










Improving Design Phase Evaluations of High Pile Rebound Soils with an Emphasis on SPT Testing

*Task Work Order BDV28 Two 977-05
15 month study*

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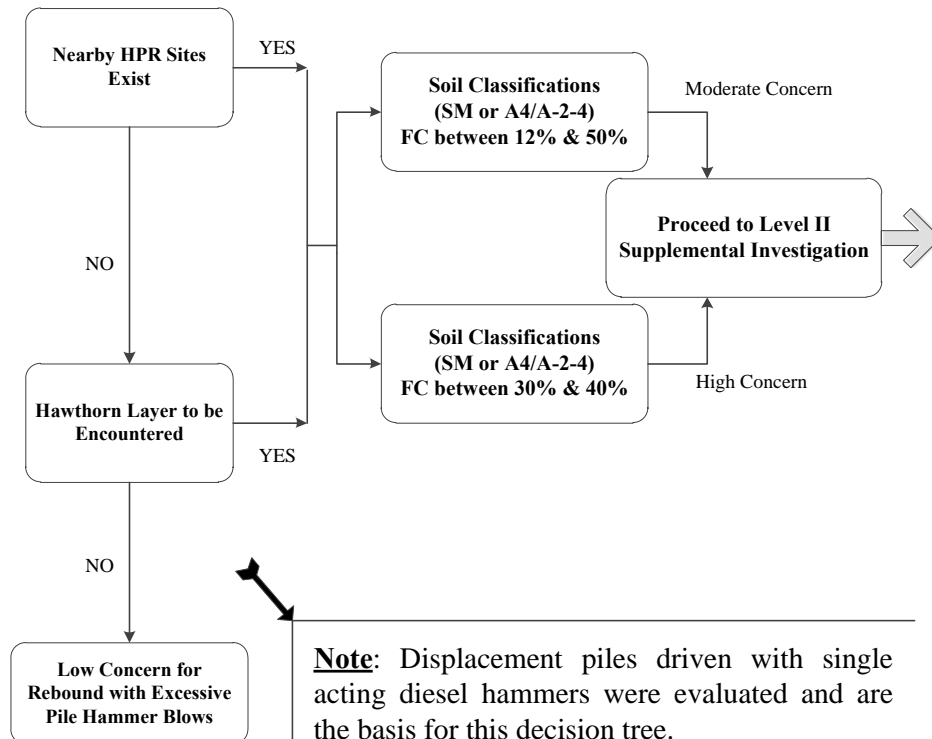
Outline

-  Introduction and Background
-  Objective
-  Approach
 -  Task 1 Additional Sites
 -  Task 2 HPR Trends
 -  Task 3 Draft Final Report and Closeout Teleconference
 -  Task 4 Final Report
-  Schedule of Tasks
-  Closing

Introduction - HPR Decision Tree

High Pile Rebound Decision Tree




Level I: Basic Design Phase Information



Three Levels


- ☛ Only Level 1 shown
- ☛ Level 1 should be refined
- ☛ Based on limited data
- ☛ Based on ½ " rebound
 - ☛ ¼ " produced poor results
 - ☛ Other rebound levels may help clarify

Introduction - FDOT Sites Tested to Date

-  SPT on 11 of 12
-  CPTu on 8 of 12
-  Shelby on 6 of 12

Number	Description	Testing		
		SPT	CPTu	Undisturbed
1	I-4 / US-192 Interchange / Osceola County / Florida.	✓	✓	✓
2	State Road 417 International Parkway / Osceola County / Florida.	✓	✓	✓
3	I-4 / Osceola Parkway / Osceola County / Florida.			✓
4	State Road 50 and State Road 436 / Orange County / Florida.	✓	✓	
5	I-4 / State Road 408 Ramp B / Orange County / Florida.	✓	✓	
6	Anderson Street Overpass at I-4/SR-408 / Orange County / Florida.	✓	✓	
7	I-4 John Young Parkway/ Orange County / Florida	✓		
8	I-4 Widening Daytona / Volusia County / Florida.	✓	✓	
9	SR 528 over Indian River, Brevard County / Florida	✓		
10	Saint Johns Heritage Parkway, Brevard County / Florida	✓	✓	✓
11	I-10 Chaffee Road, Duval County / Florida	✓		✓
12	State Road 83 over Ramsey Branch Bridge / Walton County / Florida.	✓	✓	✓

Objective

 Refine the BDV28 977-01 Decision Matrix Level I soil classification criteria based on rebound level with N values and FC.

