2016

Soil Stabilization

FIELD REPORT

WILL FERGUSON

TINDOL CONSTRUCTION | 2335 Viggo Road – Beeville, Texas 78102

TINDOL CONSTRUCTION

TABLE OF CONTENTS – SOIL STABILIZATION FIELD REPORT

TINDOL CONSTRUCTION

OVERVIEW – SOIL STABILIZATION FIELD REPORT

To whom it may concern,

Tindol Construction has been exploring multiple stabilizers and application processes regarding soil stabilization in an effort to bring our customers reduced costs for new construction, as well as repairing older projects. The information found within this report contains the results of (3) separate pads constructed utilizing a liquid soil stabilization process. The methods and materials used for the purpose of this testing are a combination of Tindol Construction's blended aggregate materials, liquid soil stabilizers, portland cement and processing methods of the stated materials. Both aggregate materials for the pad construction have been used by all of our current customers for projects including but not limited to: civil, facilities, roadwork and the Oil & Gas Industry. We believe that these new options we now have available to our customers will not only meet initial expectations, but in fact exceed them.

CHEMICAL SOIL STABILIZATION

"ROADBOND EN 1™ patented soil stabilizer fundamentally alters the ability of clay to hold adsorbed water, which is water held by electrical attraction. ROADBOND EN 1™ stabilizer causes clay to release weakly ionized water molecules from the clay matrix and replaces the water with strongly ionized sulfate radicals. The exchange is permanent and takes place at normal pH levels.

As in lime stabilization, metal hydrates are formed which help increase the strength of the clay and by leaving the clay matrix intact, the permeability is significantly reduced.

When mixed with base material and compatible in-place material, ROADBOND EN 1™ stabilizer dissolves the mineral salts and natural cementitious properties of the soil. Mixing the soil disperses the dissolved material into the void spaces between the soil grains where it cures and crystallizes.

The re-crystallized mineral salts and natural cements form an effective bond that results in improved strength, load-bearing capacity and durability. The replacement of weakly ionized water molecules with strongly ionized sulfate radicals along with the increased dry density make the treated soil more resistant to water penetration. This reduces shrink-swell potential along with freeze-thaw damage."

TINDOL CONSTRUCTION

TEST PADS – SPECS OF CONSTRUCTION AND MATERIALS

SPECIFICATIONS

All (3) pads were constructed utilizing a combination of blended aggregate materials, liquid stabilizers, portland cement and our current construction application methods. Tindol Construction can provide our customers less expensive aggregate with enhanced strength and longevity when compared to limestone by processing it on location with a unique blend of materials and application methods. The test results found within this report will detail the achieved enhancements from the combined materials and application methods.

TEST PAD A - SPECS

- Constructed on April 22nd, 2016
- 50' x 100' Surface Area
- 6" of Stabilized Import Fill on top of Subgrade
- 3% EN-1 used for Stabilization
- Only Used EN-1 to Stabilize Import Fill

TEST PAD B - SPECS

- Constructed on April 22nd, 2016
- 50' x 100' Surface Area
- 6" of Stabilized Import Fill on top of Subgrade
- 3% EN-1 used for Stabilization
- 3% Portland Cement

TEST PAD C - SPECS

- Constructed on May 10th, 2016
- 60' x 200' Surface Area
- 6" of Stabilized Flexbase on top of Subgrade
- 3% EN-1 used for Stabilization
- 2% Portland Cement

TINDOL CONSTRUCTION

MATERIALS – PI REPORT, SIEVE ANALYSIS AND APPLICATIONS

IMPORT FILL MATERIAL

Typically used for elevating subgrades when in-situ soils do not meet the required specifications. A lower cost material when compared to flexbase materials.

- Used for Construction on Test Pads A and B
- PI Report – Attachment A
- (USCS) Unified Soil Classification System
    - *Light Brown Clayey Sand w/ Gravel (SC)*
- AASHTO Soil Classification: A-2-7
- Minus (1) #200 Sieve – 34%
- Plasticity Index (PI) – 21

FLEXBASE MATERIAL

Typically used for pad and road construction to provide a durable coarse aggregate material as a pad or base for construction projects. It has higher costs when compared to the above Import Fill material due to additional required processing. Our flexbase can be produced to the same standards and classifications as limestone flexbase.

- Used for Construction on Test Pad C
- PI Report – Attachment B
- Sieve Analysis – Attachment C
- (USCS) Unified Soil Classification System
    - *Light Gray Clayey Gravel w/ Sand (GC)*
- AASHTO Soil Classification: A-2-7
- TxDOT Spec – Type A Grade 2
- Minus (1) #200 Sieve – 30%
- Plasticity Index (PI) – 29

TBPE Firm No. 2101

ROCK ENGINEERING & TESTING LABORATORY INCORPORATED

Area Offices

10856 Vandale St.	San Antonio, TX 78216	210-495-8000
6817 Leopard St.	Corpus Christi, TX 78409	361-883-4555
No. 1 Roundville Ln.	Round Rock, TX 78664	512-284-8022

Client No:	12160	Project: C214138	Date Sampled: 04/21/2016
Report Date:	05/02/2016		Sampled By: Client
Project:	Laboratory Testing 2016		By Order Of: Will Ferguson
Location:	NE-CCF		

Client: Tindol Construction, LLC

REPORT: Liquid Limit, Plastic Limit, & Plasticity Index and Minus (-) #200 Sieve

LAB NO: 28695

TEST RESULTS

Report No: 042116-44

Page 1 of 1

Sample

Liquid Limit (Method B)	45
Plastic Limit	24
PLASTICITY INDEX	**21**
Minus (-) #200 Sieve	34%

Remarks: Material Classification: Light Brown Clayey Sand w/Gravel (SC)

Test Methods: ASTM D 4318, D 1140

Orig: Tindol Construction, LLC (Beeville, TX)

Attn: Jason Tindol (1-cc copy)

1-ec Tindol Construction, LLC Attn: Vinny Oliver

1-ec Tindol Construction, LLC Attn: Rick Karlson

1-ec Tindol Construction, LLC Attn: Garret Tindol

1-ec Tindol Construction, LLC Attn: Jason Tindol

1-ec Tindol Construction, LLC Attn: Will Ferguson

Respectfully Submitted,

Rock Engineering & Testing Laboratory, Inc.

Kyle D. Hammock, P.E.

TBPE Firm No. 2101

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Client No:	12160	Project: C214138	Date Sampled: 05/06/2016
Report Date:	05/11/2016		Sampled By: Clayton Tindol
Project:	Laboratory Testing 2016		By Order Of: Will Ferguson
Location:	NE-CCF		

Client: Tindol Construction, LLC

REPORT: Liquid Limit, Plastic Limit, & Plasticity Index and Minus (-) #200 Sieve

LAB NO: 28918

TEST RESULTS

Report No: 050616-50

Sample

Liquid Limit (Method B)	47
Plastic Limit	18
PLASTICITY INDEX	**29**
Minus (-) #200 Sieve	30%

Remarks: Material Classification: Light Gray Clayey Gravel w/Sand (GC)
Test Methods: ASTM D 4318, D 1140

Orig: Tindol Construction, LLC (Beeville, TX)
Attn: Jason Tindol (1-cc copy)
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1-ec Tindol Construction, LLC Attn: Garret Tindol

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Client No: 12160 Project: C214138 Date Sampled: 05/06/2016
Report Date: 05/11/2016 Sampled By: Clayton Tindol
Project: Laboratory Testing 2016 By Order Of: Will Ferguson
Location: NE-CCF

Client: Tindol Construction, LLC

REPORT: Sieve Analysis LAB NO: 28918

TEST RESULTS Report No: 050616-50
Page 1 of 1

Sieve Size	Sample % Retained	TxDOT Gr. 2 Spec. % Required
2 1/2"	0	0
1 3/4"	3	0-10
7/8"	9	N/A
3/4"	12	N/A
3/8"	24	N/A
No. 4	36	45-75
No. 40	50	60-85

Remarks: Material Classification:
Light Gray Clayey Gravel w/Sand (GC). TxDOT Gr. 2 specifications for informational purposes only.

