

Section 4 Results of Fieldwork

CSH conducted subsurface testing between July 25 and August 6, 2012 and on September 11, 2012. The subsurface testing program included the excavation of 10 backhoe test trenches, 33 backhoe-assisted shovel tests, and 15 manual shovel tests along the length of the project area (totaling 58 test units). The test trenches are labeled Test Trenches 1-3, 5, 12-17, and the shovel tests are labeled Shovel Tests 1-48. Note that orientations for the manual shovel test profiles were not obtained as they were circular (i.e., they did not have a straight edge to measure orientation). Orientations for many of the other backhoe-assisted shovel tests also were not taken in the field.

One or more subsurface cultural layer was observed in the majority of test units (39 of 58 test units). Cultural material, in the form of charcoal, shell midden, fire-cracked rock, or human remains, was observed. In five of the test units, two cultural layers, an upper and lower, were observed. Historic property designations for this cultural layer(s) were incorporated into pre-existing historic properties, based on location (*ahupua'a*): the cultural layer observed within test units in Waipouli Ahupua'a were incorporated into SIHP # 50-30-08-1801; the cultural layer(s) observed within test units in North Olohena Ahupua'a were incorporated into SIHP # 50-30-08-1800; and the cultural layer observed within test units in South Olohena Ahupua'a were incorporated into SIHP # 50-30-08-791.

Two new burials were documented within the project area (SIHP #s TBD). Detailed descriptions of the burials are presented in Section 4.4, below.

One isolated find, a coral file, was observed within one of the test units. A detailed description of the find is presented in Section 5, below.

4.1 GPR Findings

The main purpose of this GPR study was to determine the viability of GPR in identifying stratigraphy and locating cultural deposits. The presentation of GPR data has been categorized to show GPR results for the shoreline portion of the project area and GPR results from the two inland excavations that identified human interments.

Prior to excavation, the majority of the project's backhoe test trenches and all of the project's shovel test locations were surveyed with GPR. Post-processing of GPR data was used to create GPR profile maps and horizontal slice maps of a selection of GPR survey areas along the coastline as well as the two test units with burials. The GPR maps of individual test units are depicted alongside matching digitized stratigraphic profile maps. The side-by-side presentation of GPR data and stratigraphic profile data allow for a visual analysis of the effectiveness of GPR to identify stratigraphic interfaces, buried cultural deposits, and interments.

In general, the results of the GPR survey allowed for some general observations regarding the correlation of GPR data with field-verified stratigraphic data as well as the limitations of GPR survey in the identification of subsurface anomalies. GPR analysis indicated that the uppermost strata documented during subsurface excavation throughout the project area generally corresponded to linear signatures of high reflectivity within the initial 10-20 cm of GPR profile

data. Additionally, changes in reflectivity within the deeper signals of the GPR profile do appear, in some instances, to correspond with stratigraphic interfaces.

The clearest example of the correlation between GPR data and stratigraphic information may be seen in Shovel Tests 37 and 38 (refer to Figure 26). While the depths of the changes in reflectivity of GPR data differ slightly with the depths recorded on the stratigraphic profile, there does appear to be a general correlation. Stratum Ia in both Shovel Tests 37 and 38 is represented by a linear band of high reflectivity, Stratum Ib by wavy, high reflectivity banding, and Stratum II by the absence of reflectivity and banding. The portion of the GPR profile beyond 1.0 m in both Shovel Tests 37 and 38, which was unexcavated, is beyond the depth of penetration of the GPR signal.

While Shovel Tests 37 and 38 present a data correlation, numerous other GPR data from within the project area do not readily correlate to observed and recorded stratigraphy. An example of poor correlation is observed in Shovel Test 25, which consisted of four observed strata (refer to Figure 19). The GPR data for Shovel Test 25 do not depict clear interfaces or reflectivity changes between strata. It may be postulated that the poor correlation is related to a number of limiting factors including soil conditions, content, and chemistry. The GPR profile of Shovel Test 13 also represents poor correlation with observed stratigraphy as Stratum II through Stratum IIIb returned a similar reflectivity signal (refer to Figure 21).

The GPR data did not produce a clear signature of the buried, culturally-enriched sandy A horizon that was documented throughout much of the project area. Additionally, GPR anomalies that appear within several GPR profiles as discrete parabolas (such as in Shovel Tests 15, 34, and 39; refer to Figure 14, Figure 24, and Figure 27) did not correlate with any objects (e.g., utility lines, boulders, excavated pits) observed during excavation. It is possible that these anomalies correlate to variations in density, compaction, or composition within a stratigraphic layer that were not readily observable during the process of backhoe excavation.

Particular attention is given to the post-processing and analysis of the GPR data from Test Trench 2 and Shovel Test 43, the locations of the two human interments identified during subsurface testing (refer to Figure 29 through Figure 31). In addition to GPR profiles, horizontal slice maps of Test Trench 2 and Shovel Test 43 were produced. The location and depth of each human interment is plotted on both the GPR profile and slice maps for each test unit in order to indicate whether or not a GPR signature for a burial pit or interment is visible.

The GPR profile and slice map of Test Trench 2 did not produce a reflectivity signature for the burial pit or interment. The GPR profile and slice map of Shovel Test 43 did identify two subsurface parabolic anomalies; however, the excavation of Shovel Test 43 verified that these anomalies corresponded to buried utility lines, one of which likely truncated the burial pit and disturbed the interment.

In conclusion, GPR data was collected and is presented below for a portion of the coastline in the project area and for the two inland test locations where human interments were identified. In some instances, the data has correctly identified stratigraphic transitions and interfaces. The GPR data has failed to accurately provide a reflectivity signature for the buried, culturally-enriched sandy A horizon (cultural layer) identified throughout the project area and for the human interments identified within Test Trench 2 and Shovel Test 43. The use of GPR within the

project area has contributed to the on-going understanding of the effectiveness of GPR analysis within the Hawaiian Islands, and the data collected during the current project will be used to establish and refine future GPR survey techniques and interpretation.

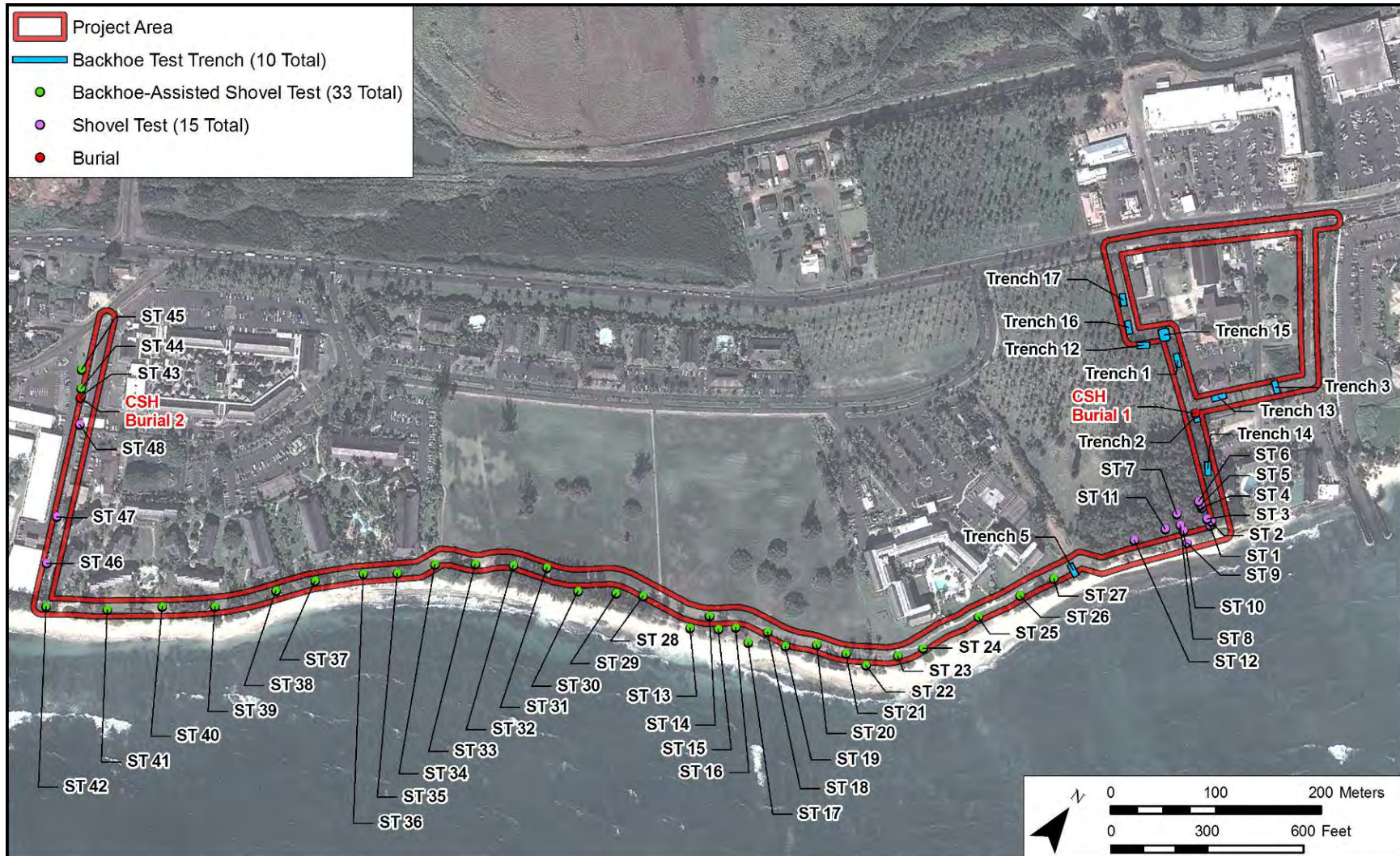


Figure 13. Locations of test trenches and shovel tests excavated within the project area during the current AIS (base map: Google Earth 2010)

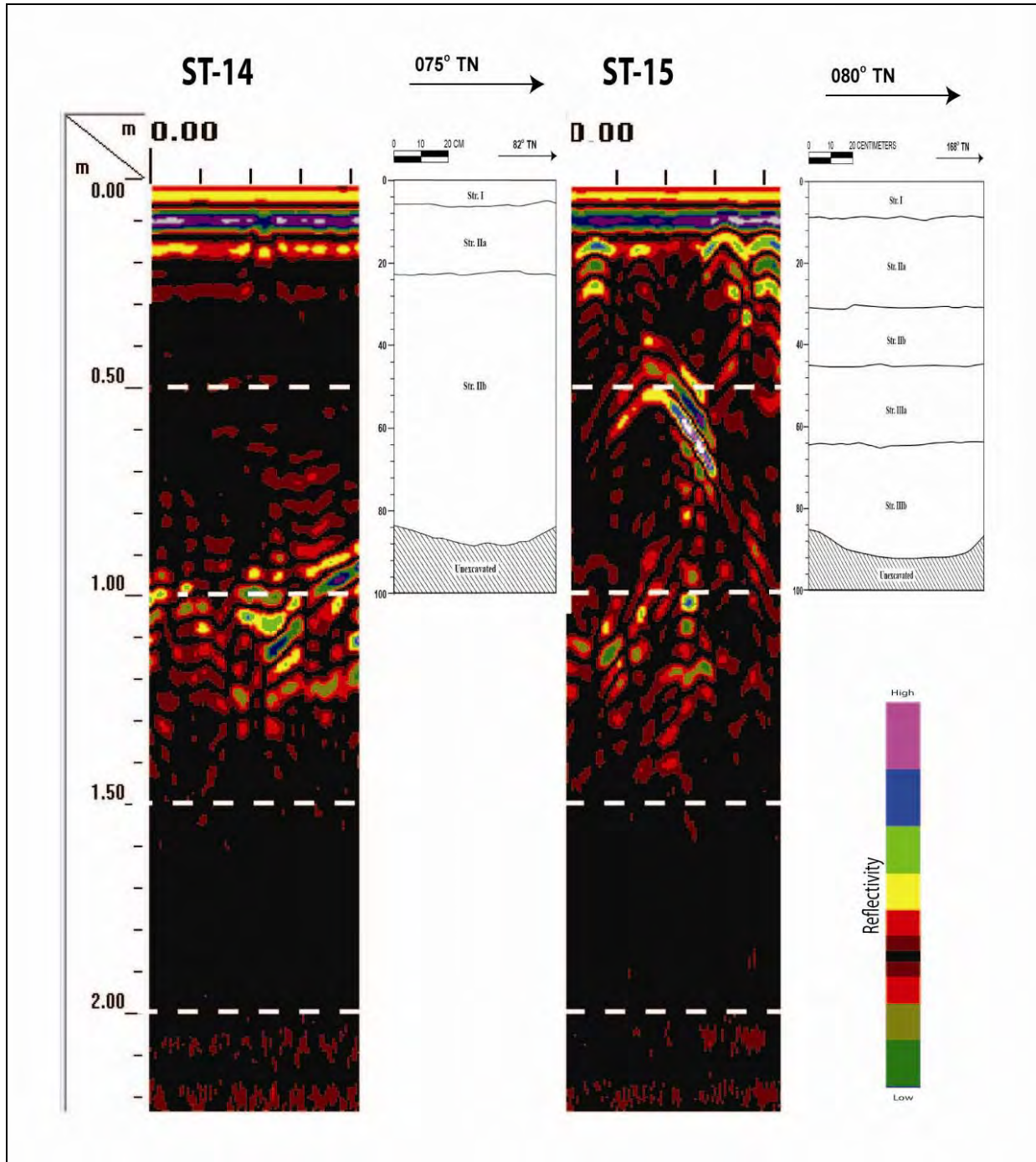


Figure 14. Comparison of GPR profiles and excavation profiles for Shovel Tests 14 and 15

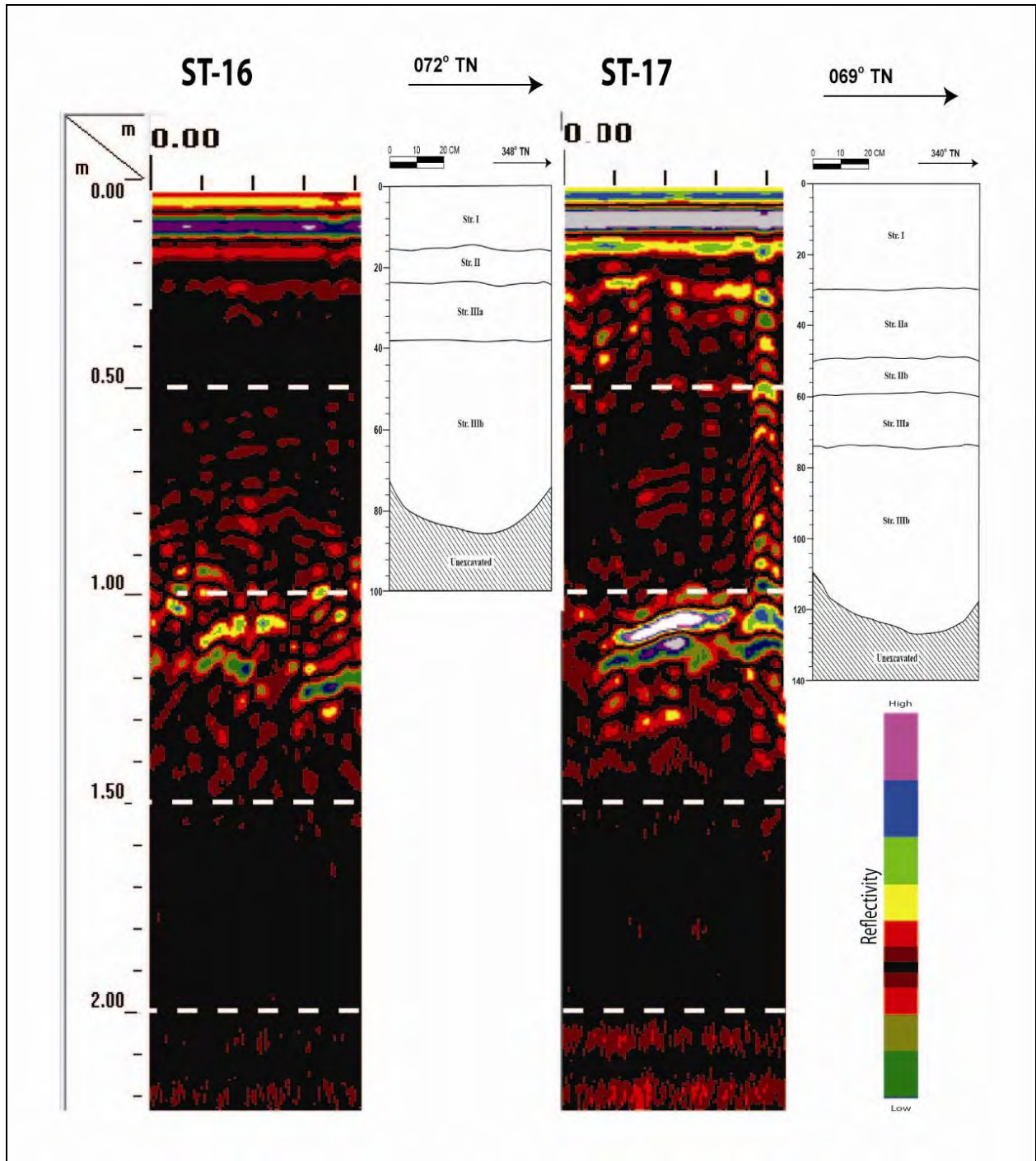


Figure 15. Comparison of GPR profiles and excavation profiles for Shovel Tests 16 and 17

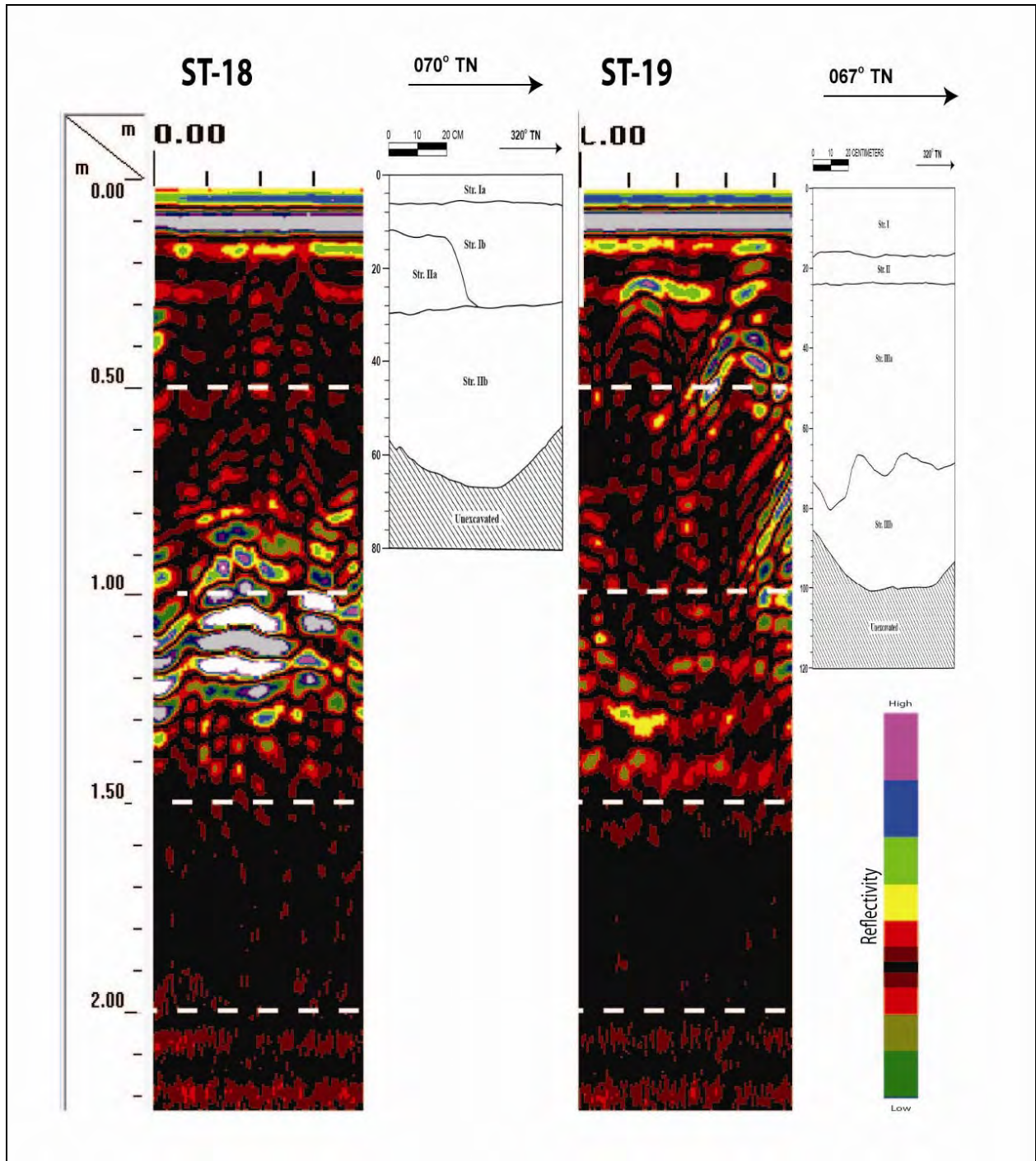


Figure 16. Comparison of GPR profiles and excavation profiles for Shovel Tests 18 and 19

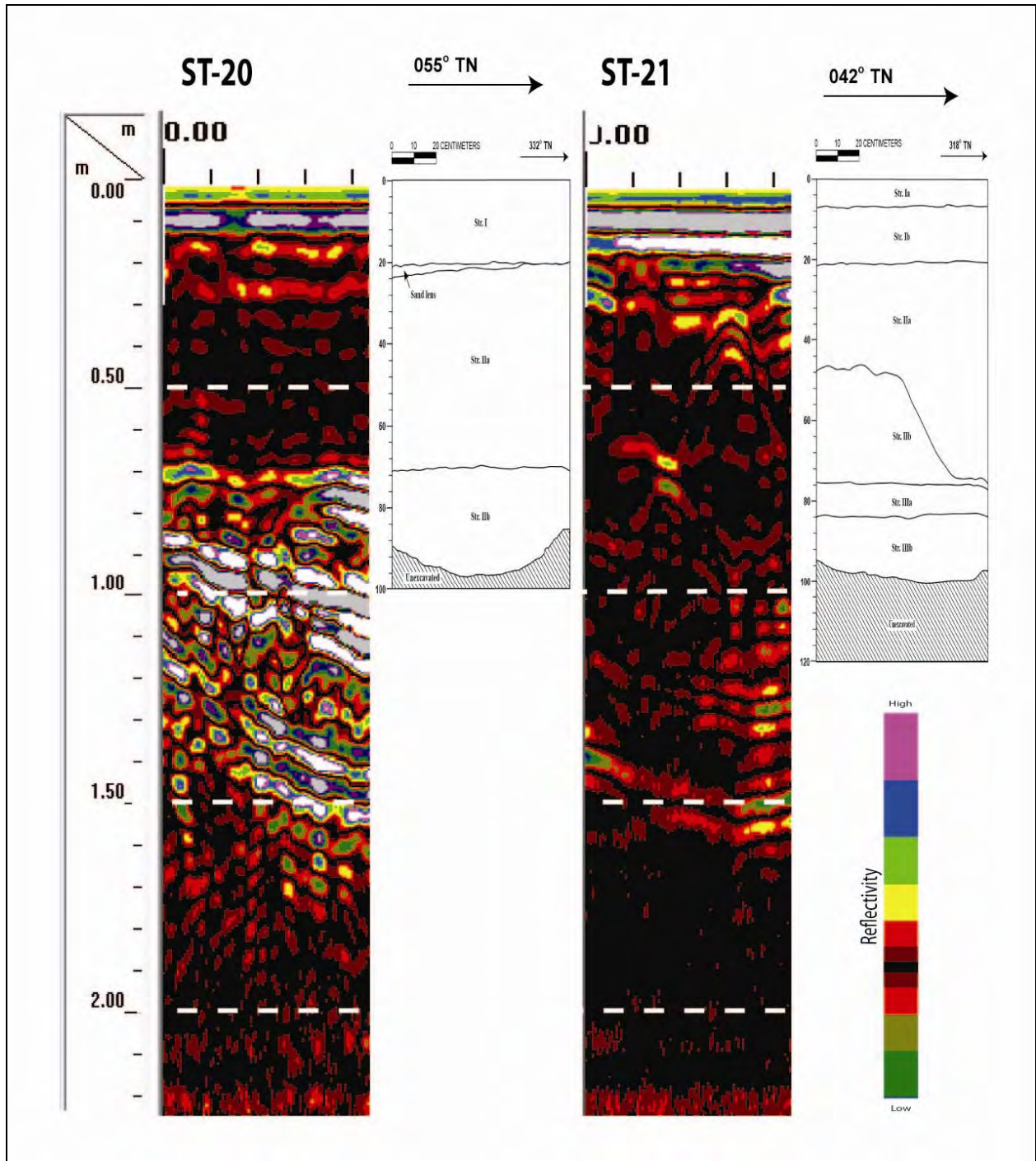


Figure 17. Comparison of GPR profiles and excavation profiles for Shovel Tests 20 and 21

