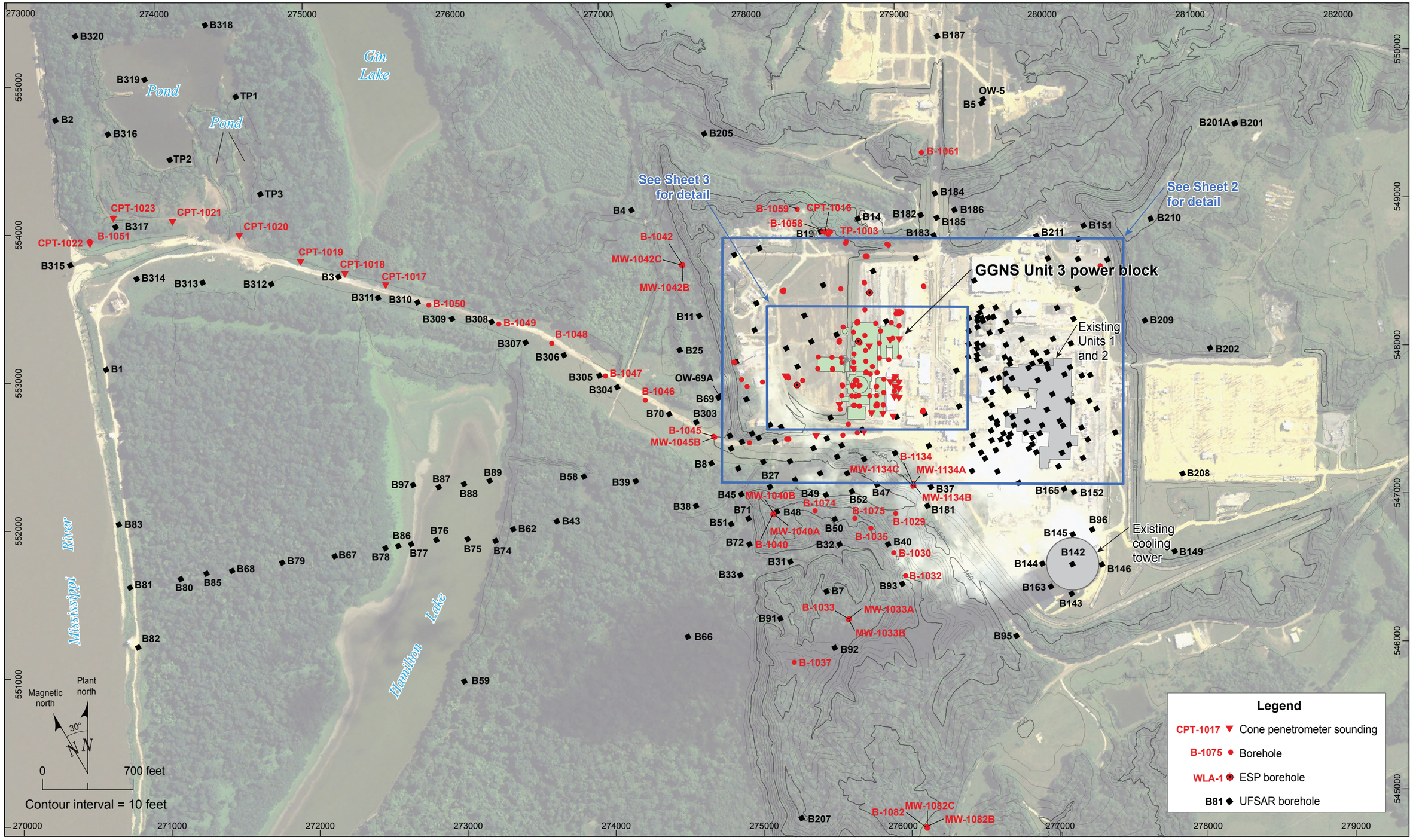
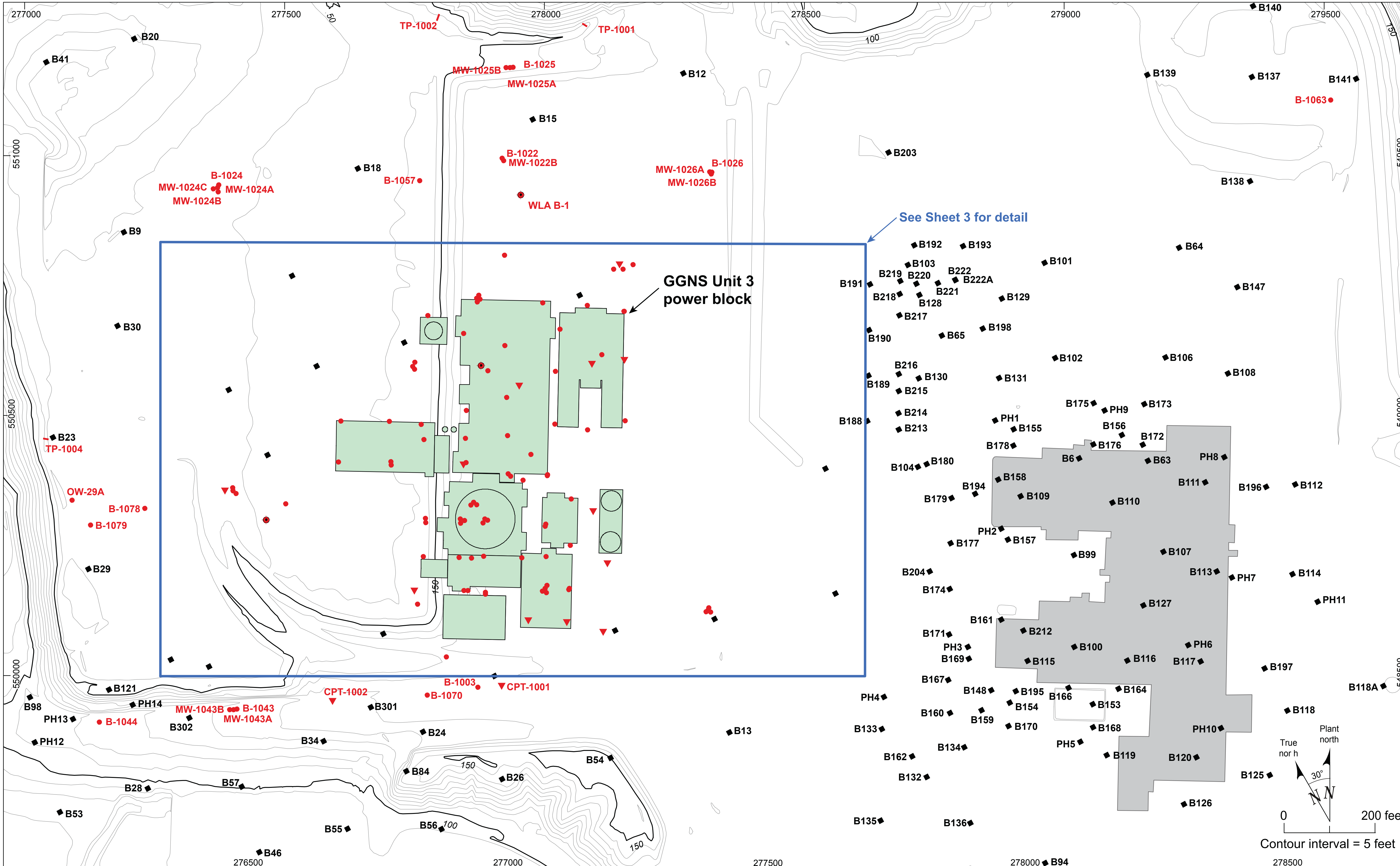
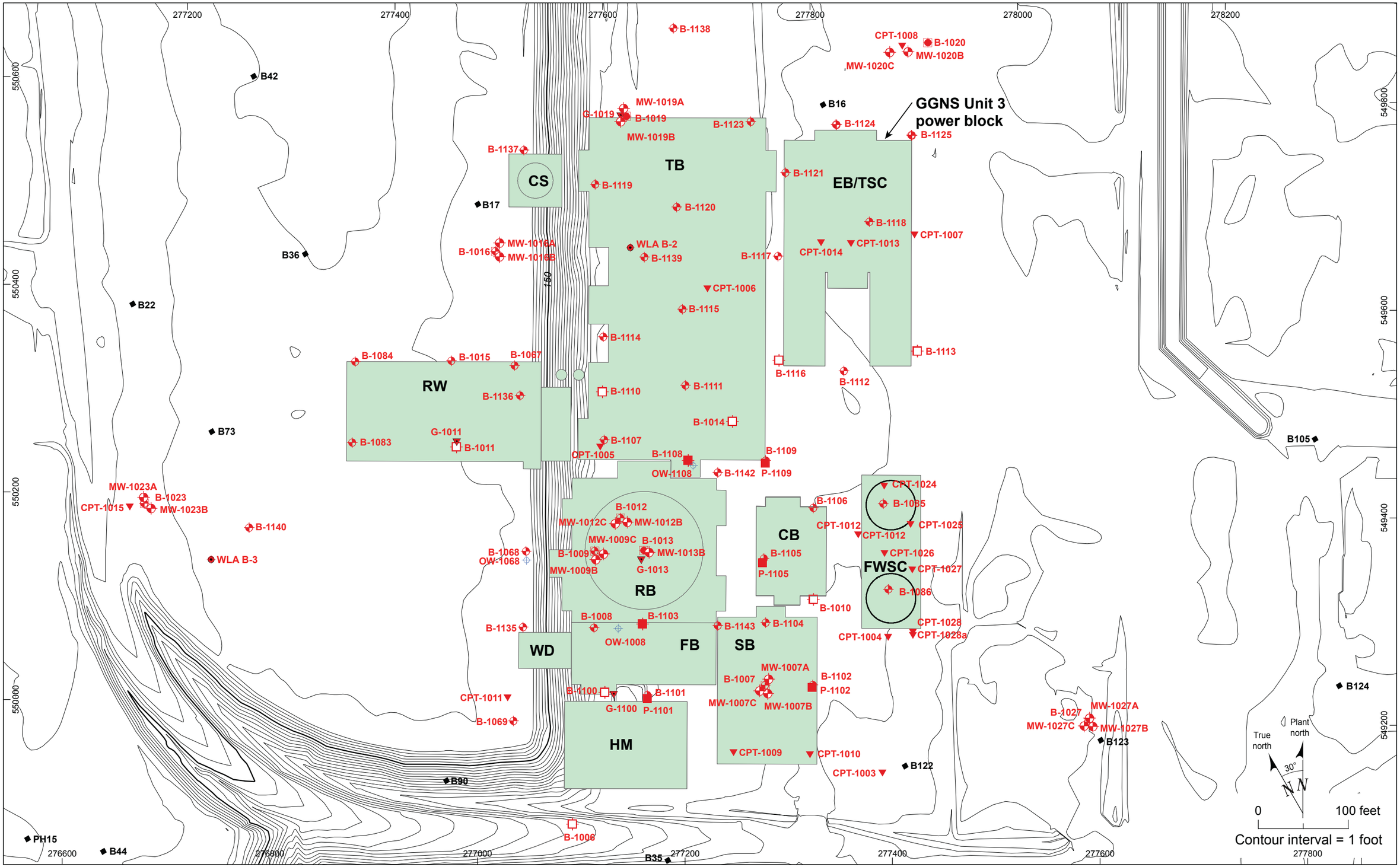


Figure 2.5.4-201. Site Exploration Maps (Sheet 1 of 4)



Note: See Sheet 4 for explanation of symbols used.

Figure 2.5.4-201. Site Exploration Maps (Sheet 2 of 4)



Note: See Sheet 4 for explanation of symbols used.

Figure 2.5.4-201. Site Exploration Maps (Sheet 3 of 4)

Legend

B-1138 Borehole

B-1016 Borehole and monitoring well

B-1020 Borehole and monitoring well with suspension logging

MW-1020C Monitoring well

OW-1068 Observation well

B-1108 Borehole with pressuremeter test

B-1113 Borehole with suspension logging

CPT-1007 Cone penetrometer test sounding

G-1100 GardnerDenver drill rig borehole

P-1109 Pitcher barrel sampler borehole

B16 GGNS Unit 1 UFSAR borehole

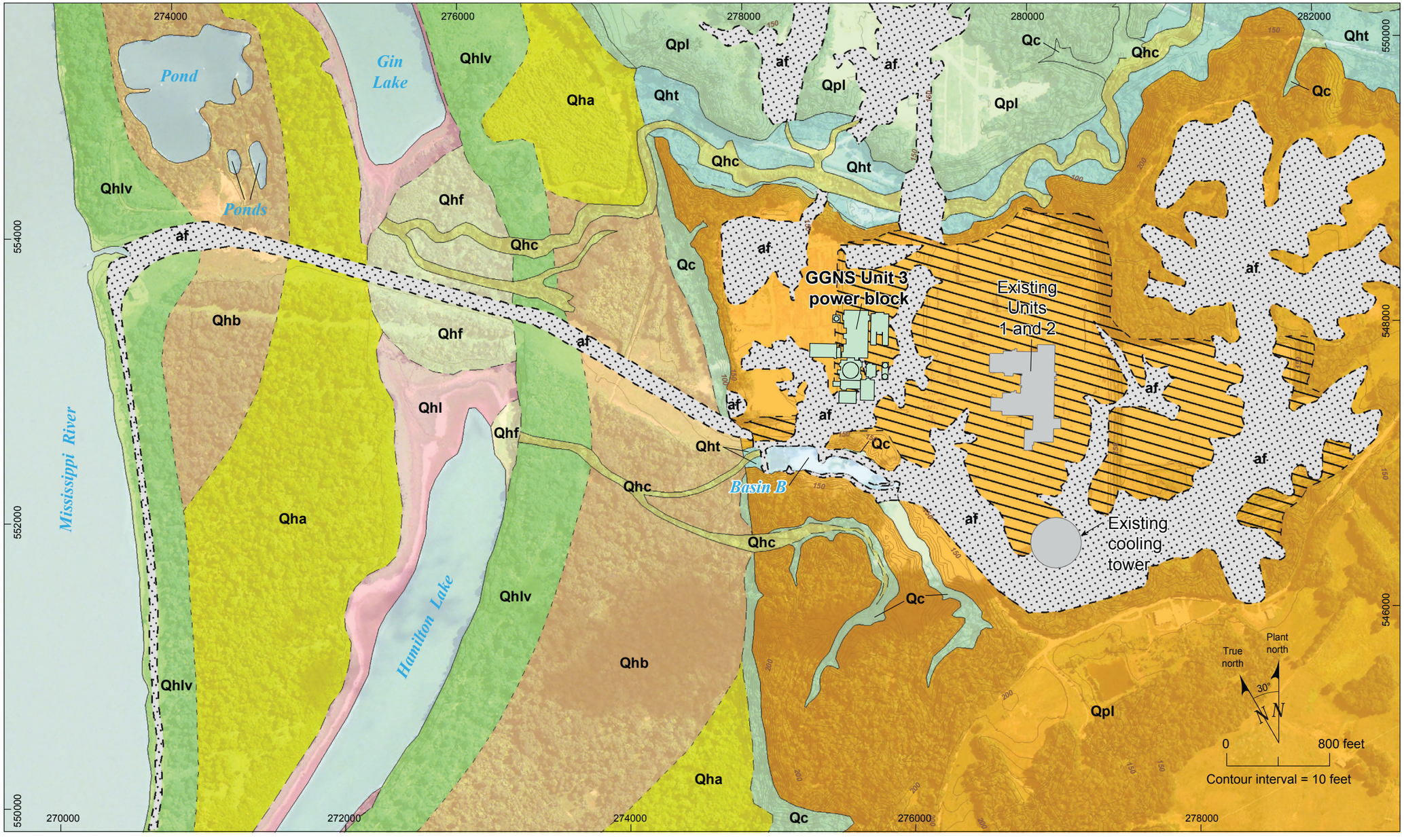
WLA B-3 GGNS ESP borehole

GGNS Unit 3
Power Block Facilities

CB	Control building
CS	Condensate storage tank
EB	Electrical building
FB	Fuel building
FWSC	Fire water service complex
HM	Hot machine shop
RB	Reactor building
RW	Radwaste building
SB	Service building
TB	Turbine building
TSC	Technical support center
WD	Wash down bays

Notes: 1. Projection NAD 27 State Plane Mississippi West FIPS.
2. Vertical datum NAVD88.

Figure 2.5.4-201. Site Exploration Maps (Sheet 4 of 4)



Notes: 1. Projection NAD 27 State Plane Mississippi West FIPS.
2. Vertical datum NAVD 88.
3. See Sheet 2 for Legend.

Figure 2.5.4-202. GGNS Site Geologic Map (Sheet 1 of 2)

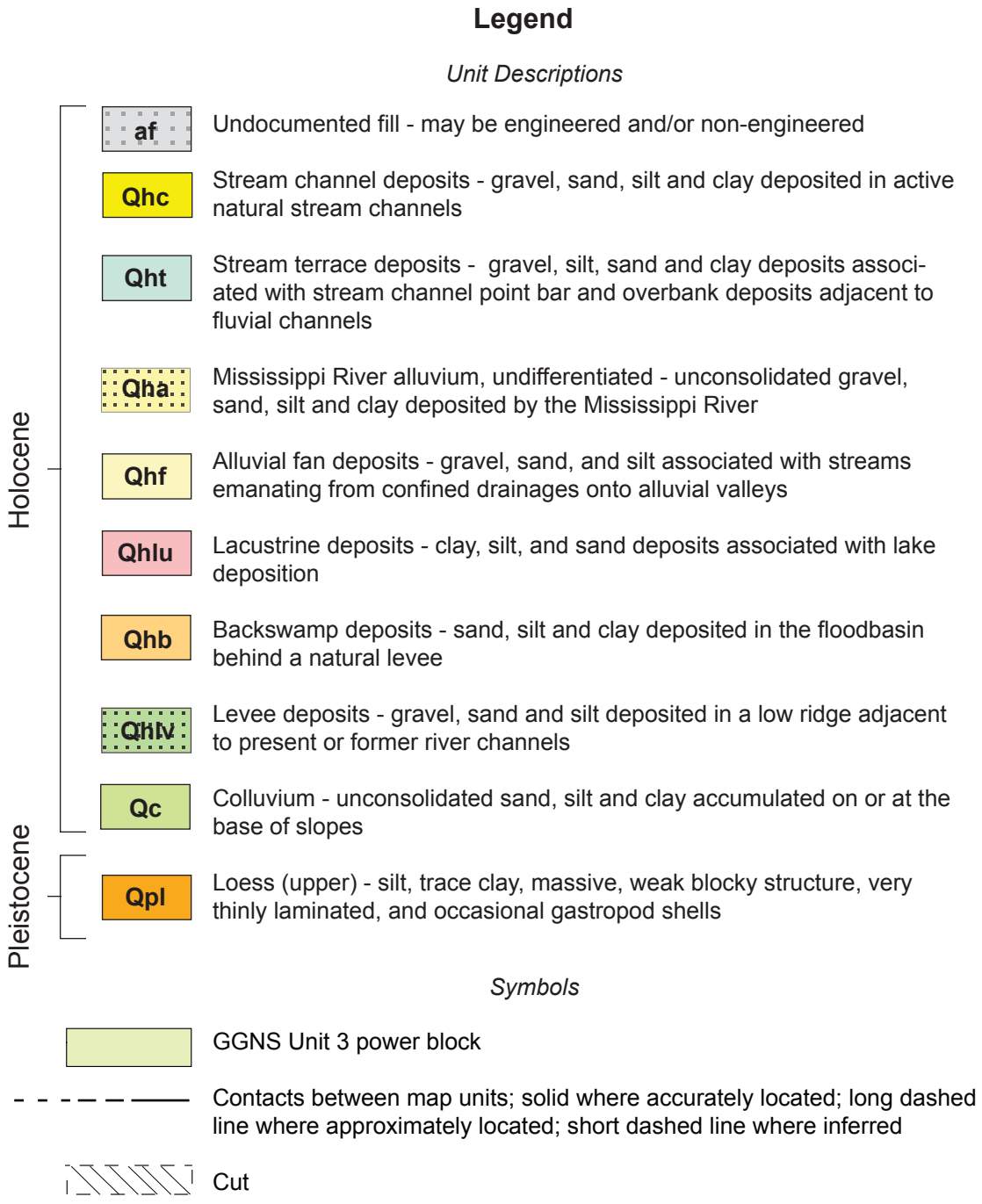
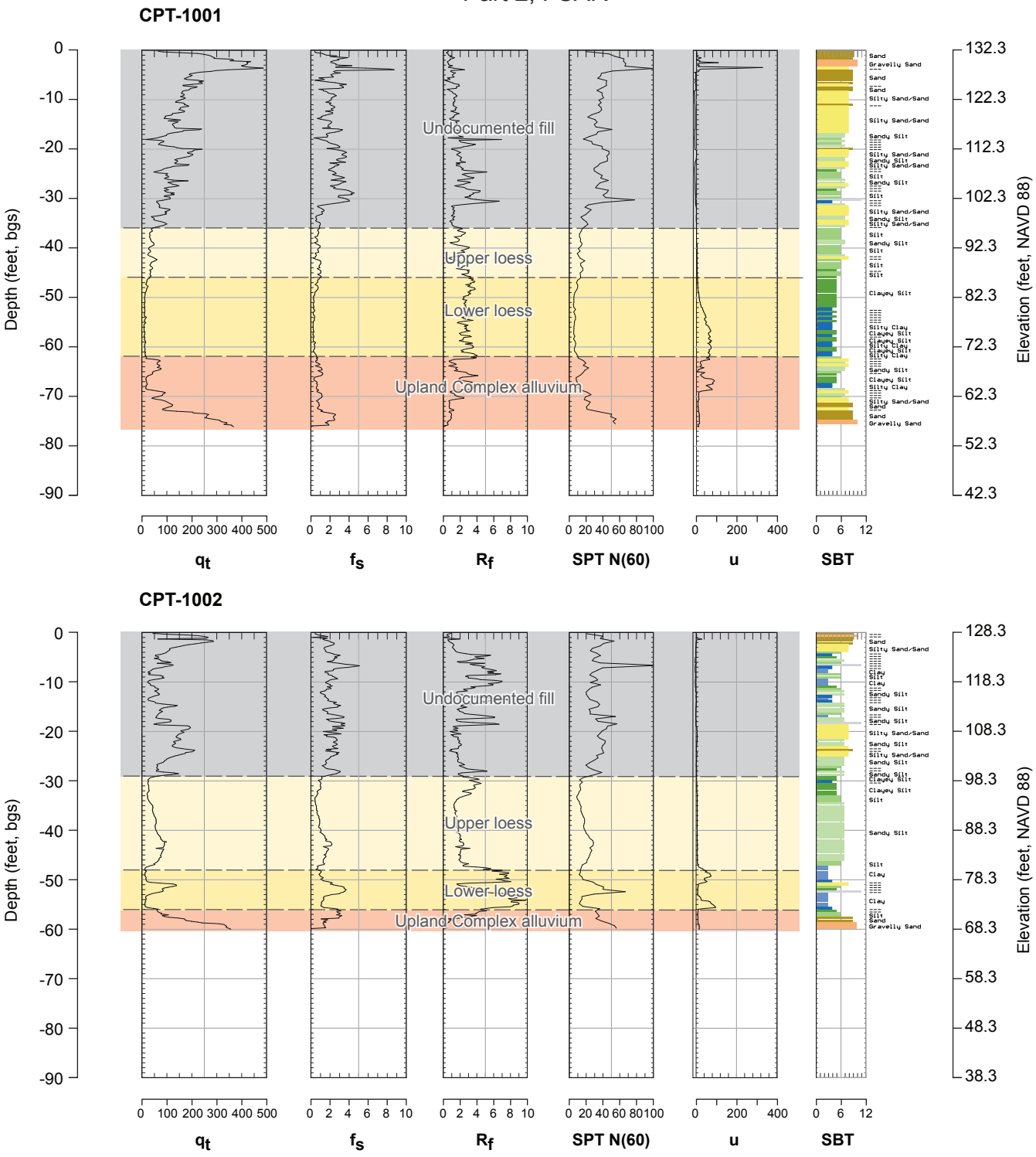


Figure 2.5.4-202. GGNS Site Geologic Map (Sheet 2 of 2)



Legend

q_t	Corrected tip resistance (tons/sq. foot)
SBT	Soil behavior type
f_s	Sleeve friction (tons/sq. foot)
u	Dynamic pore pressure (lbs./sq. inch)
SPT N(60)	Standard Penetration Test N-value at 60% energy calculated from qt/N ratios assigned to each SBT zone
R_f	Friction ratio (%)

Figure 2.5.4-203. Cone Penetrometer Test Summary Logs (Sheet 1 of 14)

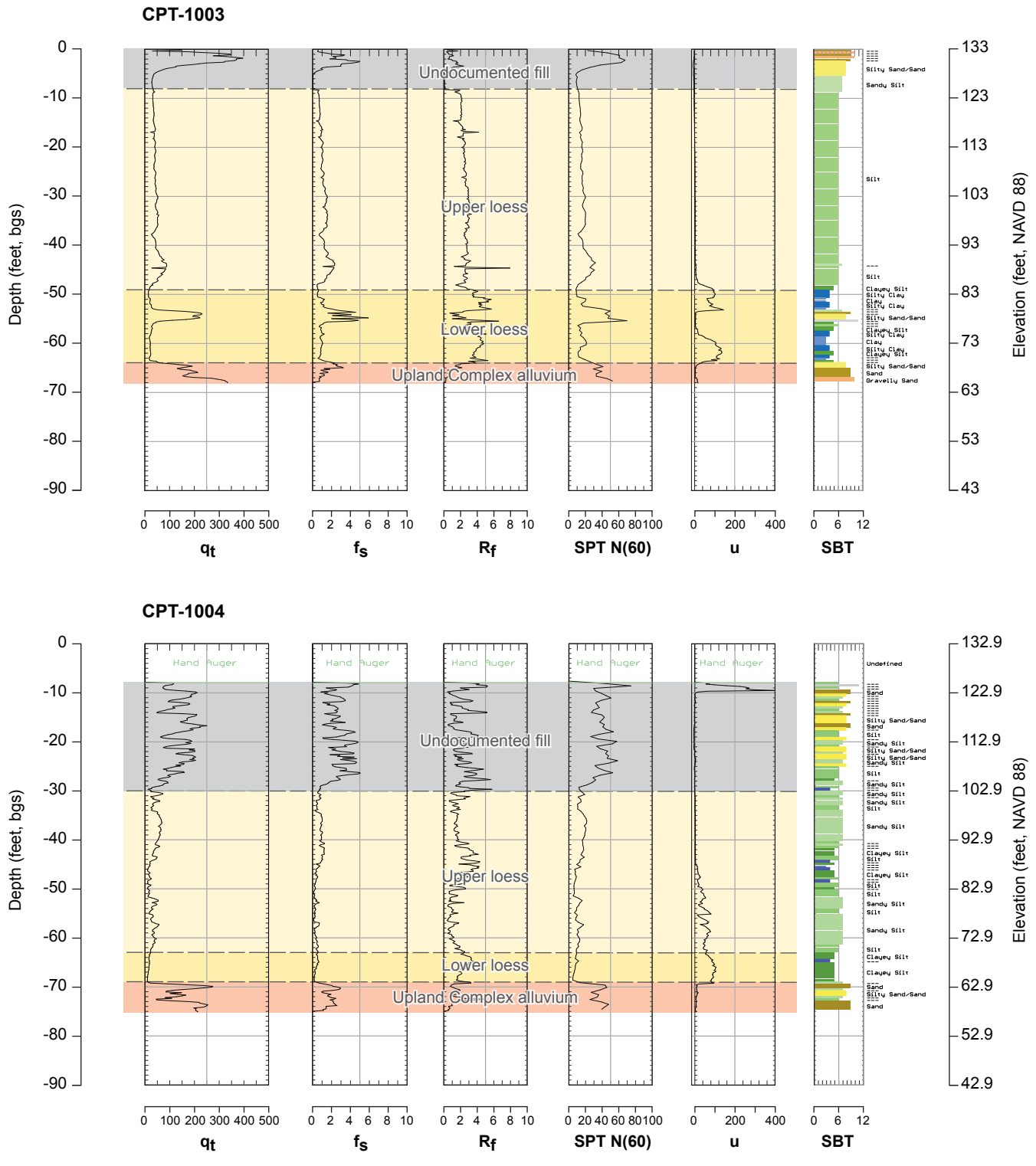
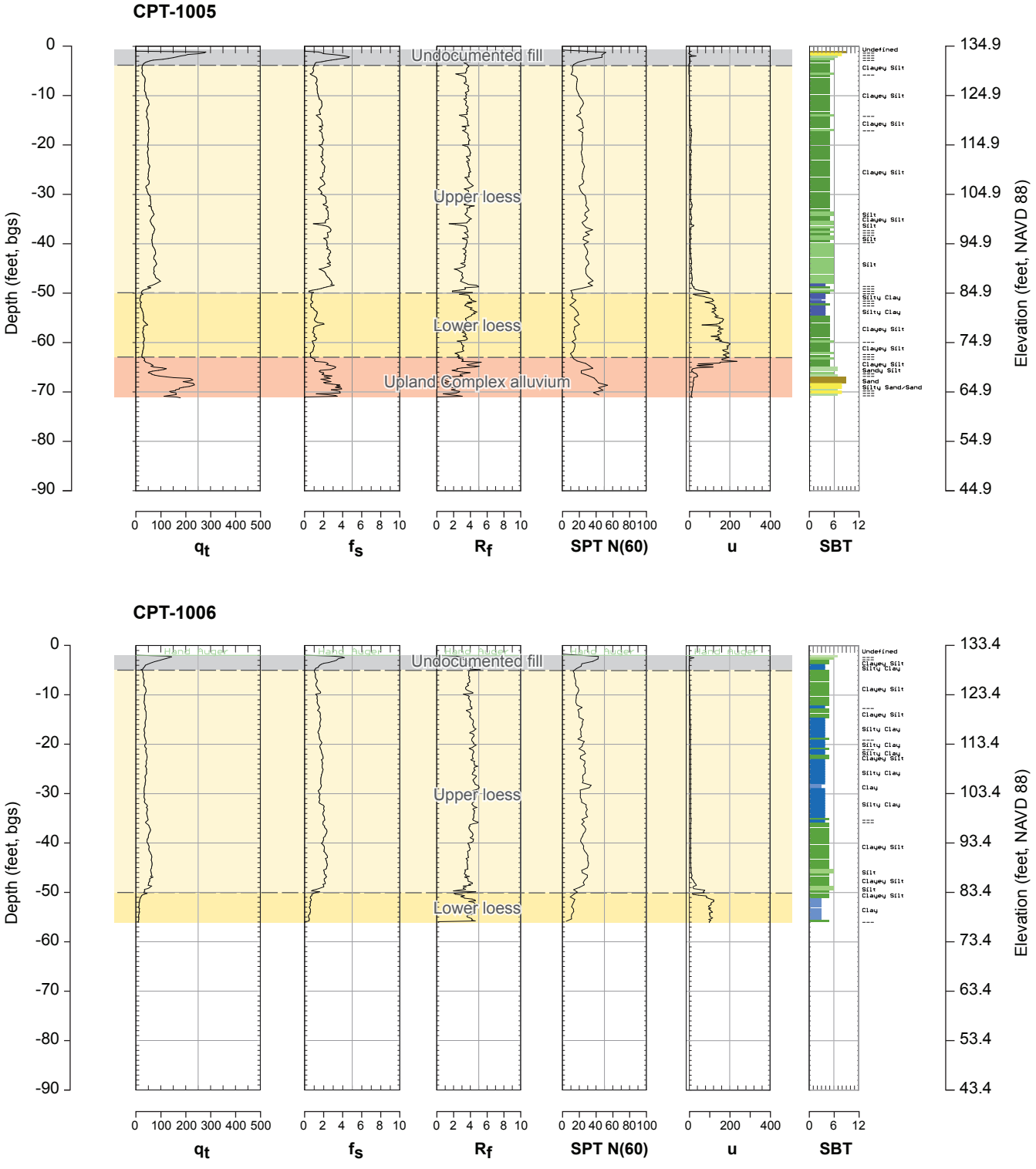


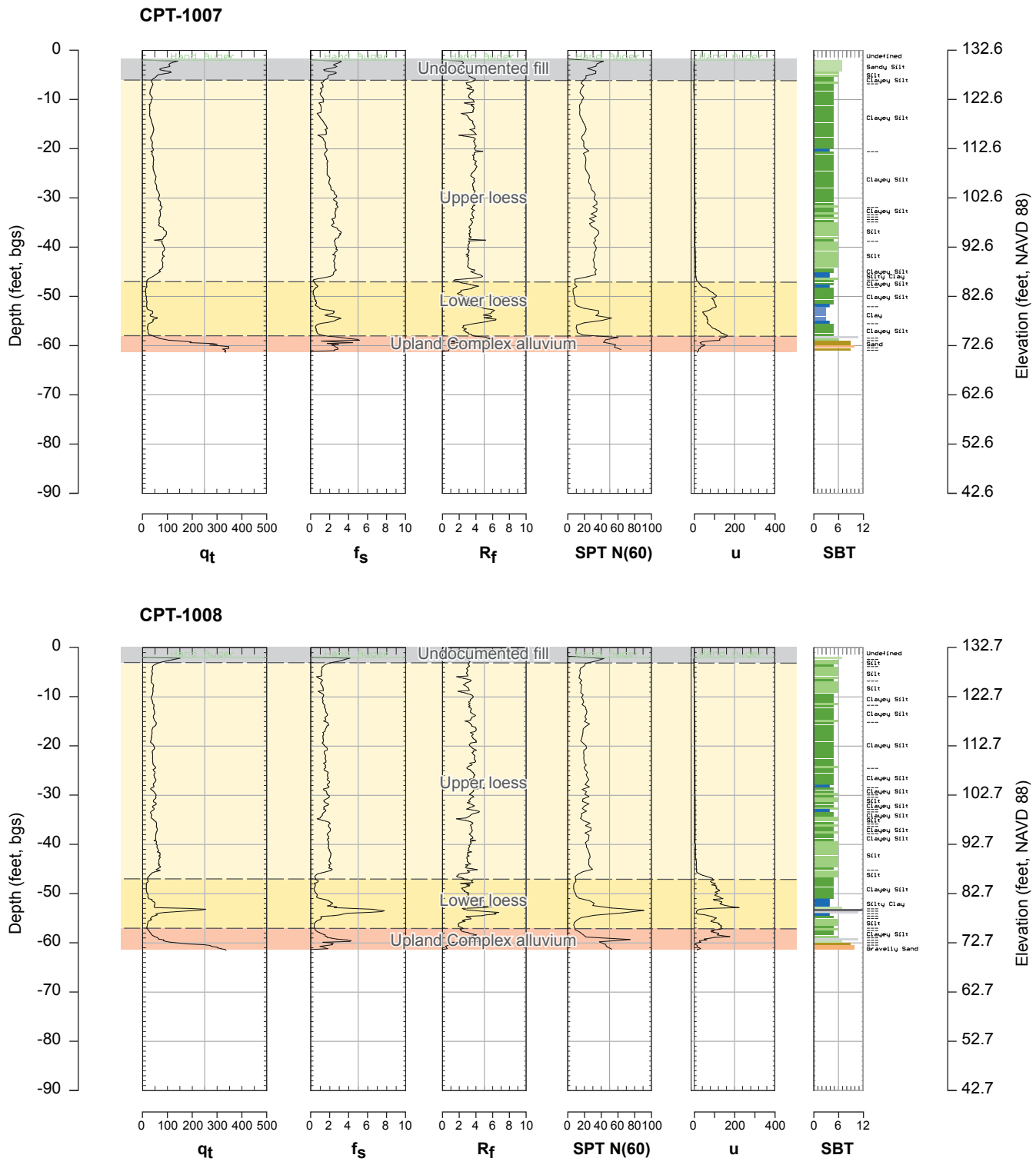
Figure 2.5.4-203. Cone Penetrometer Test Summary Logs (Sheet 2 of 14)



Legend

q_t	Corrected tip resistance (tons/sq. foot)
SBT	Soil behavior type
f_s	Sleeve friction (tons/sq. foot)
u	Dynamic pore pressure (lbs./sq. inch)
SPT N(60)	Standard Penetration Test N-value at 60% energy calculated from qt/N ratios assigned to each SBT zone
R_f	Friction ratio (%)

Figure 2.5.4-203. Cone Penetrometer Test Summary Logs (Sheet 3 of 14)



Legend

q_t Corrected tip resistance (tons/sq. foot)

SBT Soil behavior type

f_s Sleeve friction (tons/sq. foot)

u Dynamic pore pressure (lbs./sq. inch)

SPT N(60) Standard Penetration Test N-value at 60% energy calculated from qt/N ratios assigned to each SBT zone

R_f Friction ratio (%)

Figure 2.5.4-203. Cone Penetrometer Test Summary Logs (Sheet 4 of 14)

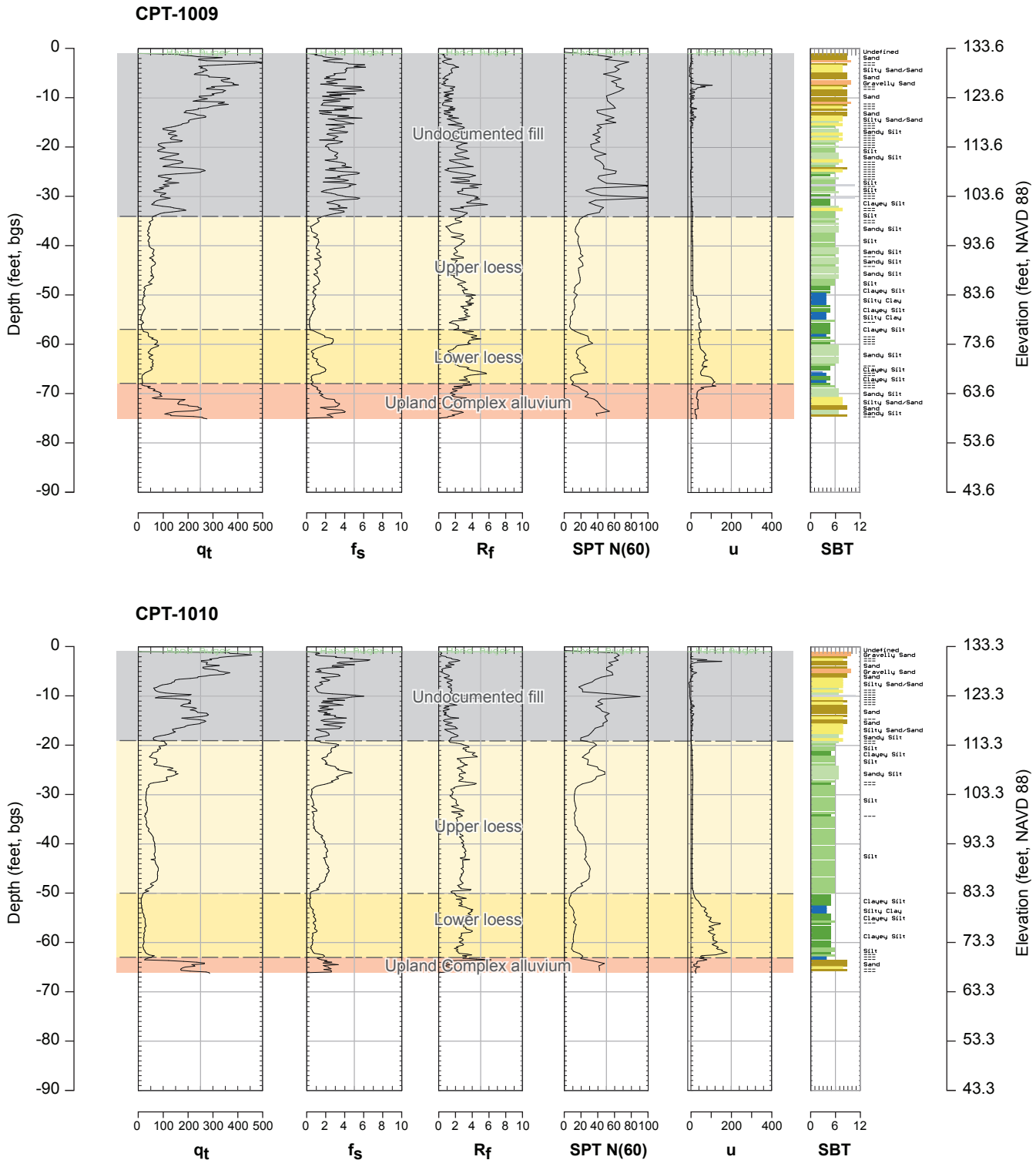


Figure 2.5.4-203. Cone Penetrometer Test Summary Logs (Sheet 5 of 14)

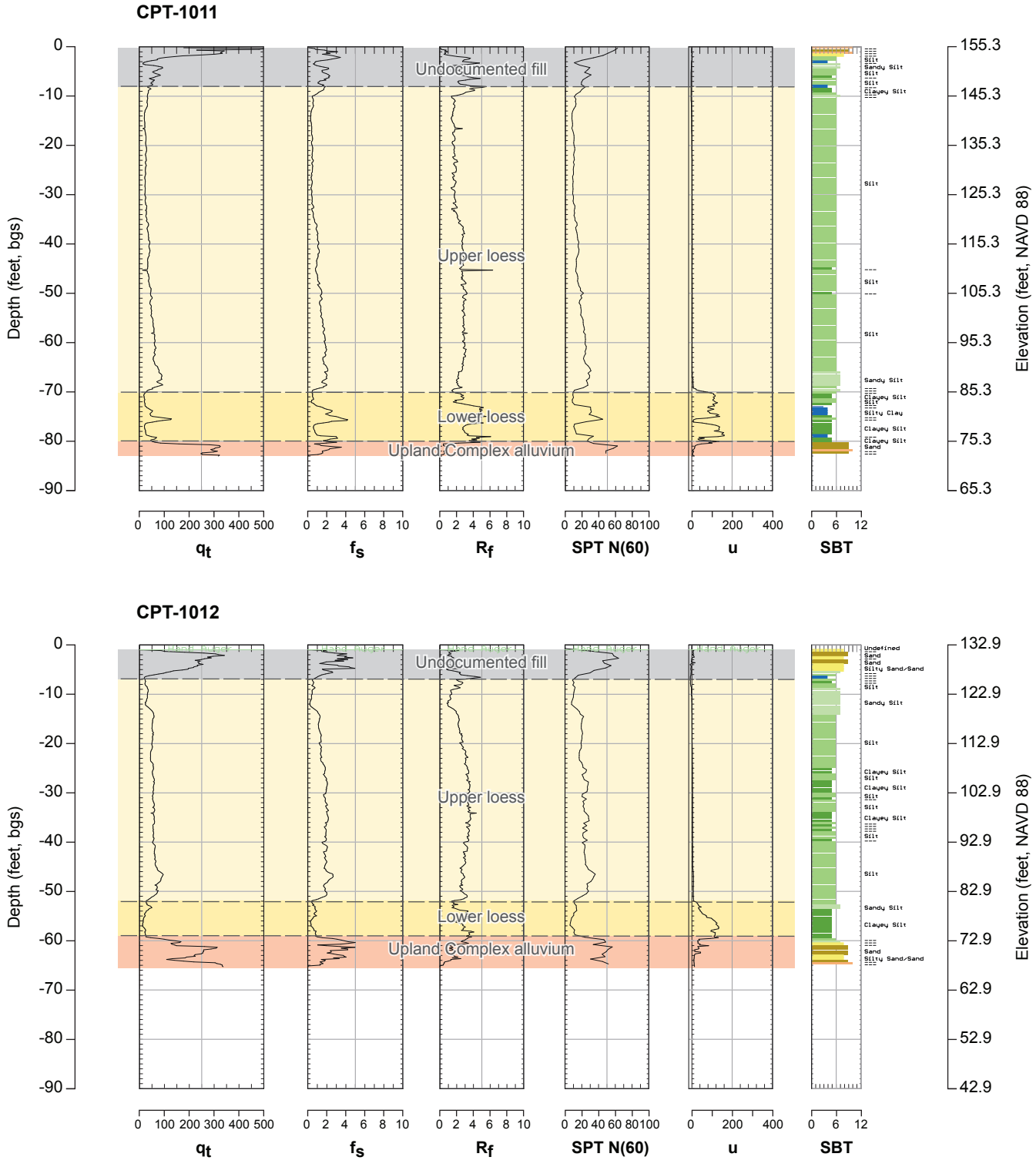
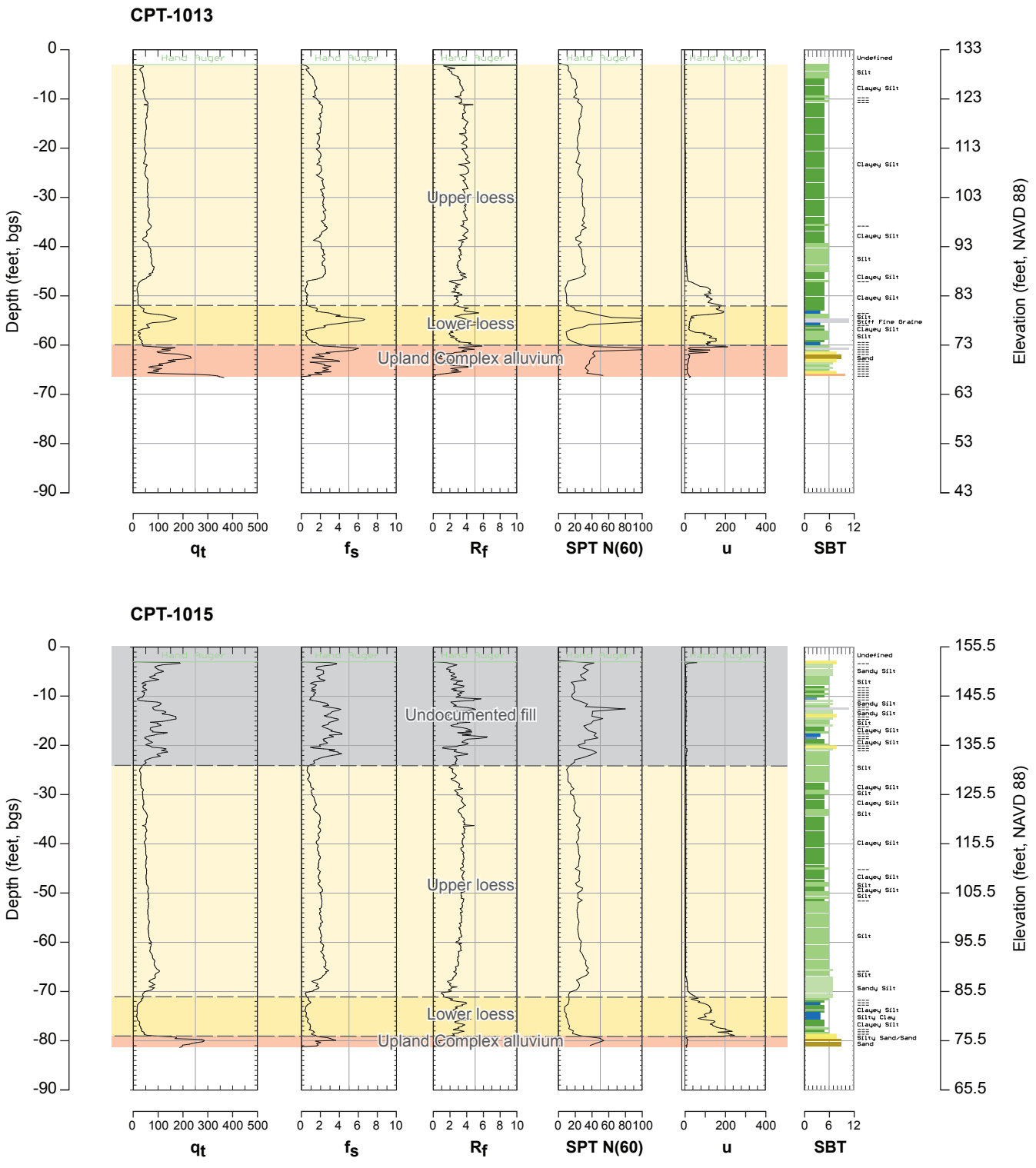


Figure 2.5.4-203. Cone Penetrometer Test Summary Logs (Sheet 6 of 14)



Legend

q_t	Corrected tip resistance (tons/sq. foot)
SBT	Soil behavior type
f_s	Sleeve friction (tons/sq. foot)
u	Dynamic pore pressure (lbs./sq. inch)
SPT N(60)	Standard Penetration Test N-value at 60% energy calculated from qt/N ratios assigned to each SBT zone
R_f	Friction ratio (%)

Figure 2.5.4-203. Cone Penetrometer Test Summary Logs (Sheet 7 of 14)

