GREGG DRILLING & TESTING, INC.
GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

October 24, 2011

Tech Law
Attn: Lorraine Larsen-Hallock

Subject: CPT Site Investigation
Hwy 101 Moffett to 70
Mt. View, California
GREGG Project Number: 11-152MA

Dear Ms. Larsen-Hallock:

The following report presents the results of GREGG Drilling & Testing's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	☒
2	Pore Pressure Dissipation Tests	(PPD)	☒
3	Seismic Cone Penetration Tests	(SCPTU)	☐
4	UVOST Laser Induced Fluorescence	(UVOST)	☐
5	Groundwater Sampling	(GWS)	☒
6	Soil Sampling	(SS)	☐
7	Vapor Sampling	(VS)	☐
8	Pressuremeter Testing	(PMT)	☐
9	Vane Shear Testing	(VST)	☐
10	Dilatometer Testing	(DMT)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (925) 313-5800.

Sincerely,
GREGG Drilling & Testing, Inc.

Mary Walden
Operations Manager

950 Howe Rd • Martinez, California 94553 • (925) 313-5800 • FAX (925) 313-0302
OTHER OFFICES: LOS ANGELES • HOUSTON
www.greggdrilling.com

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (Feet)	Depth of Groundwater Samples (Feet)	Depth of Soil Samples (Feet)	Depth of Pore Pressure Dissipation Tests (Feet)
CPT-HP-21	10/17/11	60	22, 40, 53.5, 58	-	-
CPT-HP-22	10/17/11	60	24, 49.5, 54, 60	-	-
CPT-HP-23	10/19/11	60	20, 23.5, 40	-	26.1
CPT-HP-24	10/18/11	60	20, 39.5, 59	-	-
CPT-HP-26	10/19/11	9	-	-	-
CPT-HP-29	10/20/11	60	27, 36NR, 58	-	-
CPT-HP-32	10/21/11	60	25, 46.5, 59.5	-	43.3
CPT-HP-33	10/21/11	65	22, 38, 63	-	-
CPT-HP-33a	10/20/11	60	19.5, 44.5, 51	-	-
CPT-HP-41	10/19/11	60	22.5, 27, 38	-	-

Bibliography

Lunne, T., Robertson, P.K. and Powell, J.J.M., "Cone Penetration Testing in Geotechnical Practice" E & FN Spon. ISBN 0 419 23750, 1997

Roberston, P.K., "Soil Classification using the Cone Penetration Test", Canadian Geotechnical Journal, Vol. 27, 1990 pp. 151-158.

Mayne, P.W., "NHI (2002) Manual on Subsurface Investigations: Geotechnical Site Characterization", available through www.ce.gatech.edu/~geosys/Faculty/Mayne/papers/index.html, Section 5.3, pp. 107-112.

Robertson, P.K., R.G. Campanella, D. Gillespie and A. Rice, "Seismic CPT to Measure In-Situ Shear Wave Velocity", Journal of Geotechnical Engineering ASCE, Vol. 112, No. 8, 1986 pp. 791-803.

Robertson, P.K., Sully, J., Woeller, D.J., Lunne, T., Powell, J.J.M., and Gillespie, D.J., "Guidelines for Estimating Consolidation Parameters in Soils from Piezocone Tests", Canadian Geotechnical Journal, Vol. 29, No. 4, August 1992, pp. 539-550.

Robertson, P.K., T. Lunne and J.J.M. Powell, "Geo-Environmental Application of Penetration Testing", Geotechnical Site Characterization, Robertson & Mayne (editors), 1998 Balkema, Rotterdam, ISBN 90 5410 939 4 pp 35-47.

Campanella, R.G. and I. Weemees, "Development and Use of An Electrical Resistivity Cone for Groundwater Contamination Studies", Canadian Geotechnical Journal, Vol. 27 No. 5, 1990 pp. 557-567.

DeGroot, D.J. and A.J. Lutenegger, "Reliability of Soil Gas Sampling and Characterization Techniques", International Site Characterization Conference - Atlanta, 1998.

Woeller, D.J., P.K. Robertson, T.J. Boyd and Dave Thomas, "Detection of Polyaromatic Hydrocarbon Contaminants Using the UVIF-CPT", 53rd Canadian Geotechnical Conference Montreal, QC October pp. 733-739, 2000.

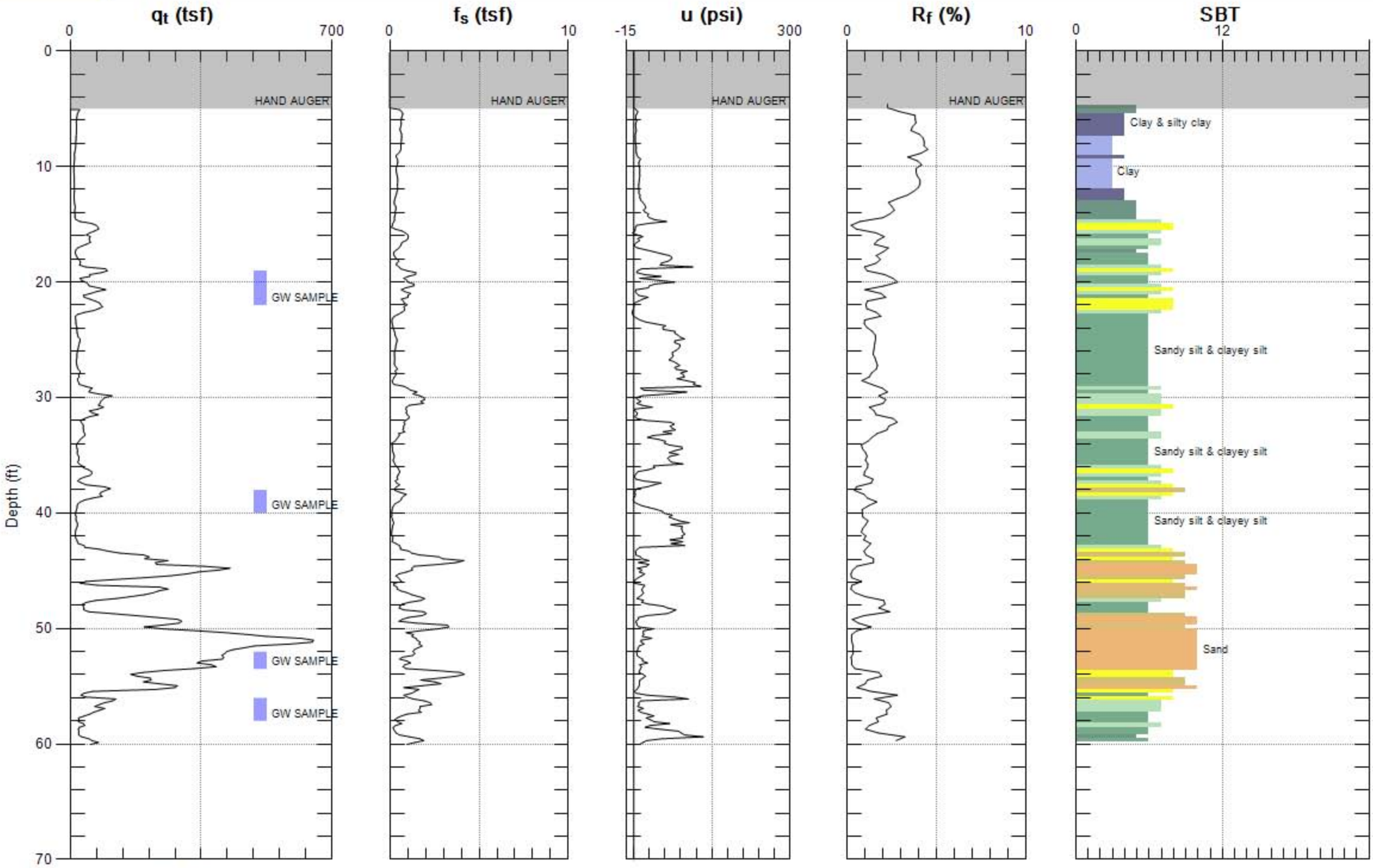
Zemo, D.A., T.A. Delfino, J.D. Gallinatti, V.A. Baker and L.R. Hilpert, "Field Comparison of Analytical Results from Discrete-Depth Groundwater Samplers" BAT EnviroProbe and QED HydroPunch, Sixth national Outdoor Action Conference, Las Vegas, Nevada Proceedings, 1992, pp 299-312.

Copies of ASTM Standards are available through www.astm.org

TECH LAW

Site: HWY 101
Sounding: CPT-HP21

Engineer: L.LARSEN-HALLOCK
Date: 10/17/2011 08:12



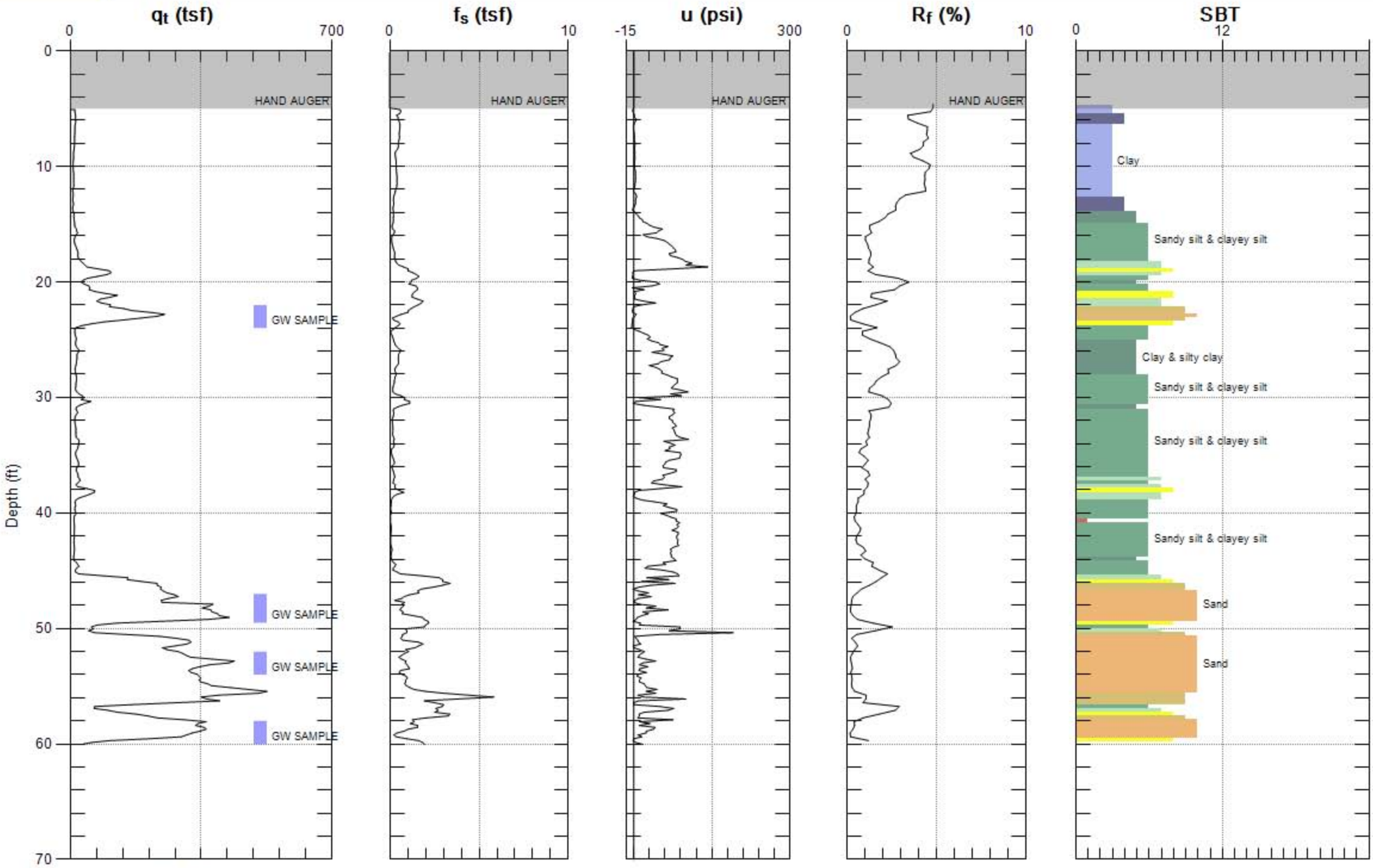
Max. Depth: 60.039 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP22

Engineer: L.LARSEN-HALLOCK
Date: 10/17/2011 04:07



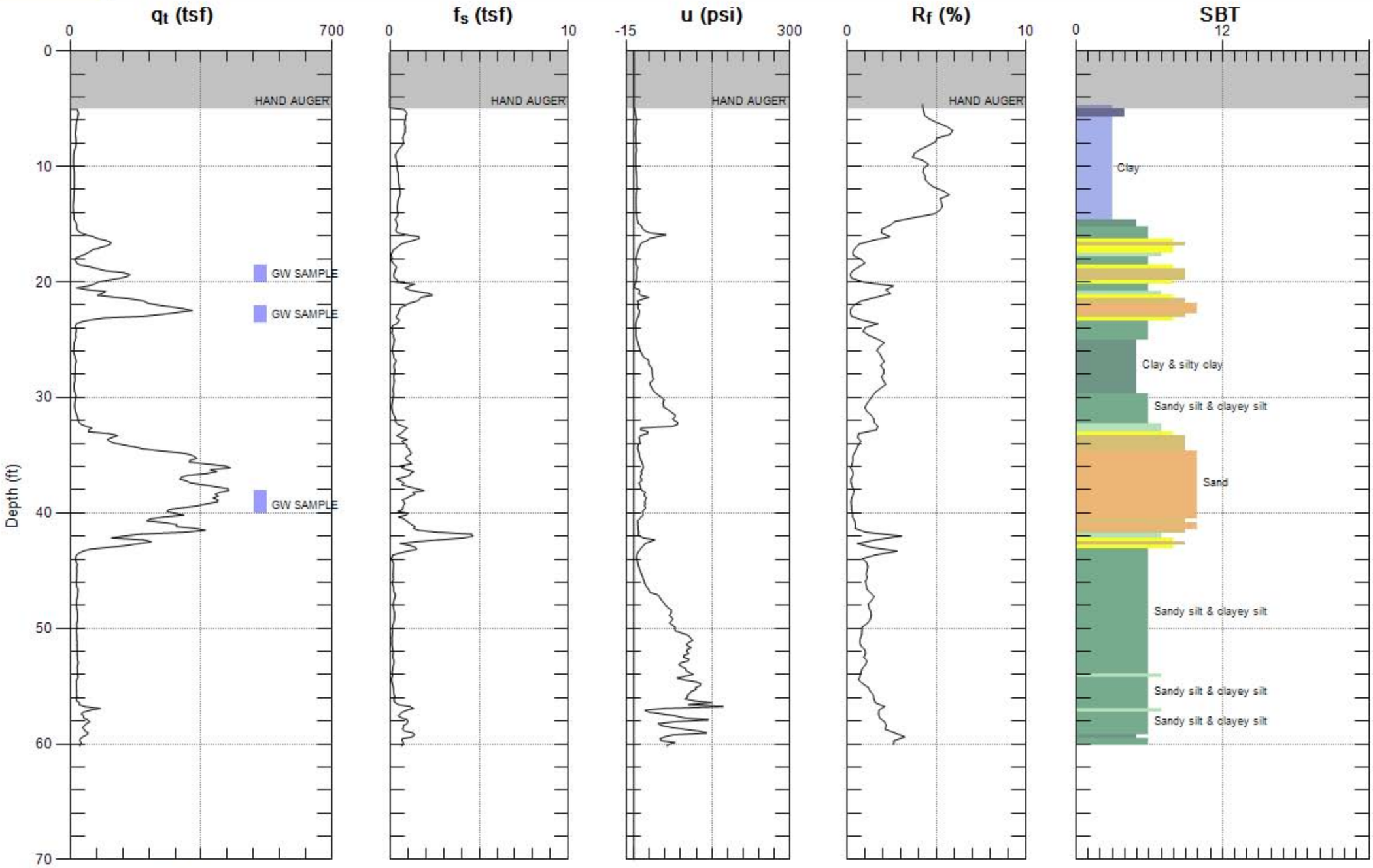
Max. Depth: 60.039 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP23