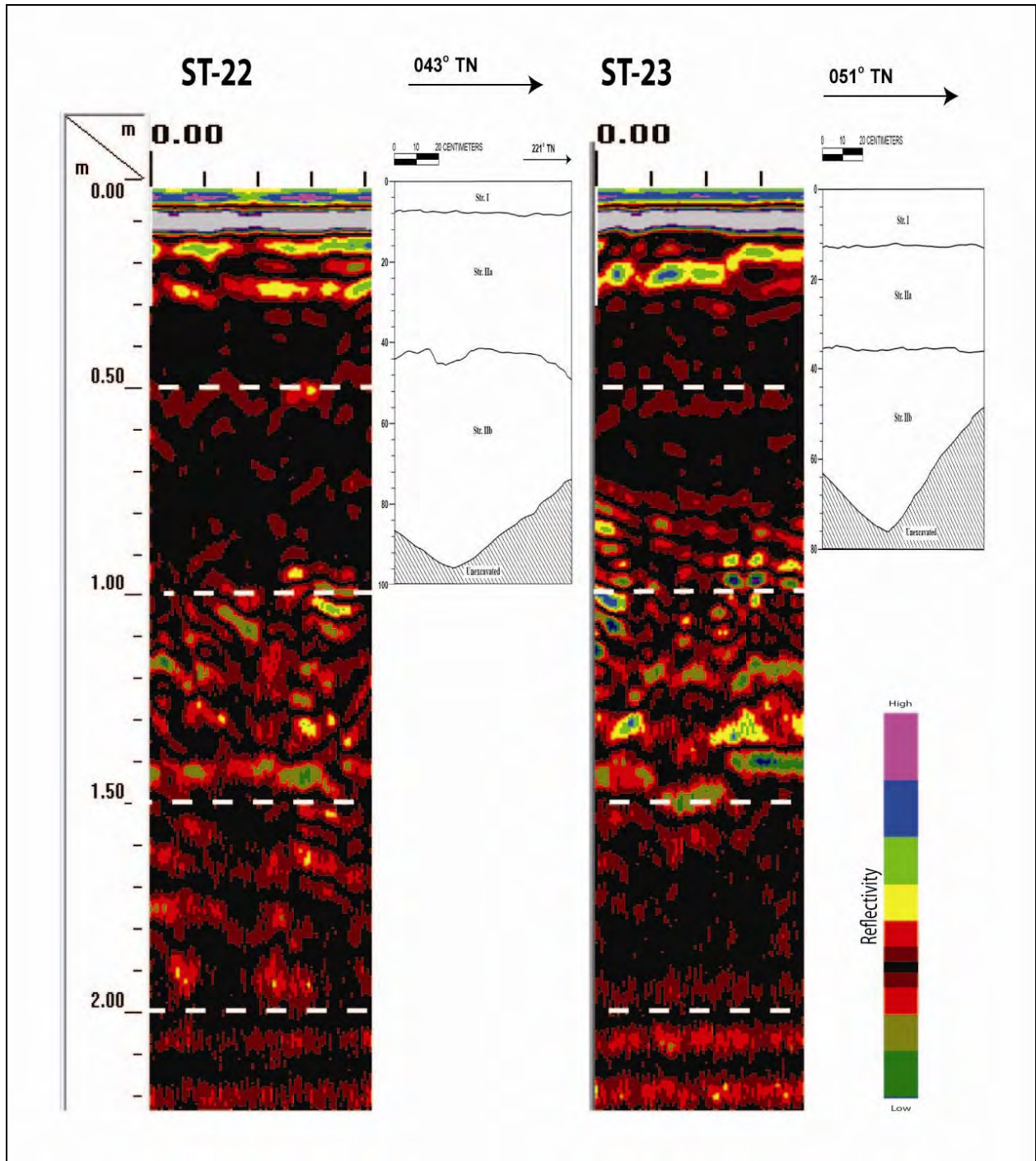


Figure 18. Comparison of GPR profiles and excavation profiles for Shovel Tests 22 and 23

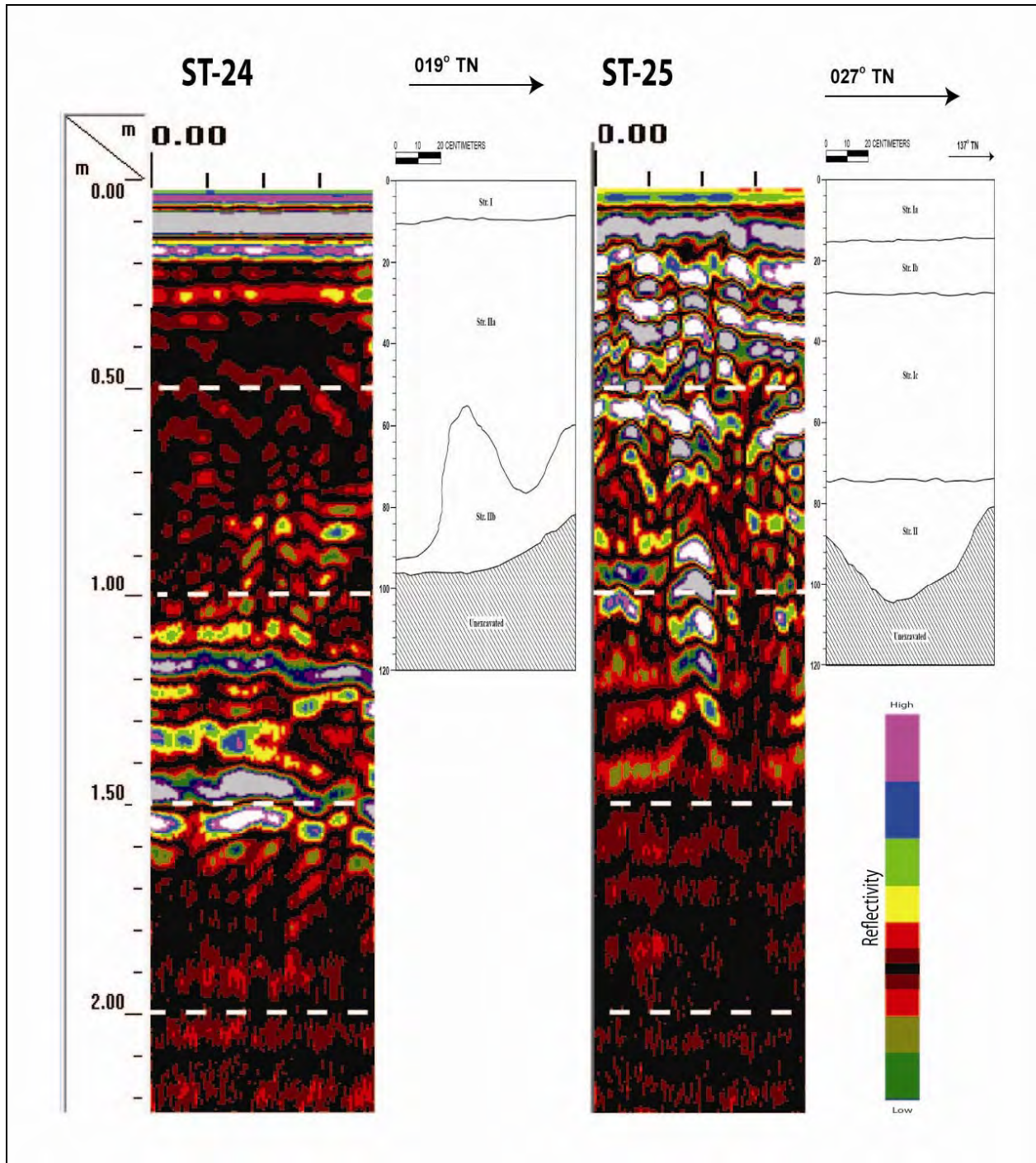


Figure 19. Comparison of GPR profiles and excavation profiles for Shovel Tests 24 and 25

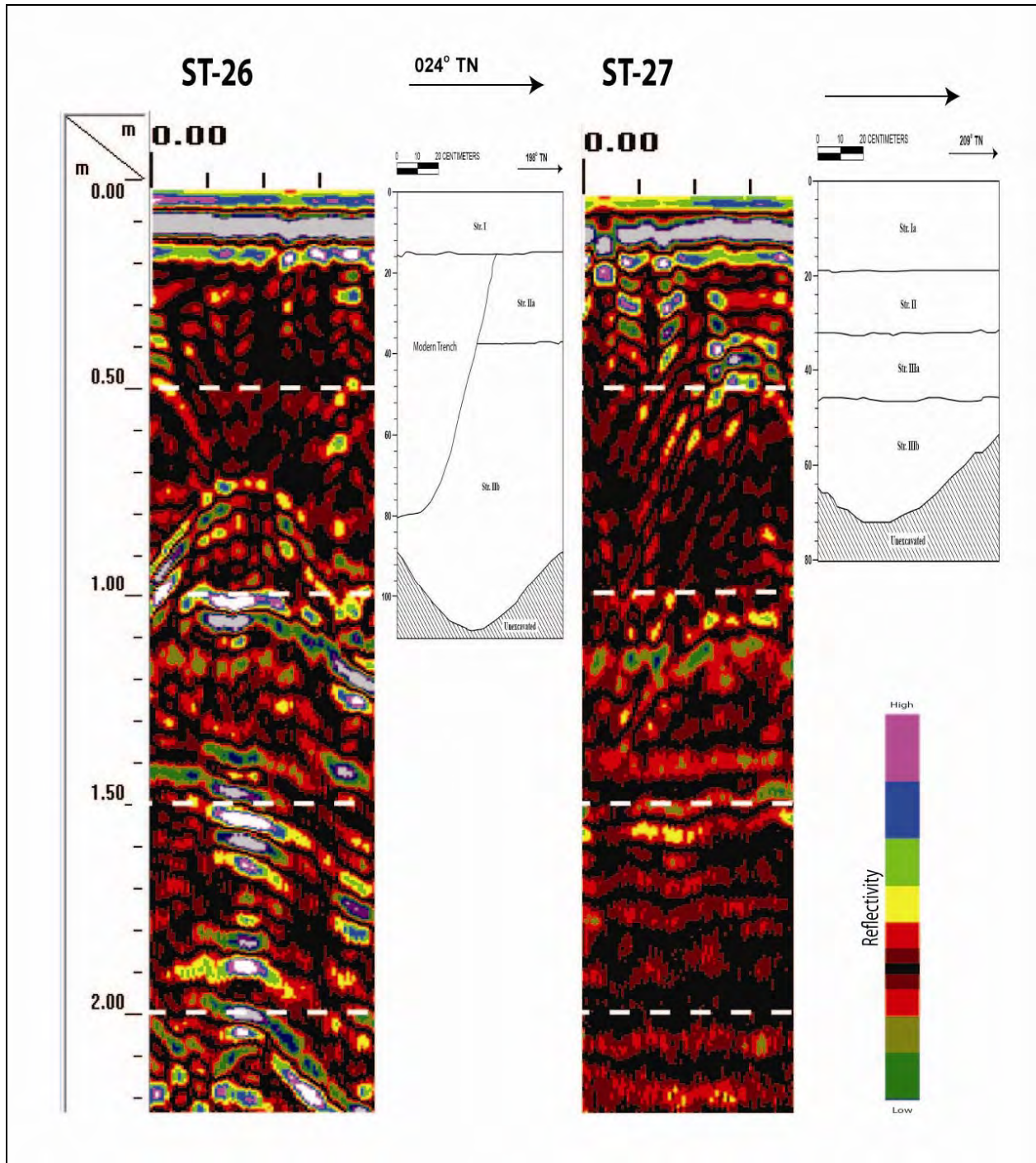


Figure 20. Comparison of GPR profiles and excavation profiles for Shovel Tests 26 and 27

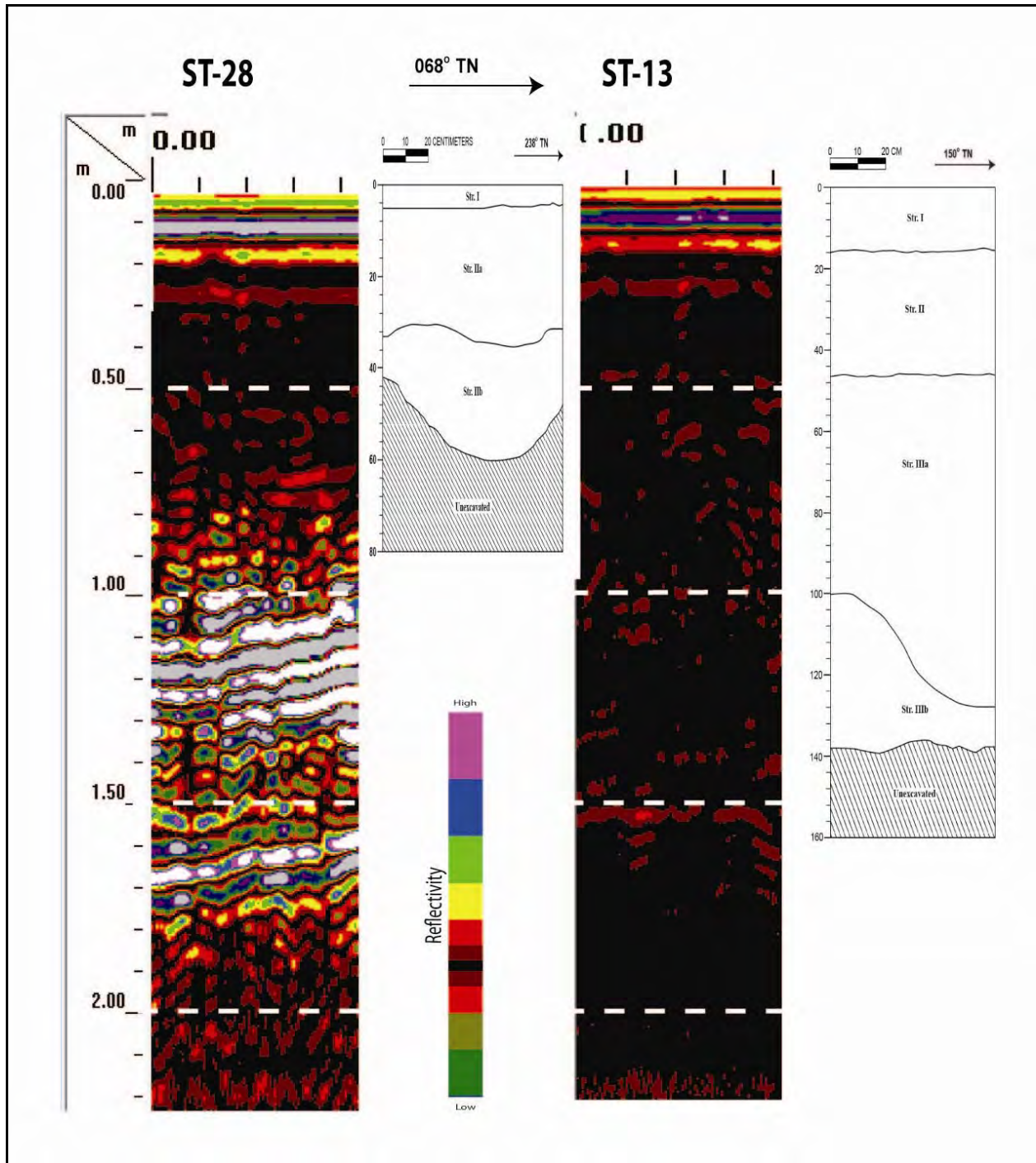


Figure 21. Comparison of GPR profiles and excavation profiles for Shovel Tests 13 and 28

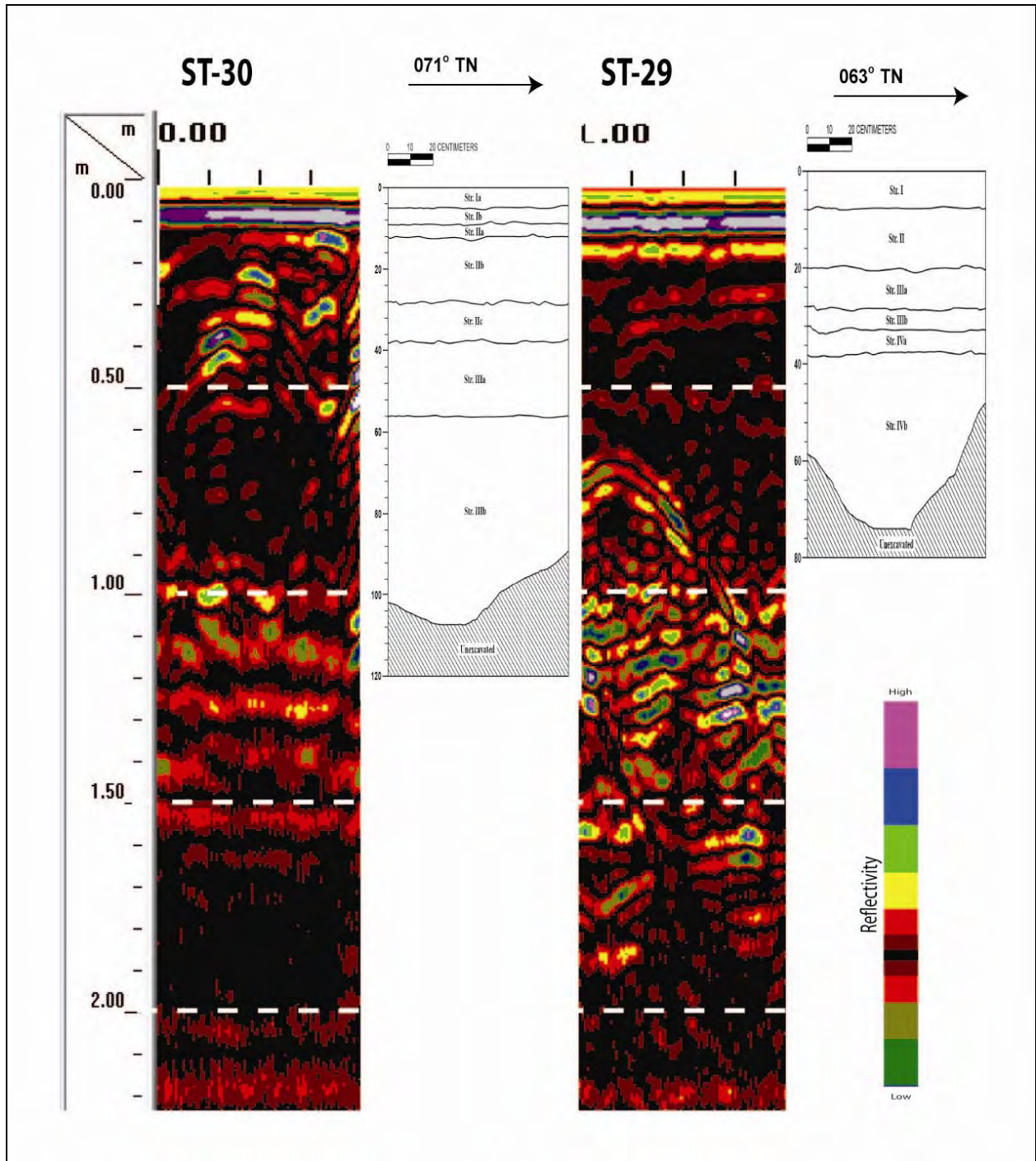


Figure 22. Comparison of GPR profiles and excavation profiles for Shovel Tests 29 and 30

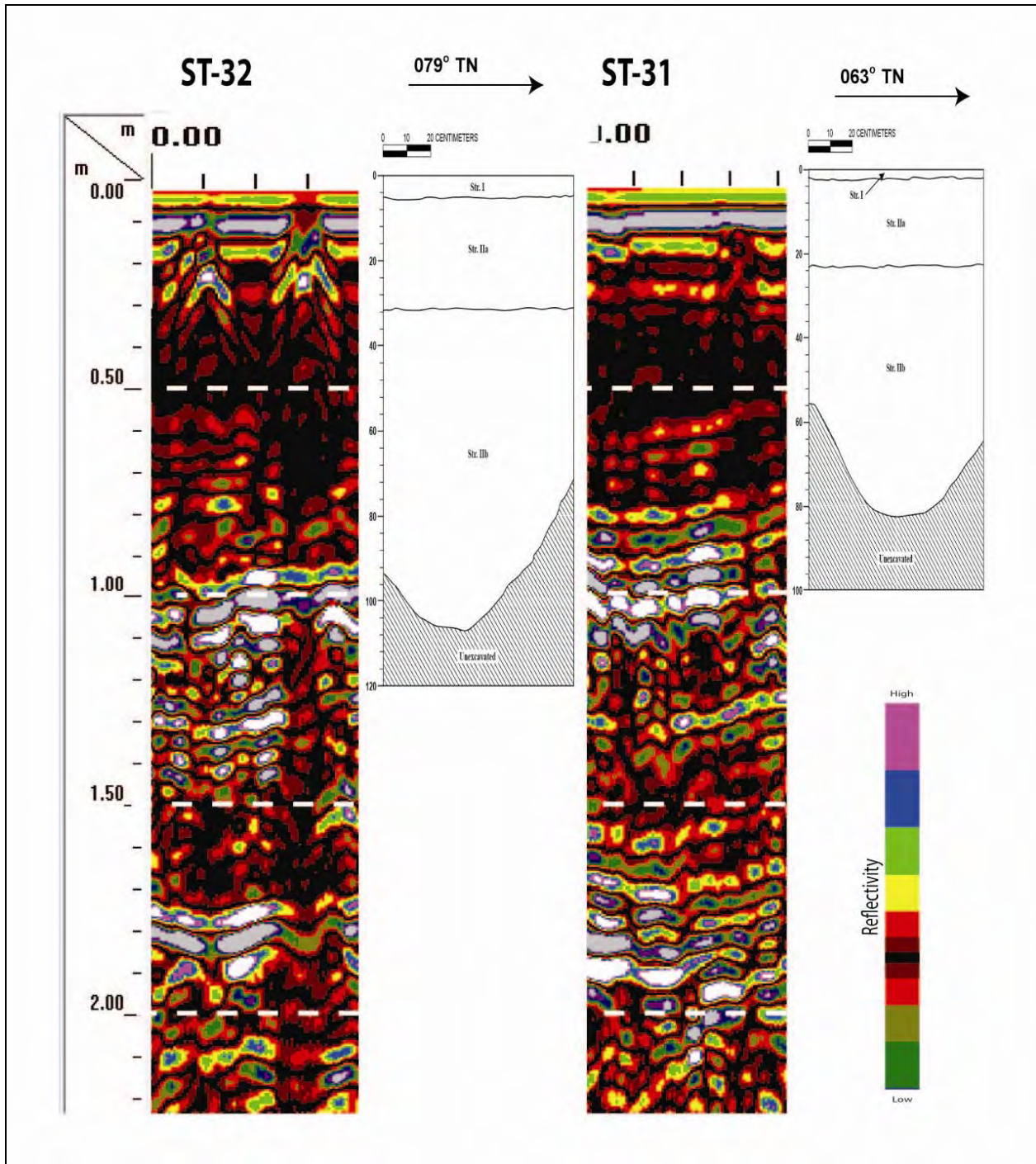


Figure 23. Comparison of GPR profiles and excavation profiles for Shovel Tests 31 and 32