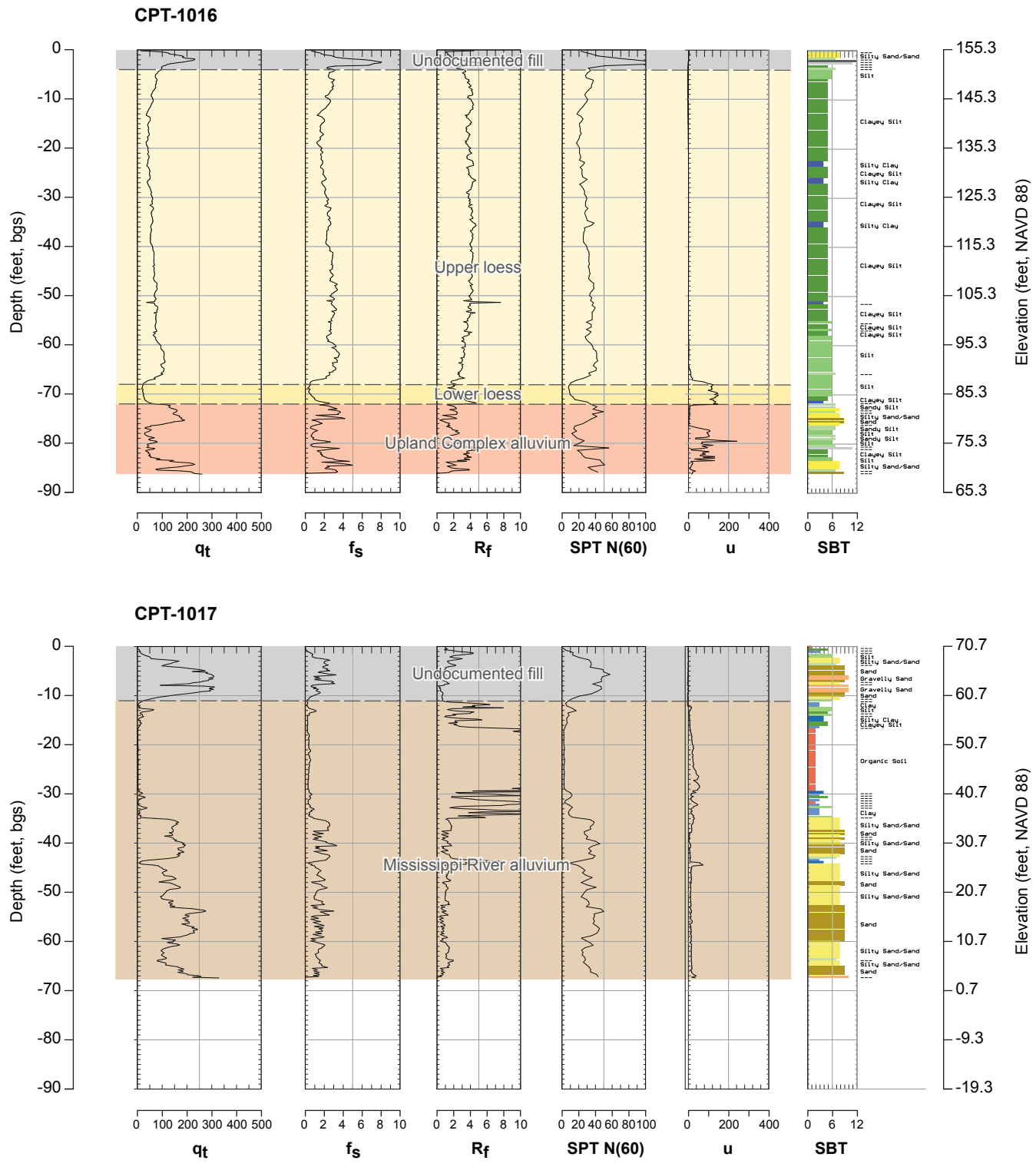
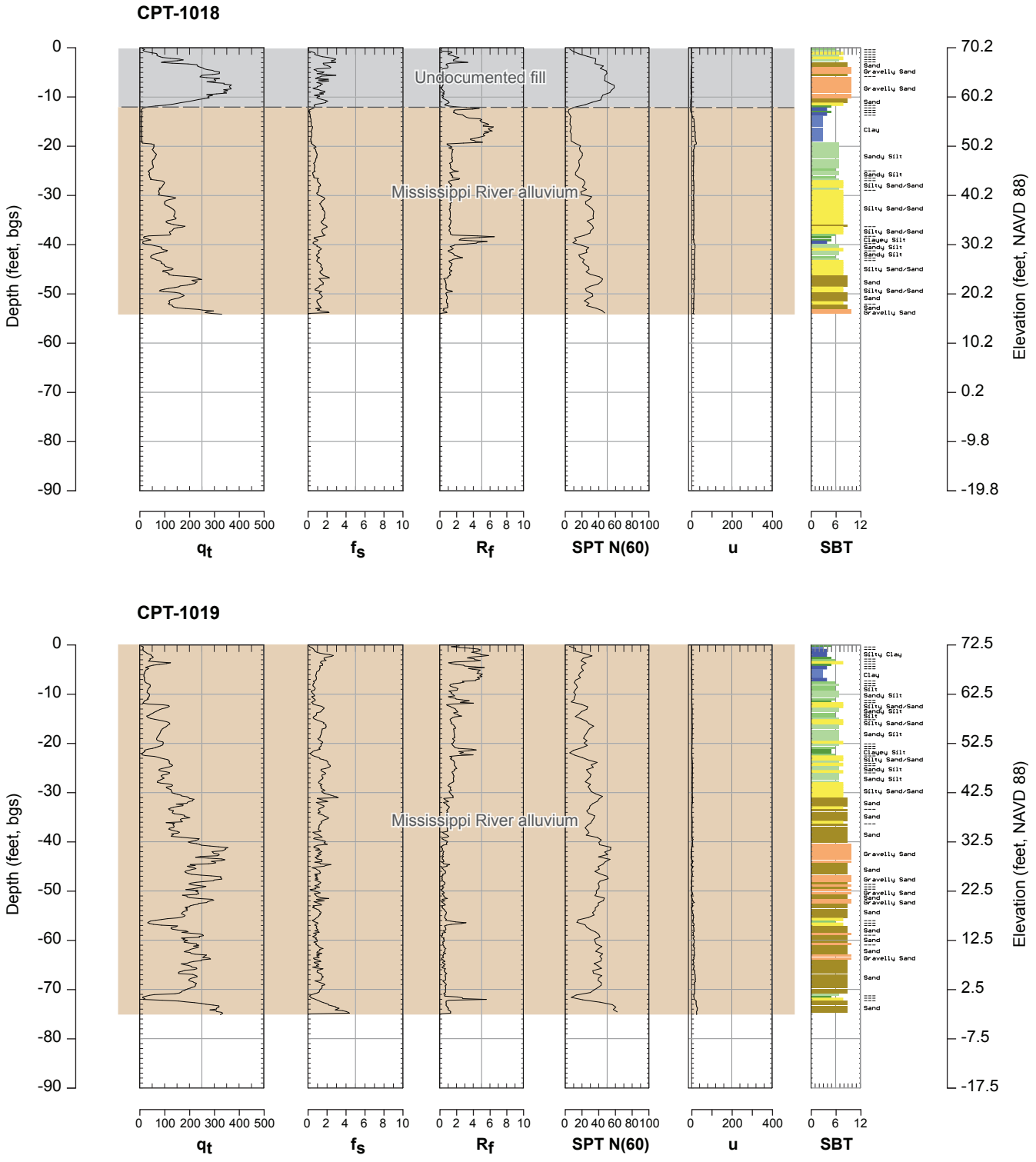


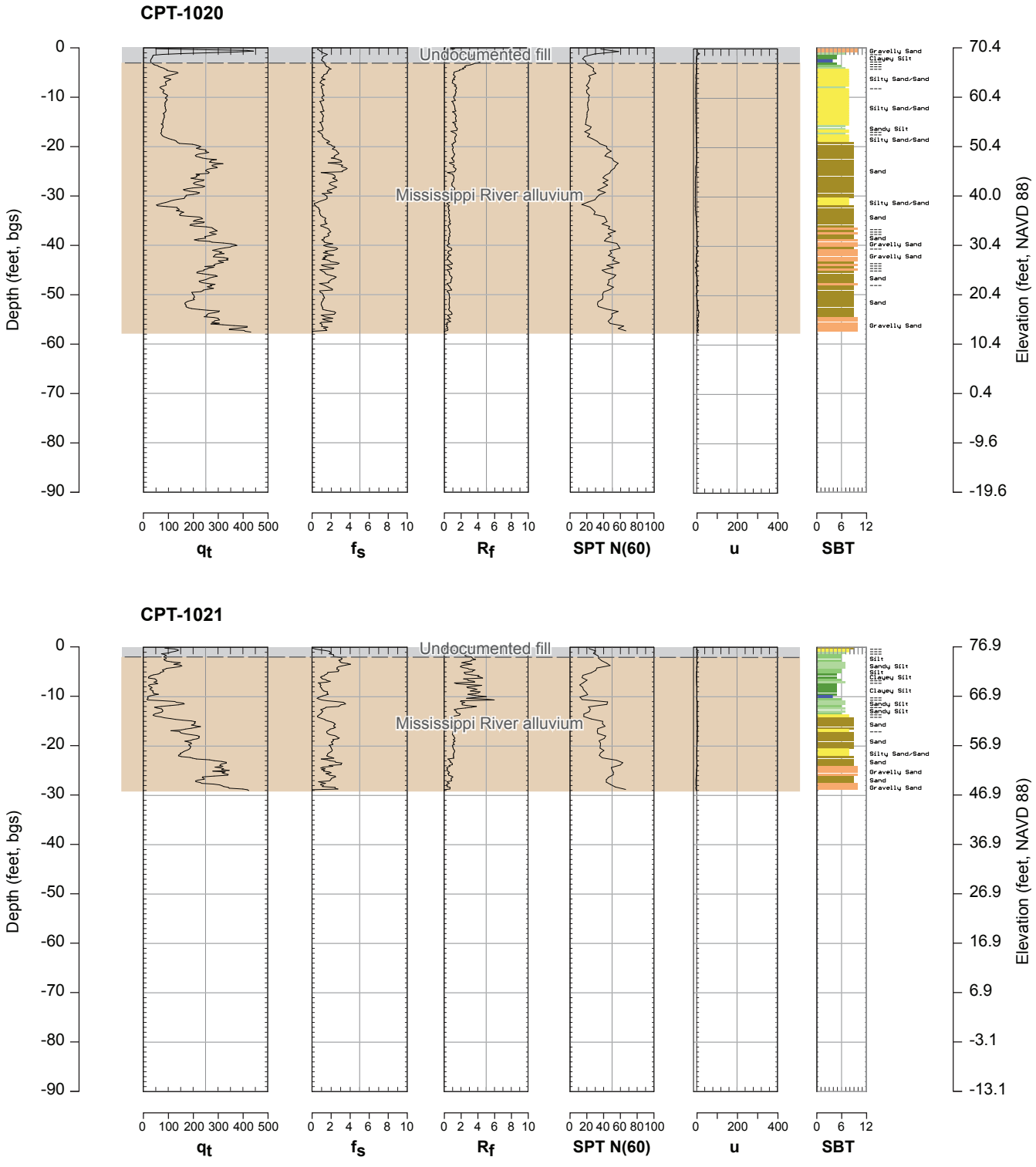
Figure 2.5.4-203. Cone Penetrometer Test Summary Logs (Sheet 8 of 14)



Legend

q_t	Corrected tip resistance (tons/sq. foot)
SBT	Soil behavior type
f_s	Sleeve friction (tons/sq. foot)
u	Dynamic pore pressure (lbs./sq. inch)
SPT N(60)	Standard Penetration Test N-value at 60% energy calculated from qt/N ratios assigned to each SBT zone
R_f	Friction ratio (%)

Figure 2.5.4-203. Cone Penetrometer Test Summary Logs (Sheet 9 of 14)



Legend

q_t Corrected tip resistance (tons/sq. foot)

SBT Soil behavior type

f_s Sleeve friction (tons/sq. foot)

u Dynamic pore pressure (lbs./sq. inch)

SPT N(60) Standard Penetration Test N-value at 60% energy calculated from qt/N ratios assigned to each SBT zone

R_f Friction ratio (%)

Figure 2.5.4-203. Cone Penetrometer Test Summary Logs (Sheet 10 of 14)

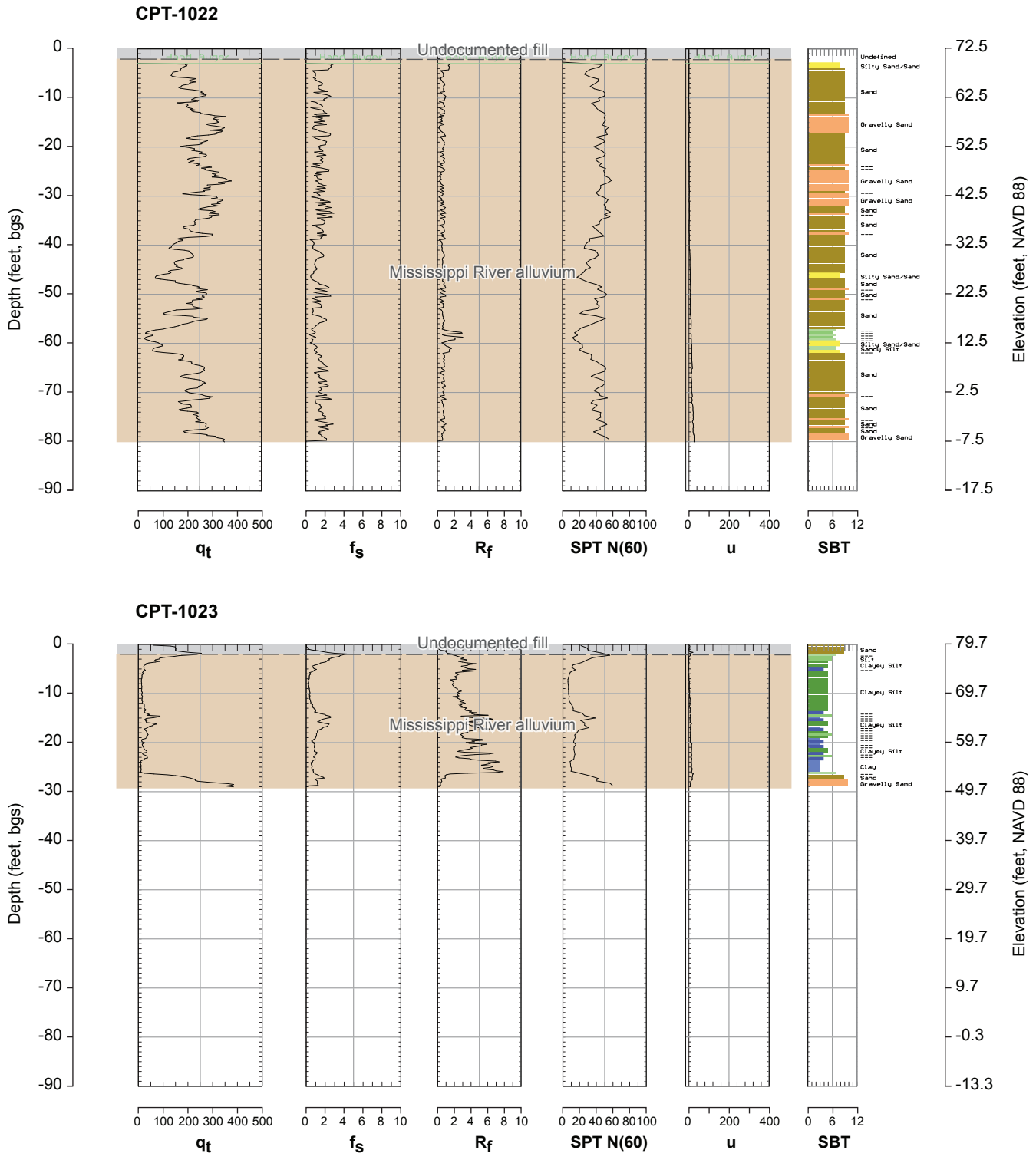
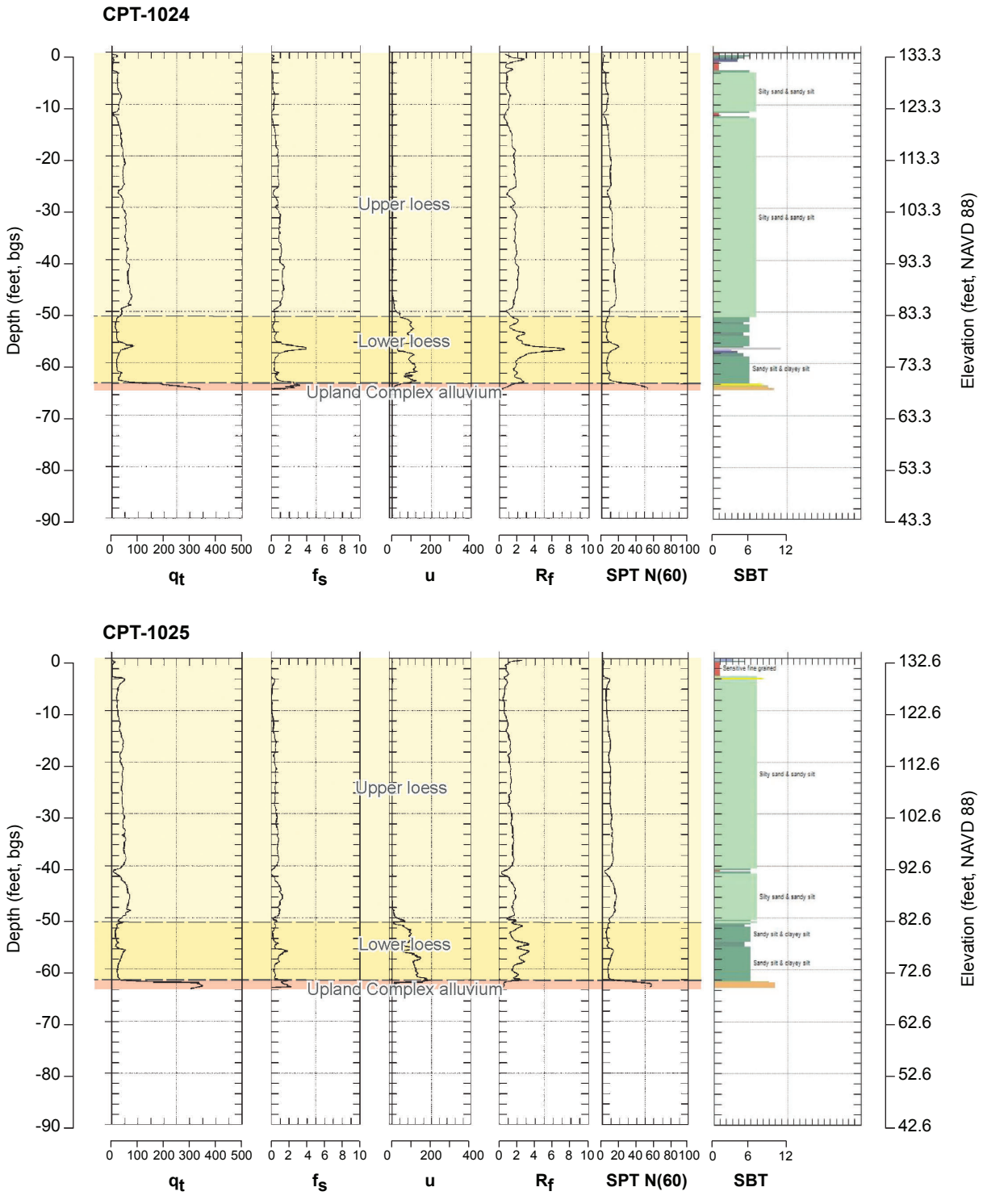


Figure 2.5.4-203. Cone Penetrometer Test Summary Logs (Sheet 11 of 14)



Legend

q_t Corrected tip resistance (tons/sq. foot)

SBT Soil behavior type

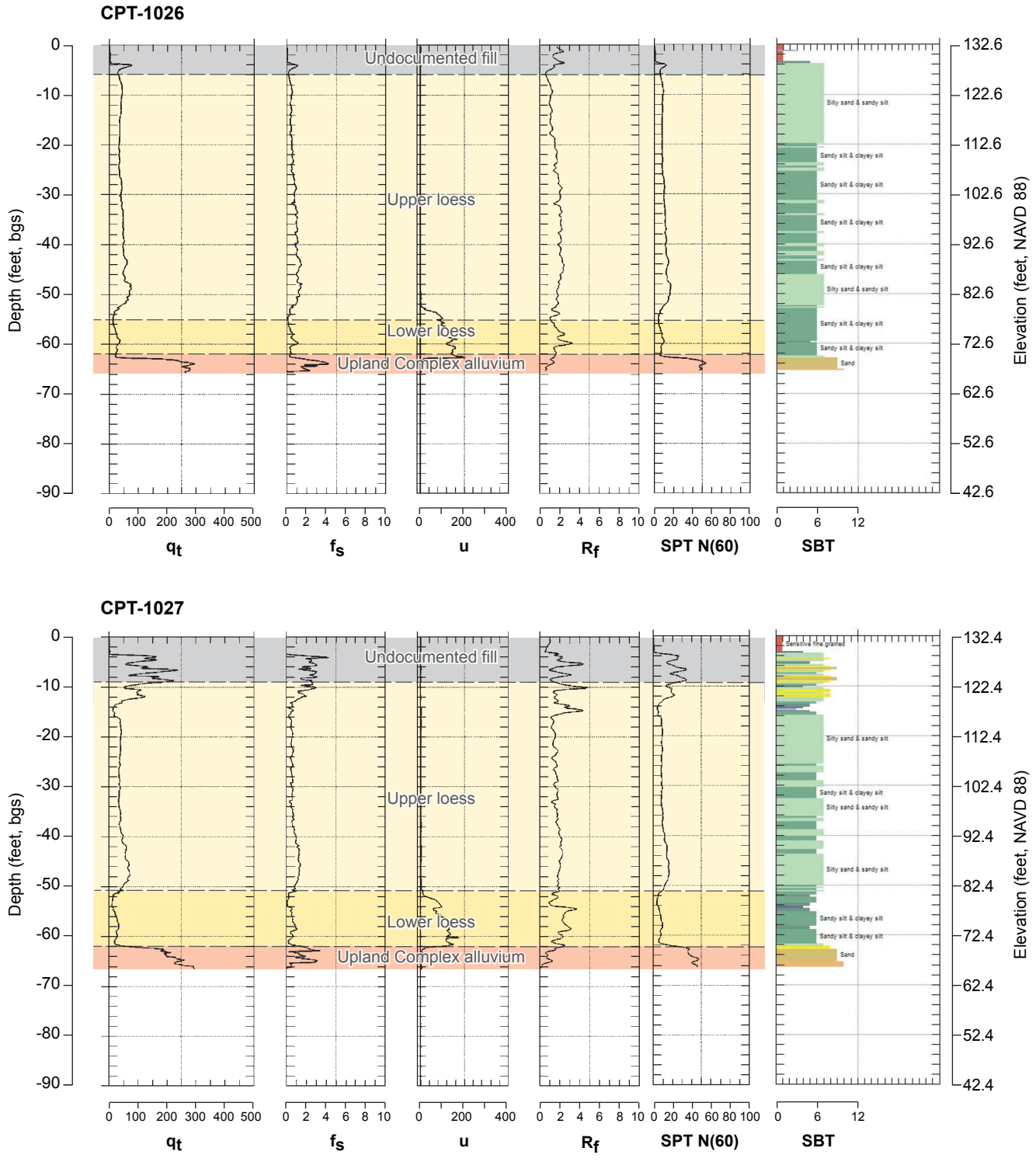
f_s Sleeve friction (tons/sq. foot)

u Dynamic pore pressure (lbs./sq. inch)

SPT N(60) Standard Penetration Test N-value at 60% energy calculated from qt/N ratios assigned to each SBT zone

R_f Friction ratio (%)

Figure 2.5.4-203. Cone Penetrometer Test Summary Logs (Sheet 12 of 14)



Legend

q_t	Corrected tip resistance (tons/sq. foot)
SBT	Soil behavior type
f_s	Sleeve friction (tons/sq. foot)
u	Dynamic pore pressure (lbs./sq. inch)
SPT N(60)	Standard Penetration Test N-value at 60% energy calculated from qt/N ratios assigned to each SBT zone
R_f	Friction ratio (%)

Figure 2.5.4-203. Cone Penetrometer Test Summary Logs (Sheet 13 of 14)

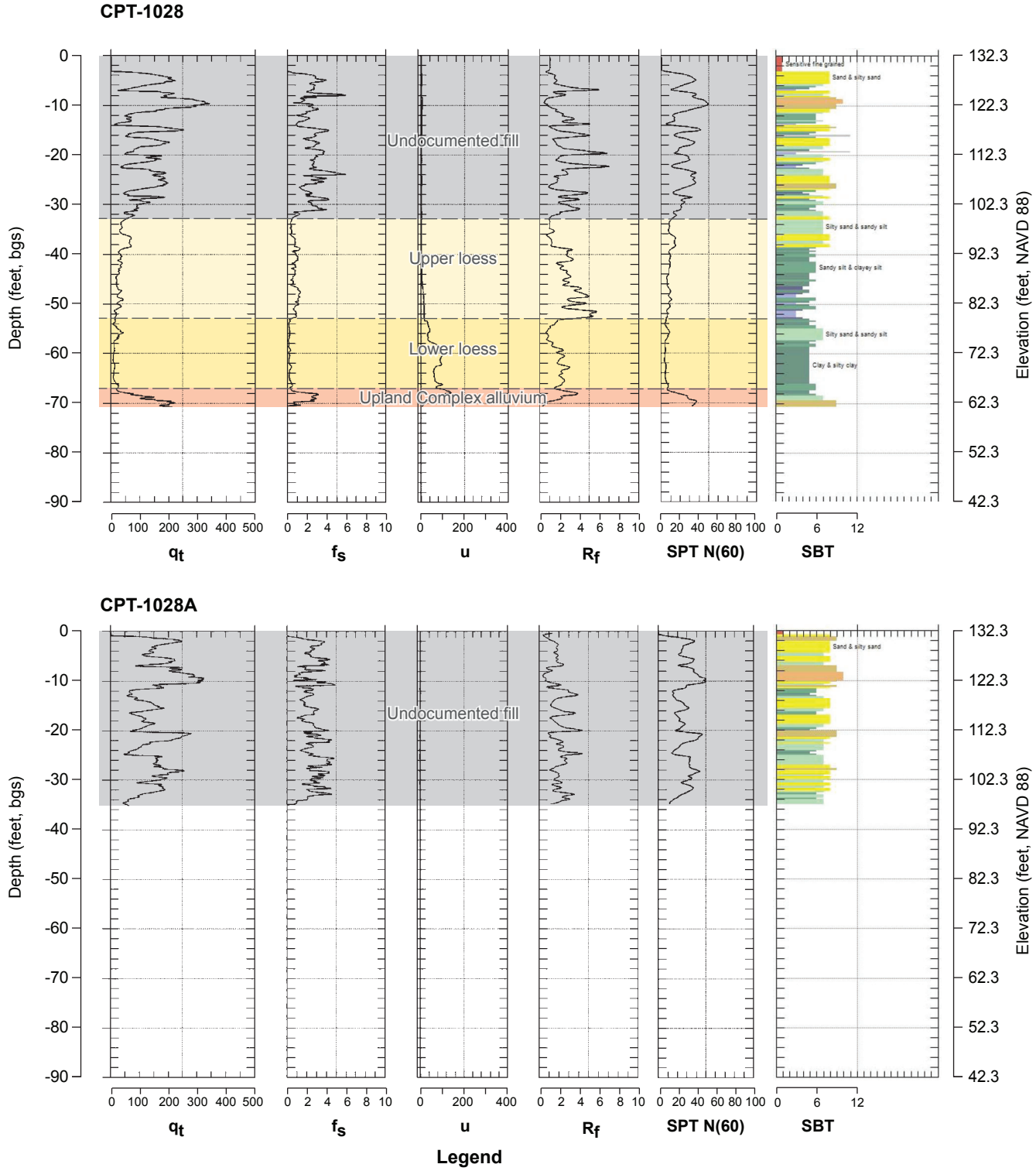
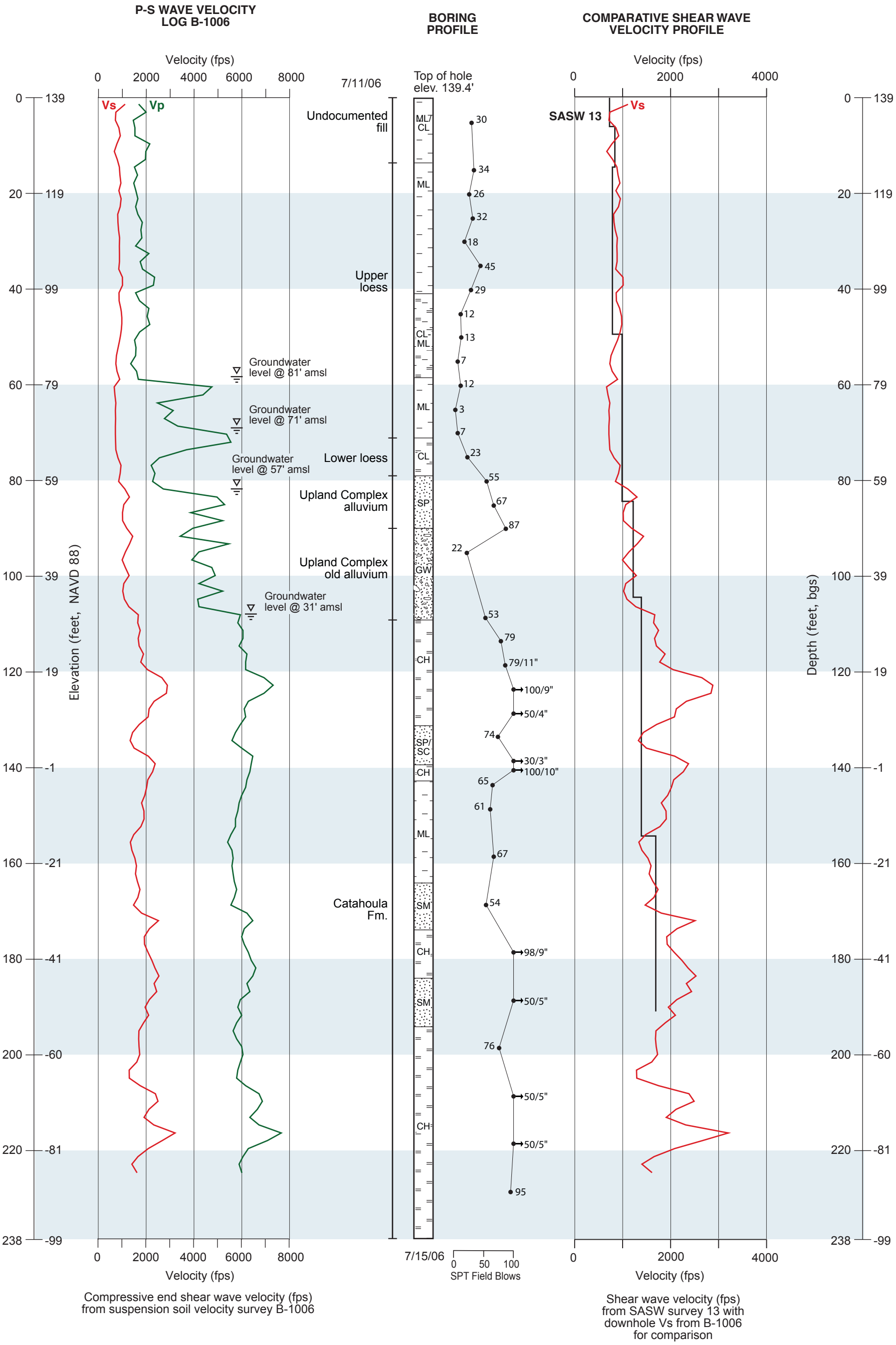
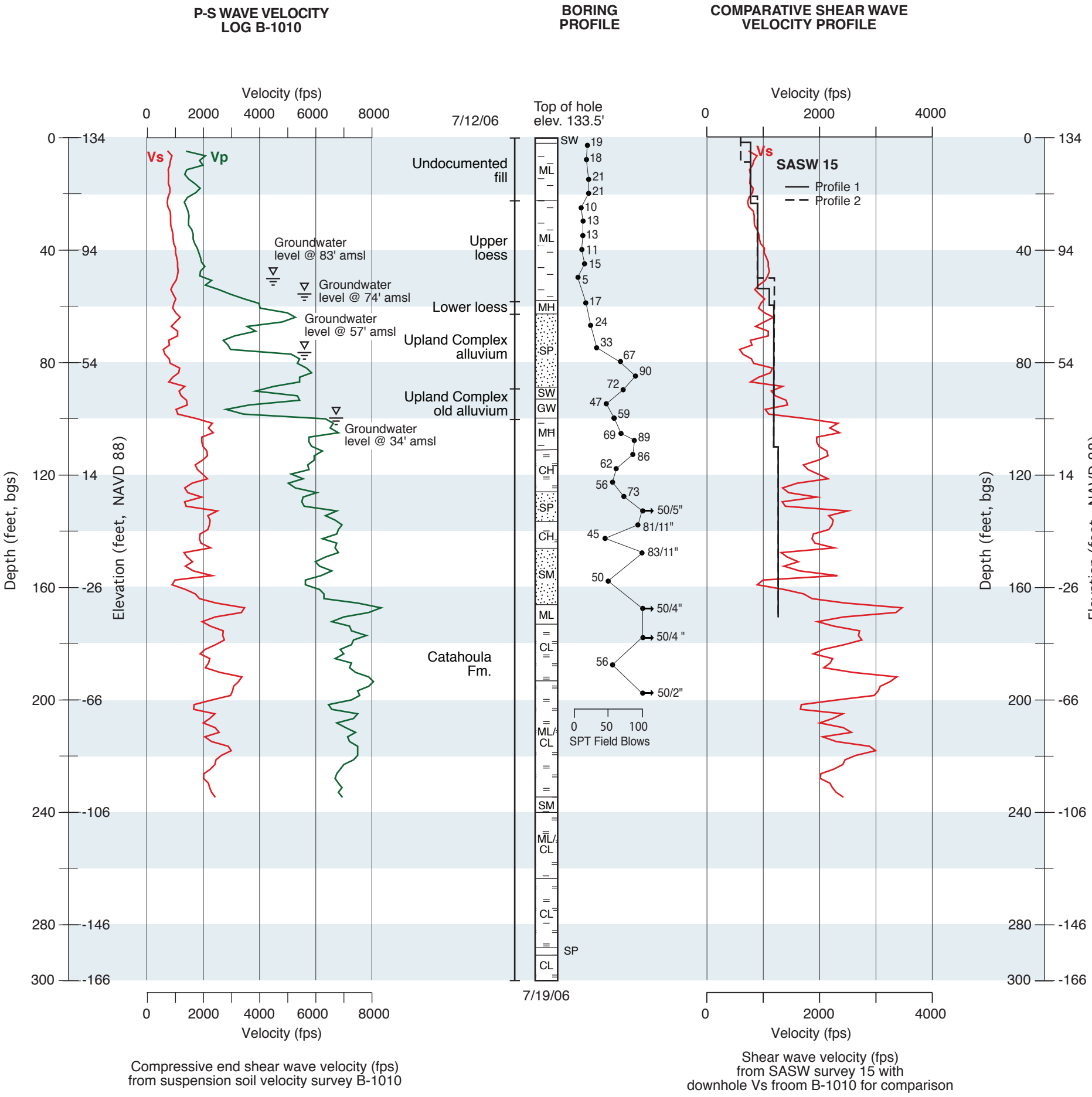


Figure 2.5.4-203. Cone Penetrometer Test Summary Logs (Sheet 14 of 14)



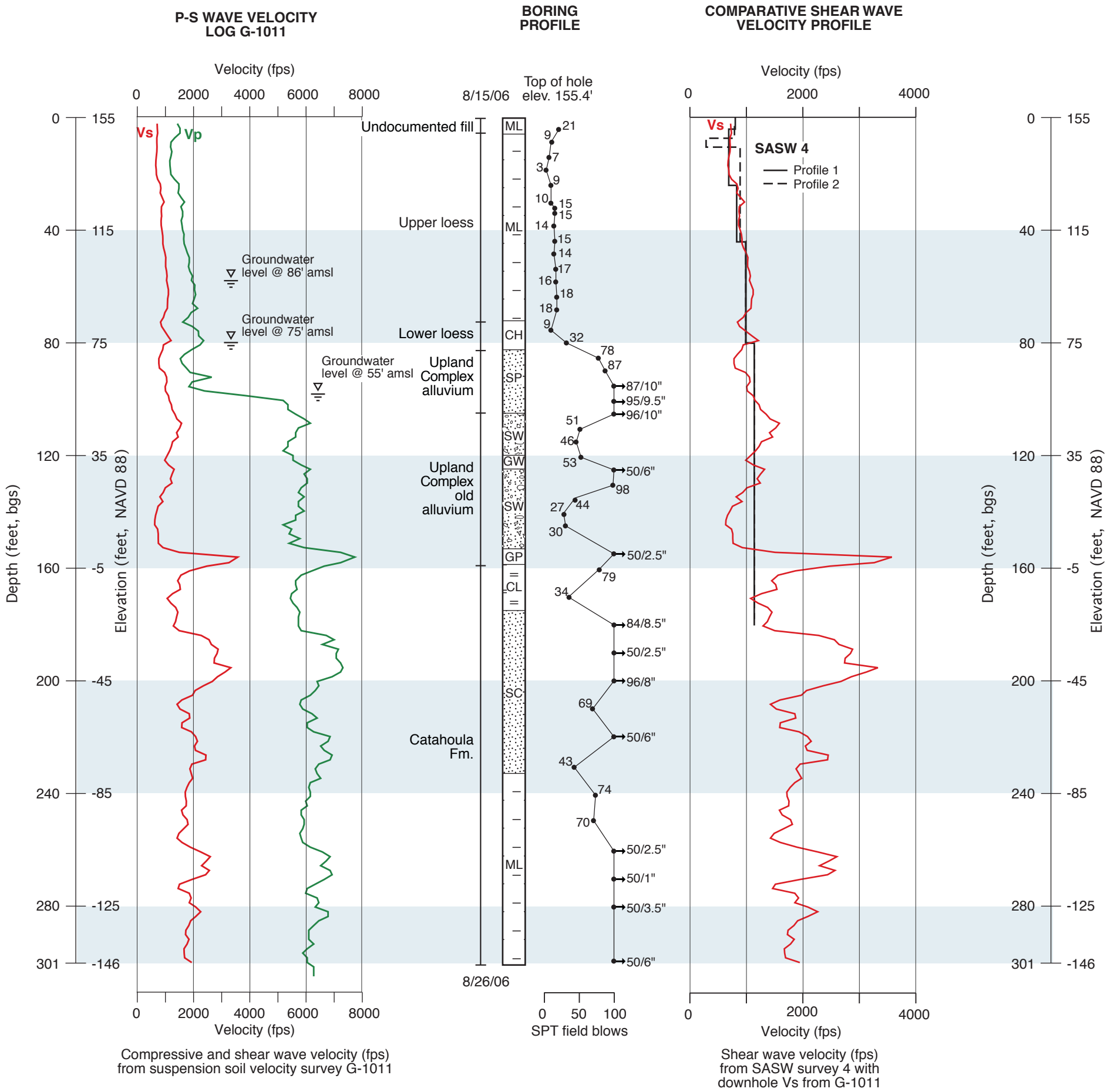
Notes: 1. Groundwater levels interpreted from geophysical log.
2. SPT field blows are uncorrected n-values.

Figure 2.5.4-204. Borehole Summary Sheet B-1006



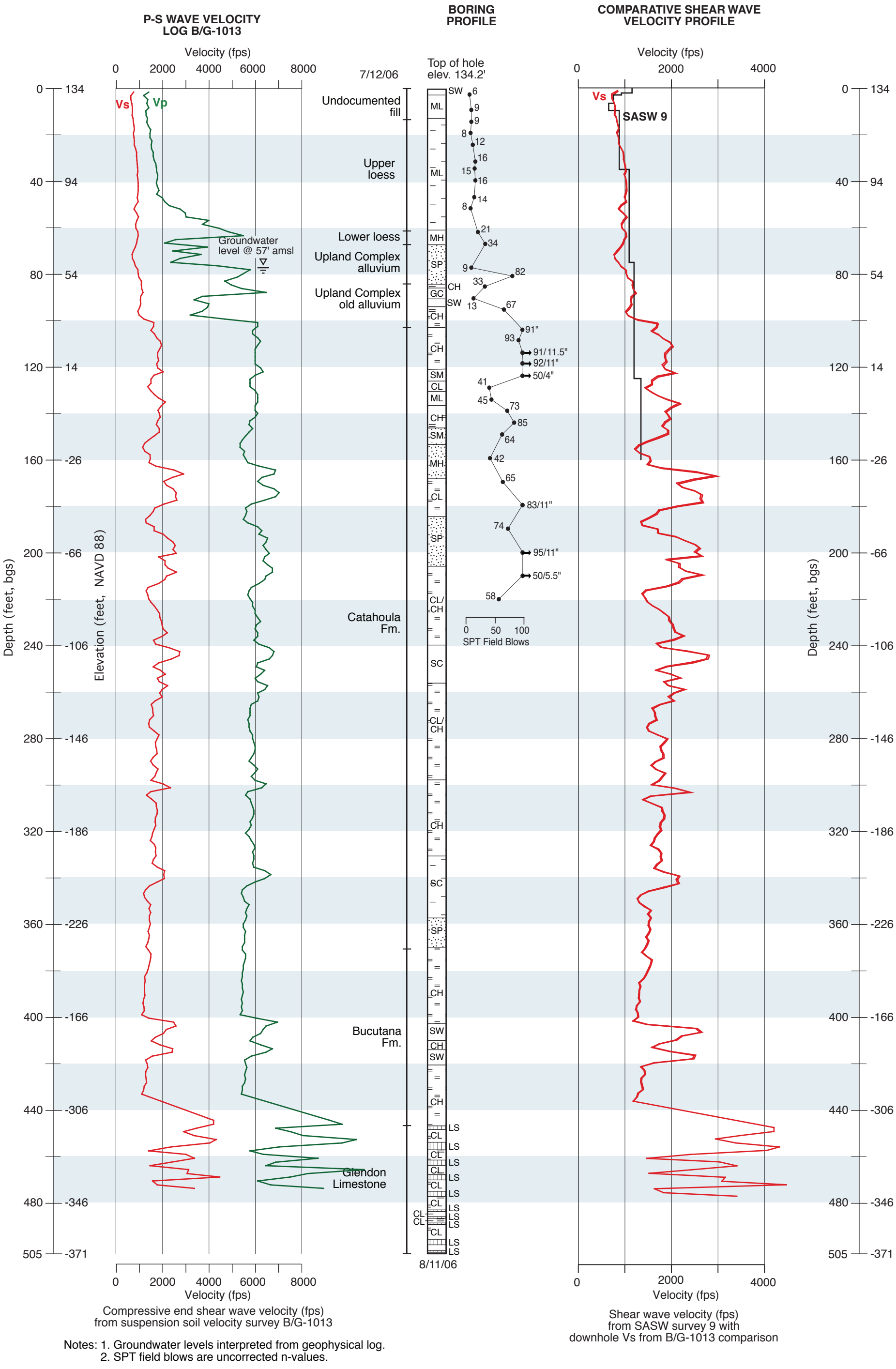
Notes: 1. Groundwater levels interpreted from geophysical log.
2. SPT field blows are uncorrected n-values.

Figure 2.5.4-205. Borehole Summary Sheet B-1010



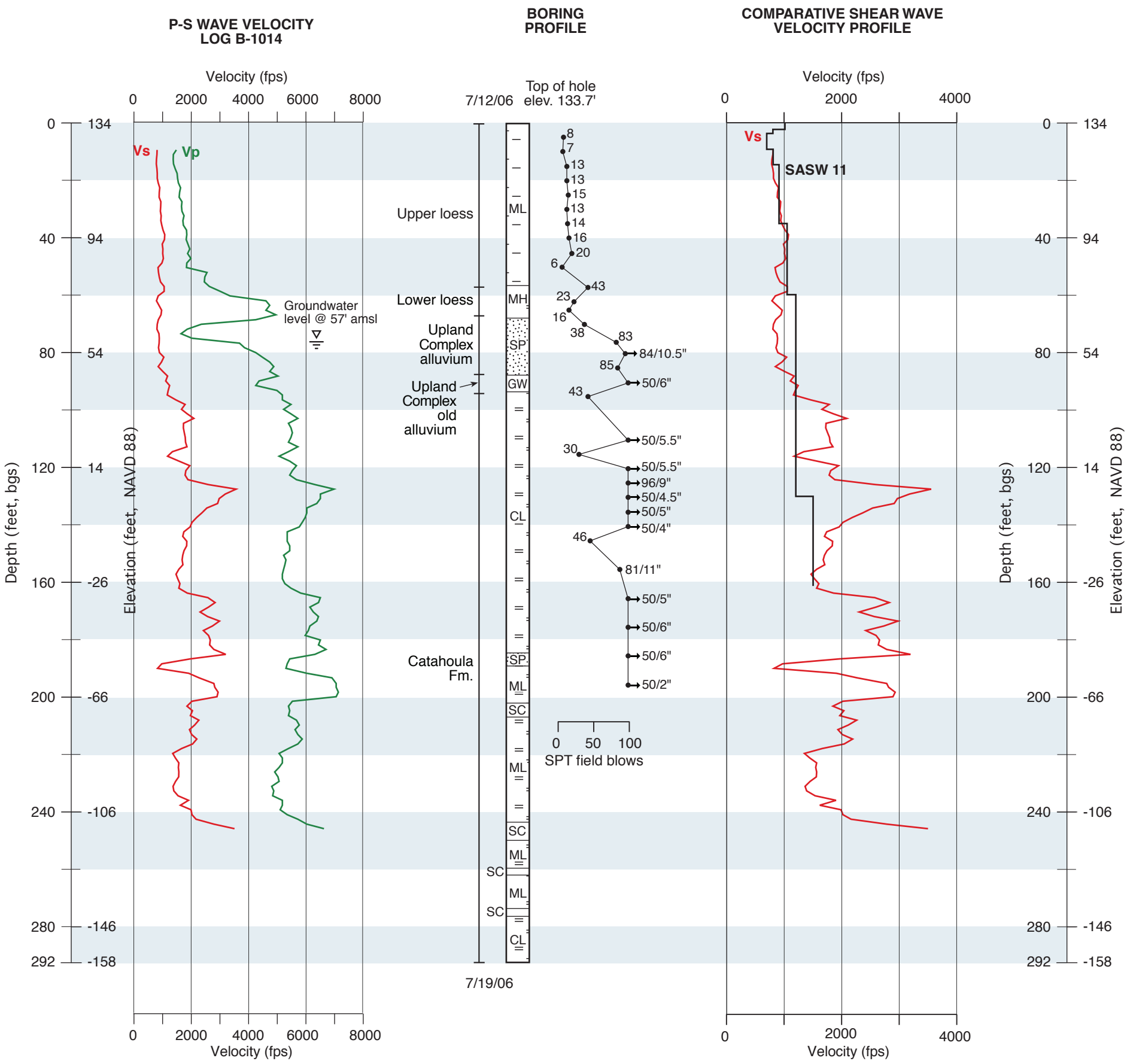
Notes: 1. Groundwater levels interpreted from geophysical log.
2. SPT field blows are uncorrected n-values.

Figure 2.5.4-206. Borehole Summary Sheet B-1011



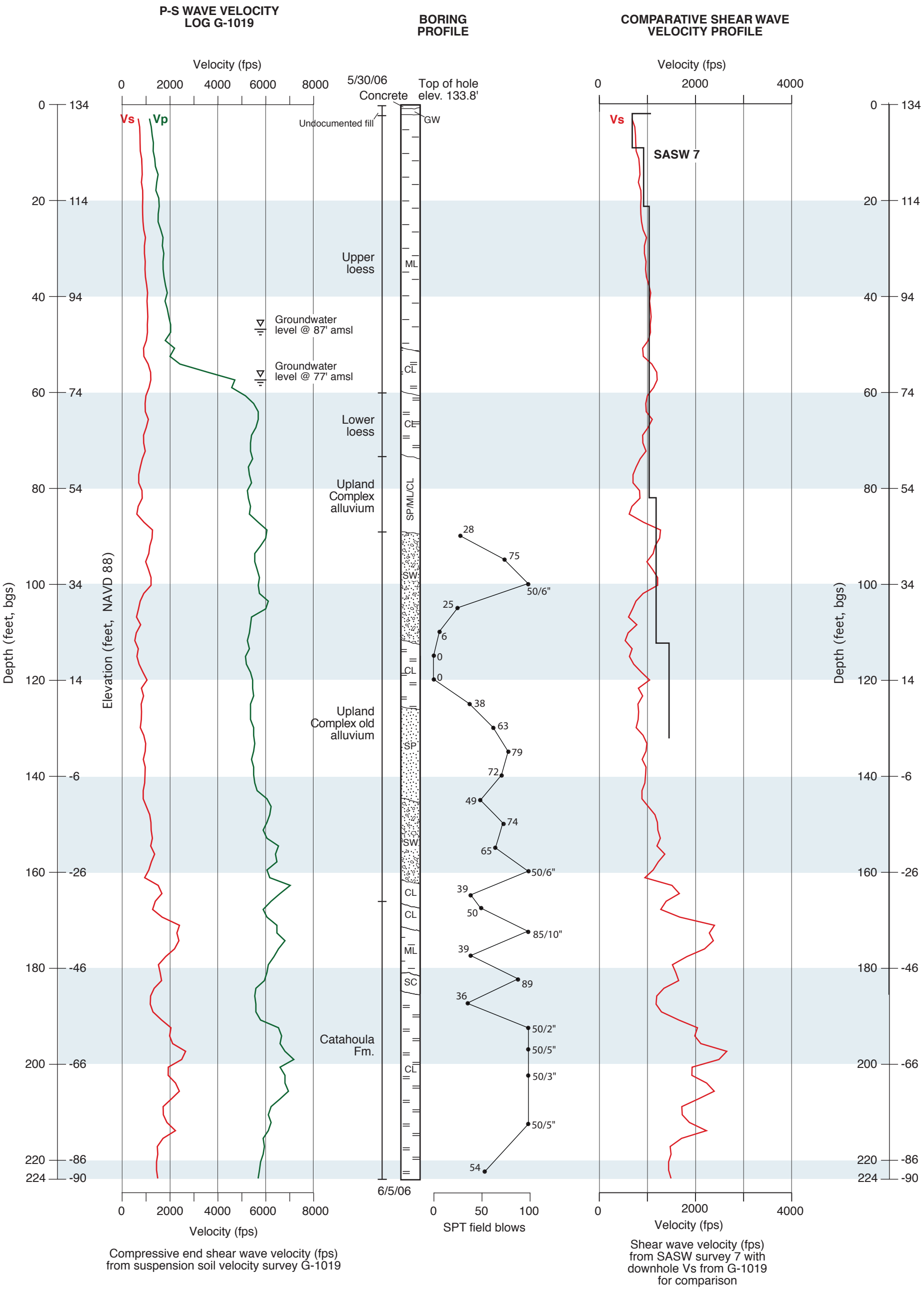
Notes: 1. Groundwater levels interpreted from geophysical log.
2. SPT field blows are uncorrected n-values.

Figure 2.5.4-207. Borehole Summary Sheet B-1013



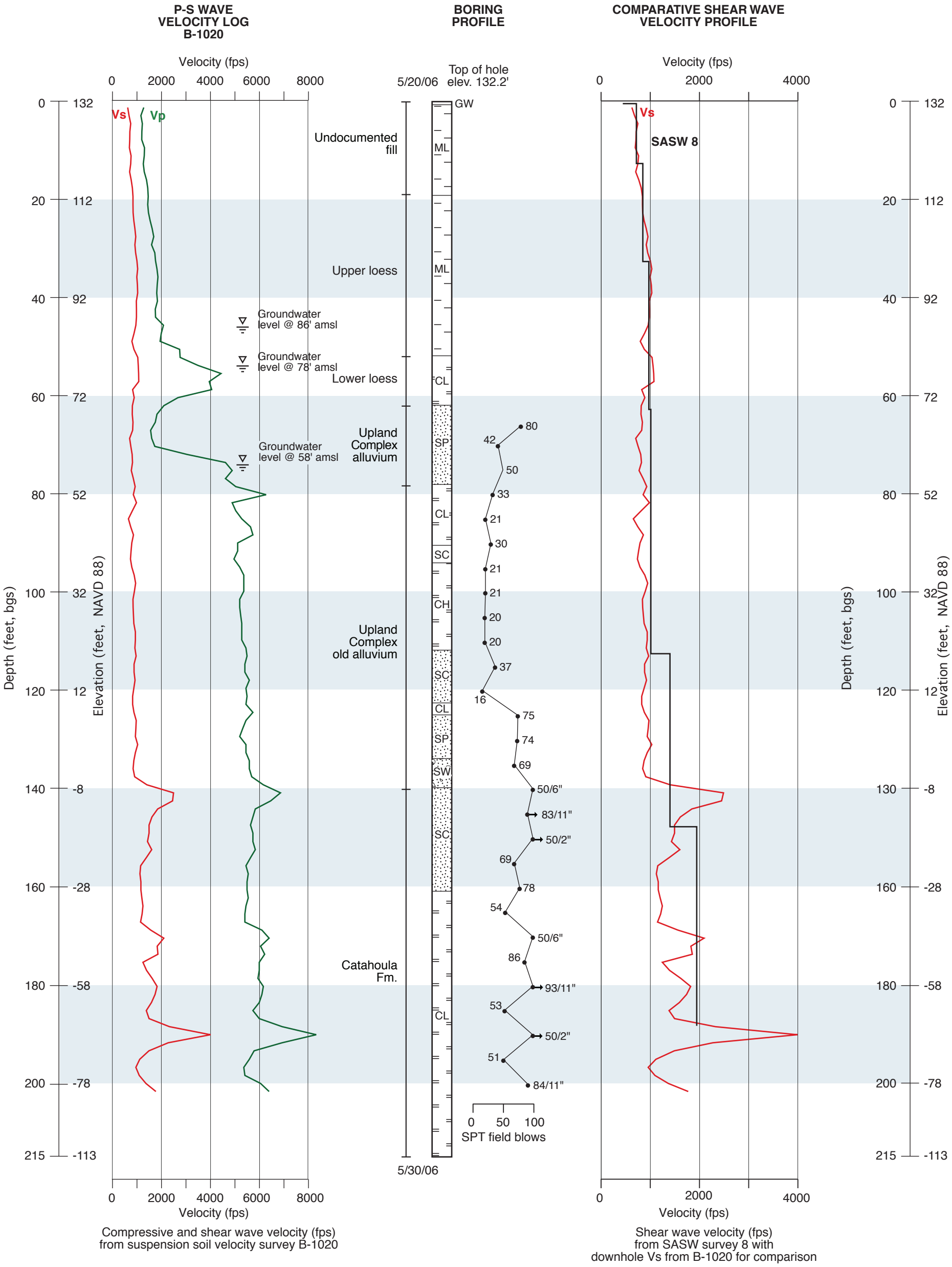
Notes: 1. Groundwater levels interpreted from geophysical log.
2. SPT field blows are uncorrected n-values.

Figure 2.5.4-208. Borehole Summary Sheet B-1014



Notes: 1. Groundwater levels interpreted from geophysical log.
2. SPT field blows are uncorrected n-values.