Engineer: L.LARSEN-HALLOCK
Date: 10/19/2011 09:43



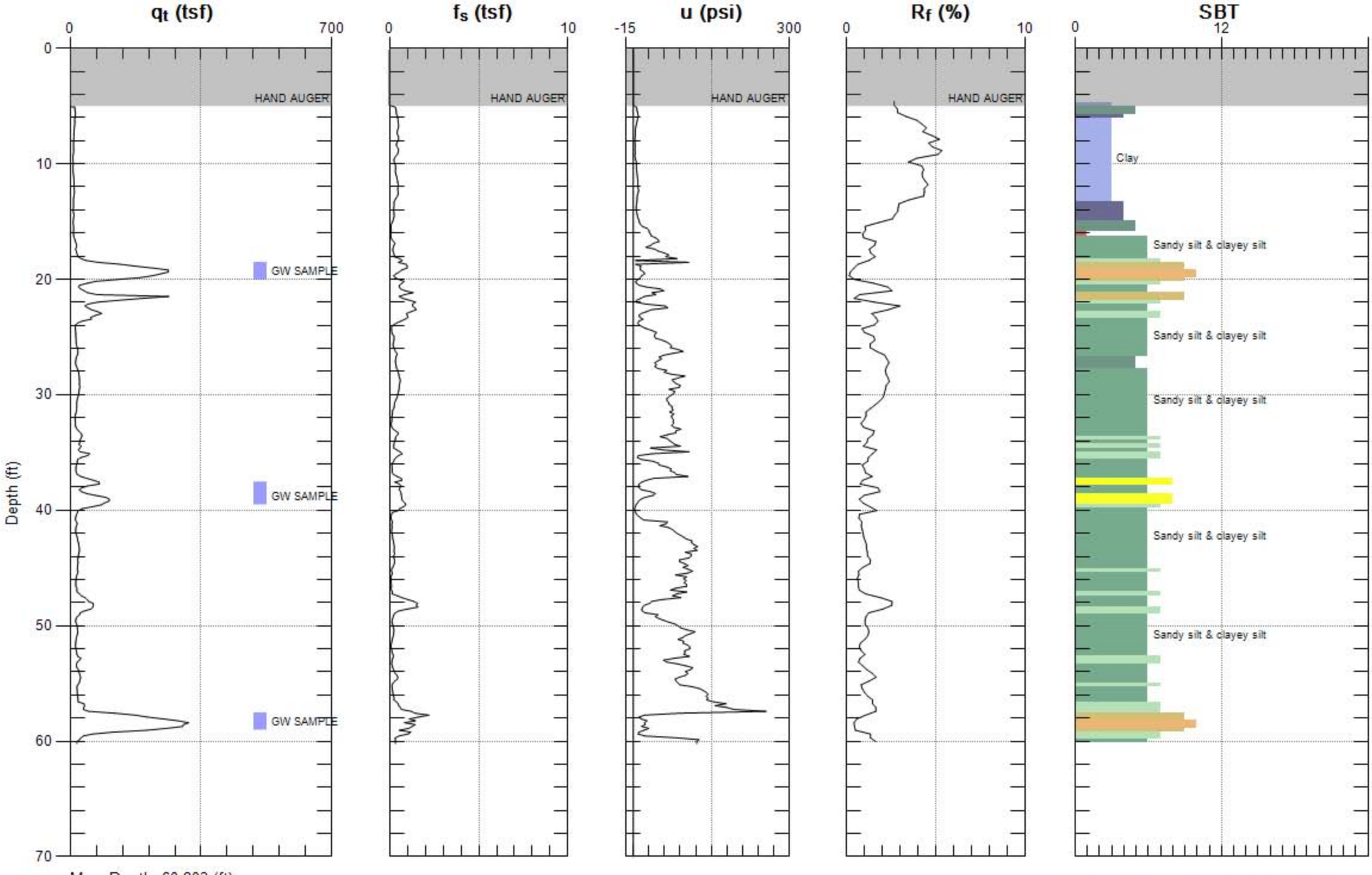
Max. Depth: 60.203 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP24

Engineer: L.LARSEN-HALLOCK
Date: 10/18/2011 12:47



Max. Depth: 60.203 (ft)
Avg. Interval: 0.328 (ft)

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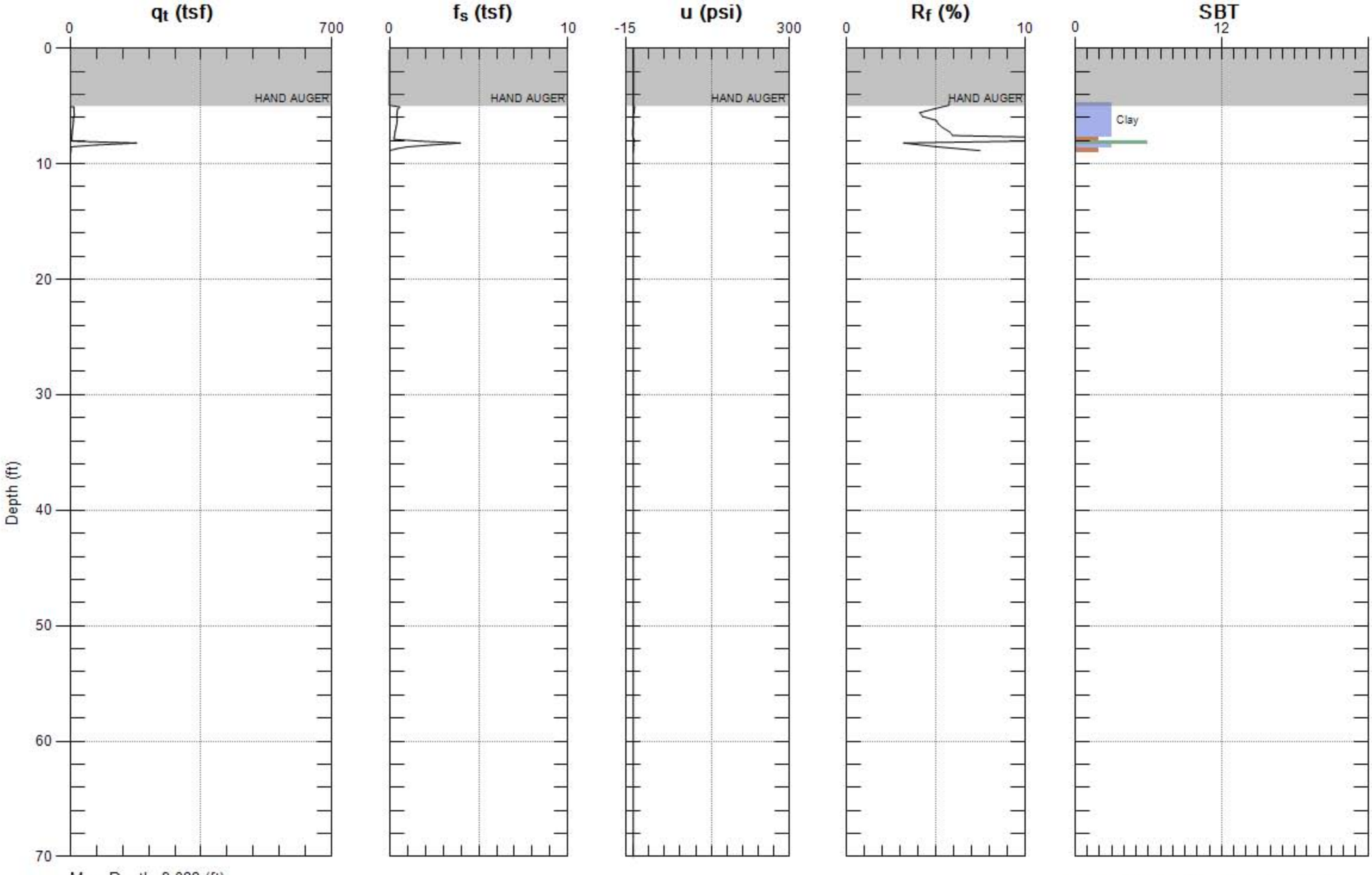
TECH LAW

Site: HWY 101
Sounding: CPT-HP26

Engineer: L.LARSEN-HALLOCK
Date: 10/19/2011 08:39



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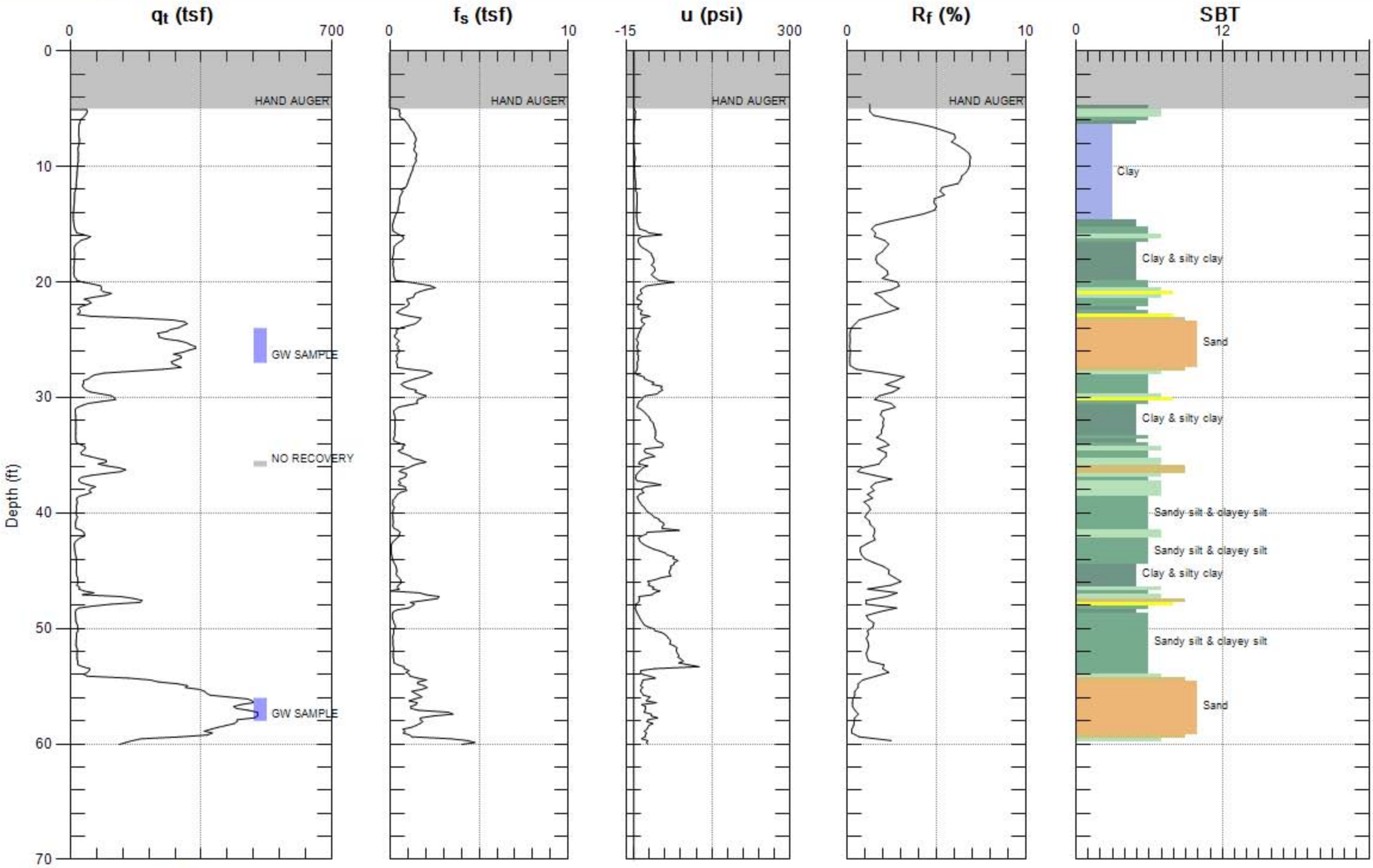
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP29

Engineer: L.LARSEN-HALLOCK
Date: 10/20/2011 02:19



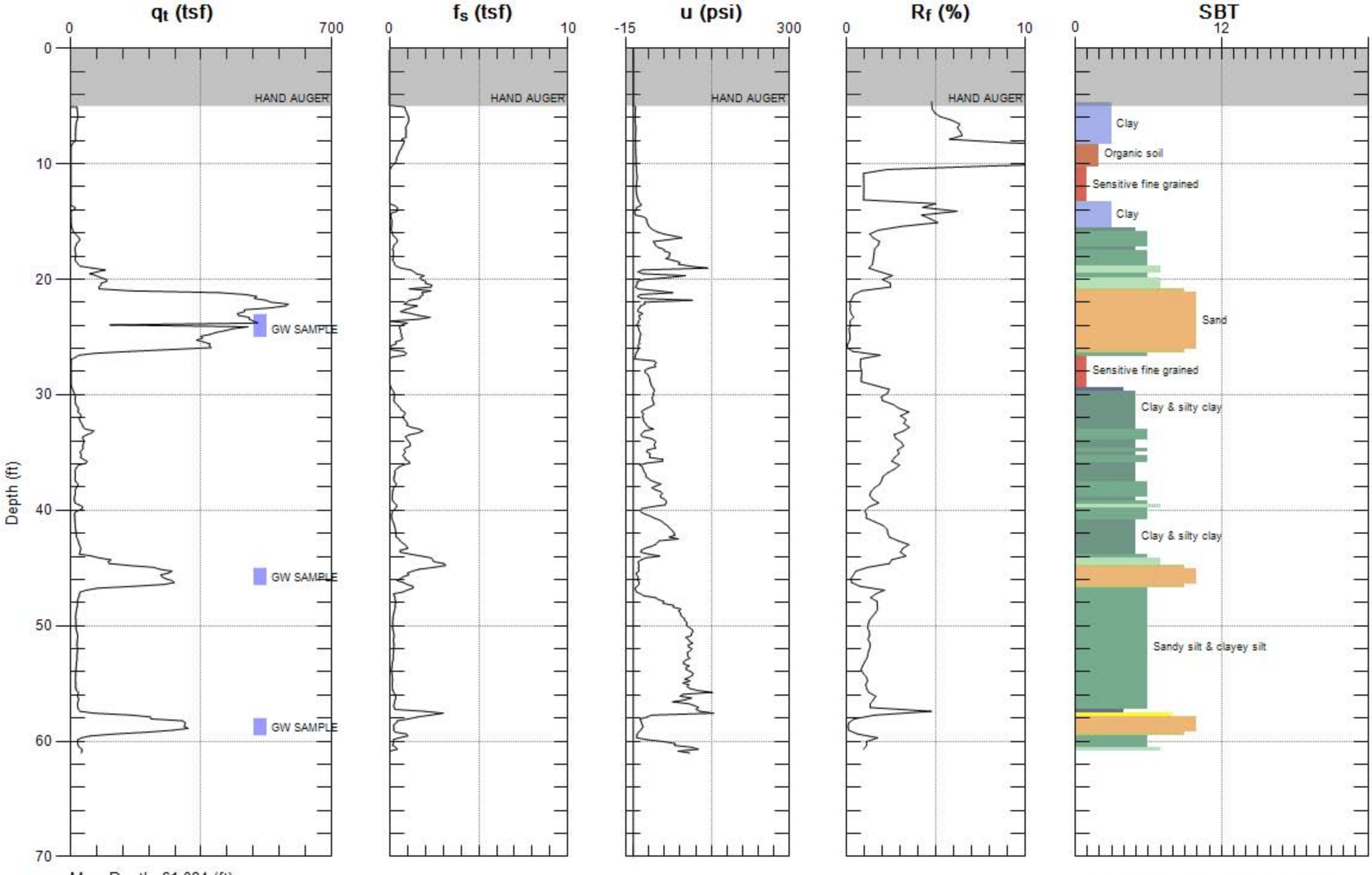
Max. Depth: 60.039 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP32

