



Driving job-site efficiencies through better data

Tod Michael and Austin Ashbacher



Better Data

- Data is a collection of facts, such as numbers, **words**, measurements, observations or just descriptions of things ⁽¹⁾
- Data is factual information (such as measurements or statistics) used as a basis for reasoning, **discussion**, or calculation ⁽²⁾
- Data is information in **digital** form that can be transmitted or processed ⁽²⁾



definition of data



Settings

About 1,820,000,000 results (0.72 seconds)

Dictionary

Search for a word



da·ta

/ˈdɑdə,ˈdādə/

See definitions in:

All

Computing

Philosophy

noun

noun: **data**

facts and statistics collected together for reference or analysis.

Similar:

facts

figures

statistics

details

particulars

specifics



- the quantities, characters, or symbols on which operations are performed by a computer, being and transmitted in the form of electrical signals and recorded on magnetic, optical, or mechanic recording media.

• PHILOSOPHY

things known or assumed as facts, making the basis of reasoning or calculation.



What kind of data do we have available?

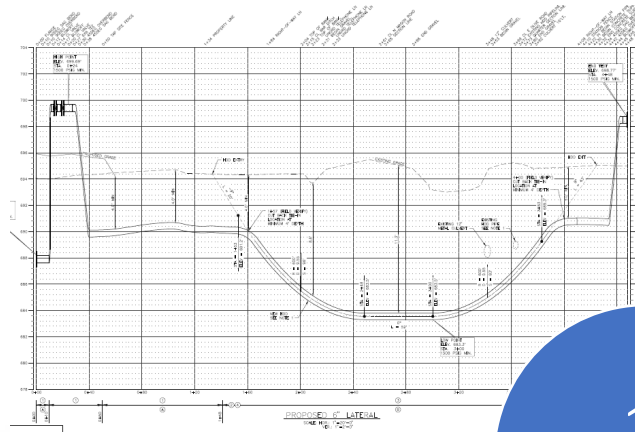
- Quantitative
 - Depth
 - Torque
 - Thrust
 - Rate of penetration (ROP)
 - Bend radius
 - Date/time
- Qualitative
 - “Good” vs. “bad”
 - Recordings
 - Observations
 - “Difficult” ground conditions
 - “Clean” jobsite