Figure 2.5.4-209. Borehole Summary Sheet B-1019

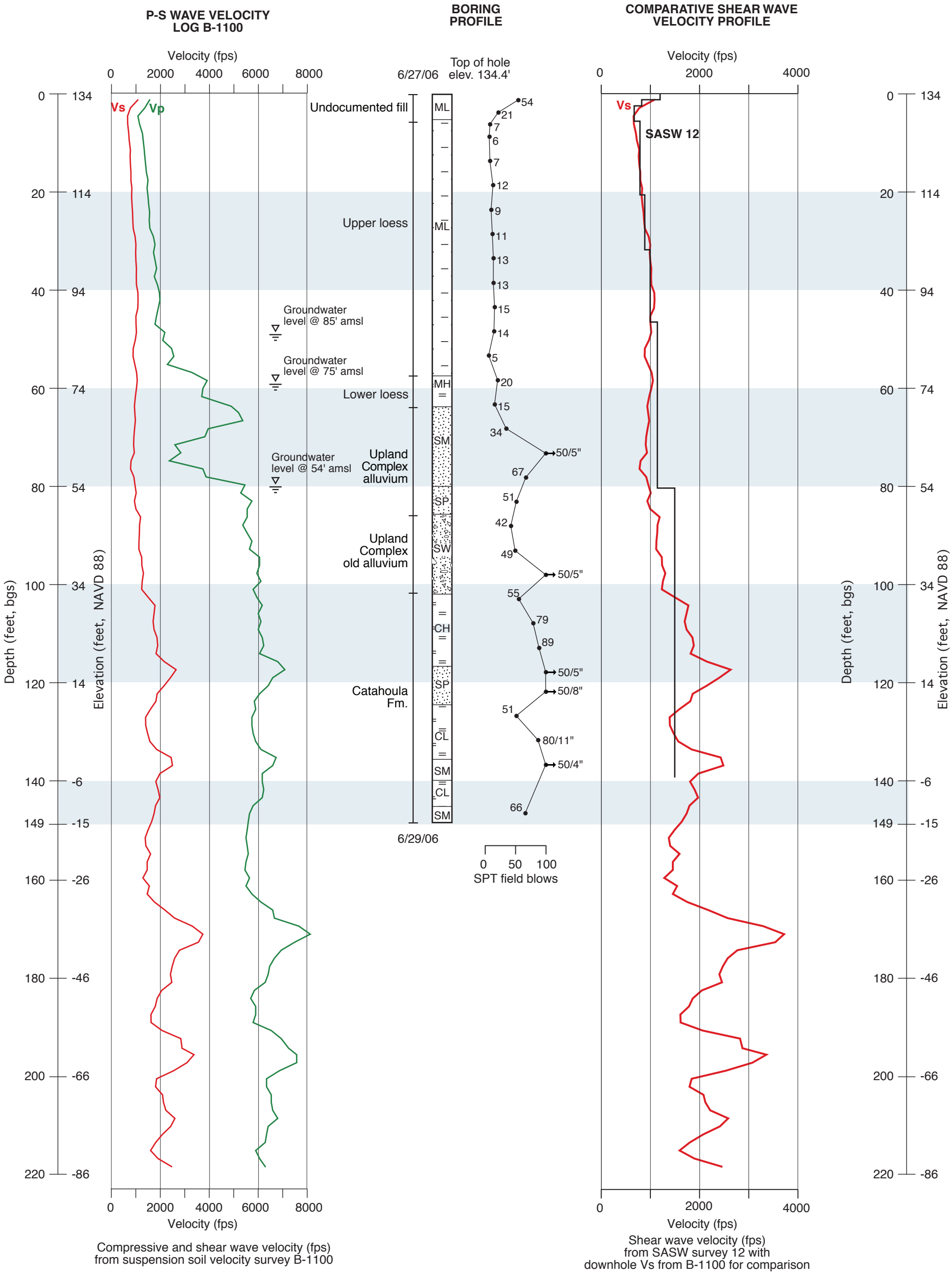


Compressive and shear wave velocity (fps) from suspension soil velocity survey B-1020

Shear wave velocity (fps) from SASW survey 8 with downhole Vs from B-1020 for comparison

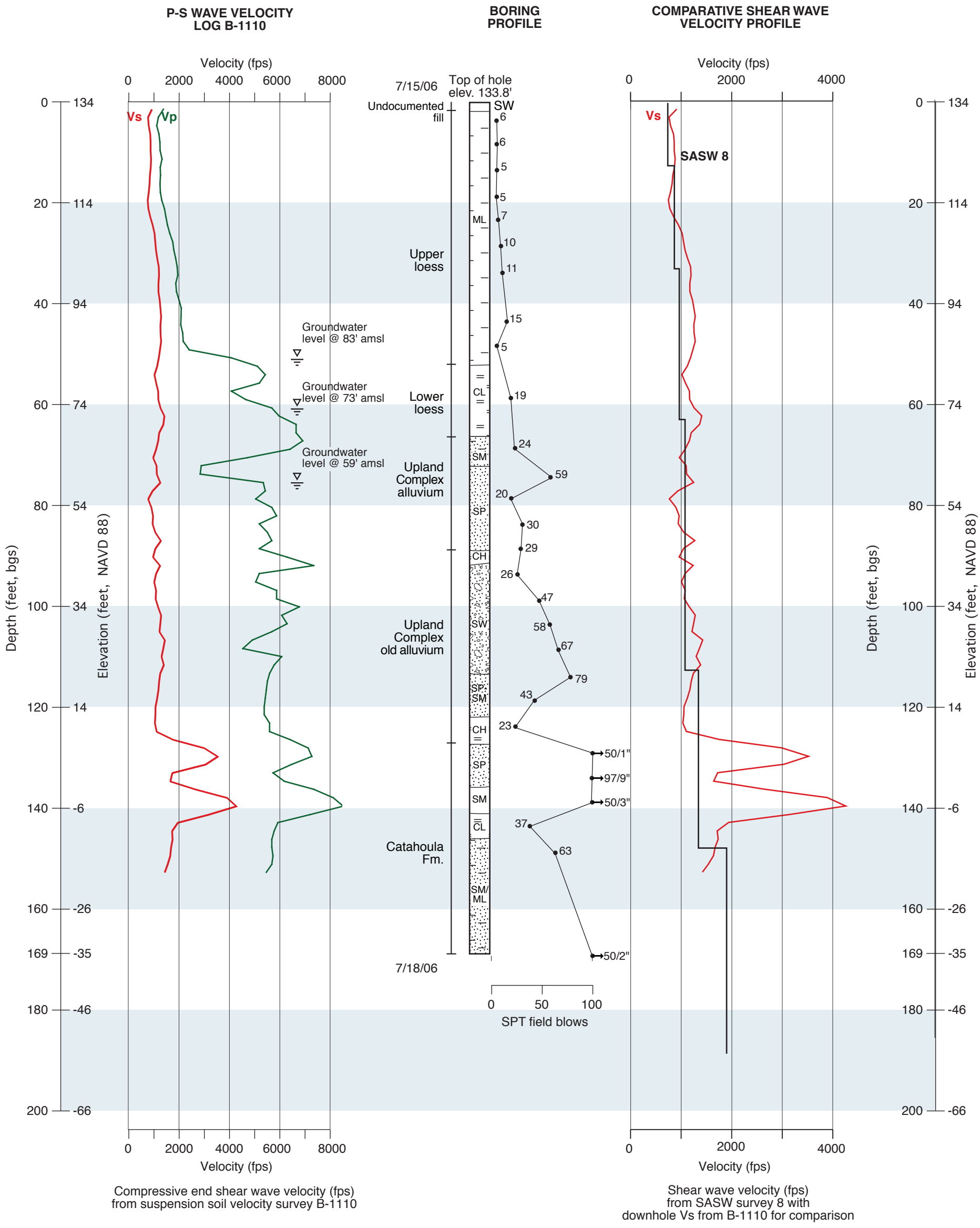
Notes: 1. Groundwater levels interpreted from geophysical log.
2. SPT field blows are uncorrected n-values.

Figure 2.5.4-210. Borehole Summary Sheet B-1020



Notes: 1. Groundwater levels interpreted from geophysical log.
2. SPT field blows are uncorrected n-values.

Figure 2.5.4-211. Borehole Summary Sheet B-1100

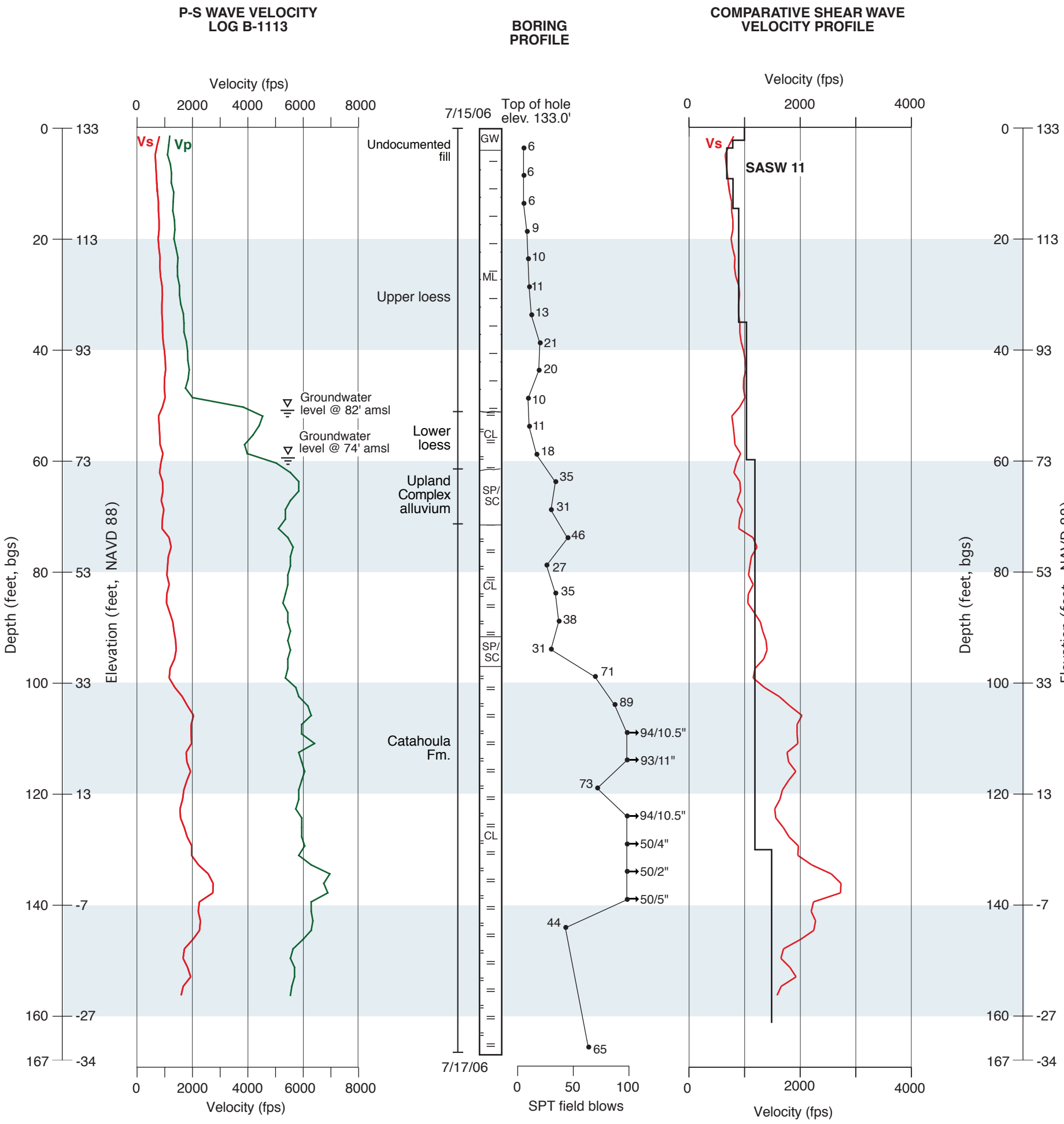


Compressive end shear wave velocity (fps) from suspension soil velocity survey B-1110

Shear wave velocity (fps) from SASW survey 8 with downhole Vs from B-1110 for comparison

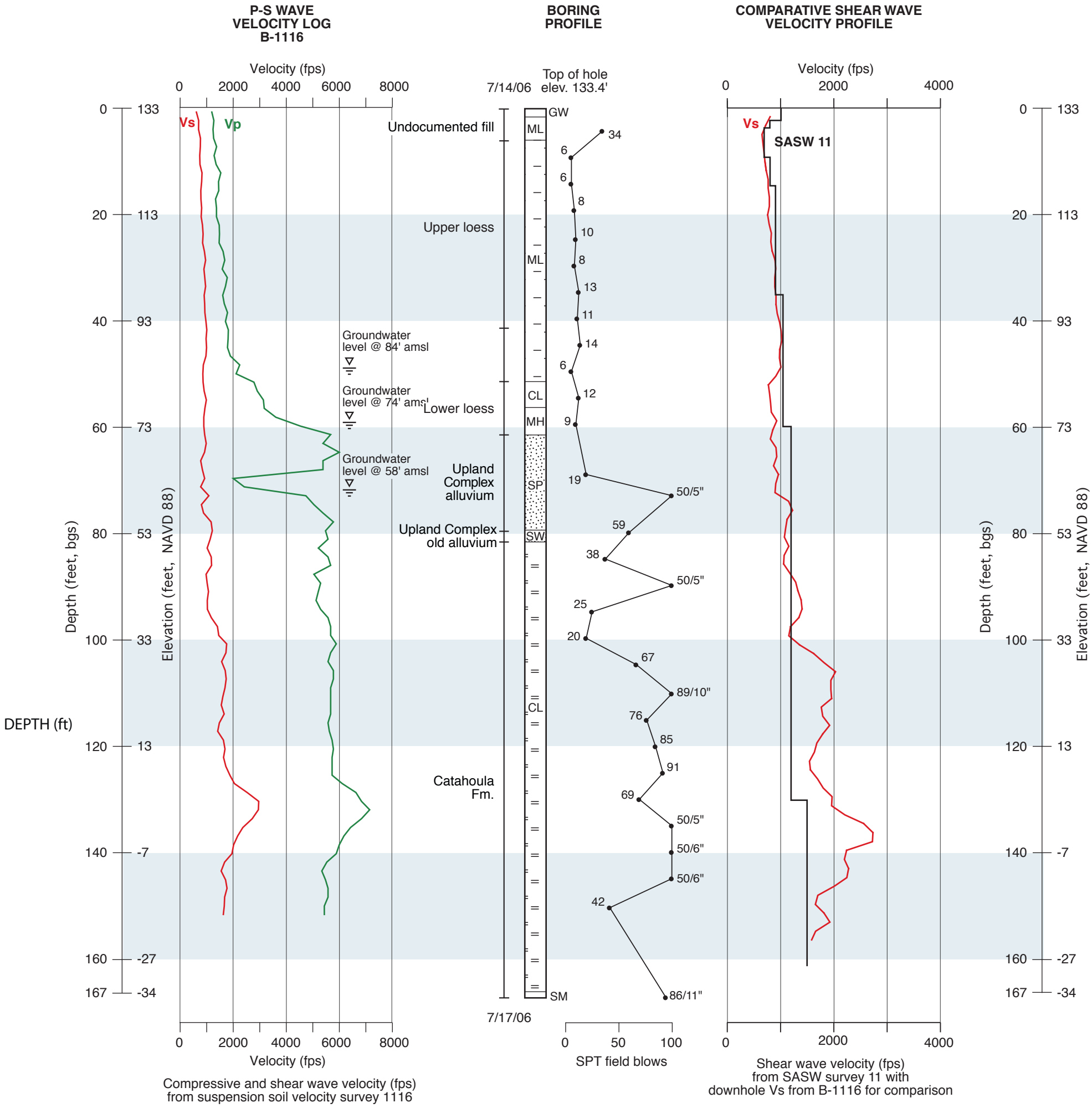
Notes: 1. Groundwater levels interpreted from geophysical log.
2. SPT field blows are uncorrected n-values.

Figure 2.5.4-212. Borehole Summary Sheet B-1110



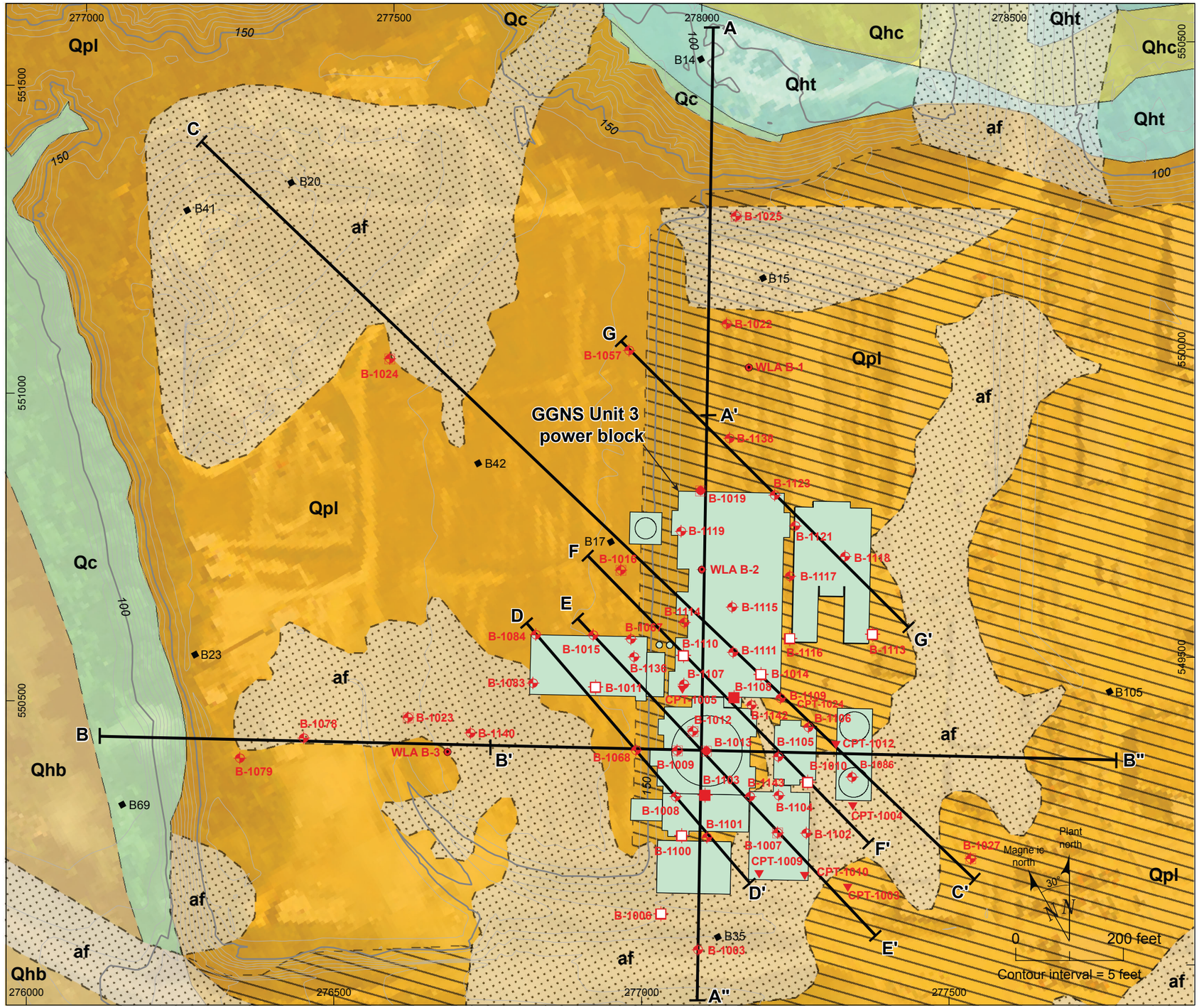
Notes: 1. Groundwater levels interpreted from geophysical log.
2. SPT field blows are uncorrected n-values.

Figure 2.5.4-213. Borehole Summary Sheet B-1113



Notes: 1. Groundwater levels interpreted from geophysical log.
2. SPT field blows are uncorrected n-values.

Figure 2.5.4-214. Borehole Summary Sheet B-1116



Legend

Symbols

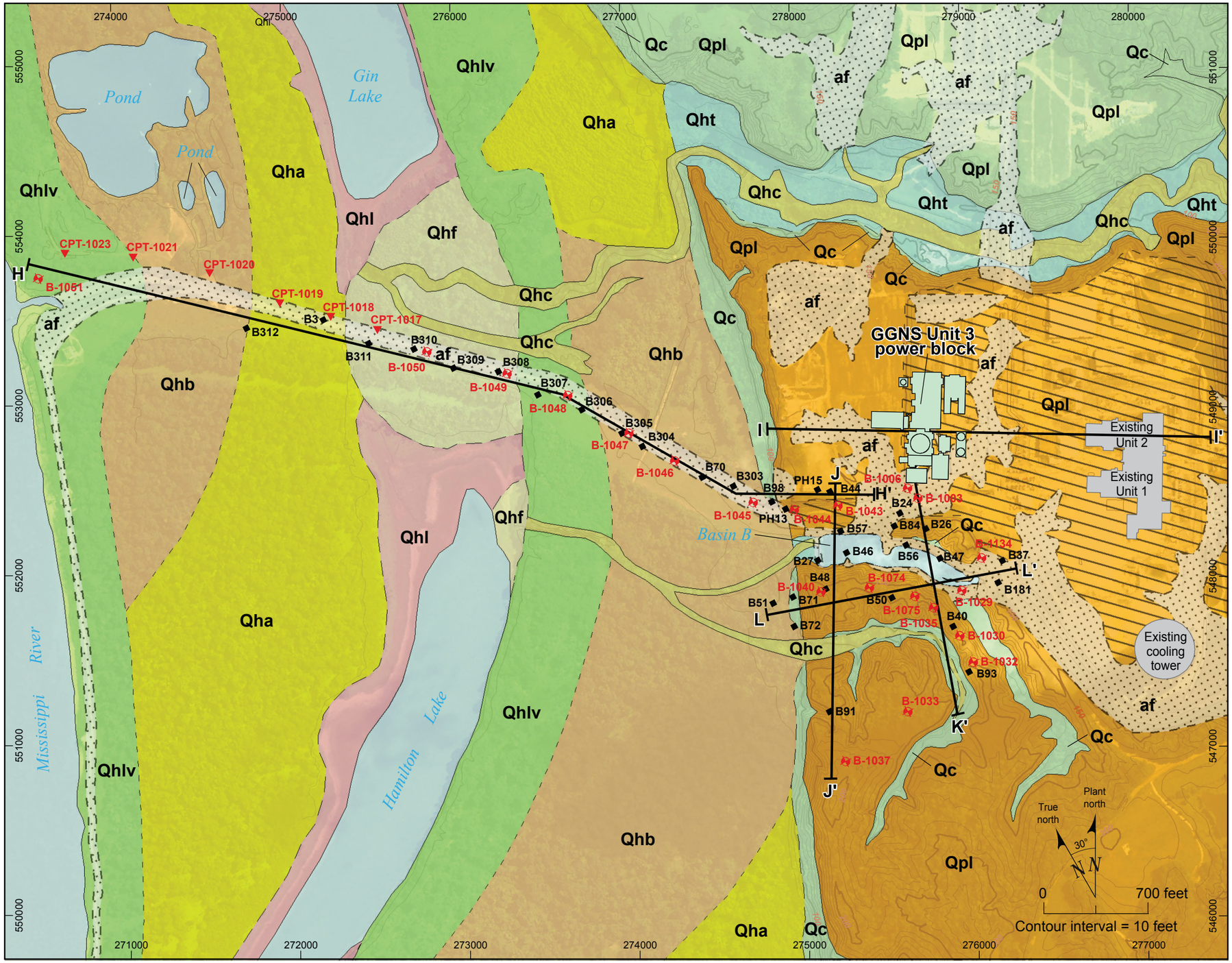
- B-1119 — Borehole
- B-1025 — Borehole and monitoring well
- B-1019 — Borehole and monitoring well with suspension logging
- B-1103 — Borehole with pressuremeter test
- B-1113 — Borehole with suspension log
- CPT-1009 — Cone penetrometer test
- WLA B-1 — ESP borehole
- B15 — UFSAR borehole
- A — A' — Cross section location
- Geologic contact; solid where accurately located; long dash where approximate; short dash where inferred
- Graded (cut) area

Unit Descriptions

- af — Undocumented fill
- Qhc — Stream deposits
- Qht — Stream terrace deposits
- Qhb — Backswamp deposits
- Qc — Colluvium
- Qpl — Upper loess

Notes: 1. Projection NAD 27 State Plane Mississippi West FIPS.
2. Vertical datum NAVD 88.

Figure 2.5.4-215. Cross Section Location Map A – G



Legend

Symbols

- B-1003 — Borehole
- CPT-1023 — Cone penetrometer test sounding
- H H' — Cross section location
- B50 — UFSAR borehole
- Geologic contact; solid where accurately located; long dash where approximate; short dash where inferred
- Graded (cut) area

Unit Descriptions

- af — Undocumented fill
- Qhc — Stream deposits
- Qht — Stream terrace deposits
- Qha — Mississippi River alluvium, undifferentiated
- Qhf — Alluvial fan deposits
- Qhl — Lacustrine deposits
- Qhb — Backswamp deposits
- Qhlv — Levee deposits
- Qc — Colluvium
- Qpl — Upper loess

Notes: 1. Projection NAD 27 State Plane Mississippi West FIPS.
2. Vertical datum NAVD 88.

Figure 2.5.4-216. Cross Section Location Map H – L

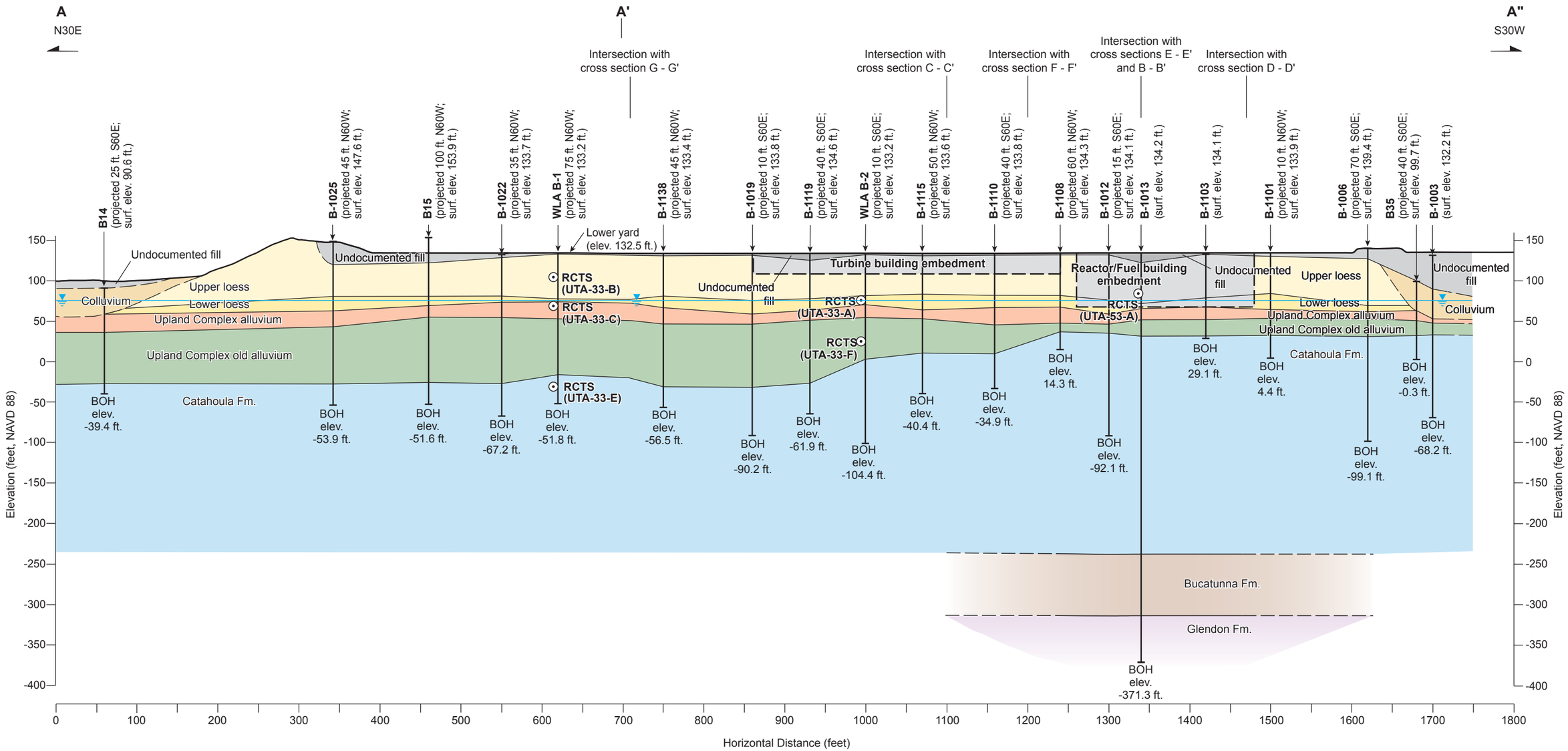


Figure 2.5.4-217. Cross Section A - A"

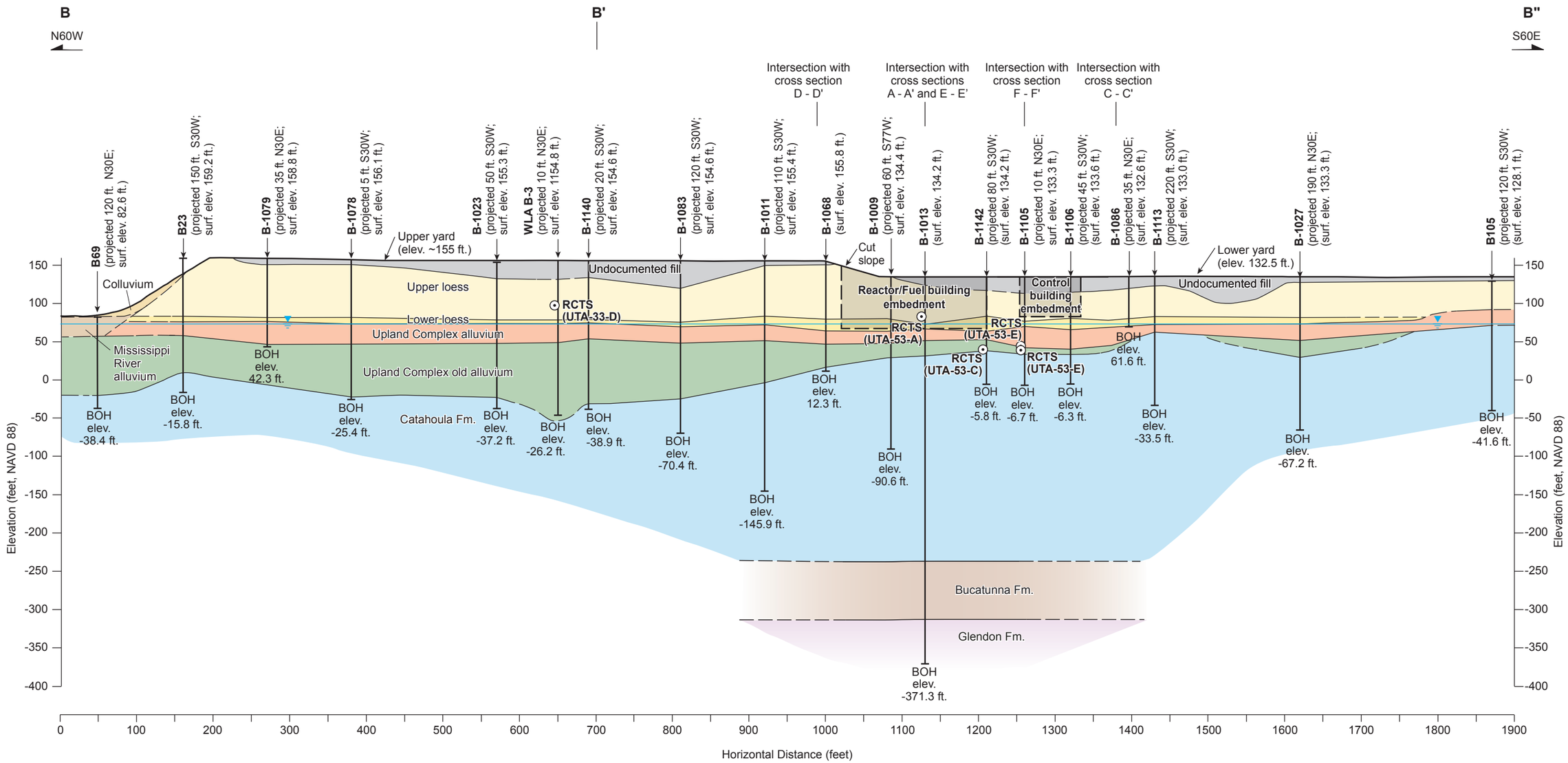


Figure 2.5.4-218. Cross Section B - B"

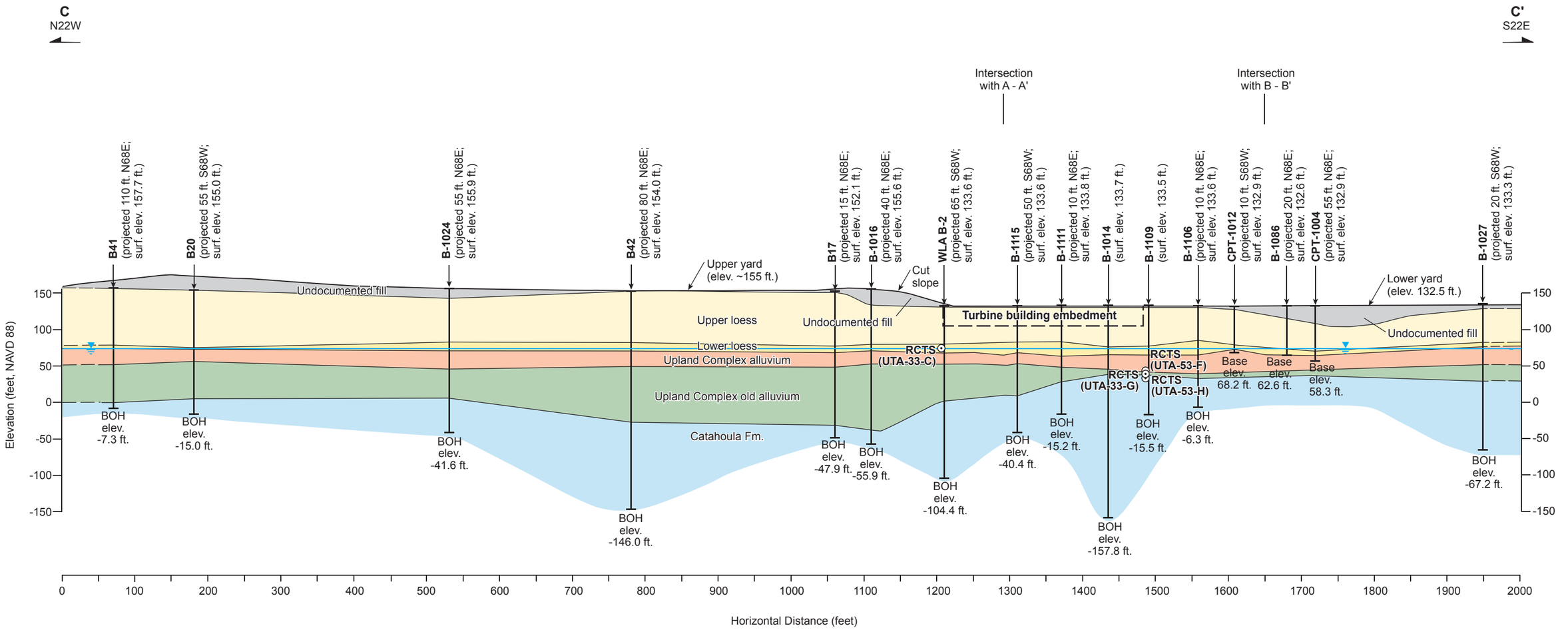


Figure 2.5.4 -219. Cross Section C - C'

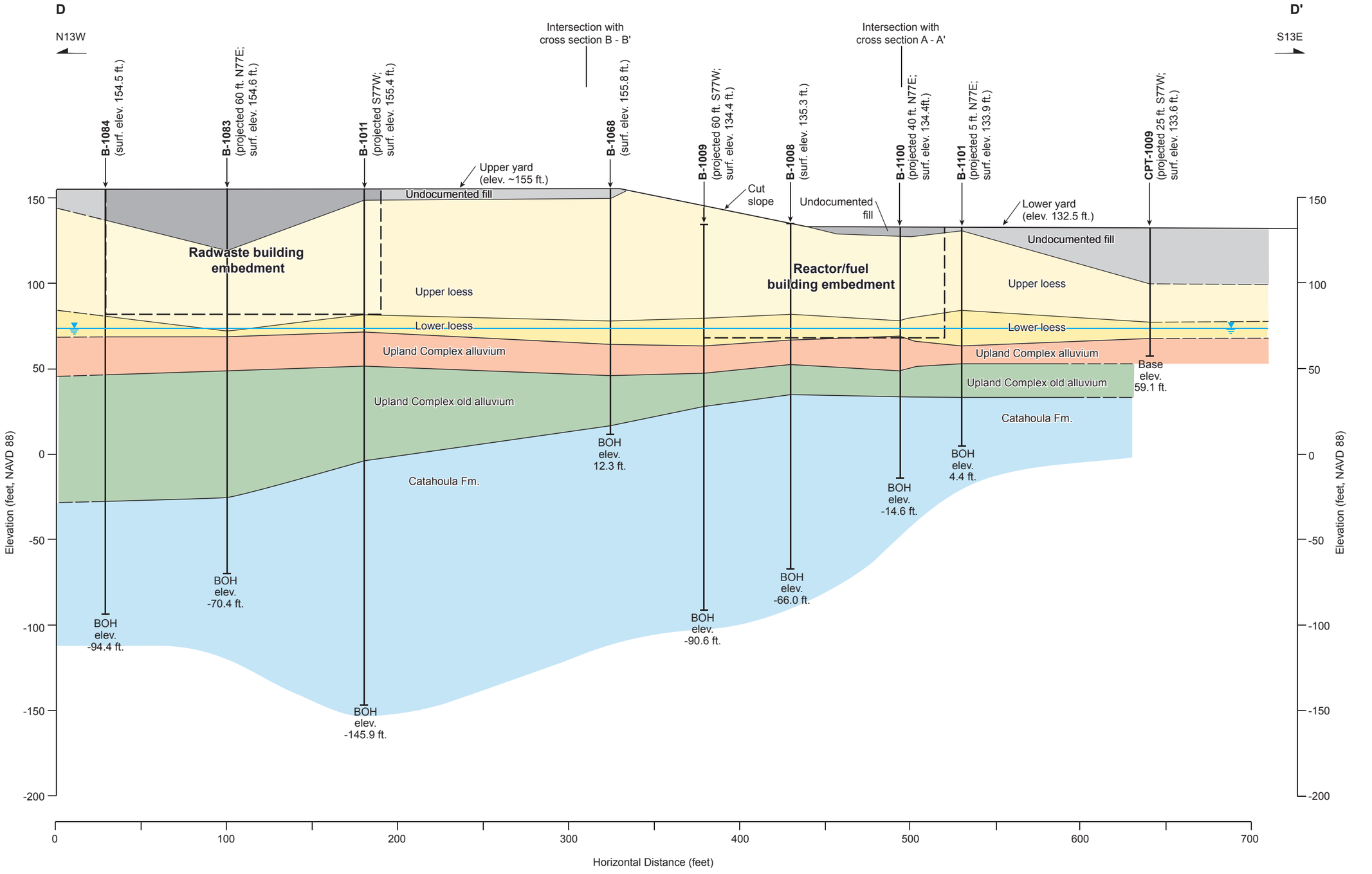


Figure 2.5.4-220. Cross Section D - D'

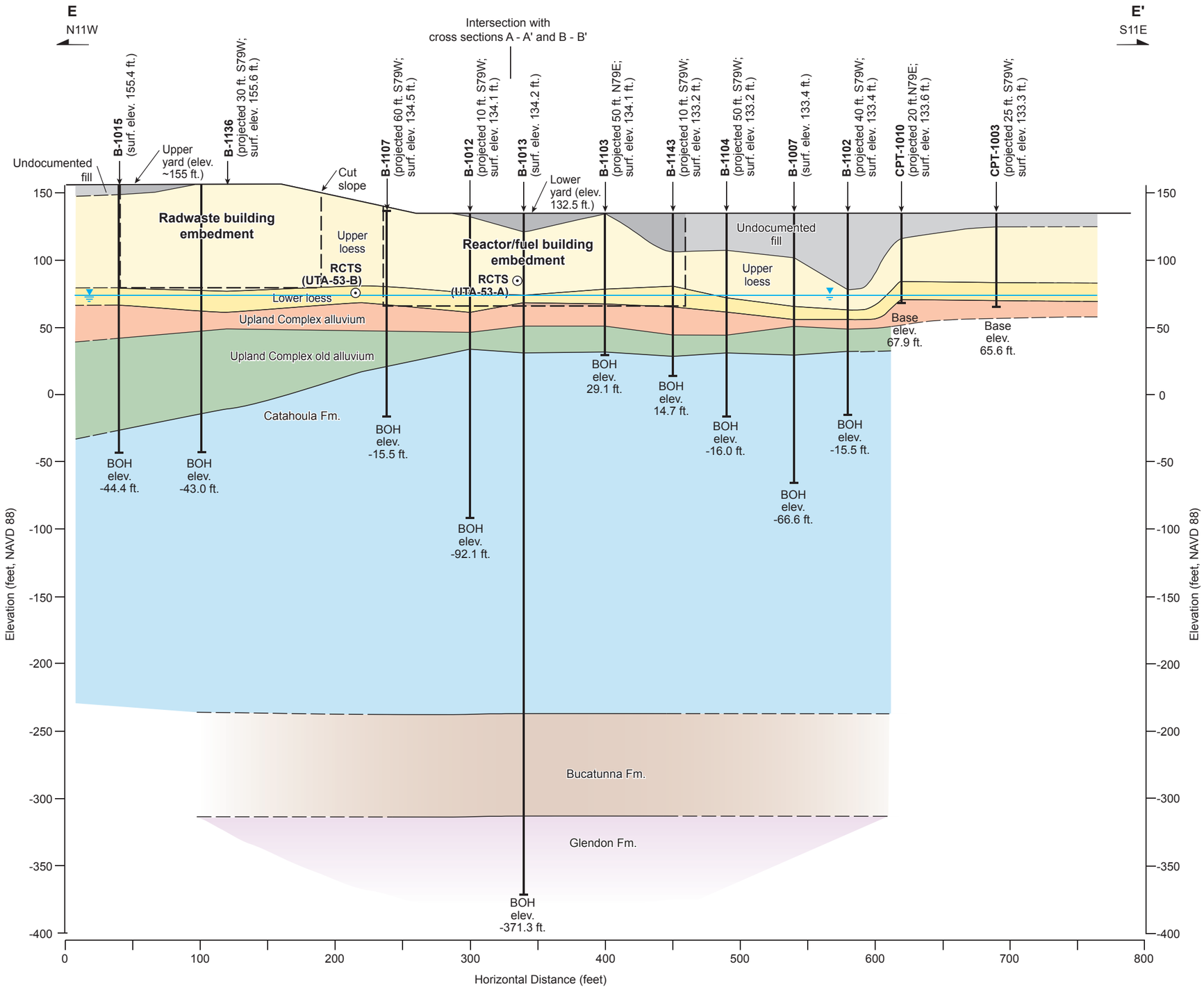


Figure 2.5.4-221. Cross Section E - E'

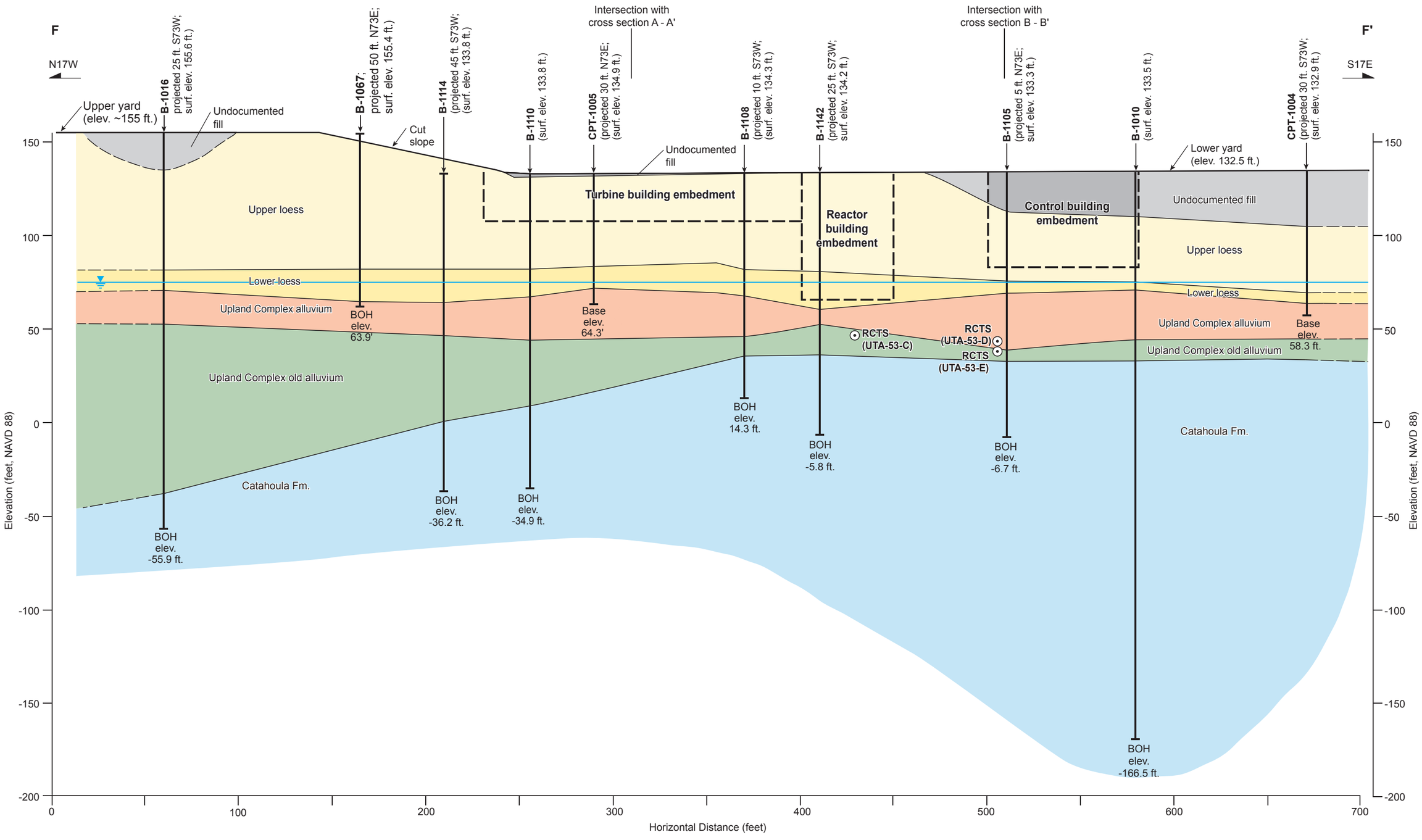


Figure 2.5.4-222. Cross Section F - F'

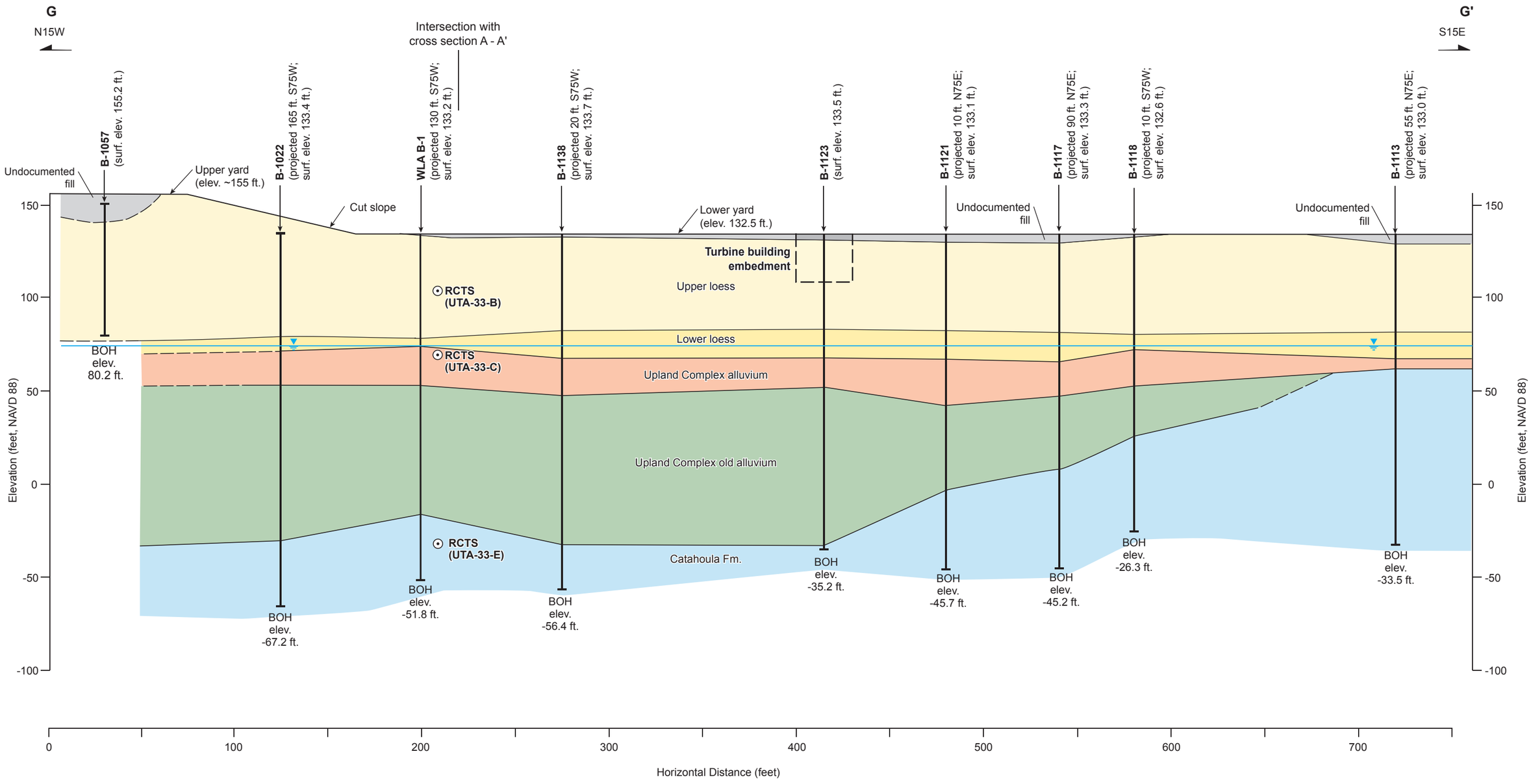


Figure 2.5.4-223. Cross Section G - G'