Approach

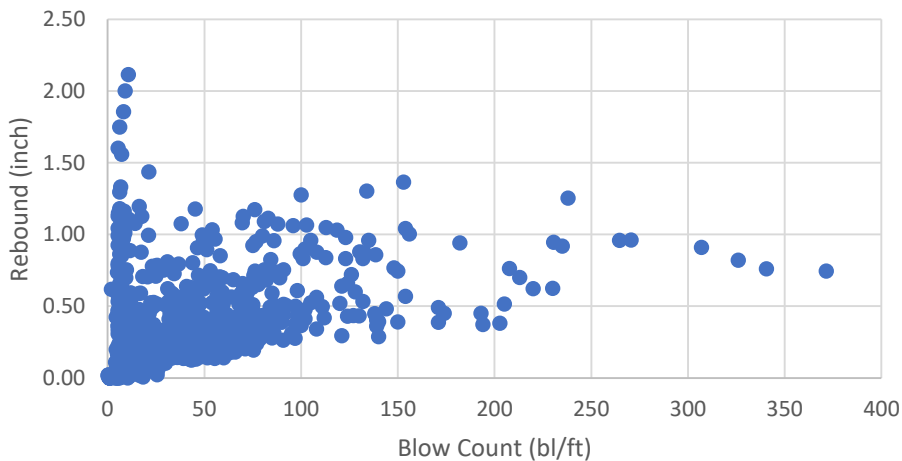
- 🐾 Identify & Organize Additional HPR and NonHPR sites Based on Rebound Level
 - 🐾 No Rebound [$< 1/4^{\text{th}}$ inch rebound]
 - 🐾 Acceptable [rebound but pile driven]
 - 🐾 Unacceptable [Rebound Greater than $1/4$ $1/2$ or $1''$]
- 🐾 Evaluation of HPR Rebound Trends
- 🐾 Draft Final Report and Closeout Teleconference
- 🐾 Final Report

Approach

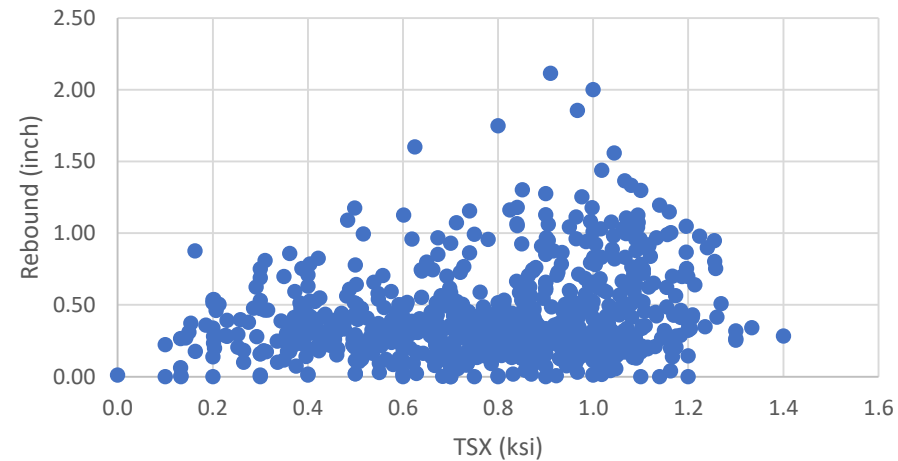
🐯 Identify & Organize Additional HPR and NonHPR sites Based on Rebound Level

