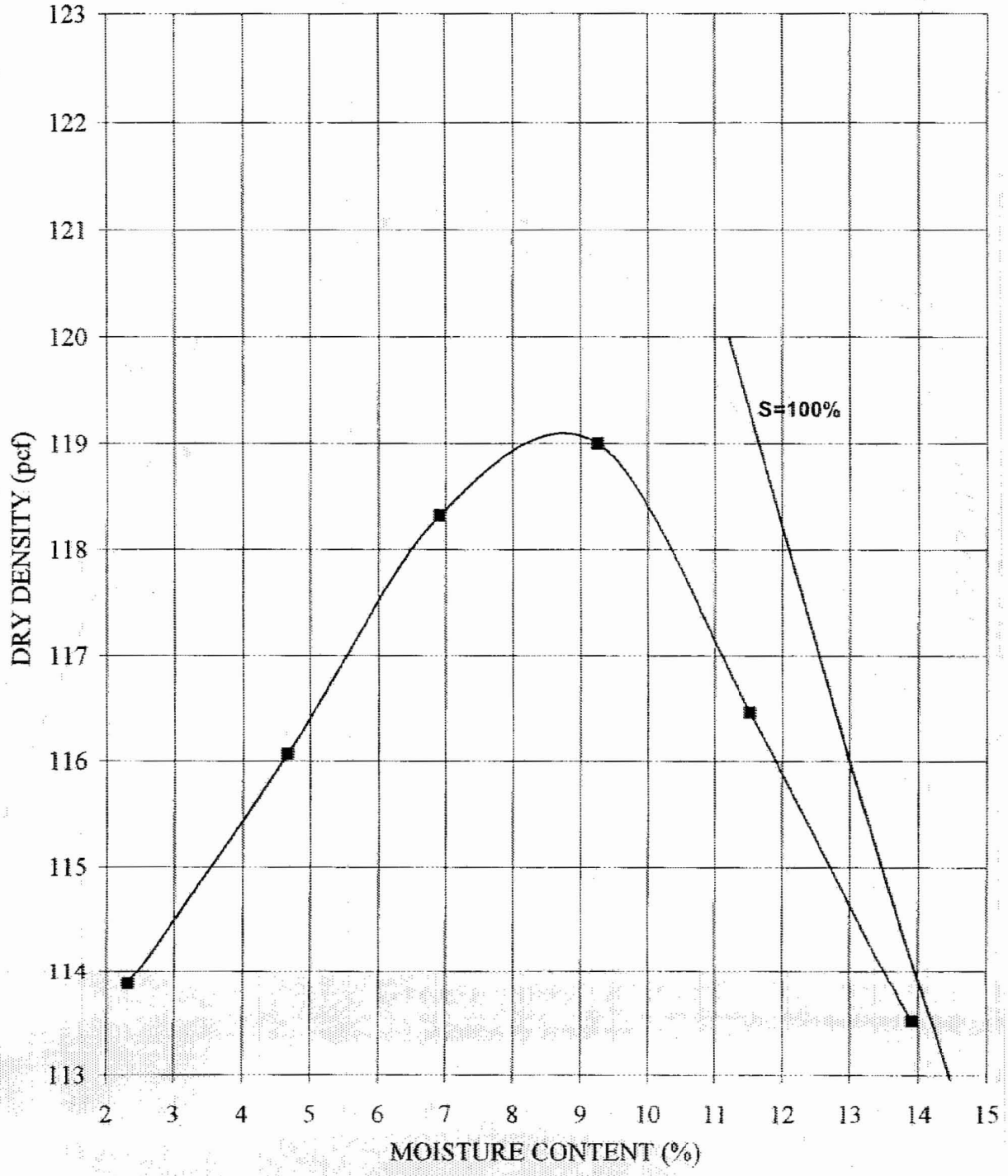
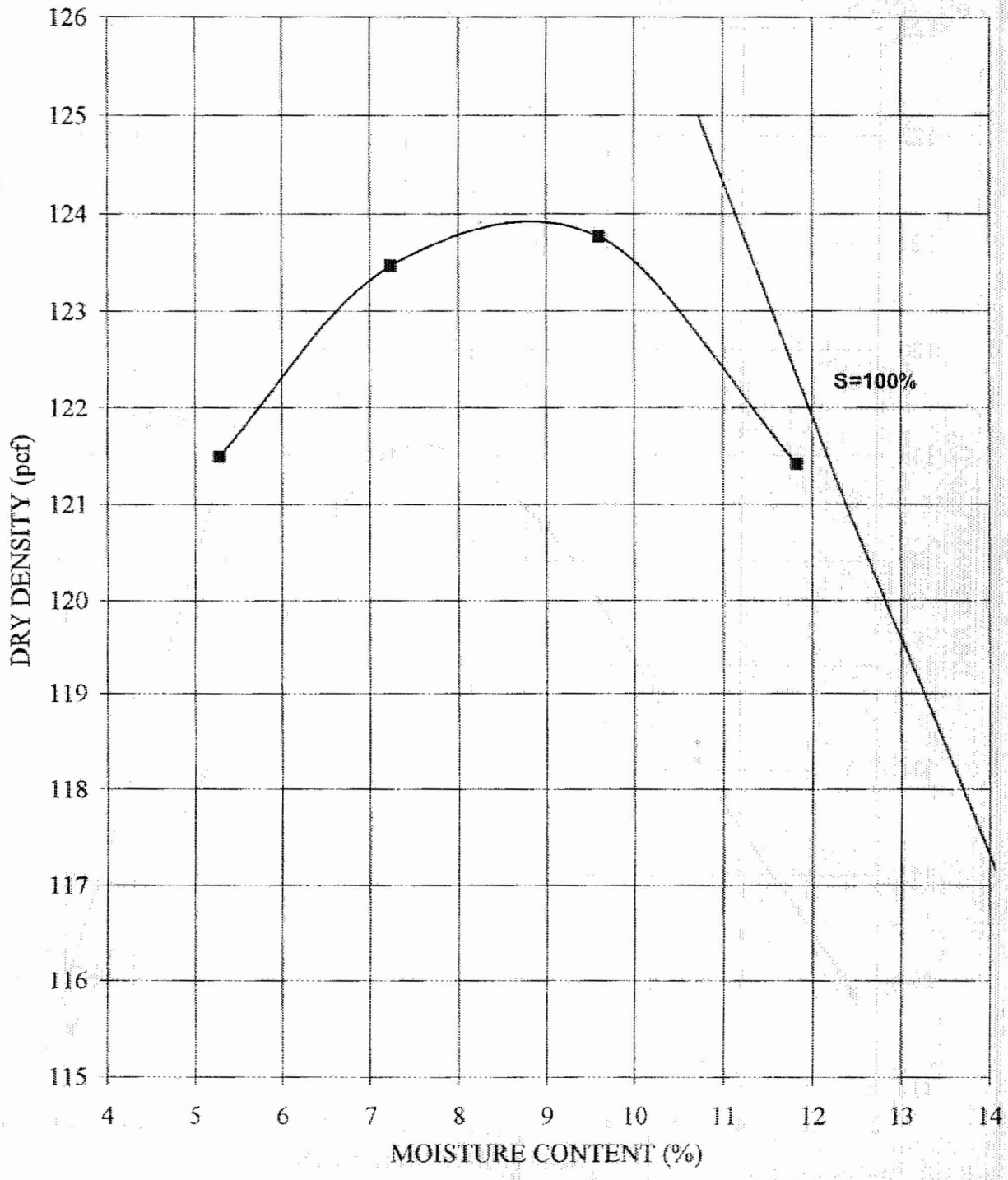


MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.:	06120048.00	Date:	9/26/2006
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI		
B-435	5.0-6.0	Silty SAND, brown	SM				
Assumed Specific Gravity:	2.45	% Passing 3/4" Sieve:		100.0			
		% Passing #4 Sieve:		100.0			
Maximum Dry Density (pcf):	**119.1**	**Optimum Moisture Content (%):**		8.9			