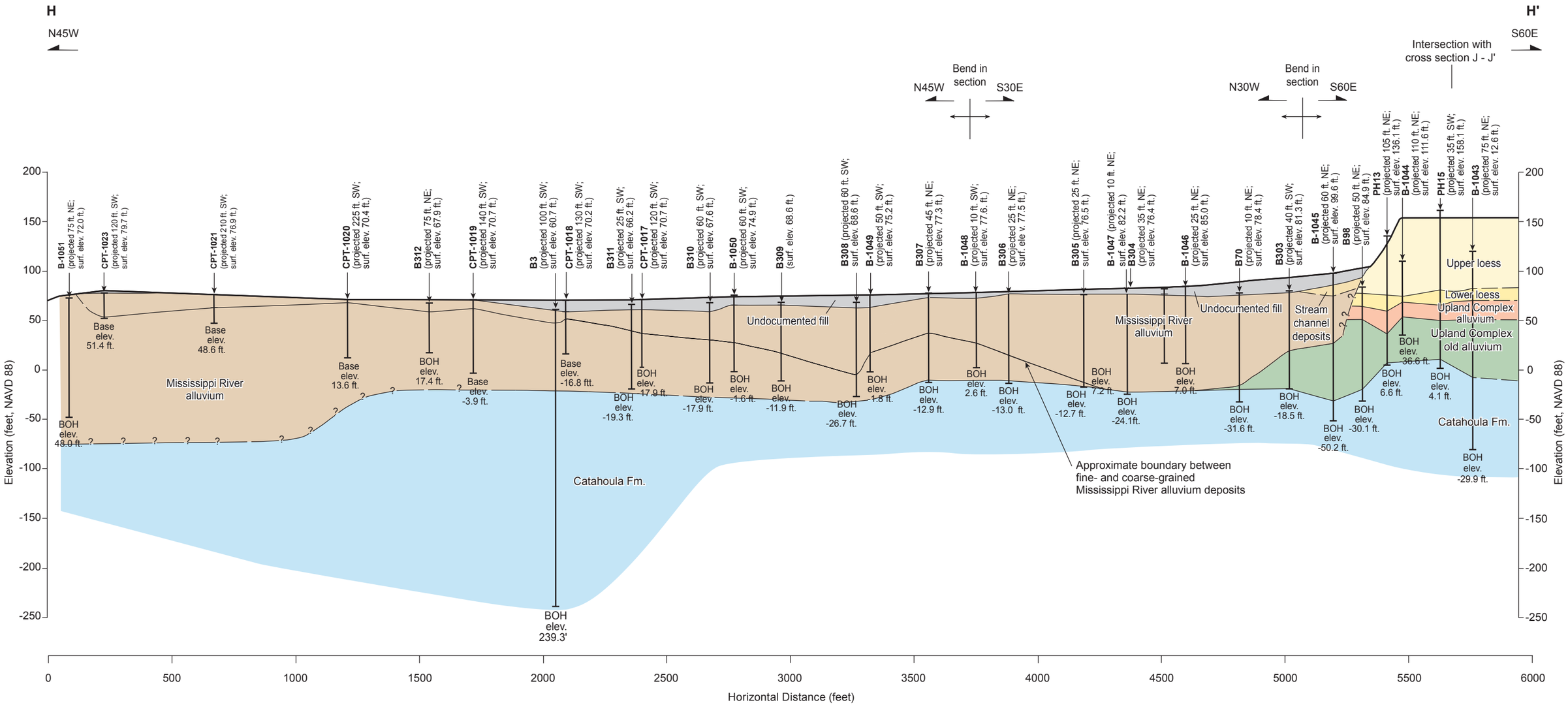


Figure 2.5.4-224. Cross Section H - H'

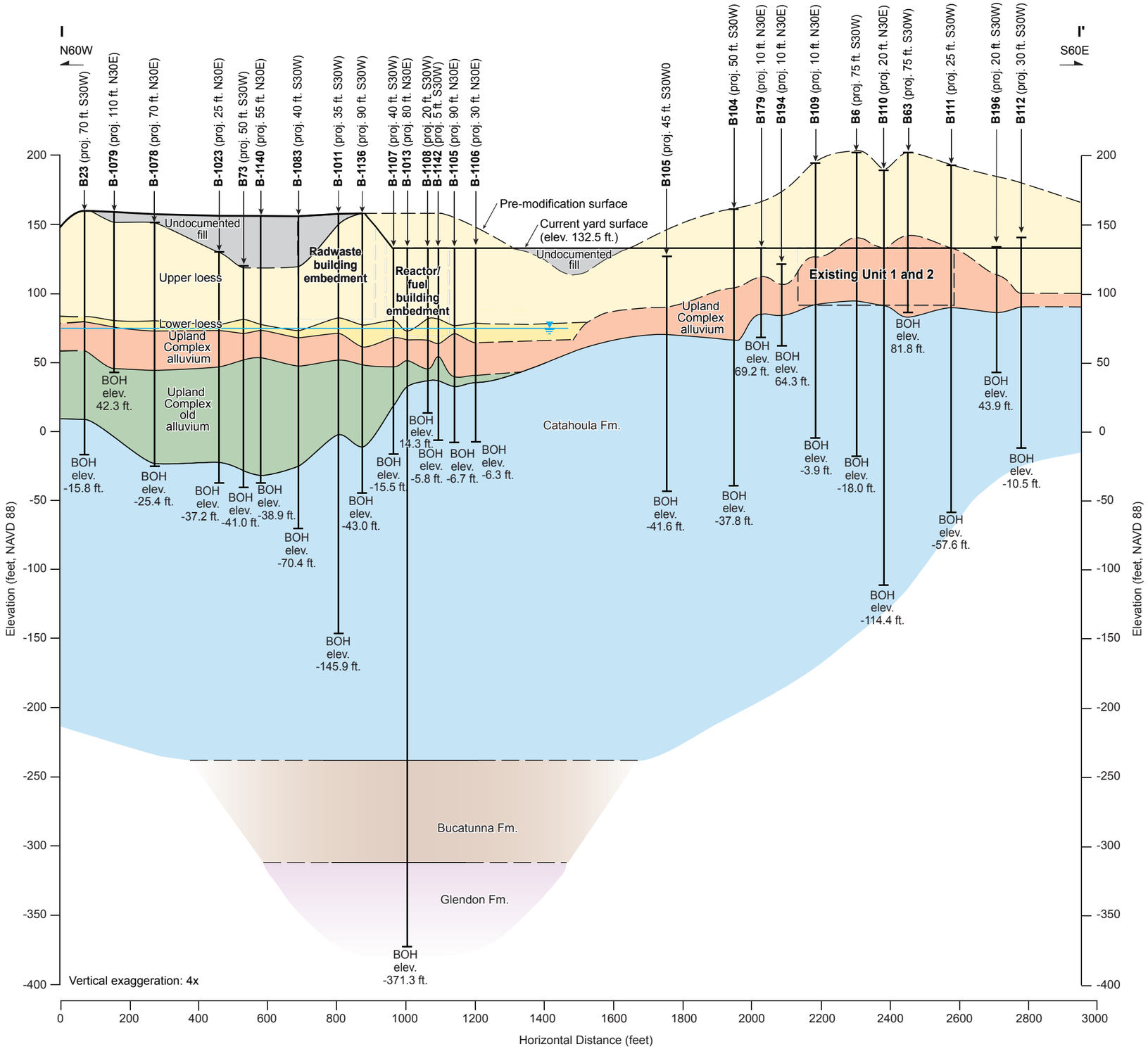


Figure 2.5.4-225. Cross Section I - I'

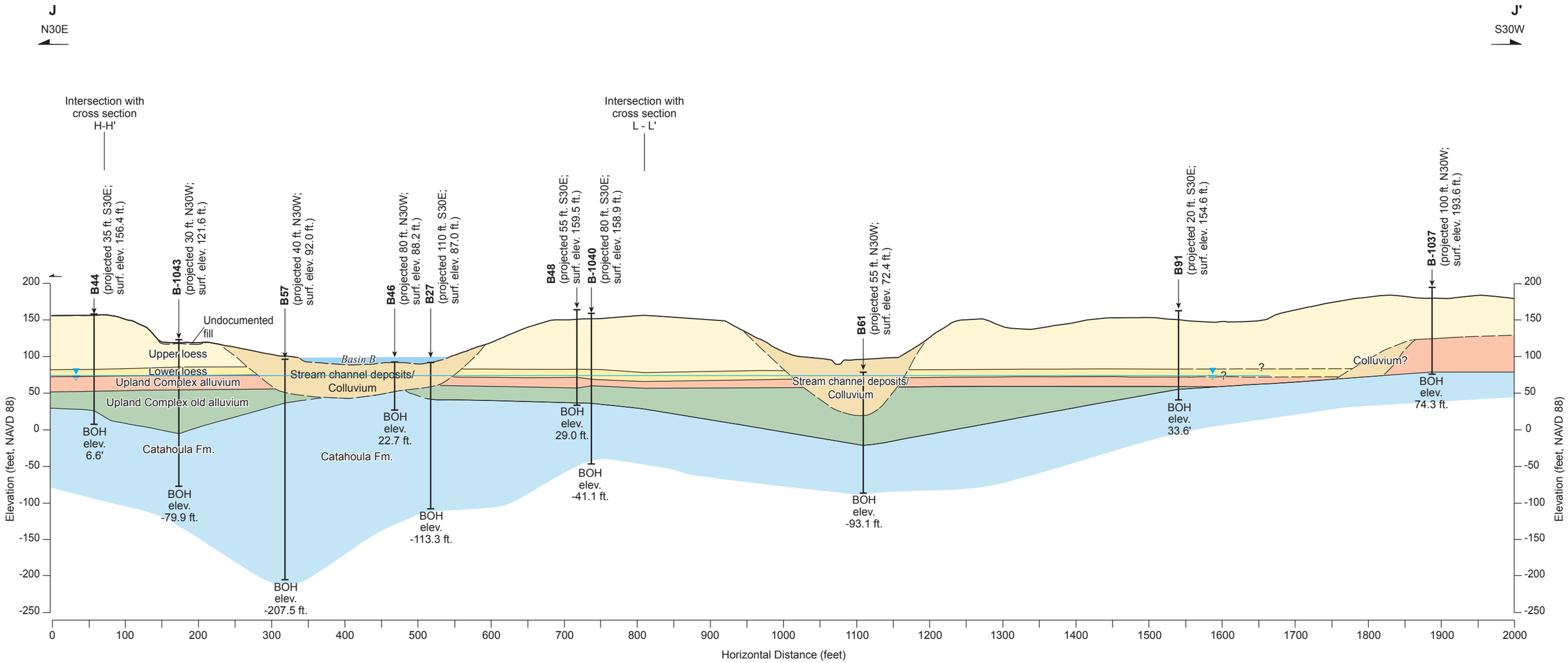


Figure 2.5.4-226. Cross Section J - J'

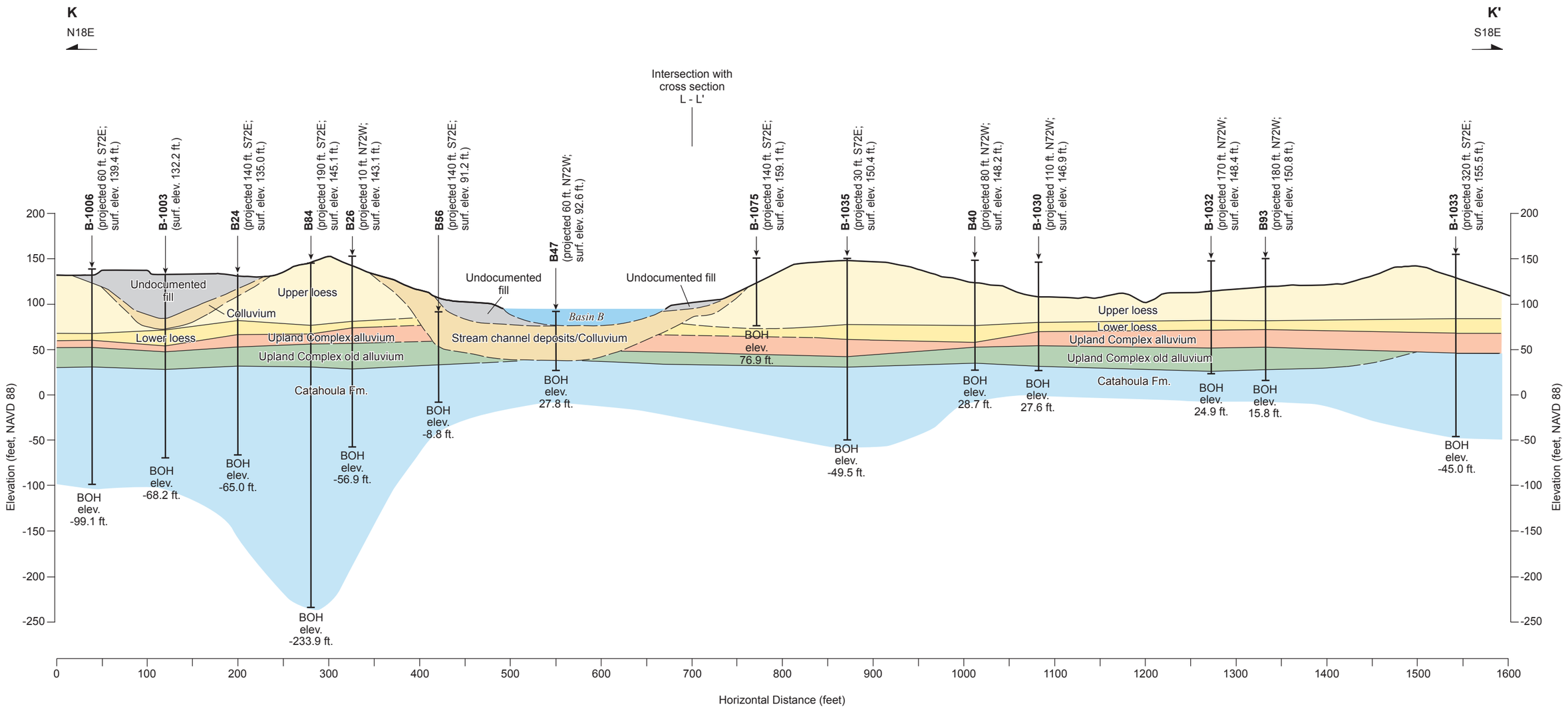


Figure 2.5.4-227. Cross Section K - K'

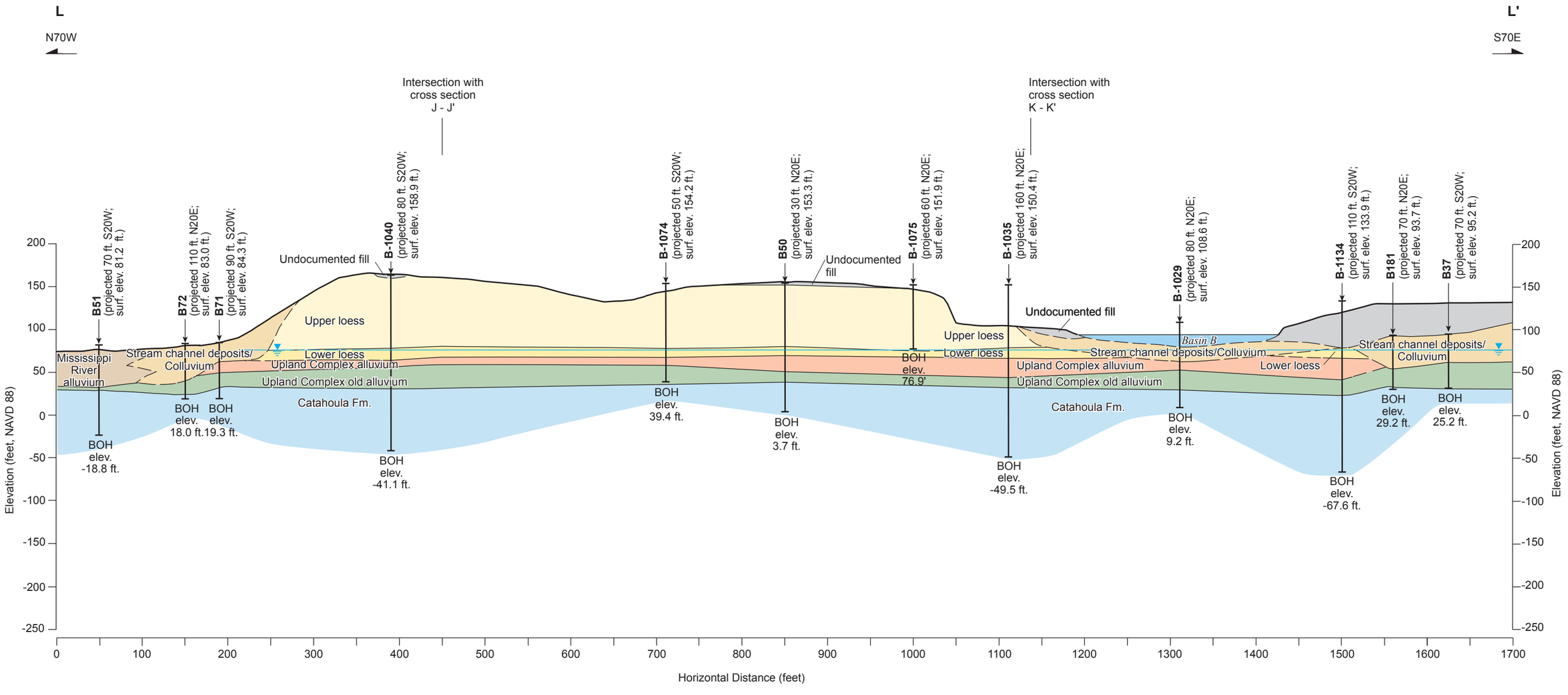
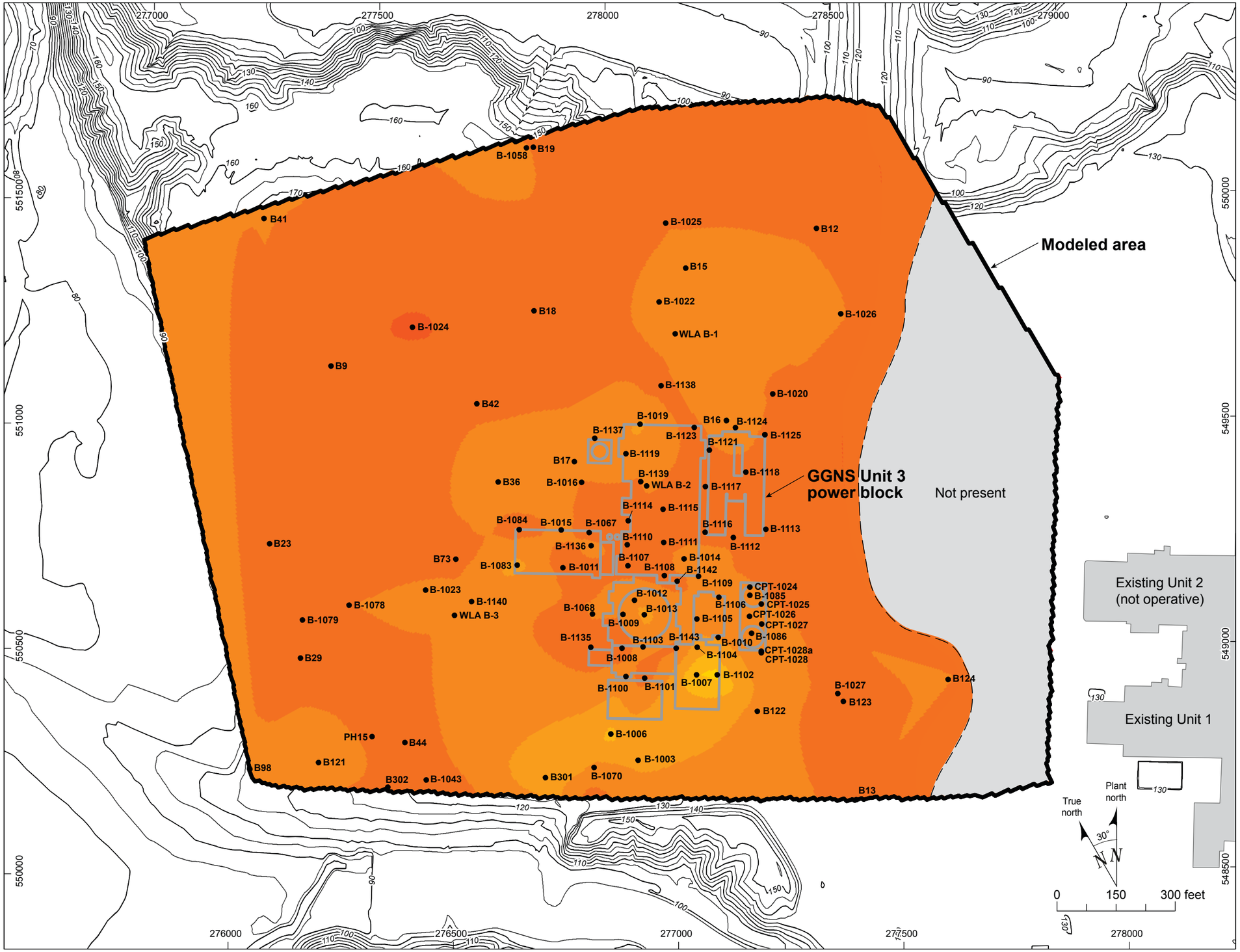


Figure 2.5.4-228. Cross Section L - L'



Legend

B-1025 ● Borehole location

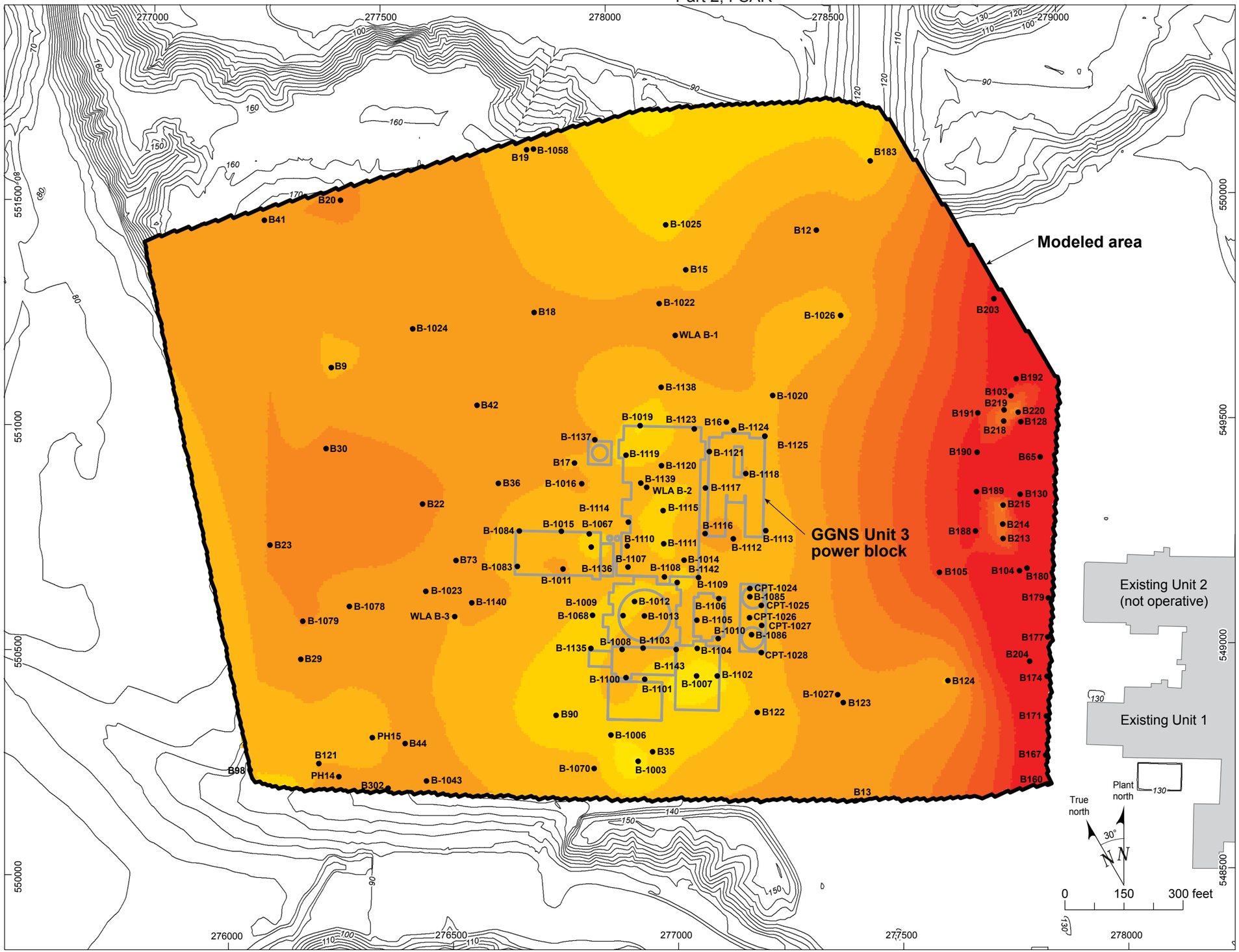
Top of Surface (feet)

Top of Lower loess

- >95
- 90 to 95
- 85 to 90
- 80 to 85
- 75 to 80
- 70 to 75
- 65 to 70
- 60 to 65
- 55 to 60
- 50 to 55
- 45 to 50
- 40 to 45
- 35 to 40
- 30 to 35
- 25 to 30
- 20 to 25
- 15 to 20
- 10 to 15
- 5 to 10
- 0 to 5
- -5 to 0
- -10 to -5
- -15 to -10
- -20 to -15
- -25 to -20
- -30 to - 25
- -35 to -30
- <-35

Notes:
1. Projection NAD 27 State Plane Mississippi West FIPS.
2. Vertical datum NAVD 88
3. Top of surface data were compiled from borehole logs located within the modeled area and used to interpolate a continuous top of unit surface map.

Figure 2.5.4-229. Structure Contour Map - Top of Lower Loess



Legend

B-1025 ● Borehole location

Top of Surface (feet)

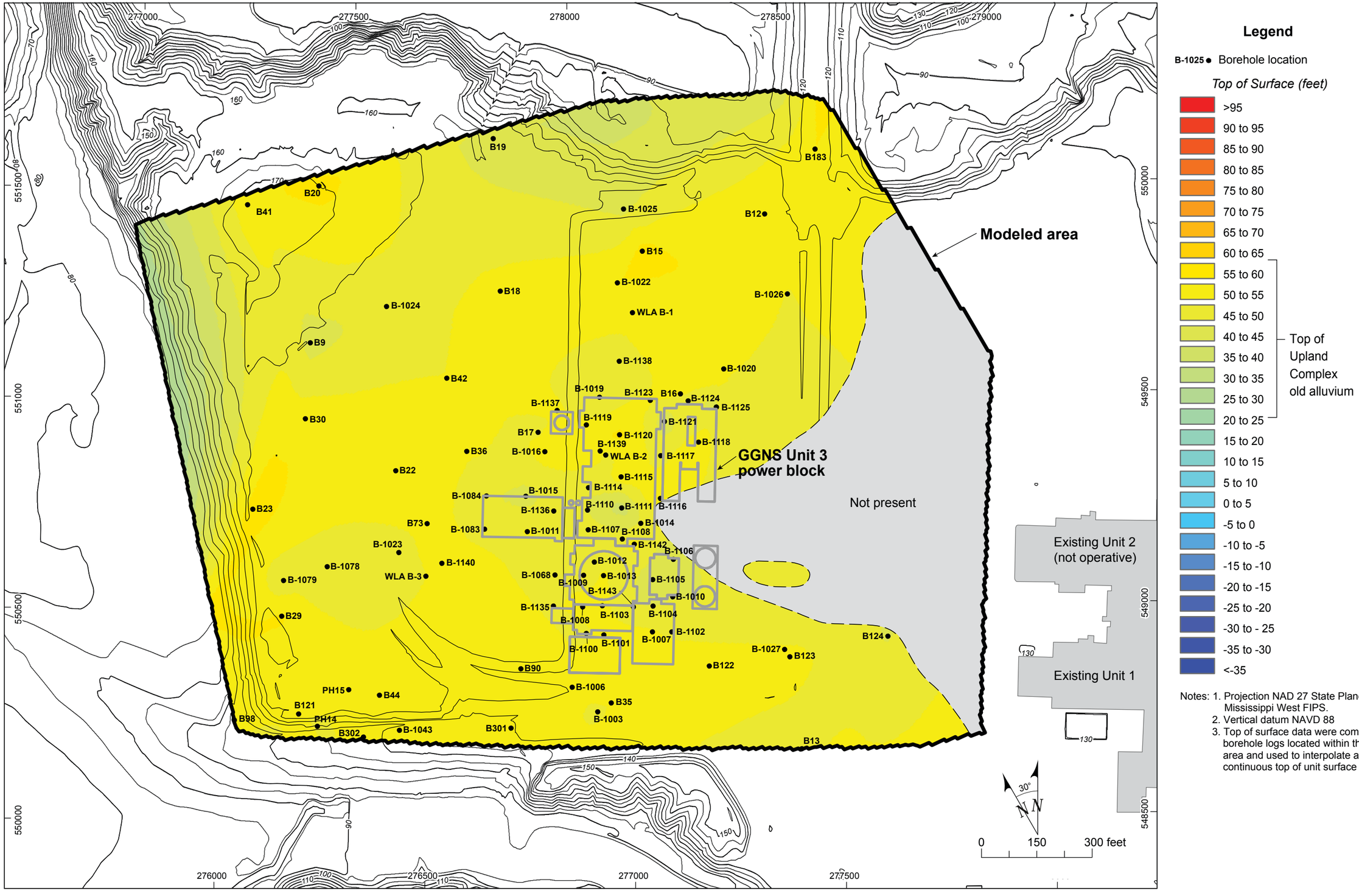
- >95
- 90 to 95
- 85 to 90
- 80 to 85
- 75 to 80
- 70 to 75
- 65 to 70
- 60 to 65
- 55 to 60

Top of Upland Complex alluvium

- 50 to 55
- 45 to 50
- 40 to 45
- 35 to 40
- 30 to 35
- 25 to 30
- 20 to 25
- 15 to 20
- 10 to 15
- 5 to 10
- 0 to 5
- -5 to 0
- -10 to -5
- -15 to -10
- -20 to -15
- -25 to -20
- -30 to - 25
- -35 to -30
- <-35

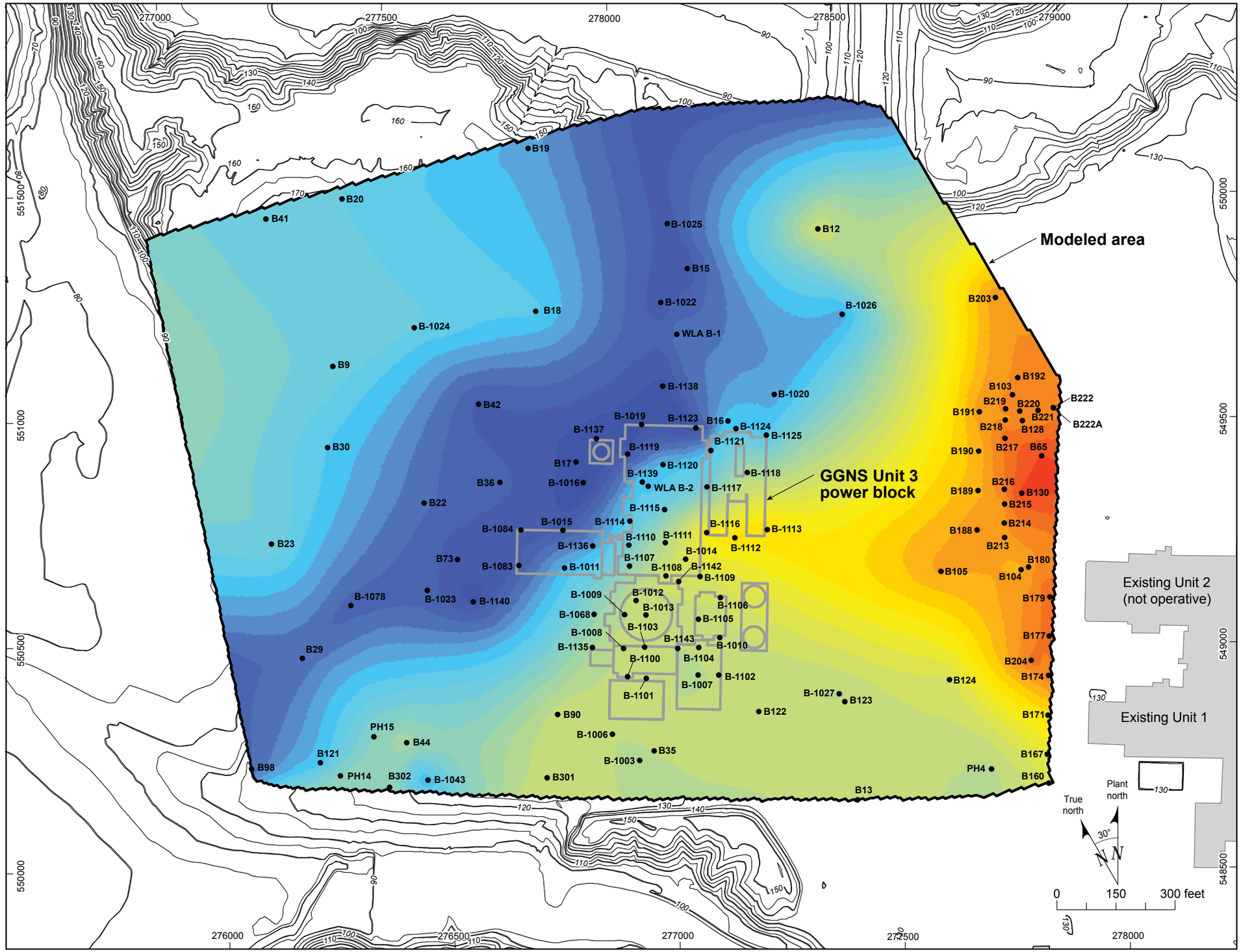
Notes: 1. Projection NAD 27 State Plane Mississippi West FIPS.
2. Vertical datum NAVD 88
3. Top of surface data were compiled from borehole logs located within the modeled area and used to interpolate a continuous top of unit surface map.

Figure 2.5.4-230. Structure Contour Map - Top of Upland Complex Alluvium



Notes: 1. Projection NAD 27 State Plane Mississippi West FIPS.
2. Vertical datum NAVD 88
3. Top of surface data were compiled from borehole logs located within the modeled area and used to interpolate a continuous top of unit surface map.

Figure 2.5.4-231. Structure Contour Map - Top of Upland Complex Old Alluvium



Legend

B-1025 ● Borehole location

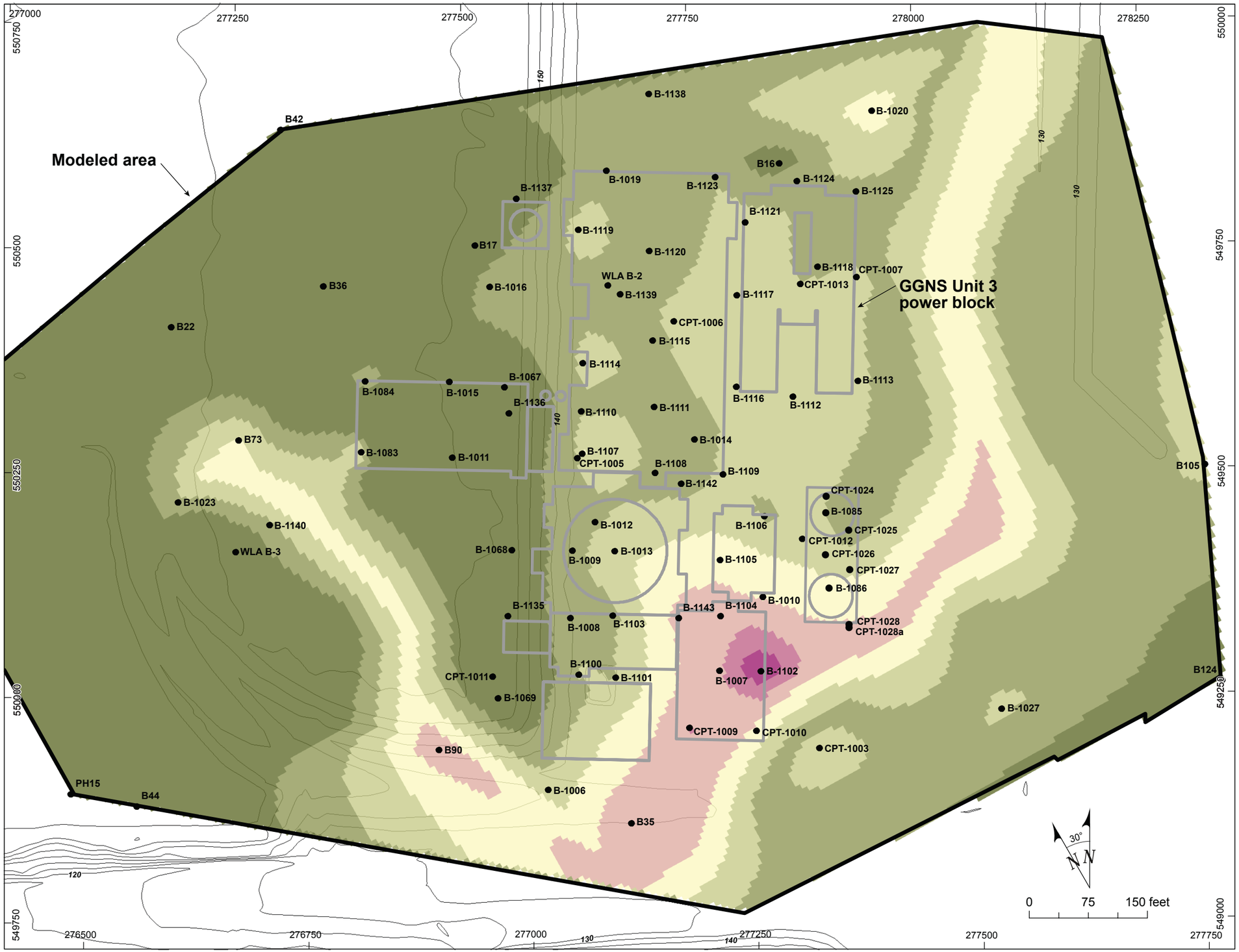
Top of Surface (feet)

- >95
- 90 to 95
- 85 to 90
- 80 to 85
- 75 to 80
- 70 to 75
- 65 to 70
- 60 to 65
- 55 to 60
- 50 to 55
- 45 to 50
- 40 to 45
- 35 to 40
- 30 to 35
- 25 to 30
- 20 to 25
- 15 to 20
- 10 to 15
- 5 to 10
- 0 to 5
- -5 to 0
- -10 to -5
- -15 to -10
- -20 to -15
- -25 to -20
- -30 to - 25
- -35 to -30
- <-35

Top of Catahoula Formation

Notes: 1. Projection NAD 27 State Plane Mississippi West FIPS.
2. Vertical datum NAVD 88
3. Top of surface data were compiled from borehole logs located within the modeled area and used to interpolate a continuous top of unit

Figure 2.5.4-232. Structure Contour Map - Top of Catahoula



Legend

B-1112 ● Borehole location

Elevation (feet)

- 140 to 158
- 130 to 140
- 120 to 130
- 110 to 120
- 100 to 110
- 90 to 100
- 80 to 90

Base of undocumented fill

Notes: 1. Projection NAD 27 State Plane Mississippi West FIPS
2. Vertical datum NAVD 88
3. Top of surface data were compiled from borehole logs located within the modeled area and used to interpolate a continuous top of unit surface

Figure 2.5.4-233. Structure Contour Map - Base of Undocumented Fill

Figure 2.5.4-234. Photographed Sample of
Typical Undocumented Fill

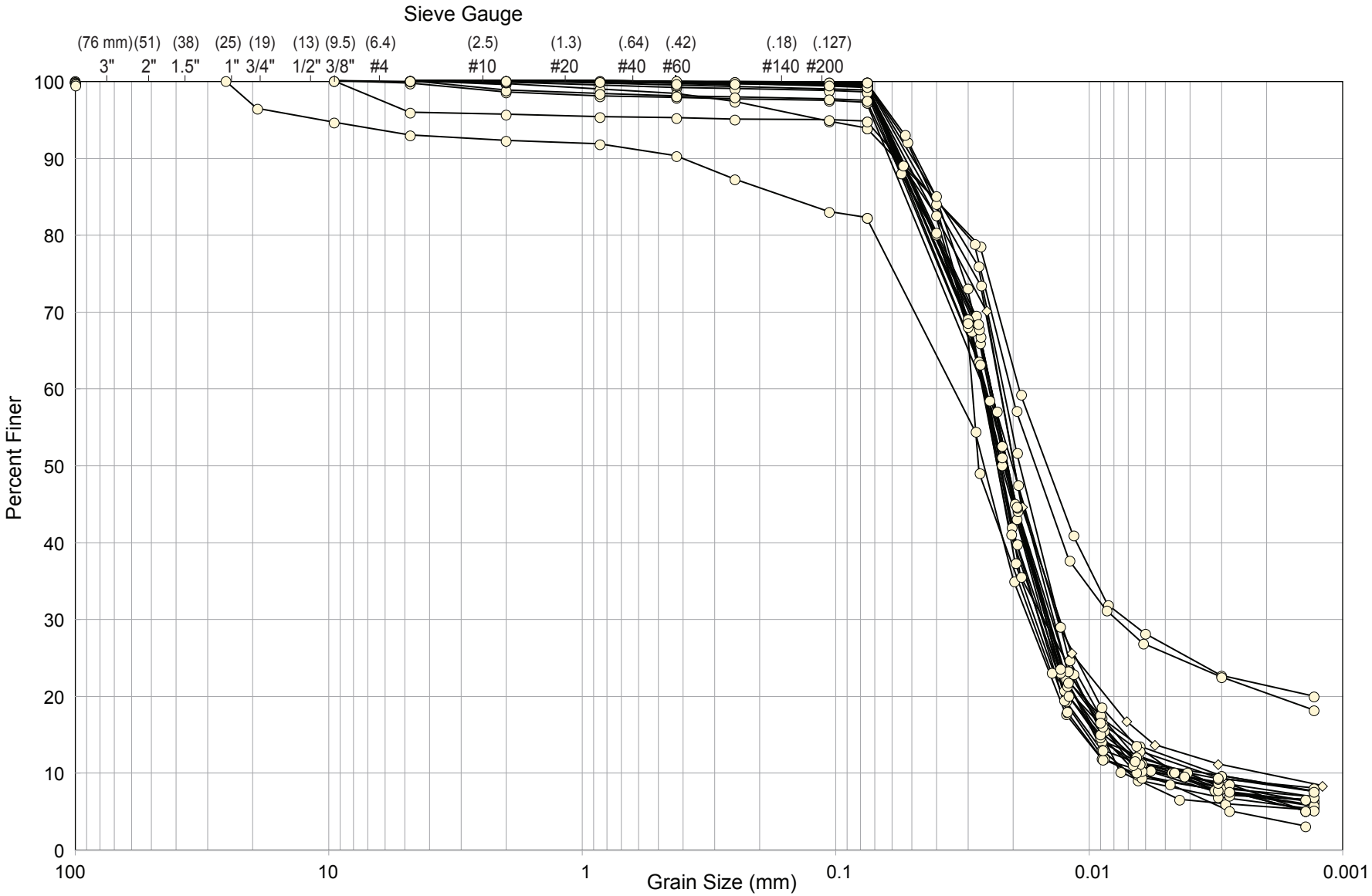


Figure 2.5.4-235. Grain Size Analysis - Upper Loess

Figure 2.5.4-236. Photographed Sample of
Typical Upper Loess

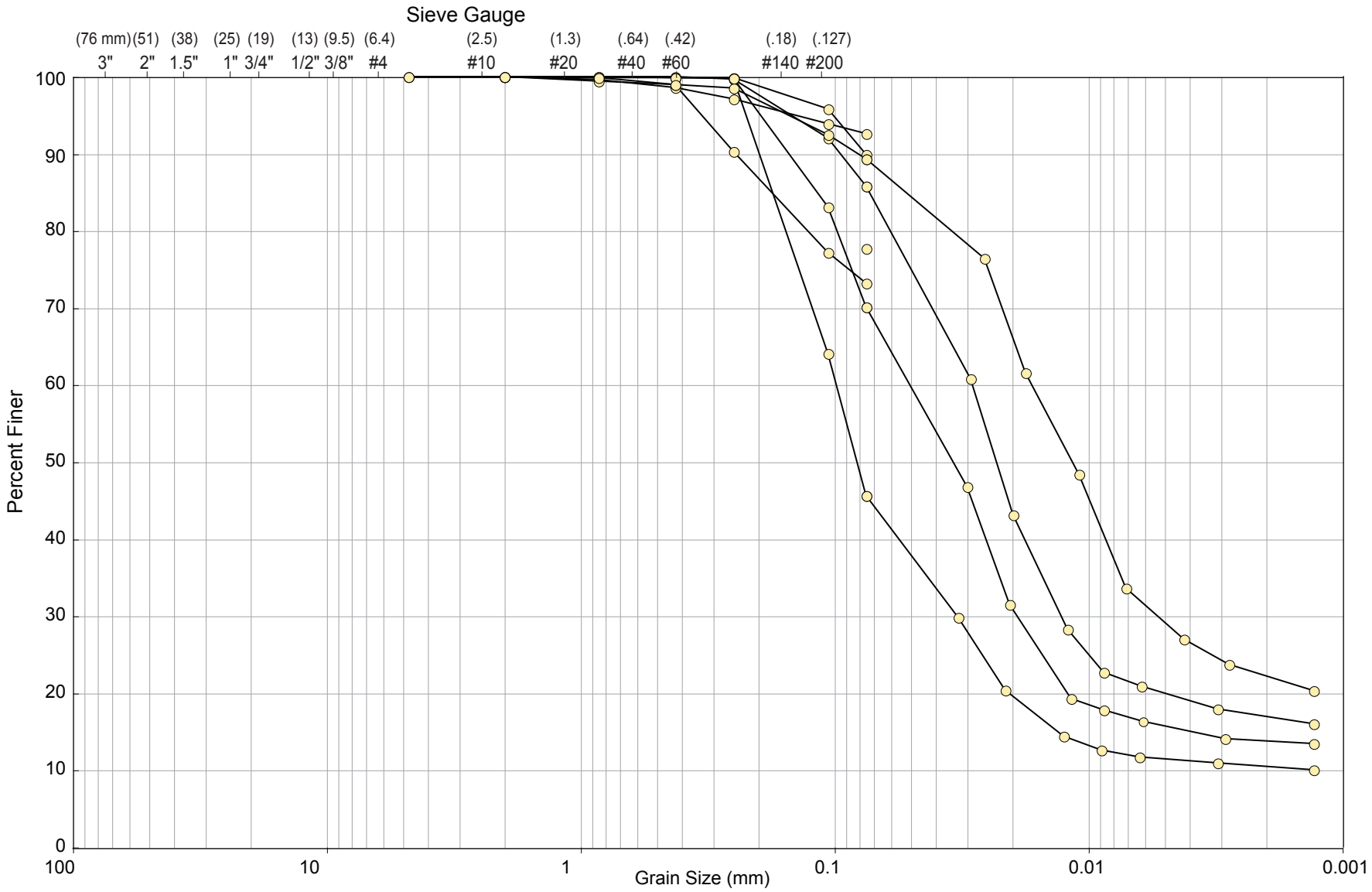


Figure 2.5.4-237. Grain Size Analysis - Lower Loess

Figure 2.5.4-238. Photographed Sample of
Typical Lower Loess

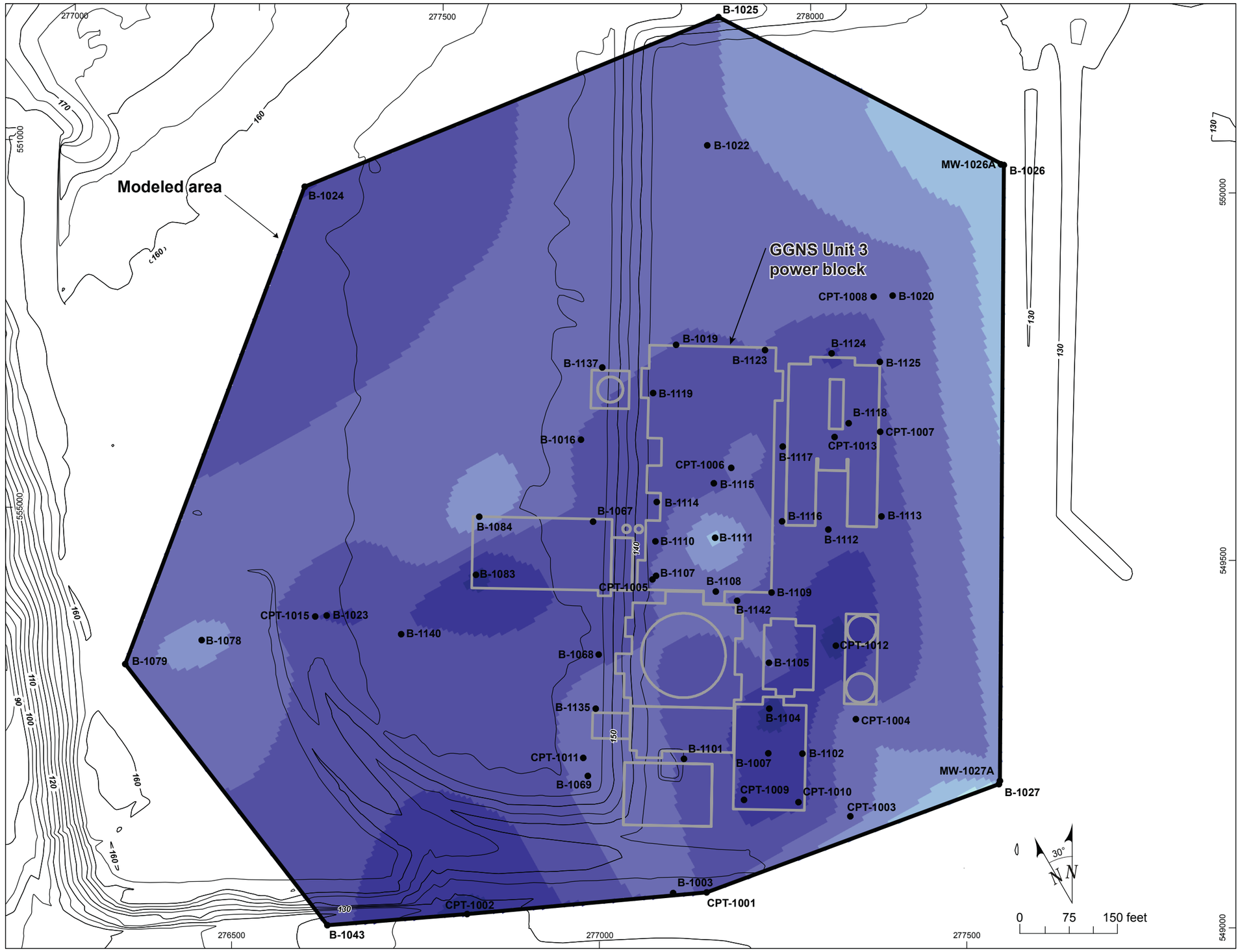


Figure 2.5.4-239. Elevation of Modeled Layer of High Water Content within the Upper and Lower Loess