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Rebound and Pile Blow Counts



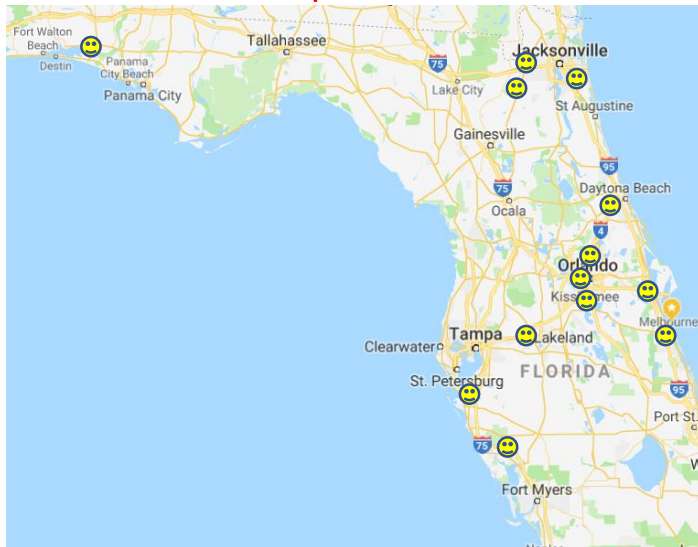
Rebound and Associated TSX Stresses



Approach

Task 1: FDOT New Sites

All Sites State Map



Site Description	Test Pile	Estimated Rebound (inches)	Rebound Classification
SR 600 Over Saddle Creek	B2 P2	0.25	acceptable
I-75 Over University Parkway	B1SB P2	0.25	acceptable
	B2SB P3	0.25*	acceptable
	B2NB P3	0.25*	acceptable
	B3NB P7	0.375	acceptable
I-75 over Deer Prairie Creek (170124)	B2 P3	1.0*	unacceptable
	B5 P3	0.50 to 1.0*	unacceptable
I-75 over Deer Prairie Creek (170125)	B1 P1	1.0*	unacceptable
	B4 P1	1.0	unacceptable
SR 64 and I-75	B1 P3	0.25* to 0.50*	acceptable
	B2 P9	0.25*	acceptable
	B3 P1	0.3	acceptable
Alligator Creek	B1SB P5	0.25* to 0.50*	acceptable
	B2SB P5	0.50* to 0.75*	unacceptable
	B3NB P5	0.25* to 0.50*	acceptable
	B4SB P5	0.25* to 0.50*	acceptable
JTB Blvd and I-95 (720817)	B1 P9	0.25*	acceptable
	B2 P1	none*	no rebound
	B4 P9	none*	no rebound
JTB Blvd and I-95 (720816)	B5 P3	1.0	unacceptable
	B6 P4	1.0	unacceptable
	B7 P14	1.0	unacceptable

*Estimated off PDA based rebound magnitudes

Approach

Task 1: FDOT New Sites

 JTB (Bridge 720817)