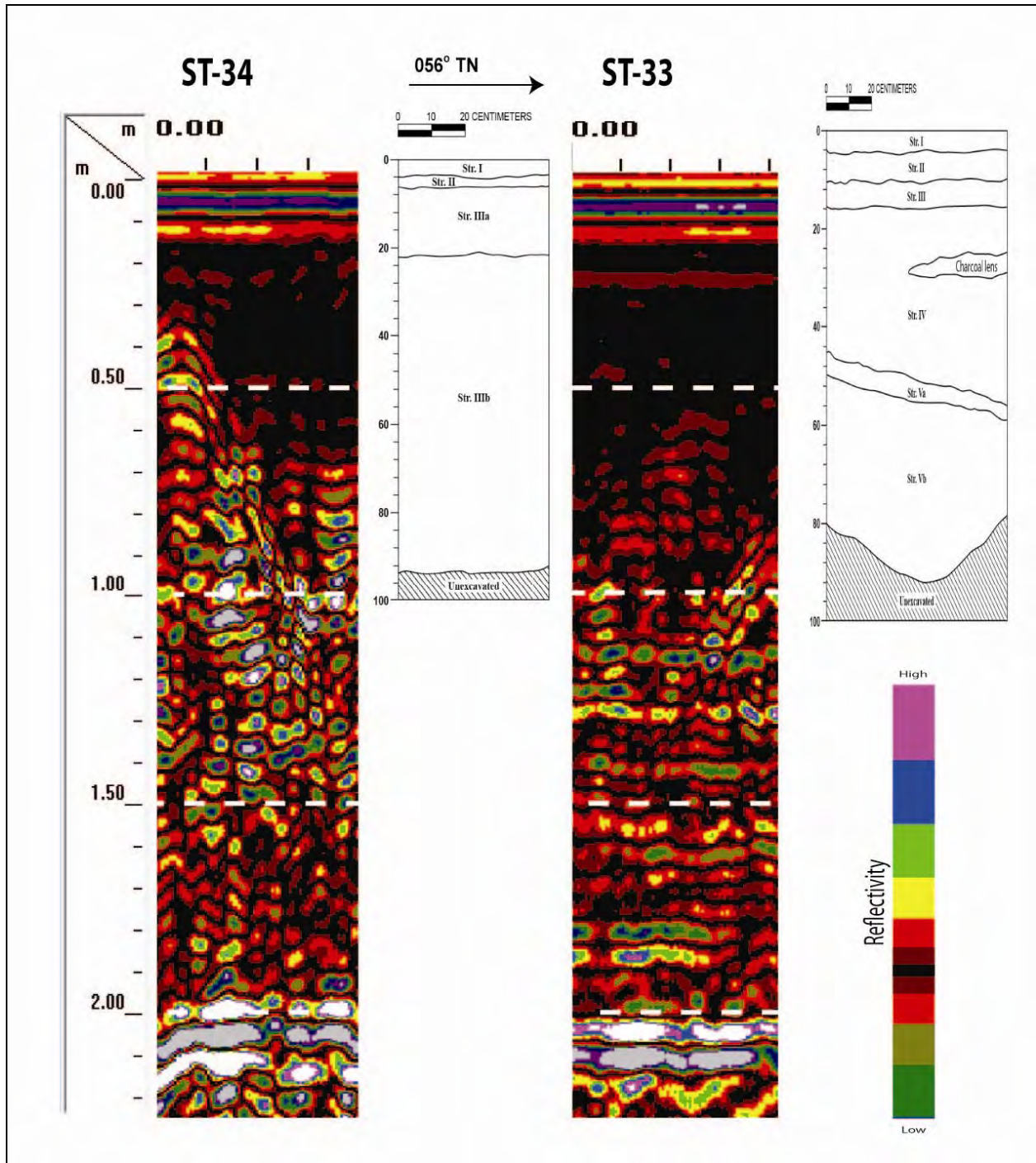


Figure 24. Comparison of GPR profiles and excavation profiles for Shovel Tests 33 and 34

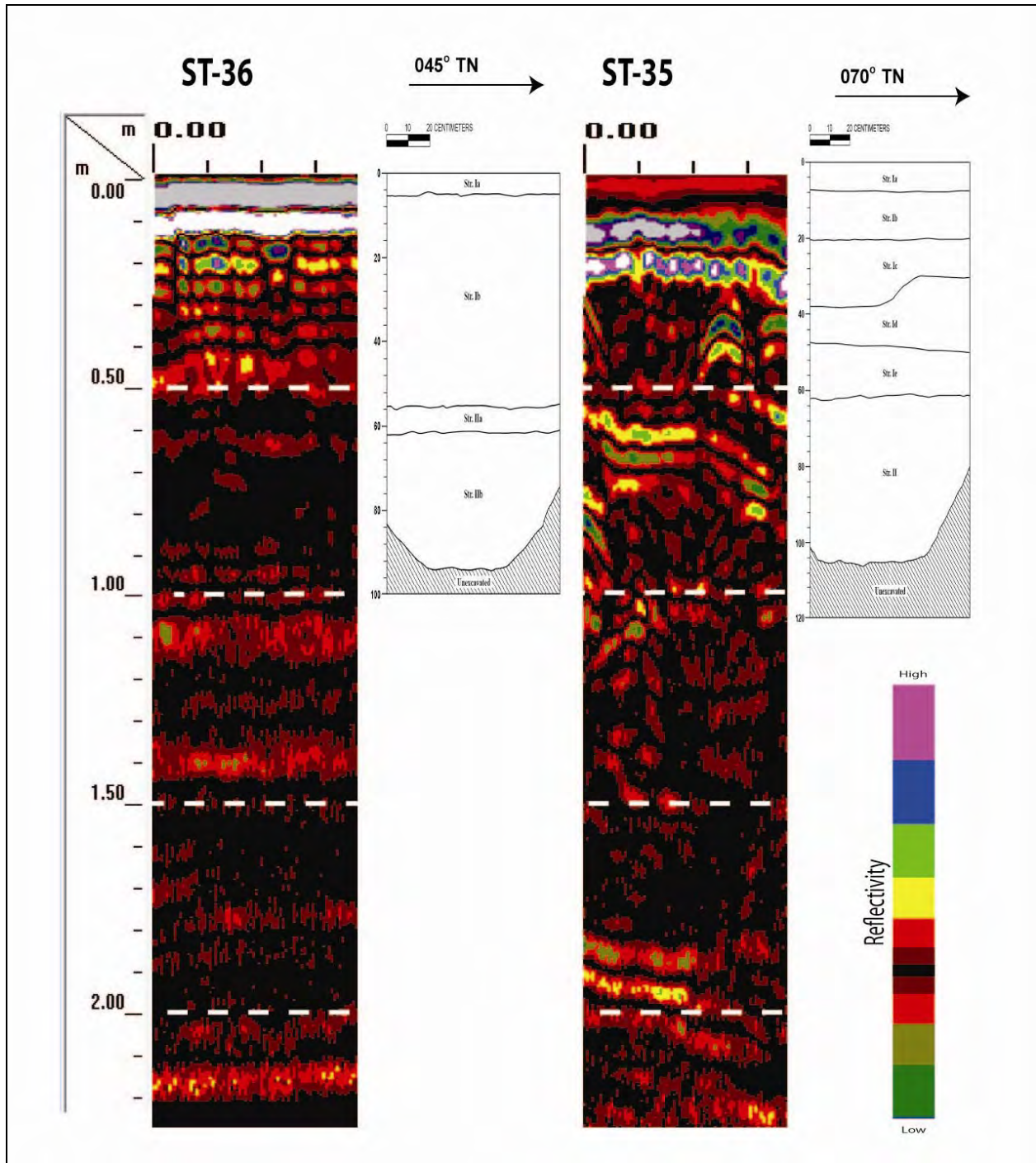


Figure 25. Comparison of GPR profiles and excavation profiles for Shovel Tests 35 and 36

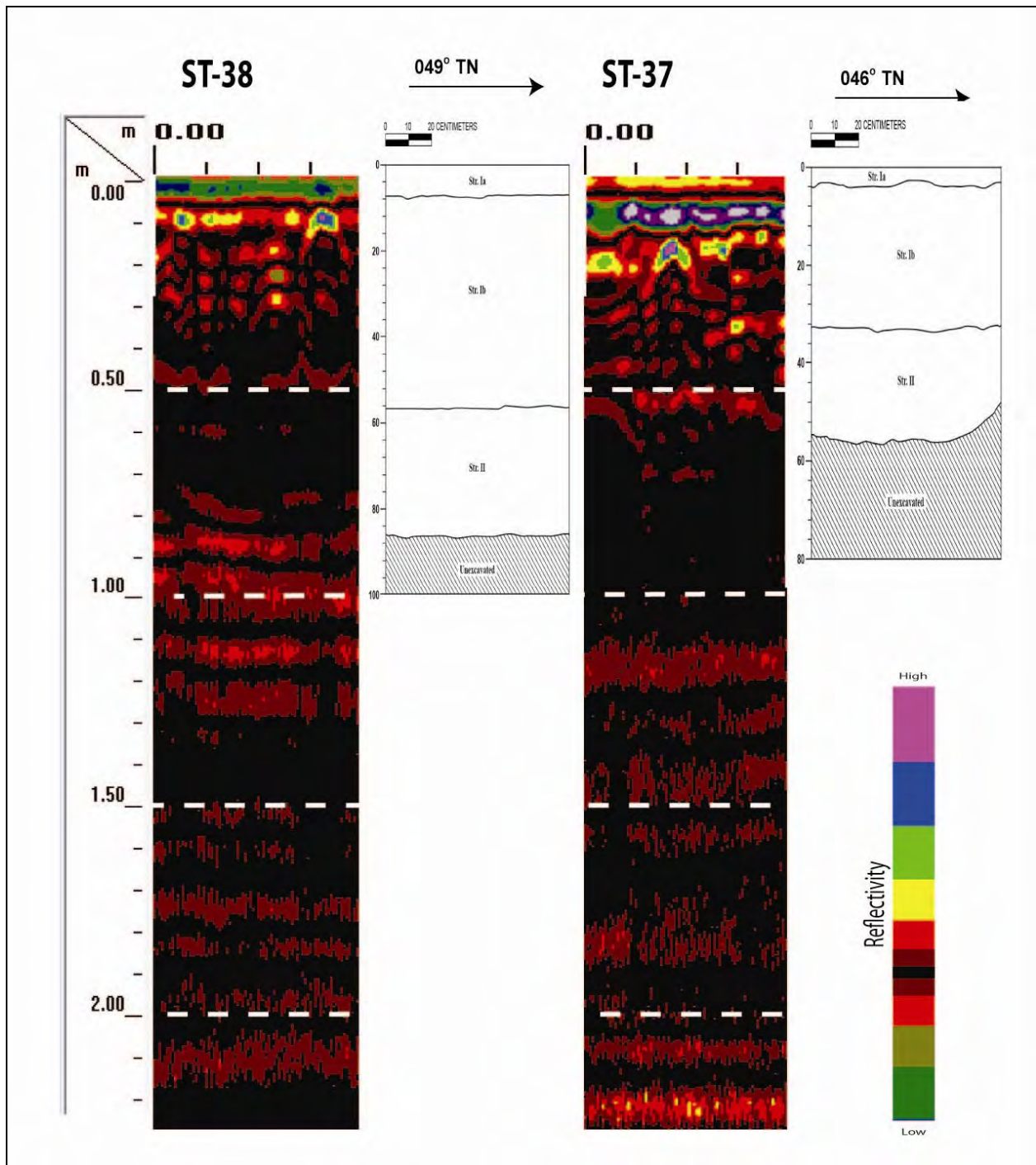


Figure 26. Comparison of GPR profiles and excavation profiles for Shovel Tests 37 and 38

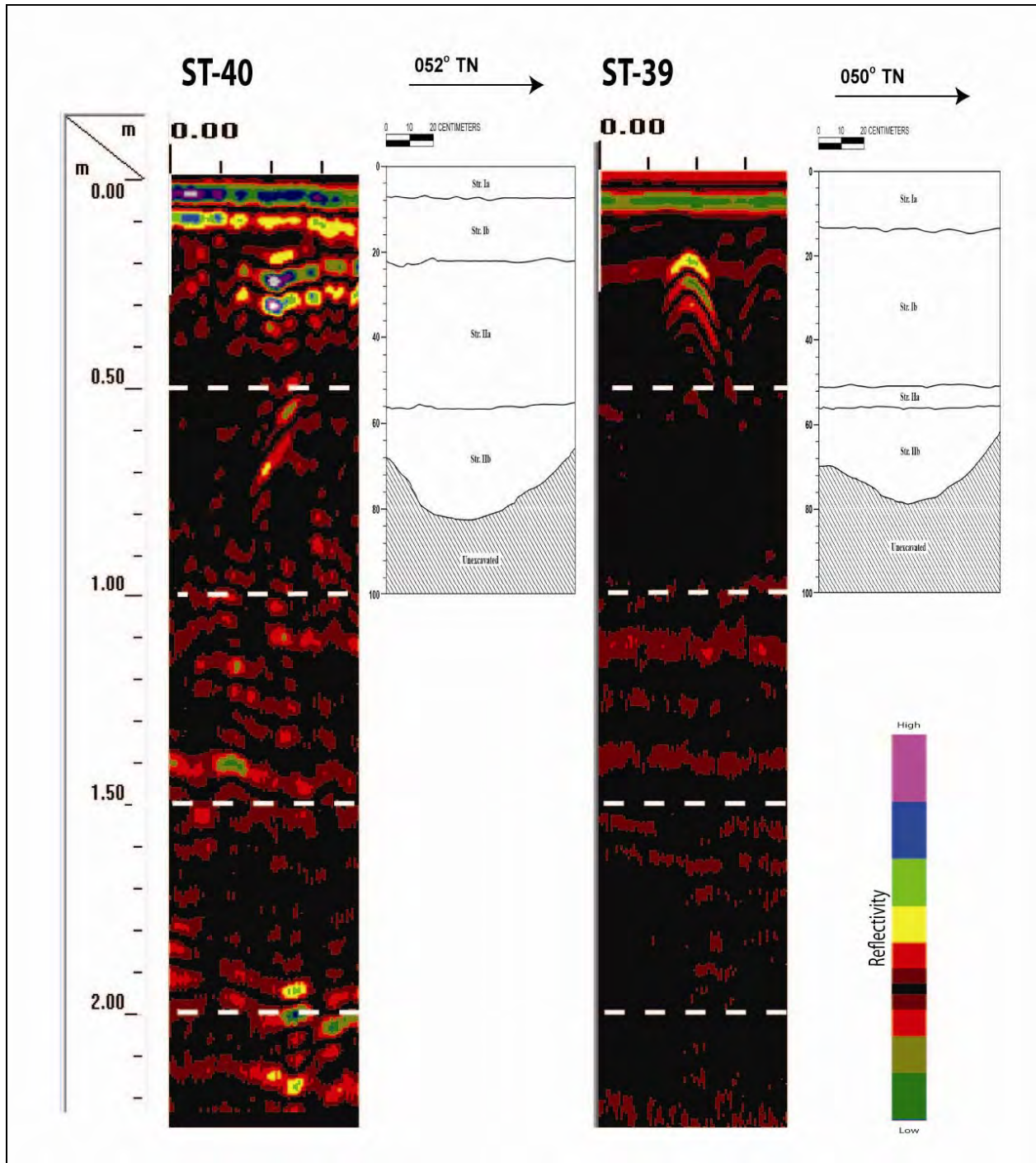


Figure 27. Comparison of GPR profiles and excavation profiles for Shovel Tests 39 and 40

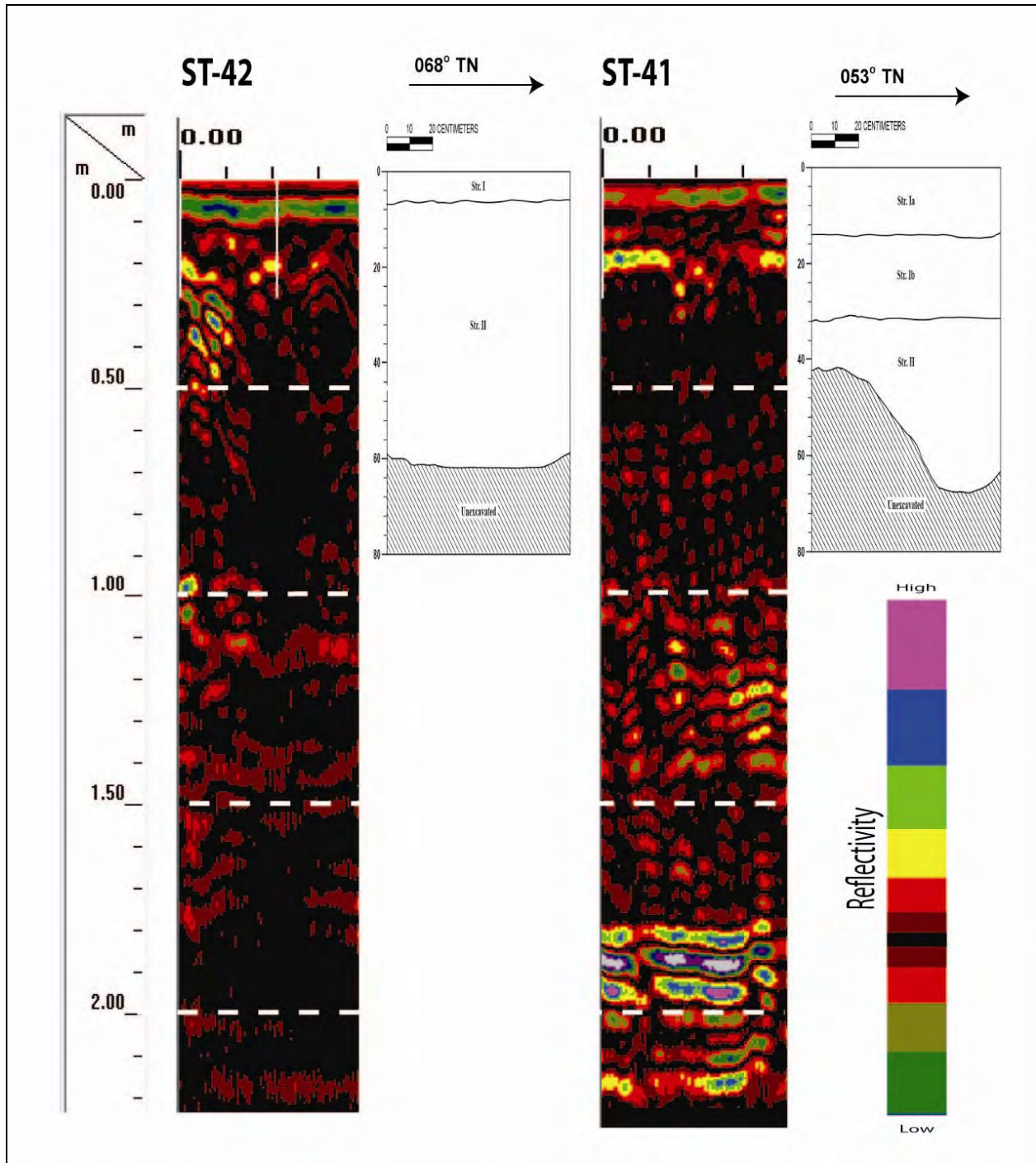


Figure 28. Comparison of GPR profiles and excavation profiles for Shovel Tests 41 and 42

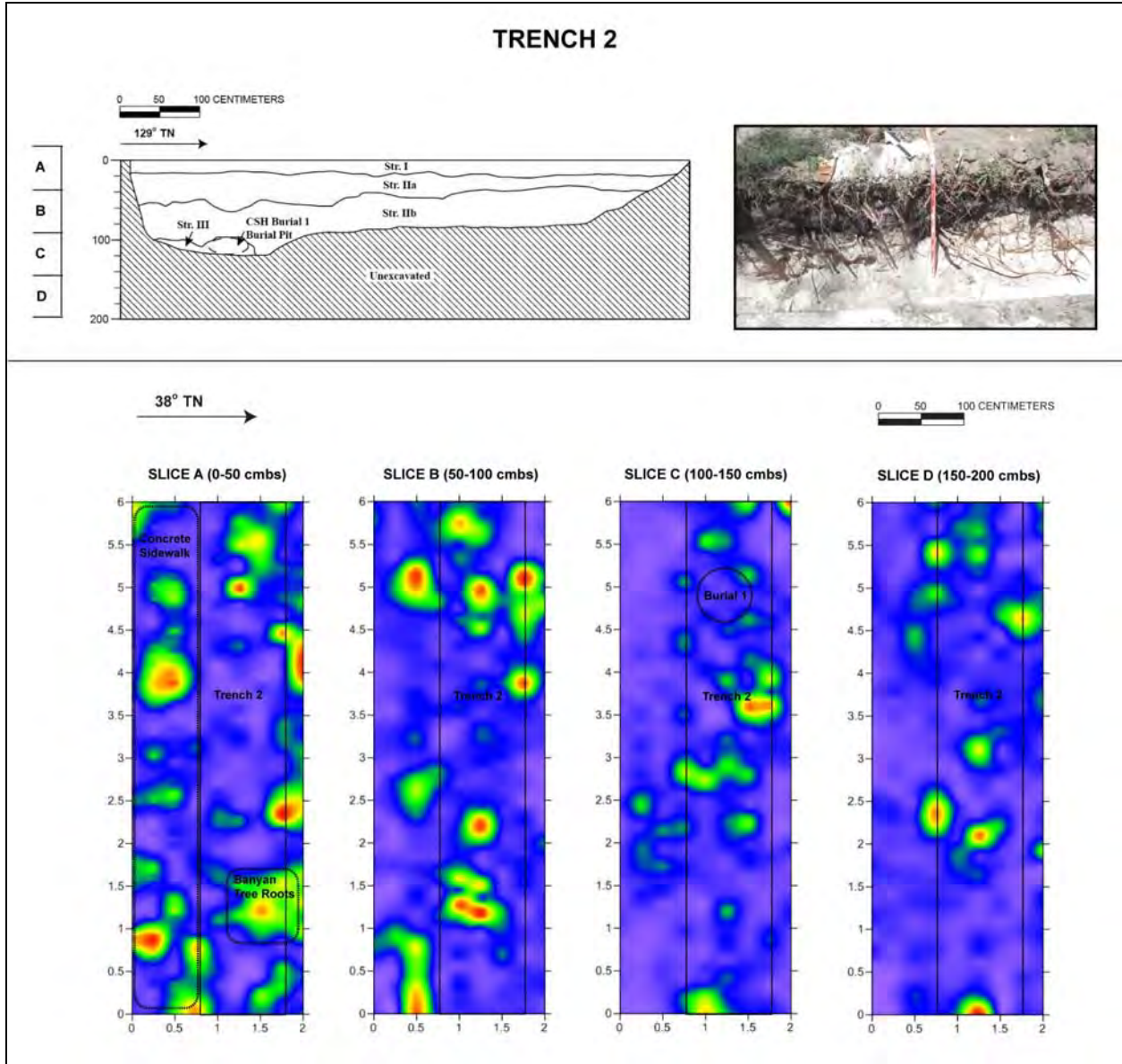


Figure 29. Excavated profile, photo, and GPR slice maps of Test Trench 2; location of CSH Burial 1 (SIHP # TBD) marked on SLICE C