UNDERGROUND CONSTRUCTION TECHNOLOGY

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Phases of a job



1.
Design

2. Plan

3.
Execute

4.
Closeout





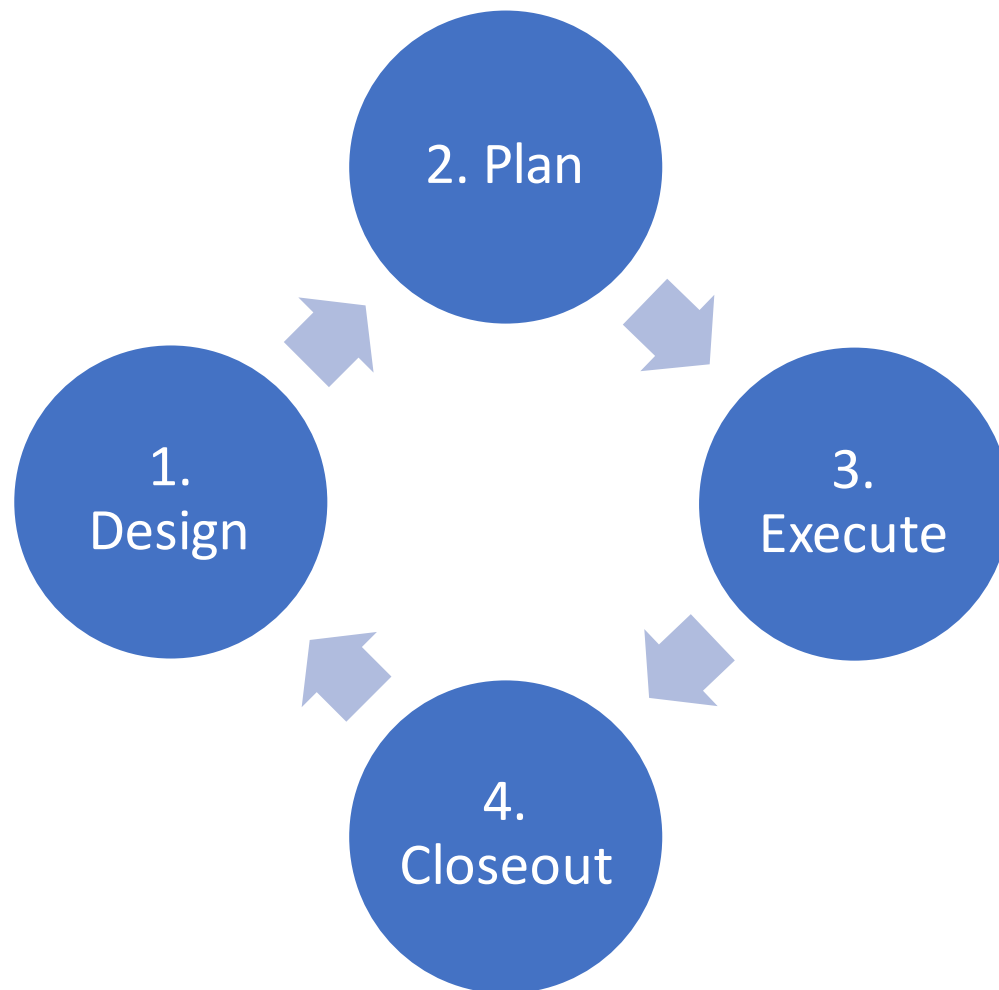
Where to look for data

• Design

- Bid Specs
- Engineering documents
- Public records

• Closeout

- As built collection
- Data logs
- Jobsite records



Plan

- Jobsite conditions
- Equipment capabilities
- Observed conditions

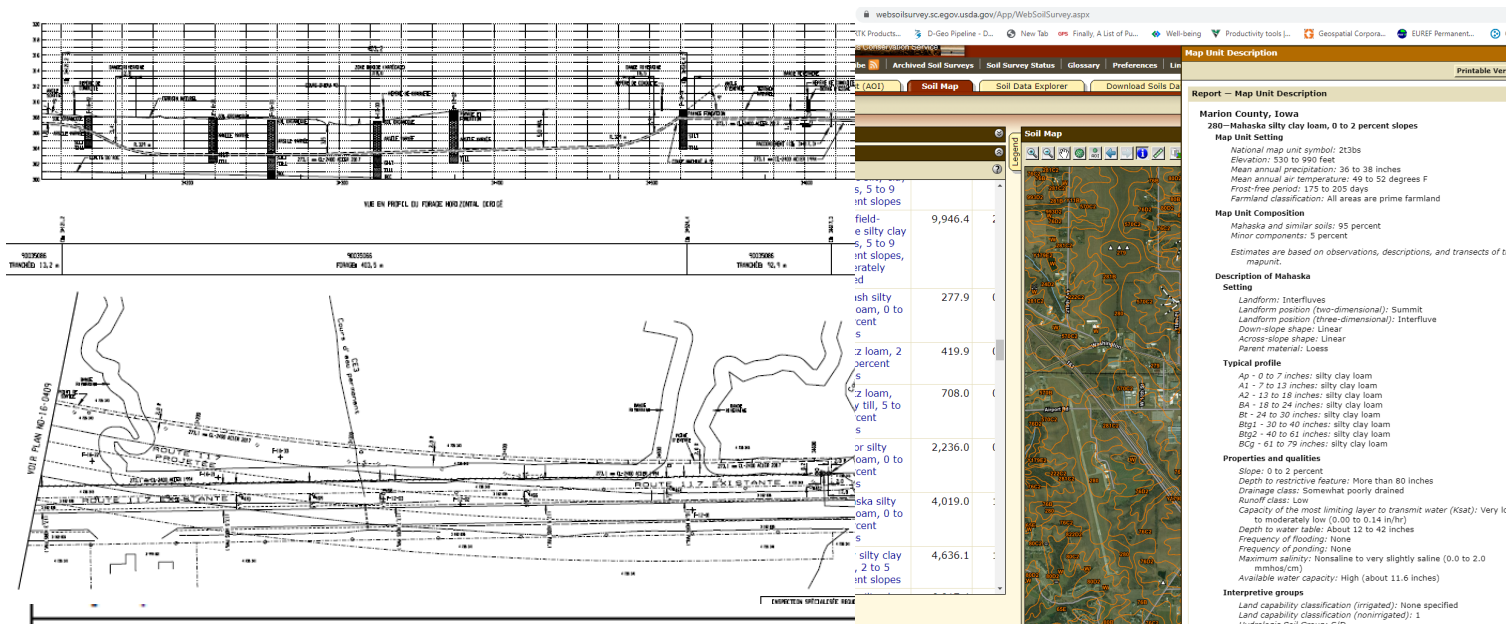
Execute

- Machine performance
- Ground conditions
- Real time readings

UCT UNDERGROUND CONSTRUCTION TECHNOLOGY

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Design



Material data

Type of material:

Quality:

Yield limit at 20°

Elastic modulus

Linear expansion coefficient

Alpha Tangential / Alpha Axial

The pipe's specific weight

Allowable deflection

Steel

EN 10208 L415

Re = 415

N/mm²

E = 205800

N/mm²

$\alpha_p = 1,2 \cdot 10^{-5}$

mm/(mm·K)