 Bent 1 Pile 9

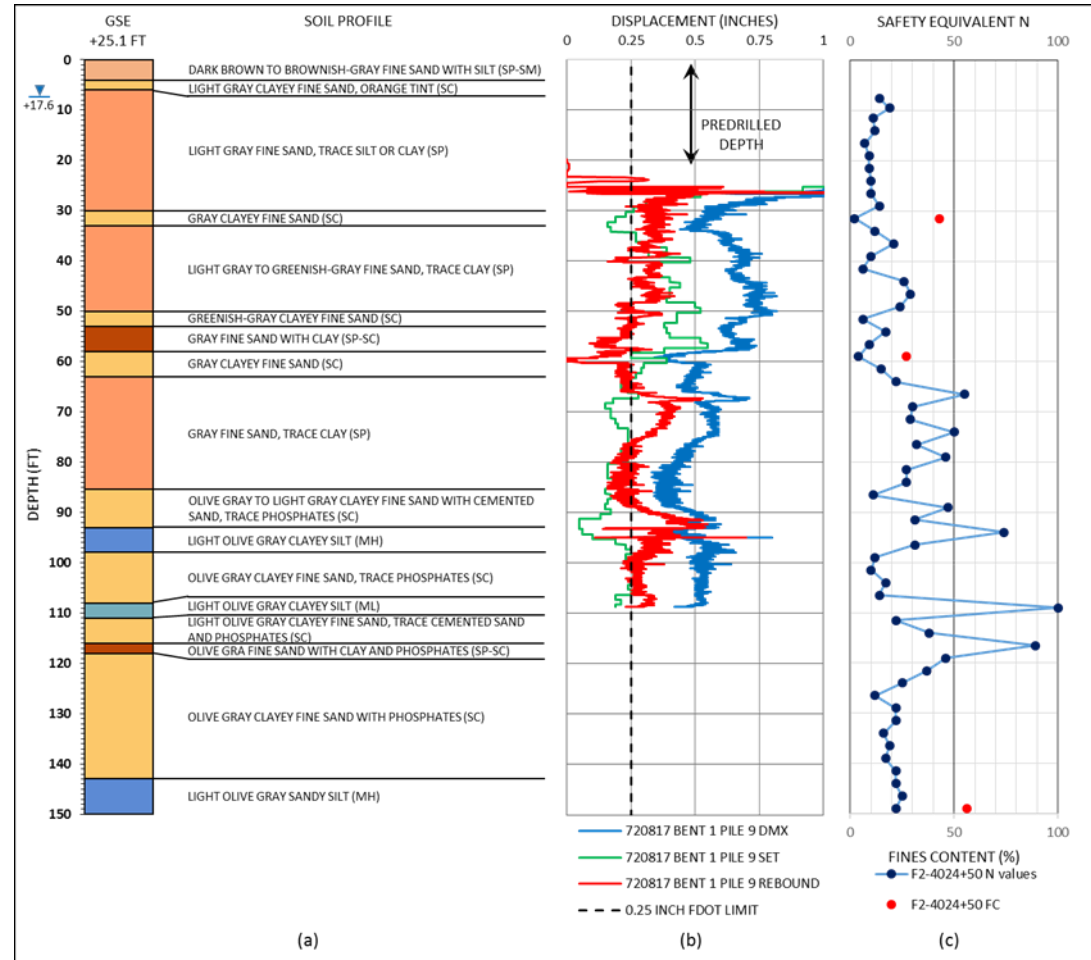



Figure 24. (a) F2-4024+50 Soil Profile, (b) PDA diagram, (c) N_{ES} and FC JTB and I-95 (Bridge 720817) Test Pile Bent 1, Pile 9