Test Methods: ASTM D 422

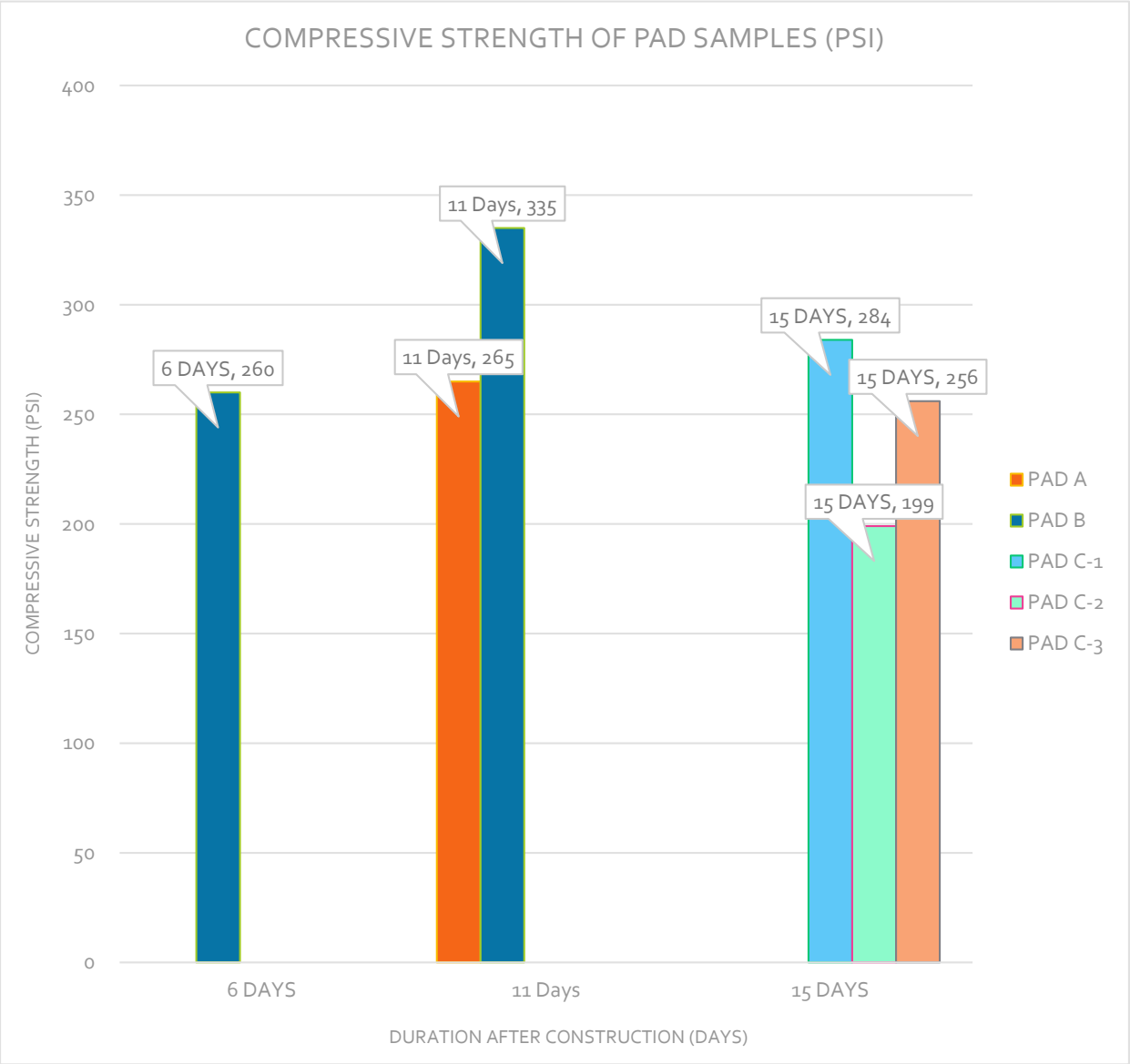
Orig: Tindol Construction, LLC (Beeville, TX)
Attn: Jason Tindol (1-cc copy)
1-ec Tindol Construction, LLC Attn: Vinny Oliver
1-ec Tindol Construction, LLC Attn: Will Ferguson
1-ec Tindol Construction, LLC Attn: Jason Tindol
1-ec Tindol Construction, LLC Attn: Garret Tindol

Respectfully Submitted,
Rock Engineering & Testing Laboratory, Inc.

Kyle D. Hammock, P.E.

TINDOL CONSTRUCTION

PSI TEST RESULTS – PADS A, B, AND C



MATERIALS	STABILIZERS	SAMPLES	6 DAYS	11 Days	15 DAYS
Import Fill	*3% EN-1*	PAD A		265	
Import Fill	*3% EN-1, 3% Portland*	PAD B	260	335	
Flexbase	*3% EN-1, 2% Portland*	PAD C-1			284
Flexbase	*3% EN-1, 2% Portland*	PAD C-2			199
Flexbase	*3% EN-1, 2% Portland*	PAD C-3			256

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No. 1 Roundville Ln.	Round Rock, TX 78664	512-284-8022

Client No:	12160	Project: C214138	Date Sampled: 04/28/2016
Report Date:	05/04/2016		Sampled By: RETL
Project:	Laboratory Testing 2016		By Order Of: Will Ferguson
Location:	Tindol Construction, LLC - Beeville Facility		
Client:	Tindol Construction, LLC		
REPORT:	Drilled Core Compression Tests		LAB NO: 28778

TEST RESULTS

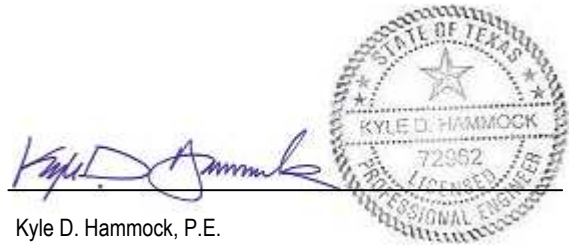
Report No: 042816-45

Page 1 of 1

As requested by Will Ferguson, RETL representatives arrived at the Tindol Construction facility in Beeville, Texas on April 25, 2016 to obtain drilled cores of the EN-1 treated material test strips constructed on April 22, 2016. The coring operation was relatively unsuccessful as only one core of the 3% EN-1 / 3% Portland cement treated material was suitable for testing. The 6-day compression test result for this 3% EN-1 / 3% Portland cement core was 260 psi.

On May 2, 2106, bulk samples of the treated materials were delivered to the RETL laboratory. The RETL Engineer determined that sawed cubes could be successfully obtained from the treated samples and tested in compression. The average 11-day compression test result for two cubes of the 3% EN-1 treated material was 265 psi. The average 11-day compression test result for two cubes of the 3% EN-1 / 3% Portland cement treated material was 335 psi.

Respectfully Submitted,
Rock Engineering & Testing Laboratory, Inc.



Kyle D. Hammock, P.E.

Orig: Tindol Construction, LLC (Beeville, TX)
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1-ec Tindol Construction, LLC Attn: Garret Tindol
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1-ec Tindol Construction, LLC Attn: Will Ferguson

TBPE Firm No. 2101

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6817 Leopard St.	Corpus Christi, TX 78409	361-883-4555
No. 1 Roundville Ln.	Round Rock, TX 78664	512-284-8022

Client No:	12160	Project: C214138	Date Sampled: 05/24/2016
Report Date:	05/27/2016		Sampled By: JW/MO
Project:	Laboratory Testing 2016		By Order Of: Will Ferguson
Location:	Tindol Construction, LLC - Beeville Facility		
Client:	Tindol Construction, LLC		
REPORT:	Drilled Core Compression & DCP Testing		LAB NO: 29115

TEST RESULTS

Report No: 052416-52

As requested by Will Ferguson, RETL representatives arrived at the Tindol Construction facility in Beeville, Texas on May 24, 2016 to obtain drilled cores of the 3% EN-1 / 2% Portland cement treated material from Pad C and to perform Dynamic Cone Penetrometer (DCP) testing on Pads A, B, & C. The cores were prepared and tested in general accordance with ASTM C-42, and the 15-day compression test results were an average of 246 psi. The compression test results and DCP readings are attached.

Orig: Tindol Construction, LLC (Beeville, TX)

Attn: Jason Tindol (1-cc copy)
1-cc Tindol Construction, LLC Attn: Vinny Oliver
1-cc Tindol Construction, LLC Attn: Will Ferguson
1-cc Tindol Construction, LLC Attn: Jason Tindol
1-cc Tindol Construction, LLC Attn: Garret Tindol

Respectfully Submitted,
Rock Engineering & Testing Laboratory, Inc.

Kyle D. Hammock, P.E.