$\alpha_\sigma = 1$

-

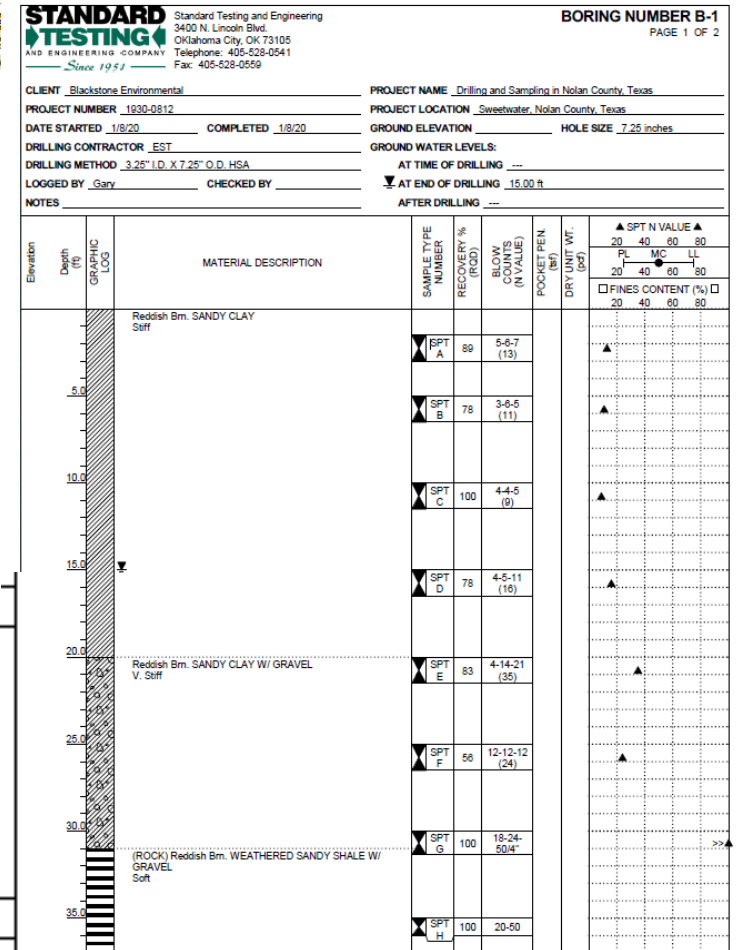
$\rho_L = 78,5$

kN/m³

$\delta = 15$

%

Pipeline data



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Plan

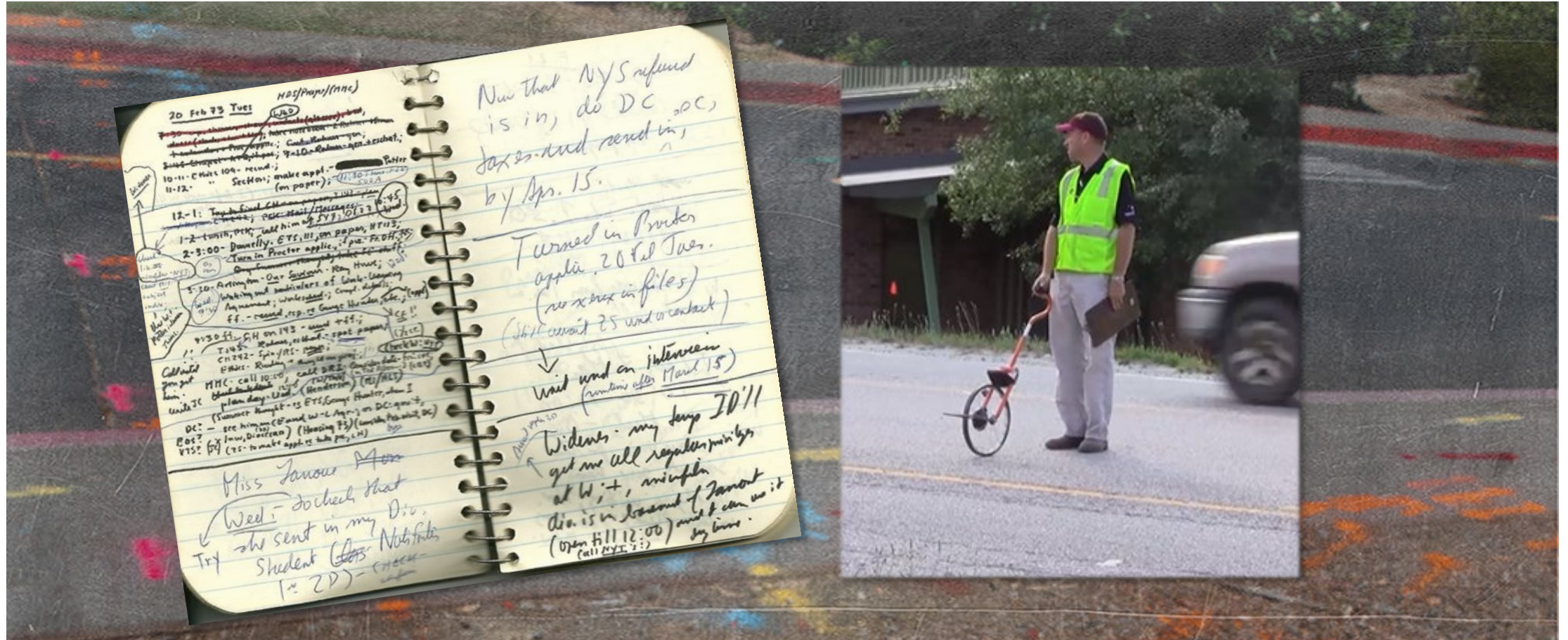


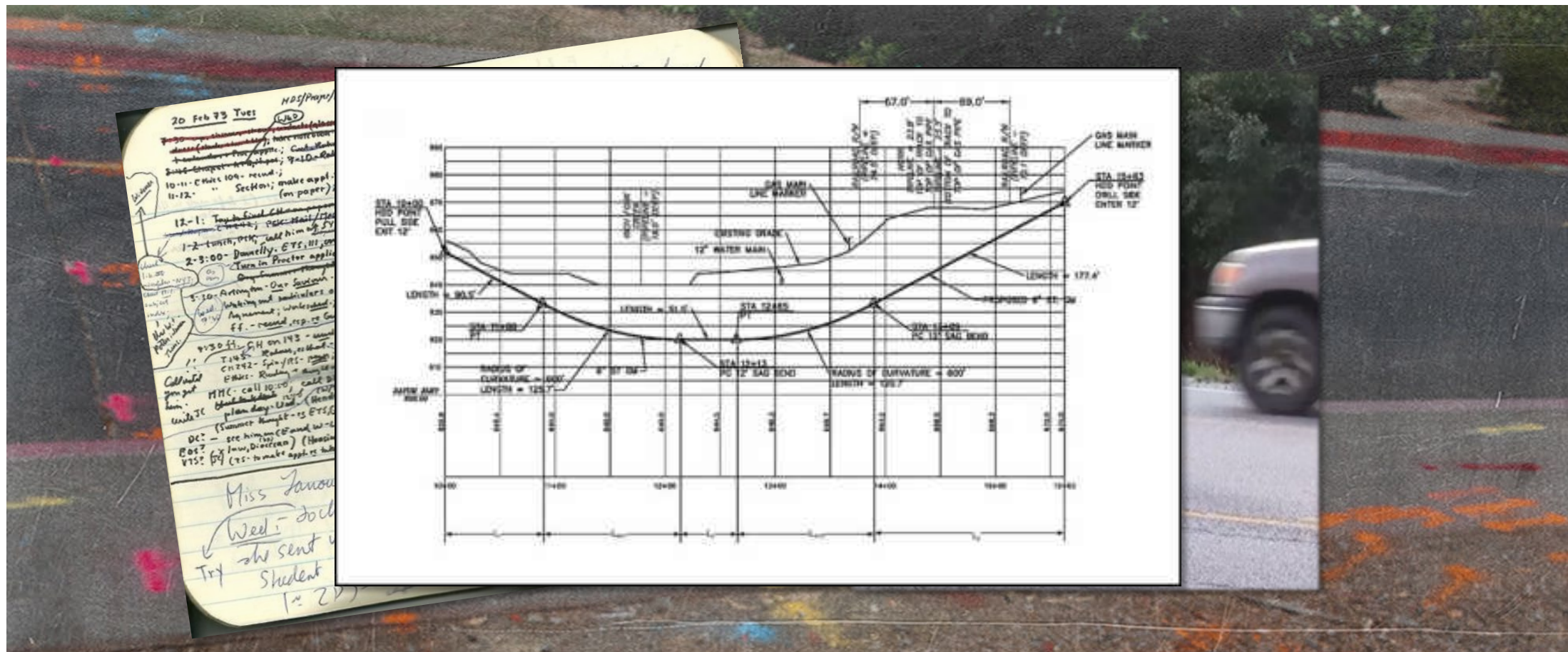


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Plan







Plan

Step	Activity	Time Spent
1	Marking bore path with flags	9:44
2	Discussion with crew	2:16
3	Noting landmarks and wheeling distance	15:12
4	Offsets discussion with crew	2:06
5	Finish distance marking	1:23
6	Discussion with crew	1:59
7	Measuring offsets	7:23
8	Setting up transit	3:57
9	Measuring elevations	16:10

TOTAL TIME:

MORE THAN 1 HOUR

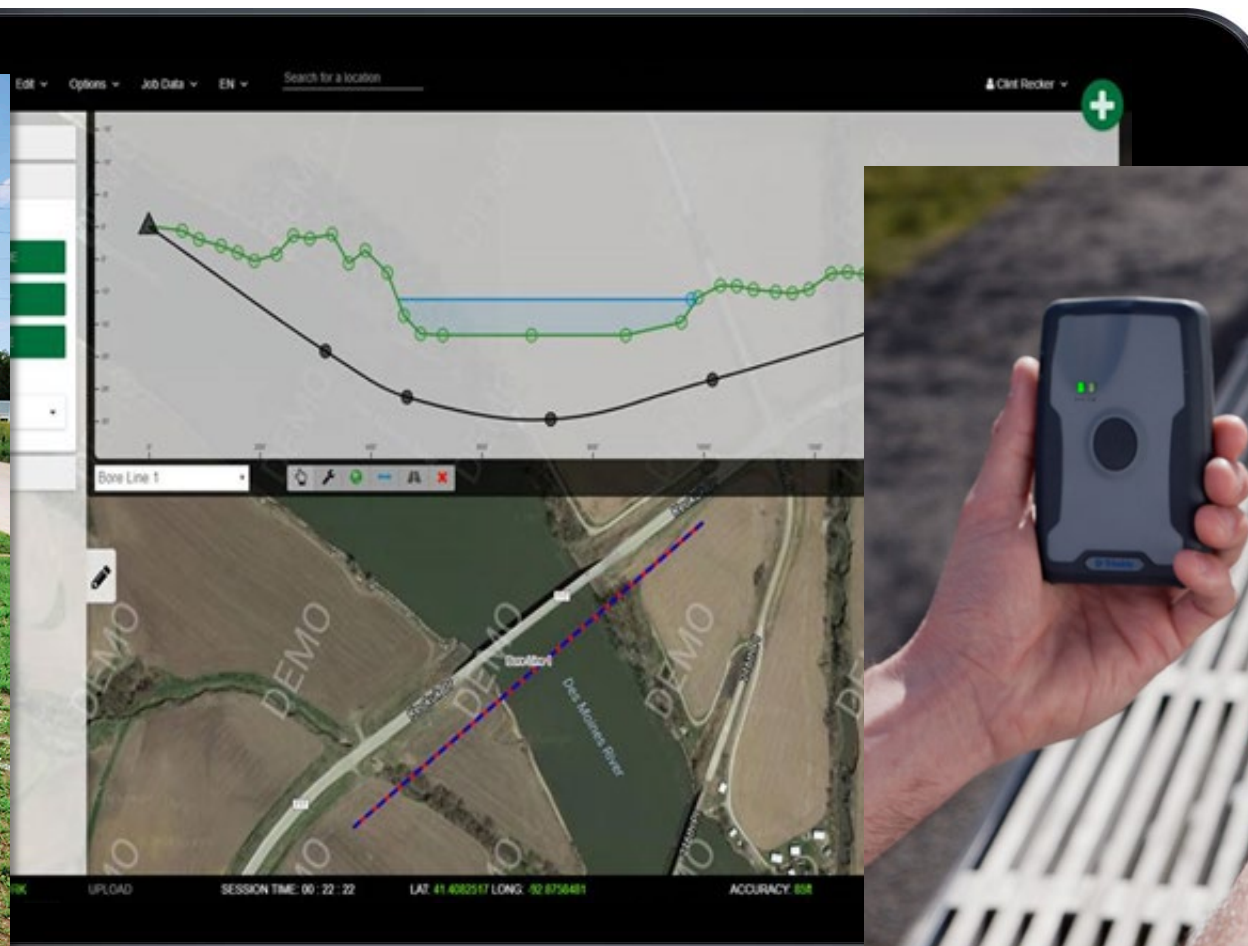
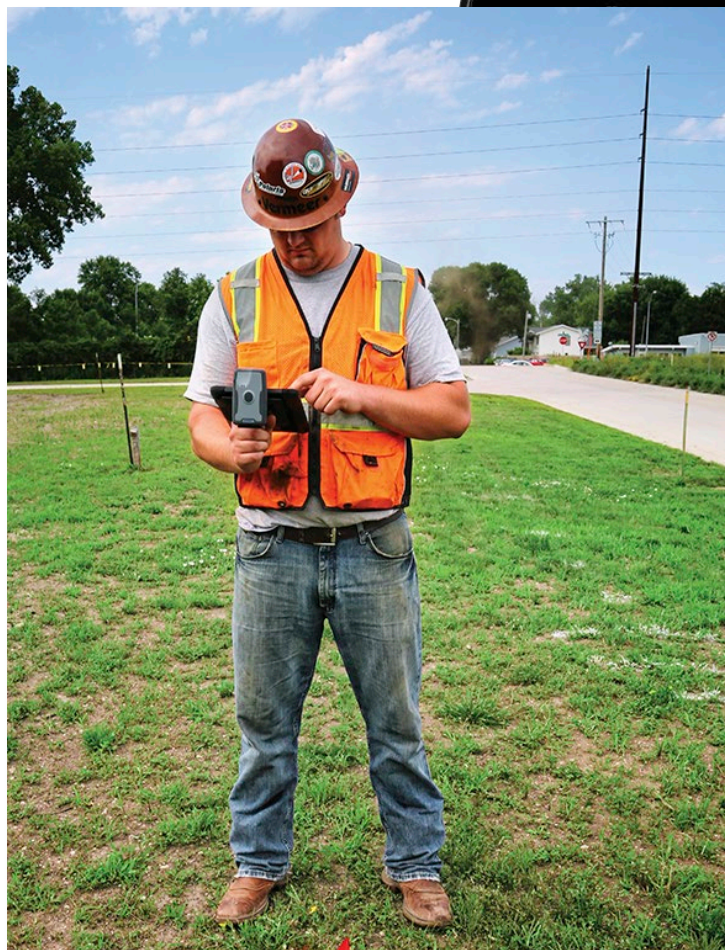




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Plan





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TOTAL TIME:

MORE THAN 1 HOUR





Plan

Step	Activity	Time Taken
1	Marking existing utilities	10:00
2	Entering landmarks	5:00
3	Measuring	5:00
4	Bore plan design	8:00

TOTAL TIME:

REDUCED TO 28 MINUTES



60% ↓



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Execute

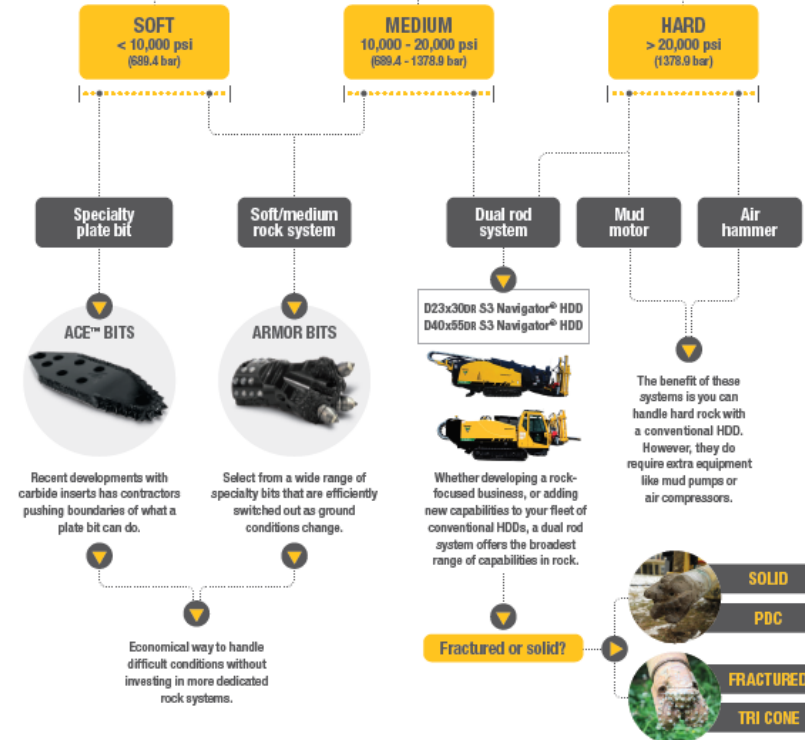
STANDARD TESTING AND ENGINEERING		BORING NUMBER B-1	
3400 N. Lincoln Blvd. Oklahoma City, OK 73105 Telephone: 405-528-0541 Fax: 405-532-5555		PAGE 1 OF 2	
CLIENT: Blackstone Environmental	PROJECT NAME: Drilling and Sampling in Nolan County, Texas		
PROJECT NUMBER: 1920-0812	PROJECT LOCATION: Sweetwater, Nolan County, Texas		
DATE STARTED: 1/8/20	COMPLETED: 1/8/20	GROUND ELEVATION:	HOLE SIZE: 7.25 inches
DRILLING CONTRACTOR: EST	GROUND WATER LEVELS:		
DRILLING METHOD: 3.25" I.D. X 7.25" O.D. HSA	AT TIME OF DRILLING: ---		
LOGGED BY: Gary	CHECKED BY:	AT END OF DRILLING: 15.00 ft	
NOTES:	AFTER DRILLING: ---		