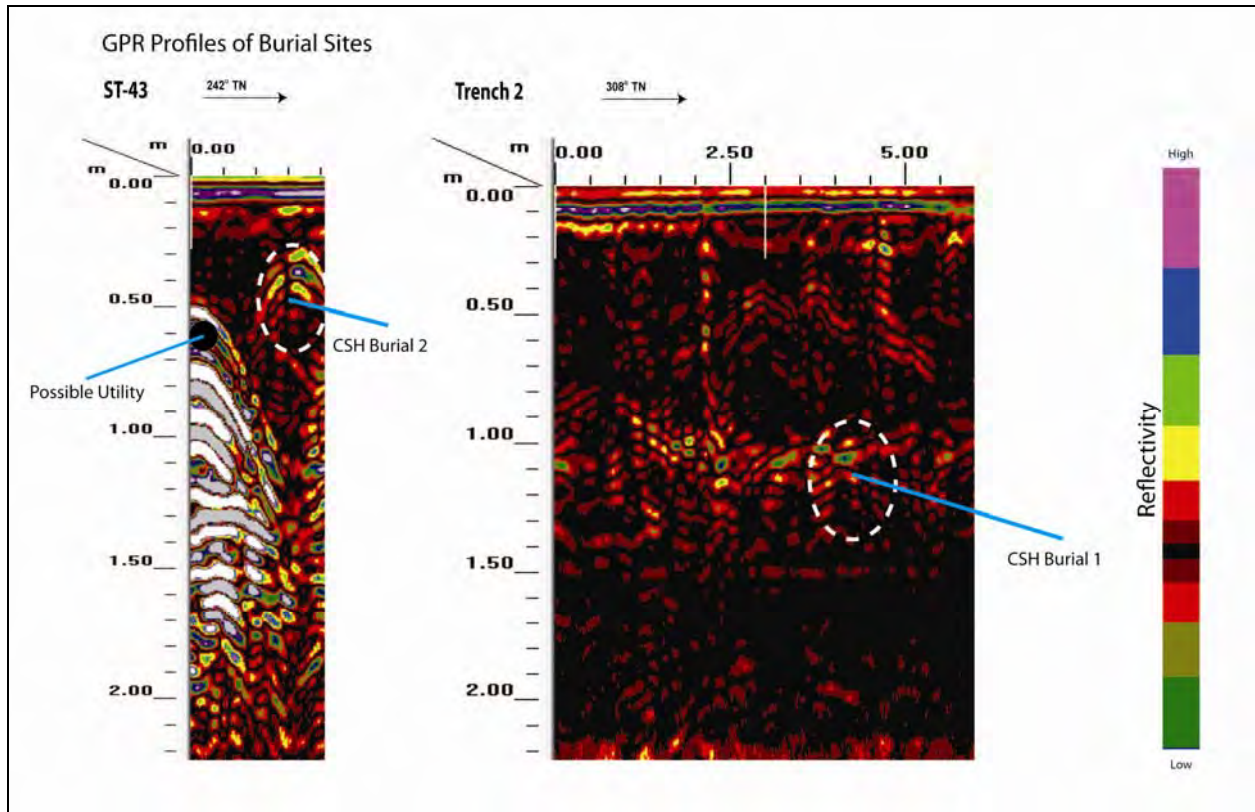


Figure 30. Views of both burials in GPR profiles

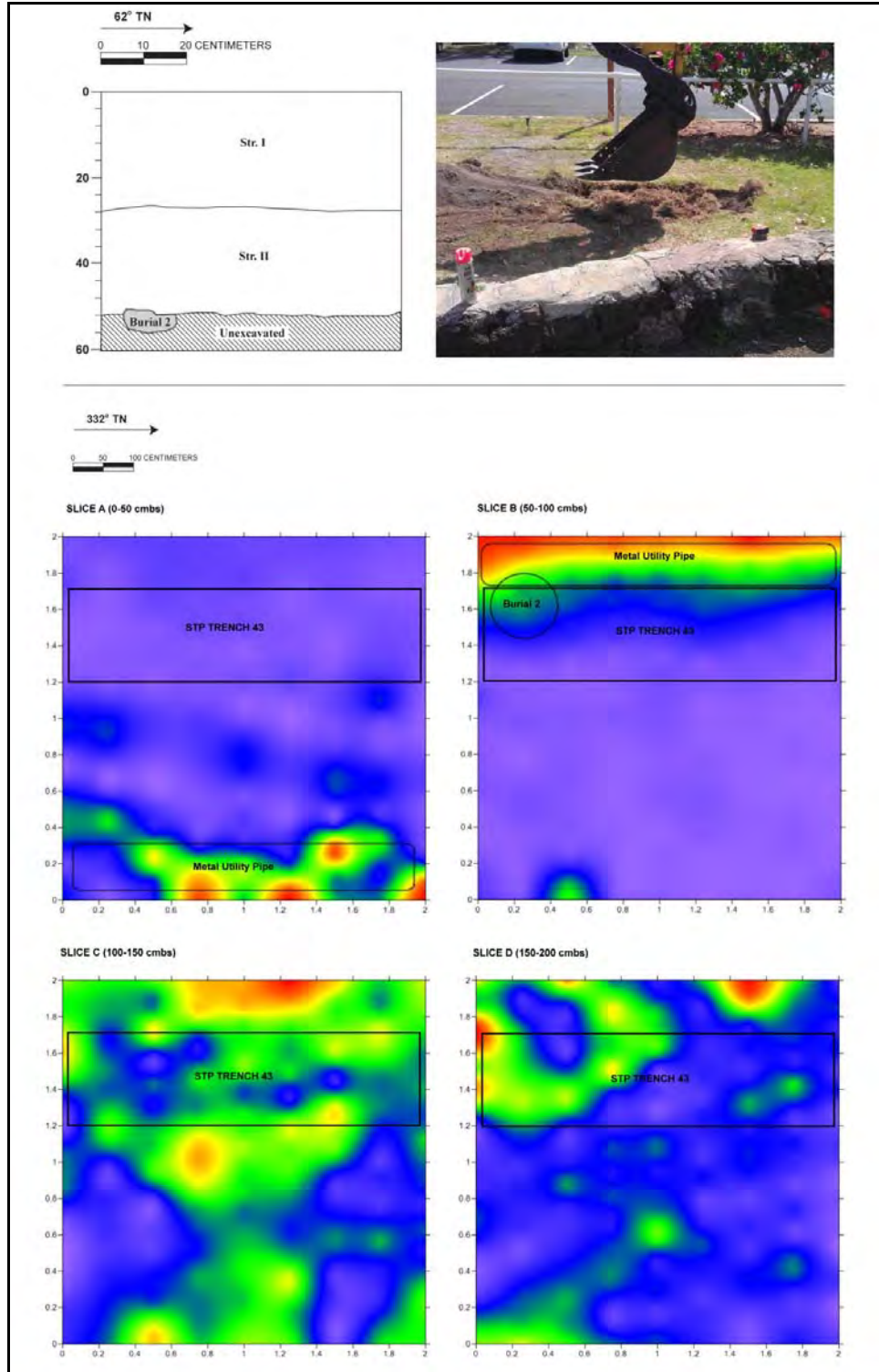


Figure 31. Excavated profile, photo, and GPR slice maps of Shovel Test 43; location of CSH Burial 2 (SIHP # TBD) marked on SLICE B

4.2 Stratigraphy

The following paragraphs provide an overview of the stratigraphy observed within the 58 test units excavated within the project area. For detailed information regarding each of the excavated test units, refer to the trench profiles, sediment descriptions, and photographs, below.

Strata were designated I through V and sub-designated a through e. The observed stratigraphic sequences throughout the project area were largely similar. In general, the test units had grass or organic material on the surface. Some trenches at the north end of the project area had asphalt surfaces. This was often followed by various fill layers including landscaping fill and grading fill, mostly composed of loamy sands or sandy loams. Following this, loamy sand or sandy loam buried A horizons were often noted. In some instances, layers of wind-deposited or high surf-deposited natural sand were observed. At the base of all excavations, natural jaucas sand was present. Some trenches at the north end of the project area exhibited a very hard, cemented layer of sand, like a soft coral shelf, at the top of their natural sand layer.

In most cases, cultural material, in the form of charcoal, shell midden, fire-cracked rock, basalt flakes, or coral, was observed within the old, buried A horizons observed. In five of the test units, two cultural layers, an upper and lower, were observed.

4.2.1 Test Trench 1

Test Trench 1 was located at the northern end of the project area. The trench measured 6.80 m long, 0.90 m wide, and 0.75 m deep. The stratigraphy of Test Trench 1 consisted of a silt loam and organic matter topsoil (Stratum Ia) overlying silt loam fill (Stratum Ib) overlying cobbly sand fill (Stratum Ic) overlying natural compacted sand (Stratum II) (Figure 32, Figure 33, and Table 5).



Figure 32. Photograph of Test Trench 1, northeast wall of excavation

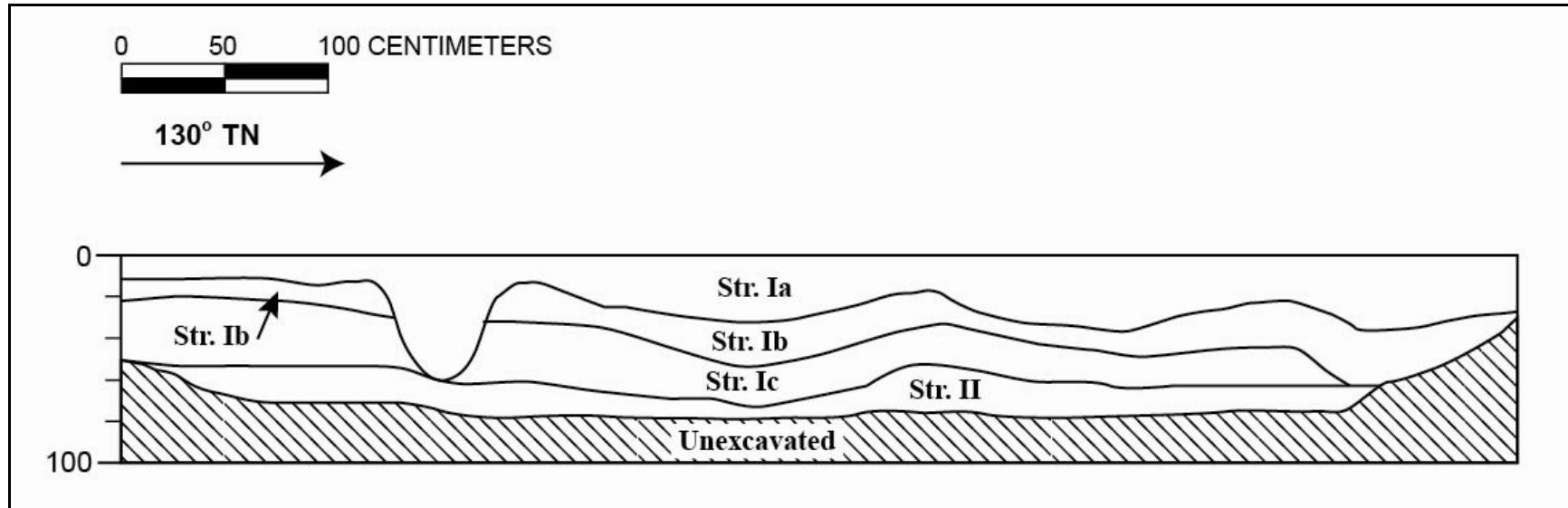


Figure 33. Test Trench 1 profile, northeast wall of excavation

Table 5. Stratigraphy Observed at Test Trench 1

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-60	Organic matter and topsoil; 10YR 3/3, dark brown; silt loam; weak, fine, granular structure; dry, loose consistency; non-plastic; terrigenous origin; abrupt, wavy lower boundary; common, fine roots.
Ib	10-60	Fill; 10YR 2/2, very dark brown; silt loam; weak, fine, granular structure; dry, loose consistency; non-plastic; terrigenous origin; abrupt, wavy lower boundary; few fine roots.
Ic	20-70	Fill; 10YR 7/6, yellow; cobbly sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, wavy lower boundary; few fine roots.
II	50-77 (base of excavation [BOE])	Natural; 10YR 7/2, light gray; sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; compacted and hard.

4.2.2 Test Trench 2

Test Trench 2 was located at the northern end of the project area. The trench measured 7.00 m long, 0.75 m wide, and 1.18 m deep. The stratigraphy of Test Trench 2 consisted of grass over a sandy loam topsoil (Stratum I) overlying a loamy sand buried A horizon (Stratum IIa) overlying natural loamy sand (Stratum IIb) overlying natural sand (Stratum III) (Figure 34, Figure 35, and Table 6). The buried A horizon contained no cultural material. CSH Burial 1 (SIHP # TBD) was located within Stratum III, in the northwest end of the trench. For a detailed description of the burial, see Section 4.4.1, below.



Figure 34. Photograph of Test Trench 2, northeast wall of excavation

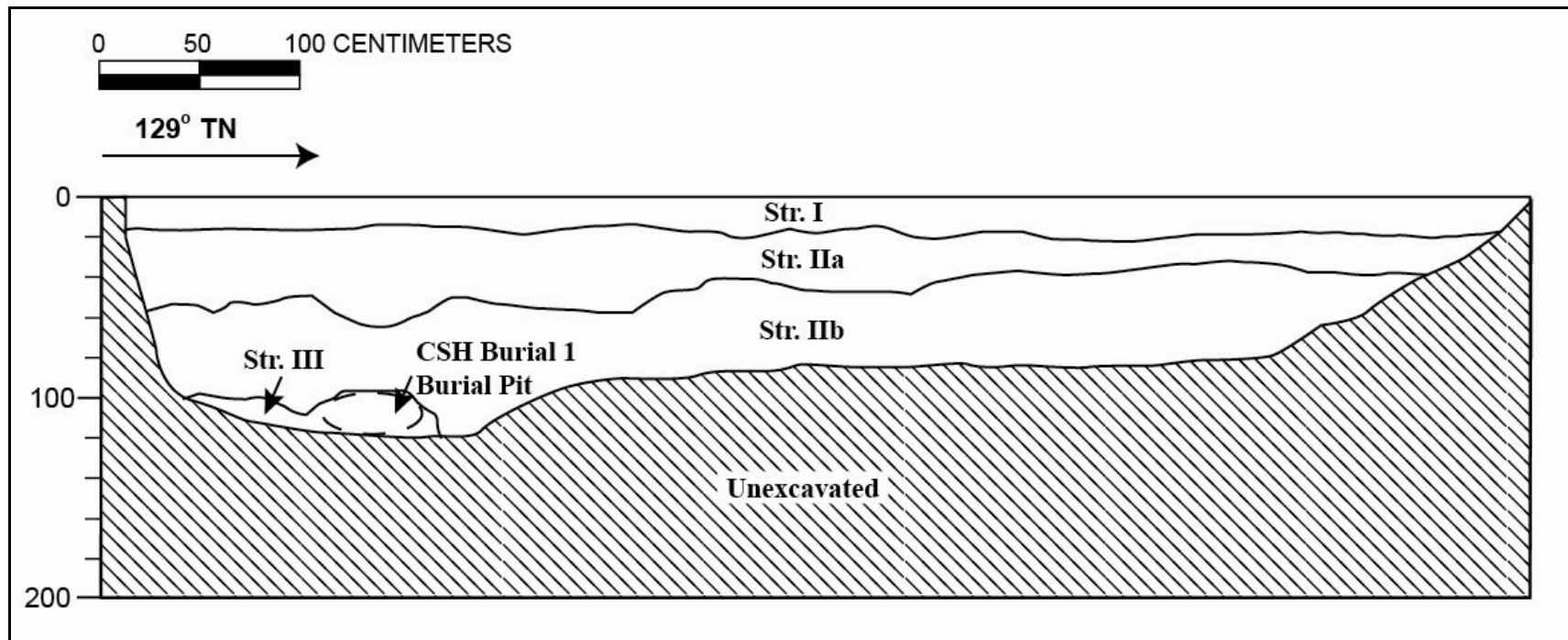


Figure 35. Test Trench 2 profile, northeast wall of excavation

Table 6. Stratigraphy Observed at Test Trench 2

Stratum	Depth (cmbs)	Description of Sediments
I	0-20	Grass and topsoil; 10YR 3/3, dark brown; sandy loam; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; many fine to medium roots.
Ia	13-66	Buried A horizon; 10YR 2/2, very dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine roots.
Iib	30-118 (BOE)	Natural; 10YR 6/2, light brownish gray; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine roots.
III	100-118 (BOE)	Natural jaucas sand; 10YR 7/6, yellow; fine-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; contained CSH Burial 1 (SIHP # TBD)

4.2.3 Test Trench 3

Test Trench 3 was located at the northern end of the project area. The trench measured 6.00 m long, 0.80 m wide, and 1.59 m deep. The stratigraphy of the south end of Test Trench 3 consisted of grass and a loamy sand topsoil (Stratum Ia) overlying natural silty sand (Stratum II) overlying natural sand (Stratum III), while the north end of the trench consisted of asphalt (Stratum Ib) overlying natural sand (Stratum III) (Figure 36, Figure 37, and Table 7).



Figure 36. Photograph of Test Trench 3, southwest wall of excavation

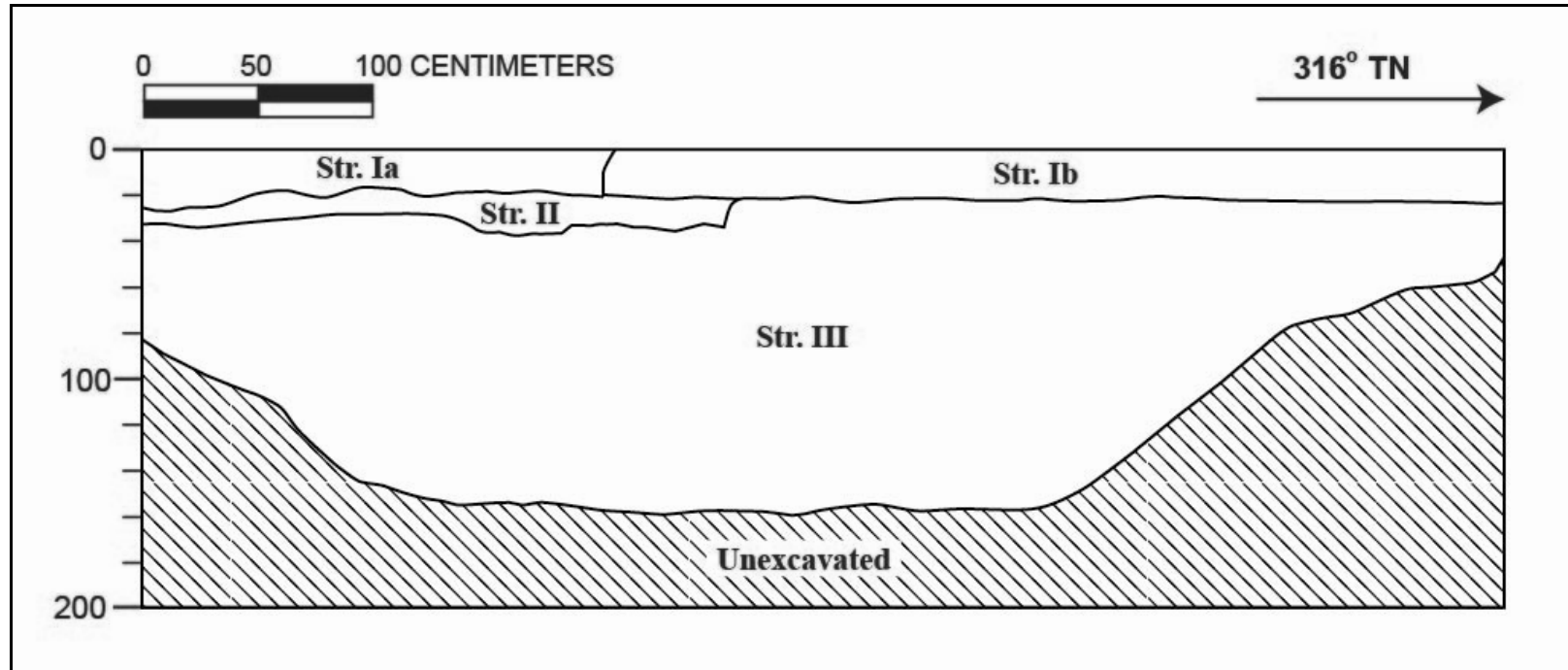


Figure 37. Test Trench 3 profile, southwest wall of excavation

Table 7. Stratigraphy Observed at Test Trench 3

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-26	Grass and topsoil; 10YR 4/2, dark grayish brown; loamy sand; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common, fine roots.
Ib	0-20	Asphalt parking lot surface
II	15-36	Natural; 10YR 5/2, grayish brown; silty sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary.
III	20-159 (BOE)	Natural jaucas sand; 10YR 7/6, yellow; fine-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.4 Test Trench 5

Test Trench 5 was located at the northeast edge of the project area along the ocean. The trench measured 7.00 m long, 0.75 m wide, and 0.95 m deep. The stratigraphy of the northwest end of Test Trench 5 consisted of grass and loamy sand fill (Stratum Ia) overlying natural loamy sand buried A horizon (Stratum IIa) overlying natural jaucas sand (Stratum IIb), while the southeast end of the trench consisted of grass and sandy clay fill (Stratum Ib) overlying a natural loamy sand buried A horizon (Stratum IIa) overlying natural jaucas sand (Stratum IIb) (Figure 38, Figure 39, and Table 8). The buried A horizon (Stratum IIa) is incorporated into SIHP # - 1801, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 38. Photograph of Test Trench 5, northeast wall of excavation

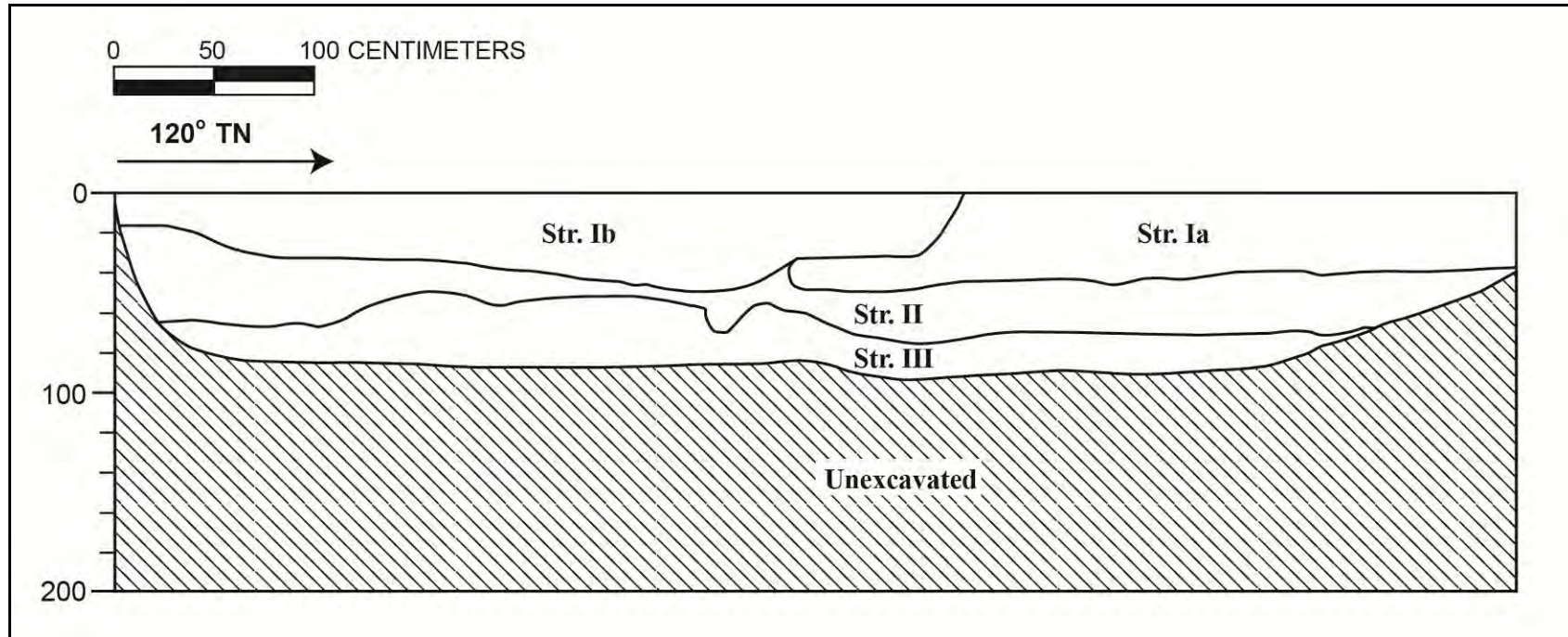


Figure 39. Test Trench 5 profile, northeast wall of excavation

Table 8. Stratigraphy Observed at Test Trench 5

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-50	Grass and fill; 10YR 4/2, dark grayish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, wavy lower boundary; common fine roots.
Ib	0-50	Grass and fill; 5YR 3/4, dark reddish brown; sandy clay; strong, very coarse, blocky structure; dry, weakly coherent consistency; slightly plastic; mixed origin; abrupt, smooth lower boundary; common fine roots.
IIa	15-70	Buried A horizon; 10YR 2/1, black; loamy sand; weak, fine, crumb structure; dry, weakly coherent consistency; non-plastic; mixed origin; abrupt, wavy lower boundary; few fine roots; contained charcoal, shell midden, and fire-cracked rock; cultural layer, incorporated into SIHP # -1801.
IIb	50-95 (BOE)	Natural jaucas sand; 10YR 7/6, yellow; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.5 Test Trench 12

Test Trench 12 was located at the northern end of the project area. The trench measured 7.50 m long, 0.90 m wide, and 1.50 m deep. The stratigraphy of Test Trench 12 consisted of grass over a sandy loam topsoil (Stratum Ia) overlying very gravelly sandy loam fill (Stratum Ib) overlying silty clay fill (Stratum Ic) overlying two layers of natural sand (Strata IIa and IIb) (Figure 40, Figure 41, and Table 9). The water table was present in this trench at approximately 1.50 m below ground surface (mbgs).