Engineer: L.LARSEN-HALLOCK
Date: 10/21/2011 07:22



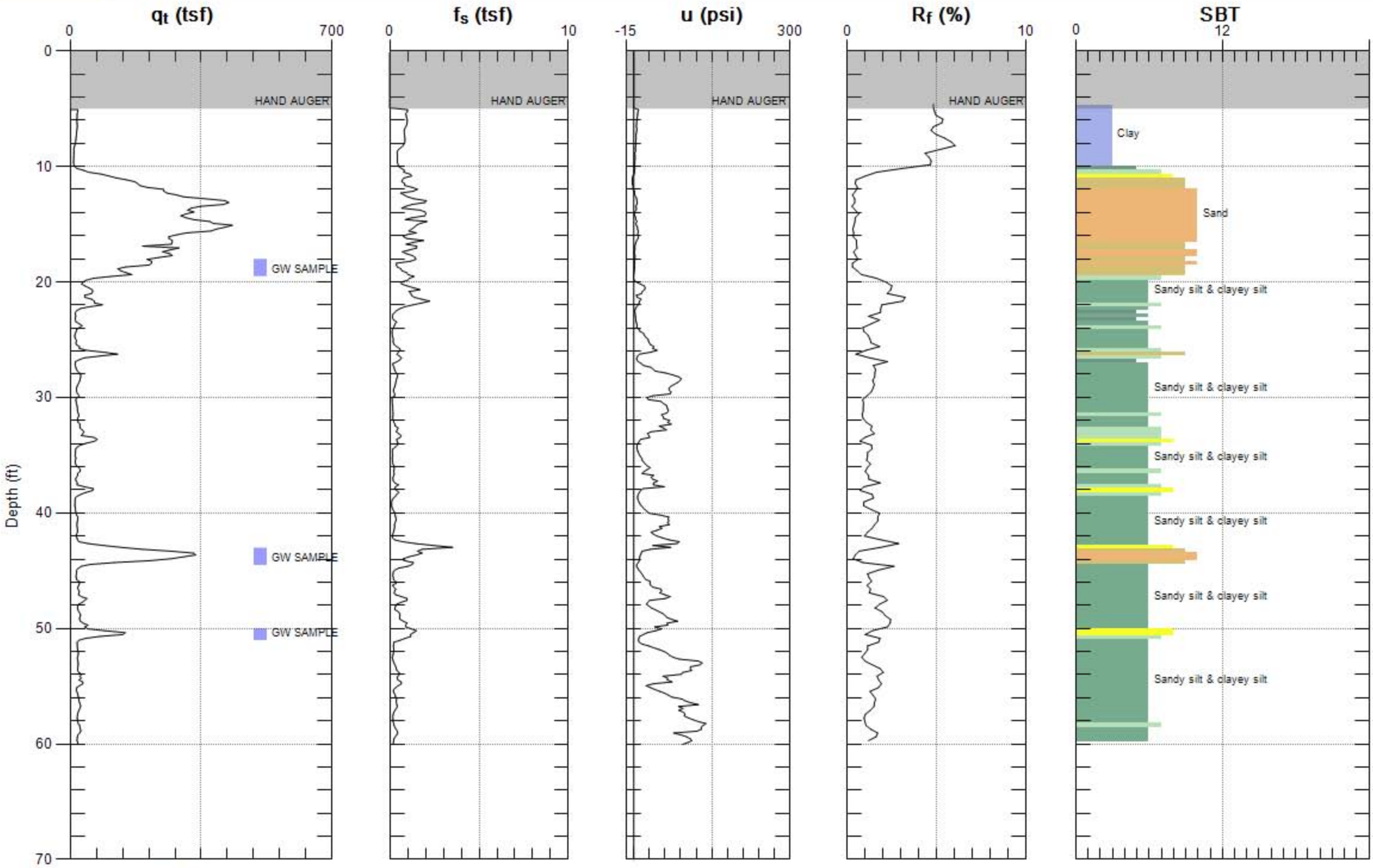
Max. Depth: 61.024 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP33A

Engineer: L.LARSEN-HALLOCK
Date: 10/20/2011 08:34



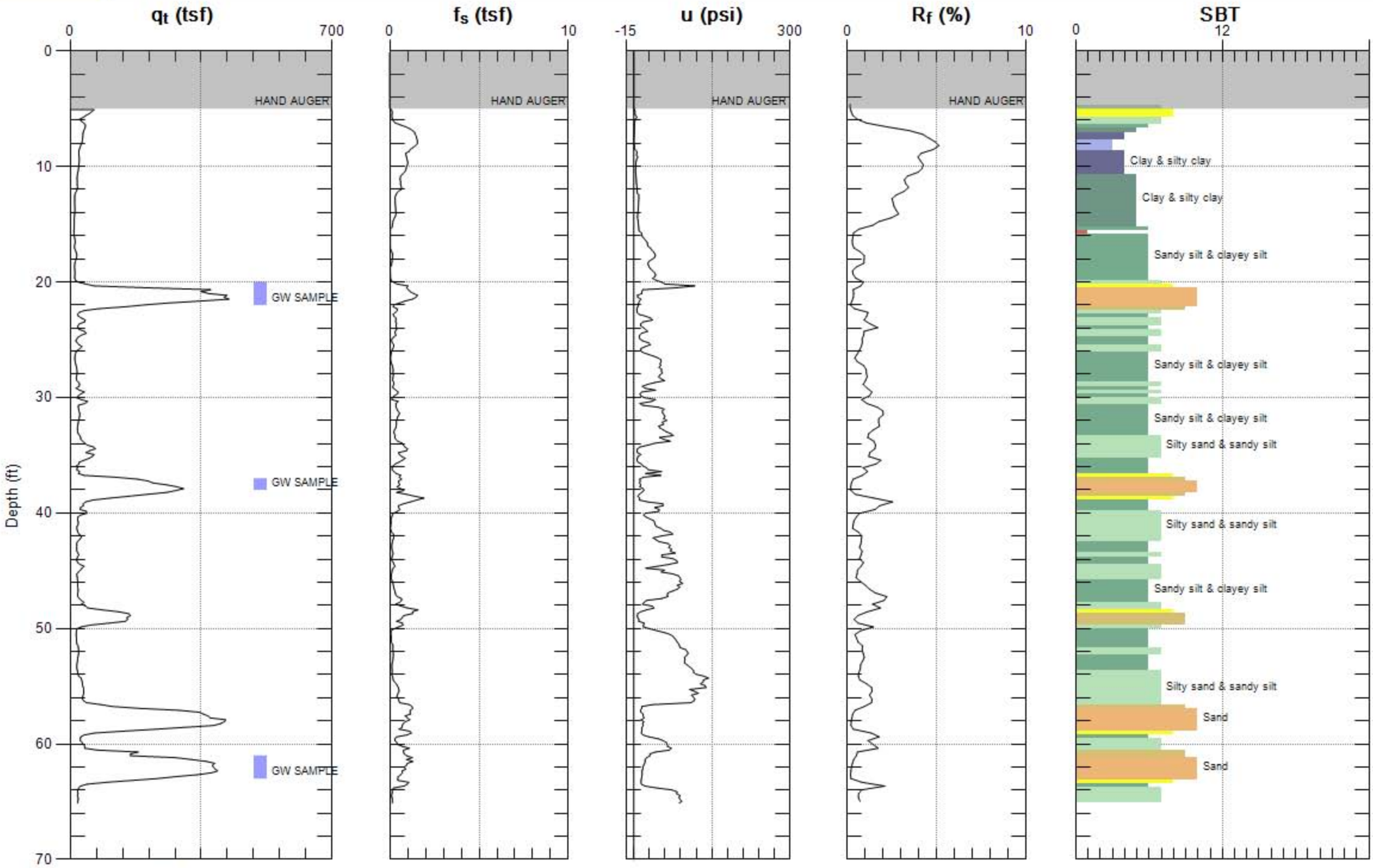
Max. Depth: 60.039 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP33

Engineer: L.LARSEN-HALLOCK
Date: 10/21/2011 01:25



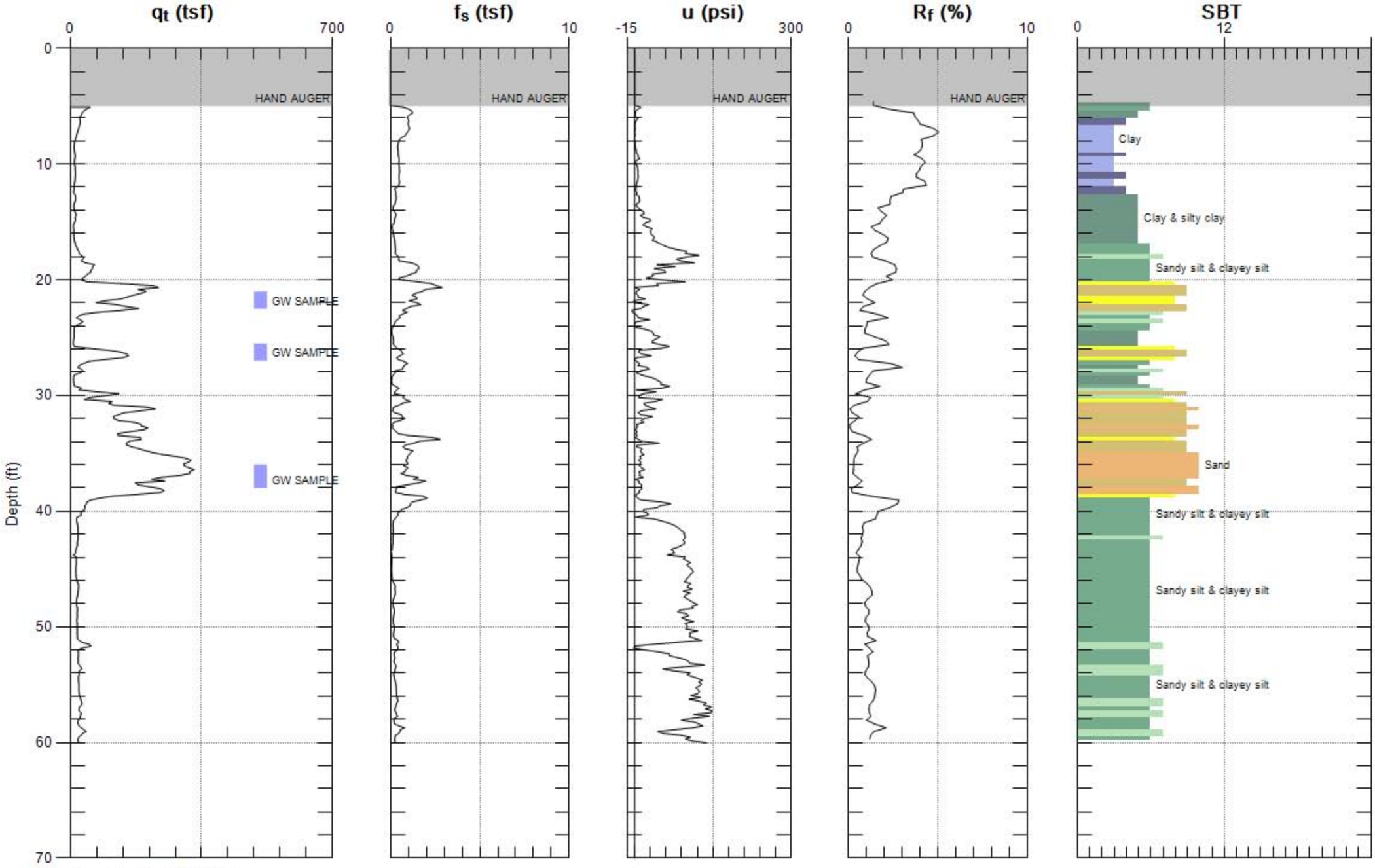
Max. Depth: 65.125 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP41

Engineer: L.LARSEN-HALLOCK
Date: 10/19/2011 02:31



Max. Depth: 60.039 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG DRILLING & TESTING, INC.
GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

October 31, 2011

Tech Law
Attn: Lorraine Larsen-Hallock

Subject: CPT Site Investigation
Hwy 101 Moffett to 70
Mt. View, California
GREGG Project Number: 11-152MA – part 2

Dear Ms. Larsen-Hallock:

The following report presents the results of GREGG Drilling & Testing's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	☒
2	Pore Pressure Dissipation Tests	(PPD)	☒
3	Seismic Cone Penetration Tests	(SCPTU)	☐
4	UVOST Laser Induced Fluorescence	(UVOST)	☐
5	Groundwater Sampling	(GWS)	☒
6	Soil Sampling	(SS)	☐
7	Vapor Sampling	(VS)	☐
8	Pressuremeter Testing	(PMT)	☐
9	Vane Shear Testing	(VST)	☐
10	Dilatometer Testing	(DMT)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (925) 313-5800.

Sincerely,
GREGG Drilling & Testing, Inc.

Mary Walden
Operations Manager

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OTHER OFFICES: LOS ANGELES • HOUSTON
www.greggdrilling.com

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (Feet)	Depth of Groundwater Samples (Feet)	Depth of Soil Samples (Feet)	Depth of Pore Pressure Dissipation Tests (Feet)
CPT-HP-26B	10/27/11	60	27, 55.5	-	-
CPT-HP-27	10/25/11	60	22, 32, 59	-	-
CPT-HP-28	10/28/11	60	36.5, 50.5	-	-
CPT-HP-34	10/27/11	60	25.5, 41, 59NR	-	-
CPT-HP-38	10/26/11	59	21.5, 39.5, 50	-	-
CPT-HP-39	10/26/11	60	21, 43.5	-	40.8
CPT-HP-42	10/28/11	60	20, 32, 57	-	-
CPT-HP-43	10/24/11	65	18.5, 30.5	-	-
CPT-HP-44	10/24/11	60	36, 56	-	-
CPT-HP-45	10/24/11	65	33, 55	-	-
CPT-HP-46	10/28/11	60	34, 56	-	-
CPT-HP-47	10/26/11	60	21.5, 27.5, 58	-	-
CPT-HP-48	10/25/11	60	19, 33.5, 48.5	-	-
CPT-HP-49	10/27/11	60	36, 47	-	-

Bibliography

Lunne, T., Robertson, P.K. and Powell, J.J.M., "Cone Penetration Testing in Geotechnical Practice" E & FN Spon. ISBN 0 419 23750, 1997

Roberston, P.K., "Soil Classification using the Cone Penetration Test", Canadian Geotechnical Journal, Vol. 27, 1990 pp. 151-158.