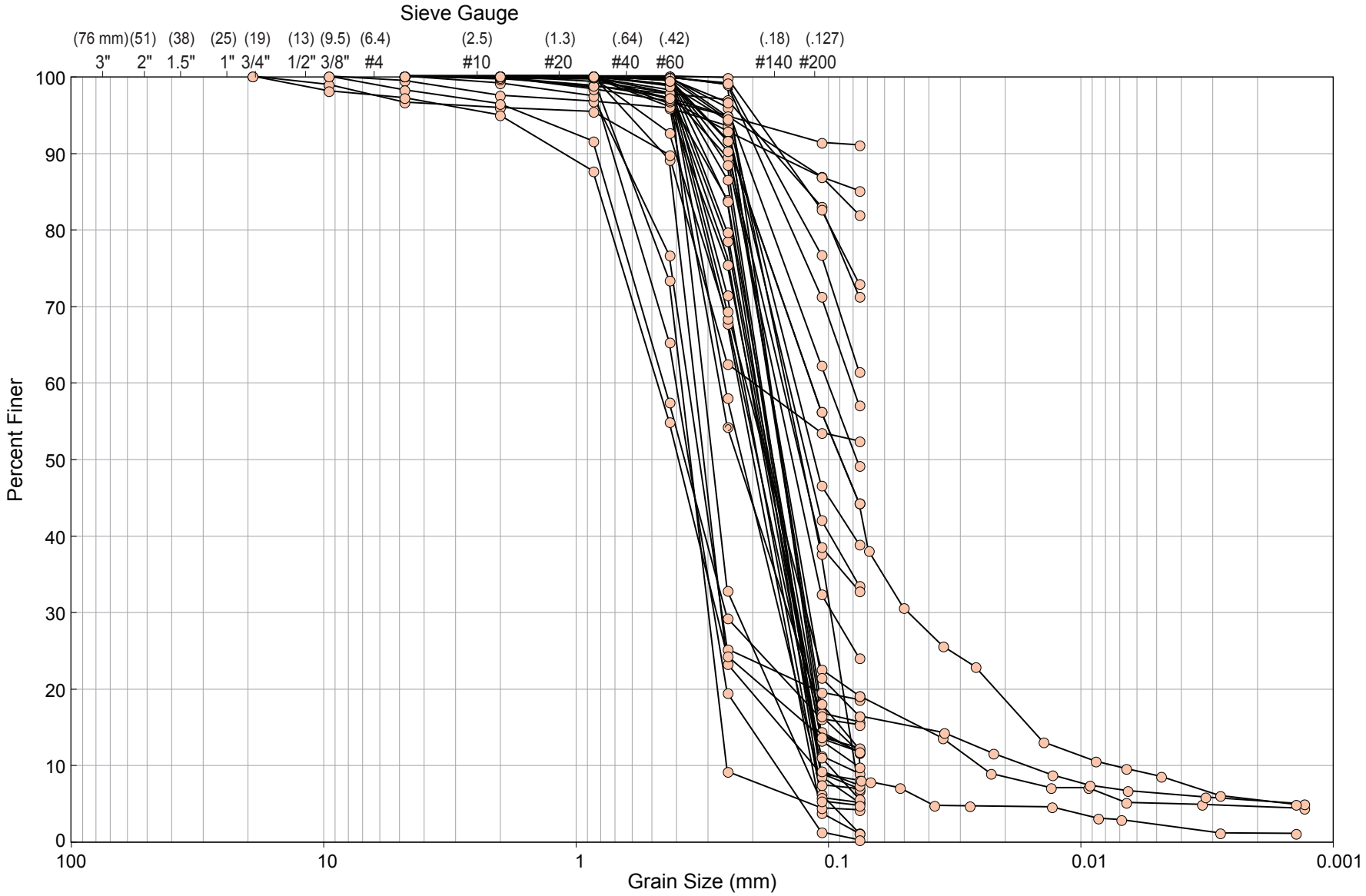


Figure 2.5.4-240. Grain Size Analysis - Upland Complex Alluvium

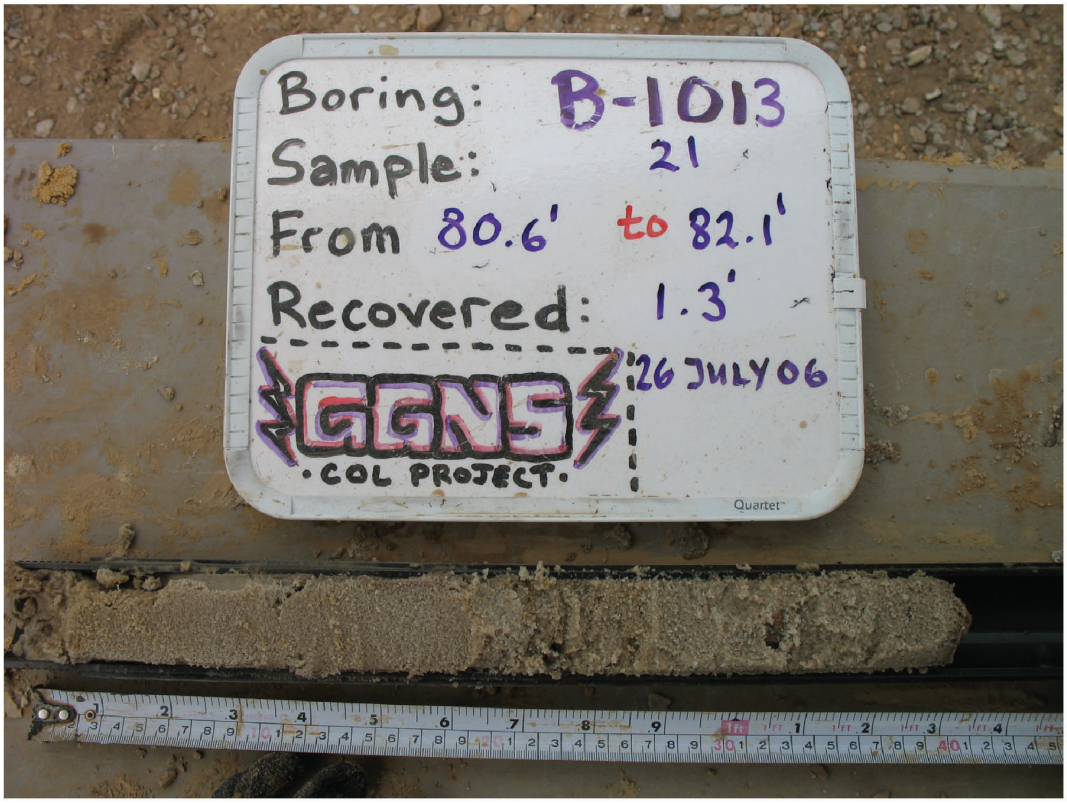


Figure 2.5.4-241. Photographed Sample of
Typical Upland Complex Alluvium

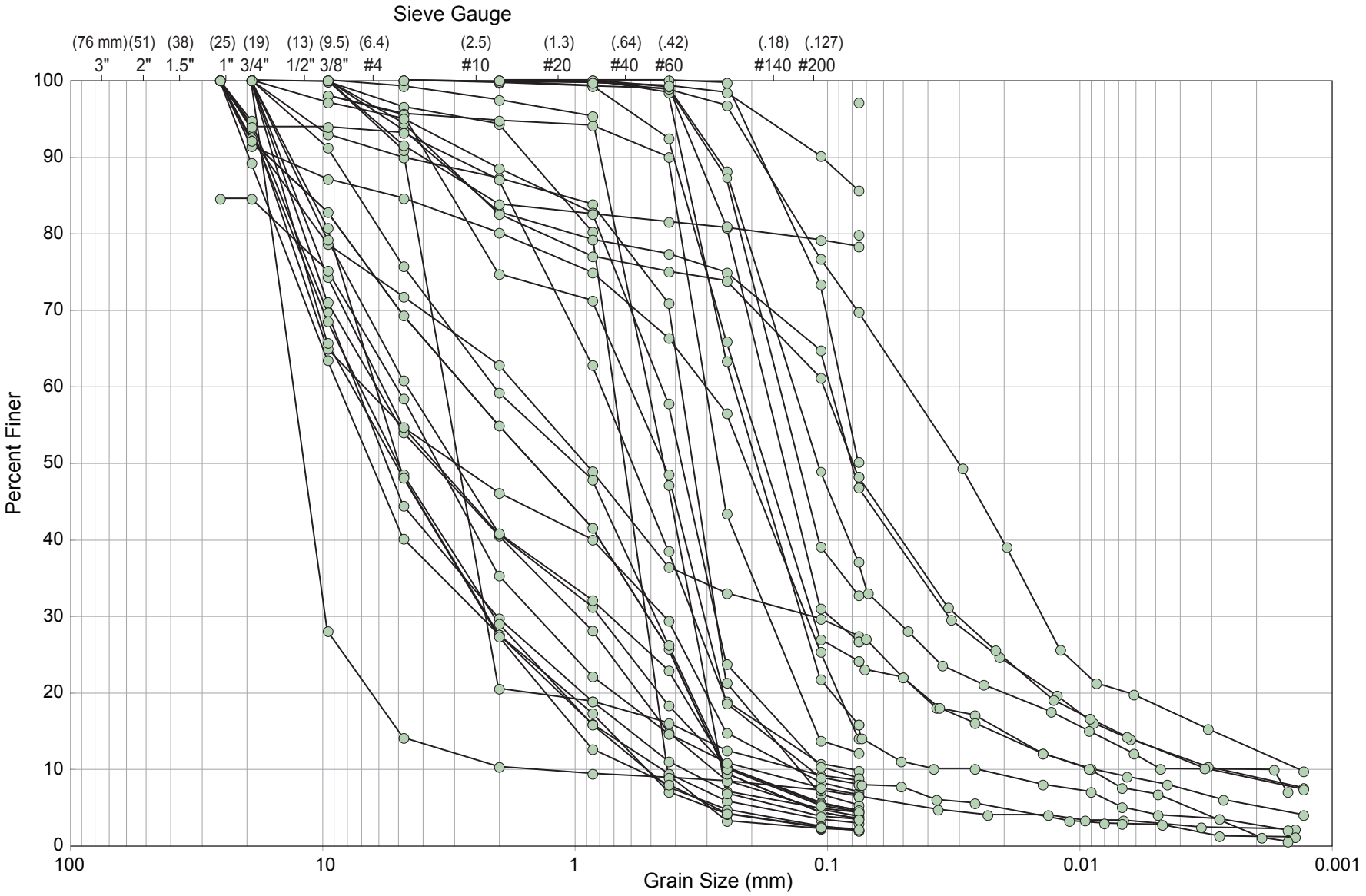


Figure 2.5.4-242. Grain Size Analysis - Upland Complex Old Alluvium

Figure 2.5.4-243. Photographed Sample of
Typical Upland Complex Old Alluvium

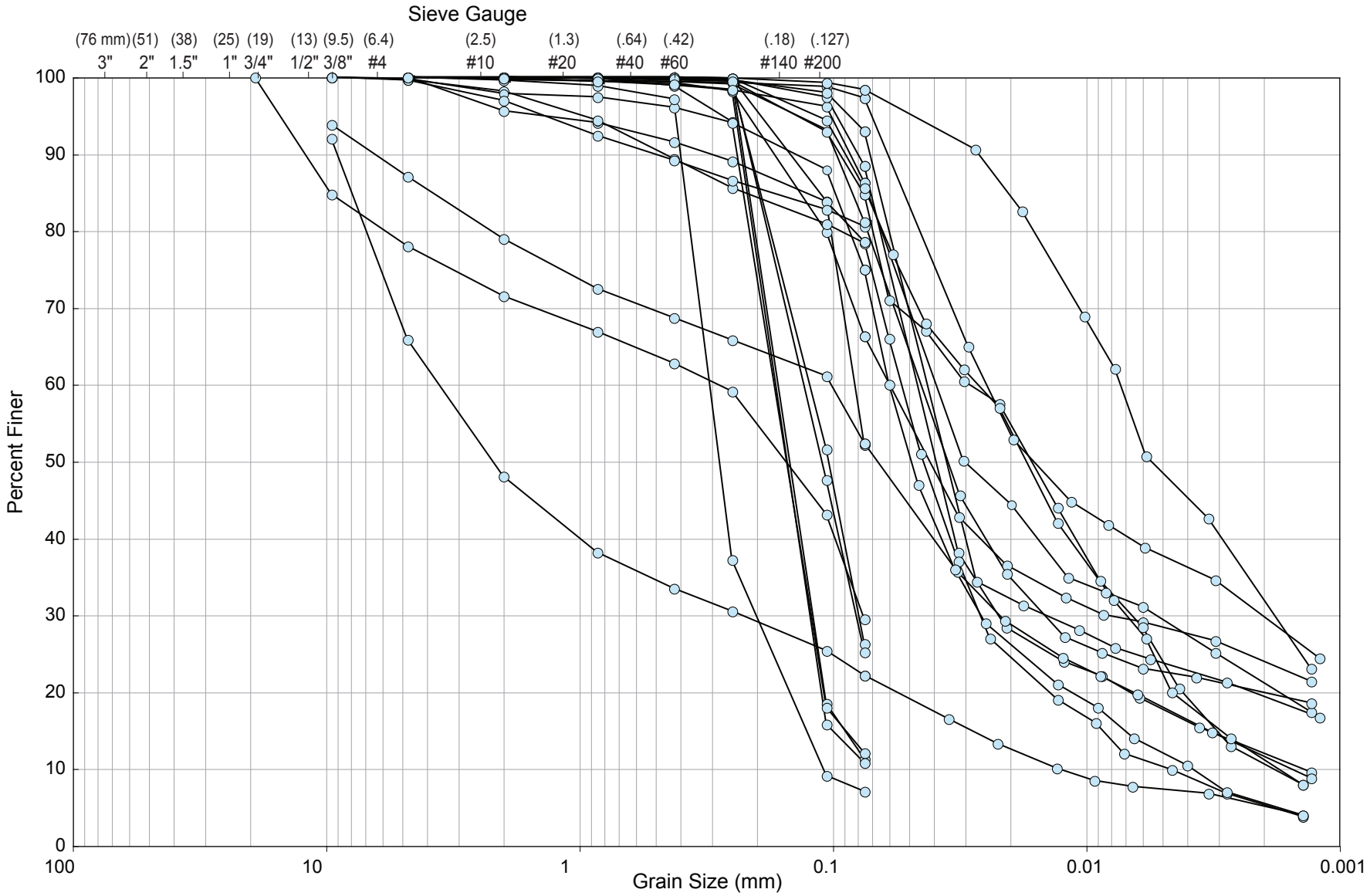


Figure 2.5.4-244. Grain Size Analysis - Catahoula Formation

Figure 2.5.4-245. Photographed Sample of Typical Catahoula Formation

Figure 2.5.4-246. Photographed Sample of Typical Bucatunna Formation

Figure 2.5.4-247. Photographed Sample of Typical Glendon Formation

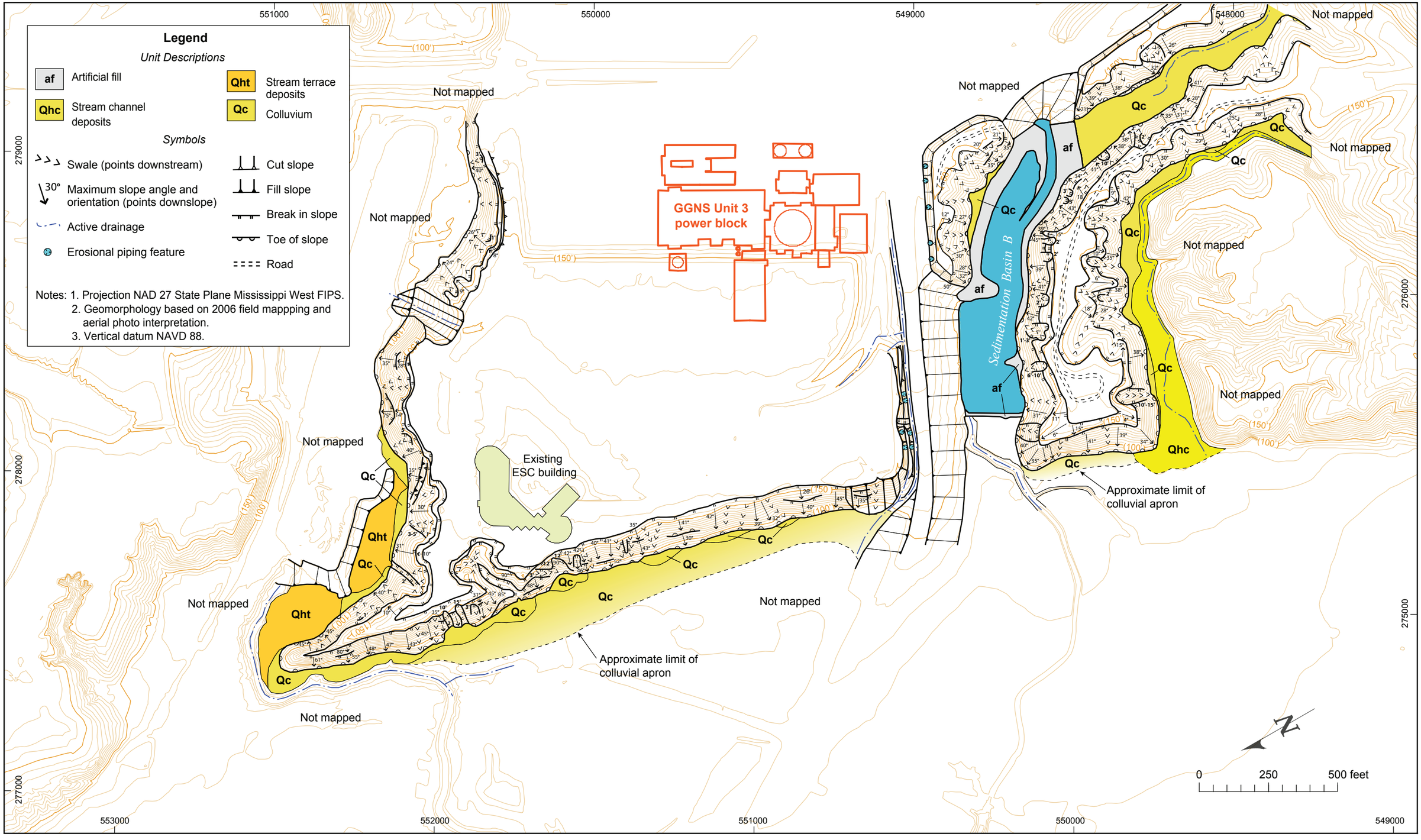
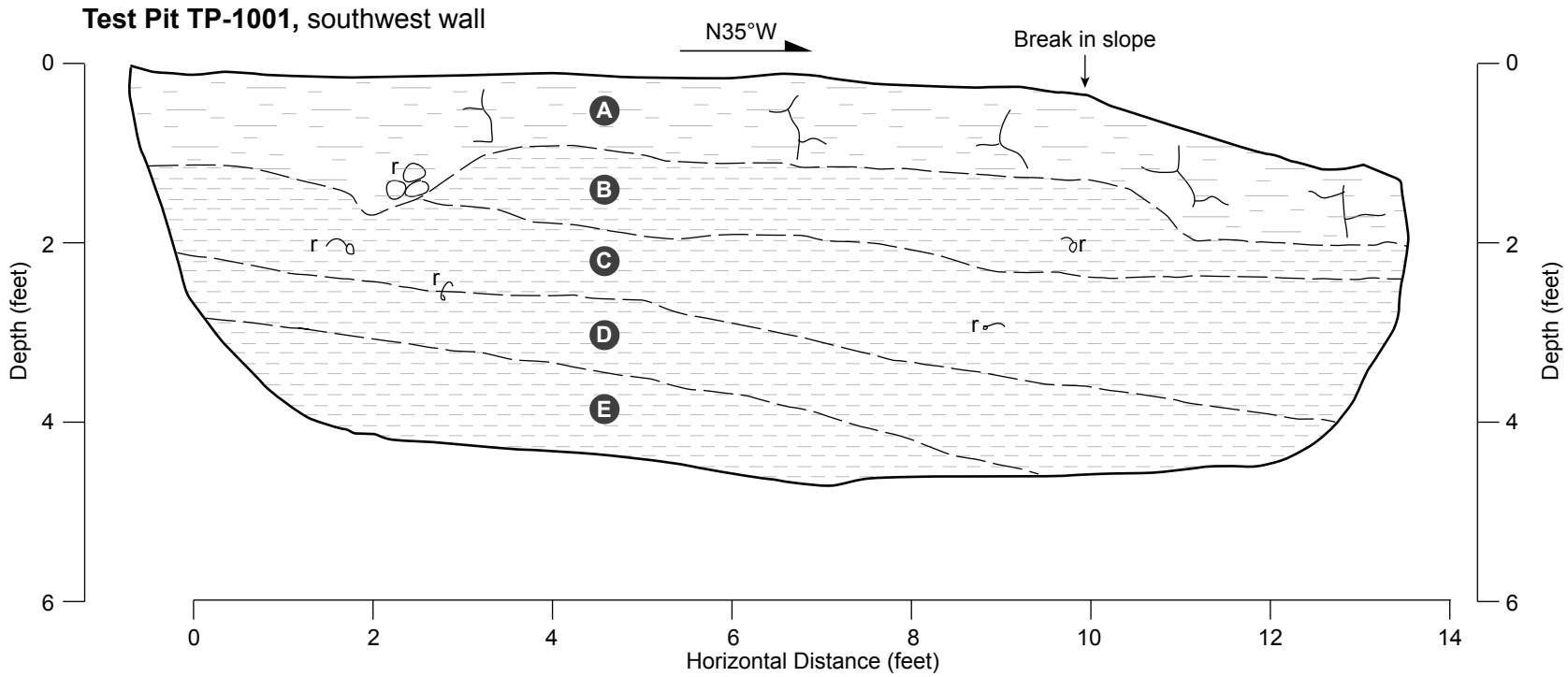


Figure 2.5.4-248. GGNS Hillslope Geomorphology Map



Legend

Symbols

r Roots

Soil ped shrinkage crack

Unit Descriptions

A Silt, clayey (ML) - brownish yellow (10YR 6/6), dry, heavily bioturbated, abundant rootlets

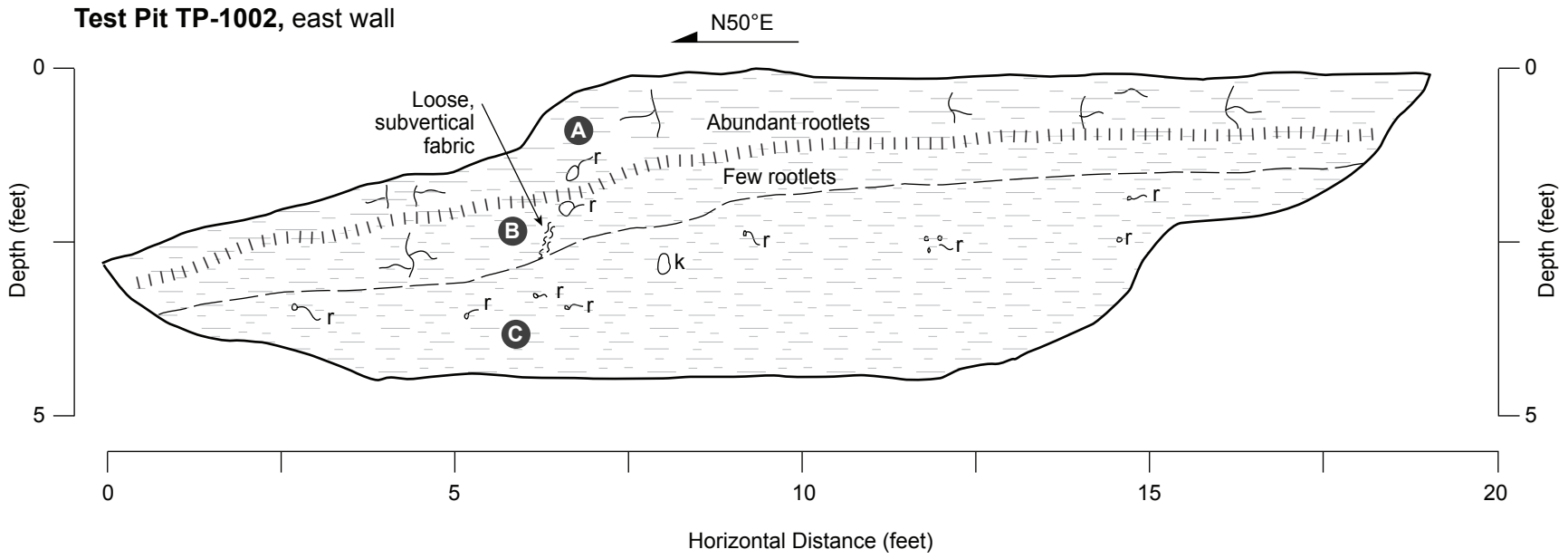
B Silt (ML) - yellowish brown (10YR 5/6), dry, few rootlets, common fine pores, no gravels

C Silt (ML) - yellowish brown (10YR 5/6) to (10YR 5/4), dry, few rootlets, common fine pores, slightly mottled, no gravels

D Silt (ML) - dark yellowish brown (10YR 4/6), dry, few rootlets, common fine pores, no gravels

E Silt (ML) - yellowish brown (10YR 5/6), dry, few rootlets, common fine pores, minor calcium carbonate, staining along root pores

Figure 2.5.4-249. Log of Test Pit TP-1001



Legend

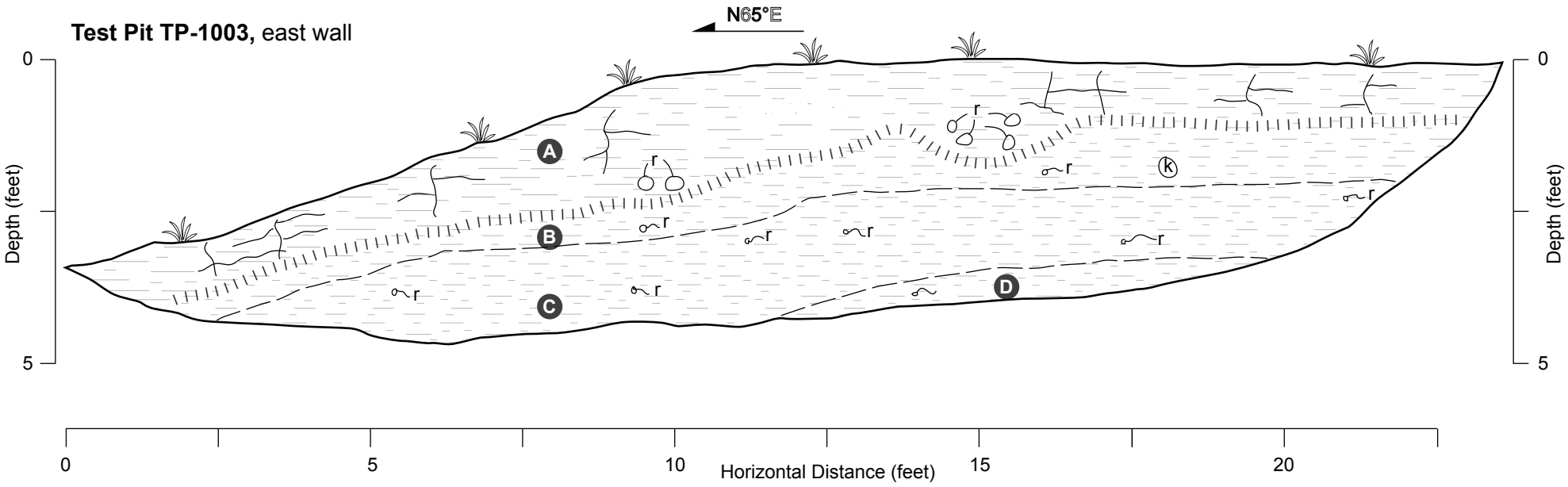
Symbols

- r — Roots
- Soil ped shrinkage crack
- k — Krotovina (animal burrows)
- Loose subvertical fabric
- Gradational soil contact

Unit Descriptions

- **A** Clay, silty (CL) - dark grayish brown (10YR 4/2), dry, medium stiff, heavily bioturbated, abundant rootlets up to 3 inches in diameter, gradational lower contact
- **B** Silt, clayey (ML) - brown (10YR 4/3) mottles to dark brown (10YR 3/3), dry, stiff (Pocket Penetrometer measured >4.5 tsf due to dry conditions), few rootlets, bleached horizon (E) near upper contact, blocky structure, few krotovinas, wavy lower contact
- **C** Silt, clayey (ML) - dark yellowish brown (10YR 4/6), dry, stiff, few mottled dark brown (10YR 3/3) zones (krotovinas?) oxidized B horizon, blocky structure, wavy lower contact

Figure 2.5.4-250. Log of Test Pit TP-1002



Legend

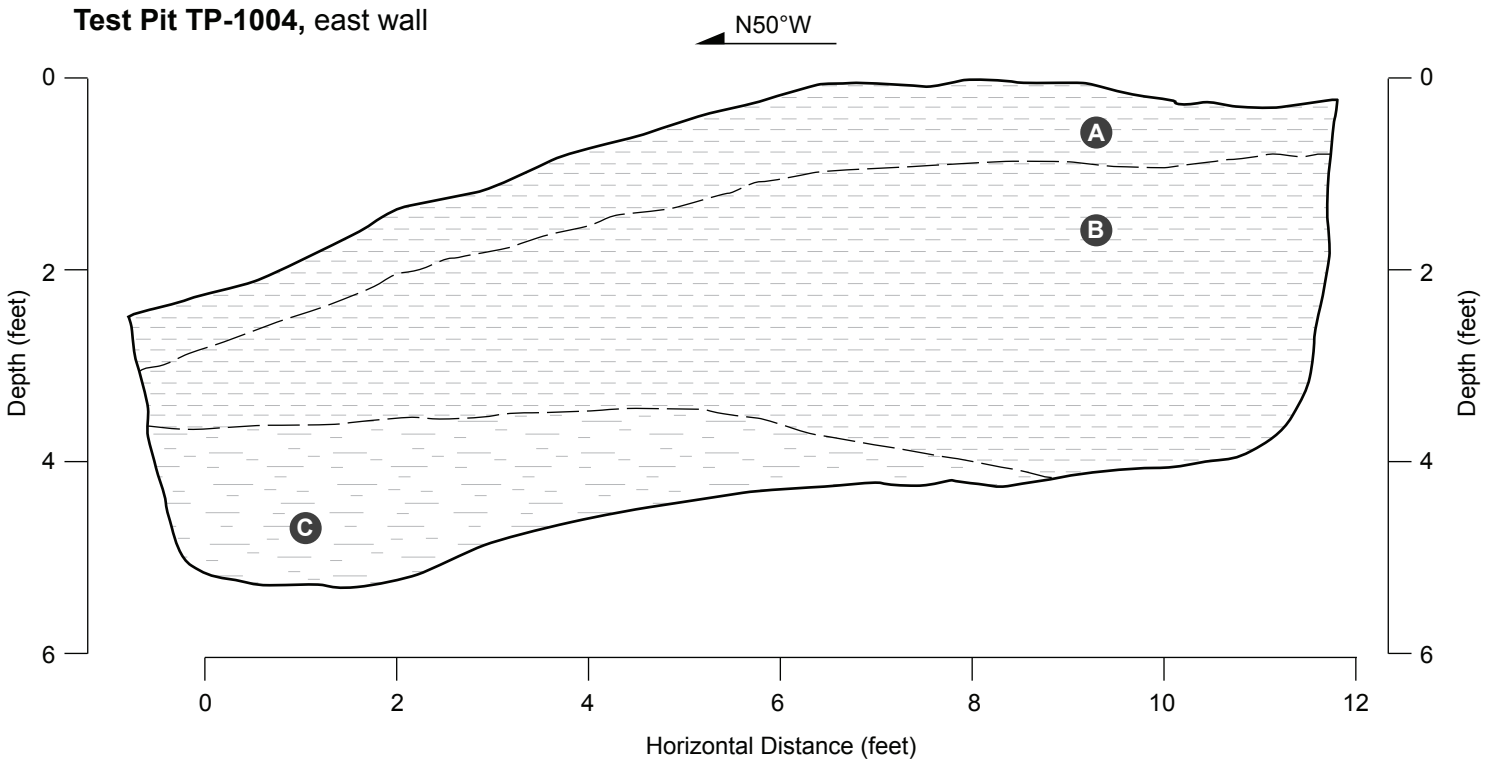
Symbols

- r — Roots
- Soil ped shrinkage crack
- (k) — Krotovina (animal burrows)
- Gradational soil contact

Unit Descriptions

- **A** Clay, silty (CL) - dark grayish brown (10YR 4/2), dry, medium stiff, heavily bioturbated, abundant rootlets up to 3 inches in diameter, gradational lower contact
- **B** Silt, clayey (ML) - brown (10YR 4/3) mottles to dark brown (10YR 3/3), dry, stiff (Pocket Penetrometer measured >4.5 tsf due to dry conditions), few rootlets, bleached horizon (E) near upper contact, blocky structure, few krotovinas, wavy lower contact
- **C** Silt, clayey (ML) - dark yellowish brown (10YR 4/6), dry, stiff, few mottled dark brown (10YR 3/3) zones (krotovinas?) oxidized B horizon, blocky structure, wavy lower contact
- **D** Silt, clayey (ML) - yellowish brown (10YR 5/6), dry, stiff, blocky structure

Figure 2.5.4-251. Log of Test Pit TP-1003



Legend

A Silt (ML) - yellowish brown (10YR 5/8), dry, rootlets, common fine pores, slight bioturbation, trace gravel (Fill).

B Silt (ML) - yellowish brown (10YR 5/8), dry, few rootlets, trace gravel up to 1/3-inch in diameter (Fill)

C Clay, silty (CL) - dark yellowish brown (10YR 4/6), dry, trace gravel and sand, few rootlets (Fill)

Figure 2.5.4-252. Log of Test Pit TP-1004

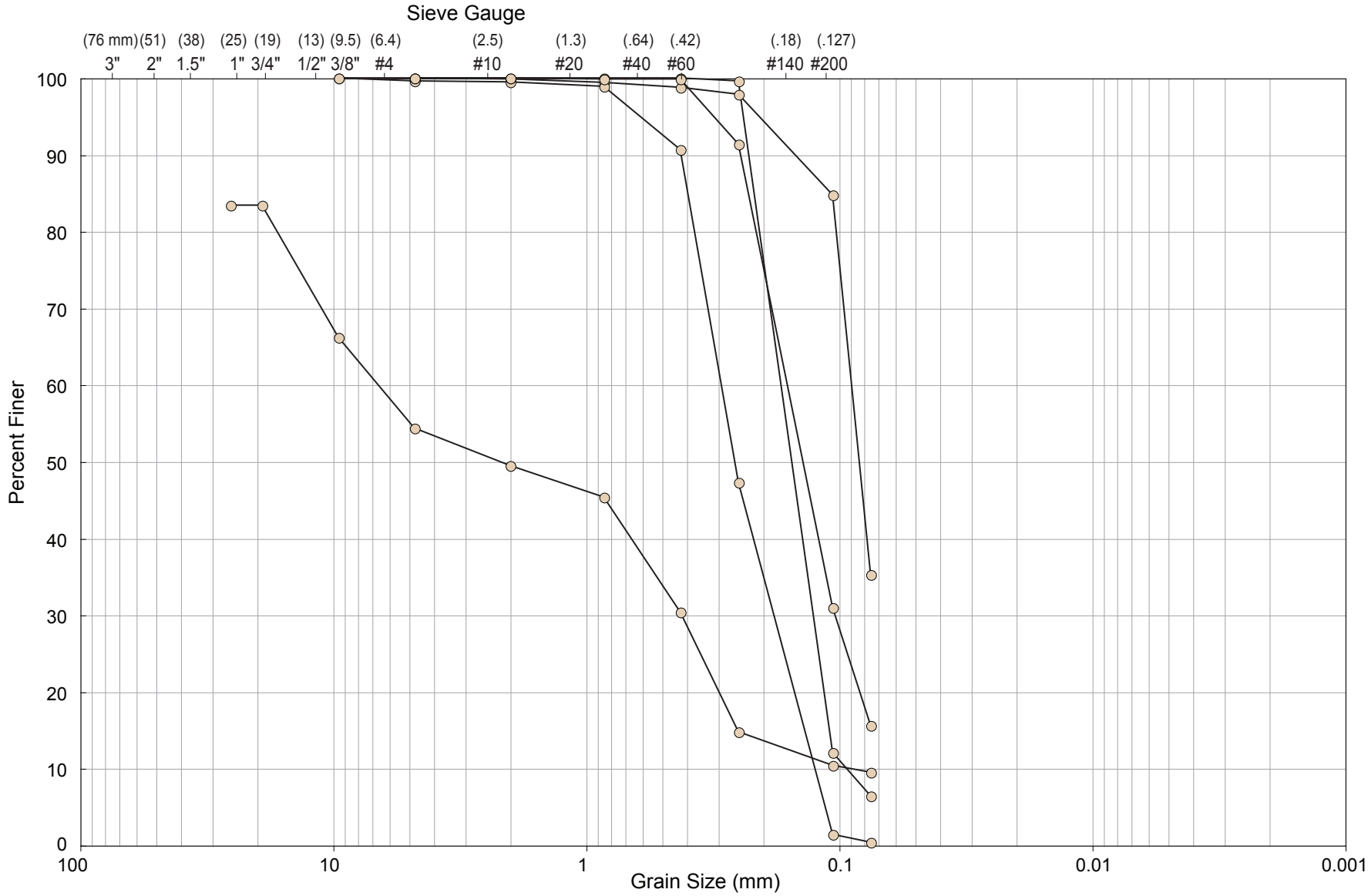


Figure 2.5.4-253. Grain Size Analysis - Mississippi River Alluvium

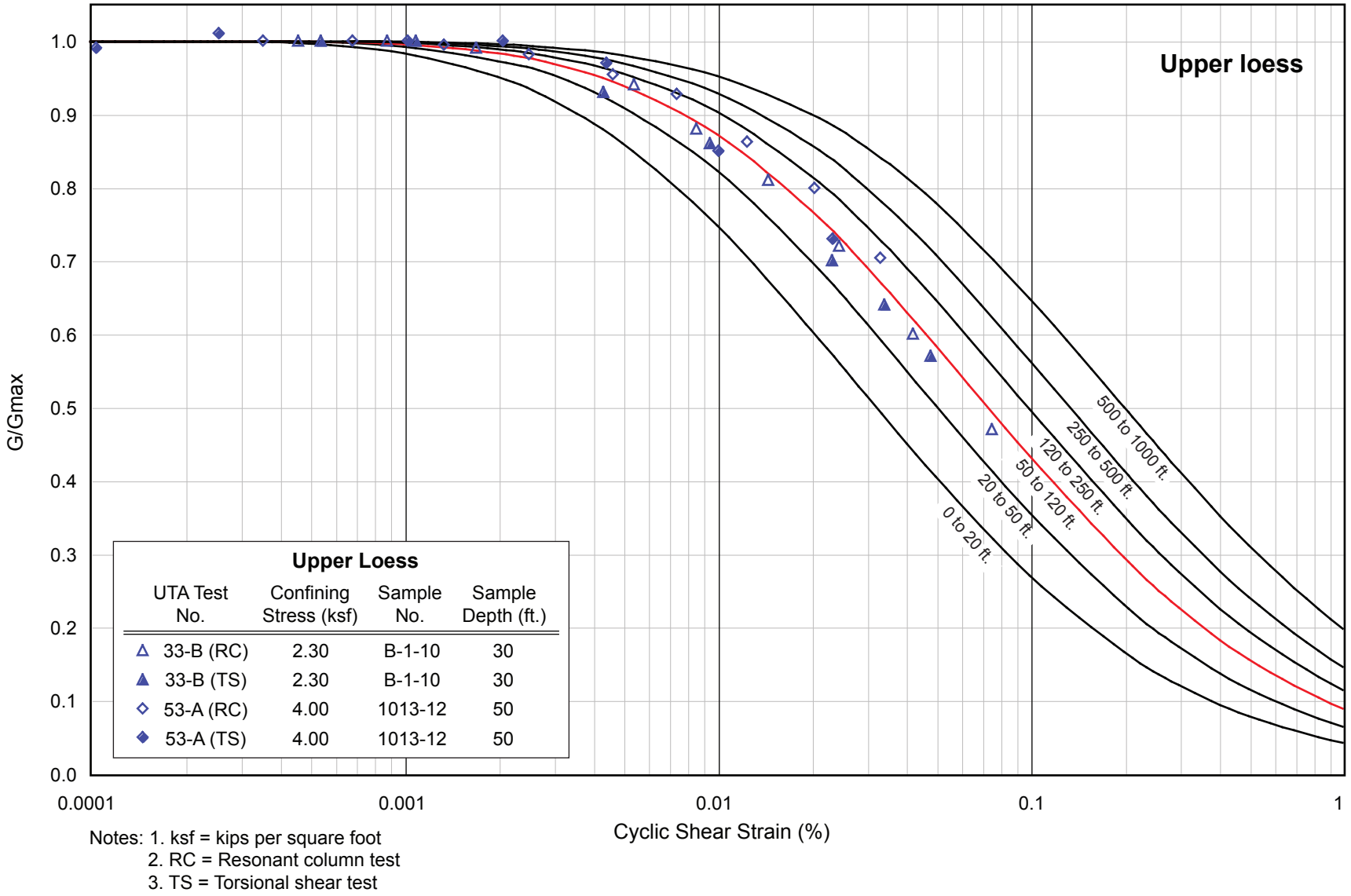
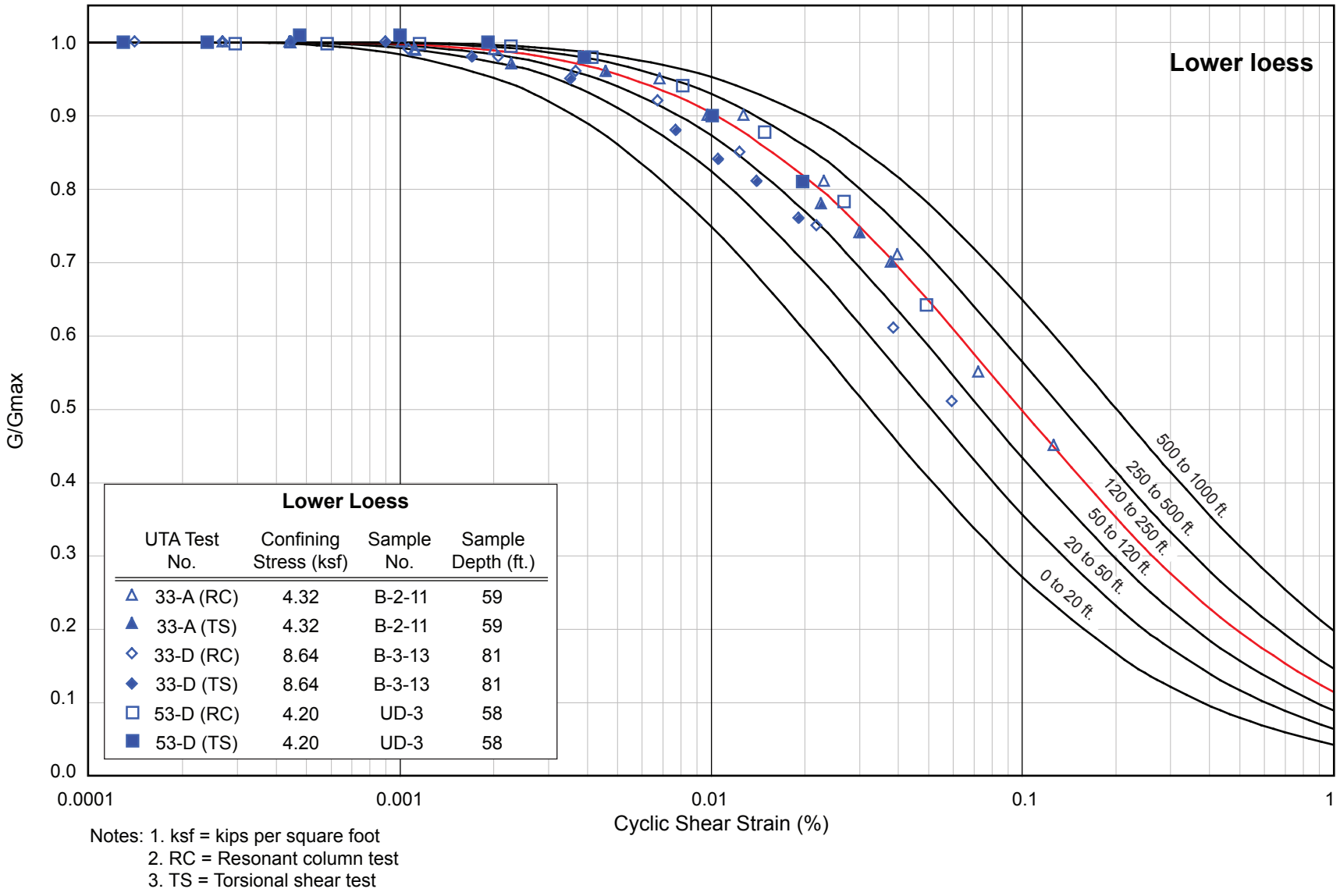


Figure 2.5.4-254. Shear Modulus Reduction Curves and RCTS Data at In-situ Confining Stress (Sheet 1 of 4)

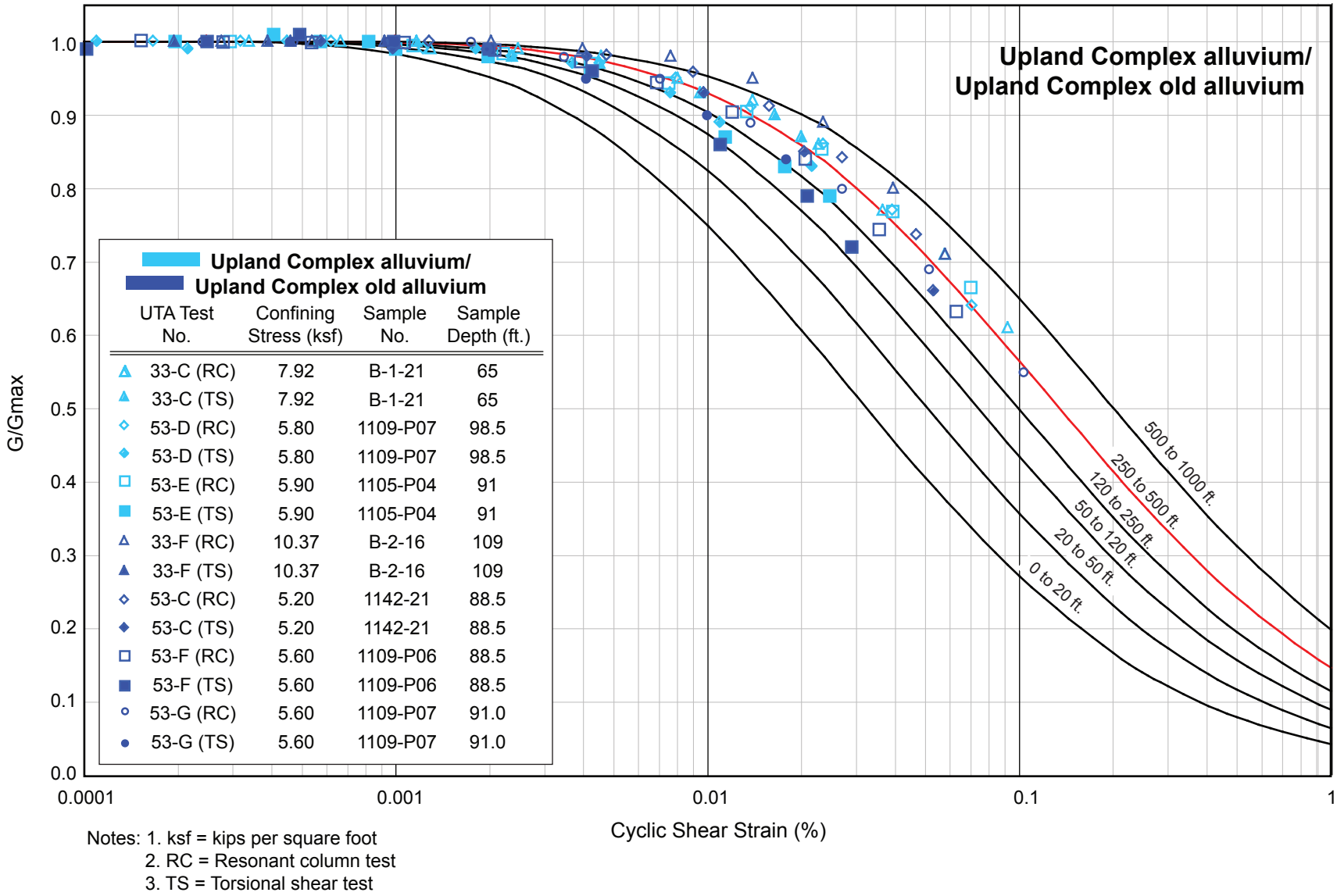


Lower Loess

UTA Test No.	Confining Stress (ksf)	Sample No.	Sample Depth (ft.)
△ 33-A (RC)	4.32	B-2-11	59
▲ 33-A (TS)	4.32	B-2-11	59
◇ 33-D (RC)	8.64	B-3-13	81
◆ 33-D (TS)	8.64	B-3-13	81
□ 53-D (RC)	4.20	UD-3	58
■ 53-D (TS)	4.20	UD-3	58

Notes: 1. ksf = kips per square foot
2. RC = Resonant column test
3. TS = Torsional shear test

Figure 2.5.4-254. Shear Modulus Reduction Curves and RCTS Data at In-situ Confining Stress (Sheet 2 of 4)

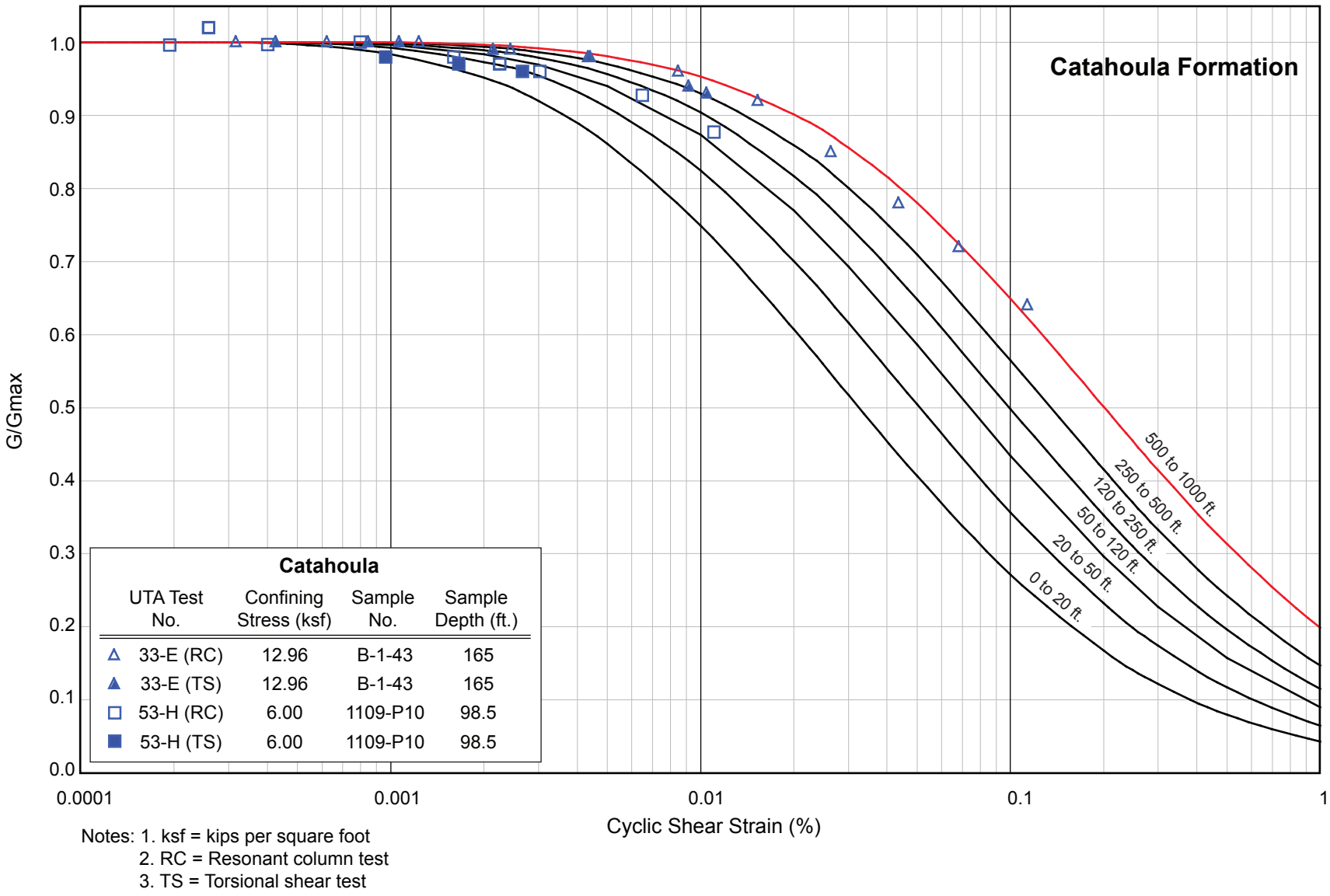


Upland Complex alluvium/
Upland Complex old alluvium

UTA Test No.	Confining Stress (ksf)	Sample No.	Sample Depth (ft.)
33-C (RC)	7.92	B-1-21	65
33-C (TS)	7.92	B-1-21	65
53-D (RC)	5.80	1109-P07	98.5
53-D (TS)	5.80	1109-P07	98.5
53-E (RC)	5.90	1105-P04	91
53-E (TS)	5.90	1105-P04	91
33-F (RC)	10.37	B-2-16	109
33-F (TS)	10.37	B-2-16	109
53-C (RC)	5.20	1142-21	88.5
53-C (TS)	5.20	1142-21	88.5
53-F (RC)	5.60	1109-P06	88.5
53-F (TS)	5.60	1109-P06	88.5
53-G (RC)	5.60	1109-P07	91.0
53-G (TS)	5.60	1109-P07	91.0