Figure 40. Photograph of Test Trench 12, northwest wall of excavation

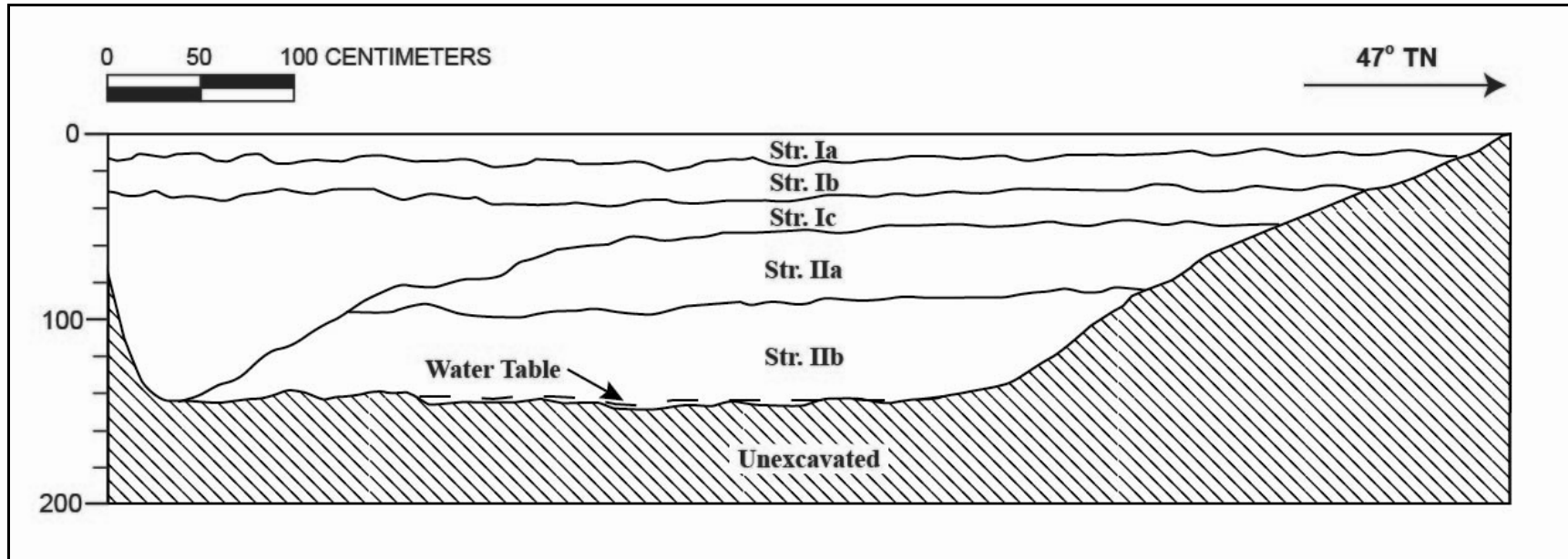


Figure 41. Test Trench 12 profile, northwest wall of excavation

Table 9. Stratigraphy Observed at Test Trench 12

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-15	Grass and topsoil; 10YR 3/4, dark yellowish brown; sandy loam; weak, fine, granular structure; dry, weakly coherent consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; many medium roots.
Ib	15-35	Fill; 10YR 2/2, very dark brown; very gravelly sandy loam; weak, fine, granular structure; dry, loose consistency; non-plastic; terrigenous origin; abrupt, wavy lower boundary; few fine roots.
Ic	35-145	Fill; 10YR 3/1, very dark gray; silty clay; moderate, fine, blocky structure; dry, slightly hard consistency; non-plastic; terrigenous origin; abrupt, irregular lower boundary; few fine roots.
IIa	50-90	Natural; 10YR 8/3, pale brown; sand; single-grain; dry, weakly coherent consistency; non-plastic; marine origin; clear, smooth lower boundary.
IIb	90-150 (BOE)	Natural; 10YR 7/4, very pale brown; gravelly sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; 20% small coral cobble inclusions.

4.2.6 Test Trench 13

Test Trench 13 was located at the northern end of the project area. The trench measured 7.50 m long, 0.75 m wide, and 1.95 m deep. The stratigraphy of Test Trench 13 consisted of grass over a loamy sand topsoil (Stratum I) overlying natural silty sand (Stratum II) overlying natural sand (Stratum III) (Figure 42, Figure 43, and Table 10).



Figure 42. Photograph of Test Trench 13, southeast wall of excavation

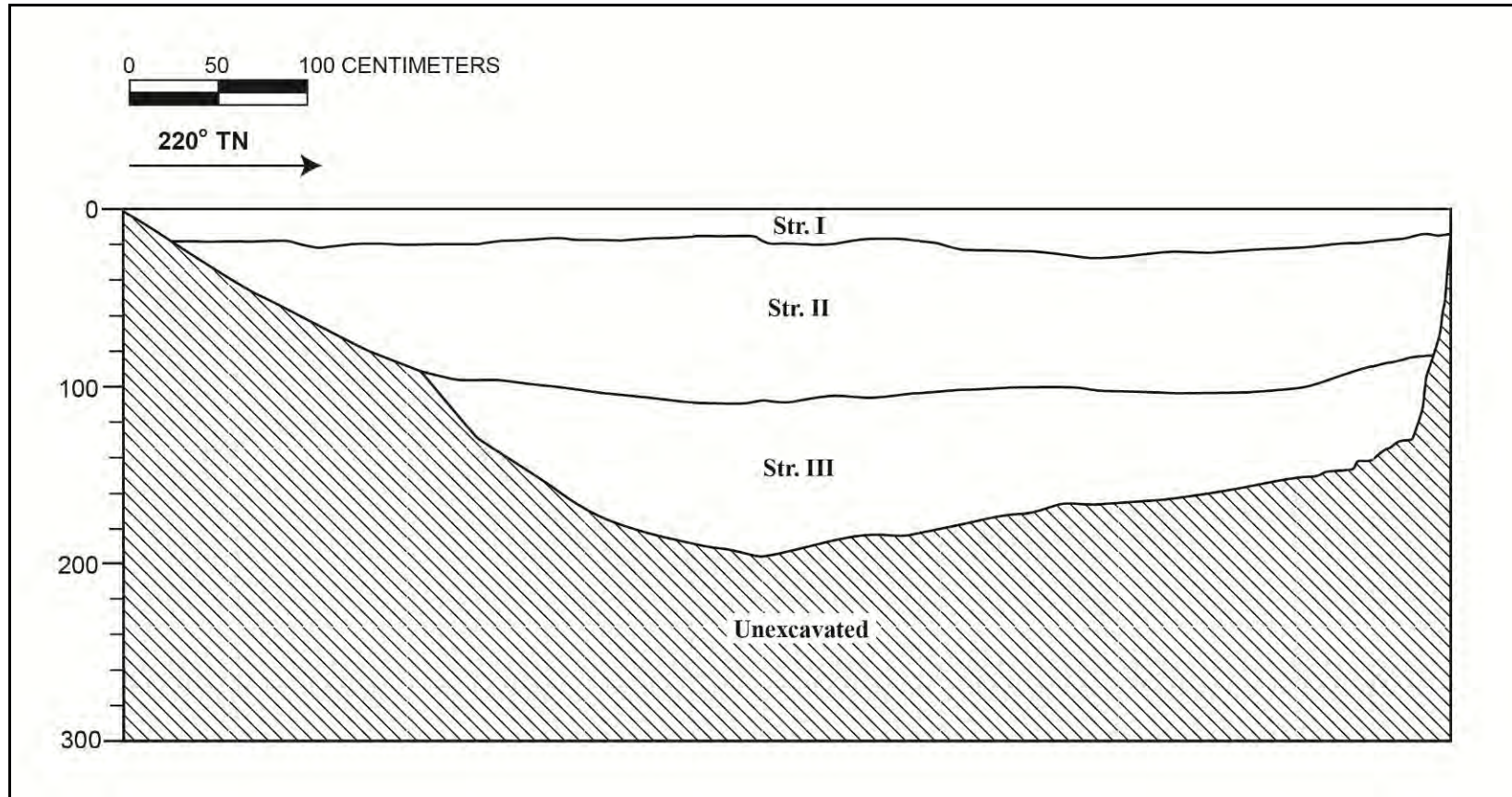


Figure 43. Test Trench 13 profile, southeast wall of excavation

Table 10. Stratigraphy Observed at Test Trench 13

Stratum	Depth (cmbs)	Description of Sediments
I	0-27	Grass and topsoil; 10YR 4/2, dark grayish brown; loamy sand; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; abrupt, wavy lower boundary; common, fine roots.
II	14-109	Natural; 10YR 5/2, grayish brown; silty sand; weak, fine, crumb structure; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine roots.
III	82-195 (BOE)	Natural jaucas sand; 10YR 7/6, yellow; fine-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine roots.

4.2.7 Test Trench 14

Test Trench 14 was located at the northeastern end of the project area. The trench measured 6.50 m long, 0.90 m wide, and 0.90 m deep. The stratigraphy of Test Trench 14 consisted of grass over loamy sand (Stratum I) overlying a loamy sand buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 44, Figure 45, and Table 11). The buried A horizon (Stratum IIa) is incorporated into SIHP # -1801, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 44. Photograph of Test Trench 14, northeast wall of excavation

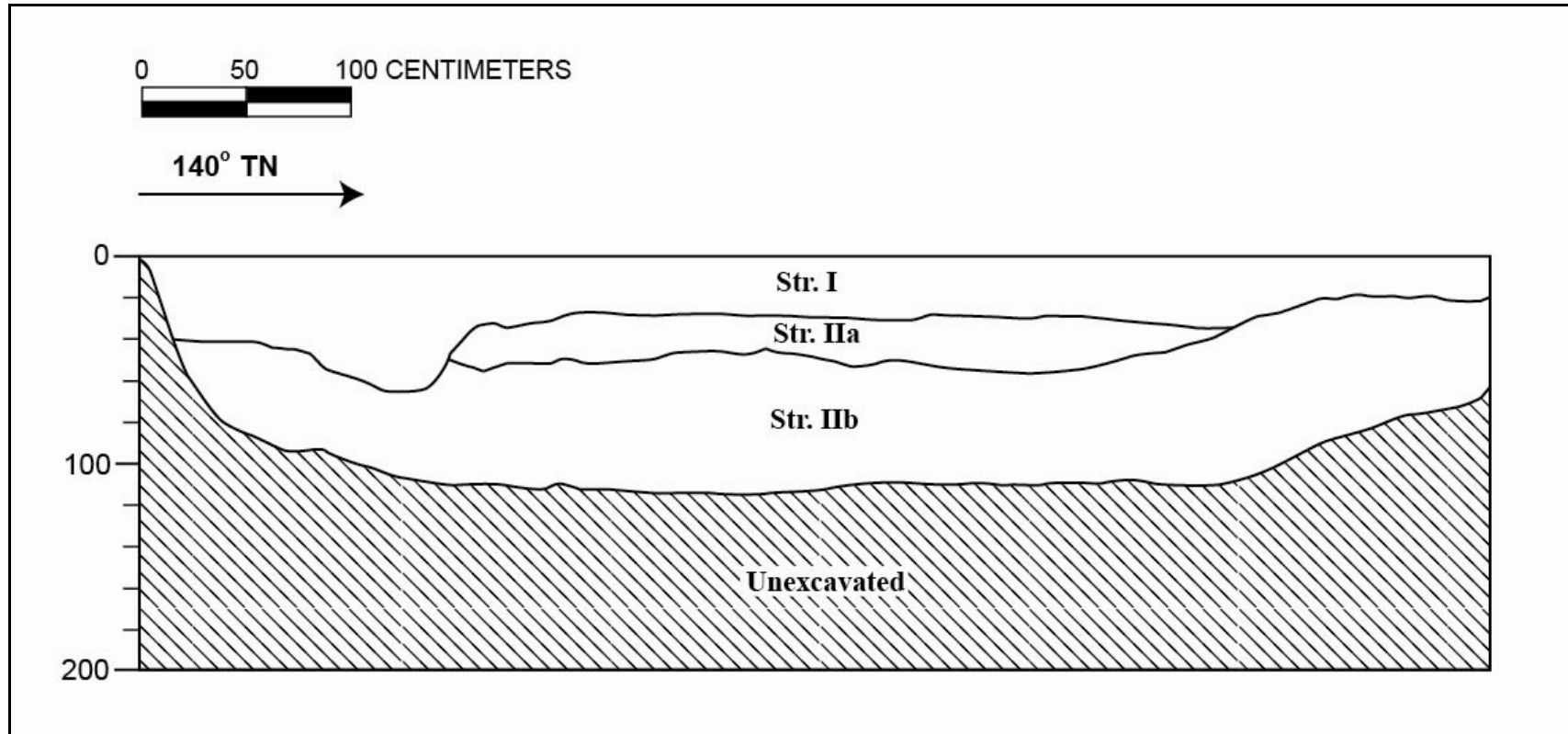


Figure 45. Test Trench 14 profile, northeast wall of excavation

Table 11. Stratigraphy Observed at Test Trench 14

Stratum	Depth (cmbs)	Description of Sediments
I	0-60	Grass and fill; 10YR 4/2, dark grayish brown; loamy sand; weak, fine, crumb structure; dry, weakly coherent consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; many medium roots.
IIa	10-60	Buried A horizon; 10YR 3/2, very dark grayish brown; loamy sand; weak, fine, crumb structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, wavy lower boundary; common fine roots; charcoal present; cultural layer, incorporated into SIHP -1801.
IIb	50-77 (BOE)	Natural jaucas sand; 10YR 7/6, yellow; fine-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; many medium roots; coral inclusions.

4.2.8 Test Trench 15

Test Trench 15 was located at the northern end of the project area. The trench measured 7.32 m long, 4.88 m wide, and 1.5 m deep. Profile maps were drawn of portions of the southeast and northwest walls. The stratigraphy of both walls consisted of asphalt (Stratum Ia) overlying crushed coral base course (Stratum Ib) overlying clay loam fill (Stratum Ic) overlying a loamy sand buried A horizon, the top of which has been graded off (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 46 through Figure 49, Table 12, and Table 13). The top of most of Stratum IIb consisted of very hard cemented sand, like a soft coral shelf. Additionally, the north end of the northwest wall contained a large pit made up of a mix of Strata Ic, IIa, and IIb, which appears to be related to a nearby sewer line. The water table was present in this trench at approximately 1.40 m below ground surface (mbgs).



Figure 46. Photograph of Test Trench 15, southeast wall of excavation

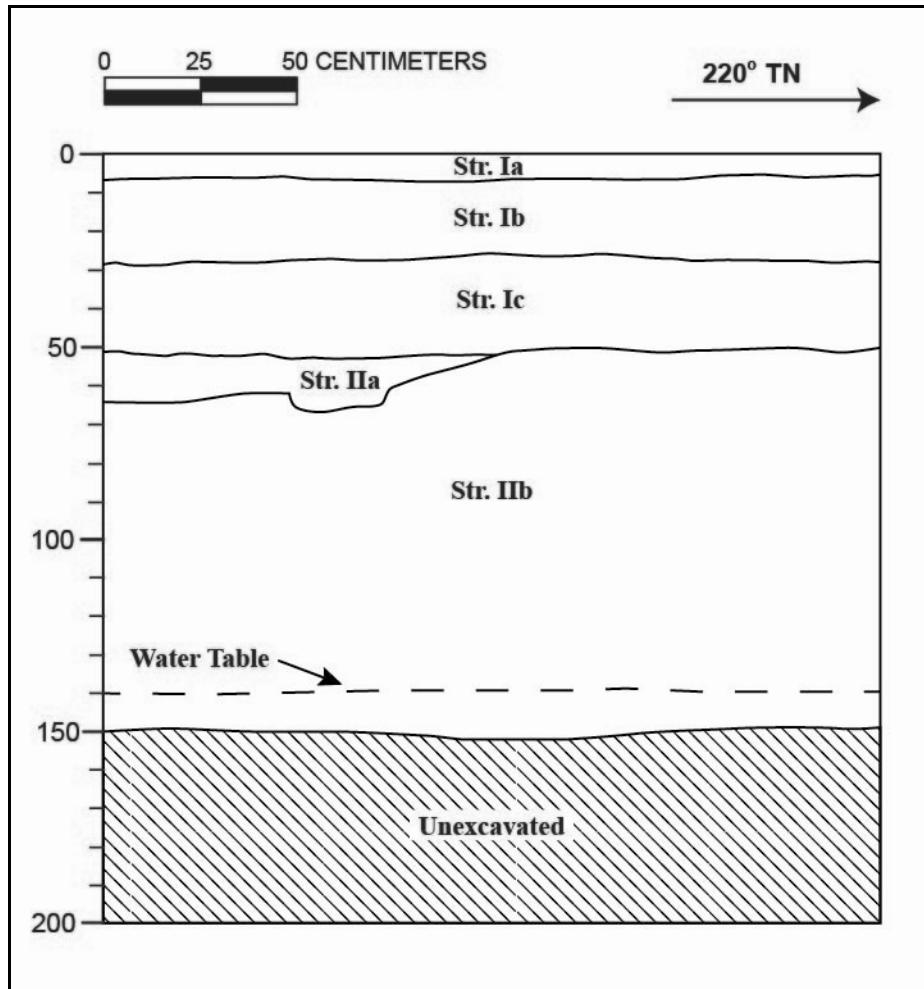


Figure 47. Test Trench 15 profile, southeast wall of excavation

Table 12. Stratigraphy Observed at Test Trench 15, northwest wall of excavation

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-7	Asphalt
Ib	7-29	Crushed coral grading fill
Ic	27-53	Fill; 7.5YR 4/6, strong brown; clay loam; moderate, medium, blocky structure; moist, friable consistency; slightly plastic; terrestrial origin; very abrupt, smooth lower boundary; plastic bag present.

Stratum	Depth (cmbs)	Description of Sediments
IIa	51-62	Buried A horizon; 10YR 4/2, dark grayish brown; loamy sand; weak, fine, crumb structure; dry, weakly coherent consistency; non-plastic; mixed origin; abrupt, smooth lower boundary.
IIb	51-150 (BOE)	Natural jaucas sand; 10YR 8/3, very pale brown; medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; top of stratum was very hard and cemented, like a soft coral shelf; sand became coarser with depth.



Figure 48. Photograph of Test Trench 15, northwest wall of excavation

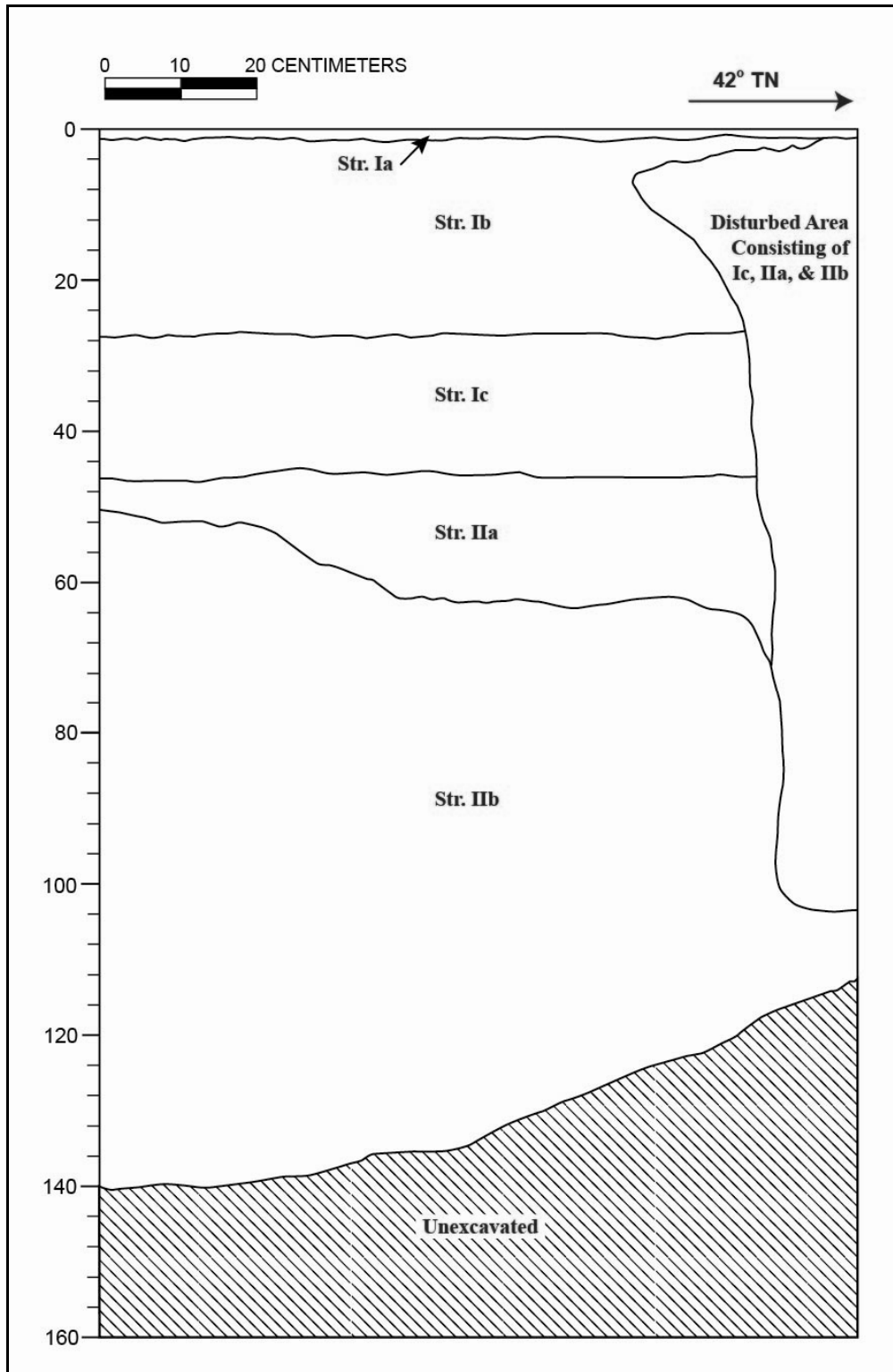


Figure 49. Test Trench 15 profile, northwest wall of excavation

Table 13. Stratigraphy Observed at Test Trench 15, northwest wall of excavation

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-5	Asphalt
Ib	5-27	Crushed coral grading fill
Ic	27-46	Fill; 7.5YR 4/6, strong brown; clay loam; moderate, medium, blocky structure; moist, friable consistency; slightly plastic; terrestrial origin; very abrupt, smooth lower boundary.
IIa	45-70	Buried A horizon; 10YR 4/2, dark grayish brown; loamy sand; weak, fine, crumb structure; dry, weakly coherent consistency; non-plastic; mixed origin; diffuse, smooth lower boundary.
IIb	50-140 (BOE)	Natural jaucas sand; 10YR 8/3, very pale brown; medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; top of stratum was very hard and cemented, like a soft coral shelf; sand became coarser with depth.

4.2.9 Test Trench 16

Test Trench 16 was located at the northern end of the project area. The trench measured 6.00 m long, 0.70 m wide, and 1.20 m deep. The stratigraphy of Test Trench 16 consisted of organic matter over silt loam topsoil (Stratum I) overlying a disturbed sandy loam buried A horizon (Stratum IIa) overlying disturbed natural sand (Stratum IIb) overlying a sandy loam buried A horizon (Stratum IIIa) overlying natural sand (Stratum IIIb) (Figure 50, Figure 51, and Table 14). The top of a portion of Stratum IIb consisted of very hard cemented sand, like a soft coral shelf.