Schnabel Engineering

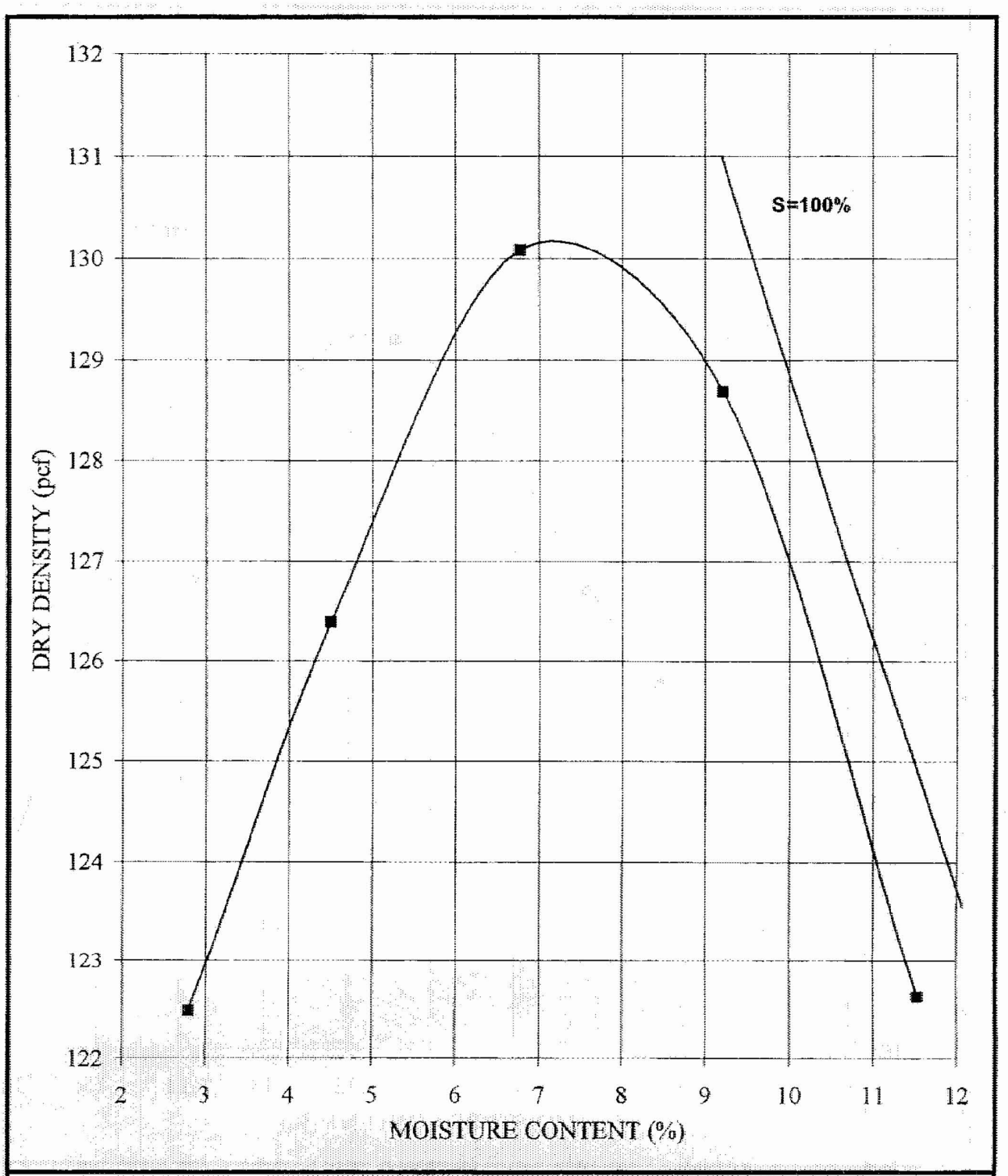


MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.:	06120048.00	Date:	9/15/2006
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI		
B-435	7.0-8.0	Poorly Graded SAND, with silt, trace gravel, light brown	SP-SM				
Assumed Specific Gravity:	2.55	% Passing 3/4" Sieve:		100.0			
		% Passing #4 Sieve:		99.2			
Maximum Dry Density (pcf):	**123.9**	**Optimum Moisture Content (%):**		**8.9**			

Schnabel Engineering



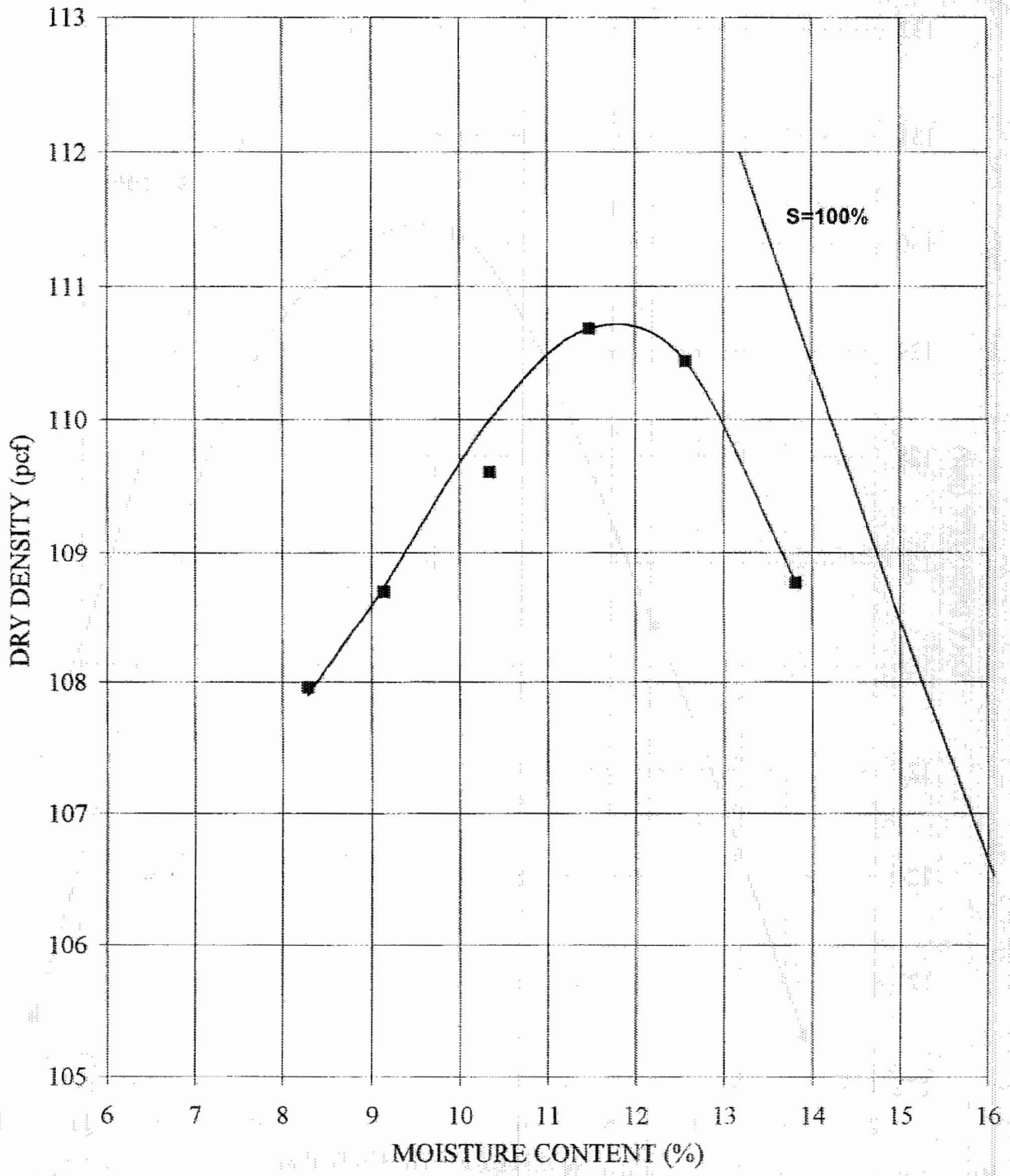
MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.:	06120048.00	Date:	9/15/2006
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI		
B-435	9.0-10.0	Clayey SAND, brown	SC	34	17		
Assumed Specific Gravity:	2.60	% Passing 3/4" Sieve:		100.0			
		% Passing #4 Sieve:		100.0			
Maximum Dry Density (pcf):	**130.2**	**Optimum Moisture Content (%):**		7.3			

Schnabel

Schnabel Engineering



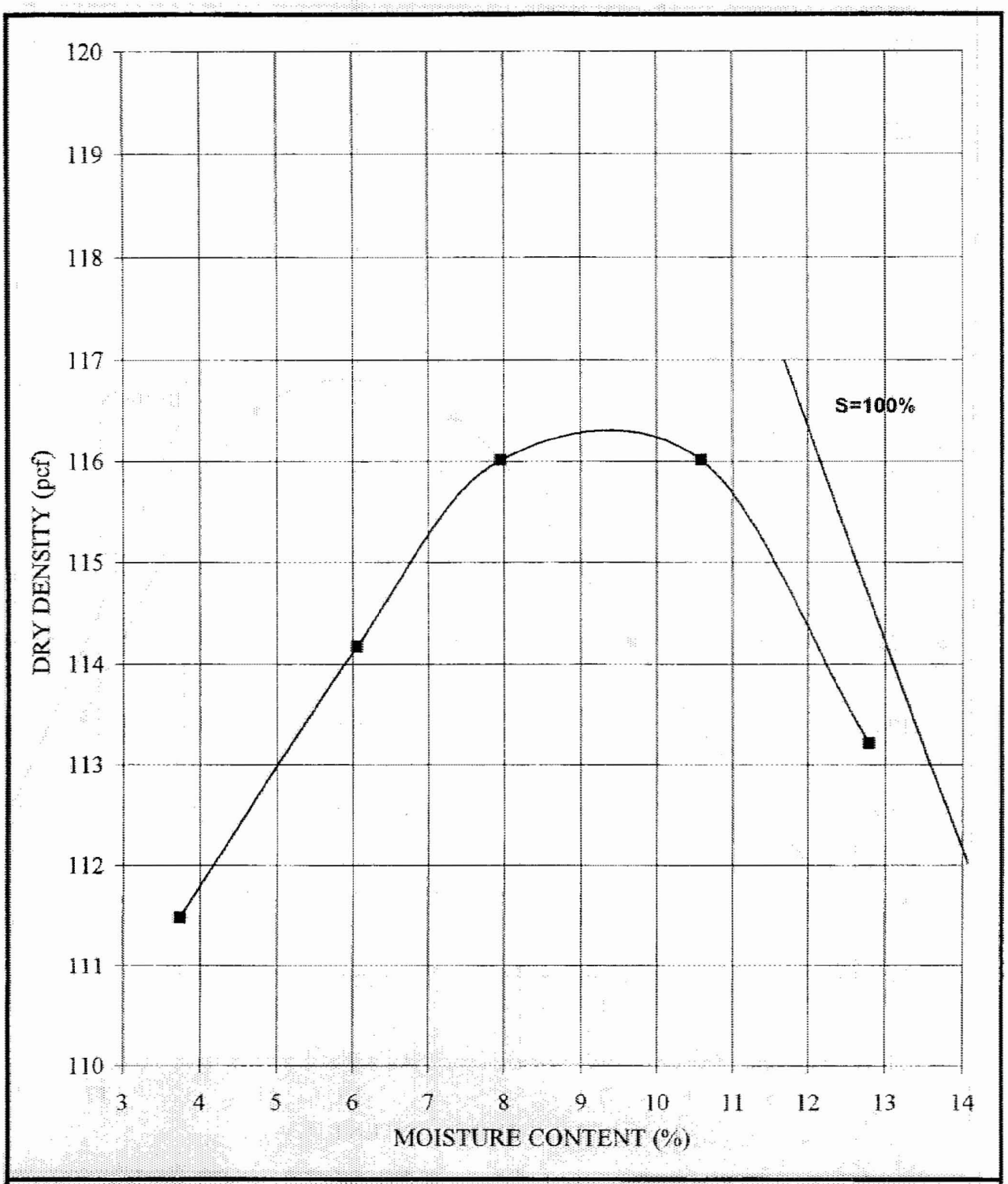
MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.	06120048.00	Date:	9/11/2006
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI		
TP-B-715	5.5-6.5	Poorly Graded SAND, with silt, trace gravel, tan	SP-SM				
Assumed Specific Gravity:	2.35	% Passing 3/4" Sieve:		100.0			
		% Passing #4 Sieve:		99.1			
Maximum Dry Density (pcf):	**110.7**	**Optimum Moisture Content (%):**		**11.8**			