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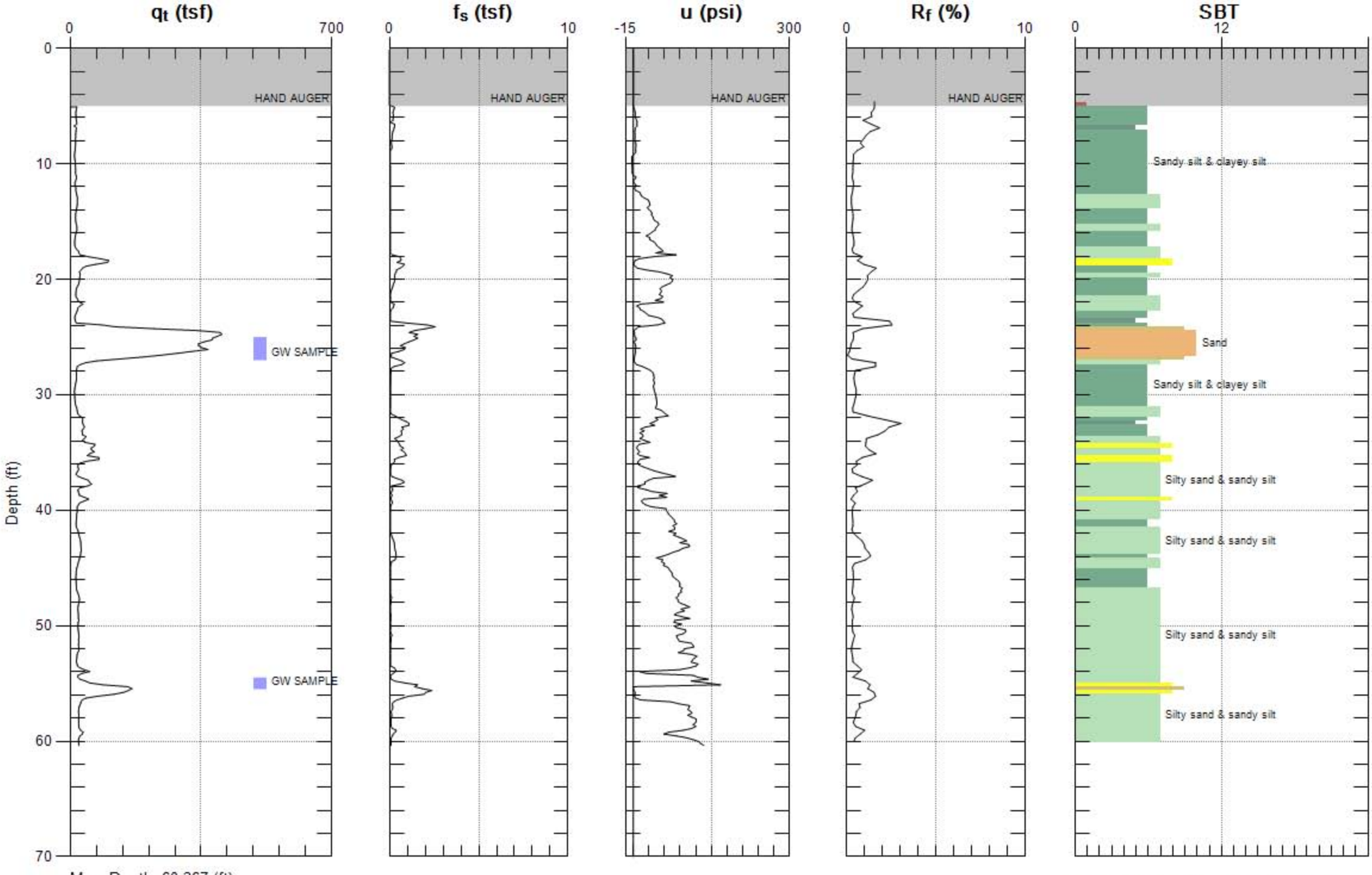
Zemo, D.A., T.A. Delfino, J.D. Gallinatti, V.A. Baker and L.R. Hilpert, "Field Comparison of Analytical Results from Discrete-Depth Groundwater Samplers" BAT EnviroProbe and QED HydroPunch, Sixth national Outdoor Action Conference, Las Vegas, Nevada Proceedings, 1992, pp 299-312.

Copies of ASTM Standards are available through www.astm.org

TECH LAW

Site: HWY 101
Sounding: CPT-HP26B

Engineer: L.LARSEN-HALLOCK
Date: 10/27/2011 09:46



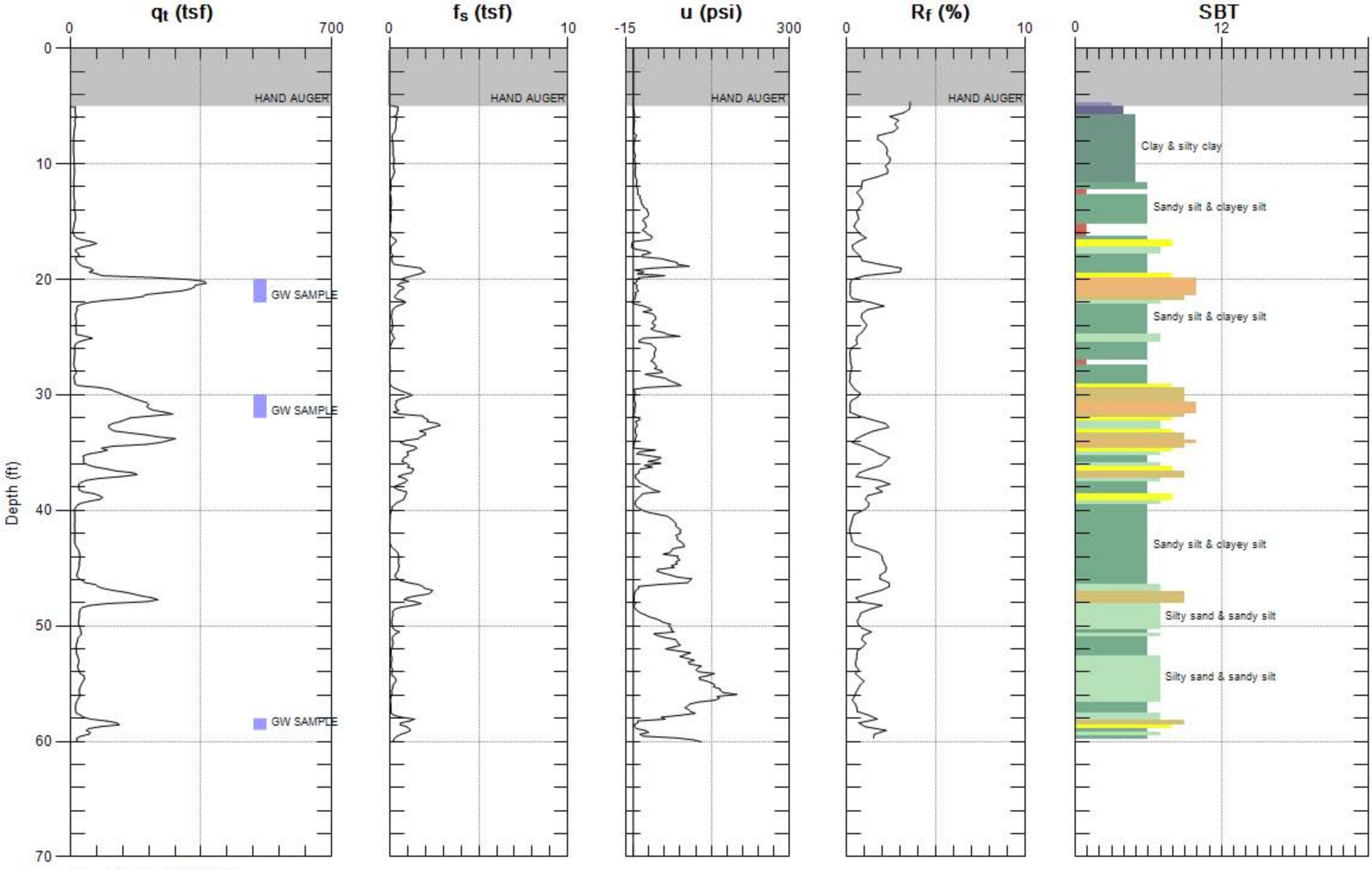
Max. Depth: 60.367 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP27

Engineer: L.LARSEN-HALLOCK
Date: 10/25/2011 01:25



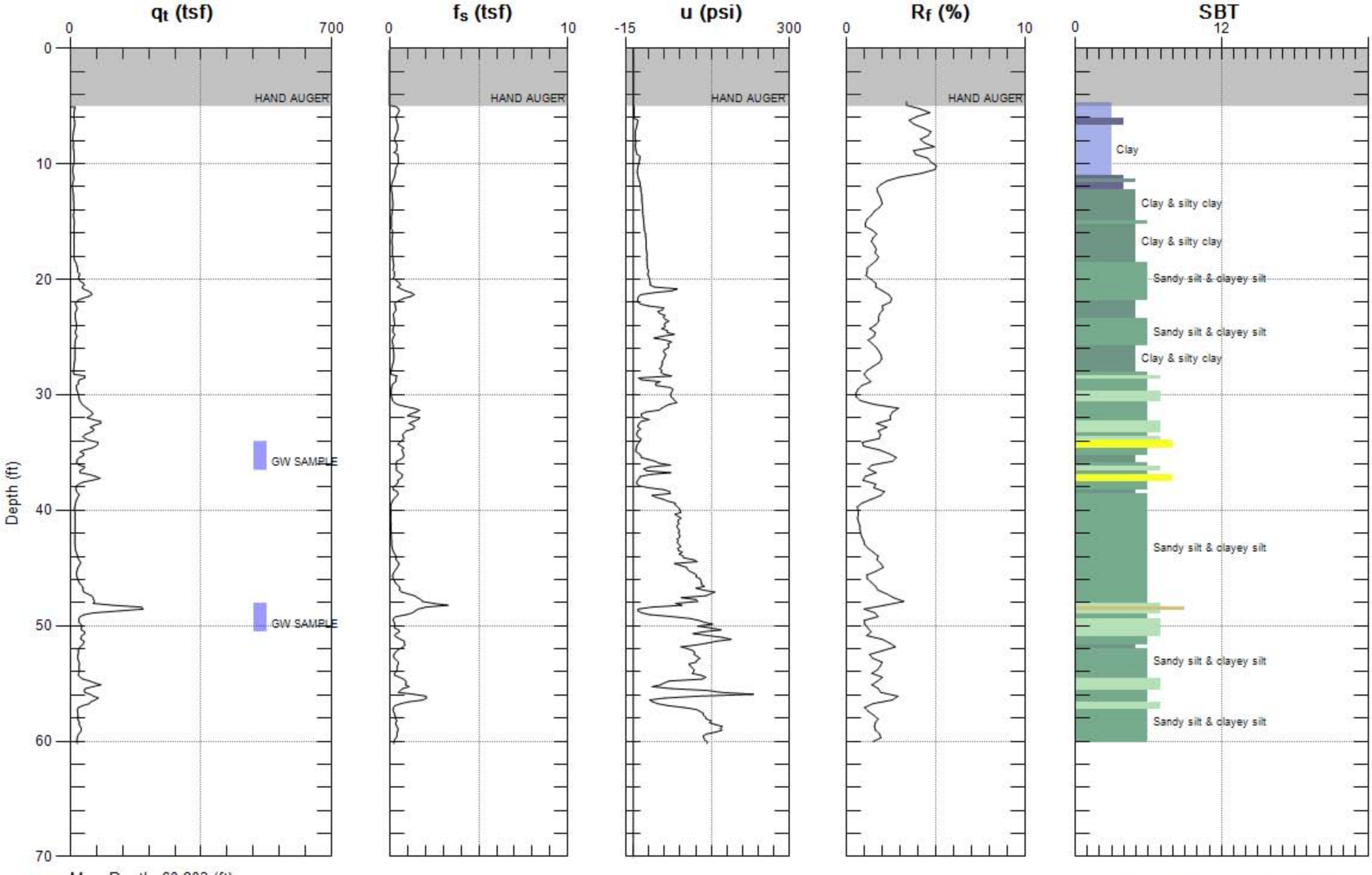
Max. Depth: 60.039 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP28

Engineer: L.LARSEN-HALLOCK
Date: 10/28/2011 07:36



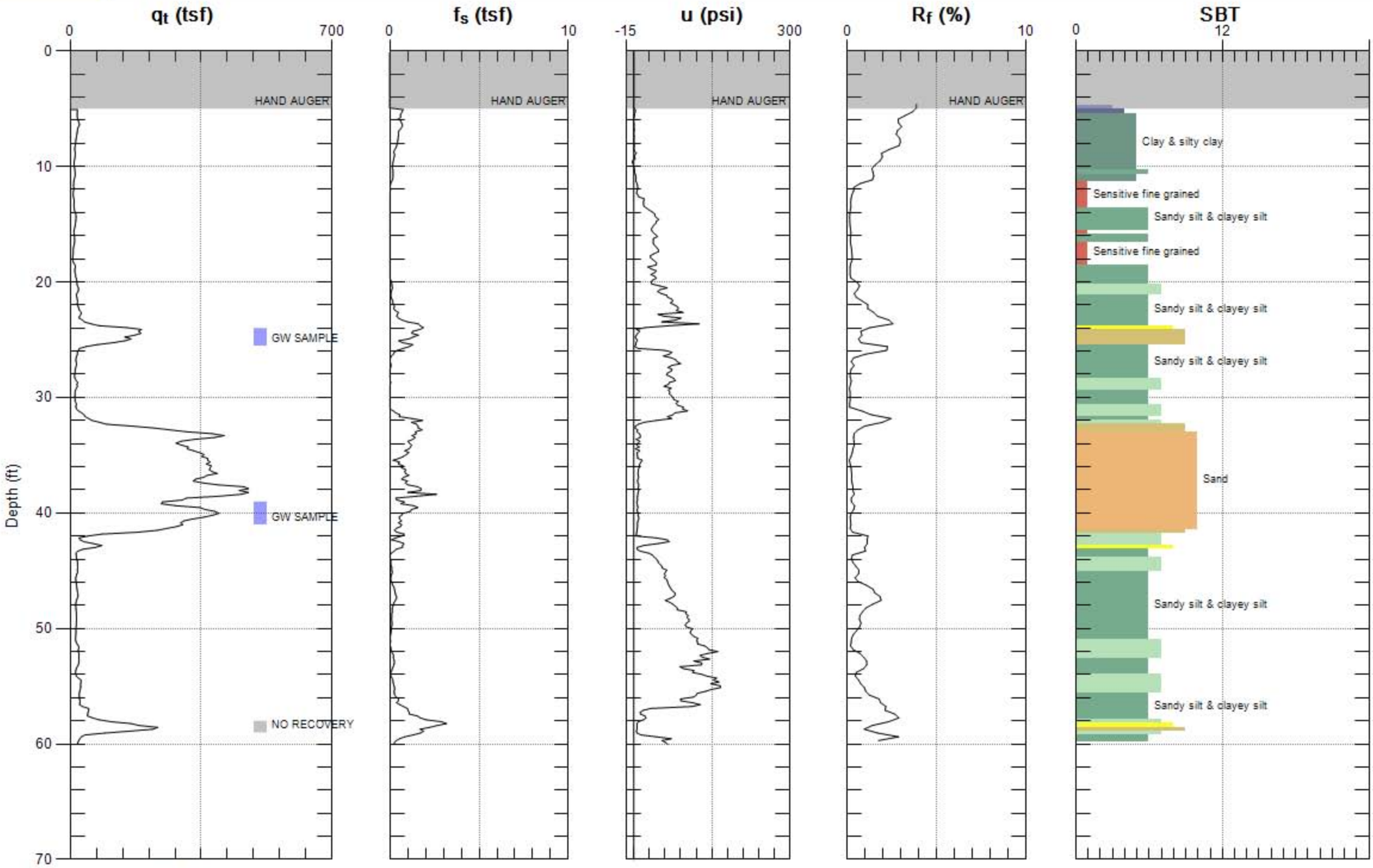
Max. Depth: 60.203 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP34