Approach

Task 1: FDOT New Sites

 I-75 over Deer Prairie

 Bent 1, Pile 1

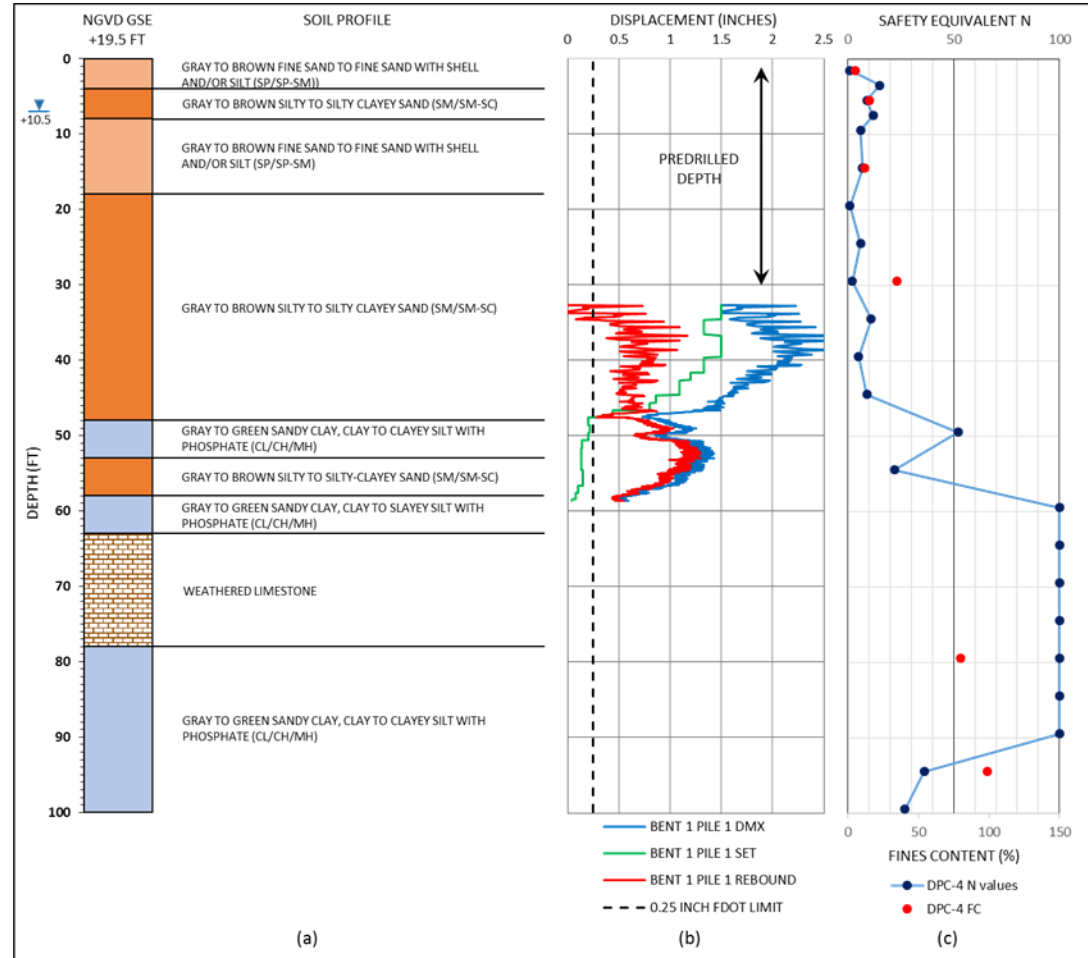


Figure 11. (a) DPC-4 Soil Profile, (b) PDA diagram, (c) N_{ES} and FC for I-75 over Deer Prairie Creek Test Pile Bent 1, Pile 1