Schnabel

Schnabel Engineering



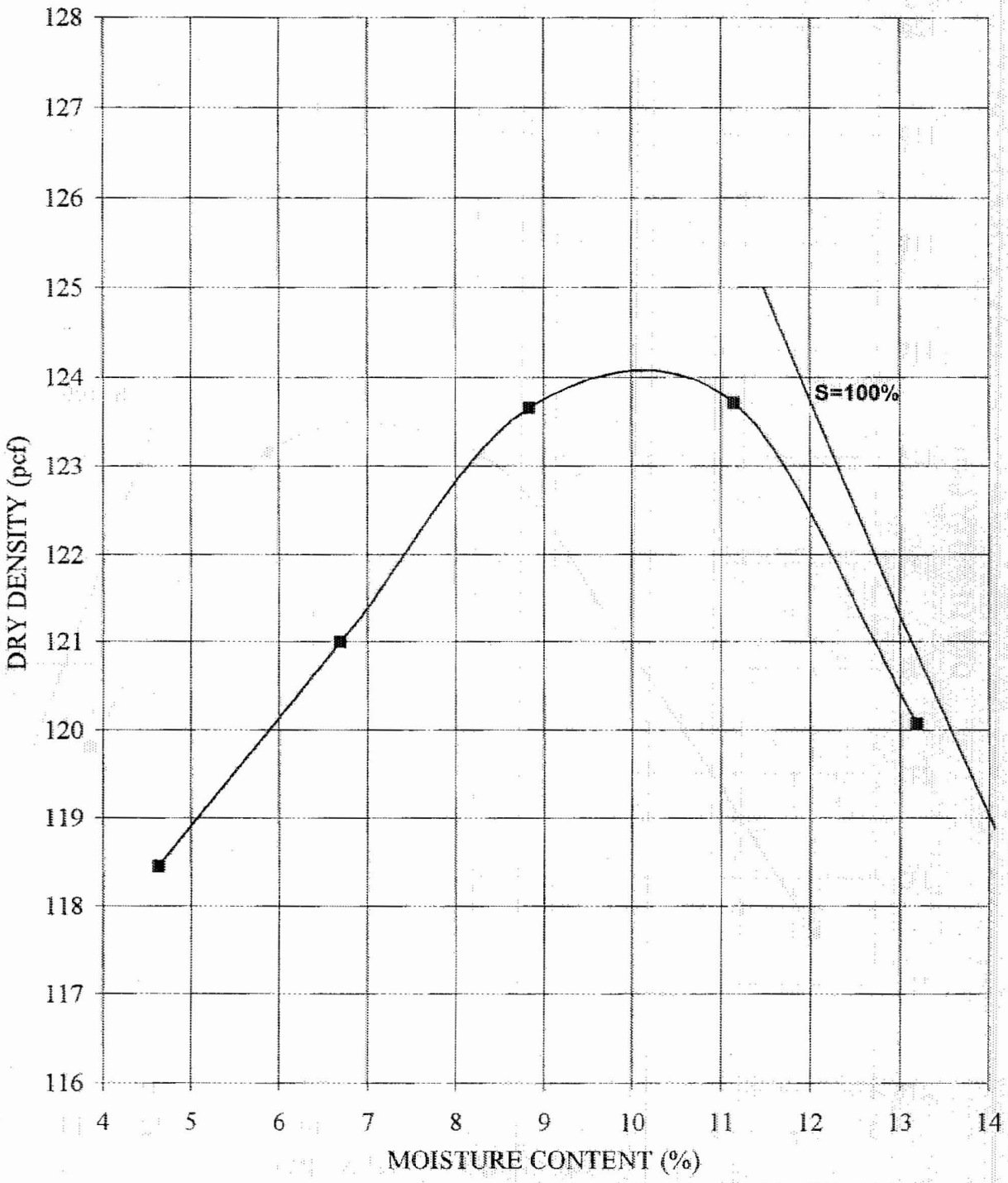
MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.:	06120048.00	Date:	9/15/2006
Boring No.	Depth (ft)	Sample Description	Class	LL	PI		
TP-B-716	6.0-7.0	Poorly Graded SAND, with silt, trace gravel , brown	SP-SM				
Assumed Specific Gravity:		2.40	% Passing 3/4" Sieve:	100.0			
			% Passing #4 Sieve:	99.0			
Maximum Dry Density (pcf):		**116.3**	**Optimum Moisture Content (%):**	9.4			

Schnabel

Schnabel Engineering



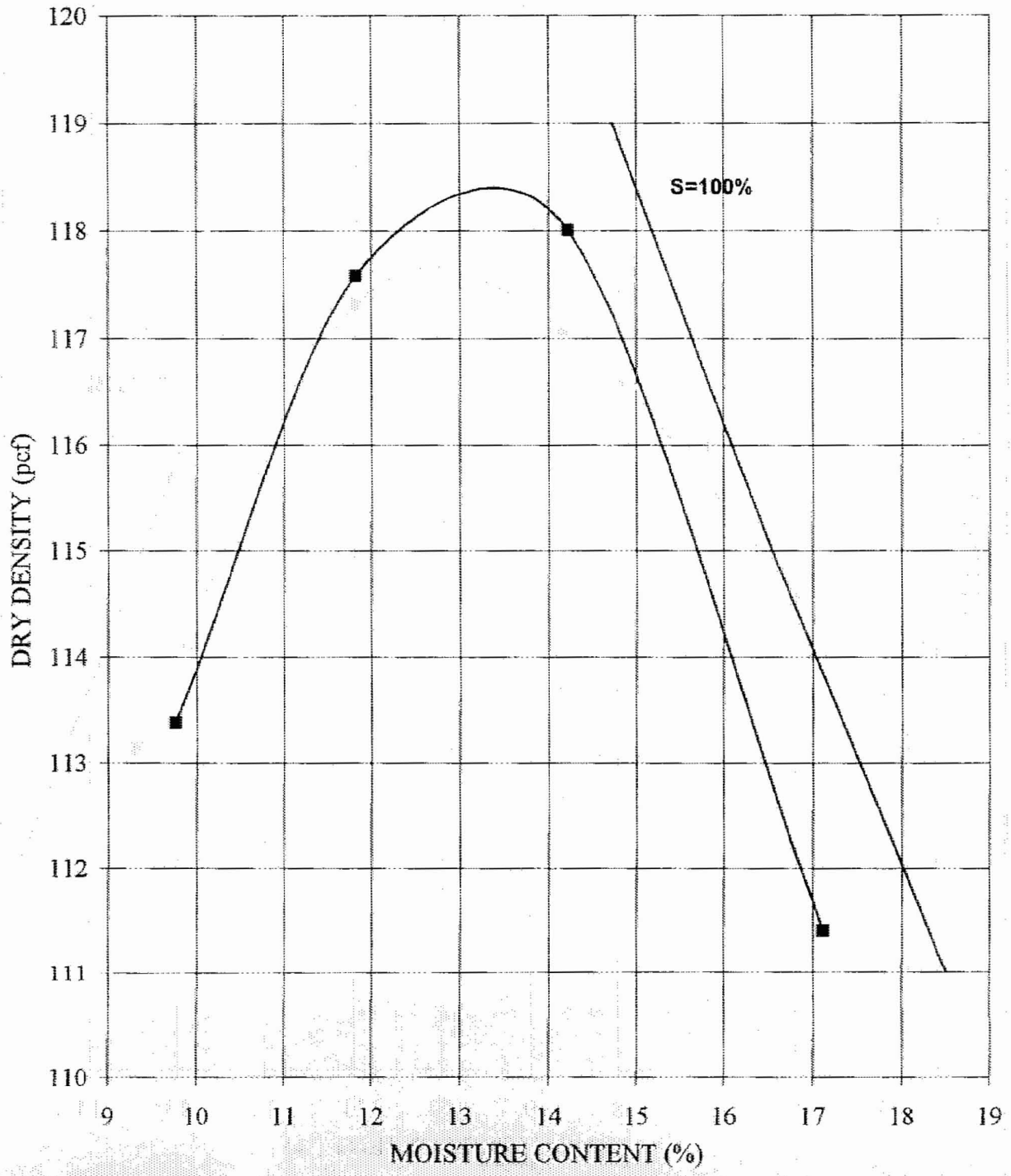
MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.:	06120048.00	Date:	9/15/2006
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI		
TP-B-717	7.0-8.0	Poorly Graded SAND, with silt, trace gravel, light brown	SP-SM				
Assumed Specific Gravity:	2.60	% Passing 3/4" Sieve:		100.0			
		% Passing #4 Sieve:		97.4			
Maximum Dry Density (pcf):	**123.8**	**Optimum Moisture Content (%):**		**10.2**			