Figure 50. Photograph of Test Trench 16, southwest wall of excavation

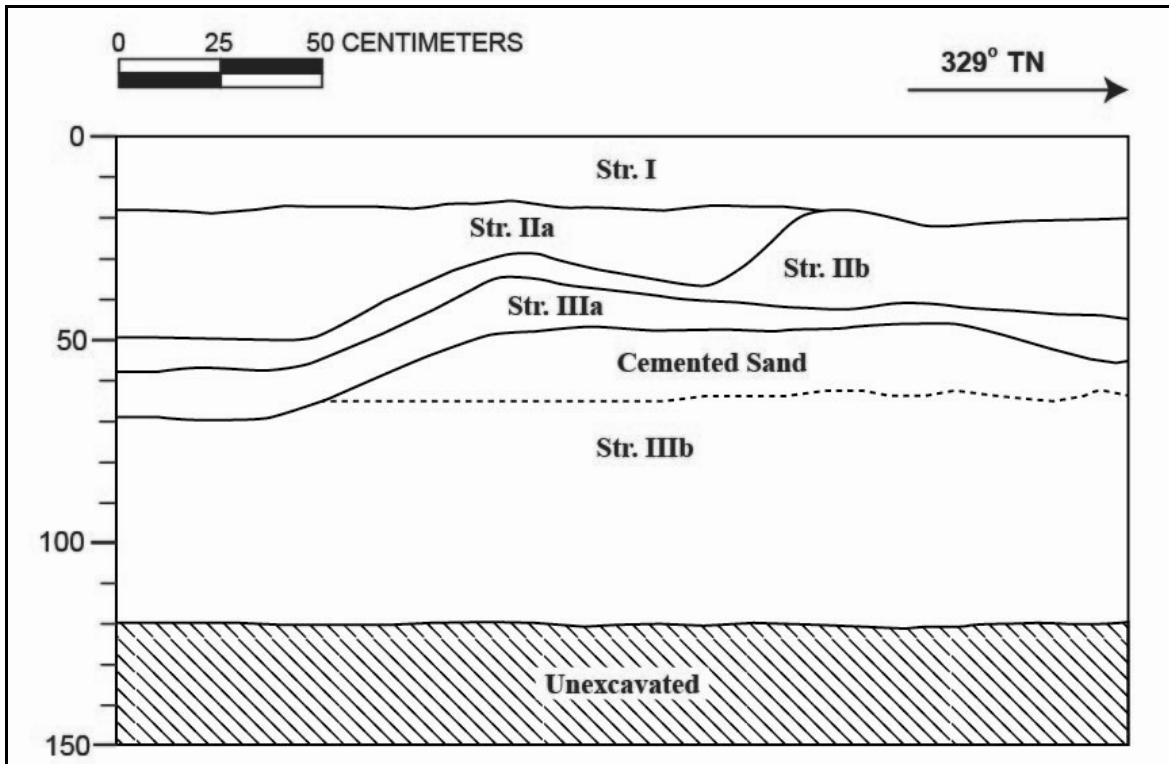


Figure 51. Test Trench 16 profile, southwest wall of excavation

Table 14. Stratigraphy Observed at Test Trench 16

Stratum	Depth (cmbs)	Description of Sediments
I	0-17	Organic matter and topsoil; 10YR 3/4, dark yellowish brown; silt loam; weak, fine, crumb structure; dry, loose consistency; non-plastic; terrestrial origin; clear, smooth lower boundary; many fine roots.
IIa	17-50	Disturbed buried A horizon; 10YR 4/2, dark grayish brown; loamy sand; weak, very fine, crumb structure; dry, weakly coherent consistency; non-plastic; mixed origin; diffuse, smooth lower boundary.
IIb	18-58	Disturbed natural jaucas sand; 10YR 8/3, very pale brown; medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; abrupt, irregular lower boundary.
IIIa	35-70	Buried A horizon; 10YR 4/2, dark grayish brown; loamy sand; weak, very fine, crumb structure; dry, weakly coherent consistency; non-plastic; mixed origin; diffuse, smooth lower boundary.
IIIb	46-120 (BOE)	Natural jaucas sand; 10YR 8/3, very pale brown; medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; top of stratum was very hard and cemented, like a soft coral shelf.

4.2.10 Test Trench 17

Test Trench 17 was located at the northern end of the project area. The trench measured 6.20 m long, 0.70 m wide, and 1.25 m deep. The stratigraphy of Test Trench 16 consisted of organic matter over sandy loam topsoil (Stratum I) overlying a loamy sand buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 52, Figure 53, and Table 15). The top of a portion of Stratum IIb consisted of very hard cemented sand, like a soft coral shelf.



Figure 52. Photograph of Test Trench 17, southwest wall of excavation

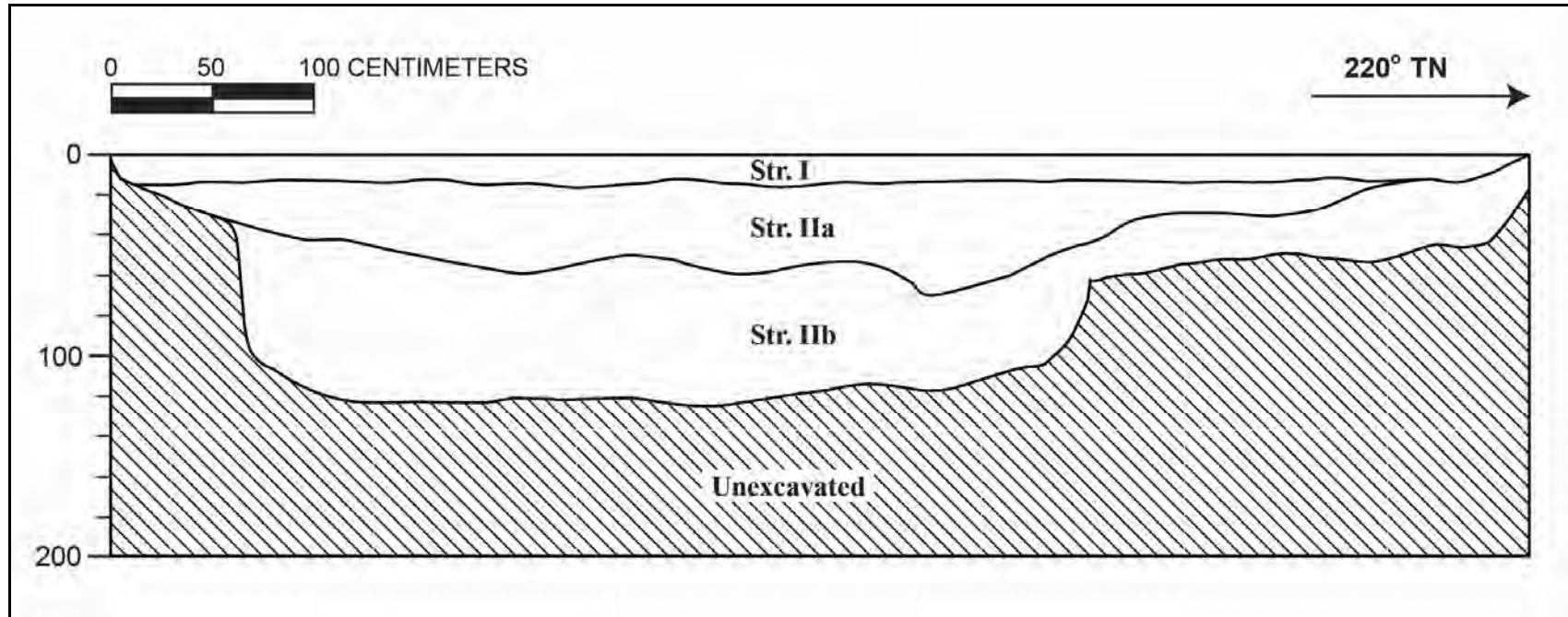


Figure 53. Test Trench 17 profile, southwest wall of excavation

Table 15. Stratigraphy Observed at Test Trench 17

Stratum	Depth (cmbs)	Description of Sediments
I	0-15	Organic matter and topsoil; 10YR 3/4, dark yellowish brown; sandy loam; weak, fine, crumb structure; dry, loose consistency; non-plastic; terrestrial origin; clear, smooth lower boundary; many fine roots.
IIa	15-65	Buried A horizon; 10YR 4/2, dark grayish brown; loamy sand; weak, fine, crumb structure; dry, loose consistency; non-plastic; mixed origin; clear, wavy lower boundary.
IIb	35-125 (BOE)	Natural jaucas sand; 10YR 8/3, very pale brown; medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few medium roots; top of stratum was very hard and cemented, like a soft coral shelf.

4.2.11 Shovel Test 1

Shovel Test 1 was located at the northeastern corner of the project area along the ocean. The shovel test had a diameter of 0.40 m and was 0.80 m deep. The stratigraphy of Shovel Test 1 consisted of organic matter over a sandy loam buried A horizon (Stratum I) overlying natural sand (Stratum II) (Figure 54, Figure 55, and Table 16). This shovel test was located within SIHP # -1801, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990). The buried A horizon (Stratum I) is incorporated into SIHP # -1801.



Figure 54. Photograph of Shovel Test 1, view northeast

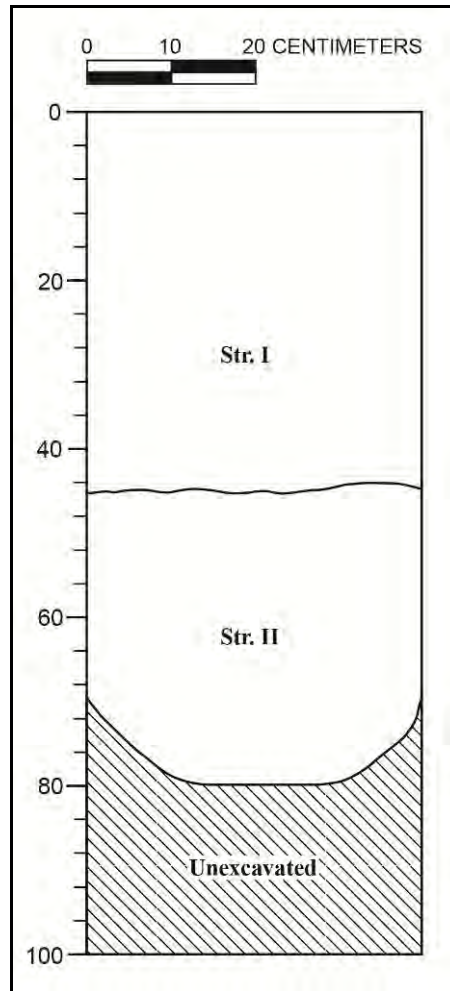


Figure 55. Shovel Test 1 profile

Table 16. Stratigraphy Observed at Shovel Test 1

Stratum	Depth (cmbs)	Description of Sediments
I	0-45	Organic matter and old A horizon; 10YR 3/2, very dark grayish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; diffuse, smooth lower boundary; common fine roots; charcoal flecking, shell midden, and coral cobbles present; cultural layer, incorporated into SIHP # -1801.
II	45-80 (BOE)	Natural jaucas sand; 10YR 8/6, yellow; fine-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.12 Shovel Test 2

Shovel Test 2 was located at the northeastern corner of the project area along the ocean. The shovel test had a diameter of 0.40 m and was 0.65 m deep. The stratigraphy of Shovel Test 2 consisted of organic matter over loamy sand (Stratum Ia) overlying natural sand (Stratum Ib) overlying a natural sand buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 56, Figure 57, and Table 17). The buried A horizon (Stratum IIa) is incorporated into SIHP # -1801, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 56. Photograph of Shovel Test 2, view east

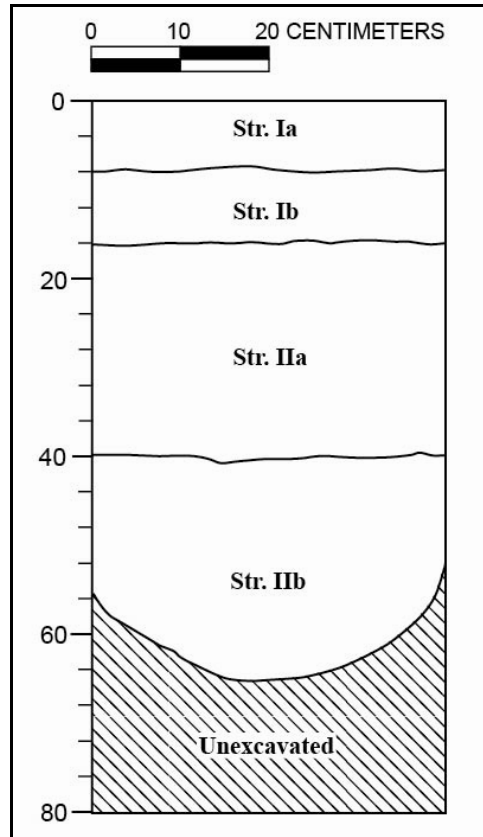


Figure 57. Shovel Test 2 profile

Table 17. Stratigraphy Observed at Shovel Test 2

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-8	Organic matter and topsoil; 10YR 2/2, black; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary.
Ib	8-16	Natural; 10YR 7/4, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; very abrupt, smooth lower boundary; few fine to medium roots.
IIa	16-40	Buried A horizon; 10YR 3/2, very dark grayish brown; sandy loam; weak, fine, crumb structure; dry, loose consistency; non-plastic; mixed origin; diffuse, smooth lower boundary; common fine roots; charcoal and shell midden present; cultural layer, incorporated into SIHP # -1801.
IIb	40-65 (BOE)	Natural jaucas sand; 10YR 8/6, yellow; fine-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; many medium roots.

4.2.13 Shovel Test 3

Shovel Test 3 was located at the northeastern corner of the project area along the ocean. The shovel test had a diameter of 0.40 m and was 0.85 m deep. The stratigraphy of Shovel Test 3 consisted of organic matter over loamy sand (Stratum Ia) overlying natural sand (Stratum Ib) overlying a natural sand buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 58, Figure 59, and Table 18). The buried A horizon (Stratum IIa) is incorporated into SIHP # -1801, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 58. Photograph of Shovel Test 3, view east

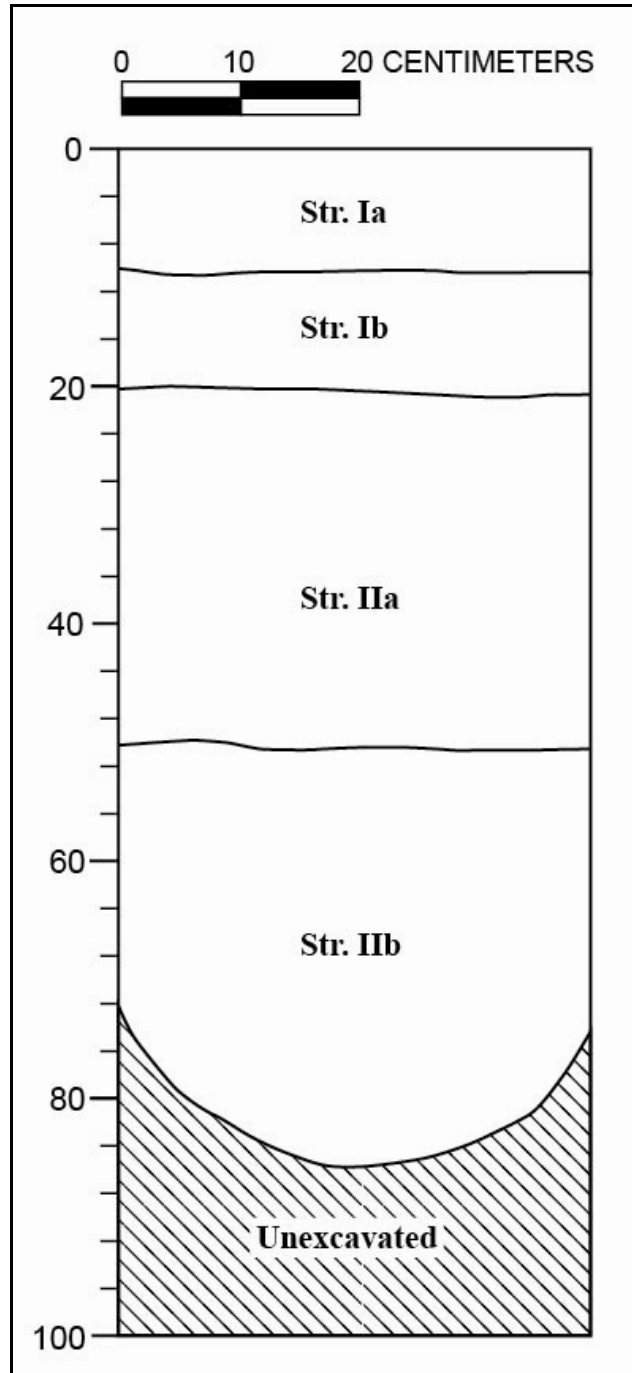


Figure 59. Shovel Test 3 profile

Table 18. Stratigraphy Observed at Shovel Test 3

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-10	Organic matter and topsoil; 10YR 2/1, black; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary.
Ib	10-20	10YR 6/4, light yellowish brown; medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; few fine to medium roots.
IIa	20-50	Buried A horizon; 10YR 3/3, dark brown; sandy loam; weak, fine, crumb structure; dry, loose consistency; non-plastic; mixed origin; diffuse, smooth lower boundary; charcoal and shell midden present; cultural layer, incorporated into SIHP # -1801.
IIb	50-85 (BOE)	Natural jaucas sand; 10YR 8/6, yellow; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.14 Shovel Test 4

Shovel Test 4 was located at the northeastern corner of the project area along the ocean. The shovel test had a diameter of 0.66 m and was 0.59 m deep. The stratigraphy of Shovel Test 4 consisted of grass over loamy sand (Stratum I) overlying natural sand (Stratum II) (Figure 60, Figure 61, and Table 19).



Figure 60. Photograph of Shovel Test 4, view east

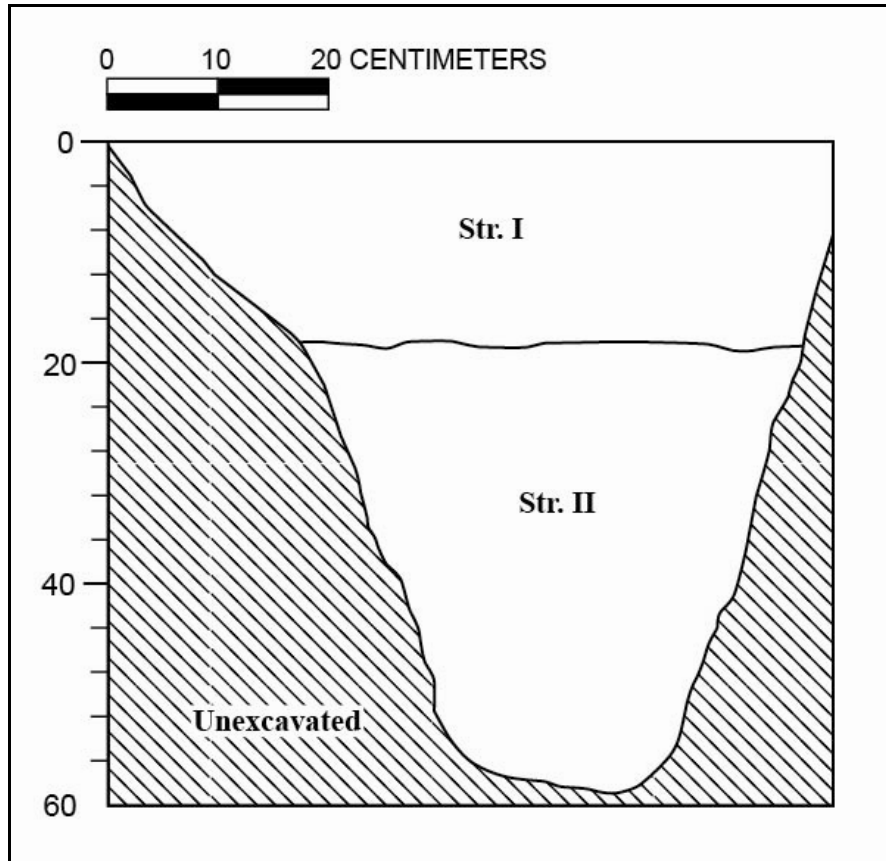


Figure 61. Shovel Test 4 profile, northeast wall of excavation

Table 19. Stratigraphy Observed at Shovel Test 4

Stratum	Depth (cmbs)	Description of Sediments
I	0-18	Grass and topsoil; 10YR 5/2, grayish brown; loamy sand; weak, fine to medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine to coarse roots.
II	18-59 (BOE)	Natural jaucas sand; 10YR 8/3, very pale brown; medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin.

4.2.15 Shovel Test 5

Shovel Test 5 was located at the northeastern corner of the project area along the ocean. The shovel test had a diameter of 0.40 m and was 0.65 m deep. The stratigraphy of Shovel Test 5 consisted of grass over loamy sand (Stratum I) overlying natural sand (Stratum II) (Figure 62, Figure 63, and Table 20).



Figure 62. Photograph of Shovel Test 5, view northwest

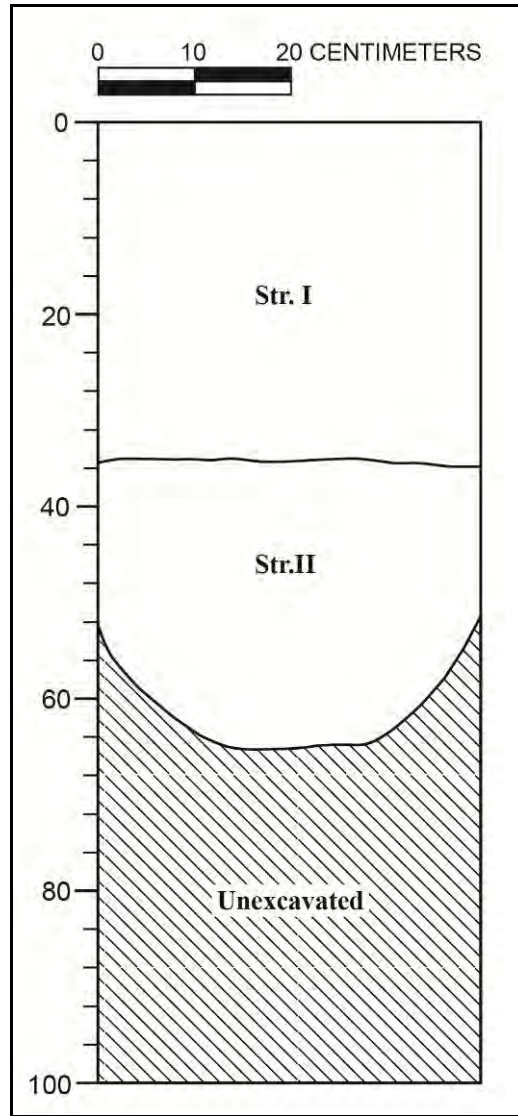


Figure 63. Shovel Test 5 profile

Table 20. Stratigraphy Observed at Shovel Test 5

Stratum	Depth (cmbs)	Description of Sediments
I	0-35	Grass and topsoil; 10YR 4/2, grayish brown; loamy sand; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few fine roots.
II	35-65 (BOE)	Natural jaucas sand; 10YR 8/4, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin.

4.2.16 Shovel Test 6

Shovel Test 6 was located at the northeastern corner of the project area along the ocean. The shovel test had a diameter of 0.50 m and was 0.50 m deep. The stratigraphy of Shovel Test 6 consisted of organic matter over loamy sand (Stratum I) overlying natural sand (Stratum II) (Figure 64, Figure 65, and Table 21).