REPORT CREATED BY ElmTree SYSTEM

ROCK ENGINEERING & TESTING LABORATORY, INCORPORATED

- **Geotechnical Engineering**
- **Construction Materials Testing**

PROJECT: Laboratory Testing 2016

CLIENT: Tindol Construction, LLC

MATERIAL: 3% EN-1 / 2% Portland Cement

DATE: 05/27/16
CLIENT NO.: 12160
JOB NO.: C214138
REPORT NO.: 052416-52
LABORATORY NO.: 29115

DRILLED CORE COMPRESSION TESTS

Core #	1C	2C	3C
Age (days)	15	15	15
Location	Pad C	Pad C	Pad C
Length as Cored (in)	5	8	7
Average Diameter (in)	3.72	3.72	3.72
Length Before Capping (in)	4.4	5.5	5.4
Length After Capping (in)	4.6	5.8	5.7
Length to Diameter Ratio	1.24	1.56	1.53
Load (lbs)	3,320	2,310	2,980
Correction Factor	0.928	0.937	0.934
Area (sq in)	10.87	10.87	10.87
Compressive Strength (psi)	**284**	**199**	**256**

Reviewed by: _____

Kyle D. Hammock, P.E.
Vice President

10856 Vandale Street * San Antonio, Texas 78216
(210) 495-8000 FAX: (210) 495-8015

TINDOL CONSTRUCTION

DYNAMIC CONE PENETROMETER TESTING – PADS A, B, AND C

Tindol Construction conducted a series of Field Dynamic Cone Penetrometer (DCP) testing in an effort to show the increased strength of our stabilized aggregate materials used in the construction of these pads. This part of the report will use the included engineer reports of our materials to classify them within the United Soil Classification System (USCS) and give us the expected CBR range for their soil group. This expected CBR range can then be used to compare the results achieved by our Field Dynamic Cone Penetrometer (DCP) testing to evaluate the enhanced strength through our stabilization methods. You can find extended detail referring to the Unified Soil Classification System (USCS) and the Dynamic Cone Penetrometer (DCP) testing on Page 7 of this report. Below you will find a breakdown of the DCP test results for each Pad.

PAD A – DCP RESULTS

- Tested 32 Days after Construction
- Materials Used: *Import Fill, 3% EN-1, 3% Portland*
- USCS: *Light Brown Clayey Sand w/ Gravel (SC)*
- Expected CBR Range: *5 to 20*
- Average CBR Achieved: **36.95**
- Average Bearing Capacity: **5,785.32 (psf)**

PAD B – DCP RESULTS

- Tested 32 Days after Construction
- Materials Used: *Import Fill, 3% EN-1, 3% Portland*
- USCS: *Light Brown Clayey Sand w/ Gravel (SC)*
- Expected CBR Range: *5 to 20*
- Average CBR Achieved: **124.81**
- Average Bearing Capacity: **11,694.65 (psf)**

PAD C – DCP RESULTS

- Tested 14 Days after Construction
- Materials Used: *Flexbase, 3% EN-1, 2% Portland*
- USCS: *Light Gray Clayey Gravel w/ Sand (GC)*
- Expected CBR Range: *20 to 40*
- Average CBR Achieved: **49.25**
- Average Bearing Capacity: **7,127.27 (psf)**

TINDOL CONSTRUCTION

DYNAMIC CONE PENETROMETER TESTING – PADS A, B, AND C (CONTINUED)

Unified Soil Classification System (USCS)
represented by two-letter symbol

First and/or second letters		*Second Letter*	
Letter	**Definition**	**Letter**	**Definition**
G	gravel	**P**	poorly graded (uniform particle sizes)
S	sand	**W**	well-graded (diversified particle sizes)
M	silt	**H**	high plasticity
C	clay	**L**	low plasticity
O	organic		

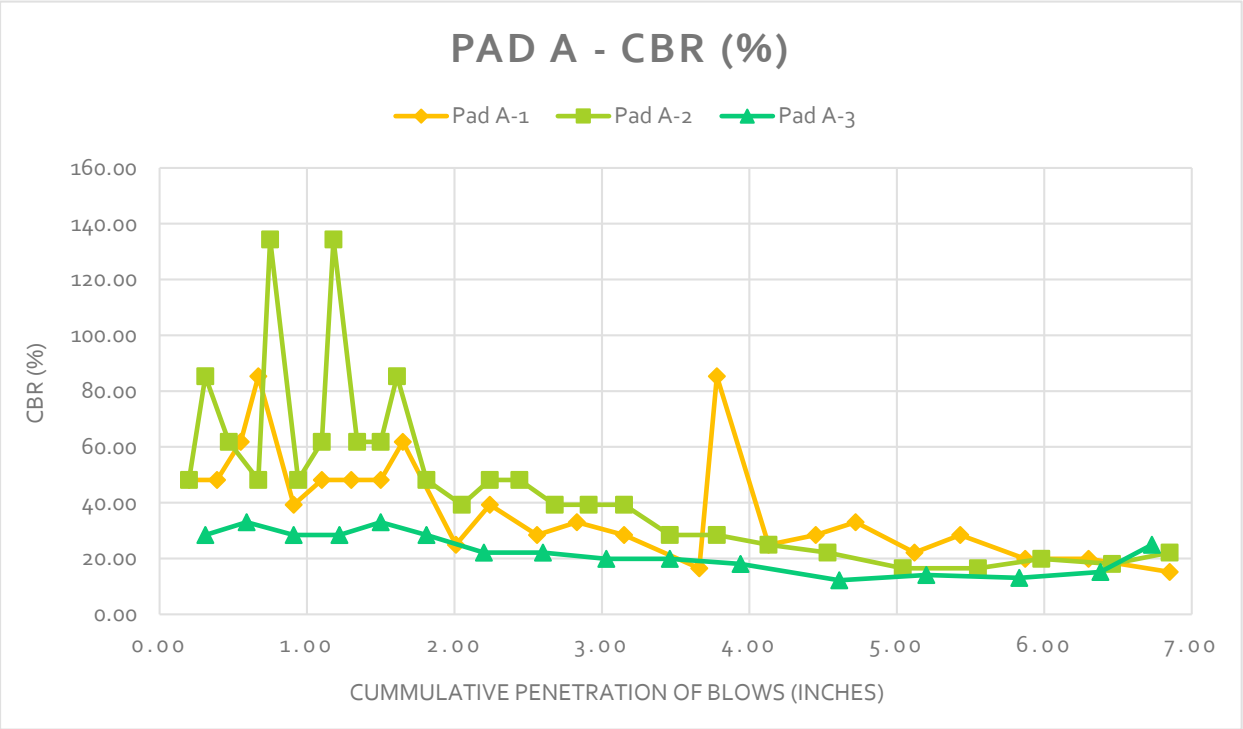
ASTM D6951 / D6951M - Dynamic Cone Penetrometer Field Test
Significance and Use

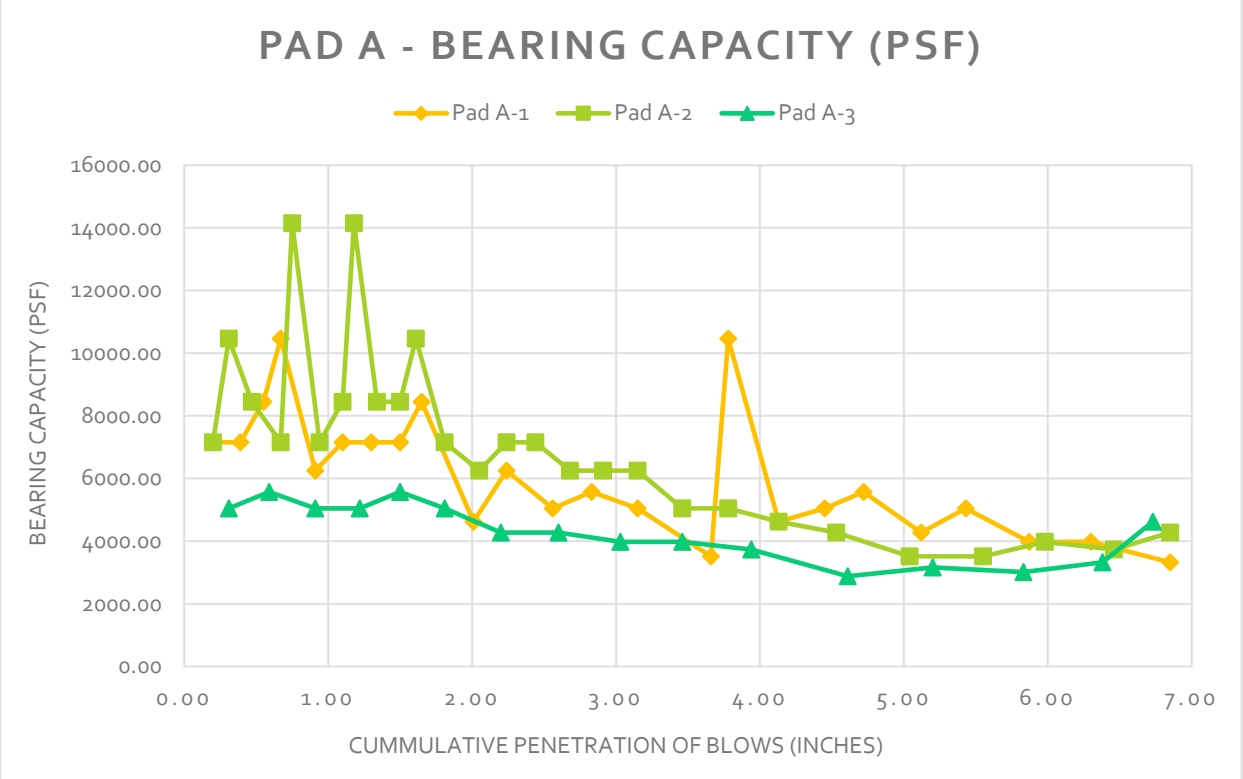
This test method is used to assess in situ strength of undisturbed soil and compacted materials (or both). The penetration rate of the 8-kg [17.6-lb] DCP can be used to estimate in-situ CBR (California Bearing Ratio), to identify strata thickness, shear strength of strata, and other material characteristics. A field DCP measurement results in a field or in situ CBR and will not normally correlate with the laboratory or soaked CBR of the same material. The test is thus intended to evaluate the in situ strength of a material under existing field conditions.