Elevation	Depth (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (ROD)	BLOW COUNTS (N-VALUES)	POCKET PEN	DRY UNIT WT (pcf)	WET UNIT WT (pcf)	WATER CONTENT (%)	FINES CONTENT (%)	SPT N VALUE
			Reddish Brn. SANDY CLAY									
			Soft	SPT A	89	5-6-7 (13)						
				SPT B	78	3-5-5 (11)						
				SPT C	100	4-4-5 (9)						
				SPT D	78	4-5-11 (16)						
			Reddish Brn. SANDY CLAY W/ GRAVEL	SPT E	83	4-14-21 (35)						
			V. Soft	SPT F	56	12-12-12 (24)						
				SPT G	100	18-24-50.4"						
			(ROCK) Reddish Brn. WEATHERED SANDY SHALE W/ GRAVEL	SPT H	100	20-50						
			Soft									

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What kind of rock are you expecting?





Execute

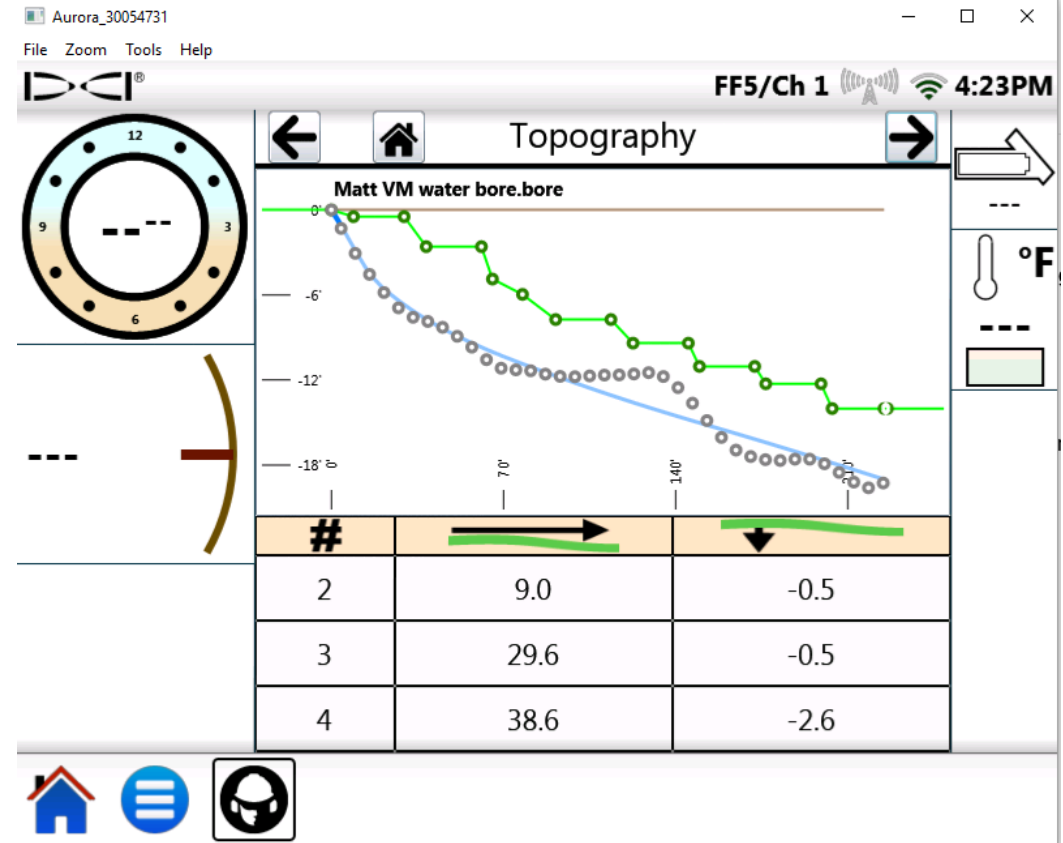
Rod by Rod Report

For bore: Bore Line 1

Machine/Rod Information: D24x40 S3/D2.375" X L10' X U2.625"

Diameter: 2.375" Length: 10'0" Bend Limit: 108'2"