Schnabel

Schnabel Engineering

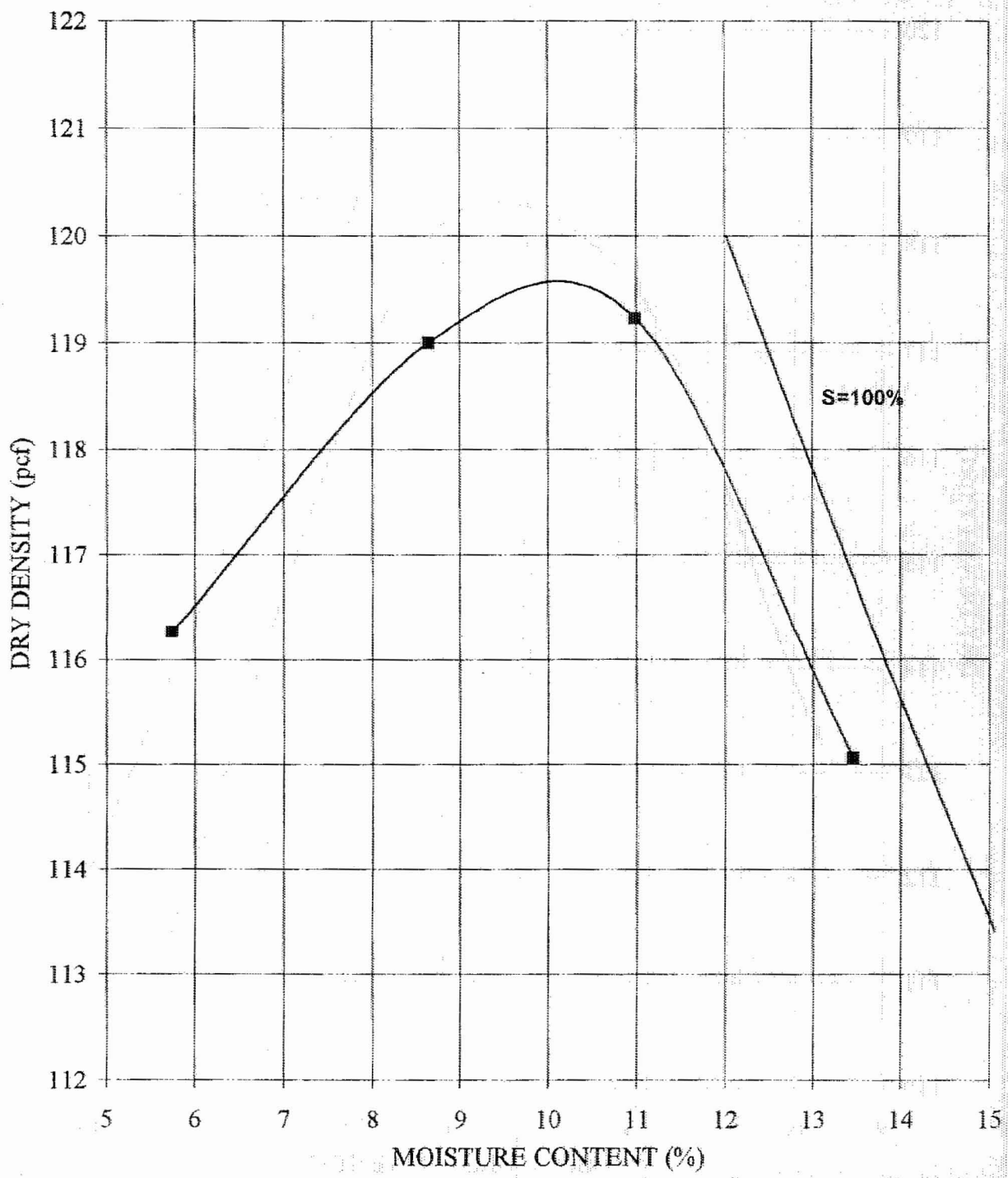


MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.:	06120048.00	Date:	9/28/2006
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI		
TP-B-719	0.5-1.5	LEAN CLAY, with sand, dark brown	CL	35	13		
Assumed Specific Gravity:		2.65	% Passing 3/4" Sieve:	100.0			
			% Passing #4 Sieve:	100.0			
Maximum Dry Density (pcf):		**118.4**	**Optimum Moisture Content (%):**	**13.5**			

Schnabel Engineering



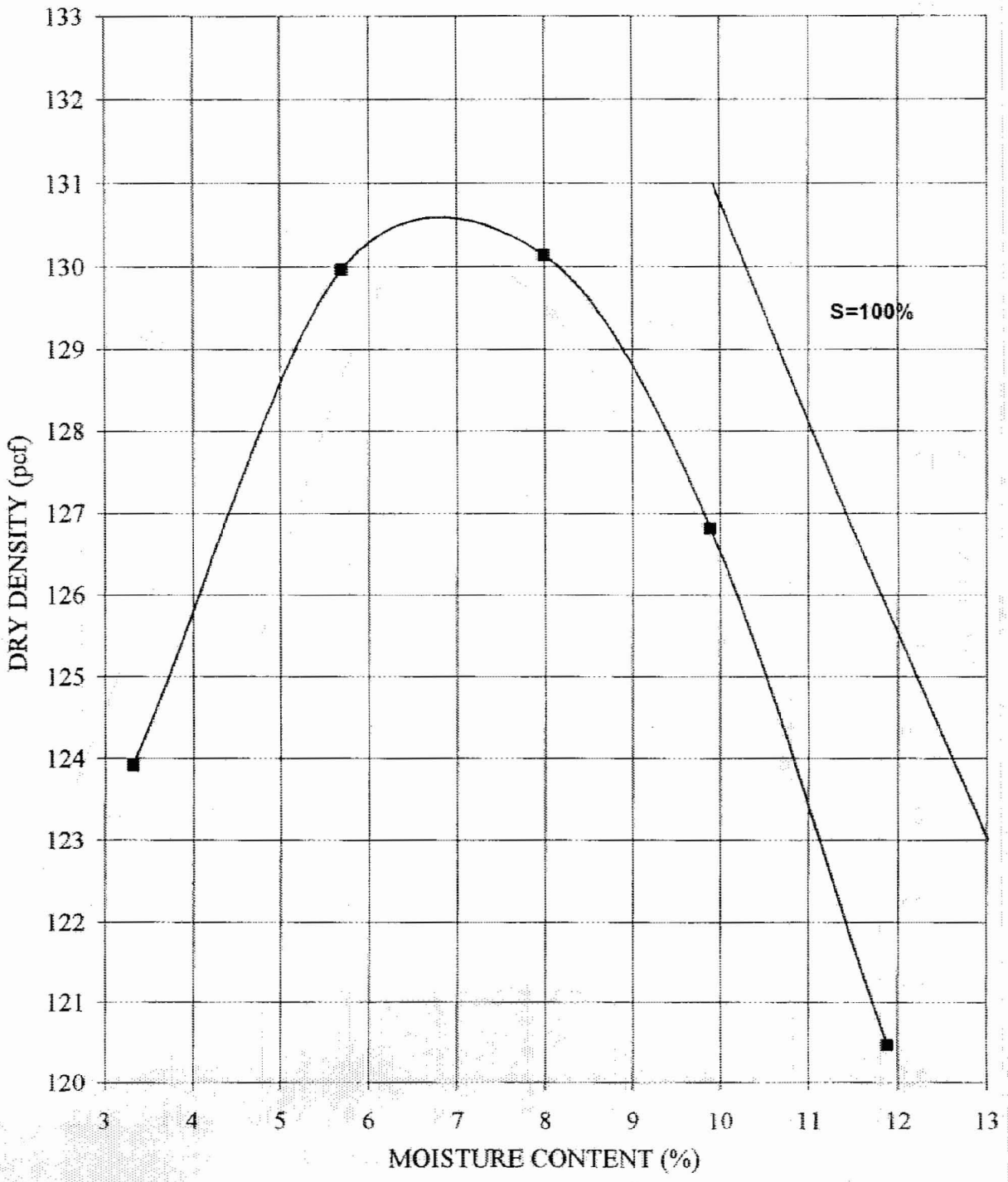
MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.:	06120048.00	Date:	9/18/2006
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI		
TP-B-719	7.0-8.0	Silty SAND, gray	SM	35	13		
Assumed Specific Gravity:	2.50	% Passing 3/4" Sieve:		100.0			
		% Passing #4 Sieve:		100.0			
Maximum Dry Density (pcf):	**119.6**	**Optimum Moisture Content (%):**		**10.0**			

Schnabel

Schnabel Engineering

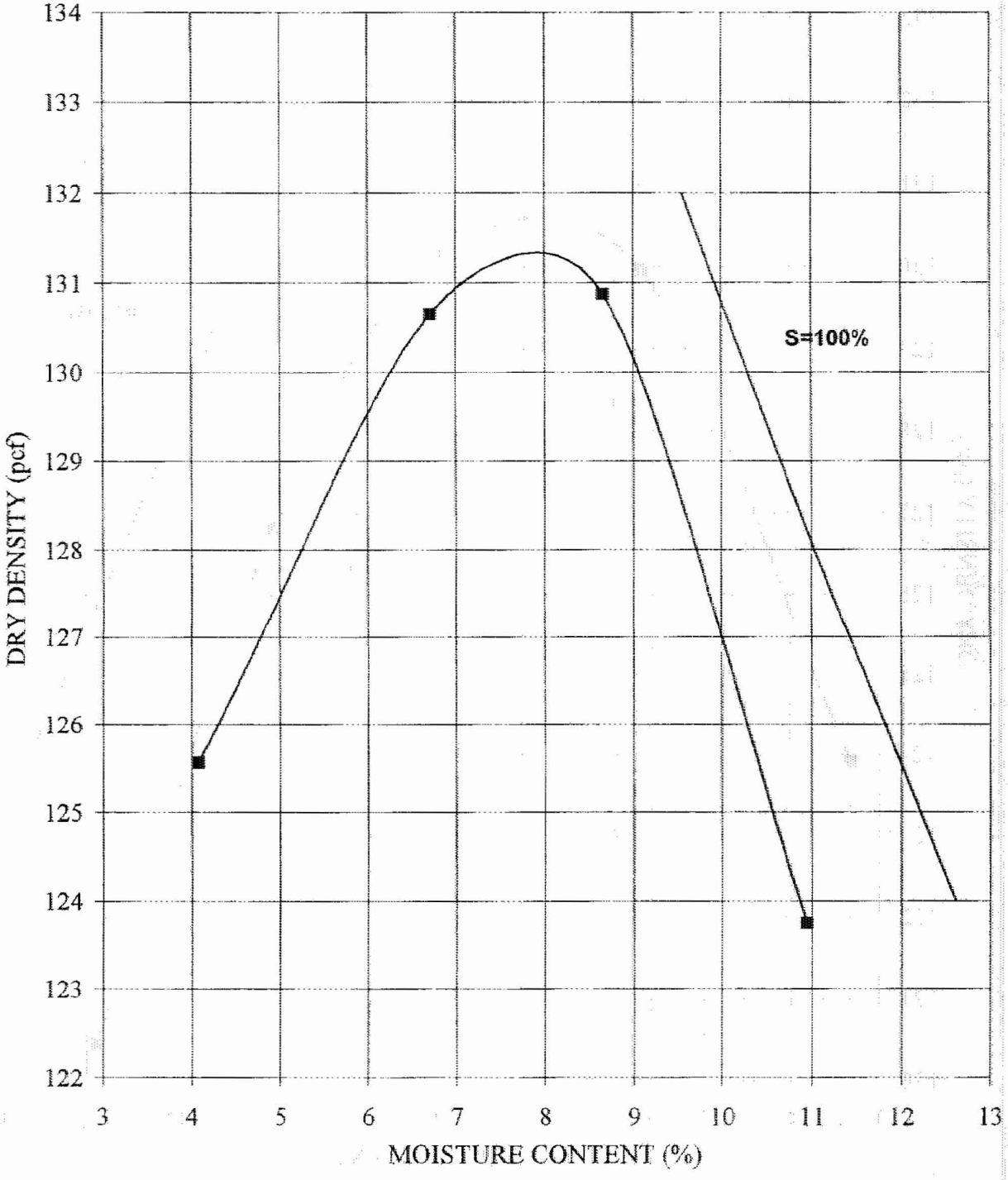


MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.	06120048.00	Date:	9/22/2006
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI		
TP-B-727	6.0-7.0	Silty SAND, dark brown	SM				
Assumed Specific Gravity:	2.65	% Passing 3/4" Sieve:		100.0			
		% Passing #4 Sieve:		100.0			
Maximum Dry Density (pcf):	130.5	**Optimum Moisture Content (%):**		6.8			