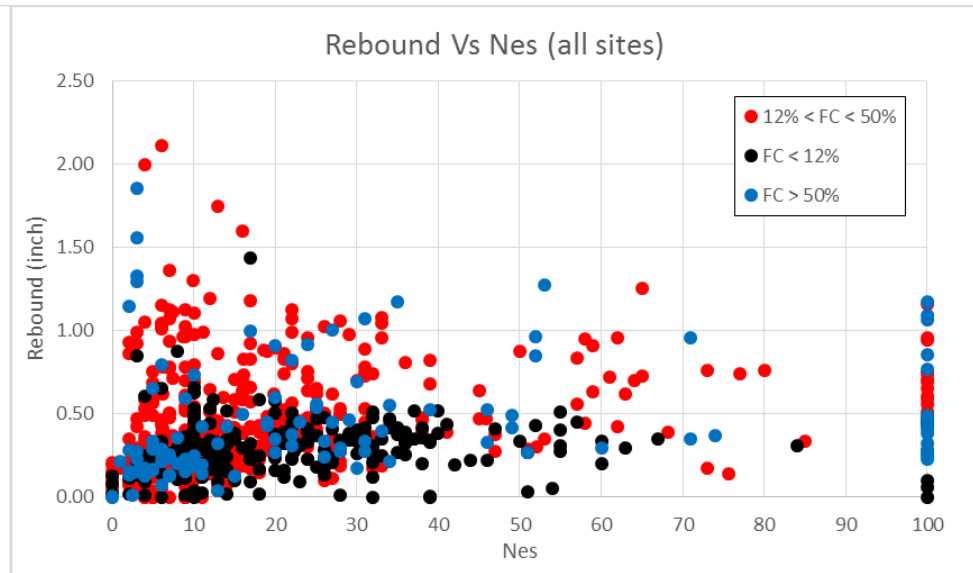
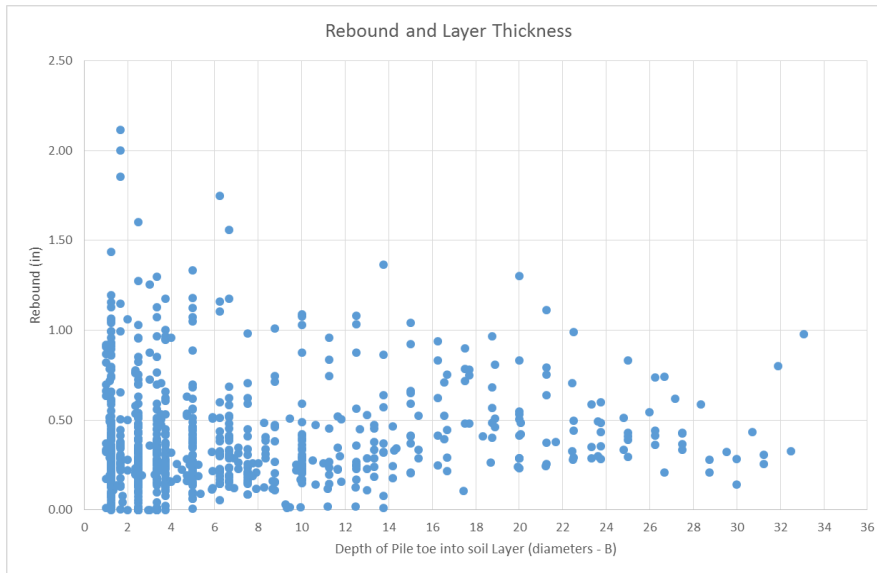
Approach

Task 2 Evaluation of HPR Rebound Trends

- 👉 Existing and New Data to be used
- 👉 Divided into 4 subtasks
 - 👉 CPTu Soil Behavior Type Charts will be used to determine CPTu rebound trends and correlations
 - Based on pile penetration into the rebound layers of 2B, 4B and 8B
 - 👉 Correlations will be developed between the CPTu N equivalent values and the measured N values
 - 👉 SPT N and FC versus rebound correlations will be investigated using the 2B, 4B and 8B layer thicknesses
 - 👉 Conclusions will be developed and the Level I Decision Tree will be updated to reflect the new findings