Major divisions			**Symbol**	**Group name**	**CBR Range**
Coarse grained soils *more than 50% retained on or above No.200 (0.075 mm) sieve*	gravel *> 50% of coarse fraction retained on No. 4 (4.75 mm) sieve*	clean gravel <5% smaller than #200 Sieve	**GW**	well-graded gravel, fine to coarse gravel	**40 to 80**
			GP	poorly graded gravel	**30 to 60**
		gravel with >12% fines	**GM**	silty gravel	**20 to 60**
			GC	clayey gravel	**20 to 40**
	sand *≥ 50% of coarse fraction passes No.4 sieve*	clean sand	**SW**	well-graded sand, fine to coarse sand	**20 to 40**
			SP	poorly graded sand	**10 to 40**
		sand with >12% fines	**SM**	silty sand	**10 to 40**
			SC	clayey sand	**5 to 20**
Fine grained soils *50% or more passing the No.200 sieve*	silt and clay *liquid limit < 50*	inorganic	**ML**	silt	**15 or Less**
			CL	clay of low plasticity, lean clay	**15 or Less**
		organic	**OL**	organic silt, organic clay	**5 or Less**
	silt and clay *liquid limit ≥ 50*	inorganic	**MH**	silt of high plasticity, elastic silt	**10 or Less**
			CH	clay of high plasticity, fat clay	**15 or Less**
		organic	**OH**	organic clay, organic silt	**5 or Less**
Highly organic soils			**Pt**	peat	**NA**

TINDOL CONSTRUCTION

PAD A – DCP TEST RESULTS





TINDOL CONSTRUCTION

PAD A – DCP TEST RESULTS (PAD A-1 TEST LOGS)

PAD A-1 (DCP TESTING) **Date:** 5/24/2016 *(32 Days After Construction)* **Materials:** Import Fill, 3% EN-1					**Average Bearing Capacity (psf)** 6072.68			**Average CBR (%)** 39.03		
Blow #	*Gauge Reading (mm) 286*	*Corrected Gauge Reading (mm) 46*	*Penetration (mm)*	*Cummulative Penetration (mm)*	*Penetration (in)*	**Cummulative Penetration (in)**	*Hammer Factor (17.6 lbs)*	*DCP Index (mm/blow)*	**CBR (%)**	**Bearing Capacity (psf)**
1	290	50	5	5	0.20	0.20	1	5	48.14	7155.90
2	295	55	5	10	0.20	0.39	1	5	48.14	7155.90
3	299	59	4	14	0.16	0.55	1	4	61.81	8447.61
4	302	62	3	17	0.12	0.67	1	3	85.31	10462.81
5	308	68	6	23	0.24	0.91	1	6	39.25	6248.54
6	313	73	5	28	0.20	1.10	1	5	48.14	7155.90
7	318	78	5	33	0.20	1.30	1	5	48.14	7155.90
8	323	83	5	38	0.20	1.50	1	5	48.14	7155.90
9	327	87	4	42	0.16	1.65	1	4	61.81	8447.61
10	336	96	9	51	0.35	2.01	1	9	24.92	4621.93
11	342	102	6	57	0.24	2.24	1	6	39.25	6248.54
12	350	110	8	65	0.31	2.56	1	8	28.44	5045.03
13	357	117	7	72	0.28	2.83	1	7	33.03	5571.75
14	365	125	8	80	0.31	3.15	1	8	28.44	5045.03
15	378	138	13	93	0.51	3.66	1	13	16.51	3516.06
16	381	141	3	96	0.12	3.78	1	3	85.31	10462.81
17	390	150	9	105	0.35	4.13	1	9	24.92	4621.93
18	398	158	8	113	0.31	4.45	1	8	28.44	5045.03
19	405	165	7	120	0.28	4.72	1	7	33.03	5571.75
20	415	175	10	130	0.39	5.12	1	10	22.15	4273.60
21	423	183	8	138	0.31	5.43	1	8	28.44	5045.03
22	434	194	11	149	0.43	5.87	1	11	19.91	3981.17
23	445	205	11	160	0.43	6.30	1	11	19.91	3981.17
24	459	219	14	174	0.55	6.85	1	14	15.20	3327.53

TINDOL CONSTRUCTION

PAD A – DCP TEST RESULTS (PAD A-2 TEST LOGS)

PAD A-2 (DCP TESTING) **Date:** 5/24/2016 *(32 Days After Construction)* **Materials:** Import Fill, 3% EN-1					**Average Bearing Capacity (psf)** 6997.77			**Average CBR (%)** 49.24		
Blow #	*Gauge Reading (mm) 286*	*Corrected Gauge Reading (mm) 46*	*Penetration (mm)*	*Cummulative Penetration (mm)*	*Penetration (in)*	**Cummulative Penetration (in)**	*Hammer Factor (17.6 lbs)*	*DCP Index (mm/blow)*	**CBR (%)**	**Bearing Capacity (psf)**
1	286	46	5	5	0.20	0.20	1	5	48.14	7155.90
2	289	49	3	8	0.12	0.31	1	3	85.31	10462.81
3	293	53	4	12	0.16	0.47	1	4	61.81	8447.61
4	298	58	5	17	0.20	0.67	1	5	48.14	7155.90
5	300	60	2	19	0.08	0.75	1	2	134.35	14145.04
6	305	65	5	24	0.20	0.94	1	5	48.14	7155.90
7	309	69	4	28	0.16	1.10	1	4	61.81	8447.61
8	311	71	2	30	0.08	1.18	1	2	134.35	14145.04
9	315	75	4	34	0.16	1.34	1	4	61.81	8447.61
10	319	79	4	38	0.16	1.50	1	4	61.81	8447.61
11	322	82	3	41	0.12	1.61	1	3	85.31	10462.81
12	327	87	5	46	0.20	1.81	1	5	48.14	7155.90
13	333	93	6	52	0.24	2.05	1	6	39.25	6248.54
14	338	98	5	57	0.20	2.24	1	5	48.14	7155.90
15	343	103	5	62	0.20	2.44	1	5	48.14	7155.90
16	349	109	6	68	0.24	2.68	1	6	39.25	6248.54
17	355	115	6	74	0.24	2.91	1	6	39.25	6248.54
18	361	121	6	80	0.24	3.15	1	6	39.25	6248.54
19	369	129	8	88	0.31	3.46	1	8	28.44	5045.03
20	377	137	8	96	0.31	3.78	1	8	28.44	5045.03
21	386	146	9	105	0.35	4.13	1	9	24.92	4621.93
22	396	156	10	115	0.39	4.53	1	10	22.15	4273.60
23	409	169	13	128	0.51	5.04	1	13	16.51	3516.06
24	422	182	13	141	0.51	5.55	1	13	16.51	3516.06
25	433	193	11	152	0.43	5.98	1	11	19.91	3981.17
26	445	205	12	164	0.47	6.46	1	12	18.06	3731.72
27	455	215	10	174	0.39	6.85	1	10	22.15	4273.60