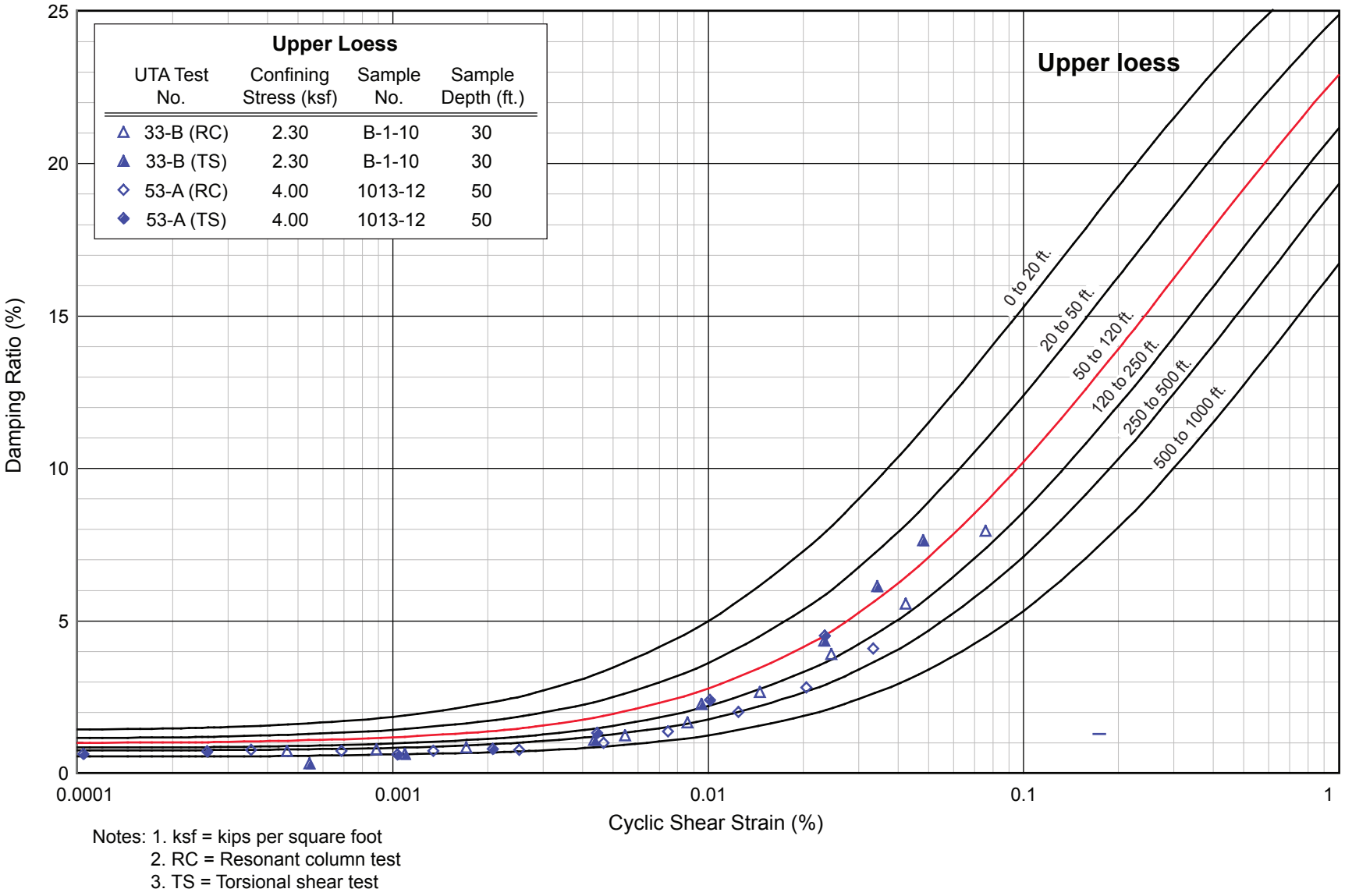
Notes: 1. ksf = kips per square foot
2. RC = Resonant column test
3. TS = Torsional shear test

Figure 2.5.4-254. Shear Modulus Reduction Curves and RCTS Data at In-situ Confining Stress (Sheet 3 of 4)



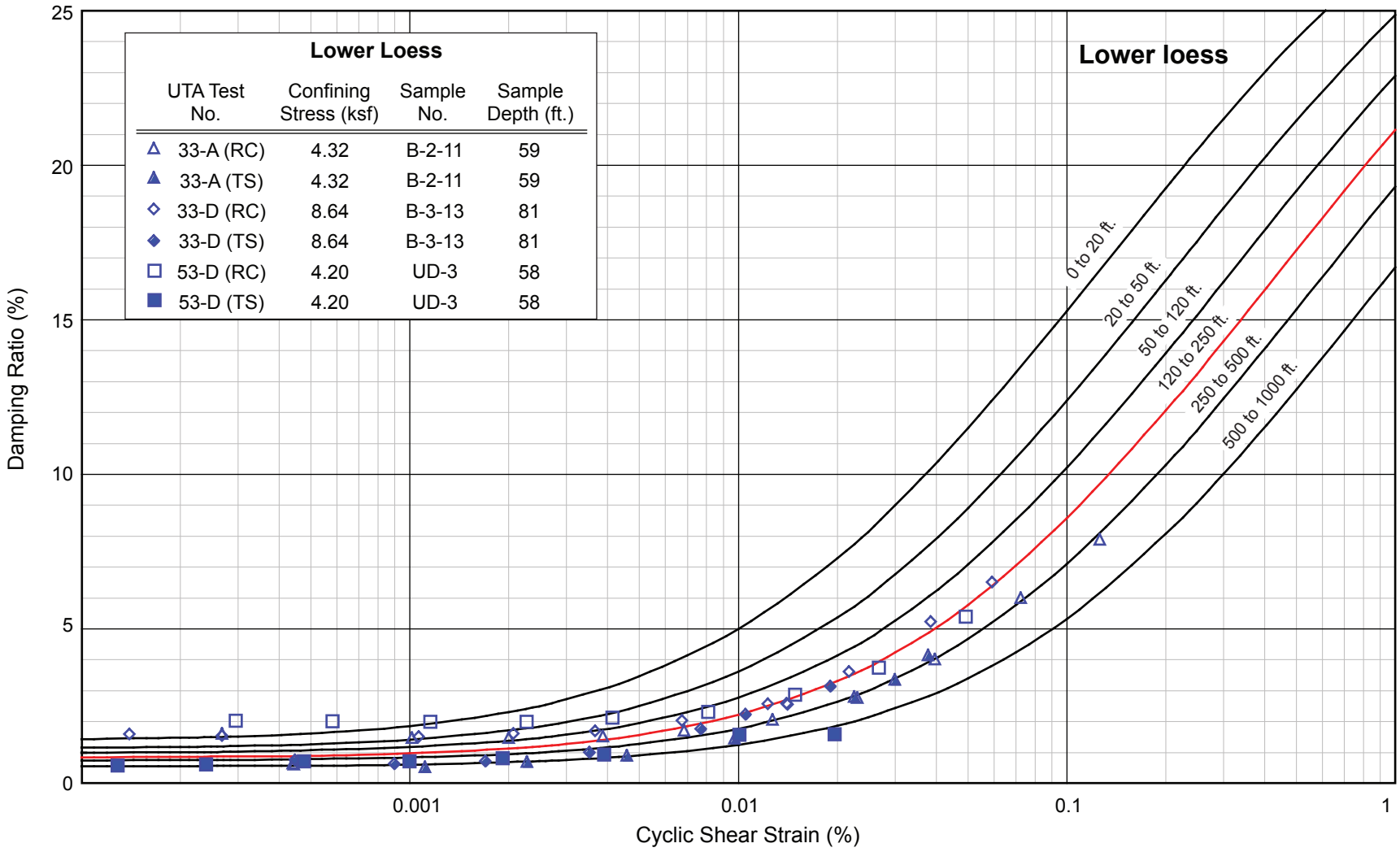
Notes: 1. ksf = kips per square foot
2. RC = Resonant column test
3. TS = Torsional shear test

Figure 2.5.4-254. Shear Modulus Reduction Curves and RCTS Data at In-situ Confining Stress (Sheet 4 of 4)



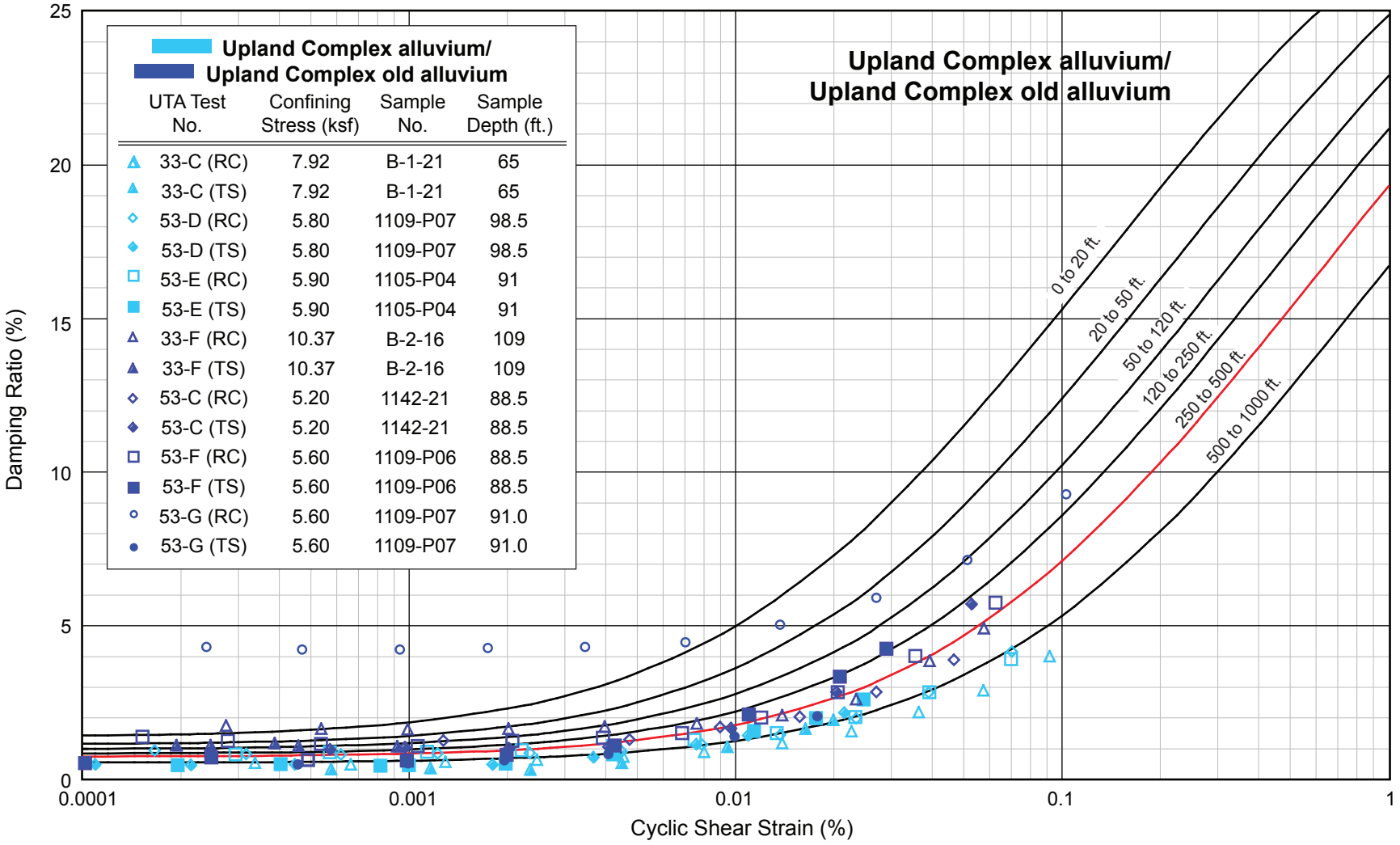
Notes: 1. ksf = kips per square foot
2. RC = Resonant column test
3. TS = Torsional shear test

Figure 2.5.4-255. Damping Ratio Curves and RCTS Data at In-situ Confining Stress (Sheet 1 of 4)



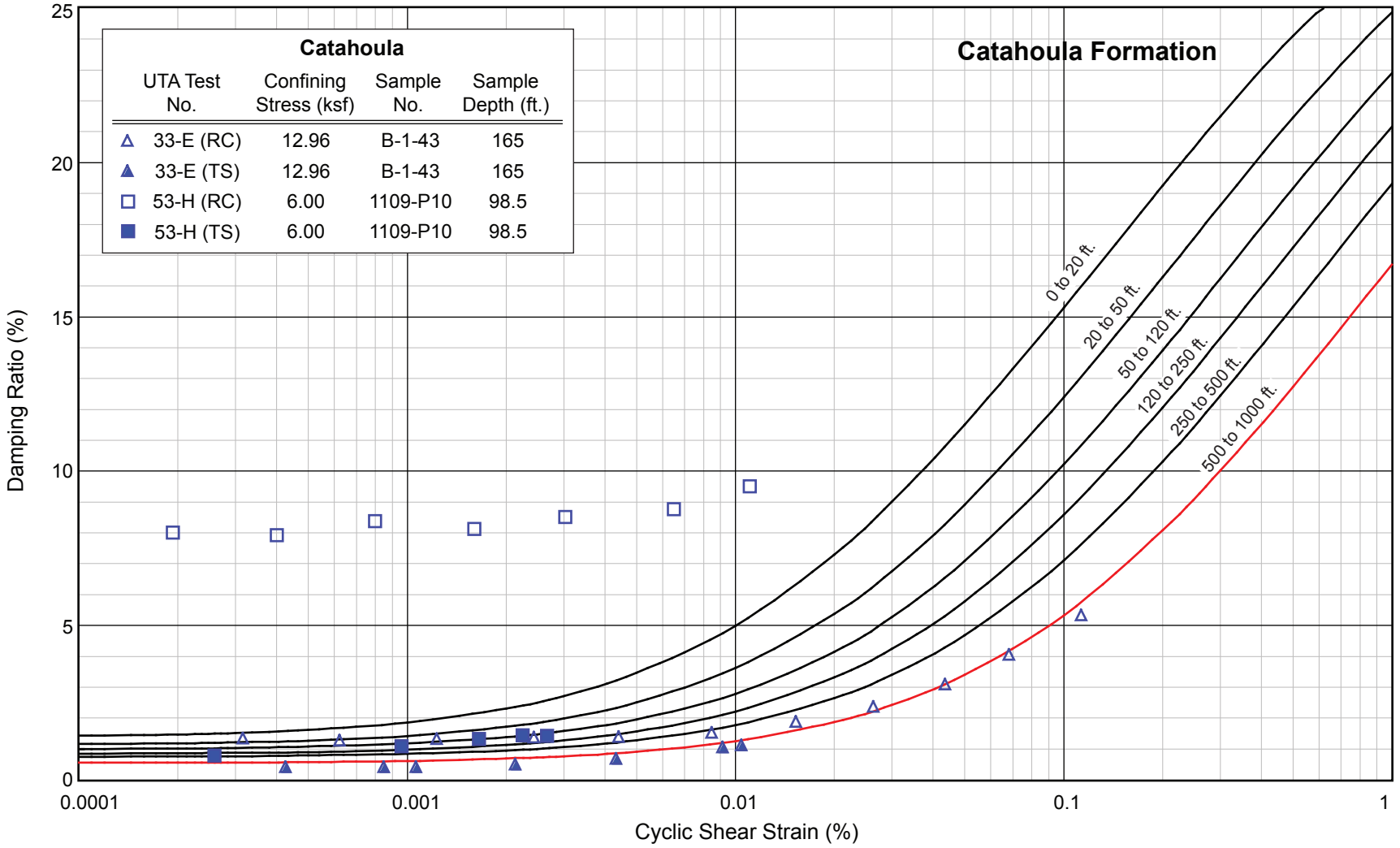
Notes: 1. ksf = kips per square foot
2. RC = Resonant column test
3. TS = Torsional shear test

Figure 2.5.4-255. Damping Ratio Curves and RCTS Data at In-situ Confining Stress (Sheet 2 of 4)



Notes: 1. ksf = kips per square foot
2. RC = Resonant column test
3. TS = Torsional shear test

Figure 2.5.4-255. Damping Ratio Curves and RCTS Data at In-situ Confining Stress (Sheet 3 of 4)



Notes: 1. ksf = kips per square foot
2. RC = Resonant column test
3. TS = Torsional shear test

Figure 2.5.4-255. Damping Ratio Curves and RCTS Data at In-situ Confining Stress (Sheet 4 of 4)

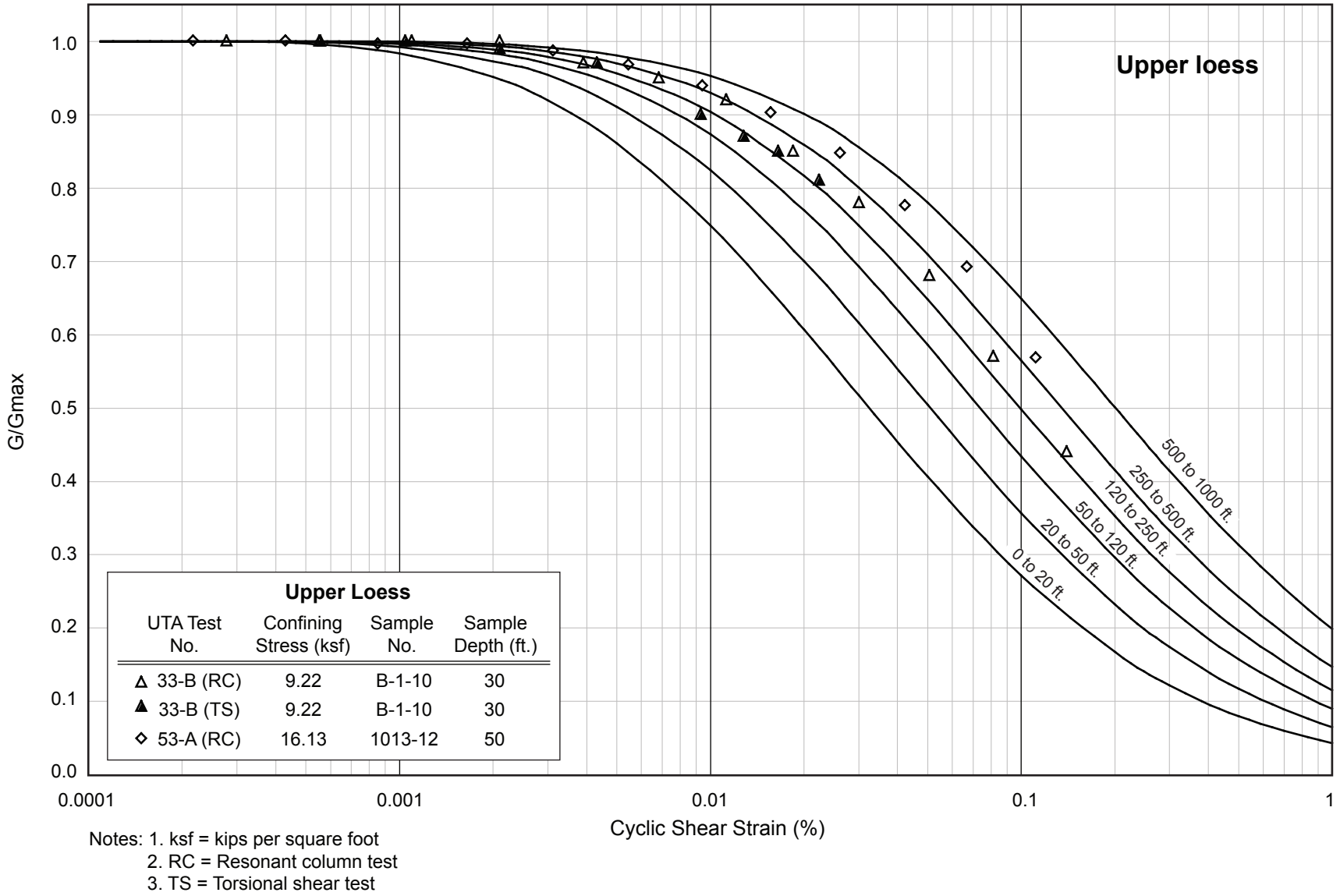
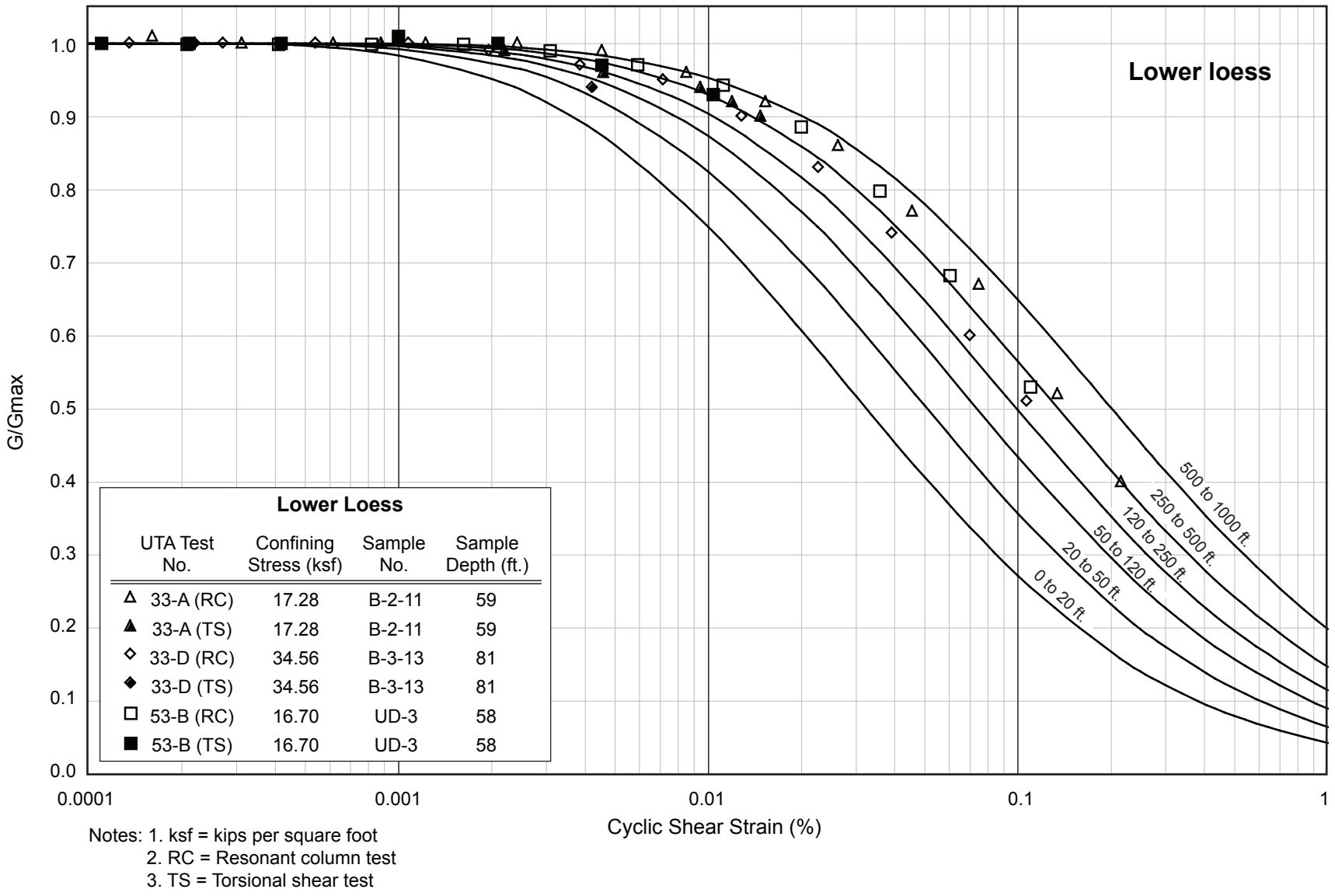


Figure 2.5.4-256. Shear Modulus Reduction Curves and RCTS Data at Four Times Confining Stress (Sheet 1 of 4)

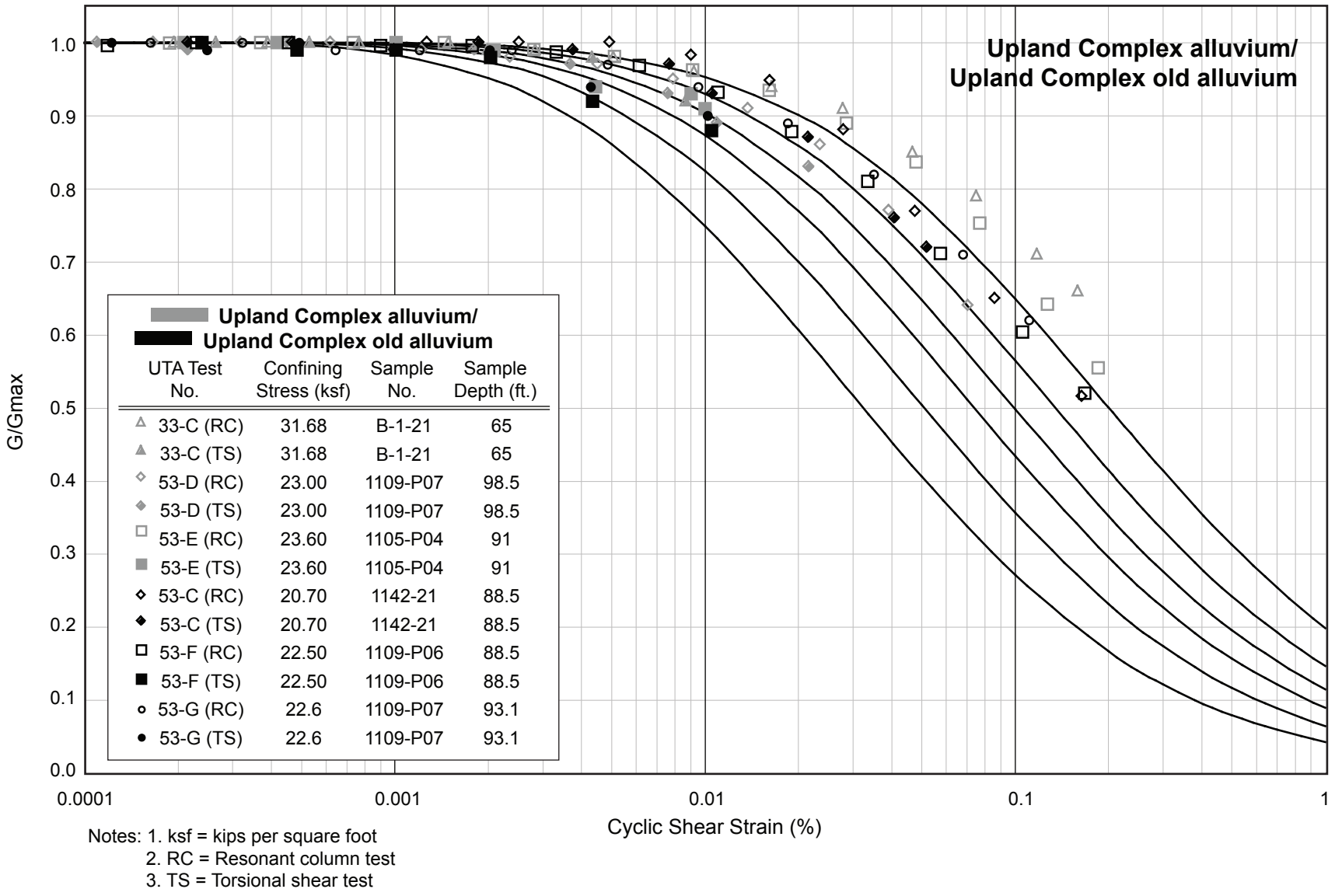


Lower Loess

UTA Test No.	Confining Stress (ksf)	Sample No.	Sample Depth (ft.)
△ 33-A (RC)	17.28	B-2-11	59
▲ 33-A (TS)	17.28	B-2-11	59
◇ 33-D (RC)	34.56	B-3-13	81
◆ 33-D (TS)	34.56	B-3-13	81
□ 53-B (RC)	16.70	UD-3	58
■ 53-B (TS)	16.70	UD-3	58

Notes: 1. ksf = kips per square foot
2. RC = Resonant column test
3. TS = Torsional shear test

Figure 2.5.4-256. Shear Modulus Reduction Curves and RCTS Data at Four Times Confining Stress (Sheet 2 of 4)



UTA Test No.	Confining Stress (ksf)	Sample No.	Sample Depth (ft.)
33-C (RC)	31.68	B-1-21	65
33-C (TS)	31.68	B-1-21	65
53-D (RC)	23.00	1109-P07	98.5
53-D (TS)	23.00	1109-P07	98.5
53-E (RC)	23.60	1105-P04	91
53-E (TS)	23.60	1105-P04	91
53-C (RC)	20.70	1142-21	88.5
53-C (TS)	20.70	1142-21	88.5
53-F (RC)	22.50	1109-P06	88.5
53-F (TS)	22.50	1109-P06	88.5
53-G (RC)	22.6	1109-P07	93.1
53-G (TS)	22.6	1109-P07	93.1

Notes: 1. ksf = kips per square foot
2. RC = Resonant column test
3. TS = Torsional shear test

Figure 2.5.4-256. Shear Modulus Reduction Curves and RCTS Data at Four Times Confining Stress (Sheet 3 of 4)

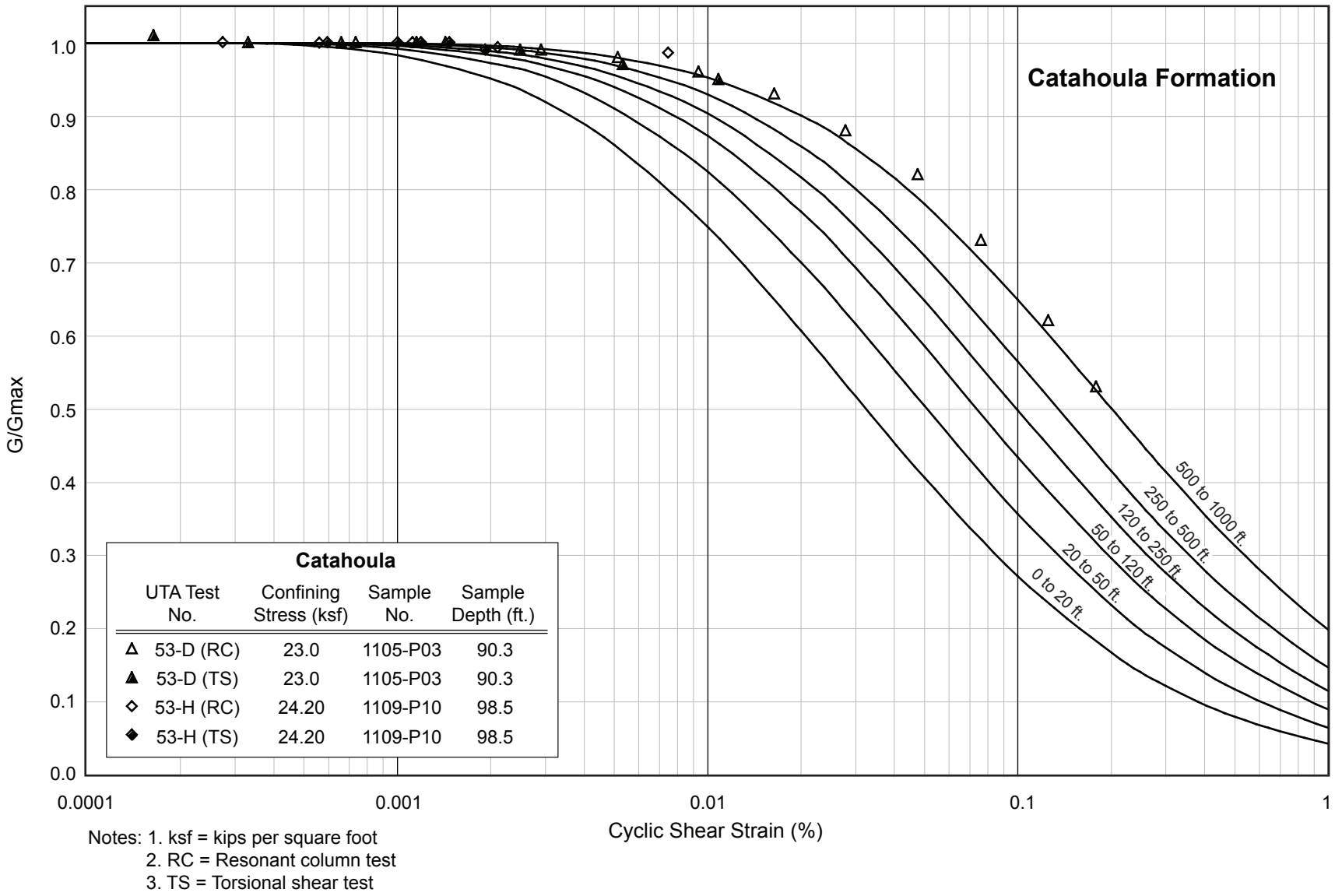
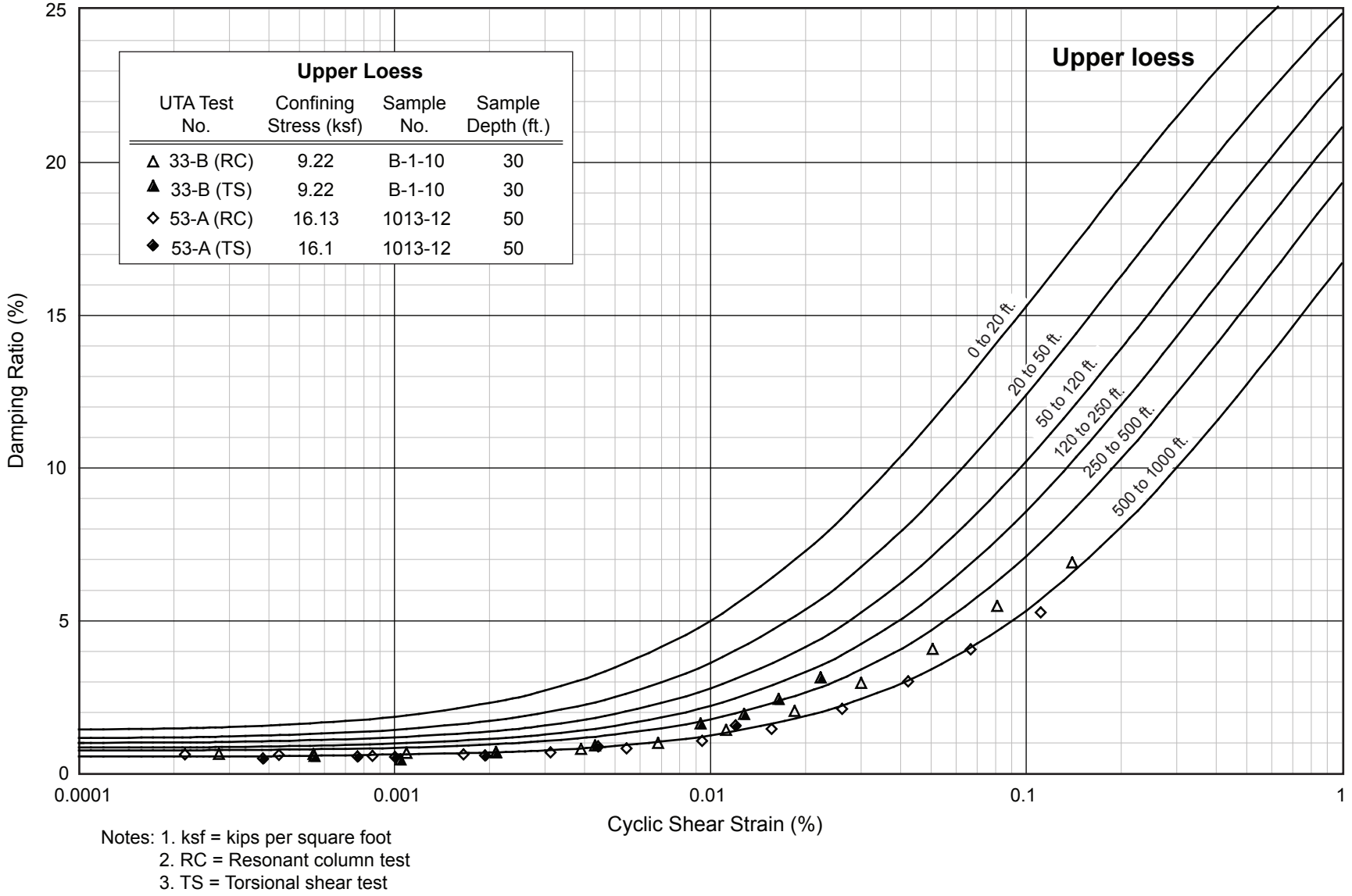
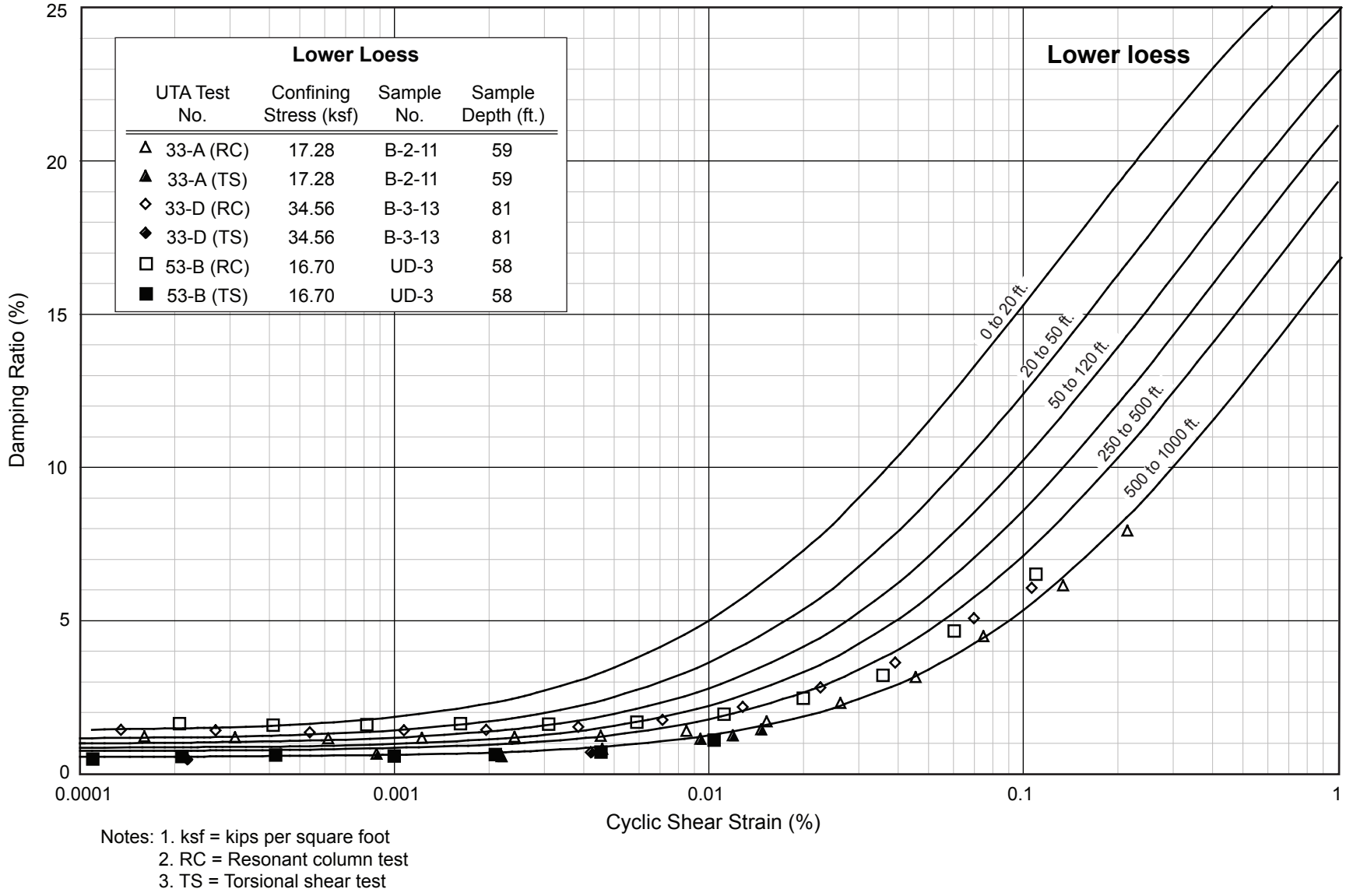


Figure 2.5.4-256. Shear Modulus Reduction Curves and RCTS Data at Four Times Confining Stress (Sheet 4 of 4)



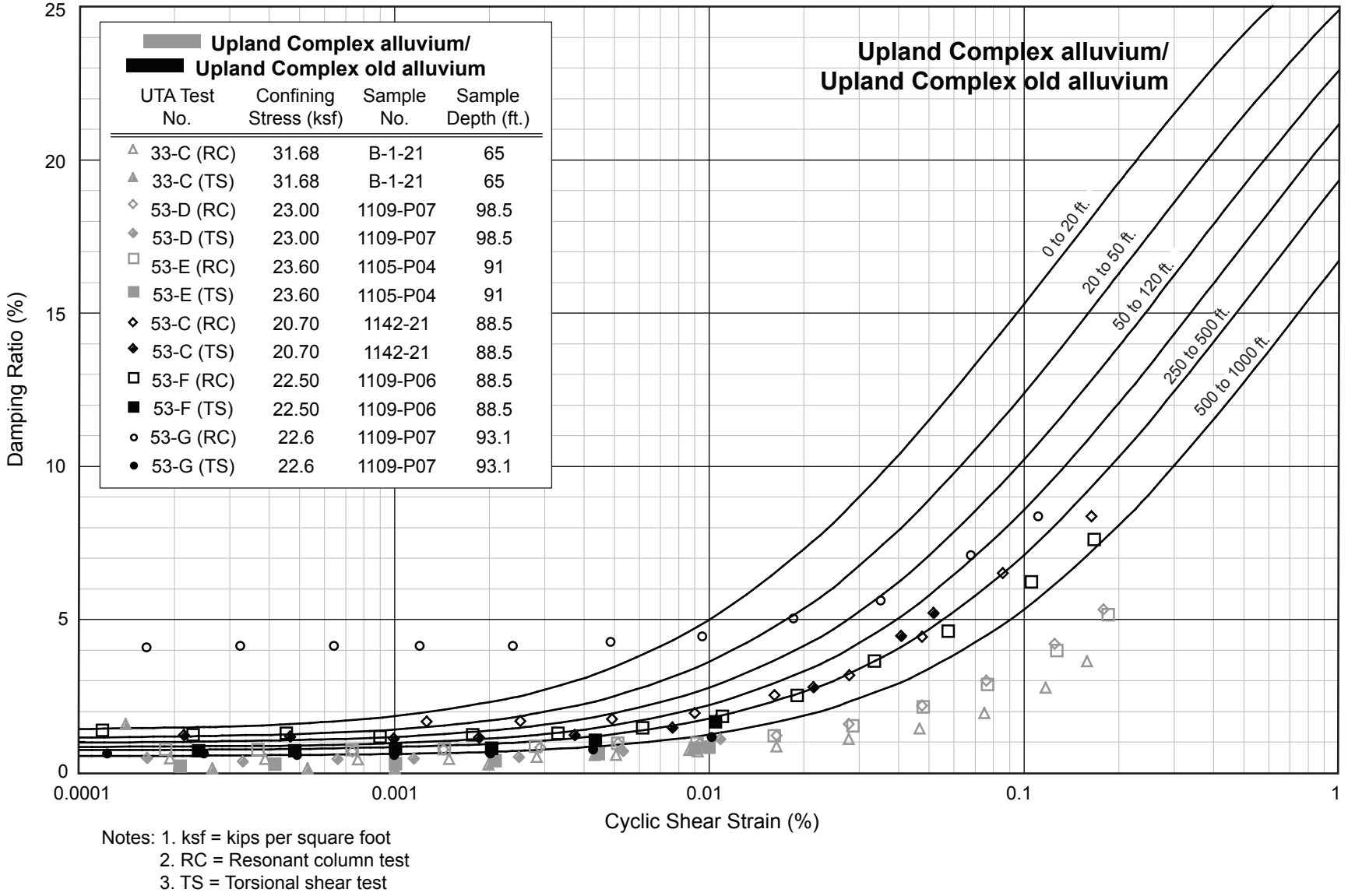
Notes: 1. ksf = kips per square foot
2. RC = Resonant column test
3. TS = Torsional shear test

Figure 2.5.4-257. Damping Ratio Curves and RCTS Data at Four Times Confining Stress (Sheet 1 of 4)



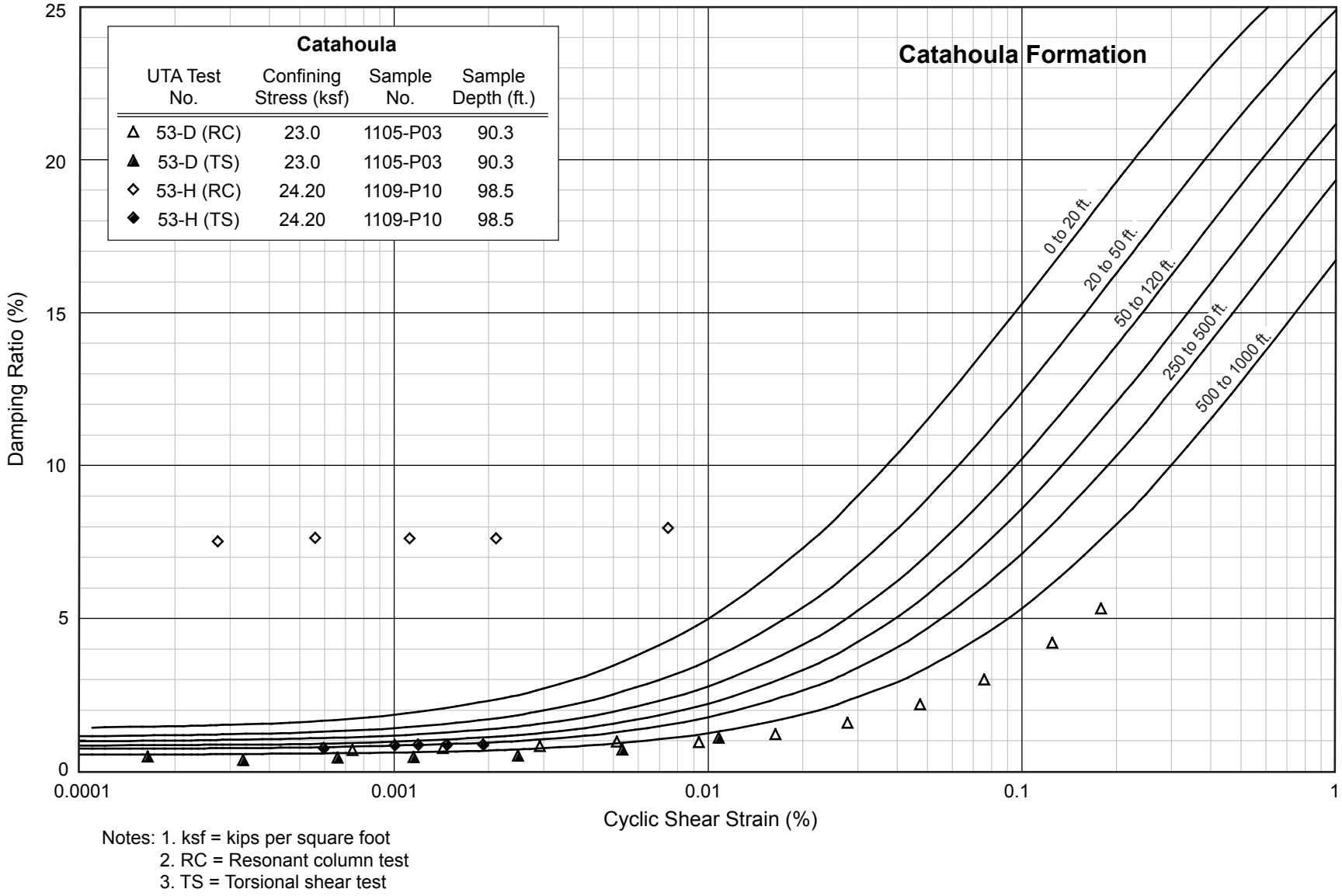
Notes: 1. ksf = kips per square foot
2. RC = Resonant column test
3. TS = Torsional shear test

Figure 2.5.4-257. Damping Ratio Curves and RCTS Data at Four Times Confining Stress (Sheet 2 of 4)



Notes: 1. ksf = kips per square foot
2. RC = Resonant column test
3. TS = Torsional shear test

Figure 2.5.4-257. Damping Ratio Curves and RCTS Data at Four Times Confining Stress (Sheet 3 of 4)



Notes: 1. ksf = kips per square foot
2. RC = Resonant column test
3. TS = Torsional shear test

Figure 2.5.4-257. Damping Ratio Curves and RCTS Data at Four Times Confining Stress (Sheet 4 of 4)

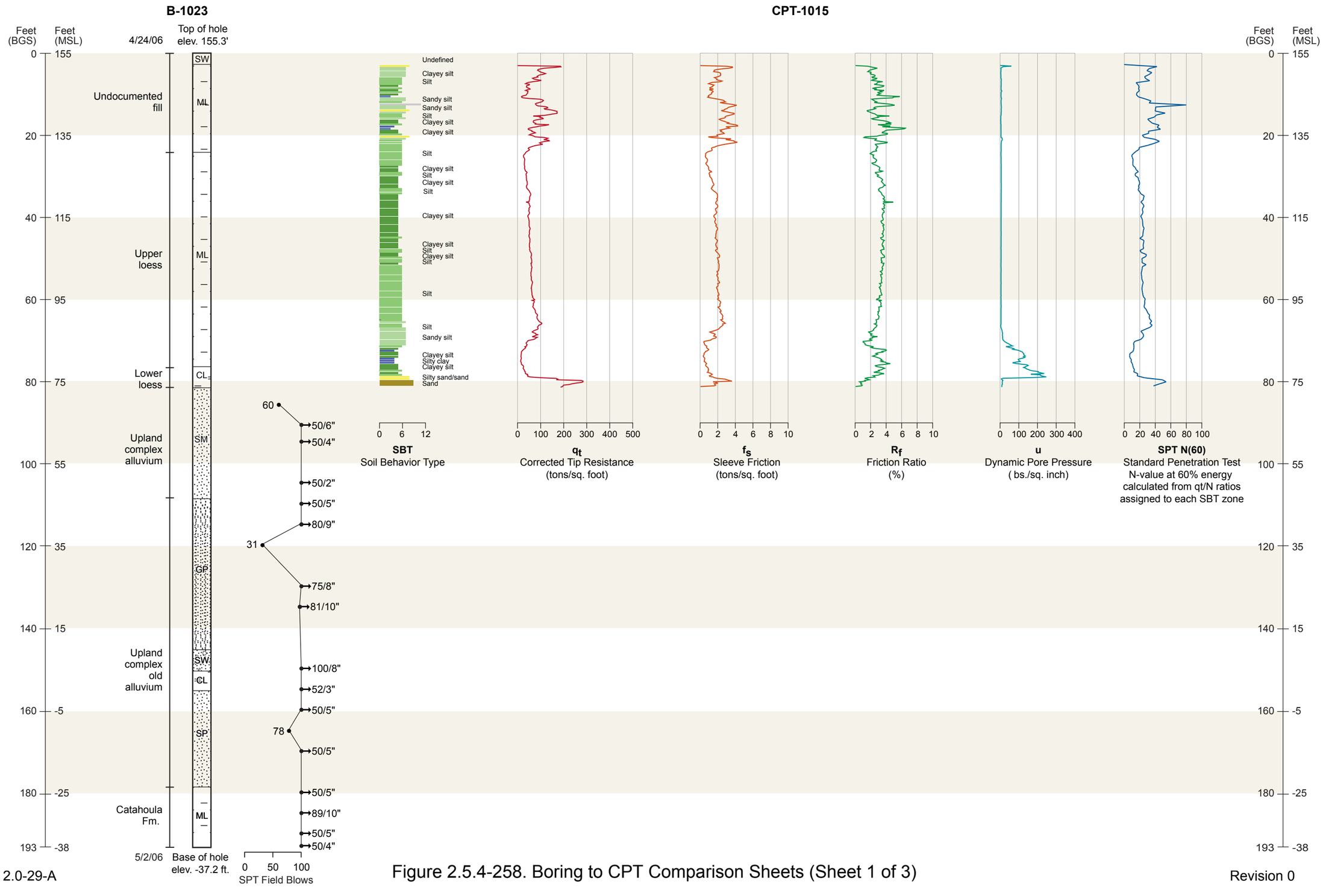


Figure 2.5.4-258. Boring to CPT Comparison Sheets (Sheet 1 of 3)