Schnabel Engineering

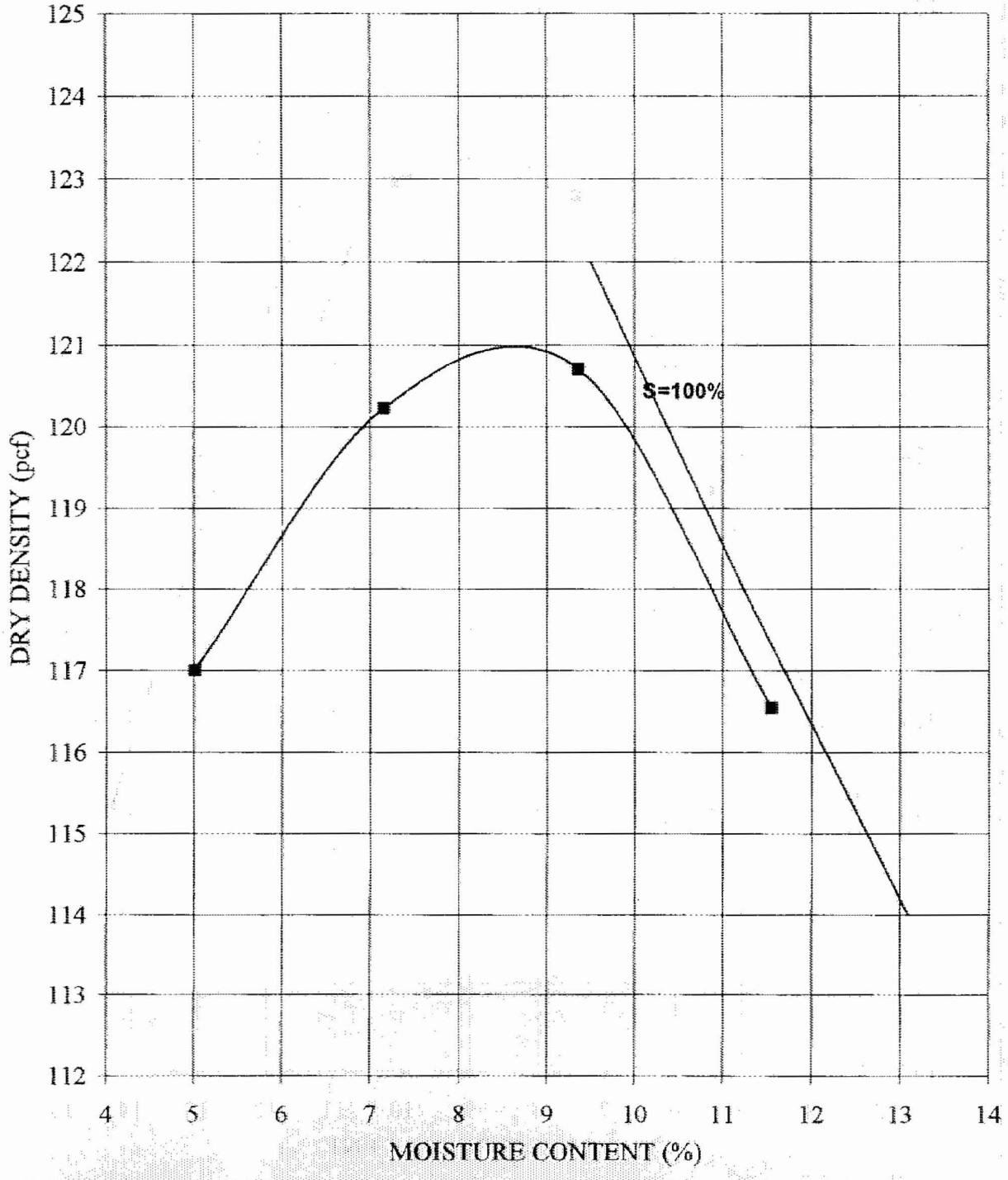


MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.:	06120048.00	Date:	9/22/2006
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI		
TP-B-744	1.5-2.5	Sandy LEAN CLAY, dark brown	CL	25	8		
Assumed Specific Gravity:	2.65	% Passing 3/4" Sieve:		100.0			
		% Passing #4 Sieve:		100.0			
Maximum Dry Density (pcf):	**131.2**	**Optimum Moisture Content (%):**		**8.0**			

Schnabel Engineering



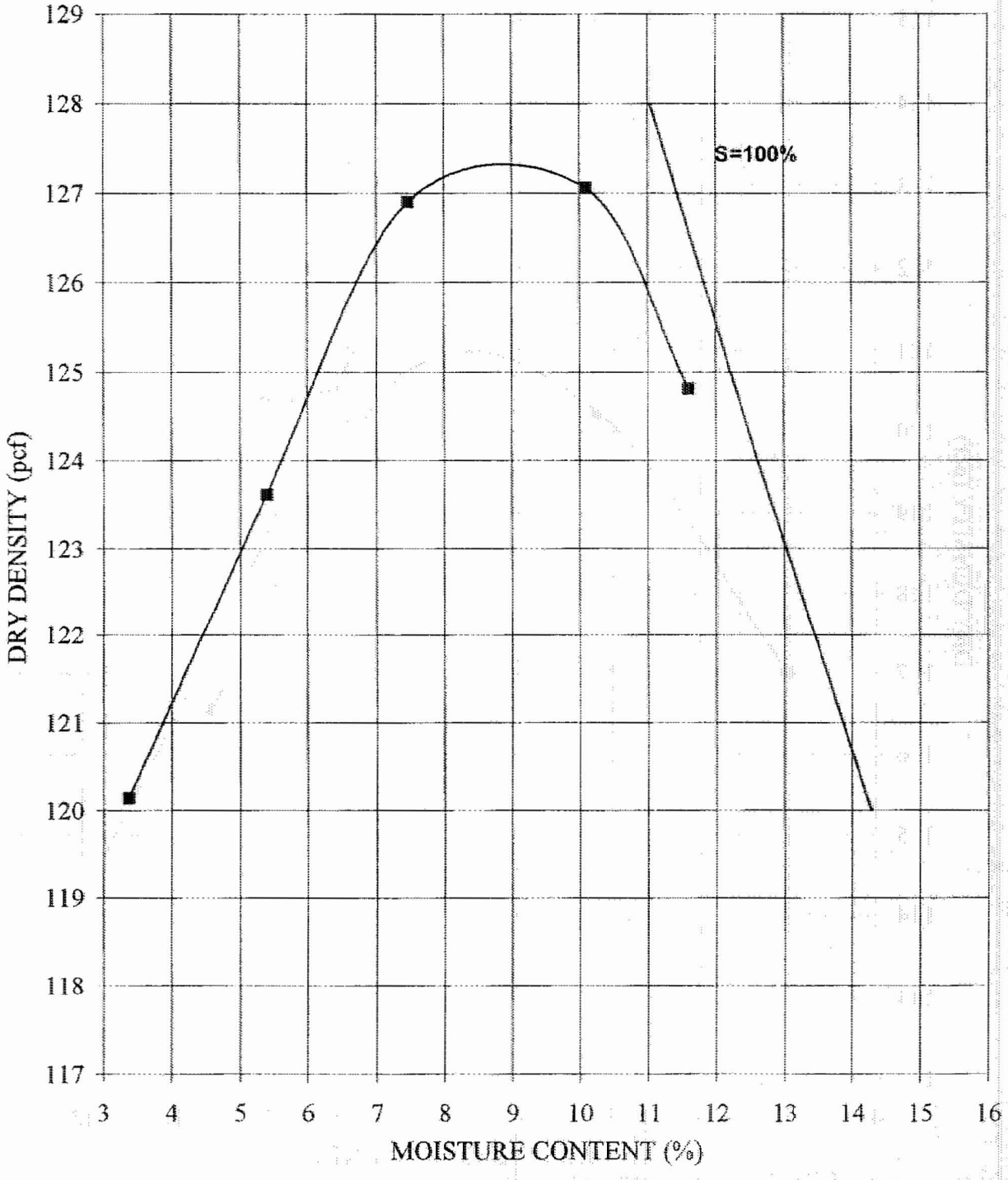
MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.:	06120048.00	Date:	9/21/2006
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI		
TP-B-758	2.0-3.0	Poorly Graded SAND, with silt, trace gravel , brown	SP-SM				
Assumed Specific Gravity:		2.40	% Passing 3/4" Sieve:	100.0			
			% Passing #4 Sieve:	99.2			
Maximum Dry Density (pcf):		**121.0**	**Optimum Moisture Content (%):**	**8.8**			