Engineer: L.LARSEN-HALLOCK
Date: 10/27/2011 12:19



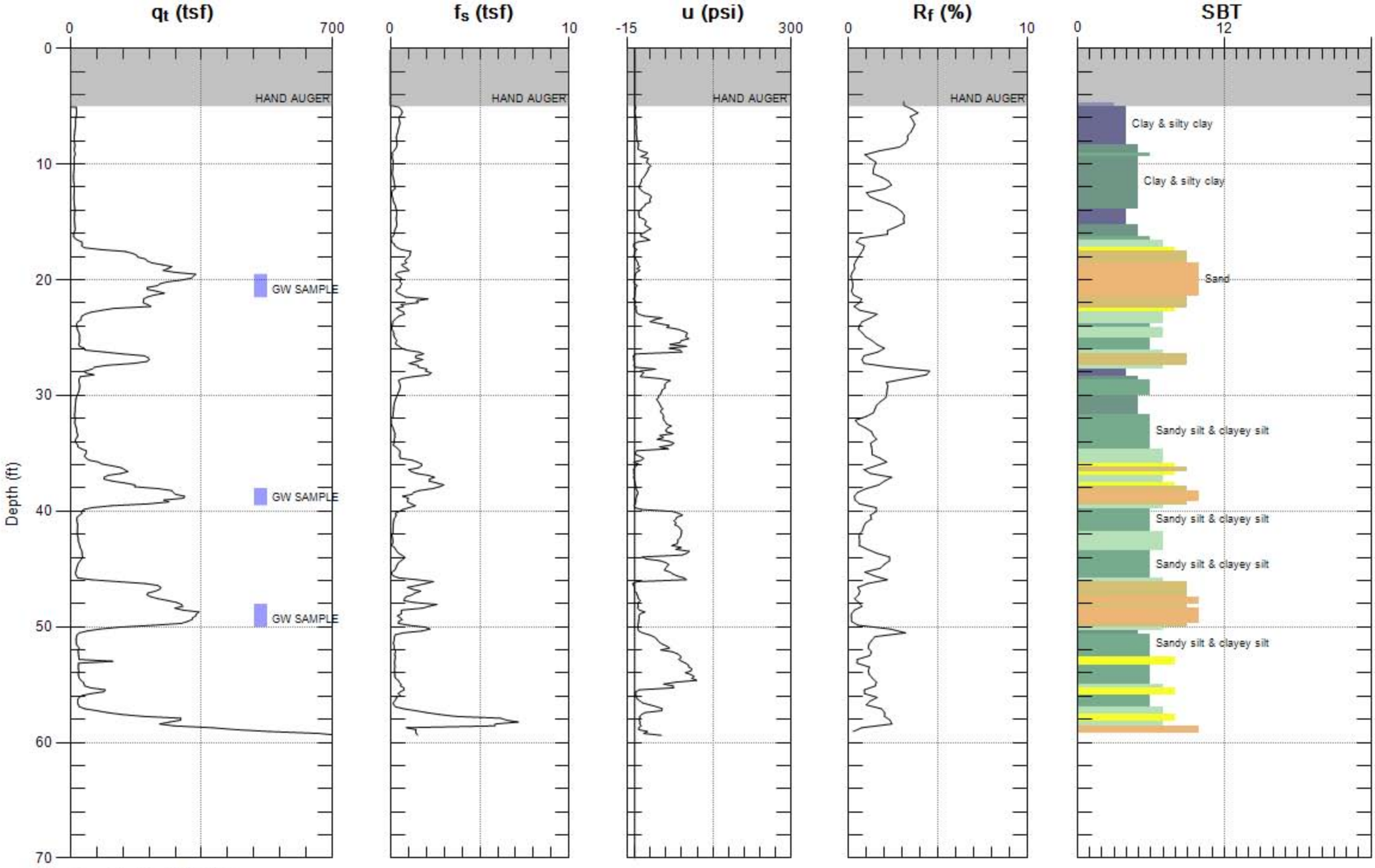
Max. Depth: 60.039 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP38

Engineer: L.LARSEN-HALLOCK
Date: 10/26/2011 11:08



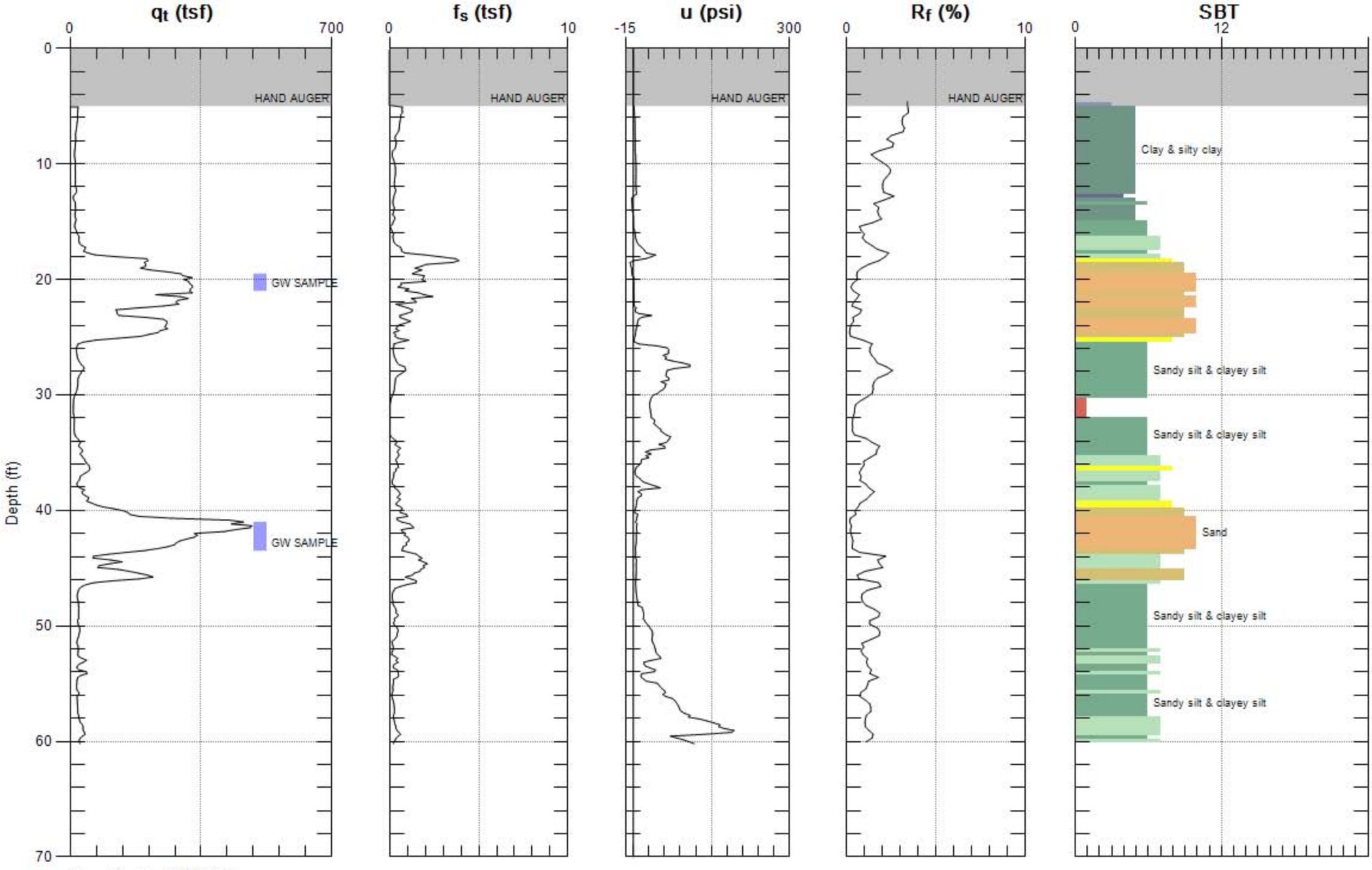
Max. Depth: 59.383 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP39

Engineer: L.LARSEN-HALLOCK
Date: 10/26/2011 07:41



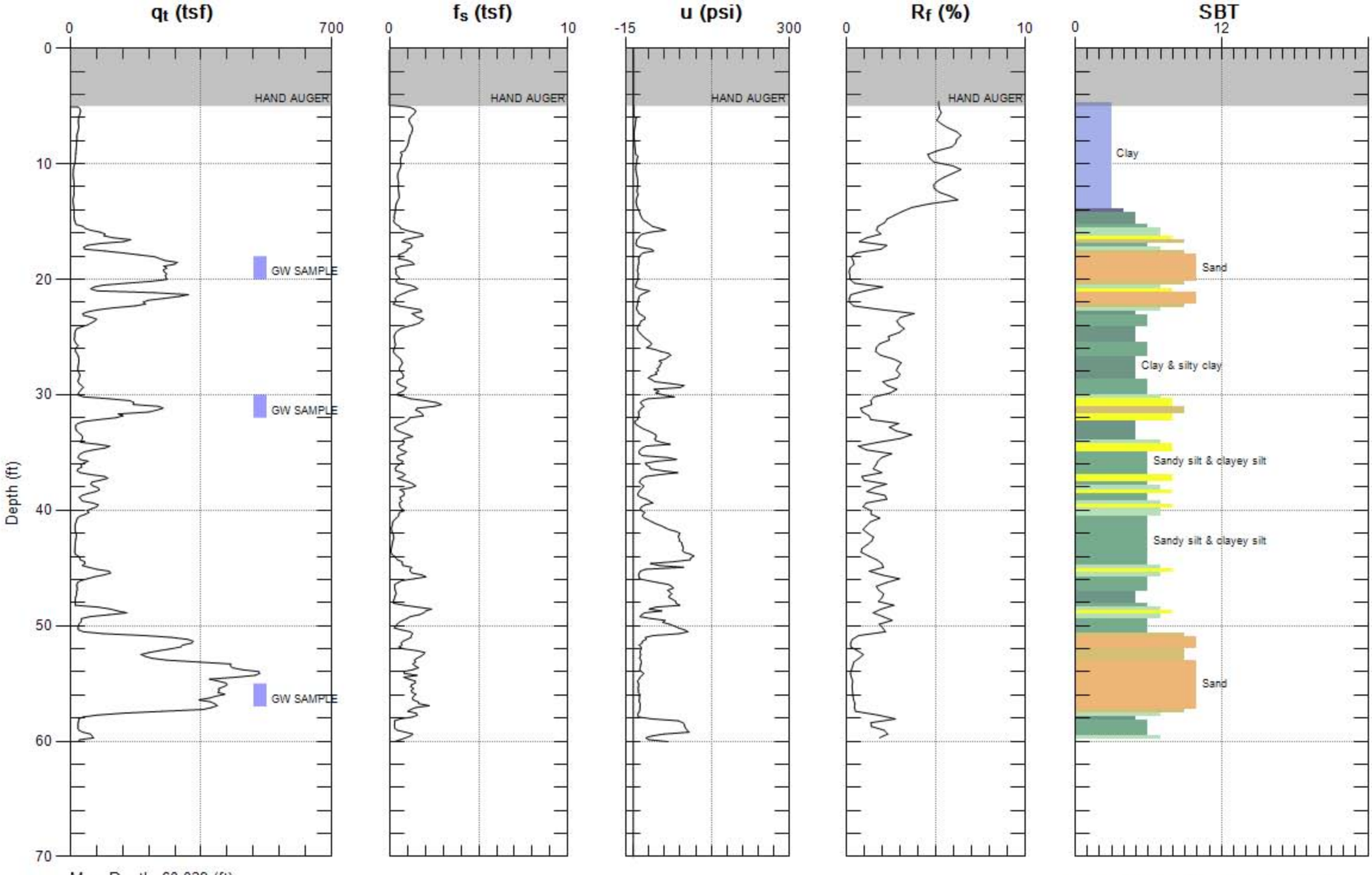
Max. Depth: 60.203 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP42

Engineer: L.LARSEN-HALLOCK
Date: 10/28/2011 01:01



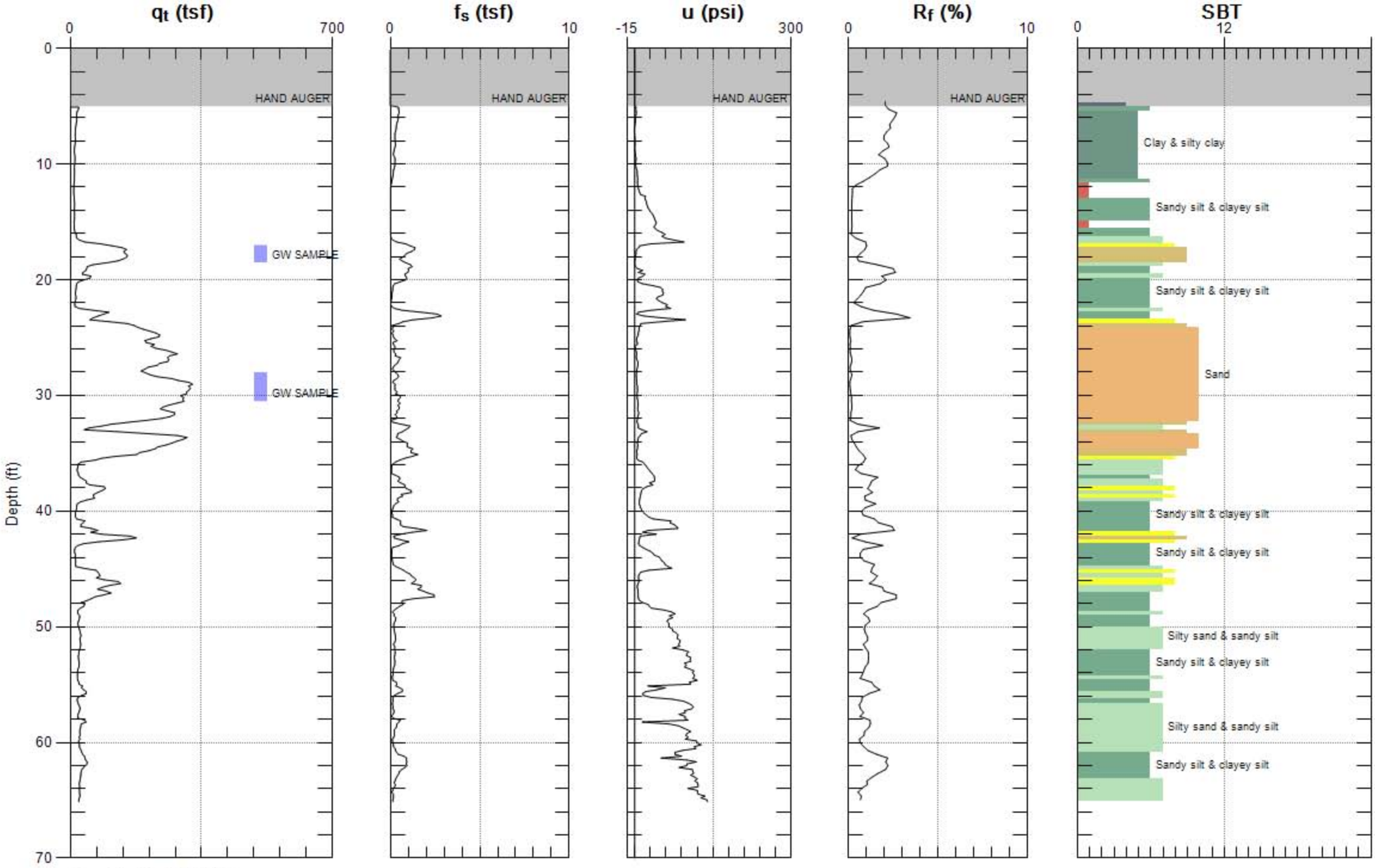
Max. Depth: 60.039 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP43

Engineer: L.LARSEN-HALLOCK
Date: 10/24/2011 08:37



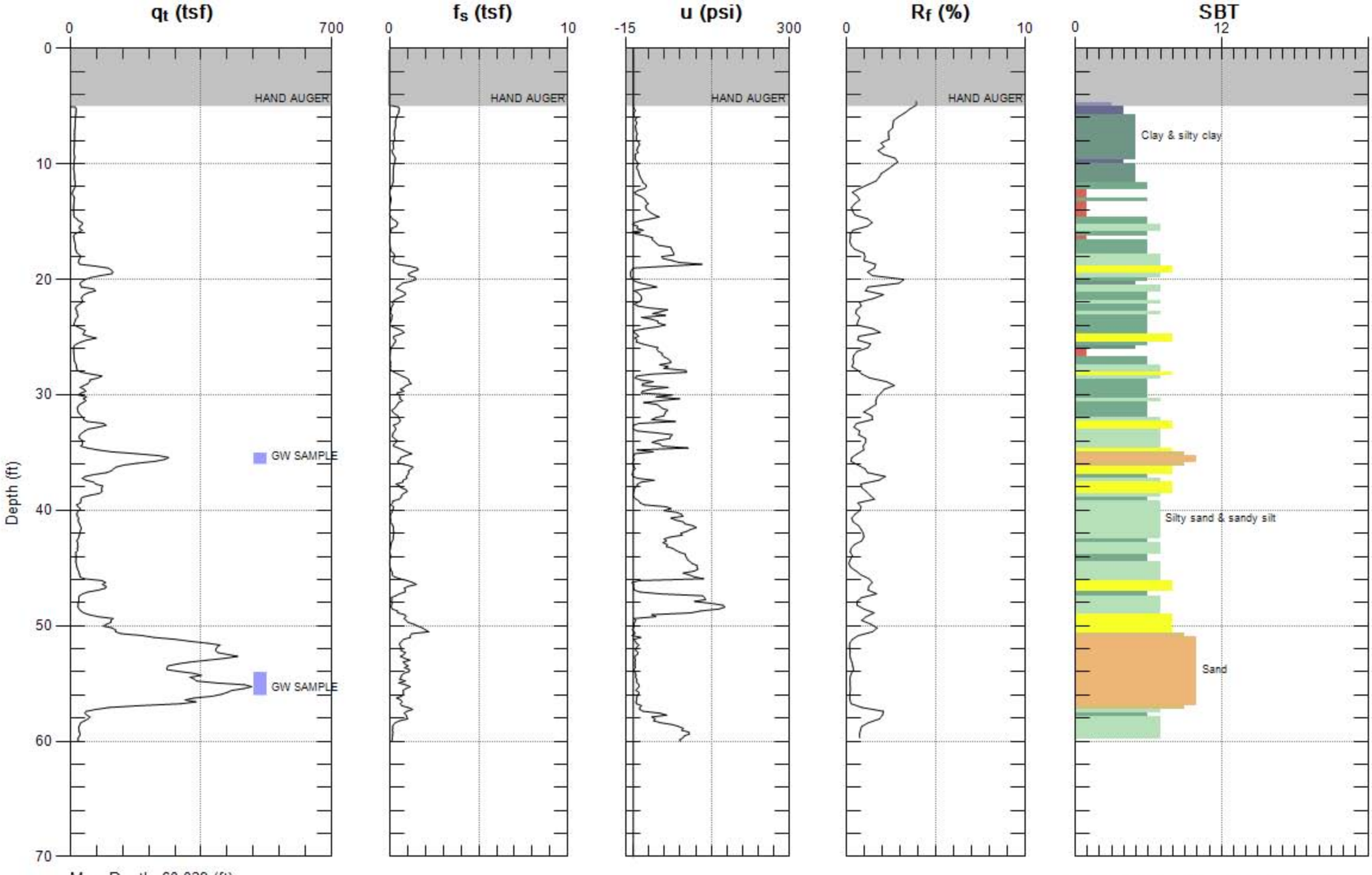
Max. Depth: 65.125 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP44