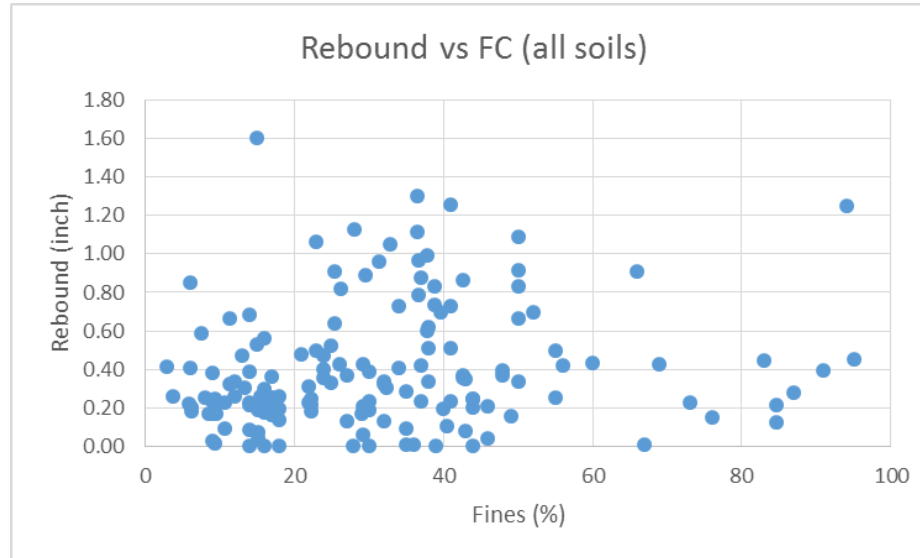
Approach

Task 2 Evaluation of HPR Rebound Trends

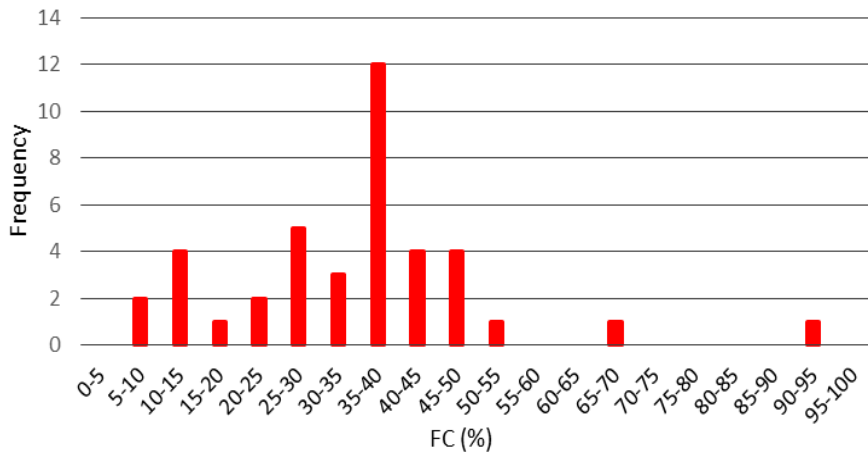


Approach

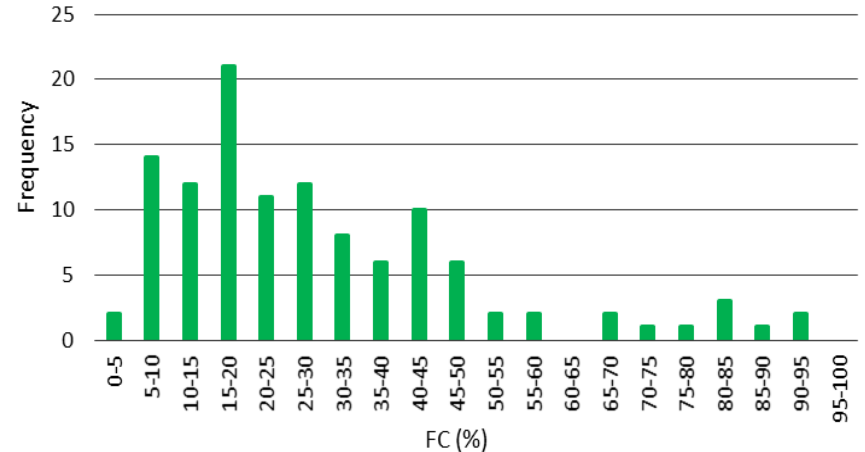
Task 2 Evaluation of HPR Rebound Trends



FC Frequency given Rebound > 0.5"