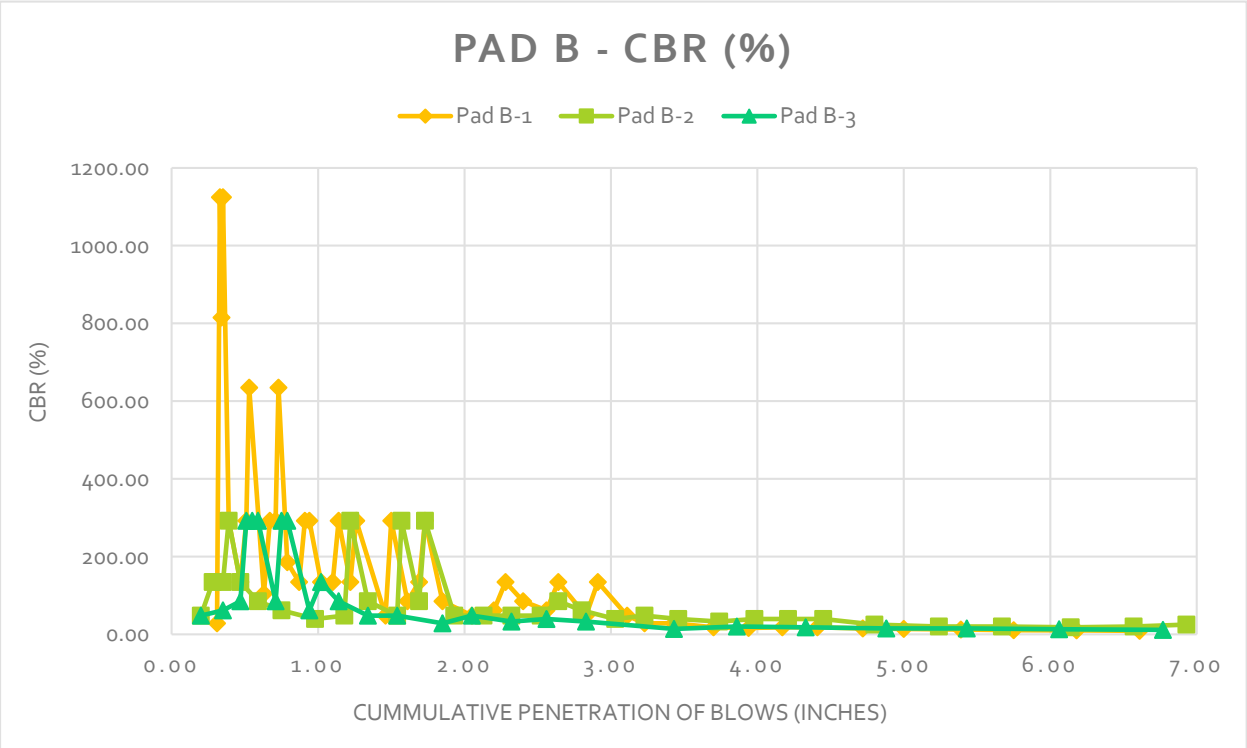
TINDOL CONSTRUCTION

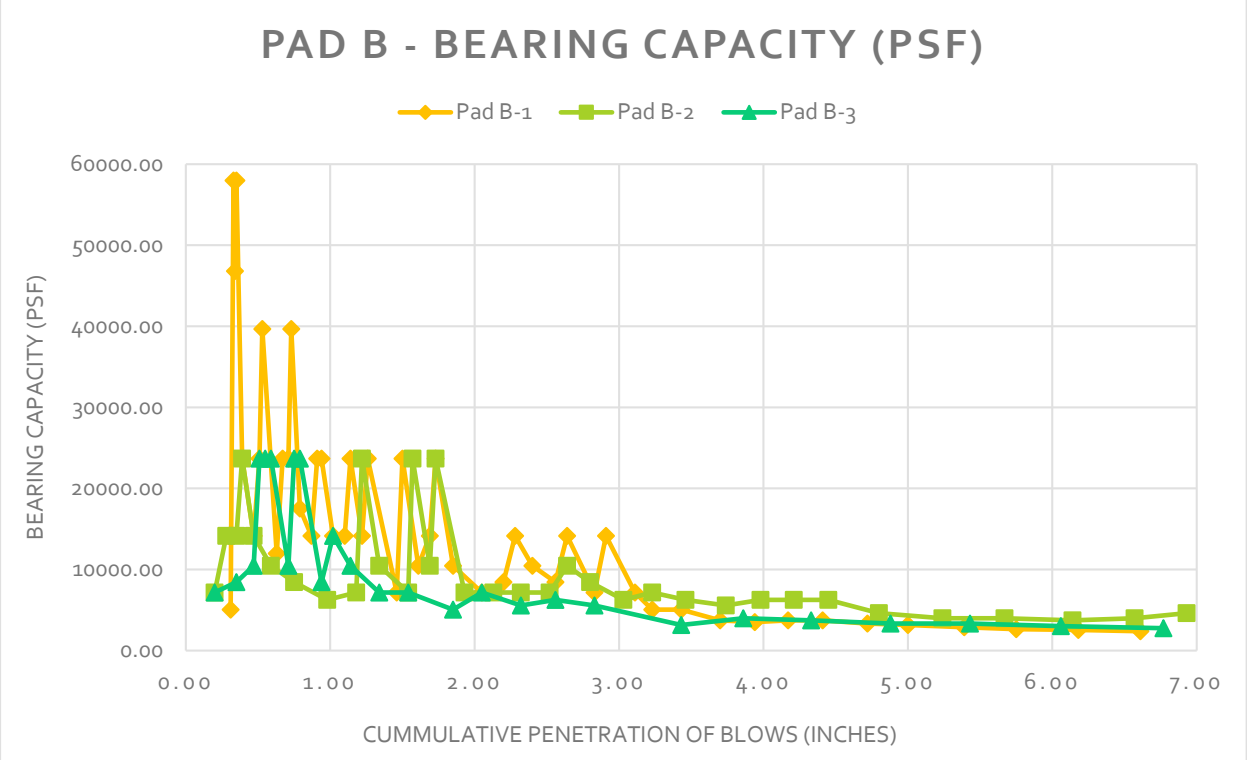
PAD A – DCP TEST RESULTS (PAD A-3 TEST LOGS)

PAD A-3 (DCP TESTING) **Date:** 5/24/2016 *(32 Days After Construction)* **Materials:** Import Fill, 3% EN-1					**Average Bearing Capacity (psf)** 4285.53			**Average CBR (%)** 22.59		
Blow #	*Gauge Reading (mm) 286*	*Corrected Gauge Reading (mm) 46*	*Penetration (mm)*	*Cummulative Penetration (mm)*	*Penetration (in)*	**Cummulative Penetration (in)**	*Hammer Factor (17.6 lbs)*	*DCP Index (mm/blow)*	**CBR (%)**	**Bearing Capacity (psf)**
1	300	60	8	8	0.31	0.31	1	8	28.44	5045.03
2	307	67	7	15	0.28	0.59	1	7	33.03	5571.75
3	315	75	8	23	0.31	0.91	1	8	28.44	5045.03
4	323	83	8	31	0.31	1.22	1	8	28.44	5045.03
5	330	90	7	38	0.28	1.50	1	7	33.03	5571.75
6	338	98	8	46	0.31	1.81	1	8	28.44	5045.03
7	348	108	10	56	0.39	2.20	1	10	22.15	4273.60
8	358	118	10	66	0.39	2.60	1	10	22.15	4273.60
9	369	129	11	77	0.43	3.03	1	11	19.91	3981.17
10	380	140	11	88	0.43	3.46	1	11	19.91	3981.17
11	392	152	12	100	0.47	3.94	1	12	18.06	3731.72
12	409	169	17	117	0.67	4.61	1	17	12.23	2880.14
13	424	184	15	132	0.59	5.20	1	15	14.07	3161.10
14	440	200	16	148	0.63	5.83	1	16	13.08	3012.96
15	454	214	14	162	0.55	6.38	1	14	15.20	3327.53
16	463	223	9	171	0.35	6.73	1	9	24.92	4621.93

TINDOL CONSTRUCTION

PAD B – DCP TEST RESULTS





TINDOL CONSTRUCTION

PAD B – DCP TEST RESULTS (PAD B-1 TEST LOGS)