Schnabel

Schnabel Engineering

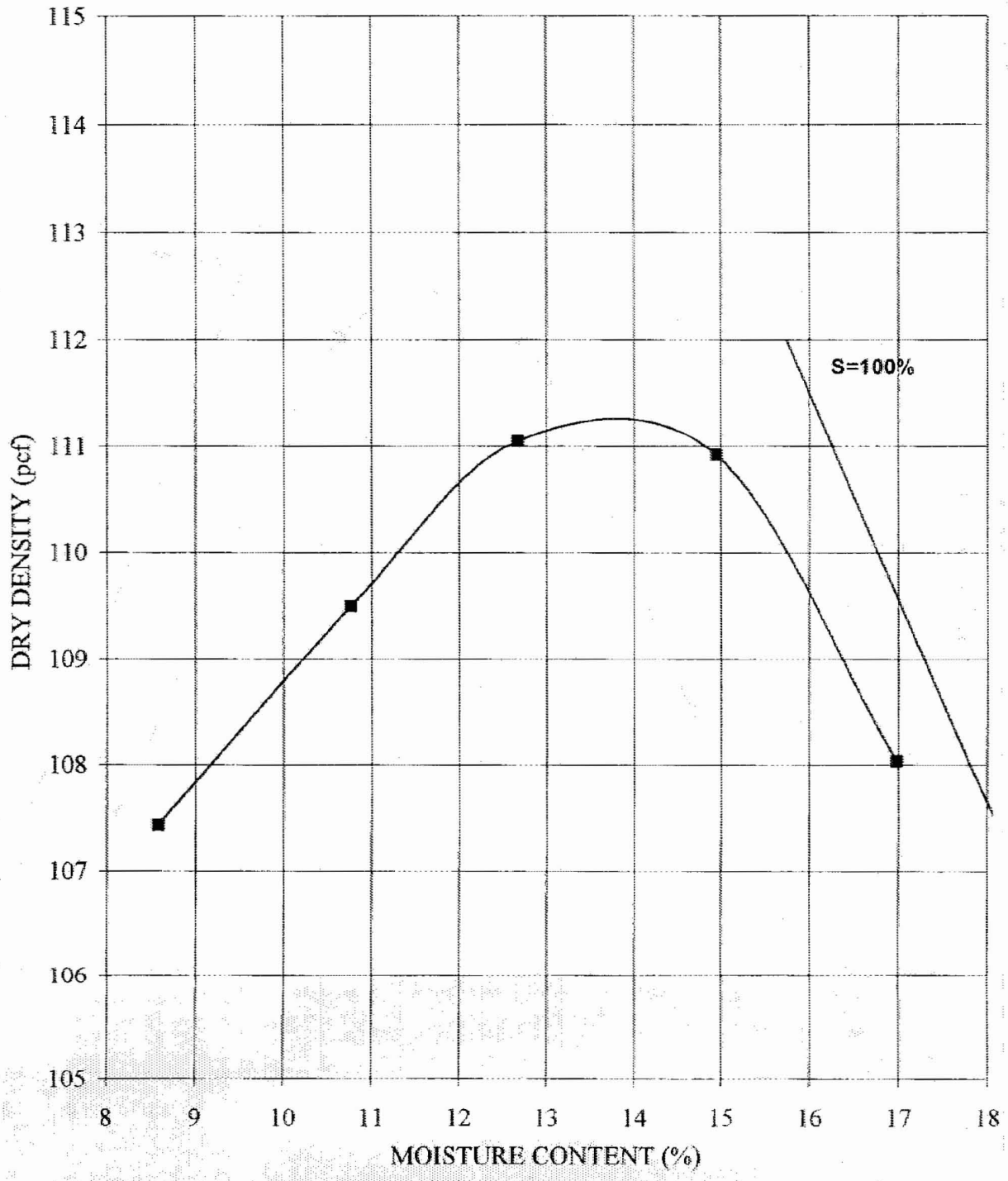


MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.:	06120048.00	Date:	9/18/2006
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI		
TP-B-758	7.5-8.5	Silty SAND, trace gravel, light brown	SM				
Assumed Specific Gravity:	2.65	% Passing 3/4" Sieve:	100.0				
		% Passing #4 Sieve:	97.4				
Maximum Dry Density (pcf):	**127.3**	**Optimum Moisture Content (%):**	**8.9**				

Schnabel Engineering



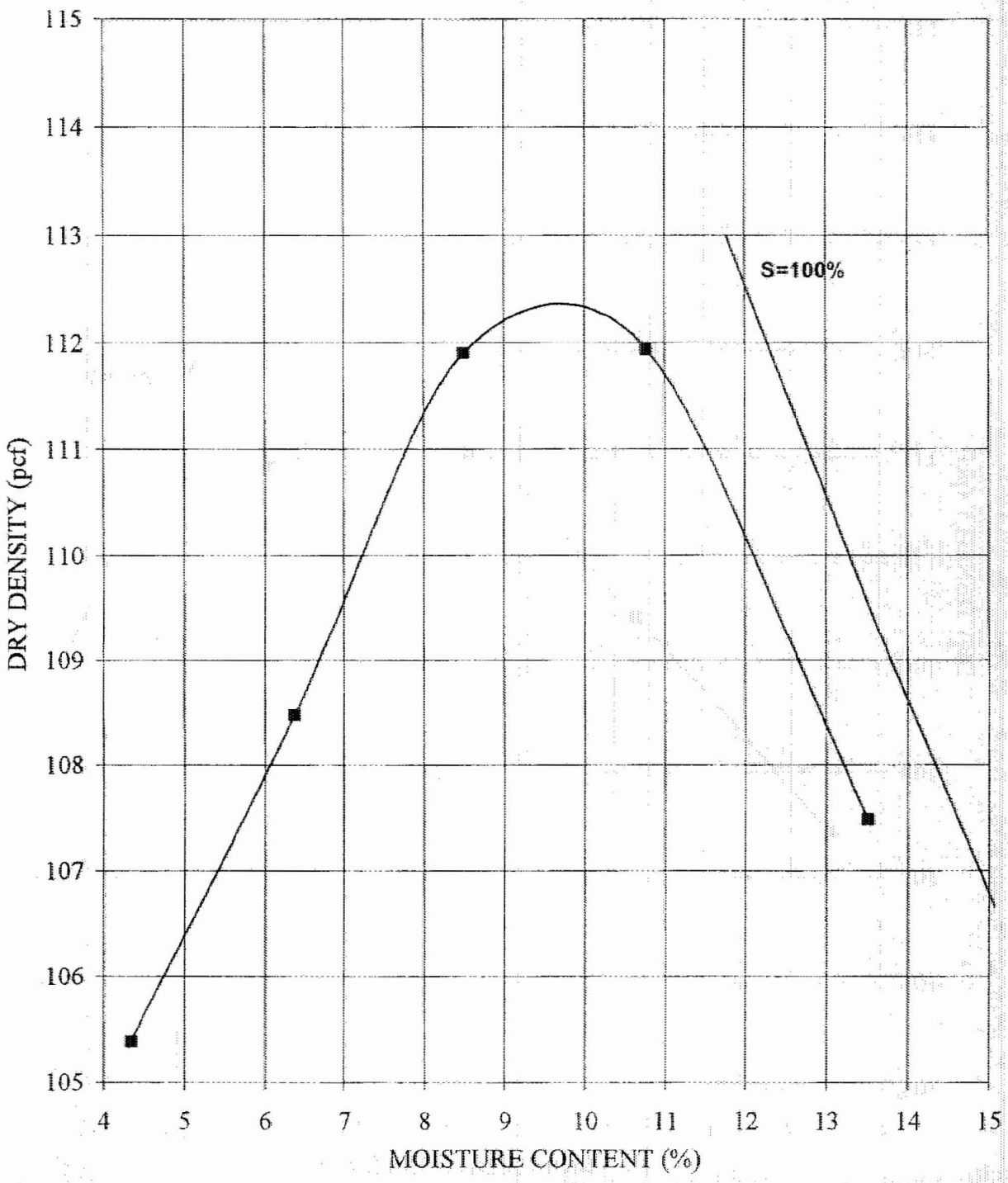
MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.:	06120048.00	Date:	9/11/2006
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI		
TP-C-309	2.0-3.0	Poorly Graded SAND, trace silt and gravel, brown	SP				
Assumed Specific Gravity:		2.50	% Passing 3/4" Sieve:	100.0			
			% Passing #4 Sieve:	98.8			
Maximum Dry Density (pcf):		**111.2**	**Optimum Moisture Content (%):**	**13.9**			