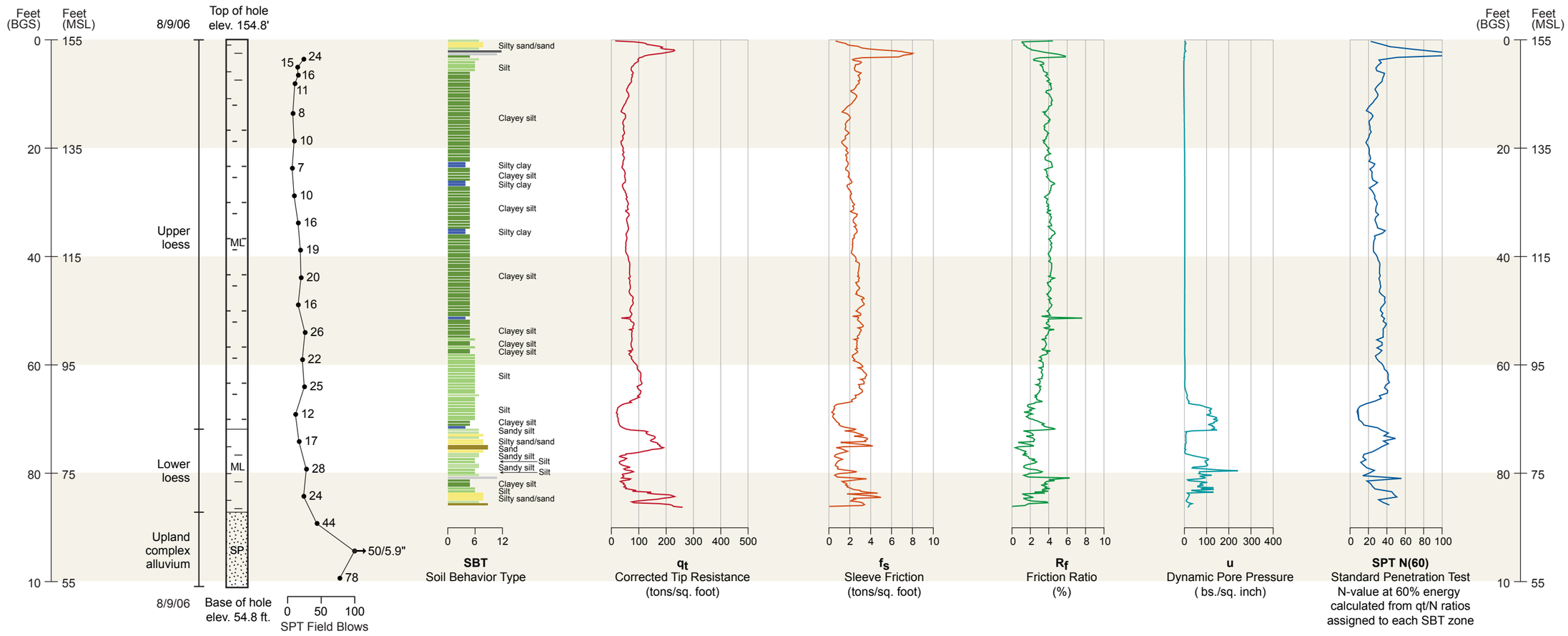


Figure 2.5.4-258. Boring to CPT Comparison Sheets (Sheet 2 of 3)

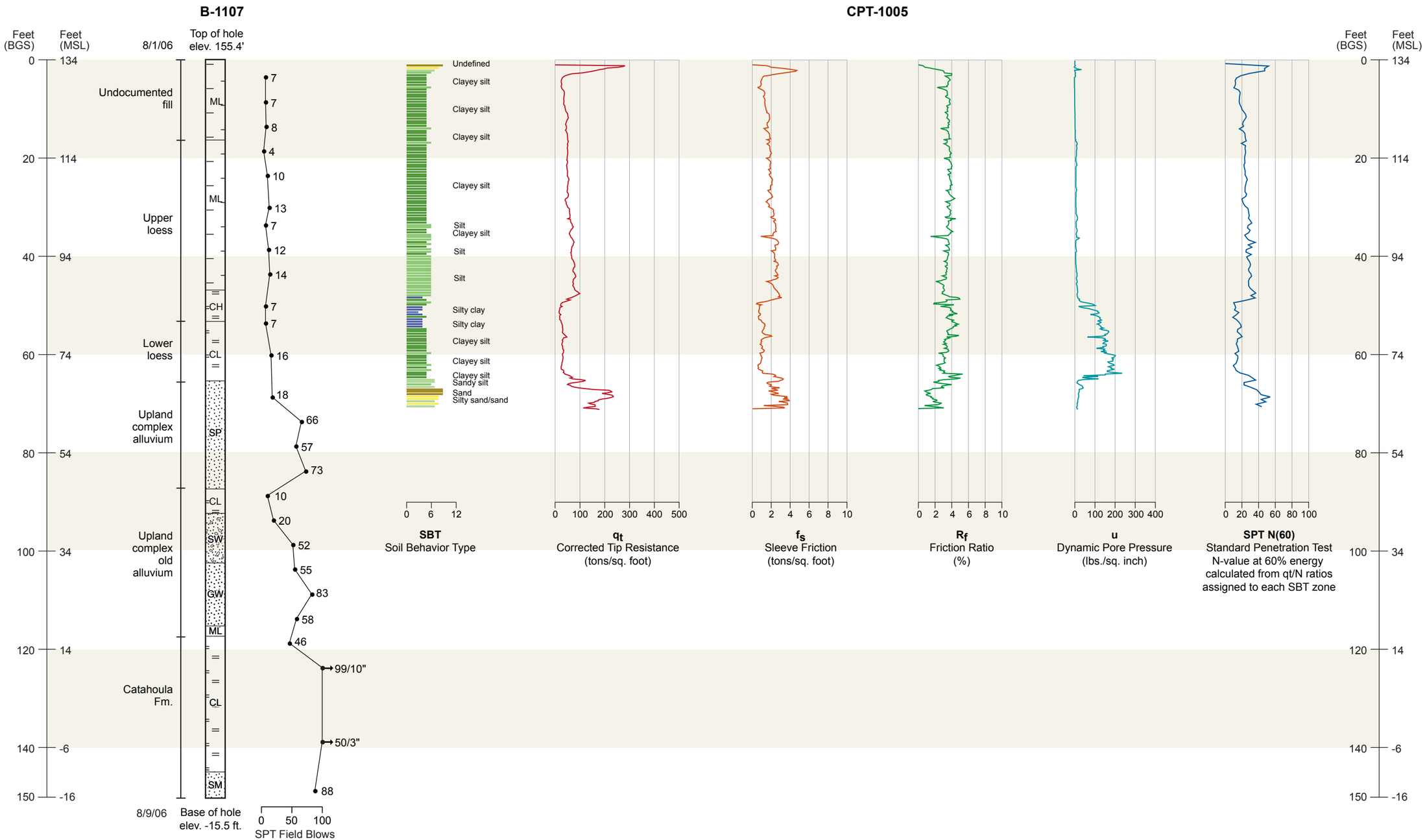


Figure 2.5.4-258. Boring to CPT Comparison Sheets (Sheet 3 of 3)

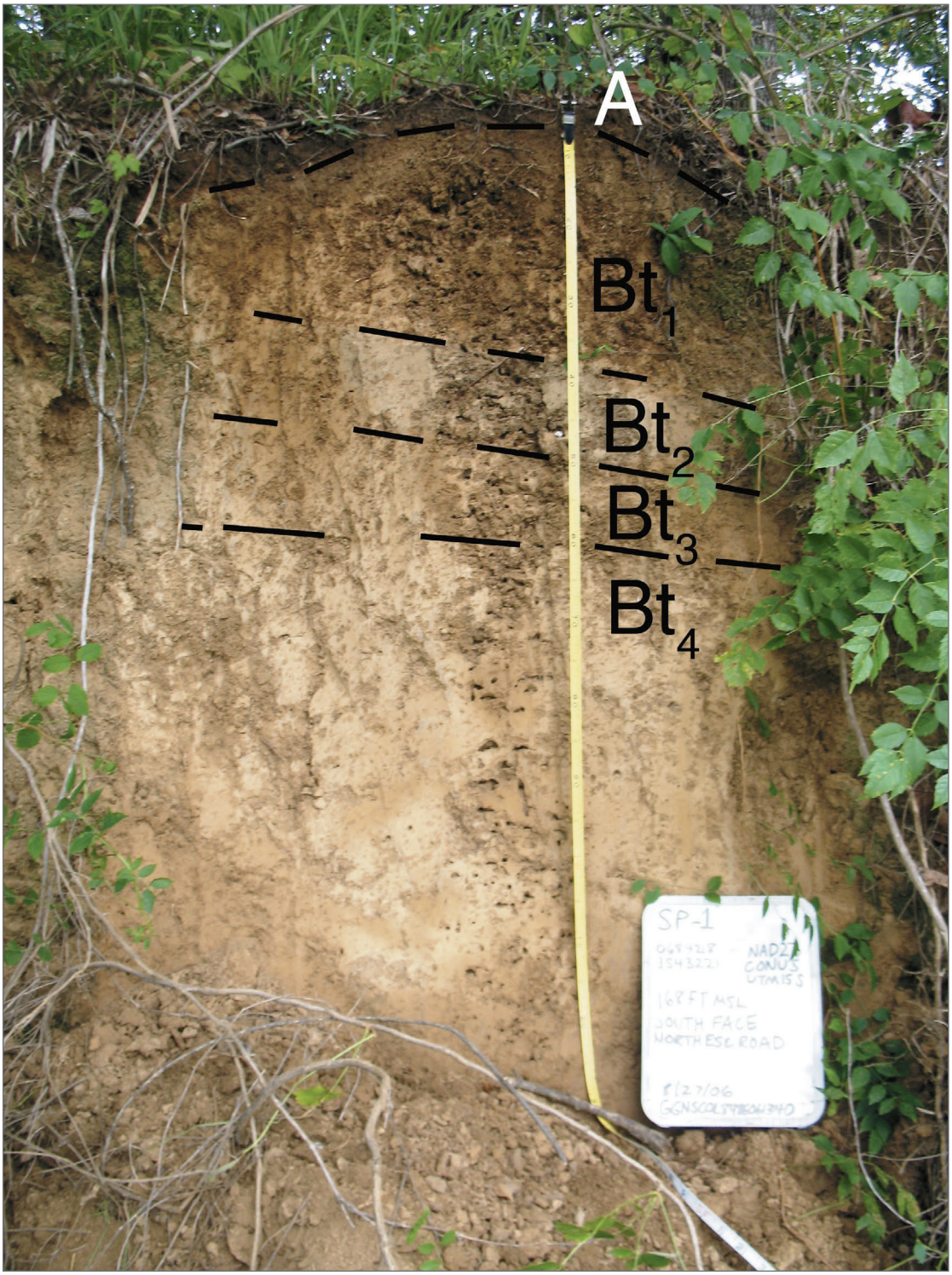
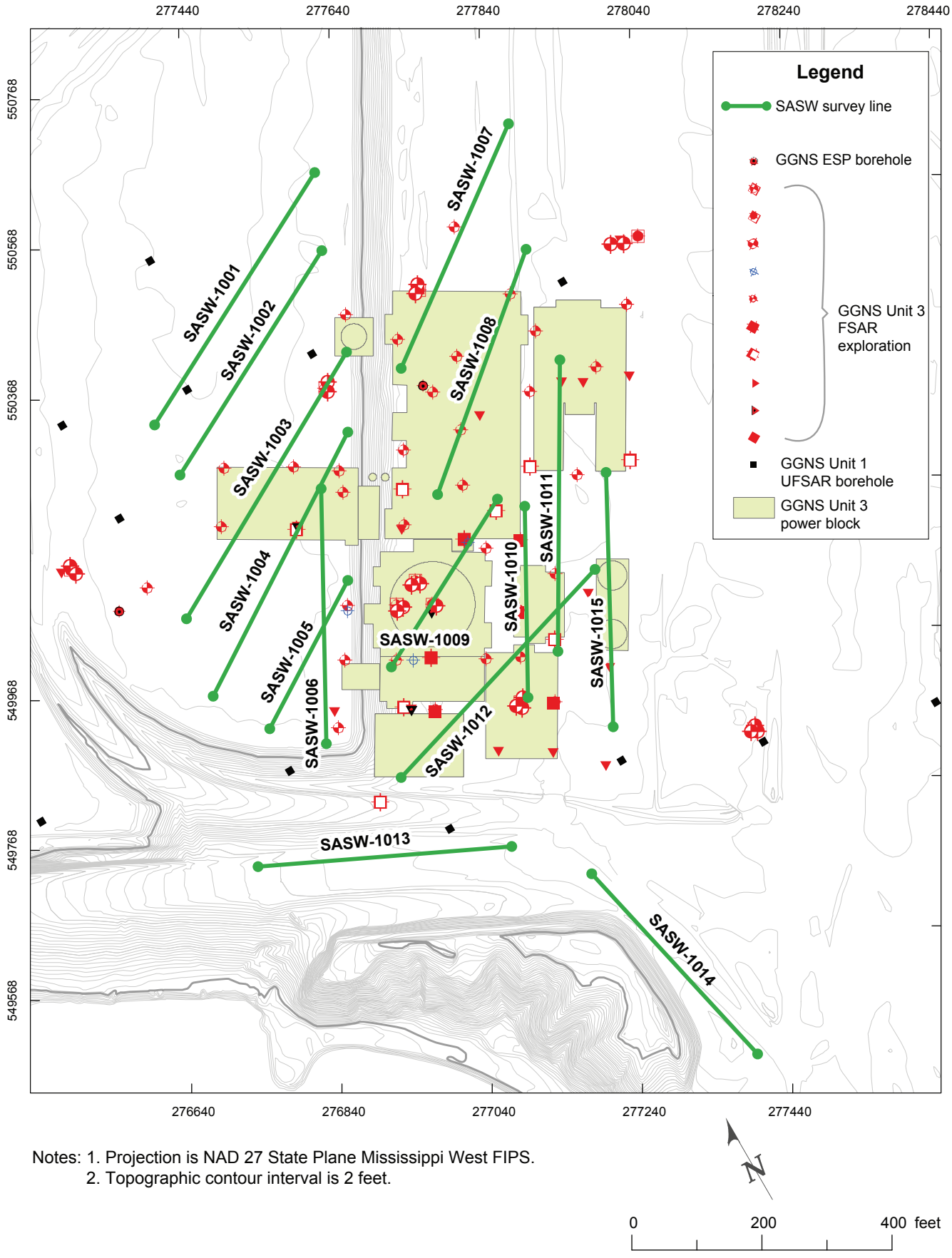
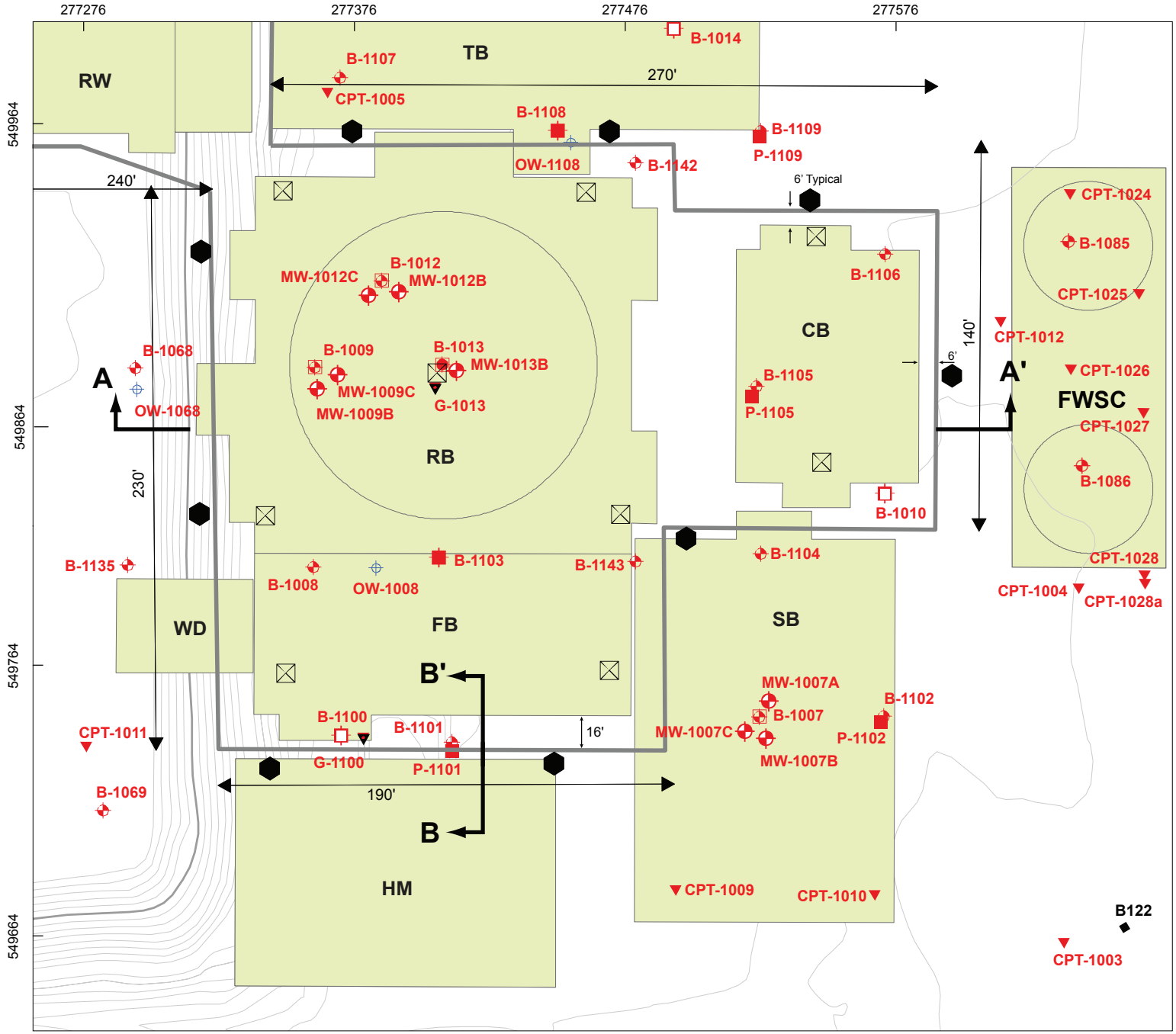


Figure 2.5.4-259. Soil Profile SP-1



Notes: 1. Projection is NAD 27 State Plane Mississippi West FIPS.
2. Topographic contour interval is 2 feet.

Figure 2.5.4-260. SASW Survey Locations



Legend

- Location for tieback wall instrumentation (inclinometer, load cell)
- Borehole extensometer location (9 total)
- B-1119 Borehole
- B-1025 Borehole and monitoring well
- B-1019 Borehole and monitoring well with suspension logging
- B-1103 Borehole with pressuremeter test
- B-1113 Borehole with suspension log
- CPT-1009 Cone penetrometer test
- OW 1008 Observation well
- WLA B-1 ESP SSAR borehole
- B15 GGNS UFSAR borehole
- GGNS Unit 3 power block

Notes:
1. Projection NAD 27 State Plane Mississippi West FIPS.
2. Vertical datum NAVD 88.
3. See Figure 2.5.4-263 for FWSC excavation limits; FWSC is completed and backfilled prior to the work shown on this figure.

Plant north
Magnetic north
30°

0 25 50 feet
1 inch equals 60 feet
Contour interval = 1 foot

Figure 2.5.4-261. Lateral Extent of RB/FB and CB Seismic Category 1 Excavation and Geotechnical Instrumentation Location Plan

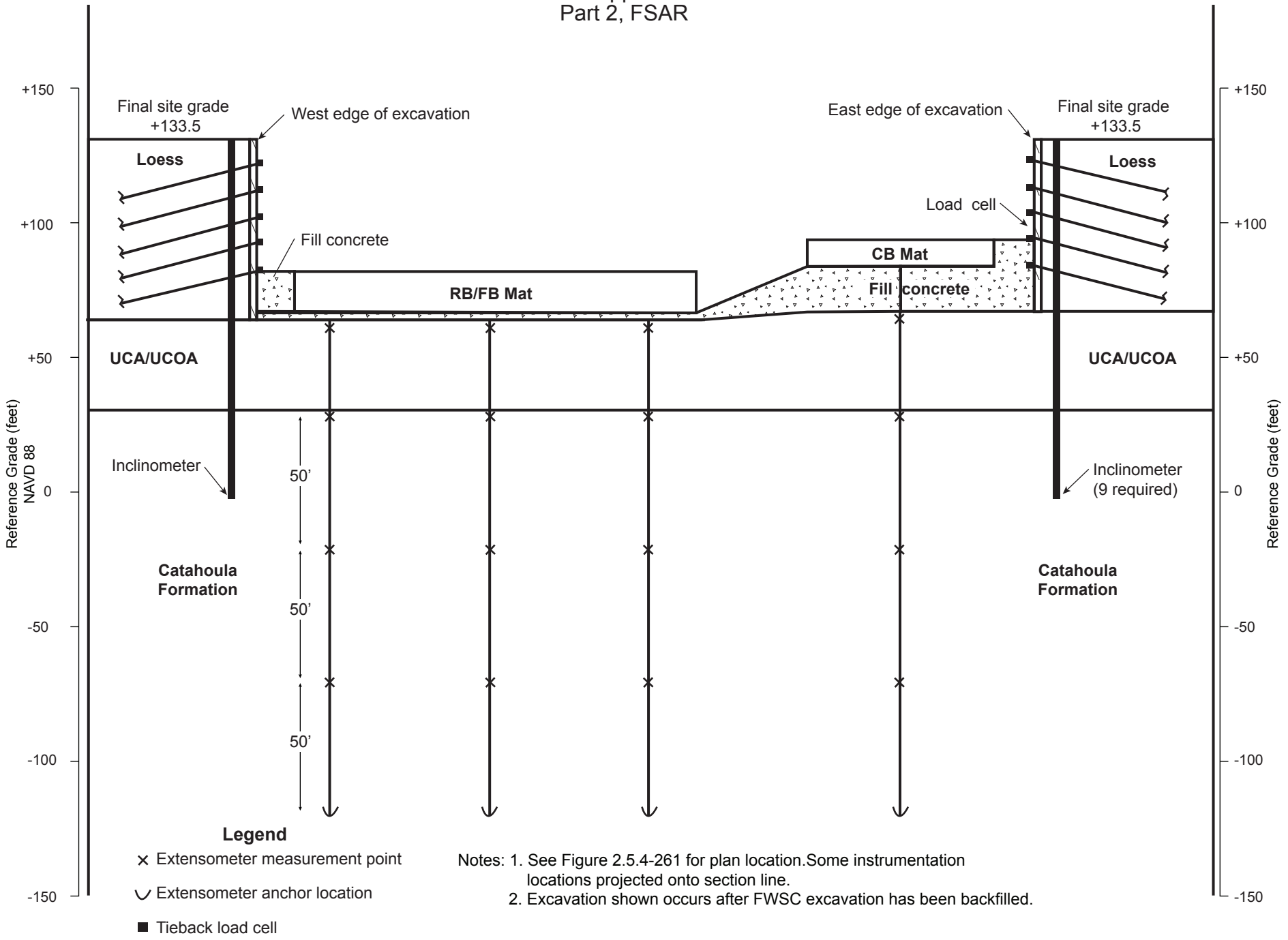
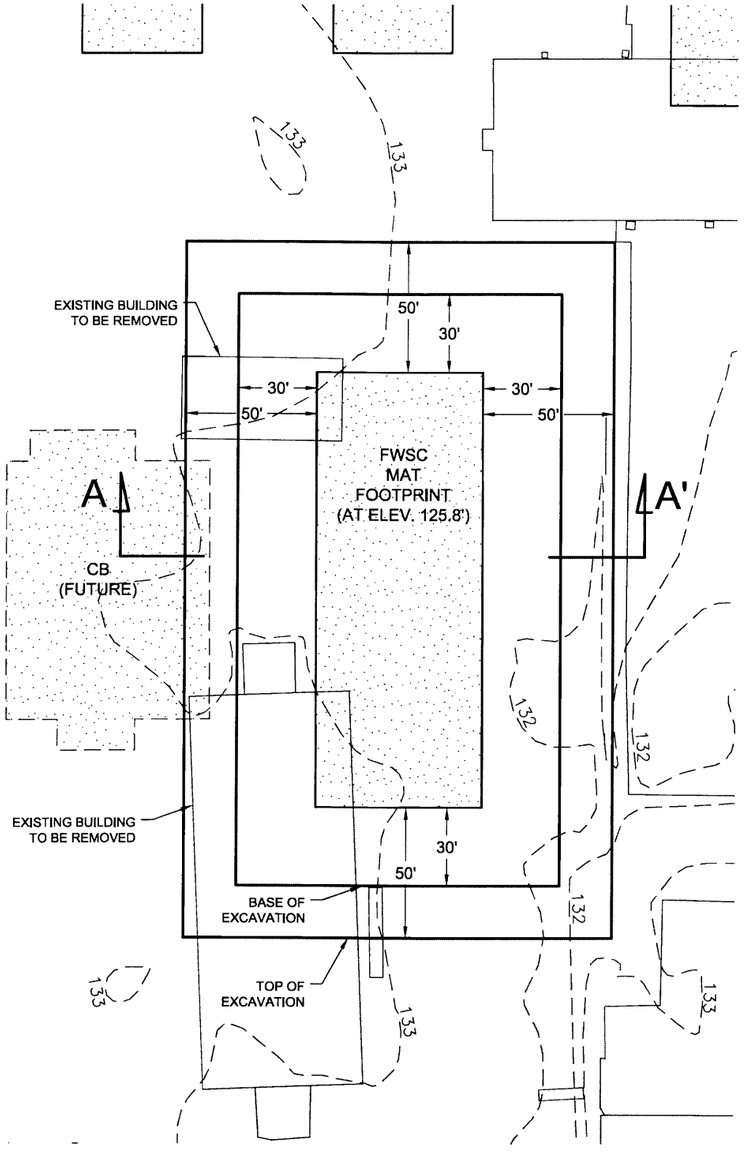
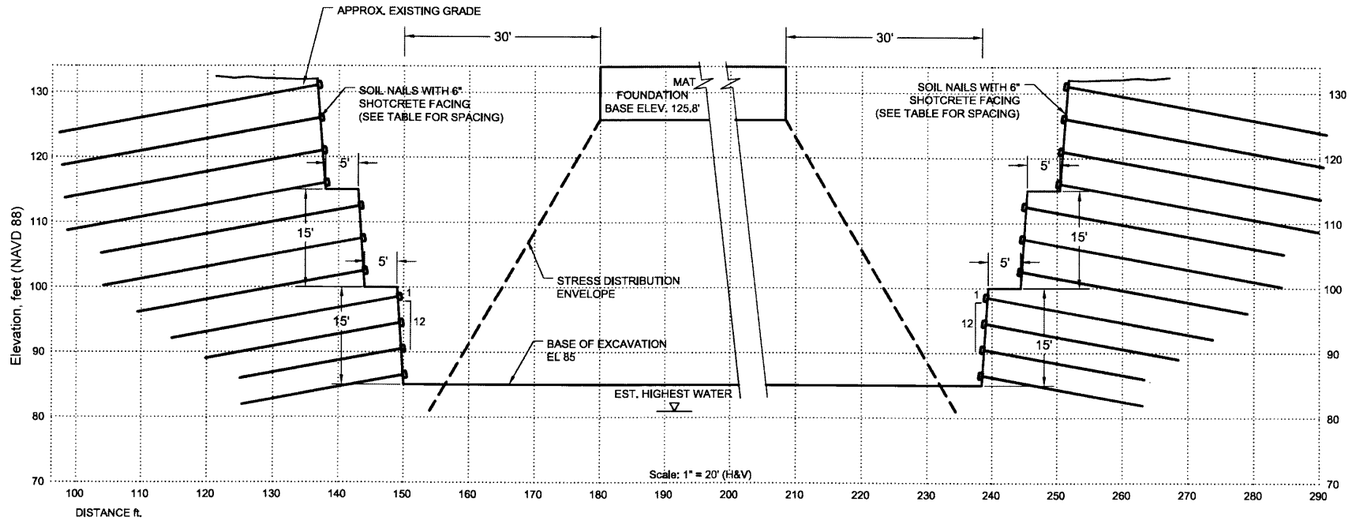


Figure 2.5.4-262. Excavation Section A - A' Showing Monitoring Instrumentation



NOTE:
CONSTRUCTION ENTRANCE RAMP NOT SHOWN. LOCATION AND ORIENTATION TO BE COORDINATED BETWEEN OWNER AND CONTRACTORS.

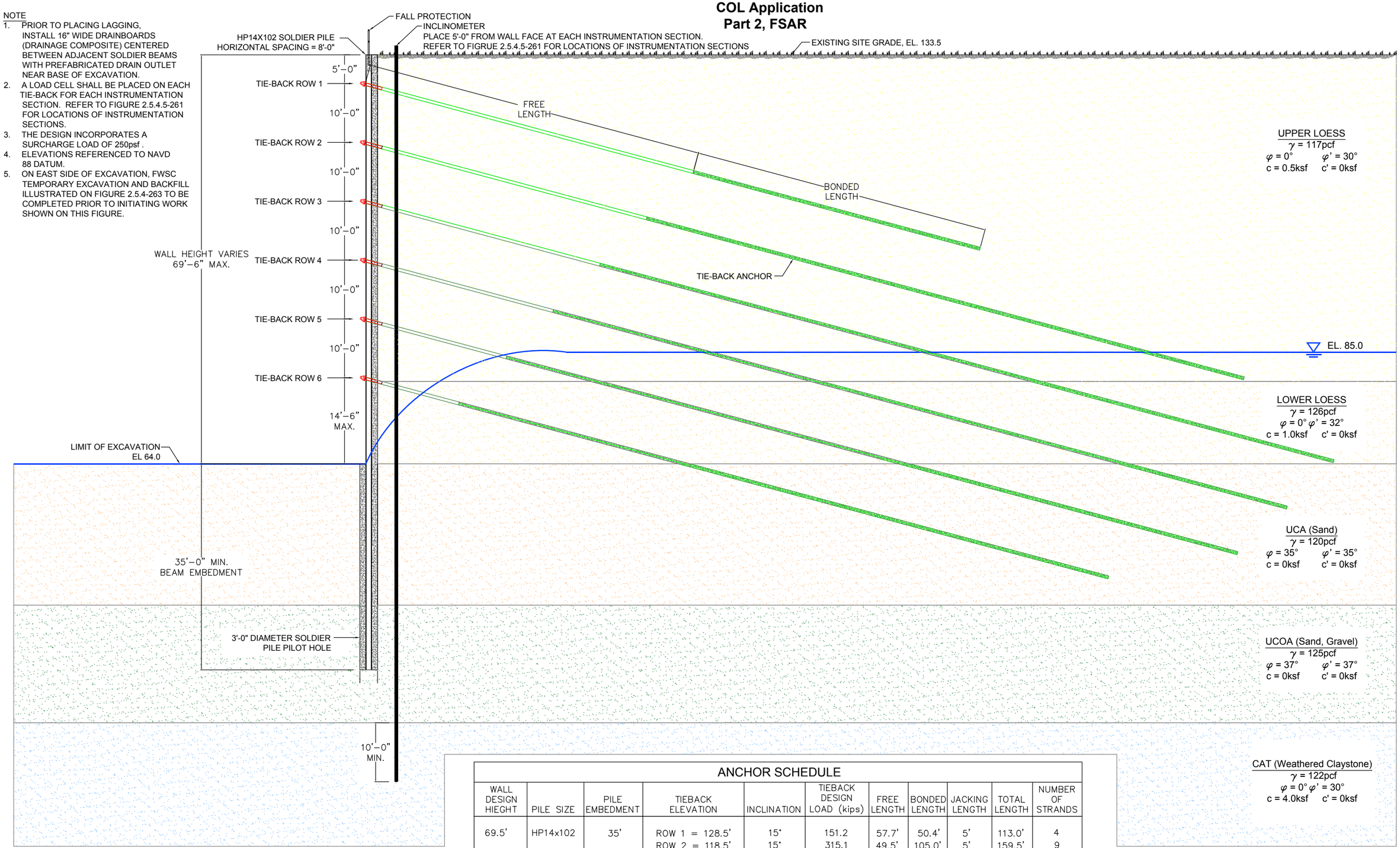


SECTION A-A'

SOIL NAIL SPACINGS		
TIER	HORIZONTAL (ft)	VERTICAL (ft)
TOP	5	5
MIDDLE	4	5
BOTTOM	4	4

Figure 2.5.4-263. Lateral and Vertical Extents of Excavation and Backfill for FWSC

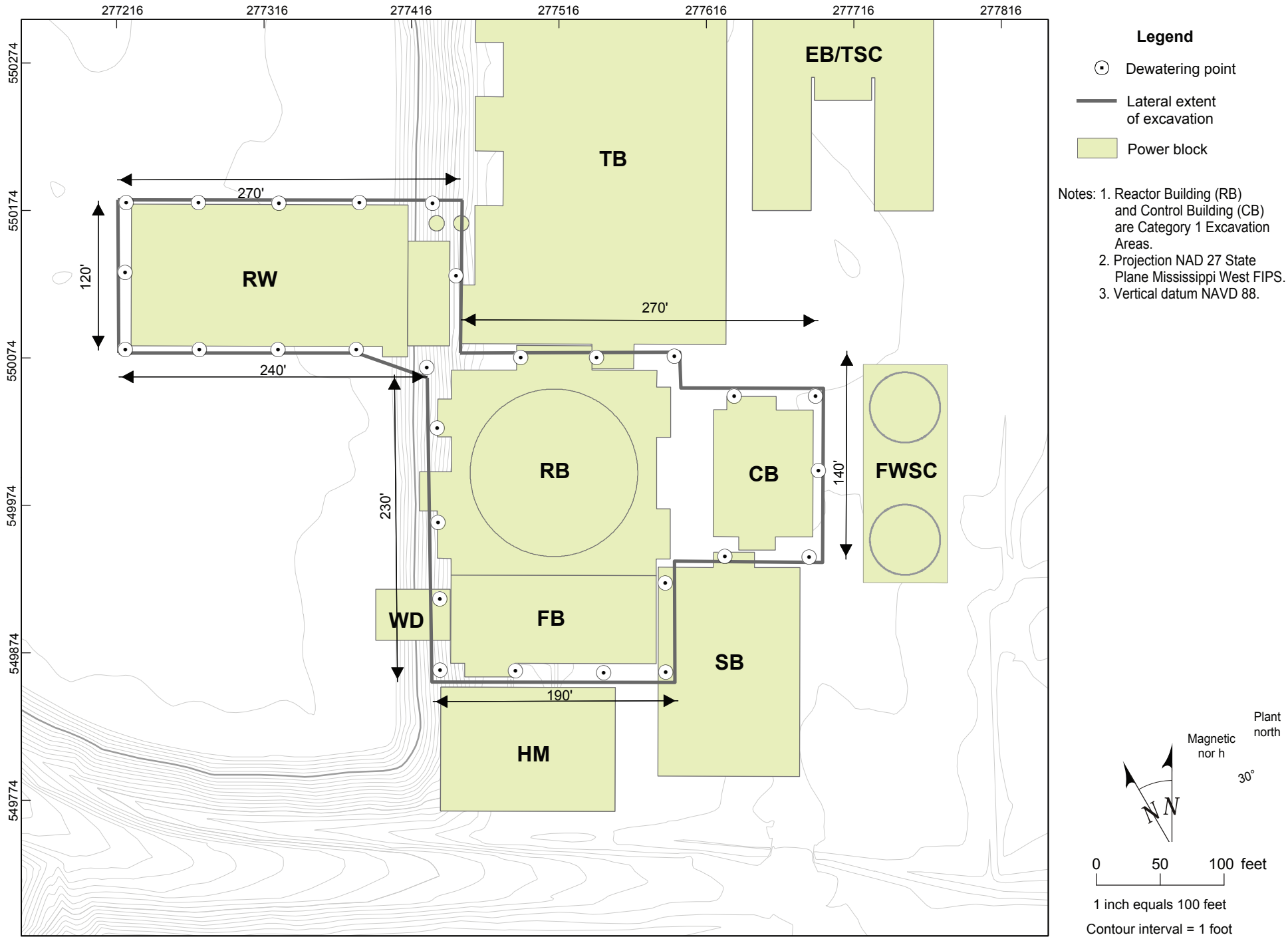
NOTE
1. PRIOR TO PLACING LAGGING, INSTALL 16" WIDE DRAINBOARDS (DRAINAGE COMPOSITE) CENTERED BETWEEN ADJACENT SOLDIER BEAMS WITH PREFABRICATED DRAIN OUTLET NEAR BASE OF EXCAVATION.
2. A LOAD CELL SHALL BE PLACED ON EACH TIE-BACK FOR EACH INSTRUMENTATION SECTION. REFER TO FIGURE 2.5.4.5-261 FOR LOCATIONS OF INSTRUMENTATION SECTIONS.
3. THE DESIGN INCORPORATES A SURCHARGE LOAD OF 250psf .
4. ELEVATIONS REFERENCED TO NAVD 88 DATUM.
5. ON EAST SIDE OF EXCAVATION, FWSC TEMPORARY EXCAVATION AND BACKFILL ILLUSTRATED ON FIGURE 2.5.4-263 TO BE COMPLETED PRIOR TO INITIATING WORK SHOWN ON THIS FIGURE.



ANCHOR SCHEDULE

WALL DESIGN HIEGHT	PILE SIZE	PILE EMBEDMENT	TIEBACK ELEVATION	INCLINATION	TIEBACK DESIGN LOAD (kips)	FREE LENGTH	BONDED LENGTH	JACKING LENGTH	TOTAL LENGTH	NUMBER OF STRANDS
69.5'	HP14x102	35'	ROW 1 = 128.5'	15°	151.2	57.7'	50.4'	5'	113.0'	4
			ROW 2 = 118.5'	15°	315.1	49.5'	105.0'	5'	159.5'	9
			ROW 3 = 108.5'	15°	387.1	41.3'	129.0'	5'	175.4'	11
			ROW 4 = 98.5'	15°	386.9	33.2'	129.0'	5'	167.1'	11
			ROW 5 = 88.5'	15°	385.4	25.0'	128.5'	5'	158.5'	11
			ROW 6 = 78.5'	15°	342.5	16.8'	114.2'	5'	136.0'	10

FIGURE 2.5.4 - 264 SECTION B-B' - TYPICAL TIE-BACK WALL SECTION



GGNS COL 2.0-29-A

Figure 2.5.4-265. Plan of Excavation Footprint and Dewatering Well Locations

Revision 0

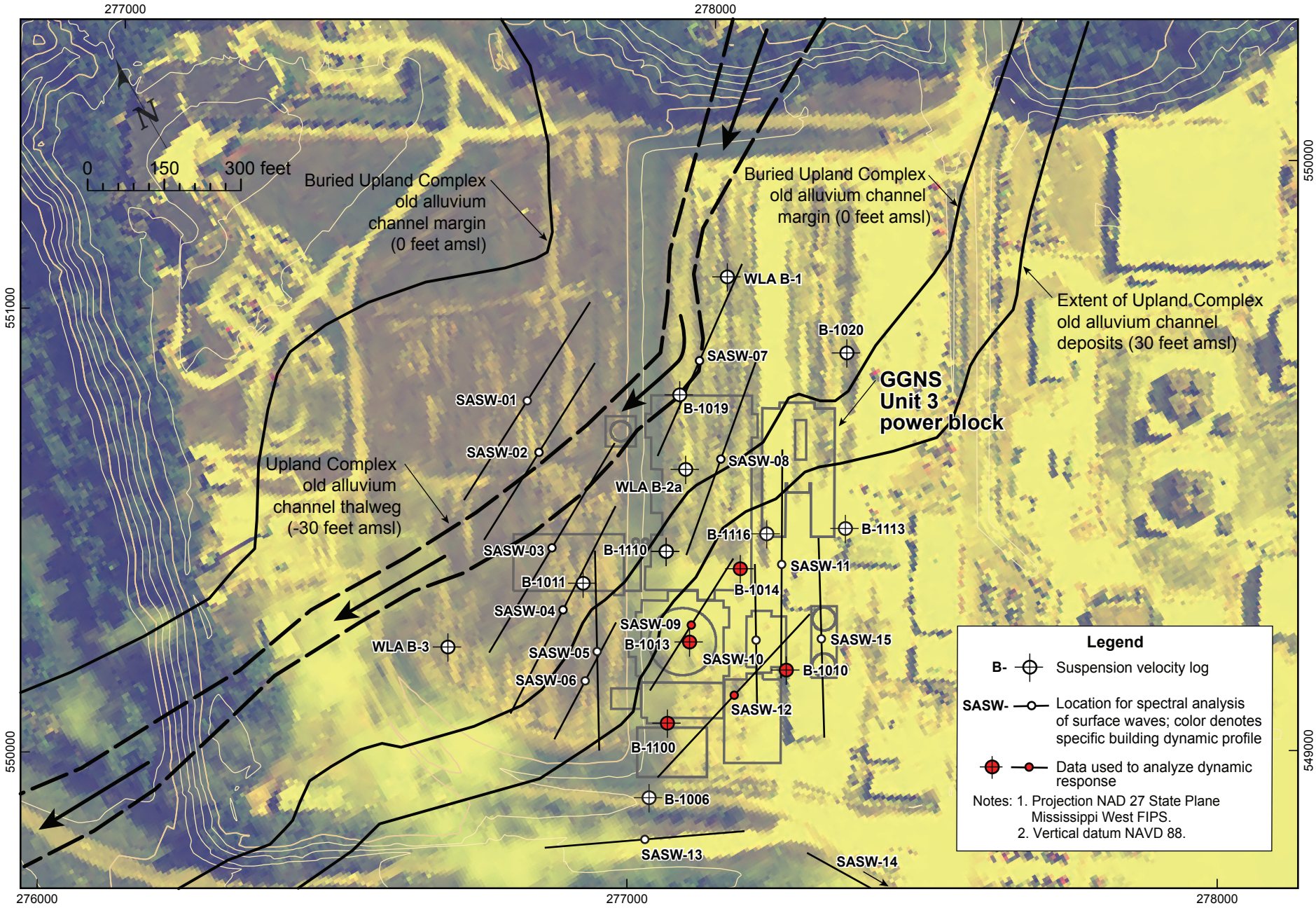


Figure 2.5.4-266. Locations of Shear Wave Data and Generalized Geometry of Upland Complex Old Alluvium Channel

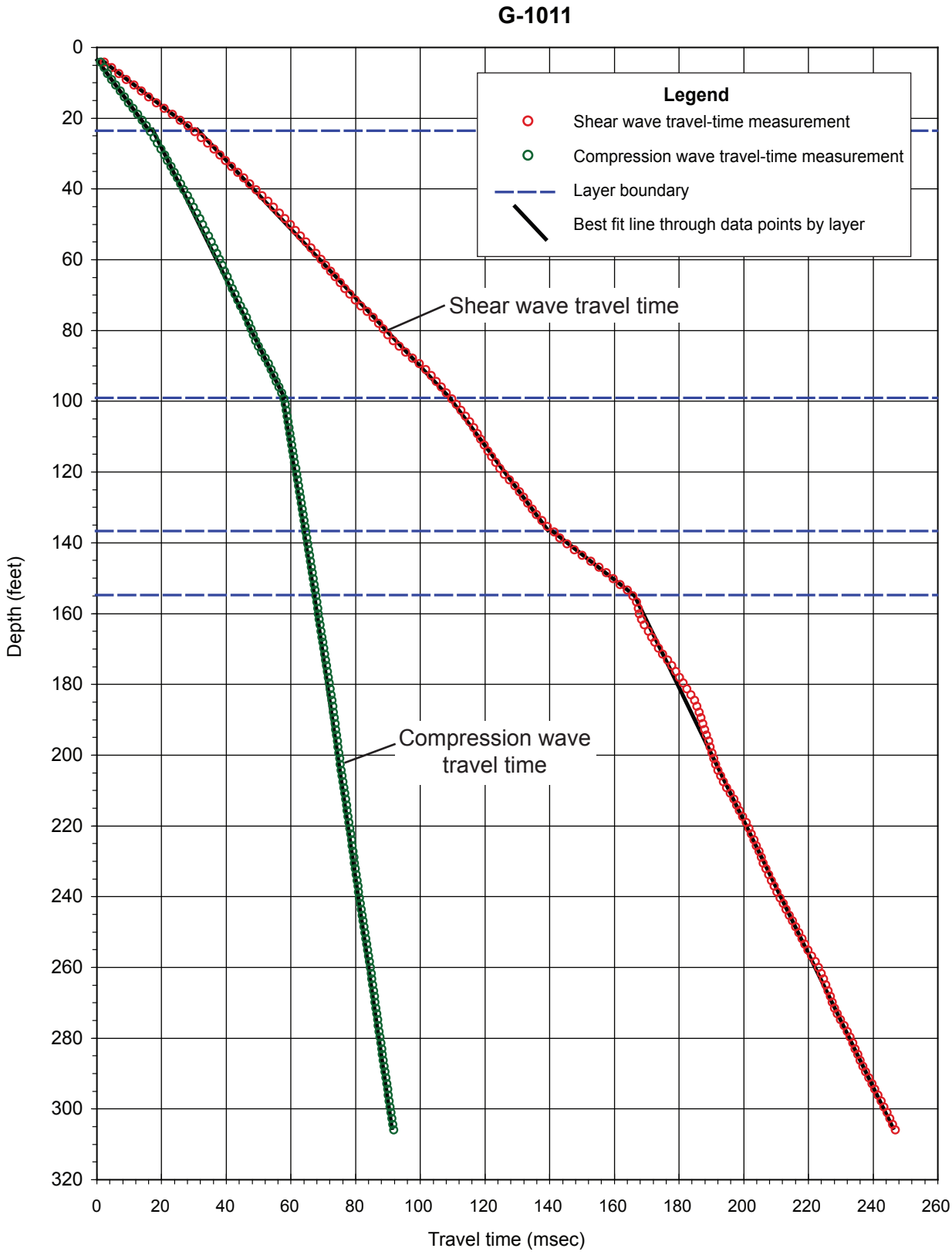


Figure 2.5.4-267. Slope Calculations for Depth vs. Travel-time Plots (Sheet 1 of 4)

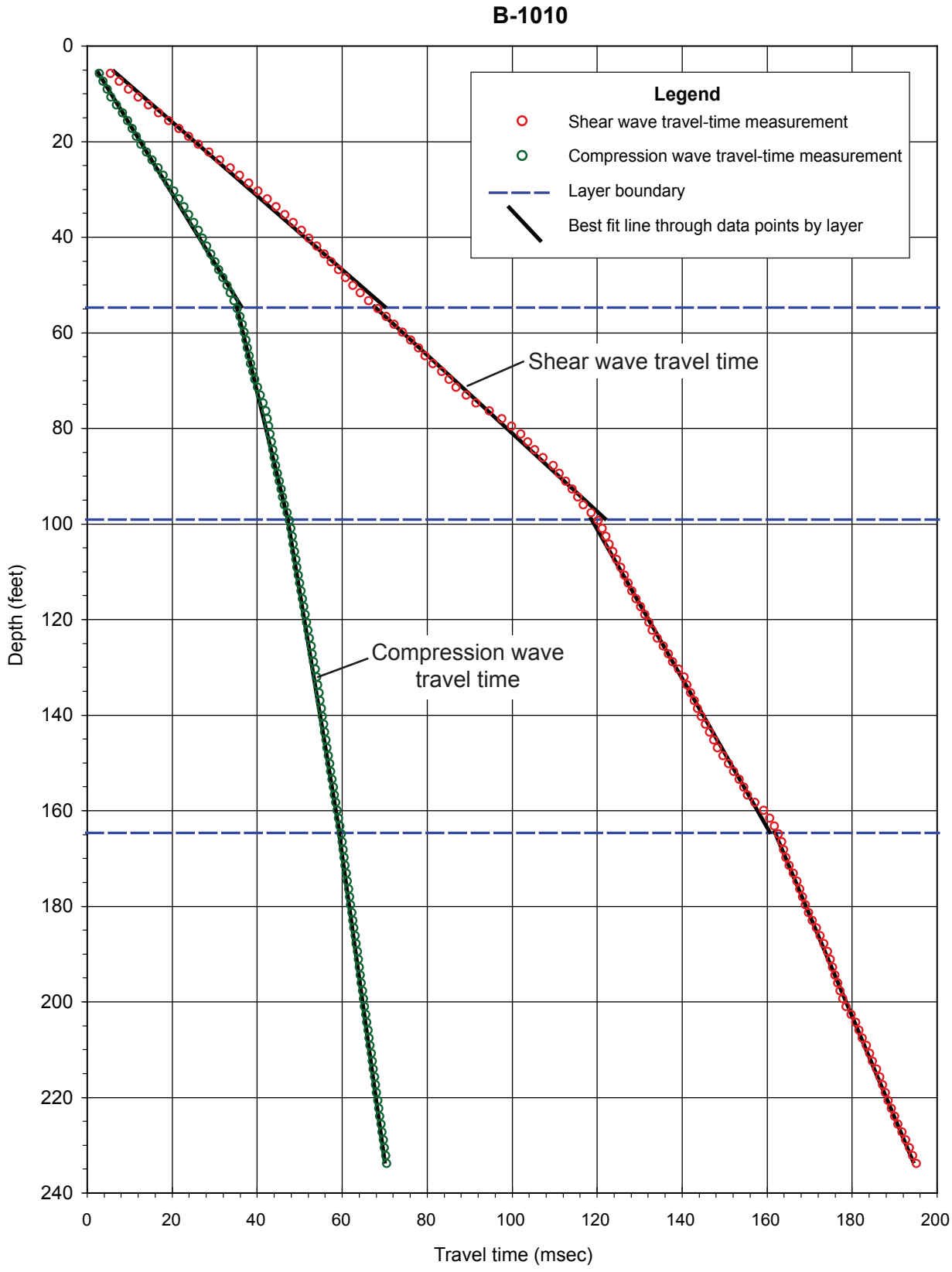


Figure 2.5.4-267. Slope Calculations for Depth vs. Travel-time Plots (Sheet 2 of 4)