PAD B-1 (DCP TESTING) **Date:** 5/24/2016 *(32 Days After Construction)* **Materials:** Import Fill, 3% EN-1, 3% Portland					**Average Bearing Capacity (psf)** 15822.31			**Average CBR (%)** 199.01		
Blow #	*Gauge Reading (mm) 286*	*Corrected Gauge Reading (mm) 46*	*Penetration (mm)*	*Cummulative Penetration (mm)*	*Penetration (in)*	**Cummulative Penetration (in)**	*Hammer Factor (17.6 lbs)*	*DCP Index (mm/blow)*	**CBR (%)**	**Bearing Capacity (psf)**
1	280	40	8	8	0.31	0.31	1	8	28.44	5045.03
2	280.3	40.3	0	8	0.01	0.33	1	0	1124.62	57986.71
3	280.7	40.7	0	9	0.02	0.34	1	0	814.85	46818.13
4	281	41	0	9	0.01	0.35	1	0	1124.62	57986.71
5	282	42	1	10	0.04	0.39	1	1	292.00	23685.04
6	284	44	2	12	0.08	0.47	1	2	134.35	14145.04
7	285	45	1	13	0.04	0.51	1	1	292.00	23685.04
8	285.5	45.5	1	14	0.02	0.53	1	1	634.65	39659.21
9	288	48	3	16	0.10	0.63	1	3	104.64	11982.13
10	289	49	1	17	0.04	0.67	1	1	292.00	23685.04
11	290	50	1	18	0.04	0.71	1	1	292.00	23685.04
12	290.5	50.5	1	19	0.02	0.73	1	1	634.65	39659.21
13	292	52	2	20	0.06	0.79	1	2	185.42	17519.37
14	294	54	2	22	0.08	0.87	1	2	134.35	14145.04
15	295	55	1	23	0.04	0.91	1	1	292.00	23685.04
16	296	56	1	24	0.04	0.94	1	1	292.00	23685.04
17	298	58	2	26	0.08	1.02	1	2	134.35	14145.04
18	300	60	2	28	0.08	1.10	1	2	134.35	14145.04
19	301	61	1	29	0.04	1.14	1	1	292.00	23685.04
20	303	63	2	31	0.08	1.22	1	2	134.35	14145.04
21	304	64	1	32	0.04	1.26	1	1	292.00	23685.04
22	309	69	5	37	0.20	1.46	1	5	48.14	7155.90
23	310	70	1	38	0.04	1.50	1	1	292.00	23685.04
24	313	73	3	41	0.12	1.61	1	3	85.31	10462.81
25	315	75	2	43	0.08	1.69	1	2	134.35	14145.04
26	316	76	1	44	0.04	1.73	1	1	292.00	23685.04
27	319	79	3	47	0.12	1.85	1	3	85.31	10462.81
28	324	84	5	52	0.20	2.05	1	5	48.14	7155.90
29	328	88	4	56	0.16	2.20	1	4	61.81	8447.61
30	330	90	2	58	0.08	2.28	1	2	134.35	14145.04
31	333	93	3	61	0.12	2.40	1	3	85.31	10462.81
32	337	97	4	65	0.16	2.56	1	4	61.81	8447.61
33	339	99	2	67	0.08	2.64	1	2	134.35	14145.04
34	344	104	5	72	0.20	2.83	1	5	48.14	7155.90
35	346	106	2	74	0.08	2.91	1	2	134.35	14145.04
36	351	111	5	79	0.20	3.11	1	5	48.14	7155.90
37	354	114	8	82	0.31	3.23	1	8	28.44	5045.03
38	359	119	8	87	0.31	3.43	1	8	28.44	5045.03
39	366	126	12	94	0.47	3.70	1	12	18.06	3731.72
40	372	132	13	100	0.51	3.94	1	13	16.51	3516.06
41	378	138	12	106	0.47	4.17	1	12	18.06	3731.72
42	384	144	12	112	0.47	4.41	1	12	18.06	3731.72
43	392	152	14	120	0.55	4.72	1	14	15.20	3327.53
44	399	159	15	127	0.59	5.00	1	15	14.07	3161.10
45	409	169	17	137	0.67	5.39	1	17	12.23	2880.14
46	418	178	19	146	0.75	5.75	1	19	10.79	2651.49
47	429	189	20	157	0.79	6.18	1	20	10.19	2552.25
48	440	200	22	168	0.87	6.61	1	22	9.16	2377.61

TINDOL CONSTRUCTION

PAD B – DCP TEST RESULTS (PAD B-2 TEST LOGS)

PAD B-2 (DCP TESTING) **Date:** 5/24/2016 *(32 Days After Construction)* **Materials:** Import Fill, 3% EN-1, 3% Portland					**Average Bearing Capacity (psf)** 9445.62			**Average CBR (%)** 82.86		
Blow #	*Gauge Reading (mm) 286*	*Corrected Gauge Reading (mm) 46*	*Penetration (mm)*	*Cummulative Penetration (mm)*	*Penetration (in)*	**Cummulative Penetration (in)**	*Hammer Factor (17.6 lbs)*	*DCP Index (mm/blow)*	**CBR (%)**	**Bearing Capacity (psf)**
1	285	45	5	5	0.20	0.20	1	5	48.14	7155.90
2	287	47	2	7	0.08	0.28	1	2	134.35	14145.04
3	289	49	2	9	0.08	0.35	1	2	134.35	14145.04
4	290	50	1	10	0.04	0.39	1	1	292.00	23685.04
5	292	52	2	12	0.08	0.47	1	2	134.35	14145.04
6	295	55	3	15	0.12	0.59	1	3	85.31	10462.81
7	299	59	4	19	0.16	0.75	1	4	61.81	8447.61
8	305	65	6	25	0.24	0.98	1	6	39.25	6248.54
9	310	70	5	30	0.20	1.18	1	5	48.14	7155.90
10	311	71	1	31	0.04	1.22	1	1	292.00	23685.04
11	314	74	3	34	0.12	1.34	1	3	85.31	10462.81
12	319	79	5	39	0.20	1.54	1	5	48.14	7155.90
13	320	80	1	40	0.04	1.57	1	1	292.00	23685.04
14	323	83	3	43	0.12	1.69	1	3	85.31	10462.81
15	324	84	1	44	0.04	1.73	1	1	292.00	23685.04
16	329	89	5	49	0.20	1.93	1	5	48.14	7155.90
17	334	94	5	54	0.20	2.13	1	5	48.14	7155.90
18	339	99	5	59	0.20	2.32	1	5	48.14	7155.90
19	344	104	5	64	0.20	2.52	1	5	48.14	7155.90
20	347	107	3	67	0.12	2.64	1	3	85.31	10462.81
21	351	111	4	71	0.16	2.80	1	4	61.81	8447.61
22	357	117	6	77	0.24	3.03	1	6	39.25	6248.54
23	362	122	5	82	0.20	3.23	1	5	48.14	7155.90
24	368	128	6	88	0.24	3.46	1	6	39.25	6248.54
25	375	135	7	95	0.28	3.74	1	7	33.03	5571.75
26	381	141	6	101	0.24	3.98	1	6	39.25	6248.54
27	387	147	6	107	0.24	4.21	1	6	39.25	6248.54
28	393	153	6	113	0.24	4.45	1	6	39.25	6248.54
29	402	162	9	122	0.35	4.80	1	9	24.92	4621.93
30	413	173	11	133	0.43	5.24	1	11	19.91	3981.17
31	424	184	11	144	0.43	5.67	1	11	19.91	3981.17
32	436	196	12	156	0.47	6.14	1	12	18.06	3731.72
33	447	207	11	167	0.43	6.57	1	11	19.91	3981.17
34	456	216	9	176	0.35	6.93	1	9	24.92	4621.93