Schnabel

Schnabel Engineering

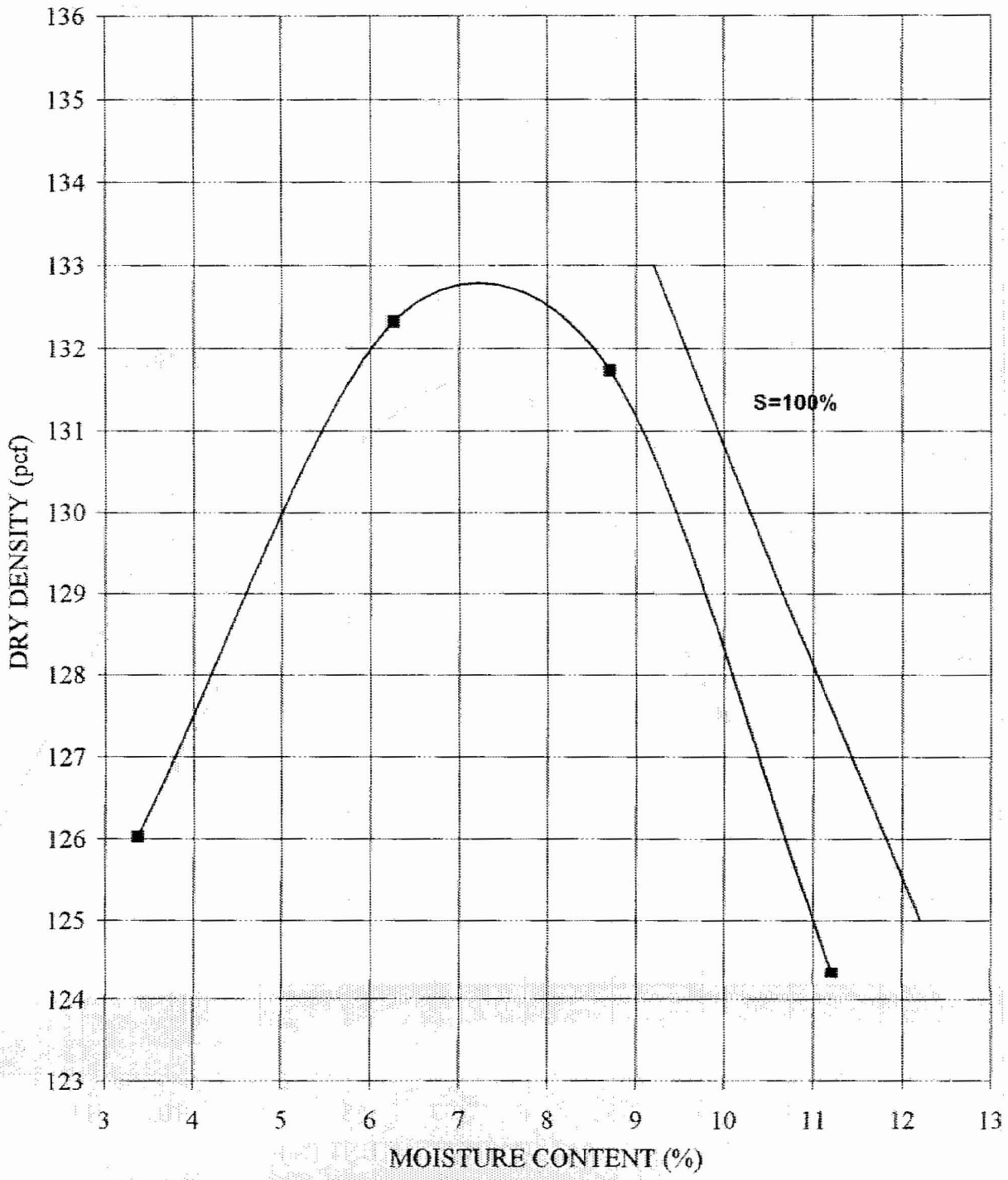


MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.:	06120048.00	Date:	9/26/2006
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI		
TP-C-309	7.0-8.0	Poorly Graded SAND, with silt, light brown	SP-SM				
Assumed Specific Gravity:	2.30	% Passing 3/4" Sieve:		100.0			
		% Passing #4 Sieve:		100.0			
Maximum Dry Density (pcf):	**112.3**	**Optimum Moisture Content (%):**		**9.8**			

Schnabel Engineering



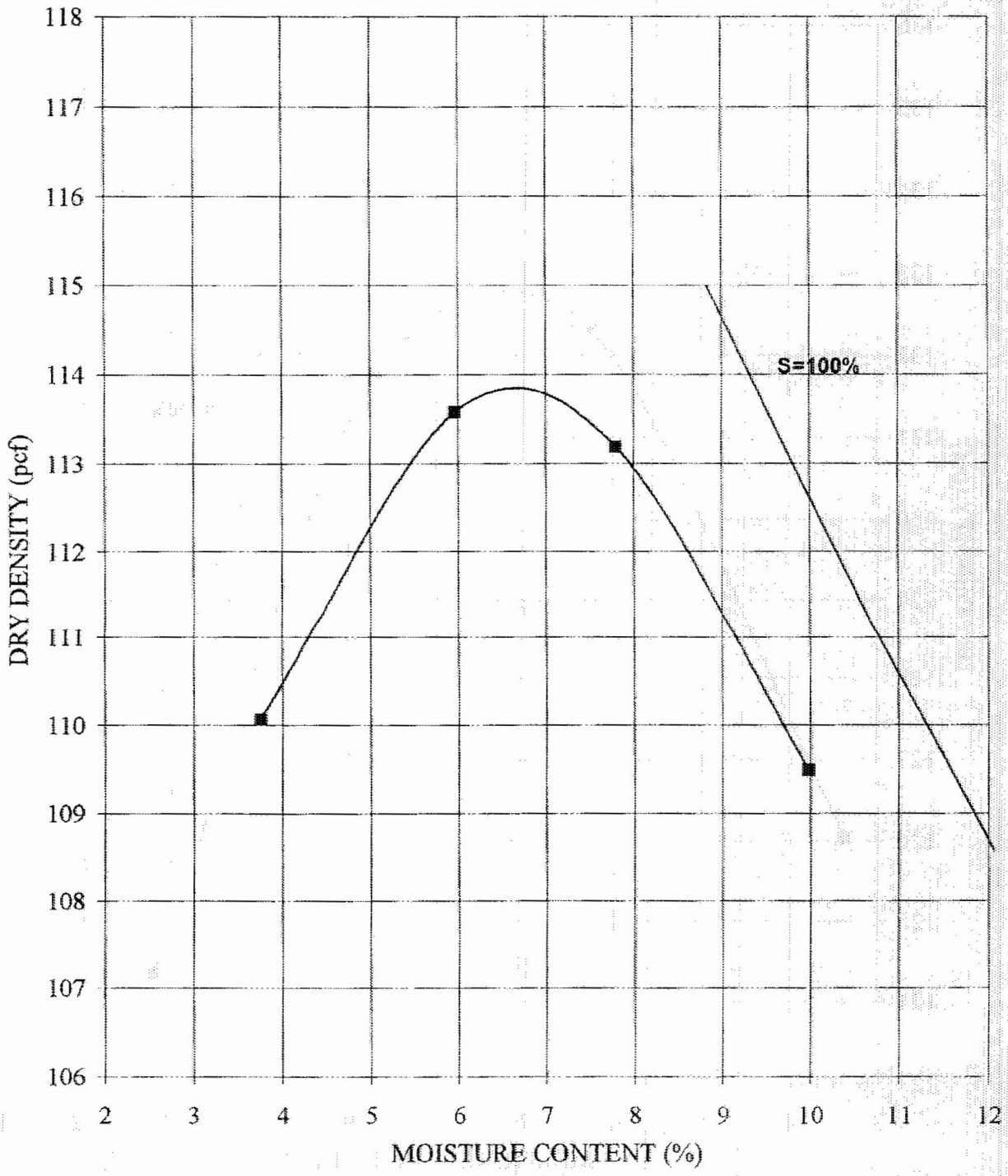
MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.:	06120048.00	Date:	9-18-06
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI		
TP-C-723	2.5-3.5	Clayey SAND, dark brown	SC	30	15		
Assumed Specific Gravity:	2.65	% Passing 3/4" Sieve:		100.0			
		% Passing #4 Sieve:		100.0			
Maximum Dry Density (pcf):	**132.8**	**Optimum Moisture Content (%):**		7.3			

Schnabel

Schnabel Engineering



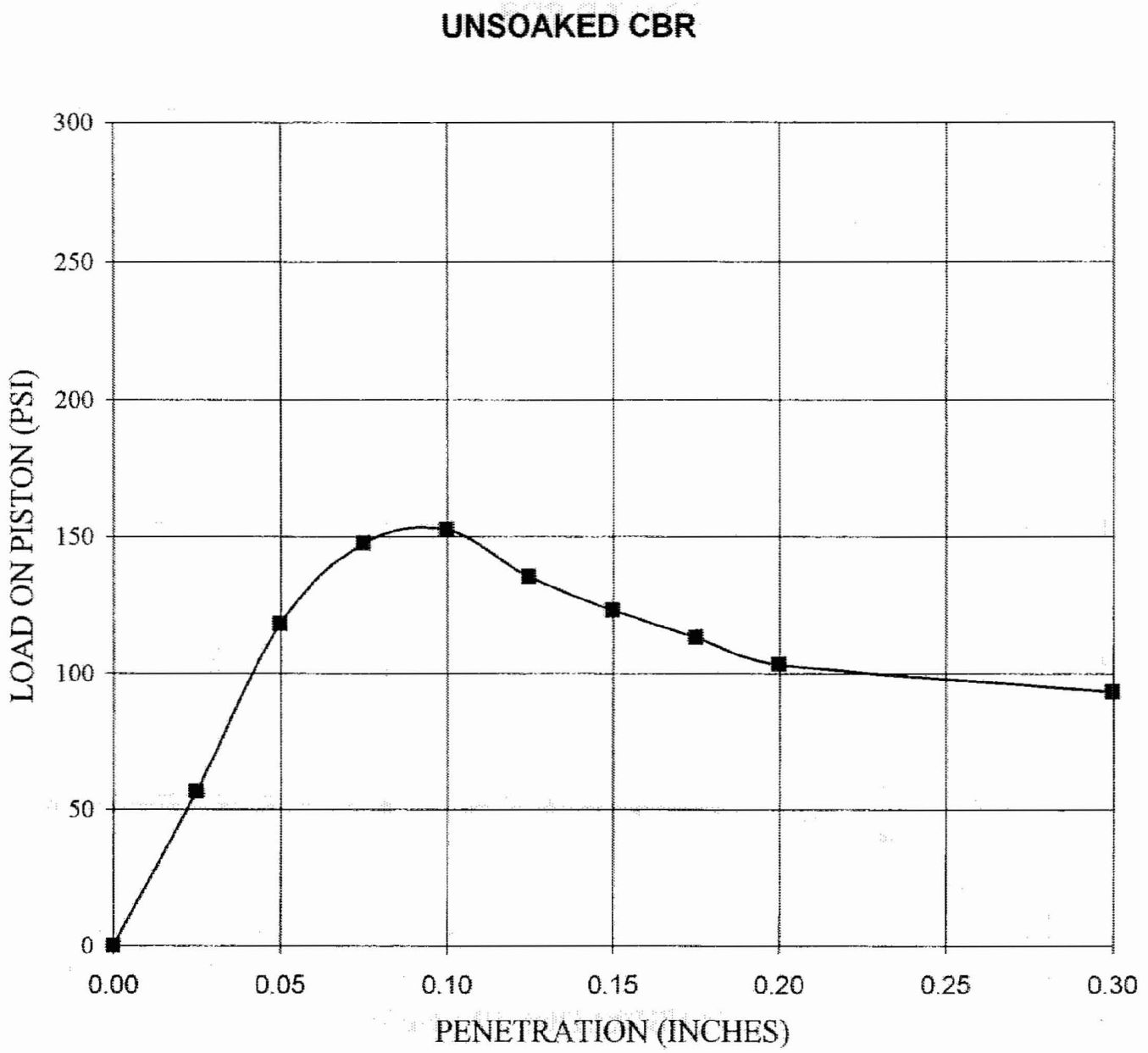
MOISTURE-DENSITY RELATION

ASTM D-1557 Method A

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland			Contract No.:	06120048.00	Date:	9/26/2006
Boring No.	Depth (ft)	Sample Description		Class.	LL	PI	
TP-C-723	6.0-7.0	Poorly Graded SAND, with silt, trace gravel, brown		SP-SM	30	15	
Assumed Specific Gravity:		2.20	% Passing 3/4" Sieve:		100.0		
			% Passing #4 Sieve:		98.8		
Maximum Dry Density (pcf):		**113.8**	**Optimum Moisture Content (%):**		**6.8**		