Rod #	Distance	L/R	Elevation	Depth	Pitch	Azimuth	Radius
1	6'10"	R0'0"	454'9"	1'0"	-16.91%	0.00%	670'4"
2	16'9"	R0'0"	453'2"	2'5"	-15.48%	0.00%	670'4"
3	26'7"	R0'0"	451'9"	3'10"	-13.88%	0.00%	670'4"
4	36'6"	R0'0"	450'5"	5'2"	-12.28%	0.00%	670'4"
5	46'6"	R0'0"	449'3"	6'4"	-10.33%	0.00%	373'8"
6	56'5"	R0'0"	448'5"	7'3"	-7.69%	0.00%	373'8"
7	66'5"	R0'0"	447'9"	8'0"	-4.89%	0.00%	373'8"
8	76'5"	R0'0"	447'5"	8'5"	-2.27%	0.00%	373'8"
9	86'5"	R0'0"	447'4"	8'8"	0.00%	0.00%	373'8"
10	96'5"	R0'0"	447'4"	8'9"	0.00%	0.00%	373'8"
11	106'5"	R0'0"	447'4"	8'10"	0.00%	0.00%	373'8"
12	116'5"	R0'0"	447'4"	8'11"	0.00%	0.00%	373'8"
13	126'5"	R0'0"	447'4"	8'11"	0.00%	0.00%	373'8"
14	136'5"	R0'0"	447'4"	9'0"	0.00%	0.00%	373'8"
15	146'5"	R0'0"	447'4"	9'0"	0.00%	0.00%	373'8"
16	156'5"	R0'0"	447'4"	9'1"	0.00%	0.00%	373'8"
17	166'5"	R0'0"	447'4"	9'1"	0.00%	0.00%	373'8"
18	176'5"	R0'0"	447'4"	9'1"	0.00%	0.00%	373'8"
19	186'5"	R0'0"	447'4"	9'2"	0.00%	0.00%	373'8"
20	196'5"	R0'0"	447'4"	9'3"	0.00%	0.00%	373'8"
21	206'5"	R0'0"	447'4"	9'4"	0.00%	0.00%	373'8"
22	216'5"	R0'0"	447'4"	9'5"	0.00%	0.00%	373'8"
23	226'5"	R0'0"	447'4"	9'6"	0.00%	0.00%	373'8"
24	236'5"	R0'0"	447'4"	9'8"	0.00%	0.00%	373'8"
25	246'5"	R0'0"	447'4"	9'9"	0.00%	0.00%	373'8"
26	256'5"	R0'0"	447'4"	9'9"	0.00%	0.00%	373'8"
27	266'5"	R0'0"	447'4"	9'9"	0.00%	0.00%	373'8"
28	276'5"	R0'0"	447'4"	9'9"	0.00%	0.00%	373'8"
29	286'5"	R0'0"	447'4"	9'9"	0.00%	0.00%	373'8"





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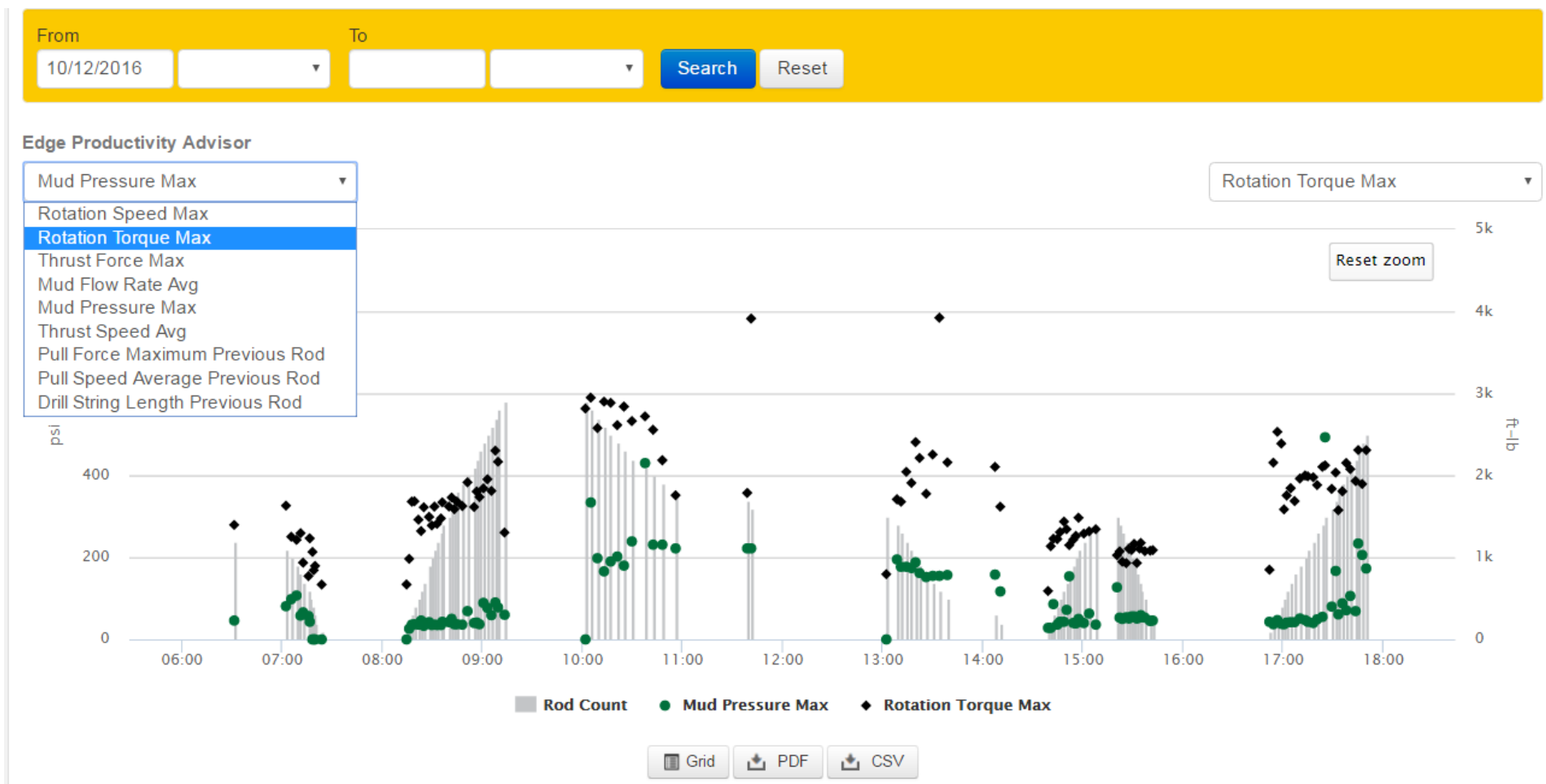