Figure 64. Photograph of Shovel Test 6, view east

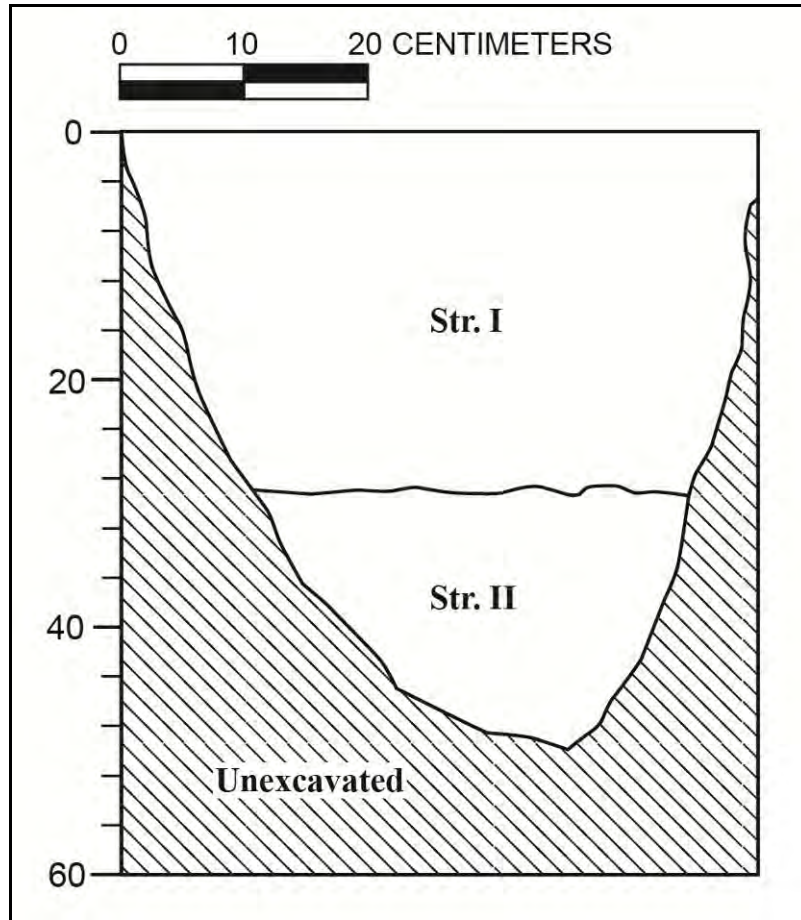


Figure 65. Shovel Test 6 profile

Table 21. Stratigraphy Observed at Shovel Test 6

Stratum	Depth (cmbs)	Description of Sediments
I	0-29	Grass and topsoil; 10YR 5/2, grayish brown; loamy sand; weak, fine to medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; many medium to coarse roots.
II	29-50 (BOE)	Natural jaucas sand; 10YR 8/3, very pale brown; medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; few fine to medium roots.

4.2.17 Shovel Test 7

Shovel Test 7 was located at the northeastern corner of the project area along the ocean. The shovel test had a diameter of 0.60 m and was 0.64 m deep. The stratigraphy of Shovel Test 7 consisted of organic matter over sandy loam (Stratum I) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 66, Figure 67, and Table 22). Stratum IIa had a small pit containing charcoal. The buried A horizon (Stratum IIa) is incorporated into SIHP # -1801, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 66. Photograph of Shovel Test 7, view north

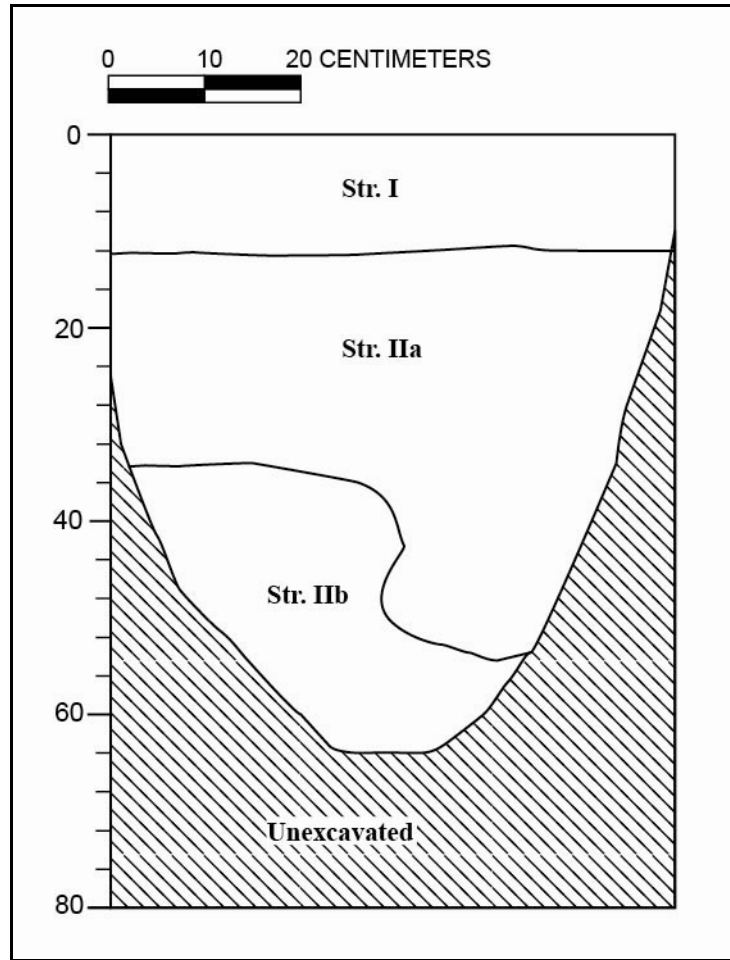


Figure 67. Shovel Test 7 profile

Table 22. Stratigraphy Observed at Shovel Test 7

Stratum	Depth (cmbs)	Description of Sediments
I	0-12	Organic matter and topsoil; 10YR 2/2, very dark brown; sandy loam; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few fine roots.
IIa	12-54	Buried A horizon; 10YR 3/3, dark brown; sandy loam; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; diffuse, wavy lower boundary; common fine to medium roots; charcoal present; cultural layer, incorporated into SIHP # -1801.
IIb	34-64 (BOE)	Natural jaucas sand; 10YR 7/6, yellow; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine to medium roots.

4.2.18 Shovel Test 8

Shovel Test 8 was located at the northeastern corner of the project area along the ocean. The shovel test had a diameter of 0.30 m and was 0.60 m deep. The stratigraphy of Shovel Test 8 consisted of organic matter over loamy sand (Stratum I) overlying natural sand (Stratum II) (Figure 68, Figure 69, and Table 23). This shovel test was located within SIHP # -1801, a pre-Contact cultural layer and burials original identified by Rosendahl and Kai (1990); however, no cultural layer was observed.



Figure 68. Photograph of Shovel Test 8, view northwest

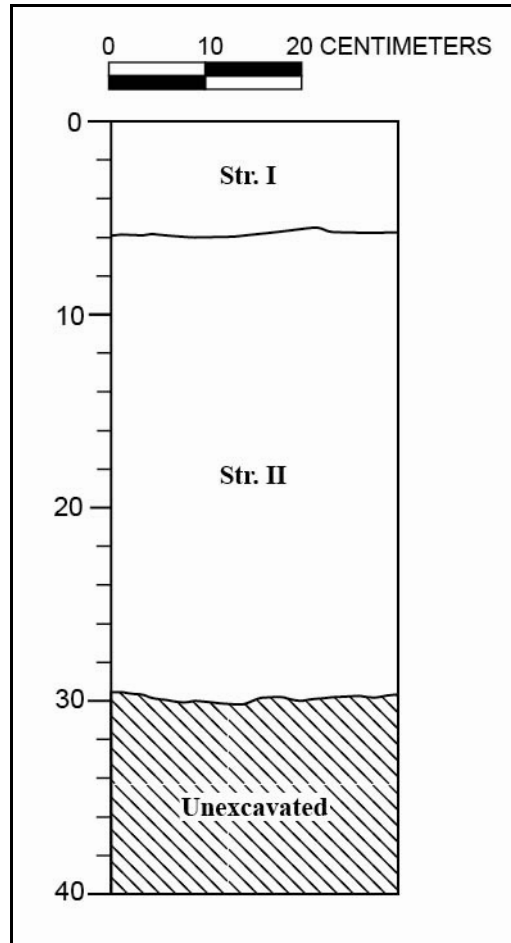


Figure 69. Shovel Test 8 profile

Table 23. Stratigraphy Observed at Shovel Test 8

Stratum	Depth (cmbs)	Description of Sediments
I	0-12	Organic matter and topsoil; 10YR 3/3, dark brown; loamy sand; weak, fine, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; diffuse, smooth lower boundary; common fine to medium roots.
II	12-60 (BOE)	Natural jaucas sand; 10YR 7/6, yellow; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine roots.

4.2.19 Shovel Test 9

Shovel Test 9 was located at the northeastern corner of the project area along the ocean. The shovel test had a diameter of 0.50 m and was 0.70 m deep. The stratigraphy of Shovel Test 9 consisted of grass over sandy loam (Stratum I) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 70, Figure 71, and Table 24). The buried A horizon (Stratum IIa) is incorporated into SIHP # -1801, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 70. Photograph of Shovel Test 9, view northwest

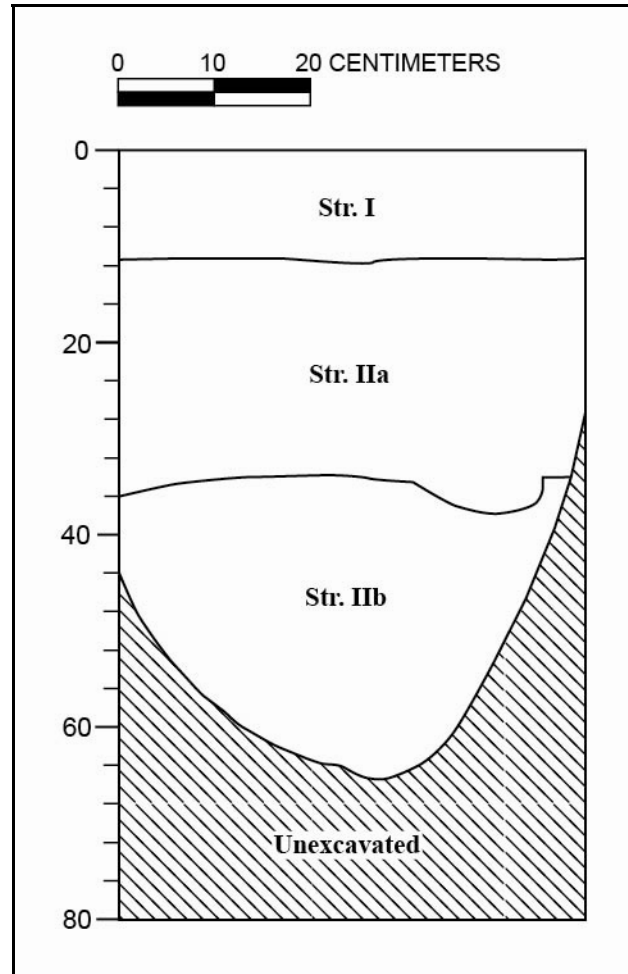


Figure 71. Shovel Test 9 profile

Table 24. Stratigraphy Observed at Shovel Test 9

Stratum	Depth (cmbs)	Description of Sediments
I	0-15	Grass and topsoil; 10YR 3/3, dark brown; sandy loam; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few fine roots.
IIa	15-38	Buried A horizon; 10YR 3/2, very dark grayish brown; sandy loam; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; diffuse, wavy lower boundary; common fine to medium roots; charcoal present; cultural layer, incorporated into SIHP # -1801.
IIb	34-65 (BOE)	Natural jaucas sand; 10YR 7/6, yellow; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine to medium roots.

4.2.20 Shovel Test 10

Shovel Test 10 was located at the northeastern corner of the project area along the ocean. The shovel test had a diameter of 0.40 m and was 0.60 m deep. The stratigraphy of Shovel Test 10 consisted of grass over sand (Stratum I) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 72, Figure 73, and Table 25). The buried A horizon (Stratum IIa) is incorporated into SIHP # -1801, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 72. Photograph of Shovel Test 10, view southeast

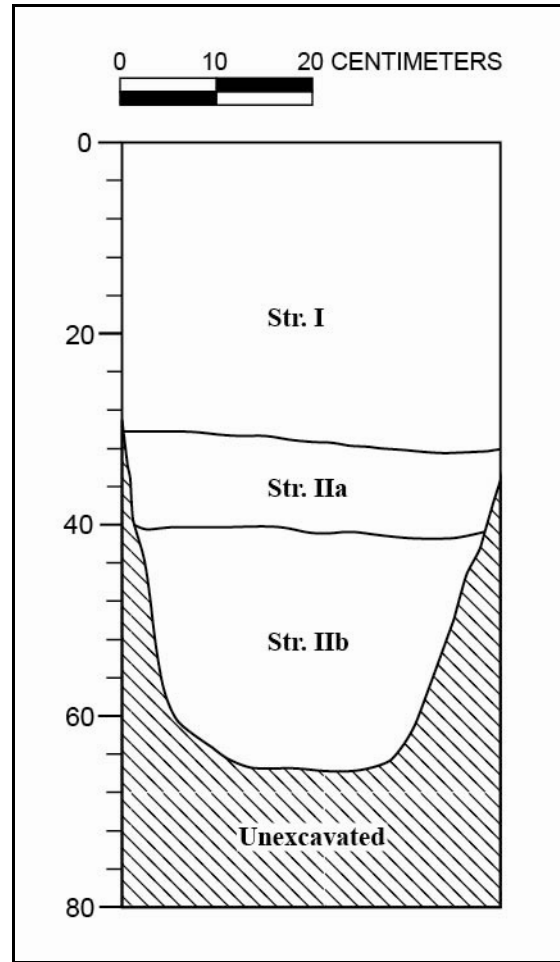


Figure 73. Shovel Test 10 profile

Table 25. Stratigraphy Observed at Shovel Test 10

Stratum	Depth (cmbs)	Description of Sediments
I	0-32	Organic matter and topsoil; 10YR 2/2, very dark brown; sandy loam; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few fine roots.
IIa	30-41	Buried A horizon; 10YR 3/3, dark brown; sandy loam; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; diffuse, wavy lower boundary; common fine to medium roots; charcoal present; cultural layer, incorporated into SIHP # -1801.
IIb	40-65 (BOE)	Natural jaucas sand; 10YR 7/6, yellow; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine to medium roots.

4.2.21 Shovel Test 11

Shovel Test 11 was located at the northeastern corner of the project area along the ocean. The shovel test had a diameter of 0.30 m and was 0.70 m deep. The stratigraphy of Shovel Test 11 consisted of organic matter over loamy sand (Stratum I) overlying a loamy sand buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 74, Figure 75, and Table 26). The buried A horizon (Stratum IIa) is incorporated into SIHP # -1801, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 74. Photograph of Shovel Test 11, view northwest

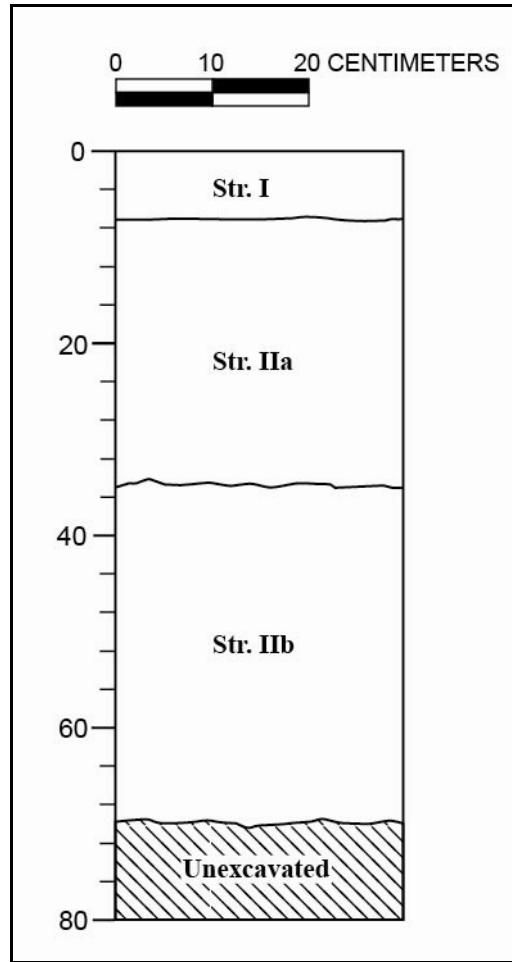


Figure 75. Shovel Test 11 profile

Table 26. Stratigraphy Observed at Shovel Test 11

Stratum	Depth (cmbs)	Description of Sediments
I	0-7	Organic matter and topsoil; 10YR 7/2, light gray; loamy sand; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine roots.
IIa	7-35	Buried A horizon; 10YR 4/3, dark brown; loamy sand; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; diffuse, smooth lower boundary; few fine to medium roots; charcoal present; cultural layer, incorporated into SIHP # -1801.
IIb	35-70 (BOE)	Natural jaucas sand; 10YR 7/6, yellow; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few medium to coarse roots.

4.2.22 Shovel Test 12

Shovel Test 12 was located at the northeastern corner of the project area along the ocean. The shovel test had a diameter of 0.40 m and was 0.66 m deep. The stratigraphy of Shovel Test 12 consisted of organic matter over sandy loam (Stratum I) overlying natural sand that has possibly been deposited by high surf (Stratum II) overlying a sandy loam modern A horizon (Stratum III) overlying a sandy loam Pre-Contact A horizon (Stratum IVa) overlying natural sand (Stratum IVb) (Figure 76, Figure 77, and Table 27). The buried A horizon (Stratum IVa) is incorporated into SIHP # -1801, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 76. Photograph of Shovel Test 12, view south

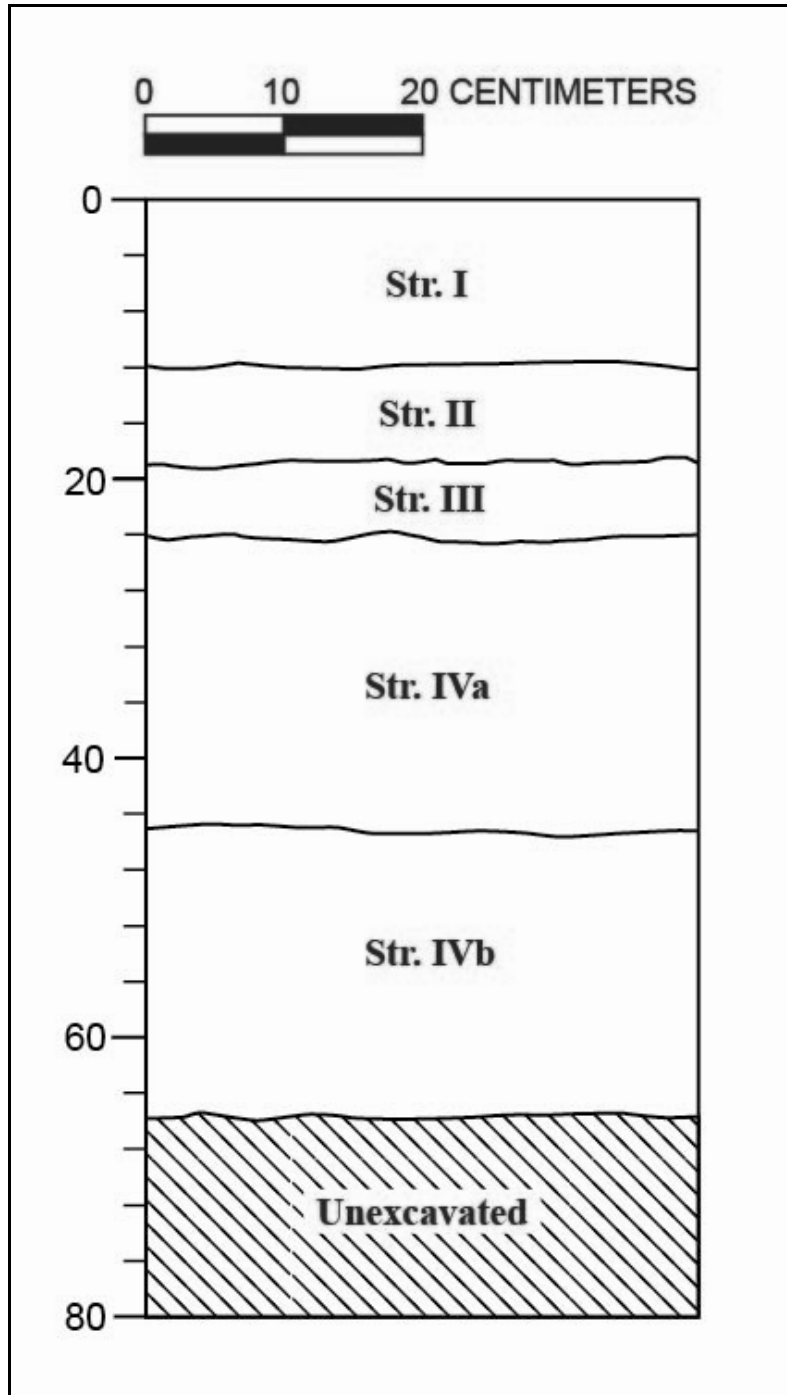


Figure 77. Shovel Test 12 profile

Table 27. Stratigraphy Observed at Shovel Test 12

Stratum	Depth (cmbs)	Description of Sediments
I	0-12	Organic matter and topsoil; 10YR 3/2, very dark grayish brown; sandy loam; weak, medium, granular structure; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots.
II	12-19	Natural; 10YR 4/2, dark grayish brown; sand; single-grain; dry, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; few fine roots; possibly deposited by high surf.
III	19-24	Buried modern A horizon; 10YR 3/2, very dark grayish brown; sandy loam; weak, medium, granular structure; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine to coarse roots.
IVa	24-45	Buried A horizon; 10YR 3/3, dark brown; loamy sand; weak, medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine to coarse roots; charcoal present; cultural layer, incorporated into SIHP # -1801.
IVb	45-65 (BOE)	Natural jaucas sand; 10YR 6/6, brownish yellow; medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; common fine to coarse roots.

4.2.23 Shovel Test 13

Shovel Test 13 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.60 m long and 1.38 m deep. The stratigraphy of Shovel Test 13 consisted of grass over loamy sand (Stratum I) overlying natural sand that has possibly been deposited by high surf (Stratum II) overlying a sandy loam buried A horizon (Stratum IIIa) overlying natural sand (Stratum IIIb) (Figure 78, Figure 79, and Table 28). The buried A horizon (Stratum IIIa) is incorporated into SIHP # -1800, pre-Contact cultural layers and burials originally identified by Rosendahl and Kai (1990).



Figure 78. Photograph of Shovel Test 13, northeast wall of excavation

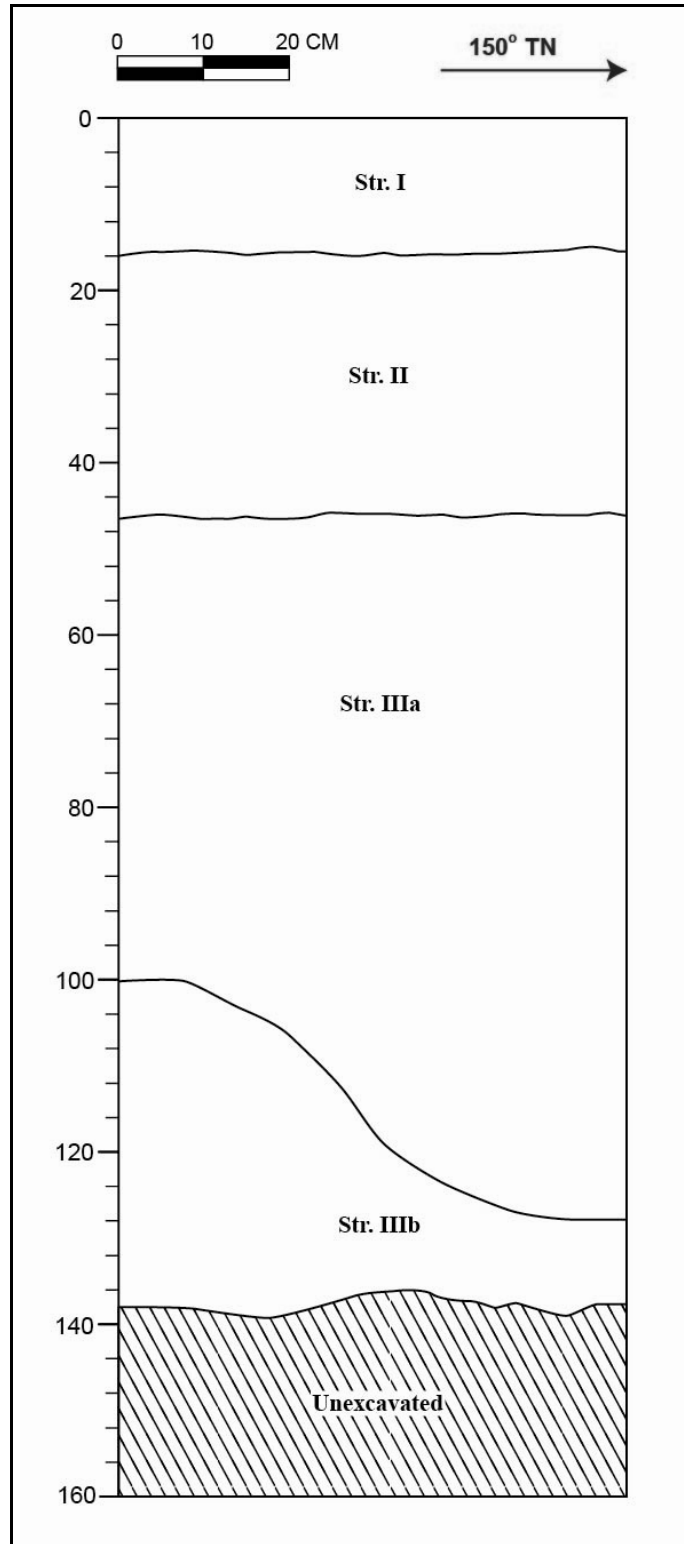


Figure 79. Shovel Test 13 profile, northeast wall of excavation

Table 28. Stratigraphy Observed at Shovel Test 13

Stratum	Depth (cmbs)	Description of Sediments
I	0-16	Grass and topsoil; 10YR 3/3, dark brown; loamy sand; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots.
II	16-47	Natural; 10YR 6/4, light yellowish brown; sand; single-grain; dry, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; few fine to medium roots; possibly deposited by high surf.
IIIa	47-128	Buried A horizon; 10YR 3/2, very dark grayish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, wavy lower boundary; common fine to coarse roots; charcoal and fire-cracked rock present; cultural layer, incorporated into SIHP # -1800.
IIIb	110-138 (BOE)	Natural jaucas sand; 10YR 7/3, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine roots.