Schnabel Engineering

CALIFORNIA BEARING RATIO RESULTS



CALIFORNIA BEARING RATIO

ASTM D-1883

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland	Contract No.:	06120048.00	Date:	9/25/2006

Boring No.	Depth (ft)	Sample Description
TP-B-307	4.5-5.5	Poorly Graded SAND, with silt, brown

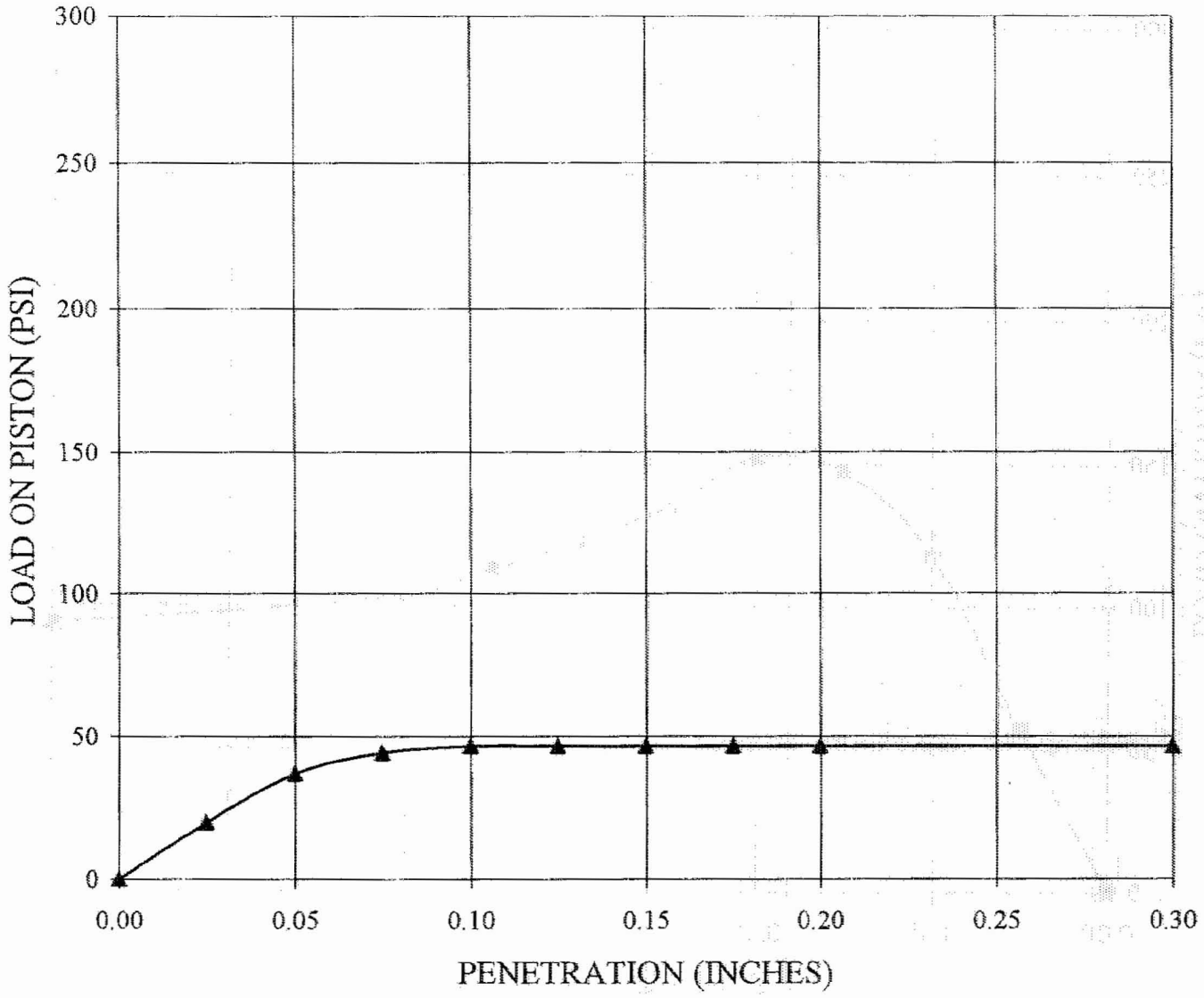
CBR (Unsoaked):	14.8	Soaking Time:	N/A
Surcharge:	50 PSF	Swell:	N/A

DRY DENSITY, PCF		MOISTURE CONTENT, %	
Before Soaking:	103.8	Before Soaking:	9.7
After Soaking:	N/A	After Soaking:	N/A
Max. Dry Density:	109.3	Optimum Moisture:	10.5

Schnabel

Schnabel Engineering

SOAKED CBR



CALIFORNIA BEARING RATIO

ASTM D-1883

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland	Contract No.:	06120048.00	Date:	9/25/2006

Boring No.	Depth (ft)	Sample Description
TP-B-307	4.5-5.5	Poorly Graded SAND, with silt, brown

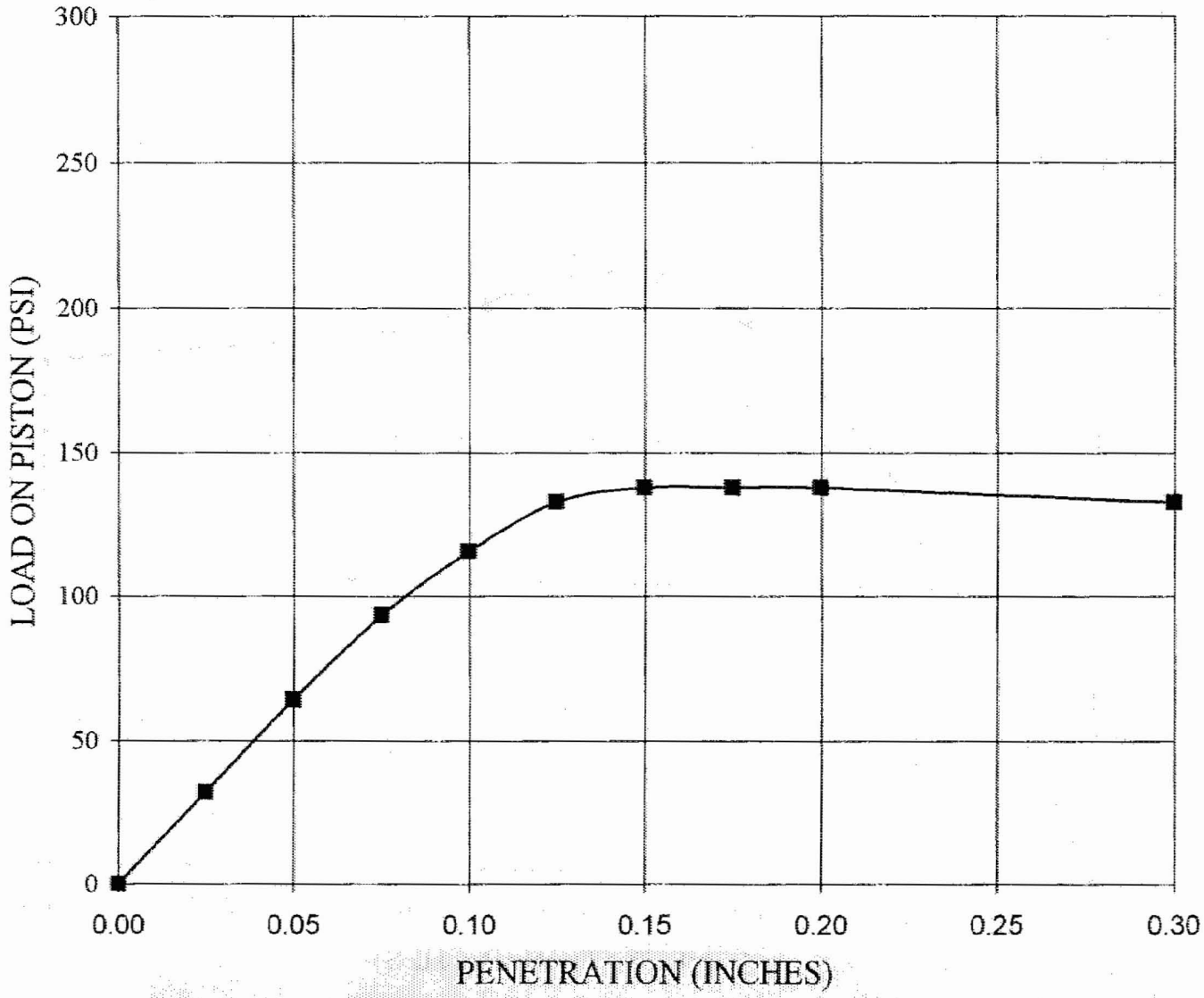
CBR (Soaked):	**4.4**	Soaking Time:	4 Days
Surcharge:	50 PSF	Swell:	0.0%

DRY DENSITY, PCF		MOISTURE CONTENT, %	
Before Soaking:	103.8	Before Soaking:	9.7
After Soaking:	103.7	After Soaking:	12.8
Max. Dry Density:	109.3	Optimum Moisture:	10.5

Schnabel

Schnabel Engineering

UNSOAKED CBR



CALIFORNIA BEARING RATIO

ASTM D-1883

Project:	Constellation Energy Group COLA Project, Calvert Cliffs NuclearPower Plant (CCNPP), Calvert County, Maryland	Contract No.:	06120048.00	Date:	9/26/2006

Boring No.	Depth (ft)	Sample Description
TP-B-315	6.0-7.0	Poorly Graded SAND, with silt, tan

CBR (Unsoaked):	**11.6**	Soaking Time:	N/A
Surcharge:	50 PSF	Swell:	N/A
DRY DENSITY, PCF		MOISTURE CONTENT, %	
Before Soaking:	109.2	Before Soaking:	11.6
After Soaking:	N/A	After Soaking:	N/A
Max. Dry Density:	114.9	Optimum Moisture:	11.4

Schnabel

Schnabel Engineering