Engineer: L.LARSEN-HALLOCK
Date: 10/24/2011 10:32



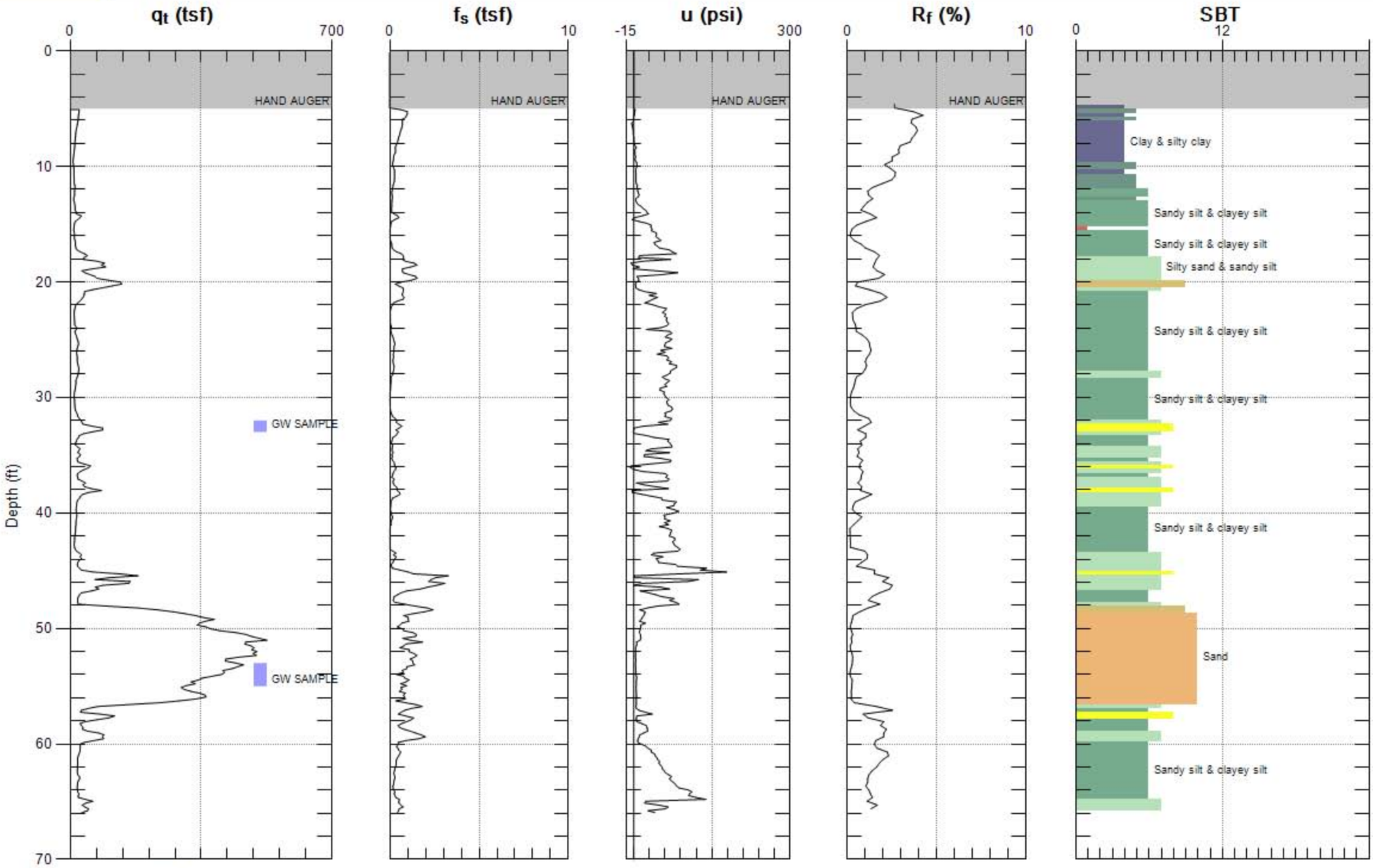
Max. Depth: 60.039 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP45

Engineer: L.LARSEN-HALLOCK
Date: 10/24/2011 03:42



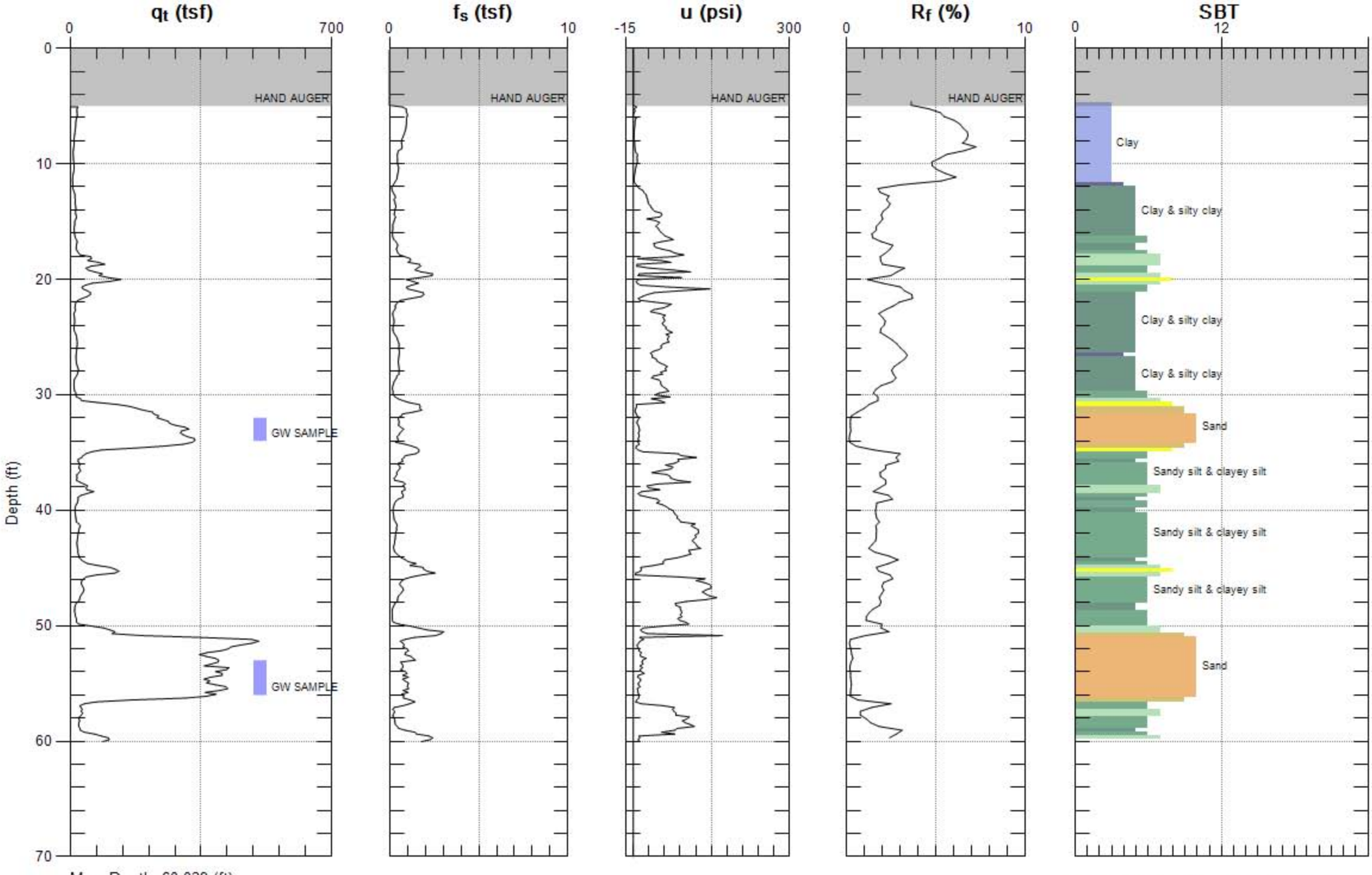
Max. Depth: 65.945 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP46

Engineer: L.LARSEN-HALLOCK
Date: 10/28/2011 11:18



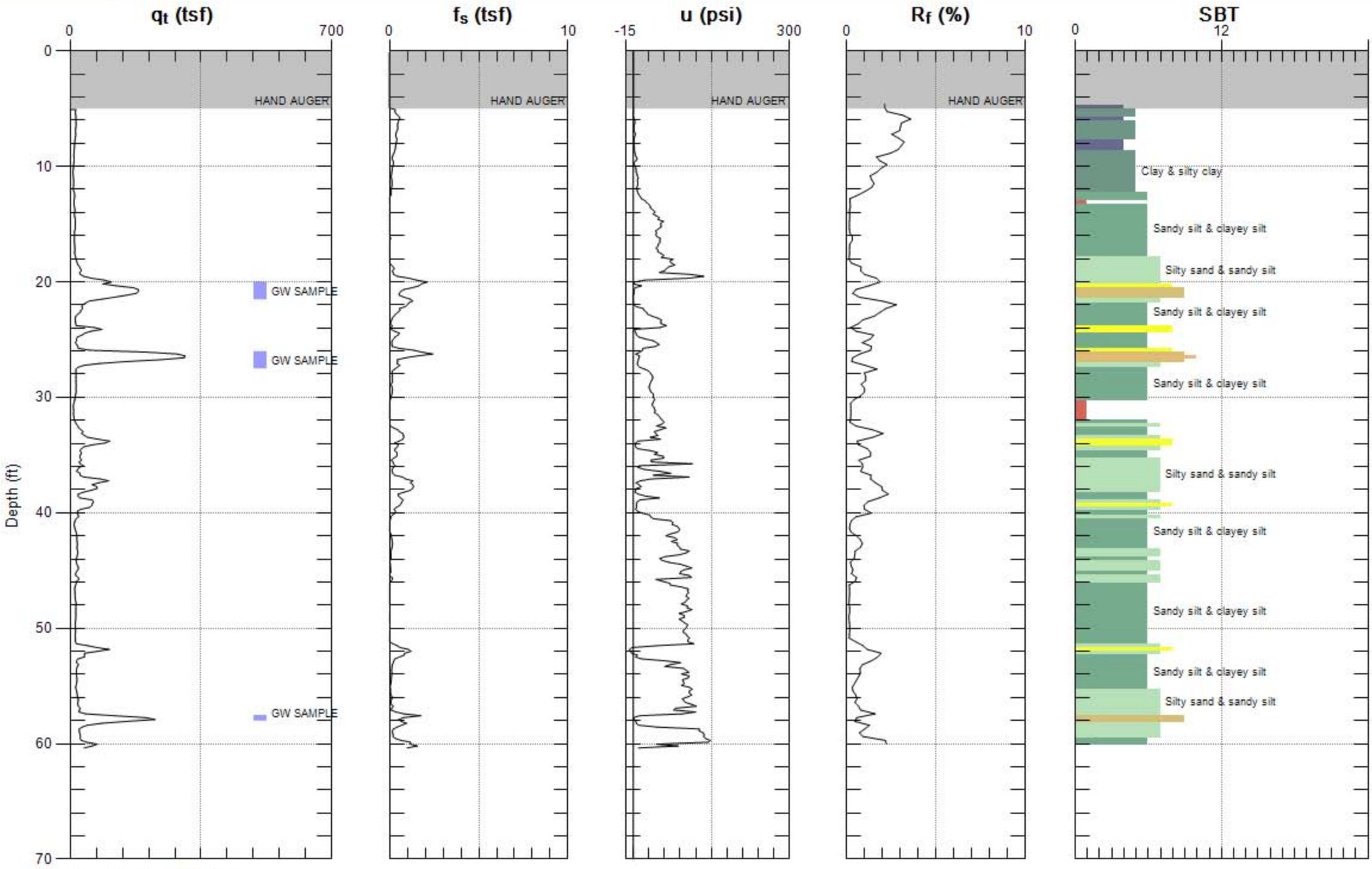
Max. Depth: 60.039 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP47

Engineer: L.LARSEN-HALLOCK
Date: 10/26/2011 03:10



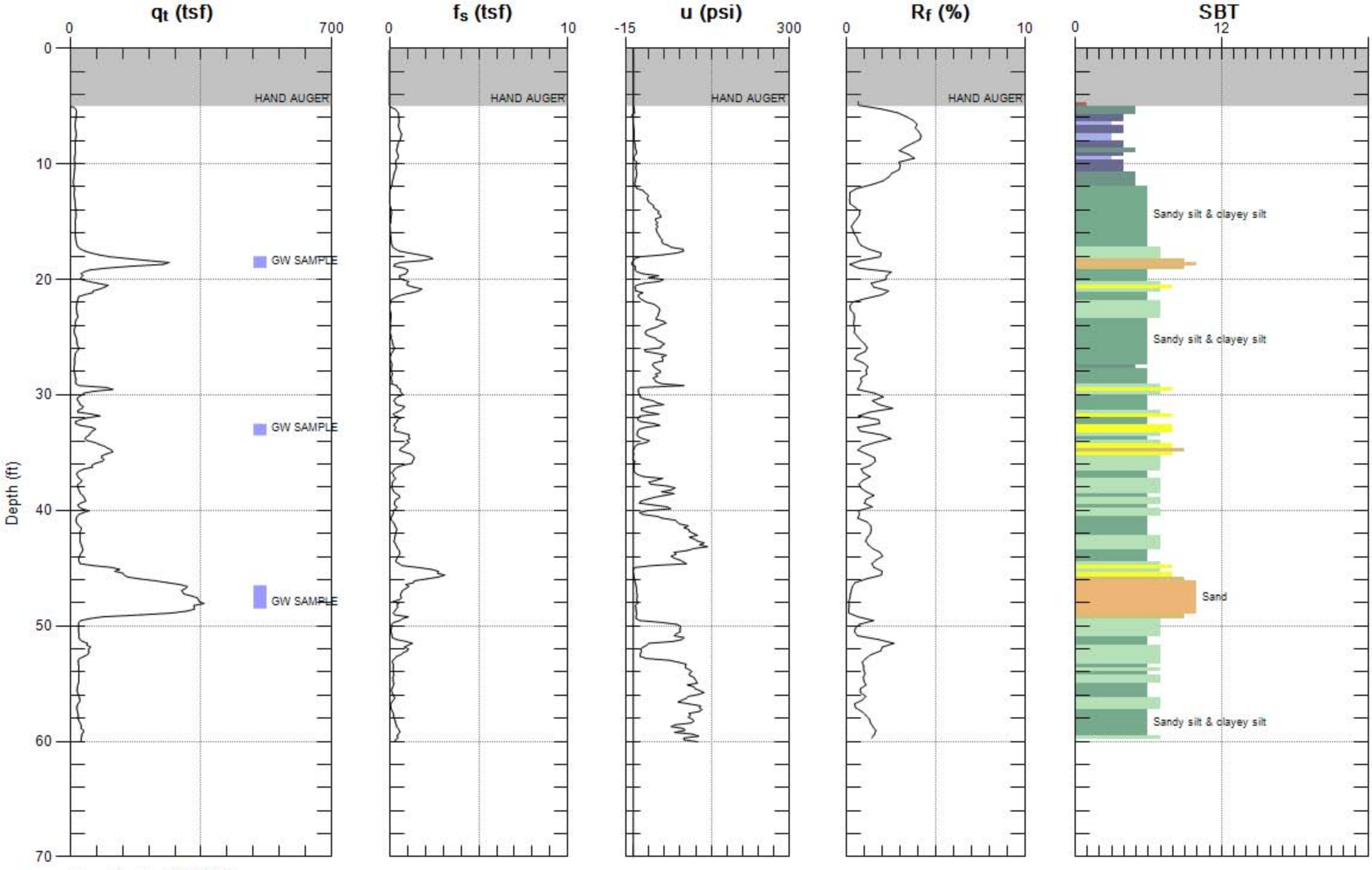
Max. Depth: 60.367 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP48