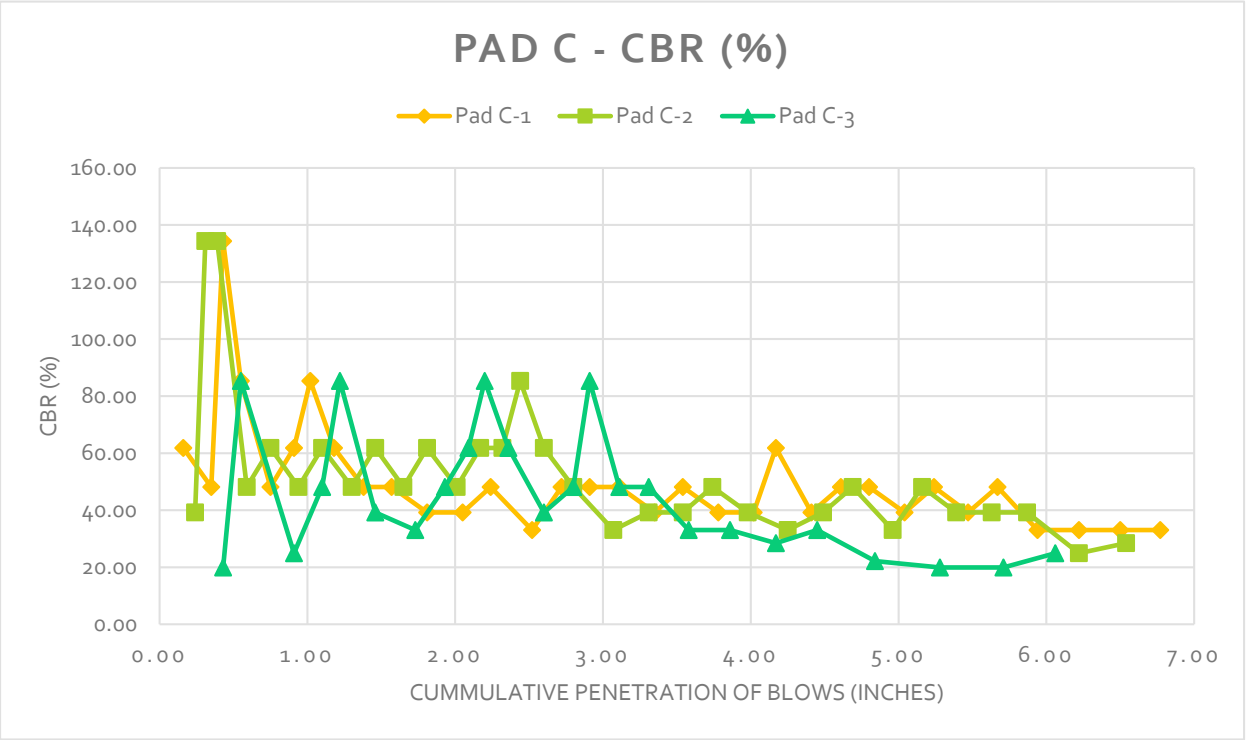
TINDOL CONSTRUCTION

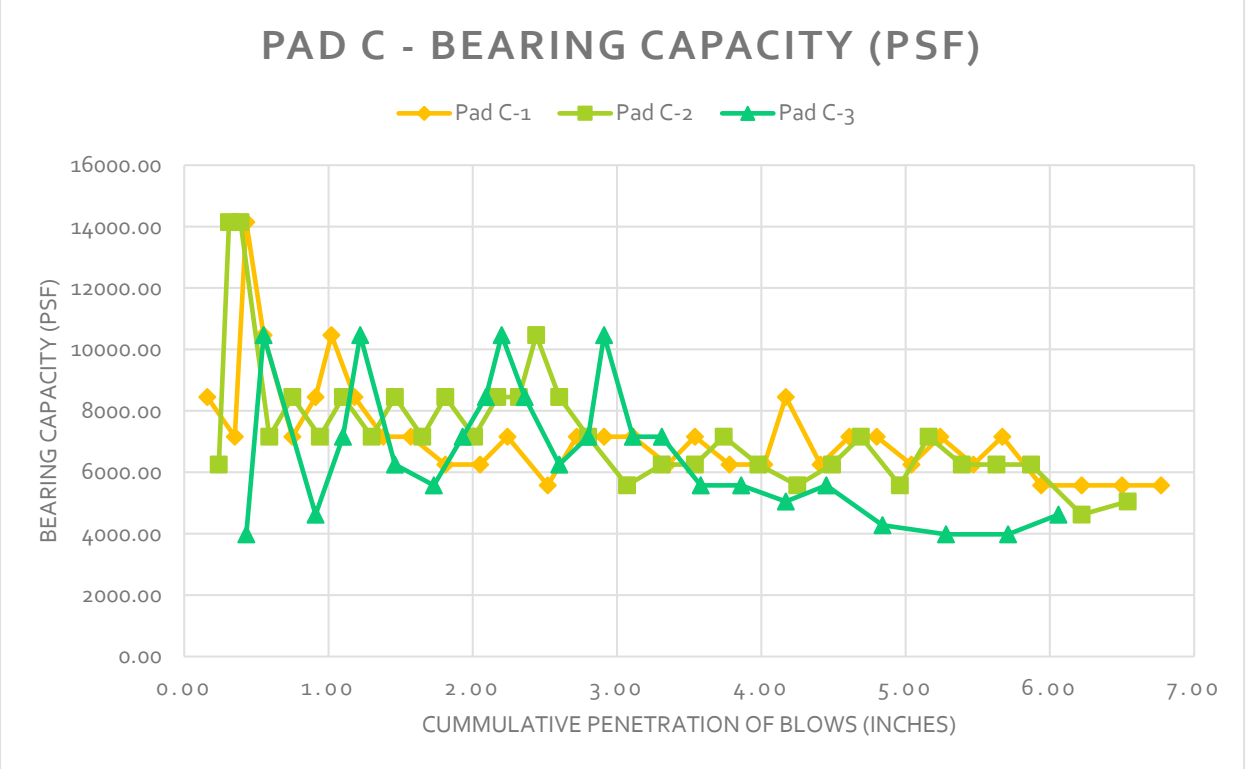
PAD B – DCP TEST RESULTS (PAD B-3 TEST LOGS)

PAD B-3 (DCP TESTING) **Date:** 5/24/2016 *(32 Days After Construction)* **Materials:** Import Fill, 3% EN-1, 3% Portland					**Average Bearing Capacity (psf)** 9816.03			**Average CBR (%)** 92.58		
Blow #	*Gauge Reading (mm) 286*	*Corrected Gauge Reading (mm) 46*	*Penetration (mm)*	*Cummulative Penetration (mm)*	*Penetration (in)*	**Cummulative Penetration (in)**	*Hammer Factor (17.6 lbs)*	*DCP Index (mm/blow)*	**CBR (%)**	**Bearing Capacity (psf)**
1	295	55	5	5	0.20	0.20	1	5	48.14	7155.90
2	299	59	4	9	0.16	0.35	1	4	61.81	8447.61
3	302	62	3	12	0.12	0.47	1	3	85.31	10462.81
4	303	63	1	13	0.04	0.51	1	1	292.00	23685.04
5	304	64	1	14	0.04	0.55	1	1	292.00	23685.04
6	305	65	1	15	0.04	0.59	1	1	292.00	23685.04
7	308	68	3	18	0.12	0.71	1	3	85.31	10462.81
8	309	69	1	19	0.04	0.75	1	1	292.00	23685.04
9	310	70	1	20	0.04	0.79	1	1	292.00	23685.04
10	314	74	4	24	0.16	0.94	1	4	61.81	8447.61
11	316	76	2	26	0.08	1.02	1	2	134.35	14145.04
12	319	79	3	29	0.12	1.14	1	3	85.31	10462.81
13	324	84	5	34	0.20	1.34	1	5	48.14	7155.90
14	329	89	5	39	0.20	1.54	1	5	48.14	7155.90
15	337	97	8	47	0.31	1.85	1	8	28.44	5045.03
16	342	102	5	52	0.20	2.05	1	5	48.14	7155.90
17	349	109	7	59	0.28	2.32	1	7	33.03	5571.75
18	355	115	6	65	0.24	2.56	1	6	39.25	6248.54
19	362	122	7	72	0.28	2.83	1	7	33.03	5571.75
20	377	137	15	87	0.59	3.43	1	15	14.07	3161.10
21	388	148	11	98	0.43	3.86	1	11	19.91	3981.17
22	400	160	12	110	0.47	4.33	1	12	18.06	3731.72
23	414	174	14	124	0.55	4.88	1	14	15.20	3327.53
24	428	188	14	138	0.55	5.43	1	14	15.20	3327.53
25	444	204	16	154	0.63	6.06	1	16	13.08	3012.96
26	462	222	18	172	0.71	6.77	1	18	11.47	2760.28

TINDOL CONSTRUCTION

PAD C – DCP TEST RESULTS





TINDOL CONSTRUCTION

PAD C – DCP TEST RESULTS (PAD C-1 TEST LOGS)

PAD C-1 (DCP TESTING) **Date:** 5/24/2016 *(14 Days After Construction)* **Materials:** Flexbase, 3% EN-1, 2% Portland					**Average Bearing Capacity (psf)** 7264.69			**Average CBR (%)** 50.22		
Blow #	*Gauge Reading (mm) 286*	*Corrected Gauge Reading (mm) 46*	*Penetration (mm)*	*Cummulative Penetration (mm)*	*Penetration (in)*	**Cummulative Penetration (in)**	*Hammer Factor (17.6 lbs)*	*DCP Index (mm/blow)*	**CBR (%)**	**Bearing Capacity (psf)**
1	290	50	4	4	0.16	0.16	1	4	61.81	8447.61
2	295	55	5	9	0.20	0.35	1	5	48.14	7155.90
3	297	57	2	11	0.08	0.43	1	2	134.35	14145.04
4	300	60	3	14	0.12	0.55	1	3	85.31	10462.81
5	305	65	5	19	0.20	0.75	1	5	48.14	7155.90
6	309	69	4	23	0.16	0.91	1	4	61.81	8447.61
7	312	72	3	26	0.12	1.02	1	3	85.31	10462.81
8	316	76	4	30	0.16	1.18	1	4	61.81	8447.61
9	321	81	5	35	0.20	1.38	1	5	48.14	7155.90
10	326	86	5	40	0.20	1.57	1	5	48.14	7155.90
11	332	92	6	46	0.24	1.81	1	6	39.25	6248.54
12	338	98	6	52	0.24	2.05	1	6	39.25	6248.54
13	343	103	5	57	0.20	2.24	1	5	48.14	7155.90
14	350	110	7	64	0.28	2.52	1	7	33.03	5571.75
15	355	115	5	69	0.20	2.72	1	5	48.14	7155.90
16	360	120	5	74	0.20	2.91	1	5	48.14	7155.90
17	365	125	5	79	0.20	3.11	1	5	48.14	7155.90
18	371	131	6	85	0.24	3.35	1	6	39.25	6248.54
19	376	136	5	90	0.20	3.54	1	5	48.14	7155.90
20	382	142	6	96	0.24	3.78	1	6	39.25	6248.54
21	388	148	6	102	0.24	4.02	1	6	39.25	6248.54
22	392	152	4	106	0.16	4.17	1	4	61.81	8447.61
23	398	158	6	112	0.24	4.41	1	6	39.25	6248.54
24	403	163	5	117	0.20	4.61	1	5	48.14	7155.90
25	408	168	5	122	0.20	4.80	1	5	48.14	7155.90
26	414	174	6	128	0.24	5.04	1	6	39.25	6248.54
27	419	179	5	133	0.20	5.24	1	5	48.14	7155.90
28	425	185	6	139	0.24	5.47	1	6	39.25	6248.54
29	430	190	5	144	0.20	5.67	1	5	48.14	7155.90
30	437	197	7	151	0.28	5.94	1	7	33.03	5571.75
31	444	204	7	158	0.28	6.22	1	7	33.03	5571.75
32	451	211	7	165	0.28	6.50	1	7	33.03	5571.75
33	458	218	7	172	0.28	6.77	1	7	33.03	5571.75