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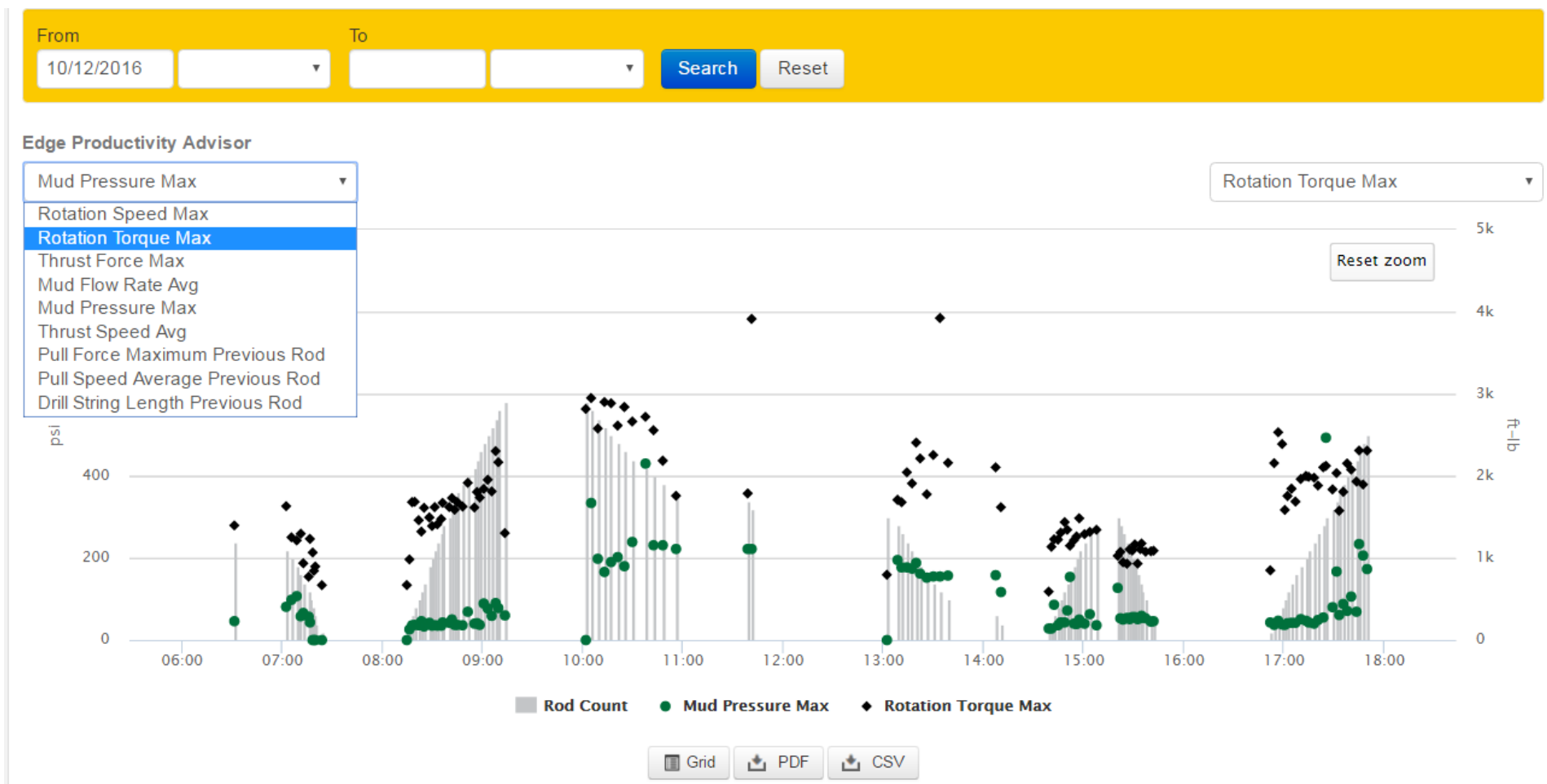




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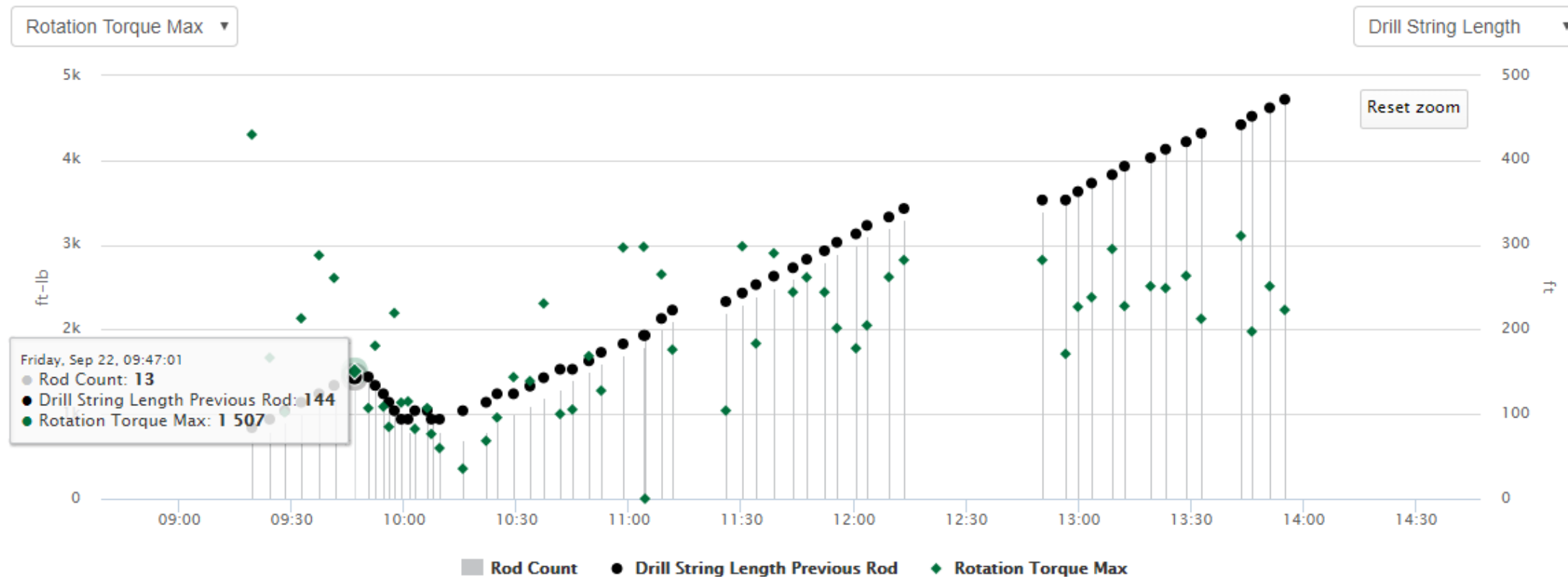