Engineer: L.LARSEN-HALLOCK
Date: 10/25/2011 09:30



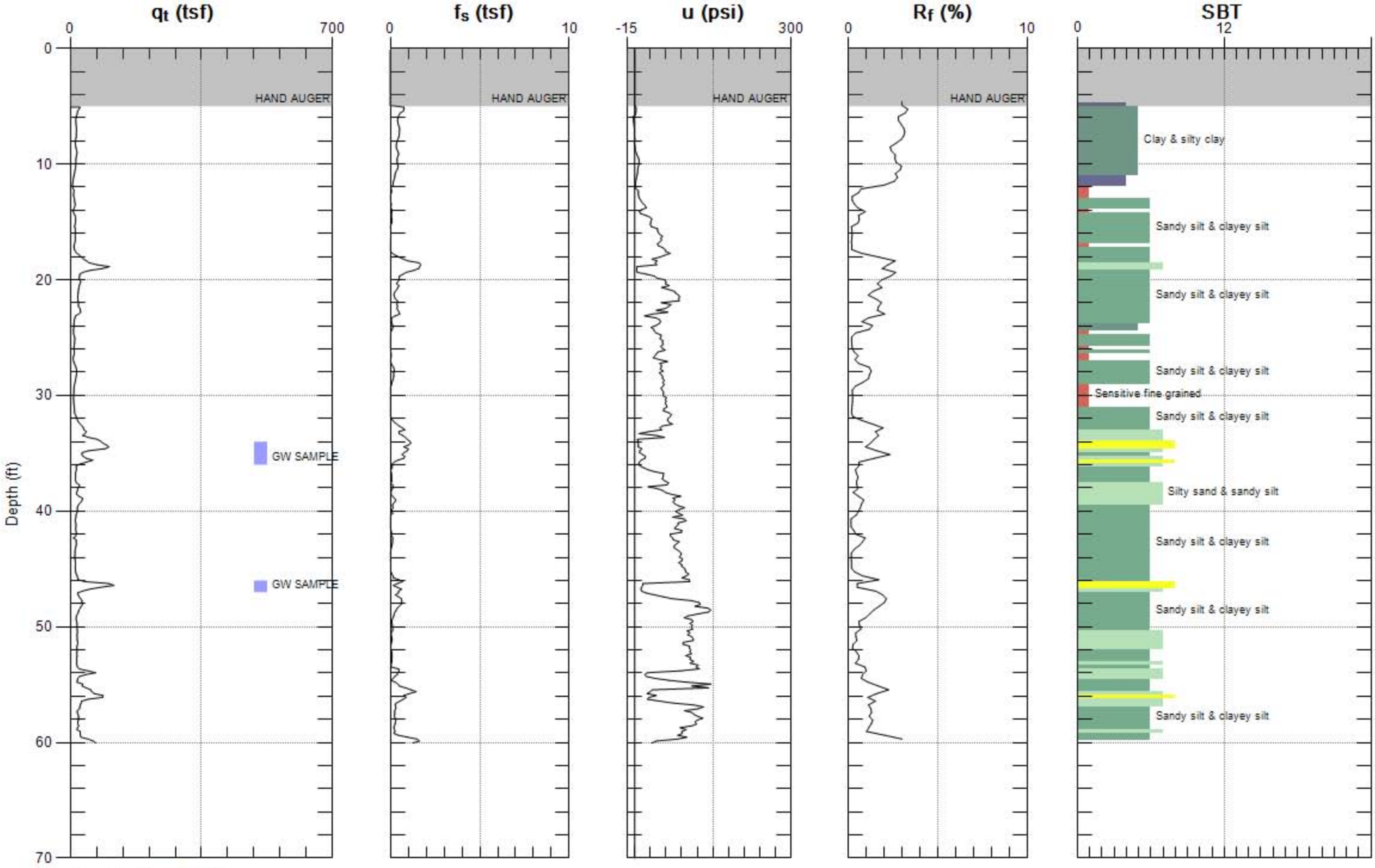
Max. Depth: 60.039 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP49

Engineer: L.LARSEN-HALLOCK
Date: 10/27/2011 03:05



Max. Depth: 60.039 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG DRILLING & TESTING, INC.
GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

November 3, 2011

Tech Law
Attn: Lorraine Larsen-Hallock

Subject: CPT Site Investigation
Hwy 101 Moffett to 70
Mt. View, California
GREGG Project Number: 11-152MA – part 3

Dear Ms. Larsen-Hallock:

The following report presents the results of GREGG Drilling & Testing's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	☒
2	Pore Pressure Dissipation Tests	(PPD)	☒
3	Seismic Cone Penetration Tests	(SCPTU)	☐
4	UVOST Laser Induced Fluorescence	(UVOST)	☐
5	Groundwater Sampling	(GWS)	☒
6	Soil Sampling	(SS)	☐
7	Vapor Sampling	(VS)	☐
8	Pressuremeter Testing	(PMT)	☐
9	Vane Shear Testing	(VST)	☐
10	Dilatometer Testing	(DMT)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (925) 313-5800.

Sincerely,
GREGG Drilling & Testing, Inc.

Mary Walden
Operations Manager

950 Howe Rd • Martinez, California 94553 • (925) 313-5800 • FAX (925) 313-0302
OTHER OFFICES: LOS ANGELES • HOUSTON
www.greggdrilling.com

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (Feet)	Depth of Groundwater Samples (Feet)	Depth of Soil Samples (Feet)	Depth of Pore Pressure Dissipation Tests (Feet)
CPT-HP-25	10/31/11	62	24, 42, 55.5	-	-s
CPT-HP-31	11/02/11	60	19.5, 28.5, 40, 56	-	-
CPT-HP-35a	11/01/11	60	21, 34, 42	-	-
CPT-HP-36	11/01/11	60	21, 32, 41	-	-
CPT-HP-37	10/31/11	61	18.5, 37.5, 58.5	-	57.7
CPT-HP-50	11/02/11	60	16.5, 25, 32, 55.5	-	58.6

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Robertson, P.K., R.G. Campanella, D. Gillespie and A. Rice, "Seismic CPT to Measure In-Situ Shear Wave Velocity", Journal of Geotechnical Engineering ASCE, Vol. 112, No. 8, 1986 pp. 791-803.

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Campanella, R.G. and I. Weemees, "Development and Use of An Electrical Resistivity Cone for Groundwater Contamination Studies", Canadian Geotechnical Journal, Vol. 27 No. 5, 1990 pp. 557-567.

DeGroot, D.J. and A.J. Lutenegger, "Reliability of Soil Gas Sampling and Characterization Techniques", International Site Characterization Conference - Atlanta, 1998.

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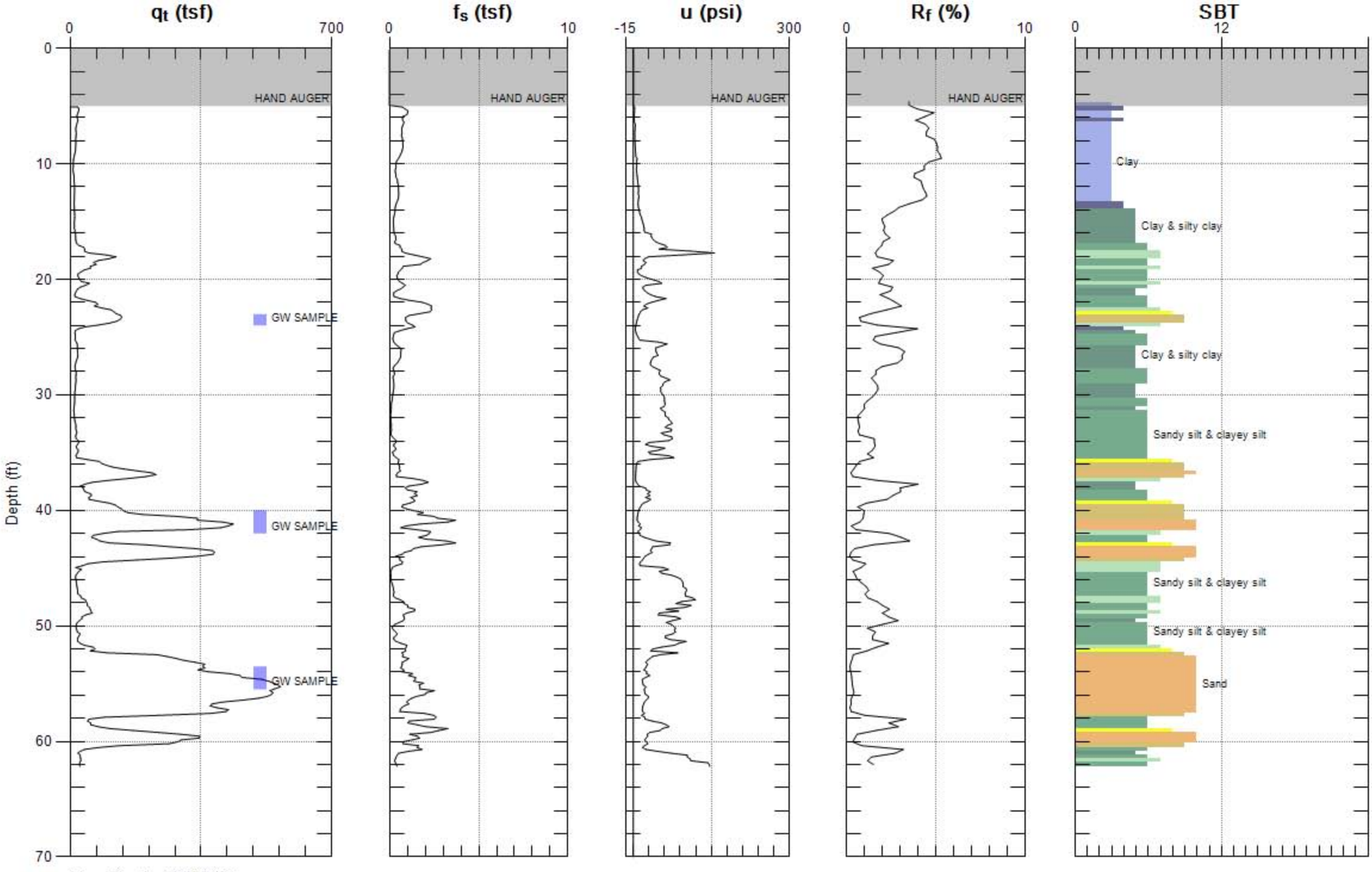
Zemo, D.A., T.A. Delfino, J.D. Gallinatti, V.A. Baker and L.R. Hilpert, "Field Comparison of Analytical Results from Discrete-Depth Groundwater Samplers" BAT EnviroProbe and QED HydroPunch, Sixth national Outdoor Action Conference, Las Vegas, Nevada Proceedings, 1992, pp 299-312.

Copies of ASTM Standards are available through www.astm.org

TECH LAW

Site: HWY 101
Sounding: CPT-HP25

Engineer: L.LARSEN-HALLOCK
Date: 10/31/2011 12:06



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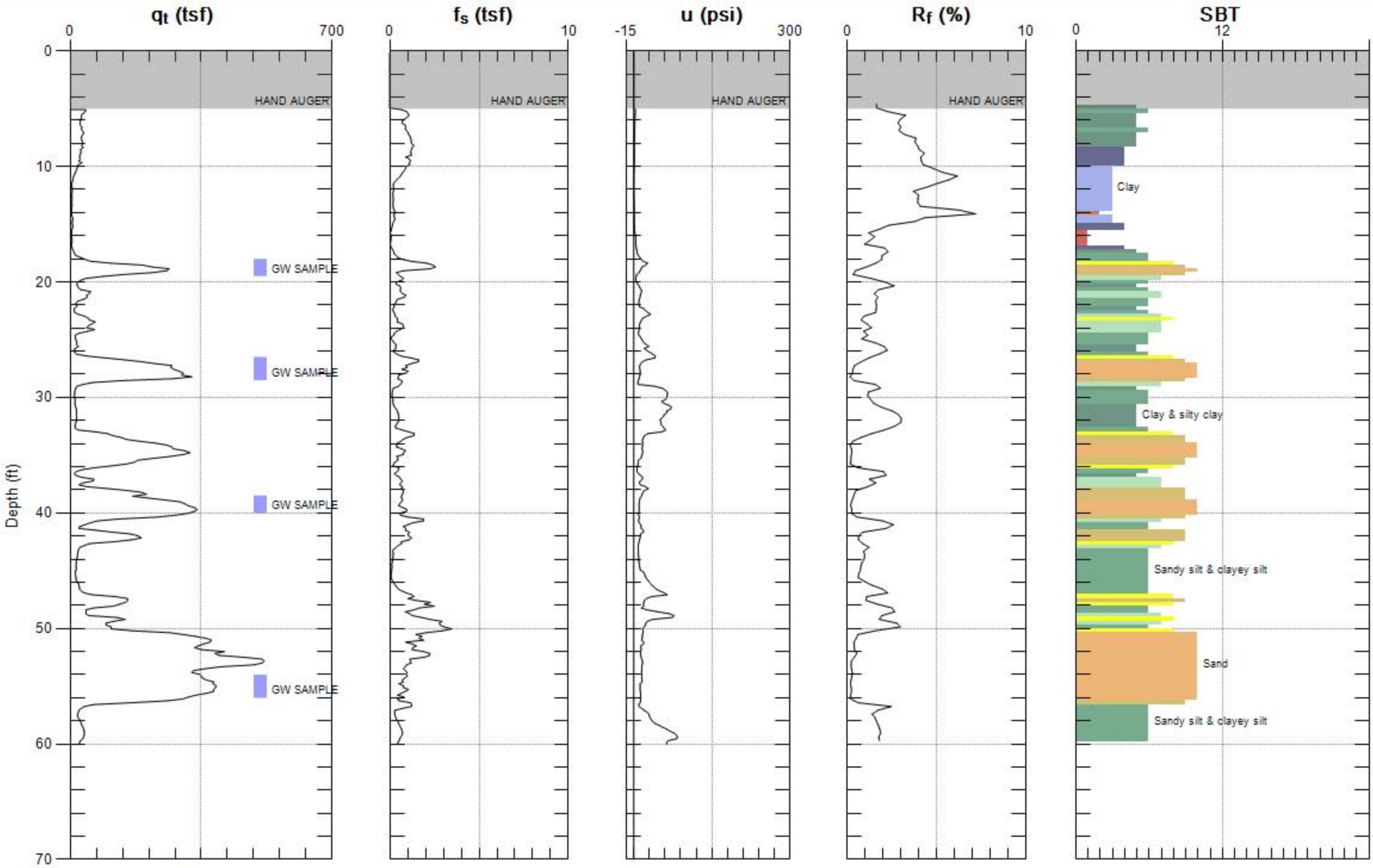
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP31