TINDOL CONSTRUCTION

PAD C – DCP TEST RESULTS (PAD C-2 TEST LOGS)

PAD C-2 (DCP TESTING) **Date:** 5/24/2016 *(14 Days After Construction)* **Materials:** Flexbase, 3% EN-1, 2% Portland					**Average Bearing Capacity (psf)** 7458.12			**Average CBR (%)** 52.70		
Blow #	*Gauge Reading (mm) 286*	*Corrected Gauge Reading (mm) 46*	*Penetration (mm)*	*Cummulative Penetration (mm)*	*Penetration (in)*	**Cummulative Penetration (in)**	*Hammer Factor (17.6 lbs)*	*DCP Index (mm/blow)*	**CBR (%)**	**Bearing Capacity (psf)**
1	292	52	6	6	0.24	0.24	1	6	39.25	6248.54
2	294	54	2	8	0.08	0.31	1	2	134.35	14145.04
3	296	56	2	10	0.08	0.39	1	2	134.35	14145.04
4	301	61	5	15	0.20	0.59	1	5	48.14	7155.90
5	305	65	4	19	0.16	0.75	1	4	61.81	8447.61
6	310	70	5	24	0.20	0.94	1	5	48.14	7155.90
7	314	74	4	28	0.16	1.10	1	4	61.81	8447.61
8	319	79	5	33	0.20	1.30	1	5	48.14	7155.90
9	323	83	4	37	0.16	1.46	1	4	61.81	8447.61
10	328	88	5	42	0.20	1.65	1	5	48.14	7155.90
11	332	92	4	46	0.16	1.81	1	4	61.81	8447.61
12	337	97	5	51	0.20	2.01	1	5	48.14	7155.90
13	341	101	4	55	0.16	2.17	1	4	61.81	8447.61
14	345	105	4	59	0.16	2.32	1	4	61.81	8447.61
15	348	108	3	62	0.12	2.44	1	3	85.31	10462.81
16	352	112	4	66	0.16	2.60	1	4	61.81	8447.61
17	357	117	5	71	0.20	2.80	1	5	48.14	7155.90
18	364	124	7	78	0.28	3.07	1	7	33.03	5571.75
19	370	130	6	84	0.24	3.31	1	6	39.25	6248.54
20	376	136	6	90	0.24	3.54	1	6	39.25	6248.54
21	381	141	5	95	0.20	3.74	1	5	48.14	7155.90
22	387	147	6	101	0.24	3.98	1	6	39.25	6248.54
23	394	154	7	108	0.28	4.25	1	7	33.03	5571.75
24	400	160	6	114	0.24	4.49	1	6	39.25	6248.54
25	405	165	5	119	0.20	4.69	1	5	48.14	7155.90
26	412	172	7	126	0.28	4.96	1	7	33.03	5571.75
27	417	177	5	131	0.20	5.16	1	5	48.14	7155.90
28	423	183	6	137	0.24	5.39	1	6	39.25	6248.54
29	429	189	6	143	0.24	5.63	1	6	39.25	6248.54
30	435	195	6	149	0.24	5.87	1	6	39.25	6248.54
31	444	204	9	158	0.35	6.22	1	9	24.92	4621.93
32	452	212	8	166	0.31	6.54	1	8	28.44	5045.03

TINDOL CONSTRUCTION

PAD C – DCP TEST RESULTS (PAD C-3 TEST LOGS)

PAD C-3 (DCP TESTING) **Date:** 5/24/2016 *(14 Days After Construction)* **Materials:** Flexbase, 3% EN-1, 2% Portland					**Average Bearing Capacity (psf)** 6659.00			**Average CBR (%)** 44.85		
Blow #	*Gauge Reading (mm) 286*	*Corrected Gauge Reading (mm) 46*	*Penetration (mm)*	*Cummulative Penetration (mm)*	*Penetration (in)*	**Cummulative Penetration (in)**	*Hammer Factor (17.6 lbs)*	*DCP Index (mm/blow)*	**CBR (%)**	**Bearing Capacity (psf)**
1	297	57	11	11	0.43	0.43	1	11	19.91	3981.17
2	300	60	3	14	0.12	0.55	1	3	85.31	10462.81
3	309	69	9	23	0.35	0.91	1	9	24.92	4621.93
4	314	74	5	28	0.20	1.10	1	5	48.14	7155.90
5	317	77	3	31	0.12	1.22	1	3	85.31	10462.81
6	323	83	6	37	0.24	1.46	1	6	39.25	6248.54
7	330	90	7	44	0.28	1.73	1	7	33.03	5571.75
8	335	95	5	49	0.20	1.93	1	5	48.14	7155.90
9	339	99	4	53	0.16	2.09	1	4	61.81	8447.61
10	342	102	3	56	0.12	2.20	1	3	85.31	10462.81
11	346	106	4	60	0.16	2.36	1	4	61.81	8447.61
12	352	112	6	66	0.24	2.60	1	6	39.25	6248.54
13	357	117	5	71	0.20	2.80	1	5	48.14	7155.90
14	360	120	3	74	0.12	2.91	1	3	85.31	10462.81
15	365	125	5	79	0.20	3.11	1	5	48.14	7155.90
16	370	130	5	84	0.20	3.31	1	5	48.14	7155.90
17	377	137	7	91	0.28	3.58	1	7	33.03	5571.75
18	384	144	7	98	0.28	3.86	1	7	33.03	5571.75
19	392	152	8	106	0.31	4.17	1	8	28.44	5045.03
20	399	159	7	113	0.28	4.45	1	7	33.03	5571.75
21	409	169	10	123	0.39	4.84	1	10	22.15	4273.60
22	420	180	11	134	0.43	5.28	1	11	19.91	3981.17
23	431	191	11	145	0.43	5.71	1	11	19.91	3981.17
24	440	200	9	154	0.35	6.06	1	9	24.92	4621.93

TINDOL CONSTRUCTION

CONCLUSION – SOIL STABILIZATION REPORT

Tindol Construction believes that these new options available to our customers will not only have an immediate impact regarding potential savings, but also a quality product that will allow more longevity of their construction projects. Below are several areas we believe that these stabilization processes could be applied effectively:

STABILIZED IMPORT FILL

- Stabilized pad subgrades
- Stabilized lease road subgrades
- Stabilized backfills

By stabilizing our import fill material, you could potentially reduce the thickness of base aggregate on top of your pad and/or road constructions.

STABILIZED BASE MATERIAL

- Reduce and/or replace the amount of Portland Cement required
- Reduce and/or replace the amount of Limestone base typically used

By stabilizing our base material, you could potentially reduce the amount of Portland Cement and/or Limestone thickness for your pad and/or road constructions.

OBSERVATIONS AFTER STABILIZATION

- Material becomes less permeable
- Based off of test results, strength of material increases over time
- Pads held up to traffic during sub-par weather conditions
- Visibly reduced rutting with heavy traffic conditions

We appreciate your time in reviewing our report. The above listed opportunities are just some of the many application processes we feel our stabilization methods could benefit your company and their future projects. Please keep in mind, we are capable of producing a ÎÙ blend of aggregates to ÐÁÉÒ ×ÉÔÈ a custom Í ÉØ ÒÁÔÉÏ of stabilizers to deliver a product specifically ÄÅÓÉÇÎÅÄ for what your project may require due to existing conditions.