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Edge Productivity Advisor





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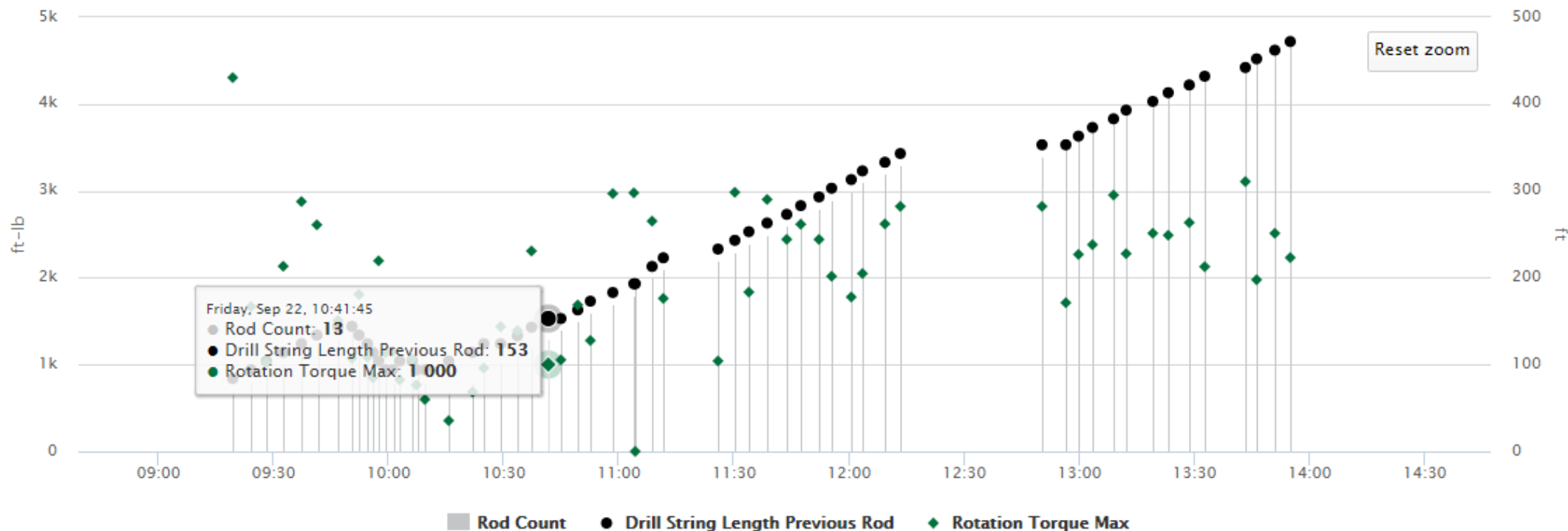
Execute

Edge Productivity Advisor

Rotation Torque Max ▾

Drill String Length ▾

Reset zoom





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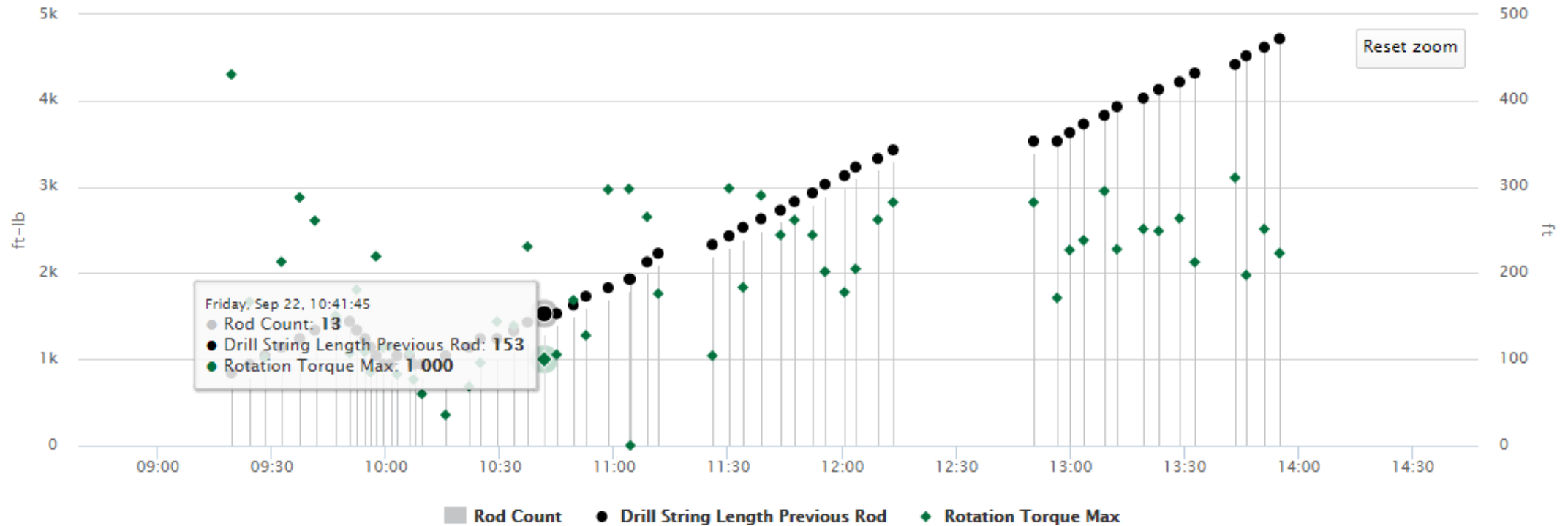
Execute

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Reset zoom





Closeout



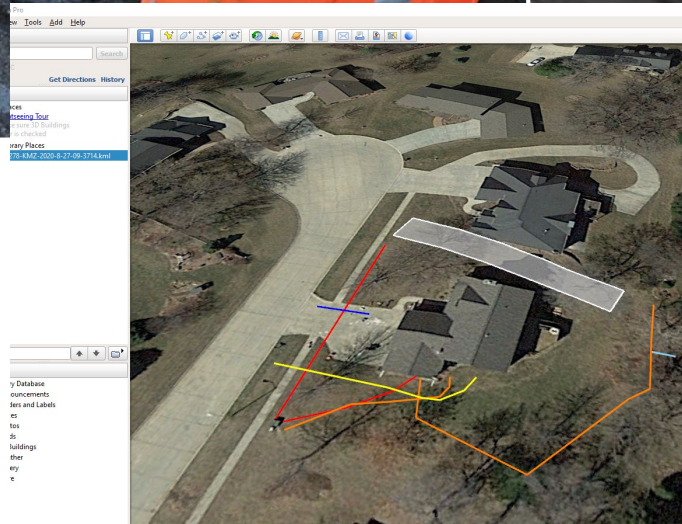
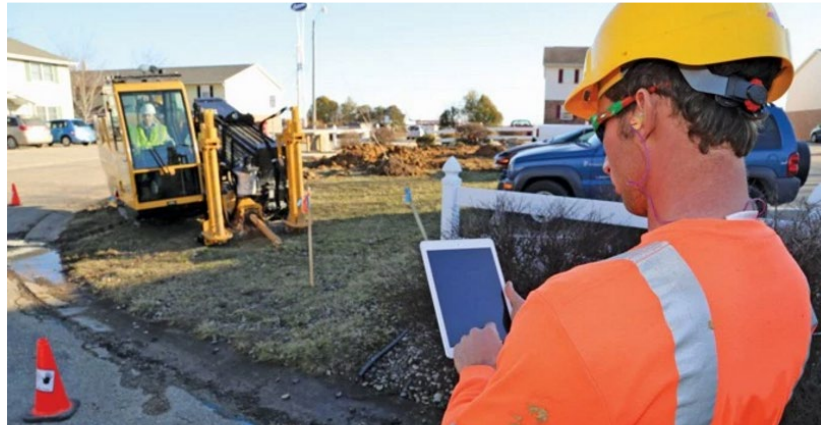




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Closeout



TURNING THIS

[illegible]



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