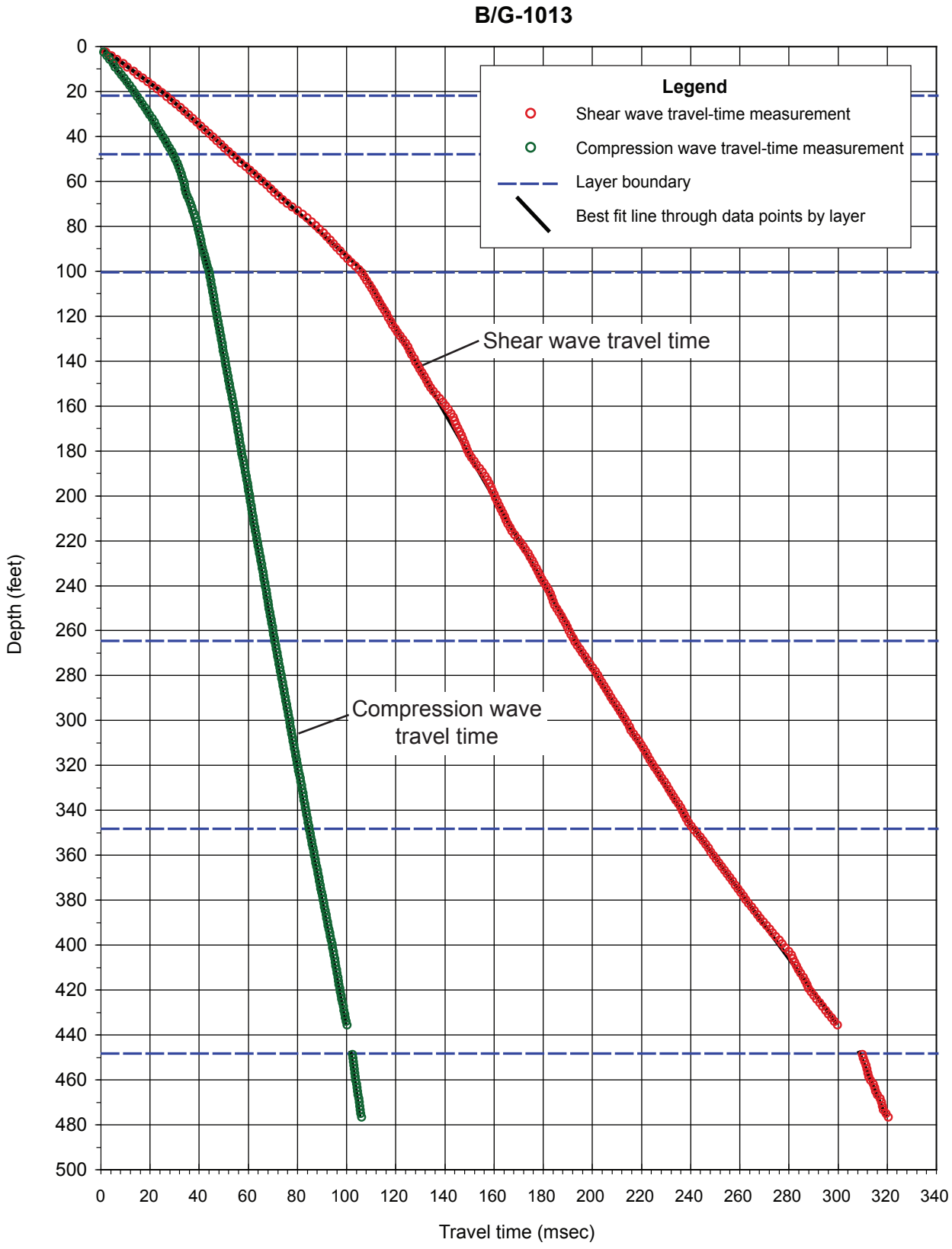


Figure 2.5.4-267. Slope Calculations for Depth vs. Travel-time Plots (Sheet 3 of 4)

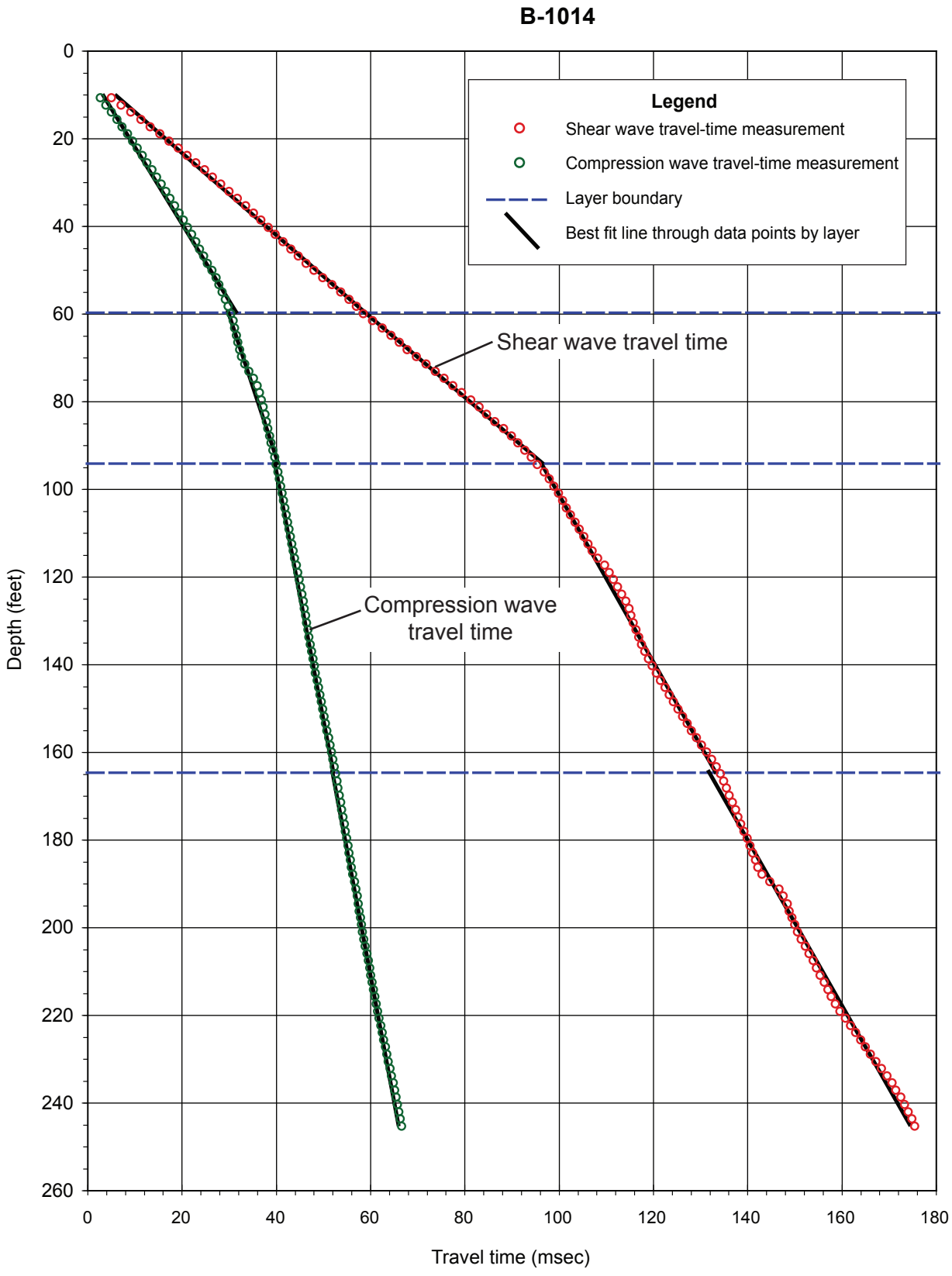


Figure 2.5.4-267. Slope Calculations for Depth vs. Travel-time Plots (Sheet 4 of 4)

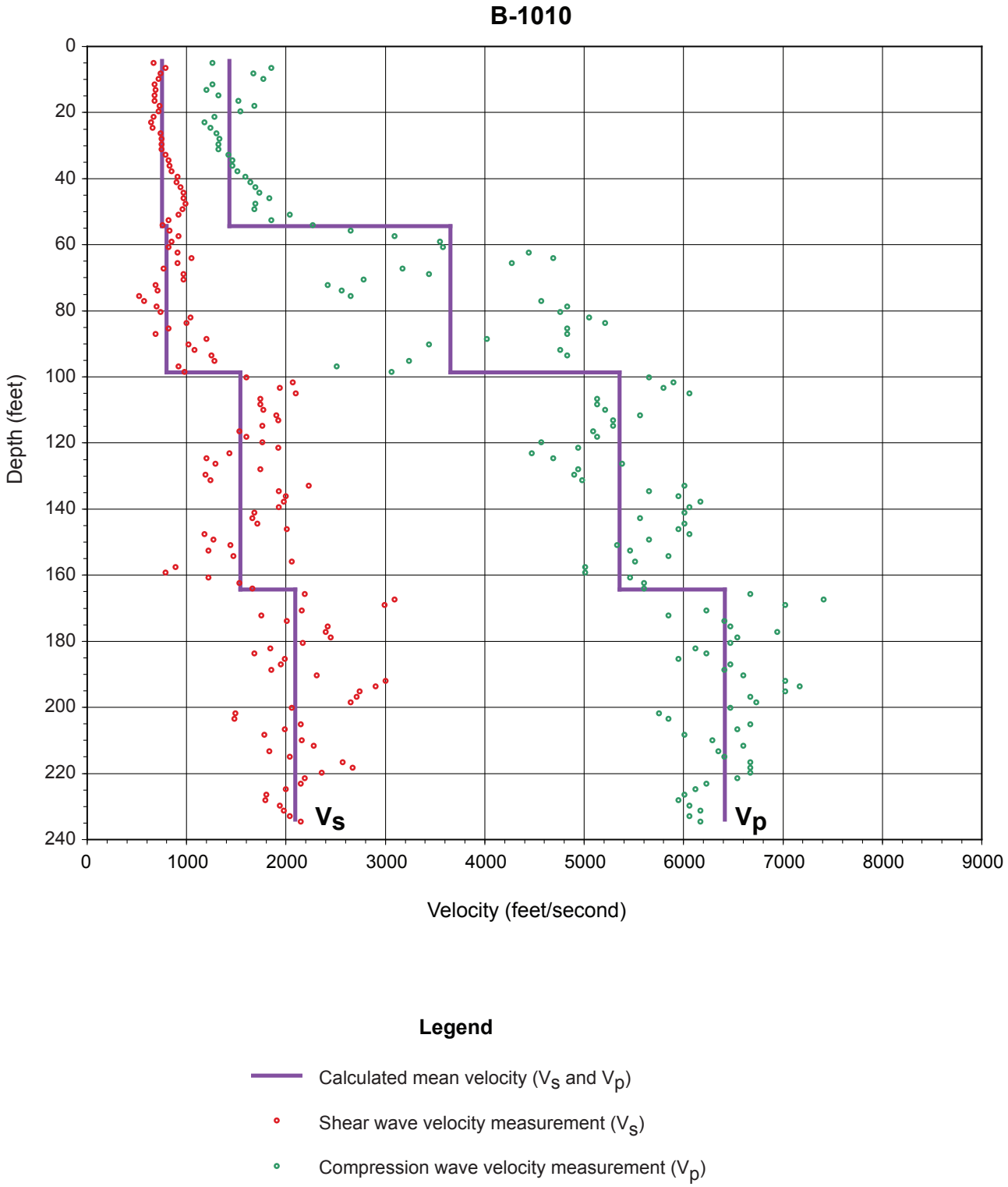


Figure 2.5.4-268. Suspension Velocity Data and Layer Models (Sheet 1 of 4)

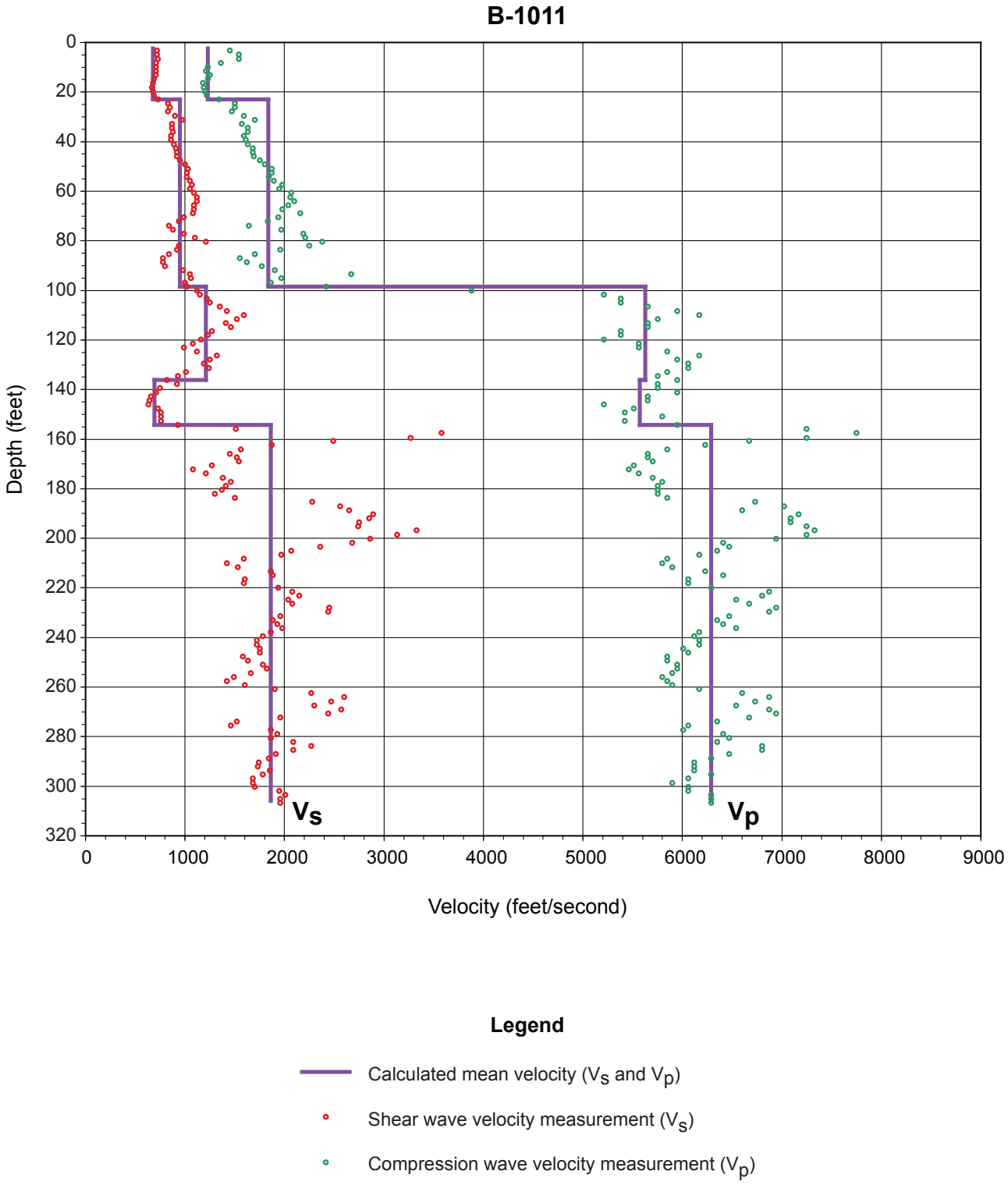


Figure 2.5.4-268. Suspension Velocity Data and Layer Models (Sheet 2 of 4)

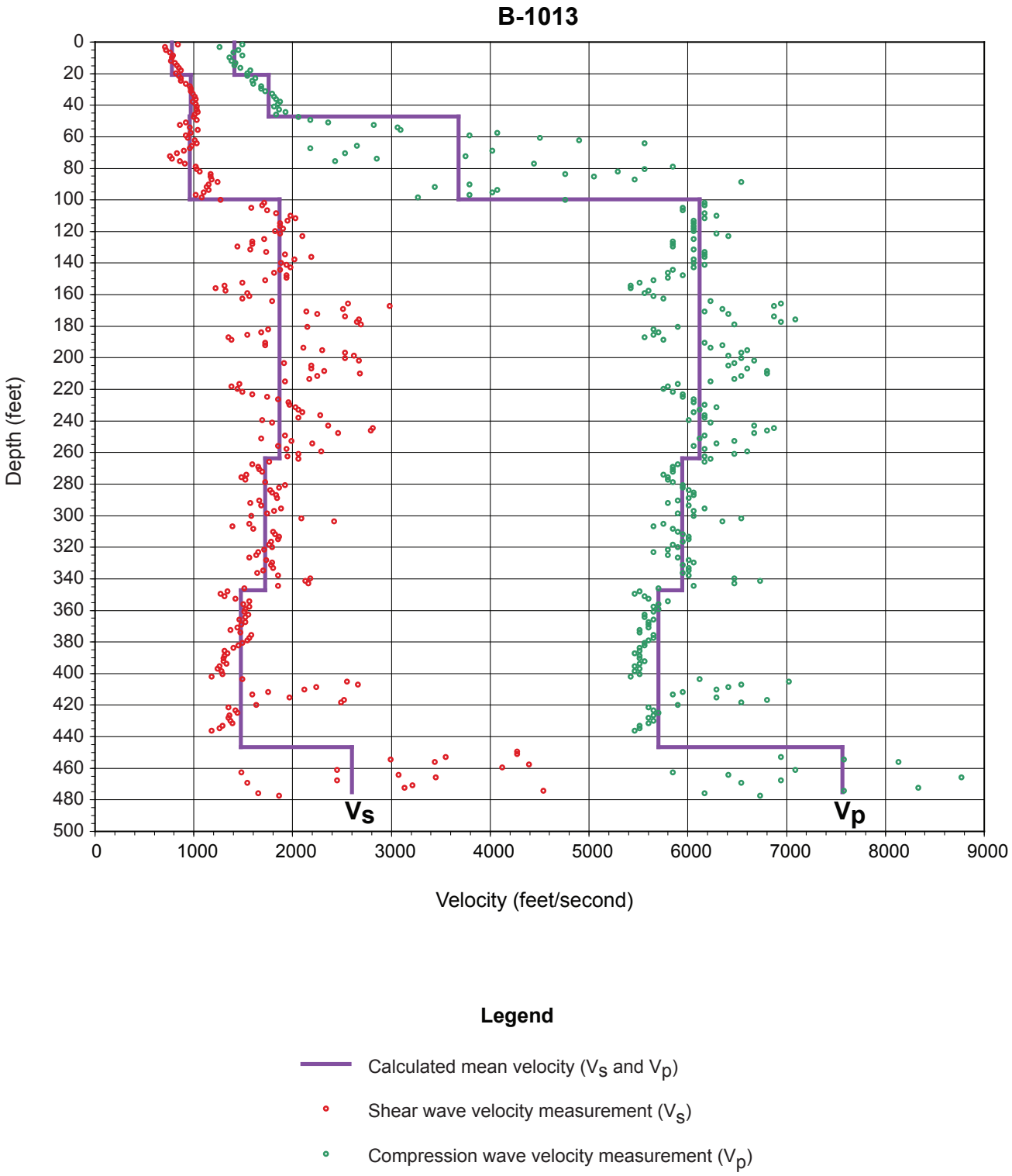


Figure 2.5.4-268. Suspension Velocity Data and Layer Models (Sheet 3 of 4)

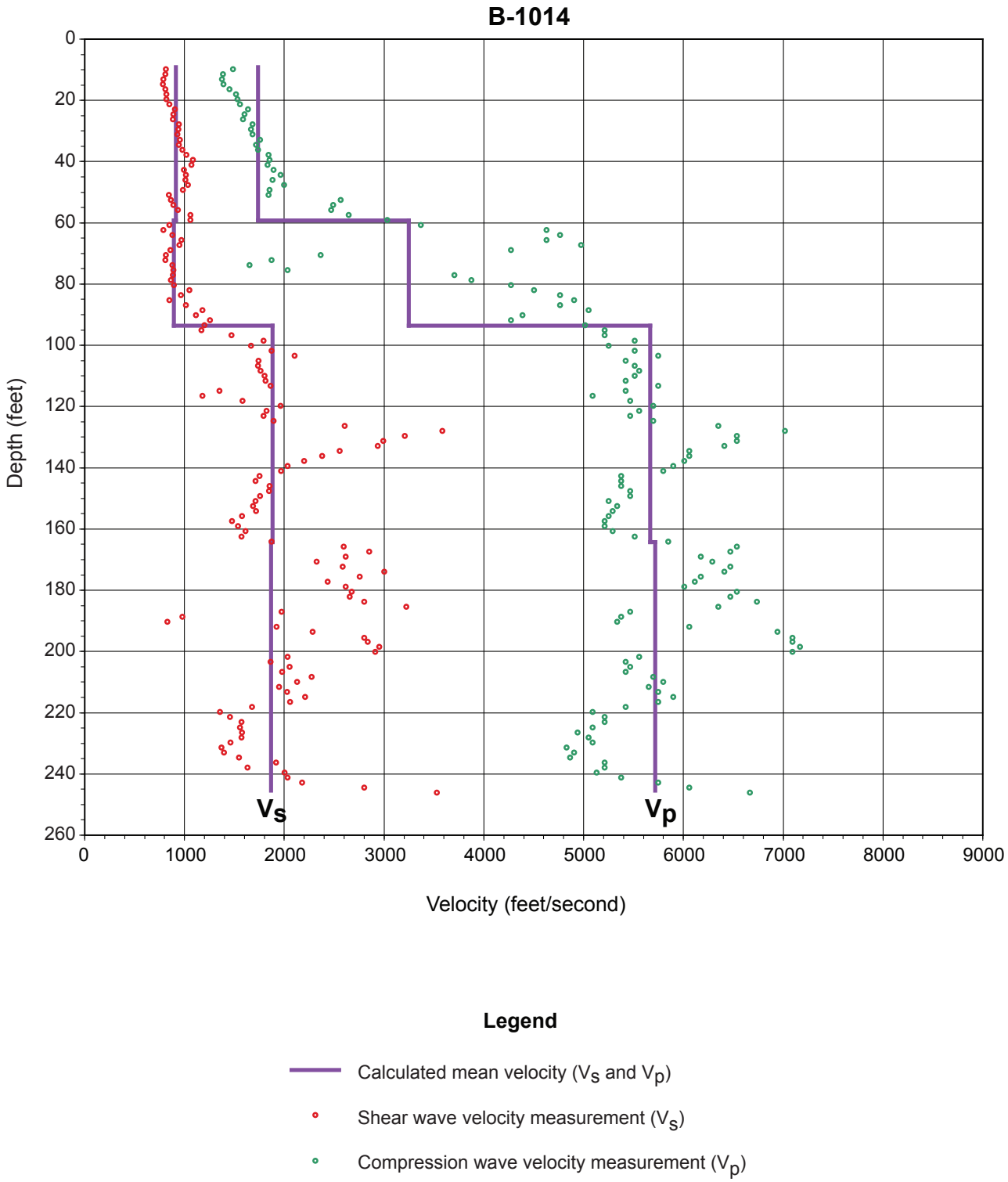


Figure 2.5.4-268. Suspension Velocity Data and Layer Models (Sheet 4 of 4)

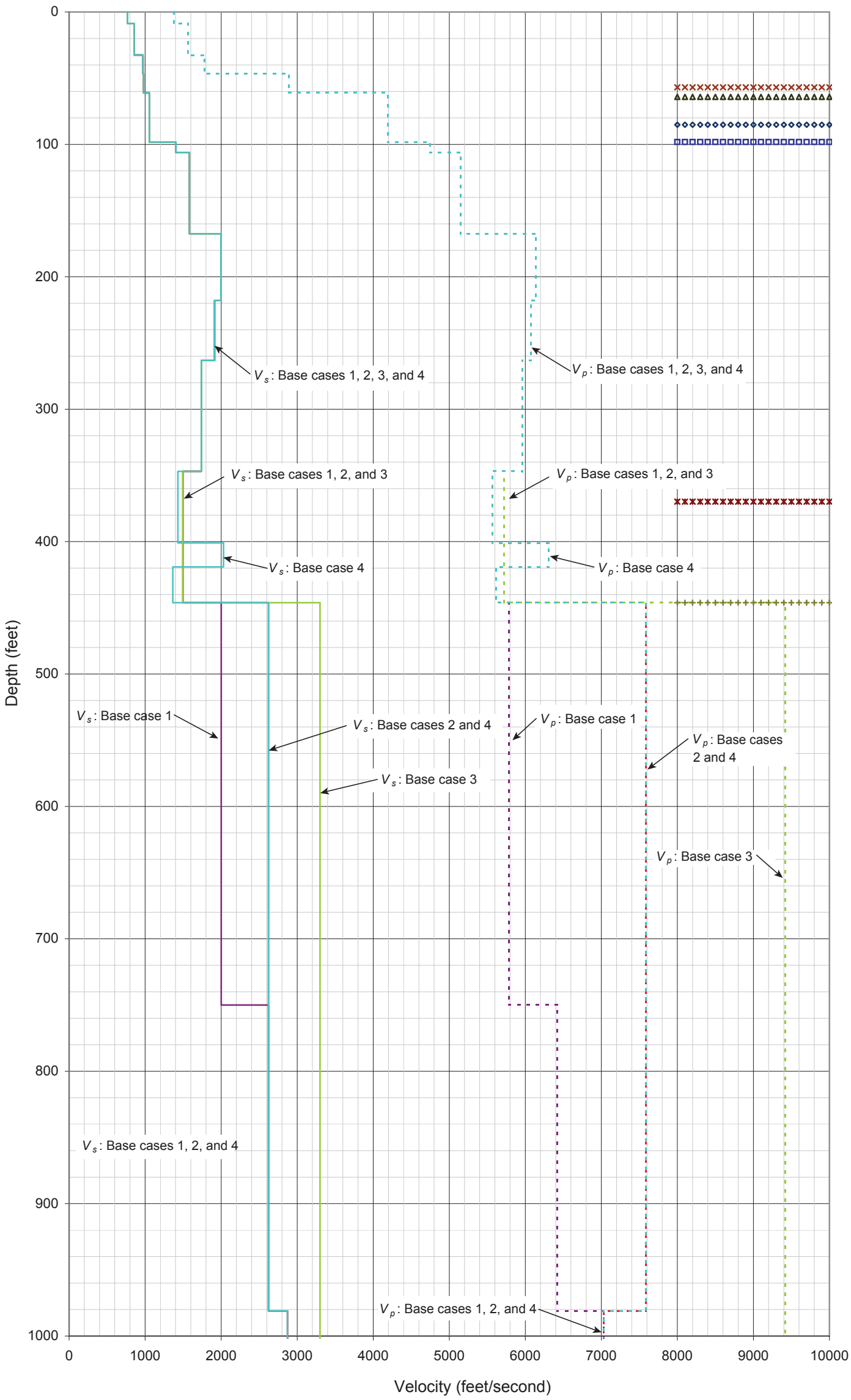


Figure 2.5.4-269. V_s and V_p Base Cases 1 to 4

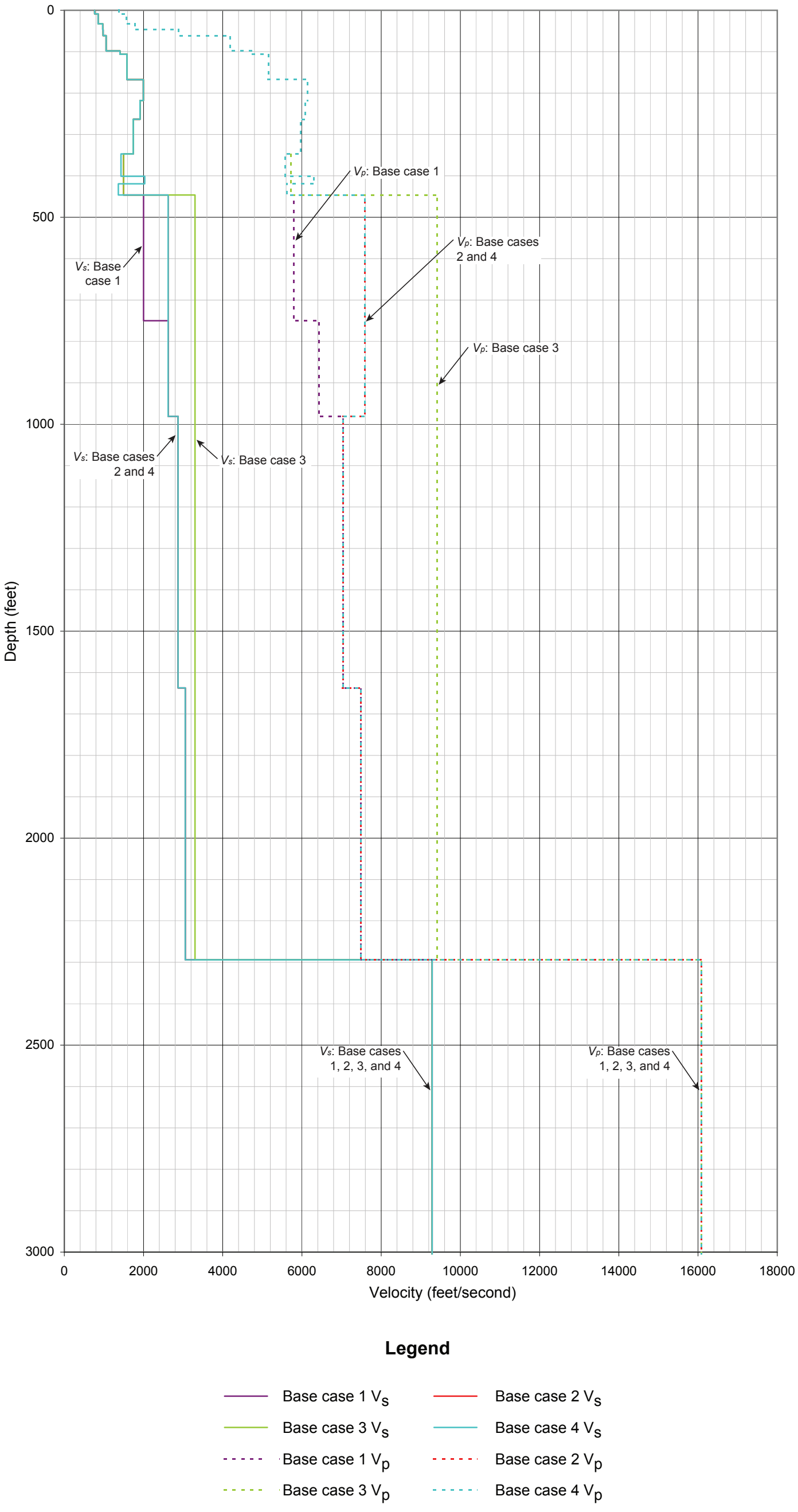
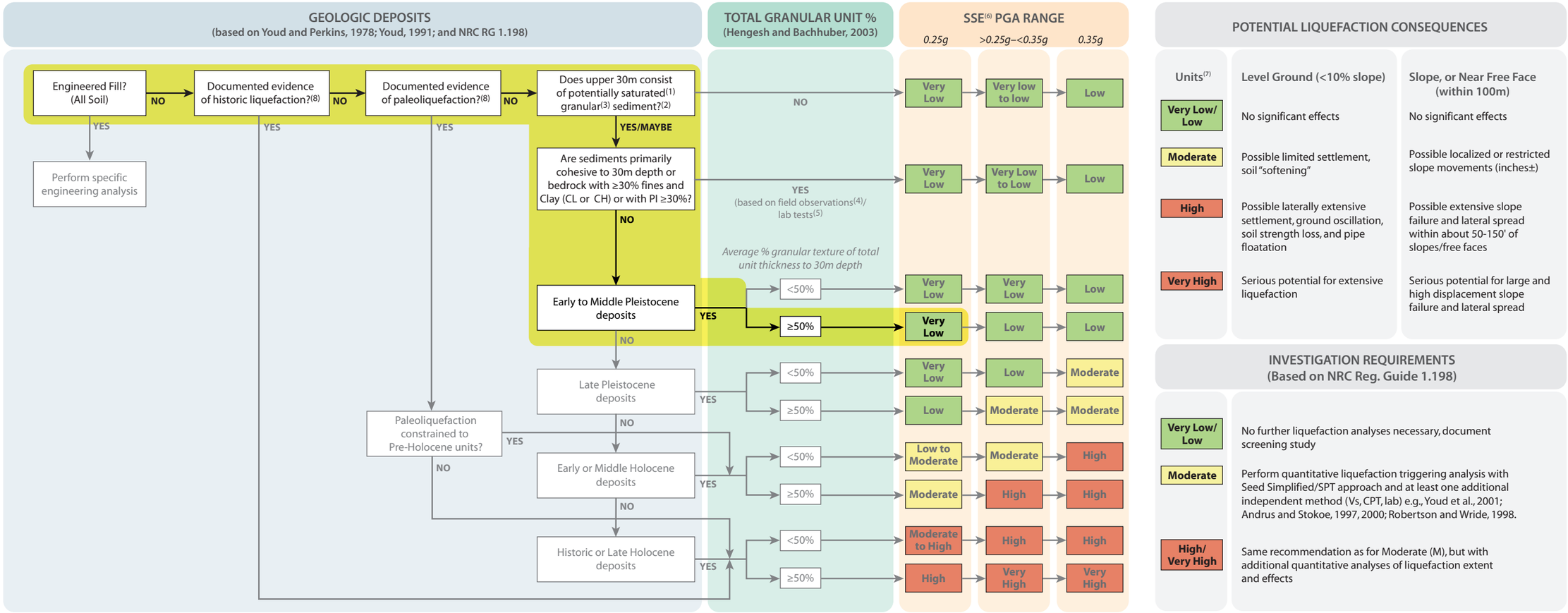
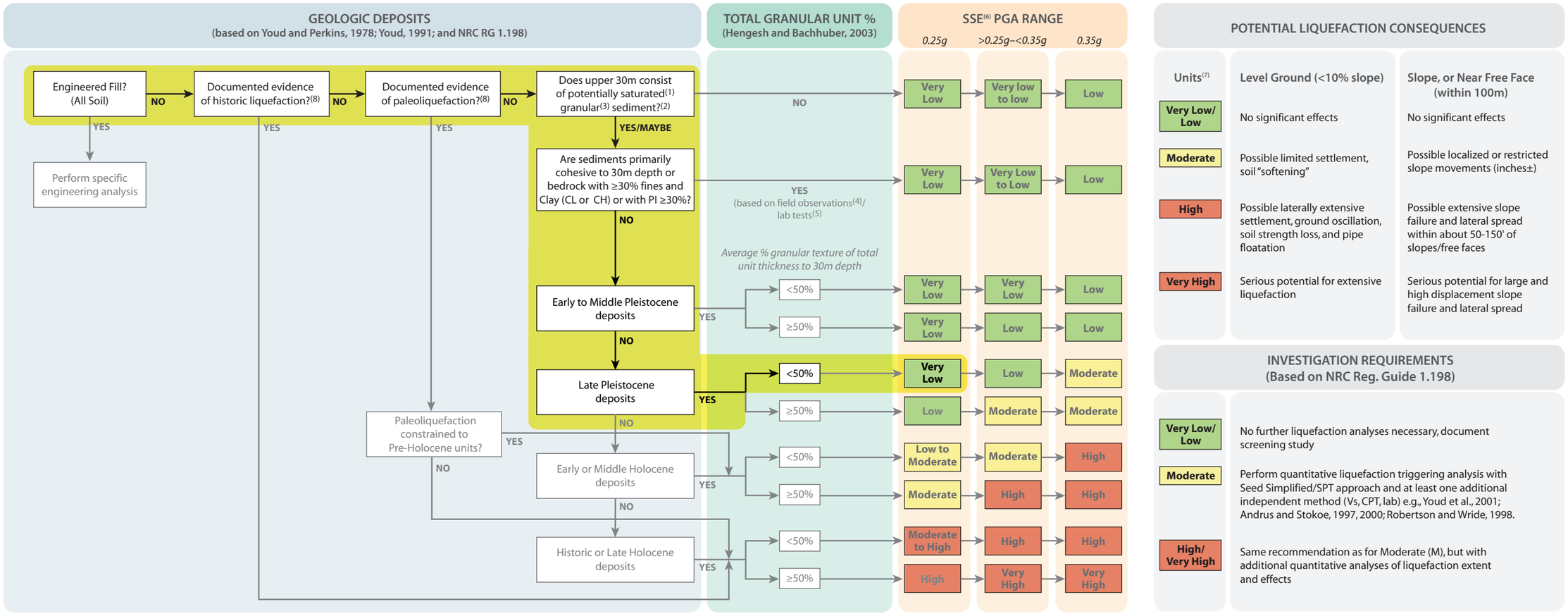


Figure 2.5.4-270. V_S and V_P Base Cases 1 to 4 with Generic Mississippi Embayment Velocity Profile



(1) Elevation of PMF and possible perched groundwater zones must be considered.
(2) The potential for vertical variability (e.g., granular lower strata) must be considered. Borings, continuous cut exposures, etc. are necessary to evaluate this condition.
(3) Soils with USCS classification of S, G, and also including classification ML and OH, OL.
(4) Classification done according to ASTM D2488(00) and collected according to D1586(00), D1587(00), D3550(01), and D 4220(00).
(5) Laboratory soils testing done according to applicable ASTM procedures and according to USNRC RG1.138.
(6) Safe shut down earthquake (SSE) determined for specific site. For preliminary investigations, conservative PGA estimate will be used.
(7) Very low (VL), Low (L), Moderate (M), High (H), and Very High (VH) are based on standard conventions for liquefaction hazard mapping
(8) Documentation of historic and paleoliquefaction to include review of regional and local literature, aerial and/or field reconnaissance, aerial photograph review, discussions with state and/or U.S. Geological Surveys, and review of site geologic and geotechnical studies.

Figure 2.5.4-271. Geologic Liquefaction Screening Flow Chart for Central-Eastern United States for Upper Loess and Lower Loess



POTENTIAL LIQUEFACTION CONSEQUENCES

Units(7)	Level Ground (<10% slope)	Slope, or Near Free Face (within 100m)
Very Low/ Low	No significant effects	No significant effects
Moderate	Possible limited settlement, soil "softening"	Possible localized or restricted slope movements (inches±)
High	Possible laterally extensive settlement, ground oscillation, soil strength loss, and pipe floatation	Possible extensive slope failure and lateral spread within about 50-150' of slopes/free faces
Very High	Serious potential for extensive liquefaction	Serious potential for large and high displacement slope failure and lateral spread

INVESTIGATION REQUIREMENTS (Based on NRC Reg. Guide 1.198)

Very Low/ Low	No further liquefaction analyses necessary, document screening study
Moderate	Perform quantitative liquefaction triggering analysis with Seed Simplified/SPT approach and at least one additional independent method (Vs, CPT, lab) e.g., Youd et al., 2001; Andrus and Stokoe, 1997, 2000; Robertson and Wride, 1998.
High/ Very High	Same recommendation as for Moderate (M), but with additional quantitative analyses of liquefaction extent and effects

(1) Elevation of PMF and possible perched groundwater zones must be considered.
(2) The potential for vertical variability (e.g., granular lower strata) must be considered. Borings, continuous cut exposures, etc. are necessary to evaluate this condition.
(3) Soils with USCS classification of S, G, and also including classification ML and OH, OL.
(4) Classification done according to ASTM D2488(00) and collected according to D1586(00), D1587(00), D3550(01), and D 4220(00).
(5) Laboratory soils testing done according to applicable ASTM procedures and according to USNRC RG1.138.
(6) Safe shut down earthquake (SSE) determined for specific site. For preliminary investigations, conservative PGA estimate will be used.
(7) Very low (VL), Low (L), Moderate (M), High (H), and Very High (VH) are based on standard conventions for liquefaction hazard mapping
(8) Documentation of historic and paleoliquefaction to include review of regional and local literature, aerial and/or field reconnaissance, aerial photograph review, discussions with state and/or U.S. Geological Surveys, and review of site geologic and geotechnical studies.

Figure 2.5.4-272. Geologic Liquefaction Screening Flow Chart for Central-Eastern United States for Upland Complex Alluvium and Upland Complex Old Alluvium

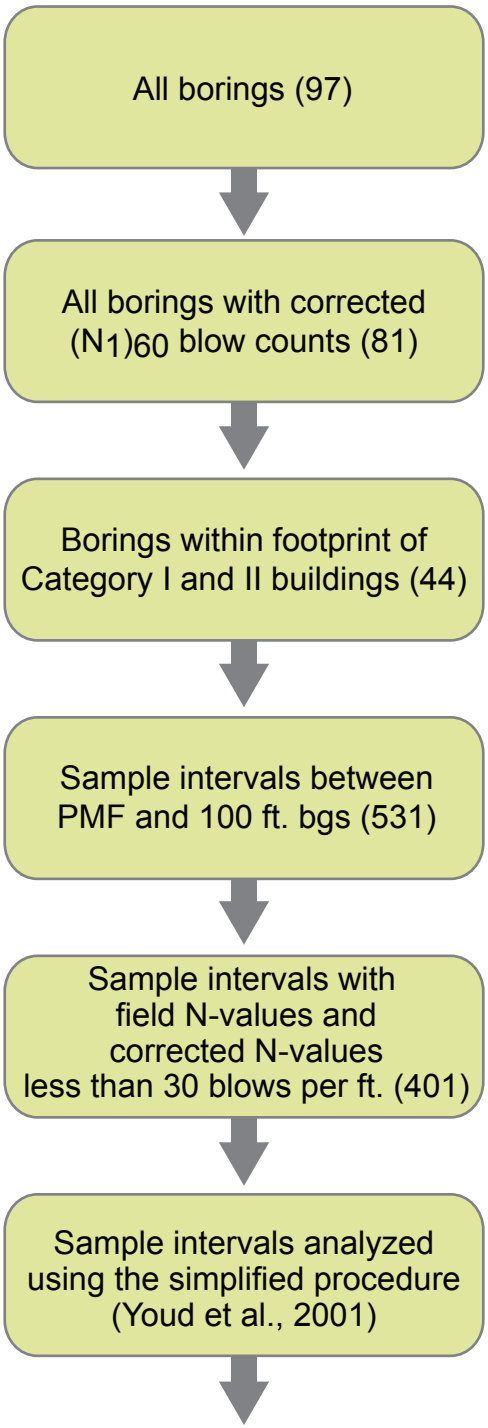


Figure 2.5.4-273. Liquefaction Analysis Flow Chart

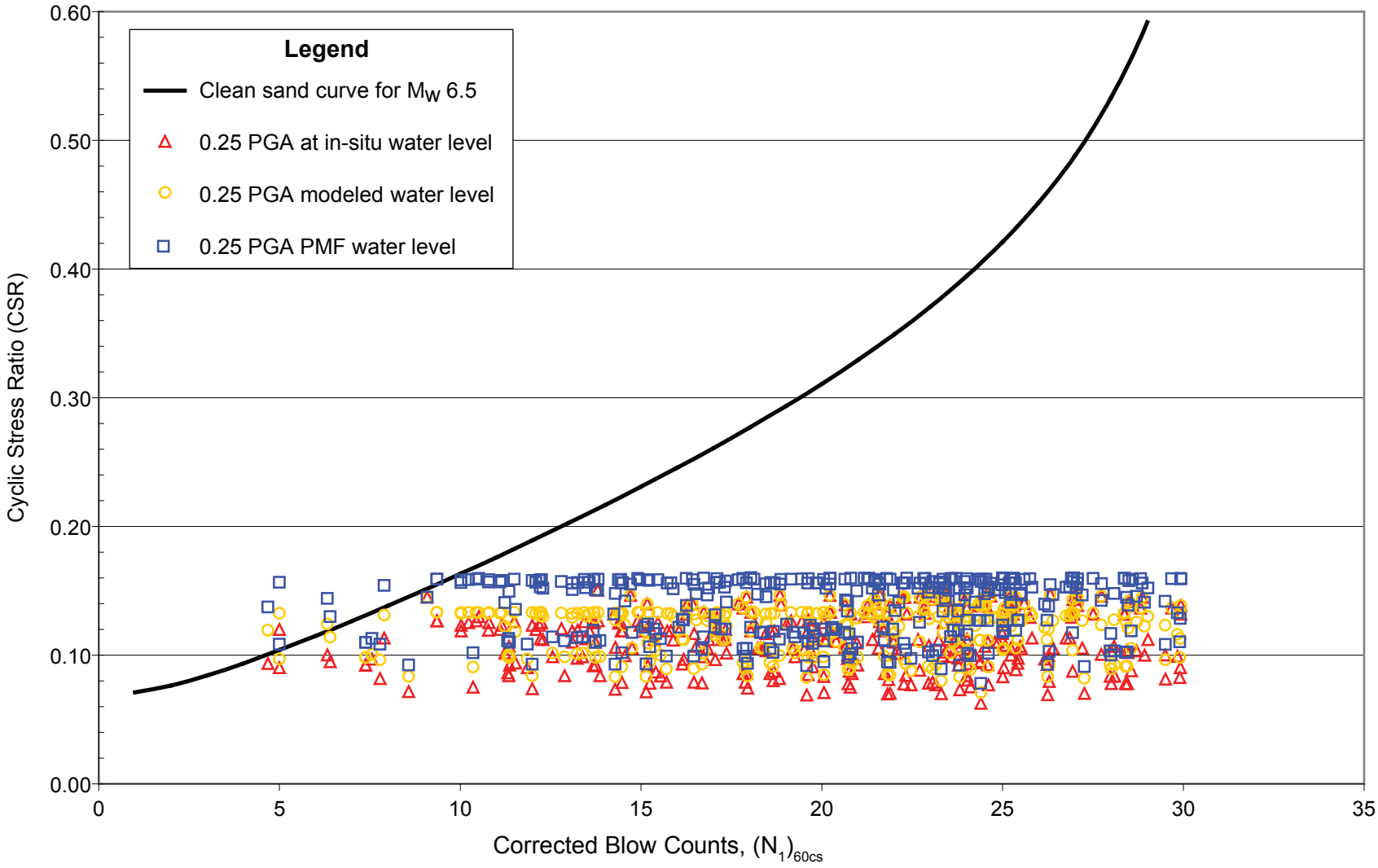


Figure 2.5.4-274. Cyclic Stress Ratio vs $(N1)_{60CS}$ Corrected Blow Counts for 0.25 PGA (modified from Youd et al. 2001)

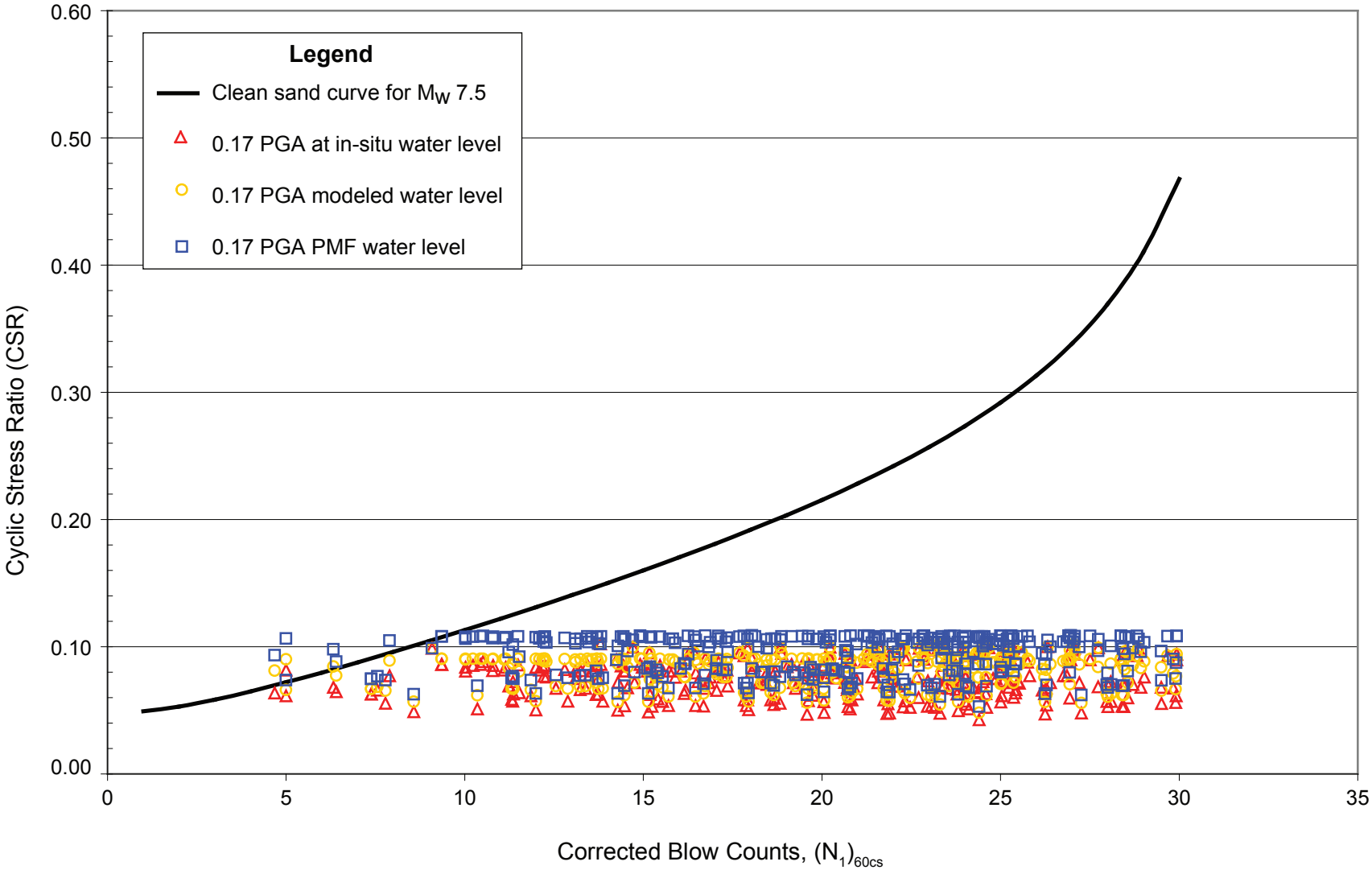


Figure 2.5.4-275. Cyclic Stress Ratio vs $(N1)_{60CS}$ Corrected Blow Counts for 0.17 PGA (modified from Youd et al. 2001)

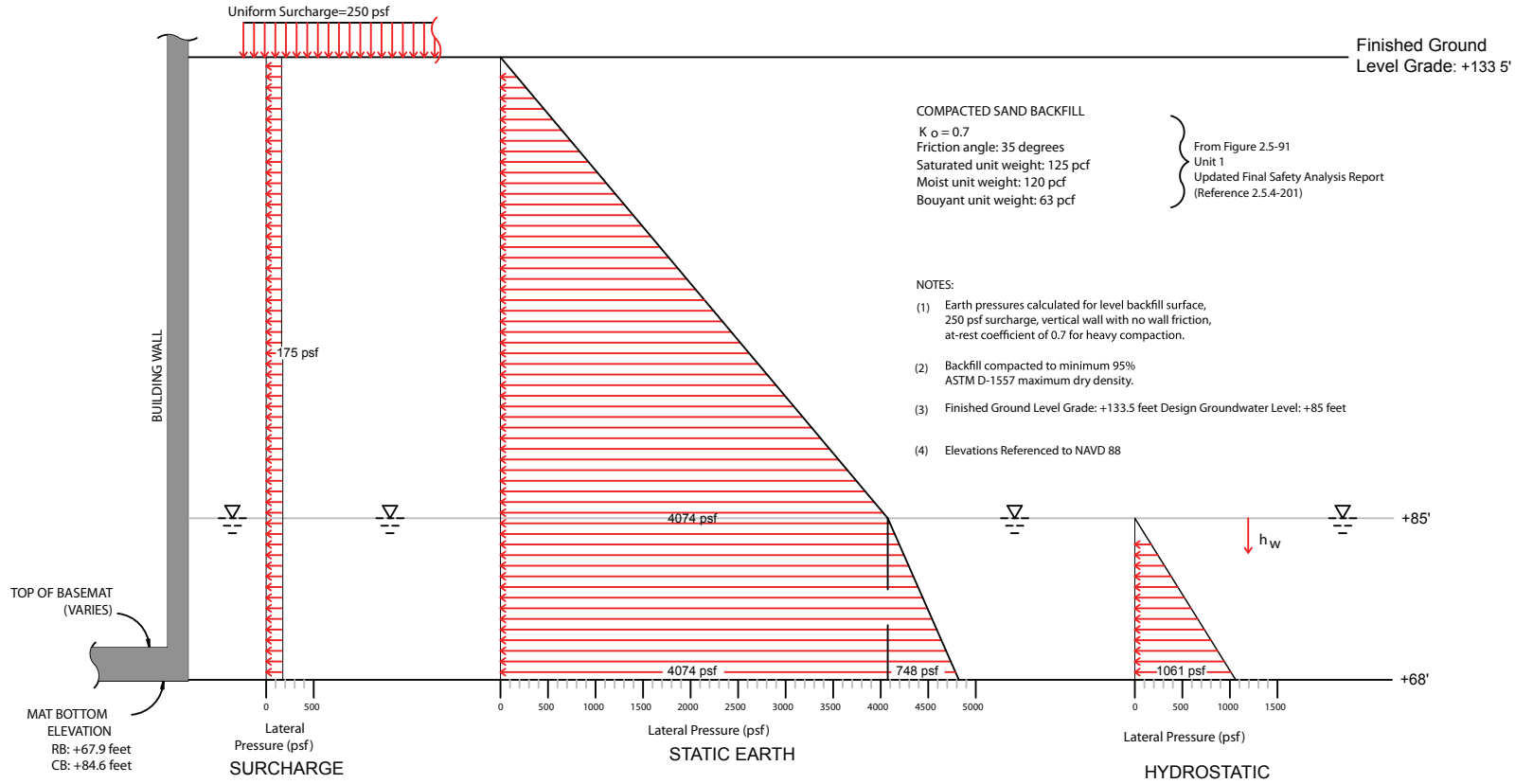


Figure 2.5.4-276. Lateral Earth Pressures and Hydrostatic Loadings for Compacted Sand Structural Fill/Backfill