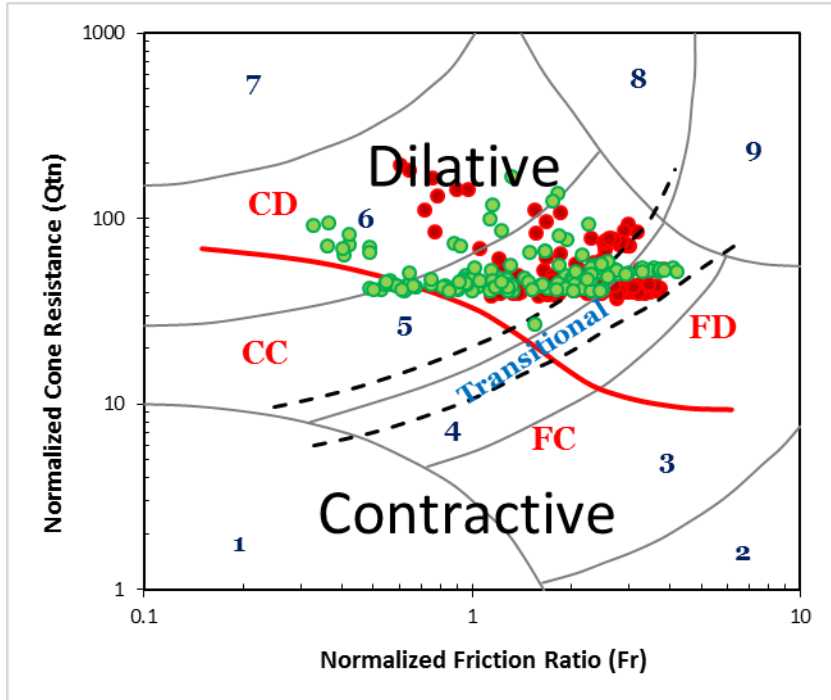


FC Frequency given Rebound < 0.5"

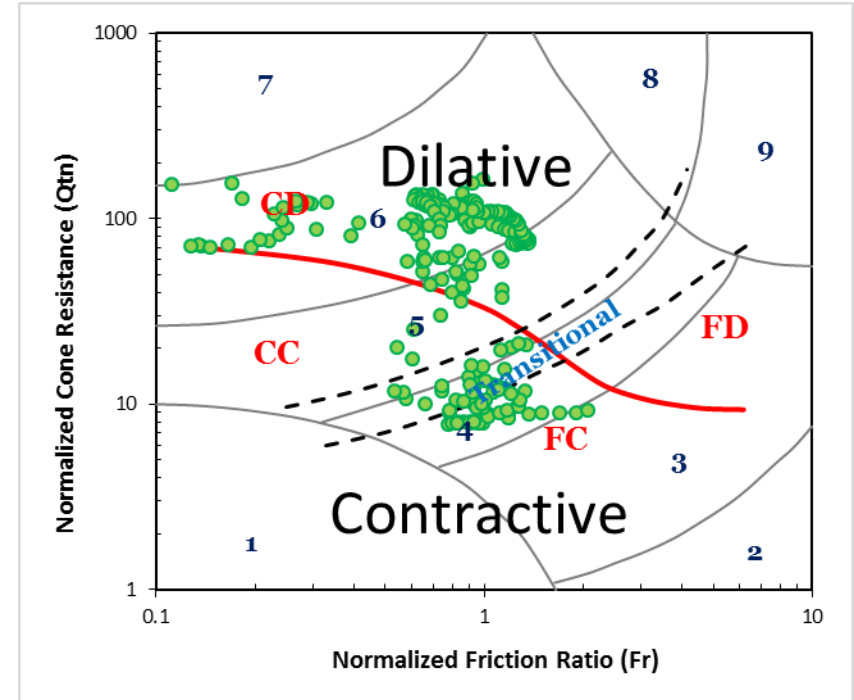


Approach

Task 2 Evaluation of HPR Rebound Trends






Ramsey Branch EB5P2





Deer Crossing EB3-1 P5

Final Two Tasks

Task 3 Draft Final Report and Closeout Teleconference

-  Contains two deliverables
-  Identified as 1 item in budget
-  A well Written document will be submitted and reviewed for approval

Task 4 Final Report

-  After revisions Final Report will be submitted on 2 Professionally labeled CD's
-  Each CD will contain the report in both a word and pdf format

Thank You