Engineer: L.LARSEN-HALLOCK
Date: 11/2/2011 11:01



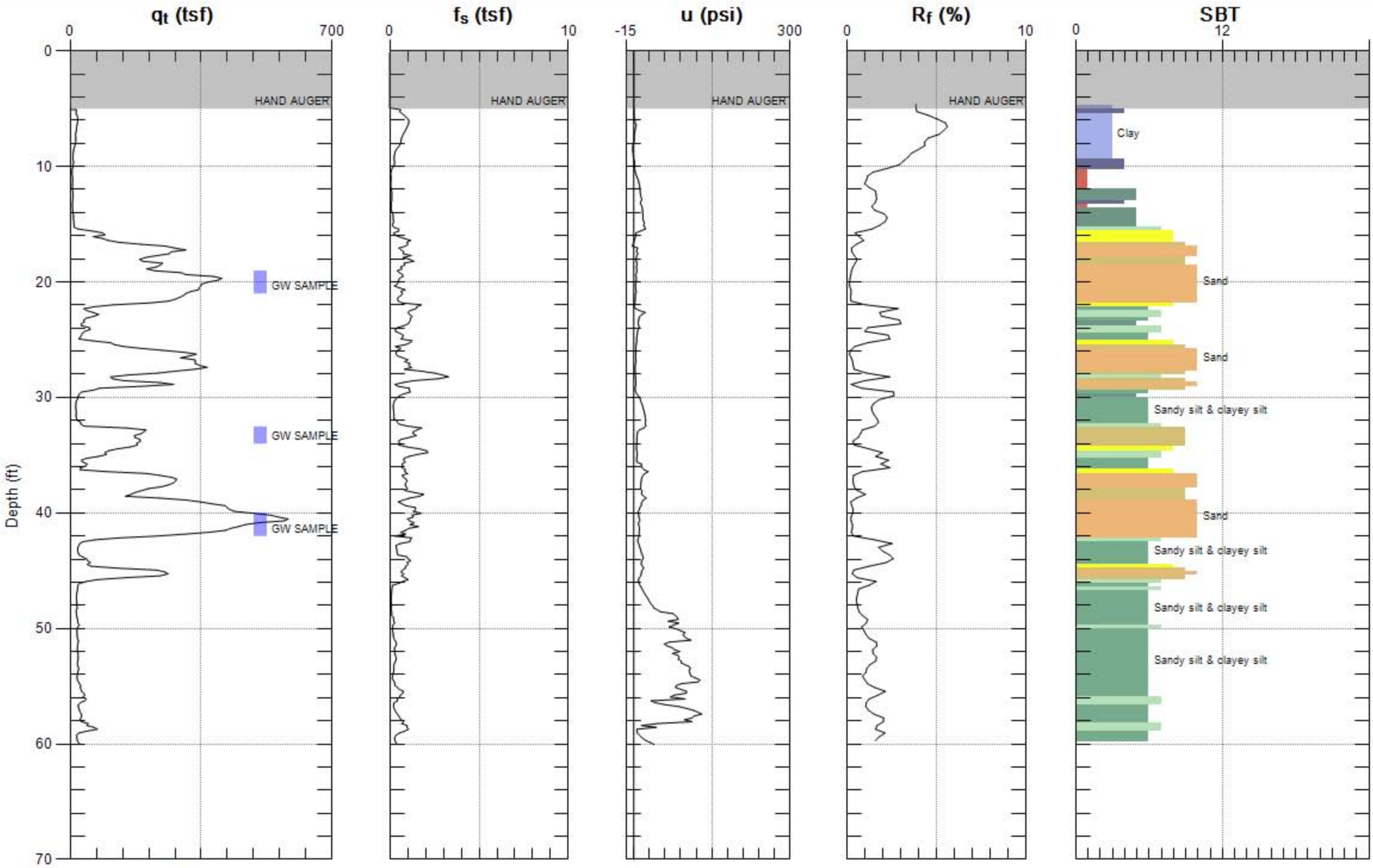
Max. Depth: 60.039 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP35A

Engineer: L.LARSEN-HALLOCK
Date: 11/1/2011 08:02



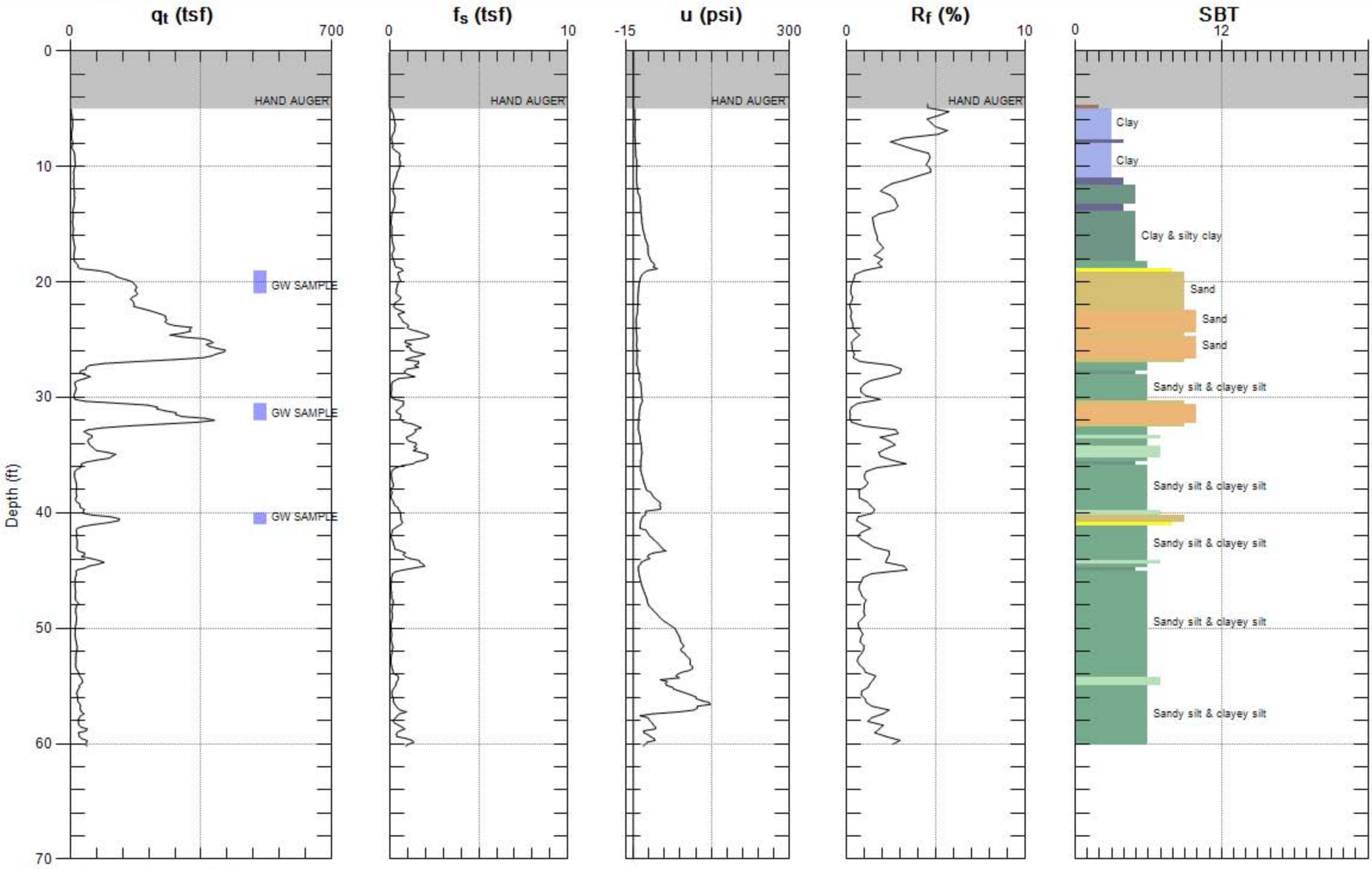
Max. Depth: 60.039 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP36

Engineer: L.LARSEN-HALLOCK
Date: 11/1/2011 10:59



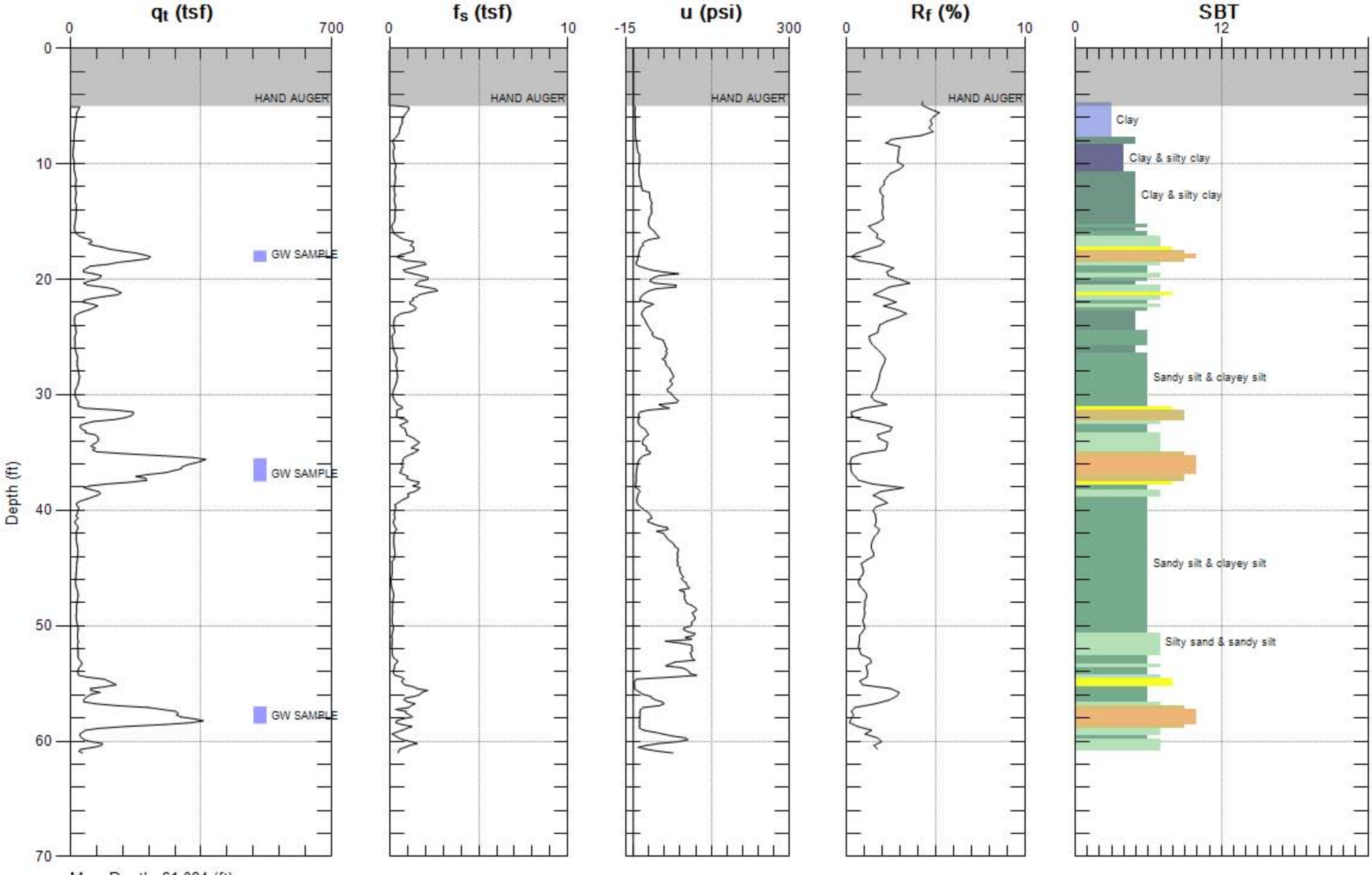
Max. Depth: 60.203 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP37

Engineer: L.LARSEN-HALLOCK
Date: 10/31/2011 07:38



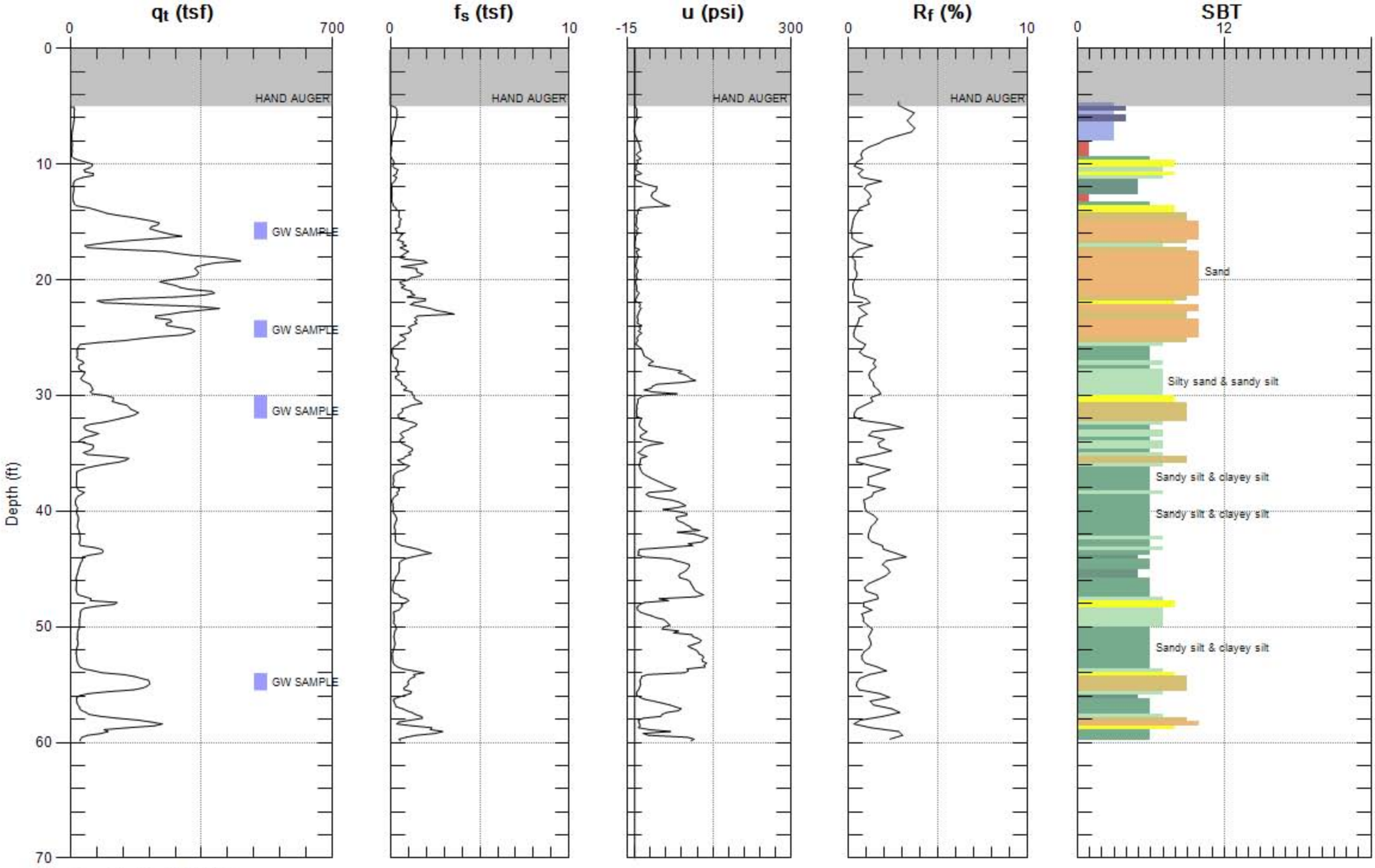
Max. Depth: 61.024 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

TECH LAW

Site: HWY 101
Sounding: CPT-HP50

Engineer: L.LARSEN-HALLOCK
Date: 11/2/2011 07:27



Max. Depth: 59.875 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)