4.2.24 Shovel Test 14

Shovel Test 14 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.60 m long and 0.89 m deep. The stratigraphy of Shovel Test 14 consisted of grass over loamy sand (Stratum I) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 80, Figure 81, and Table 29). The buried A horizon (Stratum IIa) is incorporated into SIHP # -1801, pre-Contact cultural layers and burials originally identified by Rosendahl and Kai (1990). One isolated find, a coral file, was discovered within Stratum IIa. A detailed description of the file is given in Section 5.



Figure 80. Photograph of Shovel Test 14, north wall of excavation

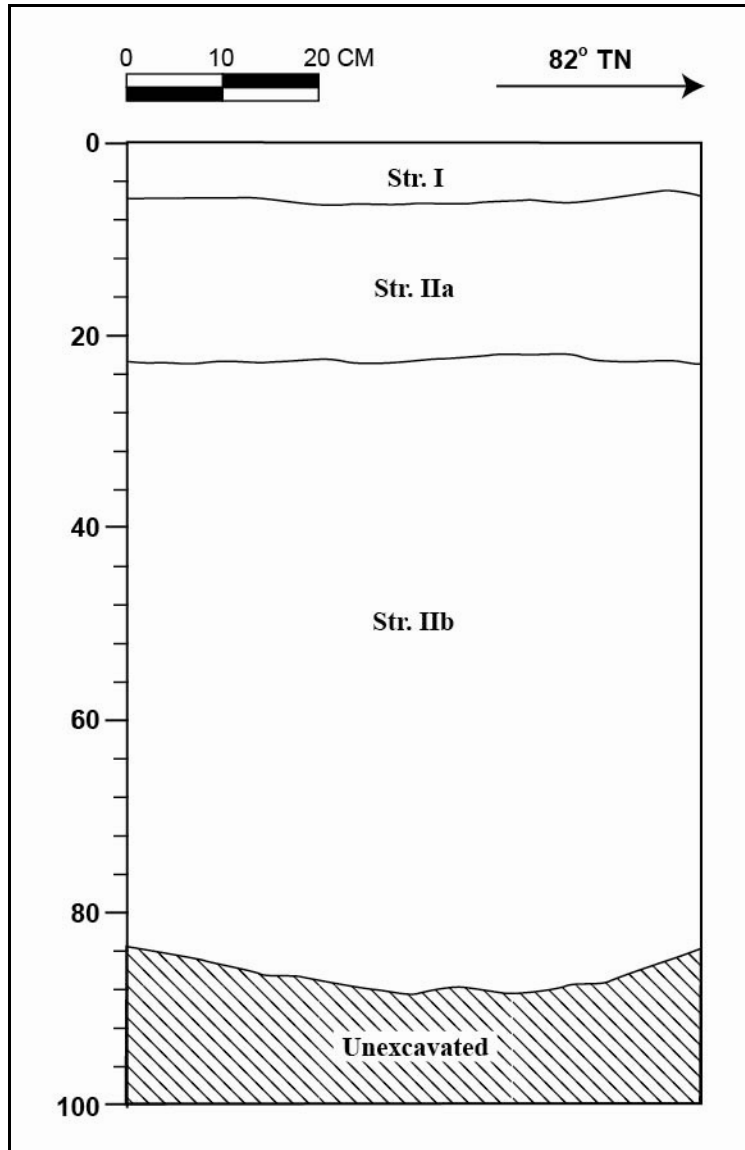


Figure 81. Shovel Test 14 profile, north wall of excavation

Table 29. Stratigraphy Observed at Shovel Test 14

Stratum	Depth (cmbs)	Description of Sediments
I	0-5	Grass and topsoil; 10YR 3/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots.
IIa	5-23	Buried A horizon; 10YR 3/2, very dark grayish brown; sandy loam; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots; charcoal and a coral file present; cultural layer, incorporated into SIHP # -1801.
IIb	23-89 (BOE)	Natural; 10YR 7/3, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine roots; micro layers of coral pebbles.

4.2.25 Shovel Test 15

Shovel Test 15 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 0.92 m deep. The stratigraphy of Shovel Test 15 consisted of grass over loamy sand (Stratum I) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand that has possibly been deposited by high surf (Stratum IIb) overlying a second and older loamy sand buried A horizon (Stratum IIIa) overlying natural sand (Stratum IIIb) (Figure 82, Figure 83, and Table 30). The buried A horizons (Strata IIa and IIIa) are incorporated into SIHP # -1801, pre-Contact cultural layers and burials originally identified by Rosendahl and Kai (1990).



Figure 82. Photograph of Shovel Test 15, east wall of excavation

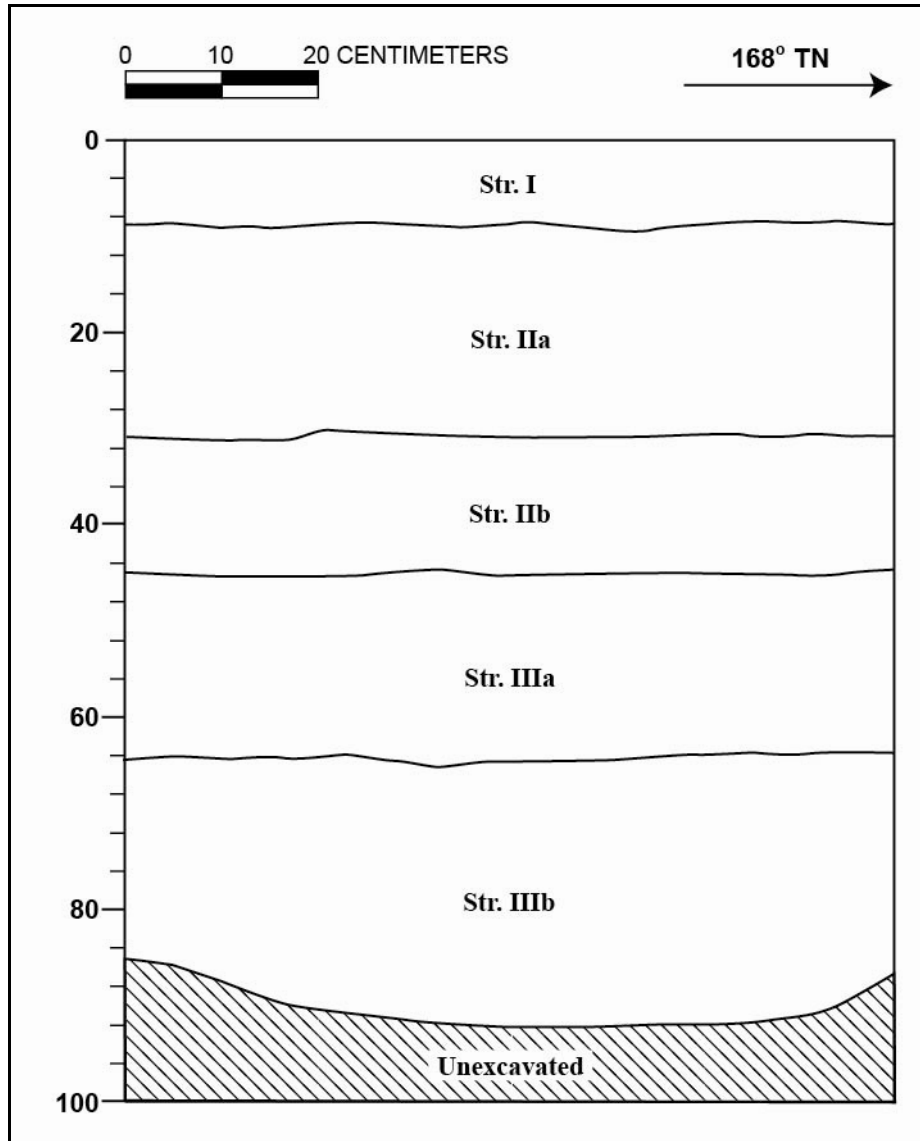


Figure 83. Shovel Test 15 profile, east wall of excavation

Table 30. Stratigraphy Observed at Shovel Test 15

Stratum	Depth (cmbs)	Description of Sediments
I	0-9	Grass and topsoil; 10YR 3/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots.
IIa	9-31	Buried A horizon; 10YR 3/1, very dark gray; sandy loam; weak, medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; diffuse, smooth lower boundary; common fine to coarse roots; charcoal present; cultural layer, incorporated into SIHP # -1800.
IIb	31-45	Natural; 10YR 6/4, light yellowish brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; few fine to medium roots; possibly deposited by high surf.
IIIa	45-65	Buried A horizon; 10YR 4/2, dark grayish brown; sandy loam; weak, medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few fine roots; charcoal present; cultural layer, incorporated into SIHP # -1800.
IIIb	65-92 (BOE)	Natural jaucas sand; 10YR 7/3, very pale brown; fine-to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine roots.

4.2.26 Shovel Test 16

Shovel Test 16 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.60 m long and 0.86 m deep. The stratigraphy of Shovel Test 16 consisted of grass over loamy sand (Stratum I) overlying natural sand that has possibly been deposited by high surf (Stratum II) overlying a loamy sand buried A horizon (Stratum IIIa) overlying natural sand (Stratum IIIb) (Figure 84, Figure 85, and Table 31). The buried A horizon (Stratum IIIa) is incorporated into SIHP # -1801, pre-Contact cultural layers and burials originally identified by Rosendahl and Kai (1990).



Figure 84. Photograph of Shovel Test 16, west wall of excavation

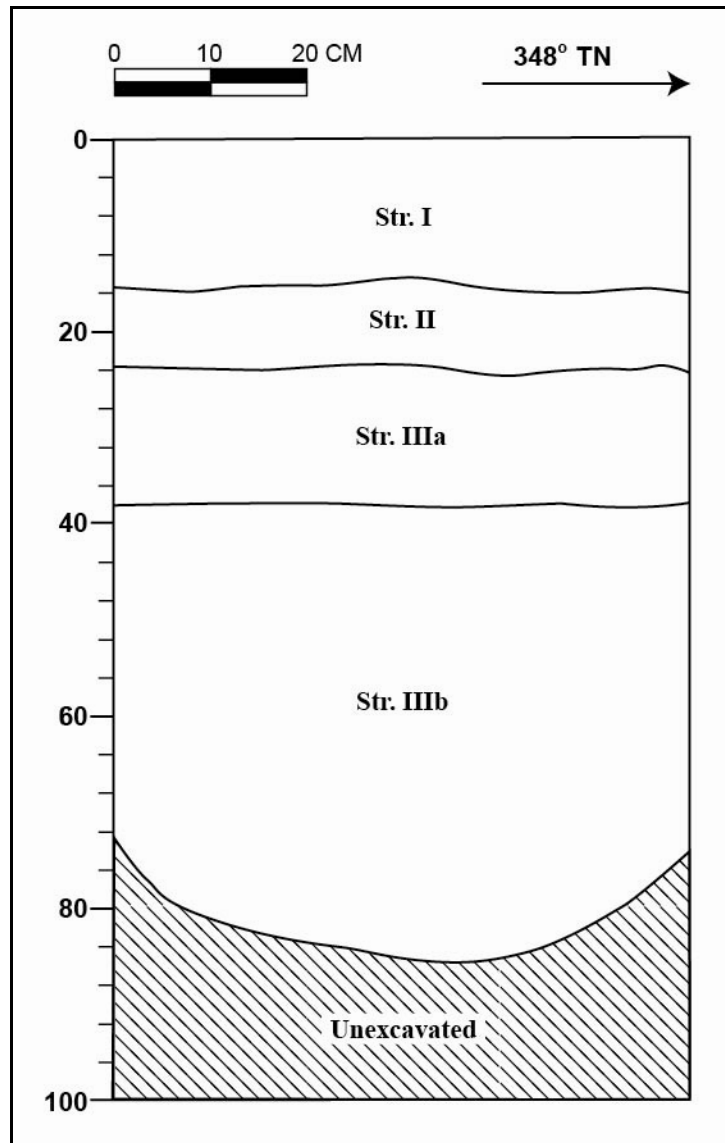


Figure 85. Shovel Test 16 profile, west wall of excavation

Table 31. Stratigraphy Observed at Shovel Test 16

Stratum	Depth (cmbs)	Description of Sediments
I	0-16	Grass and topsoil; 10YR 3/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine roots.
II	16-24	Natural; 10YR 6/4, light yellowish brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; few fine to medium roots; possibly deposited by high surf.
IIIa	24-38	Buried A horizon; 10YR 3/2, very dark grayish brown; sandy loam; weak, fine granular structure; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few fine roots; charcoal present; cultural layer, incorporated into SIHP # -1801.
IIIb	38-86 (BOE)	Natural jaucas sand; 10YR 7/3, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine roots.

4.2.27 Shovel Test 17

Shovel Test 17 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.60 m long and 1.27 m deep. The stratigraphy of Shovel Test 17 consisted of grass over loamy sand (Stratum I) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand that has possibly been deposited by high surf (Stratum IIb) overlying a second loamy sand buried A horizon (Stratum IIIa) overlying natural sand (Stratum IIIb) (Figure 86, Figure 87, and Table 32). The buried A horizons (Strata IIa and IIIa) are incorporated into SIHP # -1801, pre-Contact cultural layers and burials originally identified by Rosendahl and Kai (1990).



Figure 86. Photograph of Shovel Test 17, west wall of excavation

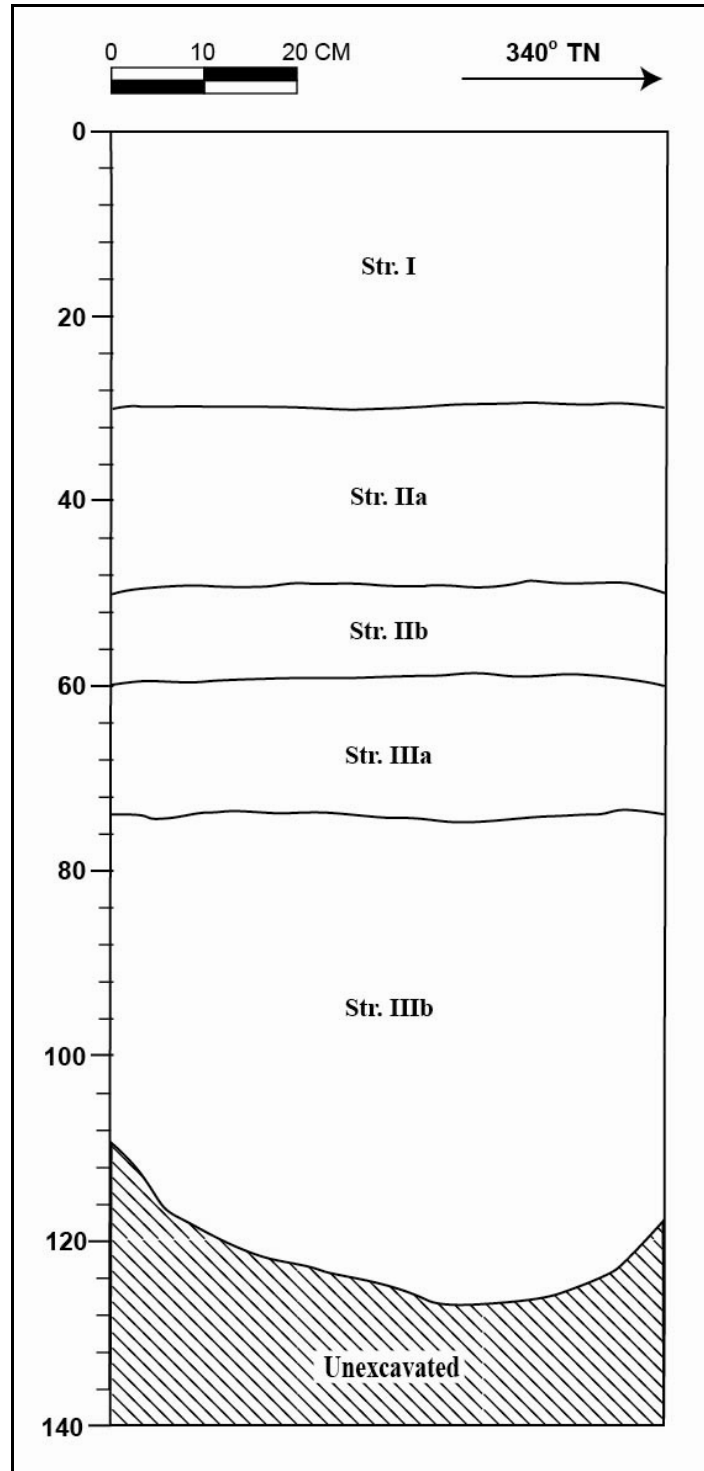


Figure 87. Shovel Test 17 profile, west wall of excavation

Table 32. Stratigraphy Observed at Shovel Test 17

Stratum	Depth (cmbs)	Description of Sediments
I	0-30	Grass and topsoil; 10YR 5/3, brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine roots.
IIa	30-50	Buried A horizon; 10YR 3/1, very dark gray; sandy loam; weak, fine granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine roots; charcoal present; cultural layer, incorporated into SIHP # -1800.
IIb	50-60	Natural; 10YR 6/4, light yellowish brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; few fine roots; possibly deposited by high surf.
IIIa	60-74	Buried A horizon; 10YR 4/2, dark grayish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few fine roots; charcoal present; cultural layer, incorporated into SIHP # -1801.
IIIb	74-127 (BOE)	Natural jaucas sand; 10YR 7/3, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.28 Shovel Test 18

Shovel Test 18 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 1.00 m deep. The stratigraphy of Shovel Test 18 consisted of grass over loamy sand (Stratum Ia) overlying sandy loam fill (Stratum Ib) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 88, Figure 89, and Table 33). The buried A horizon (Stratum IIa) is incorporated into SIHP # -1800, pre-Contact cultural layers and burials originally identified by Rosendahl and Kai (1990).



Figure 88. Photograph of Shovel Test 18, west wall of excavation

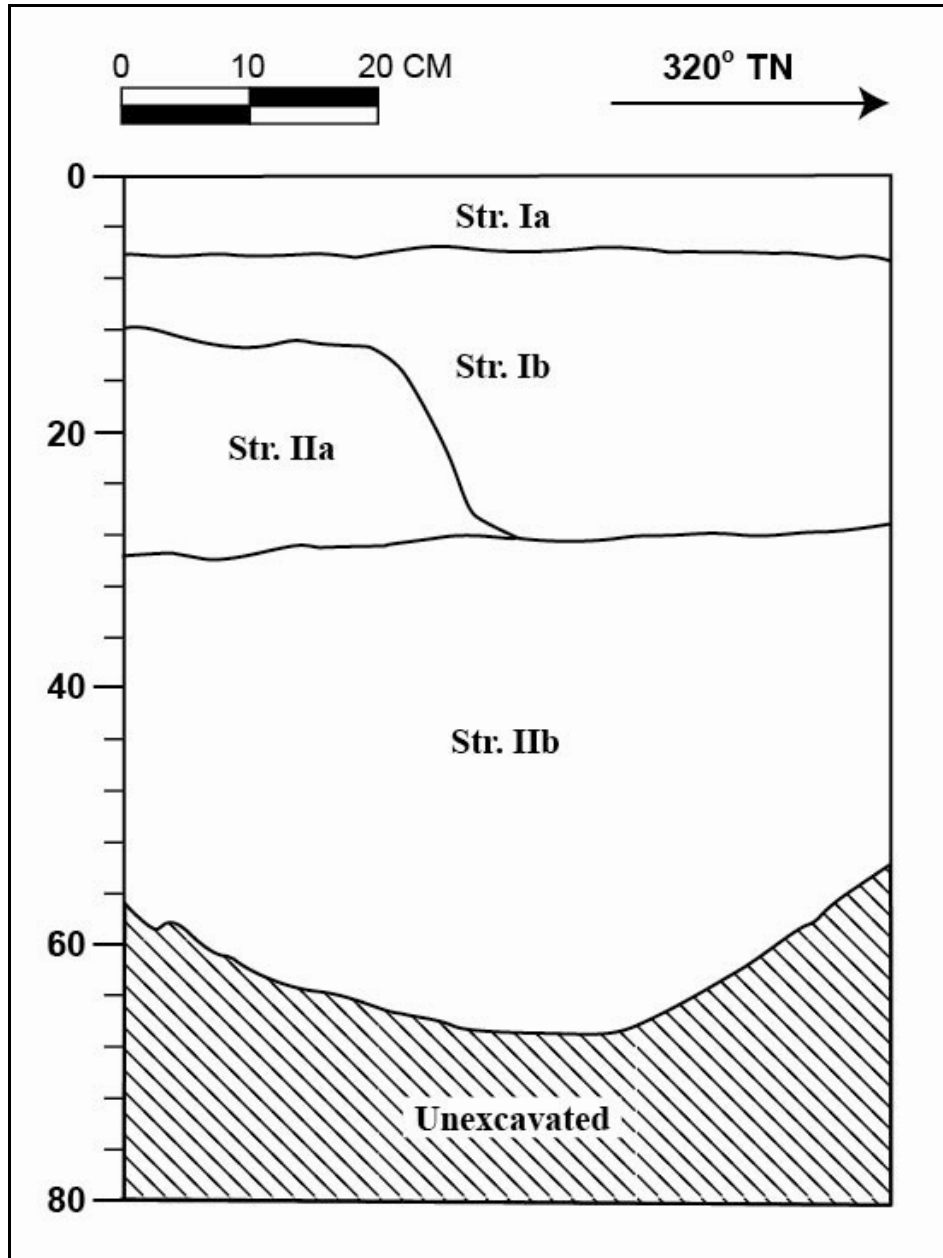


Figure 89. Shovel Test 18 profile, west wall of excavation

Table 33. Stratigraphy Observed at Shovel Test 18

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-6	Grass and topsoil; 10YR 5/3, brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine roots.
Ib	6-27	Fill; 10YR 3/4, dark yellowish brown; loam; weak, medium, granular structure; dry, slightly hard consistency; non-plastic; mixed origin; abrupt, irregular lower boundary; few fine roots; window glass and bottle glass present.
IIa	12-30	Buried A horizon; 10YR 4/2, dark grayish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few fine roots; charcoal present; cultural layer, incorporated into SIHP # - 1800.
IIb	30-66 (BOE)	Natural jaucas sand; 10YR 7/3, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.29 Shovel Test 19

Shovel Test 19 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.60 m long and 0.89 m deep. The stratigraphy of Shovel Test 19 consisted of grass over loamy sand (Stratum I) overlying natural sand that has possibly been deposited by high surf (Stratum II) overlying a sandy loam buried A horizon (Stratum IIIa) overlying natural sand (Stratum IIIb) (Figure 90, Figure 91, and Table 34). The buried A horizon (Stratum IIIa) is incorporated into SIHP # -1800, pre-Contact cultural layers and burials originally identified by Rosendahl and Kai (1990).



Figure 90. Photograph of Shovel Test 19, southwest wall of excavation

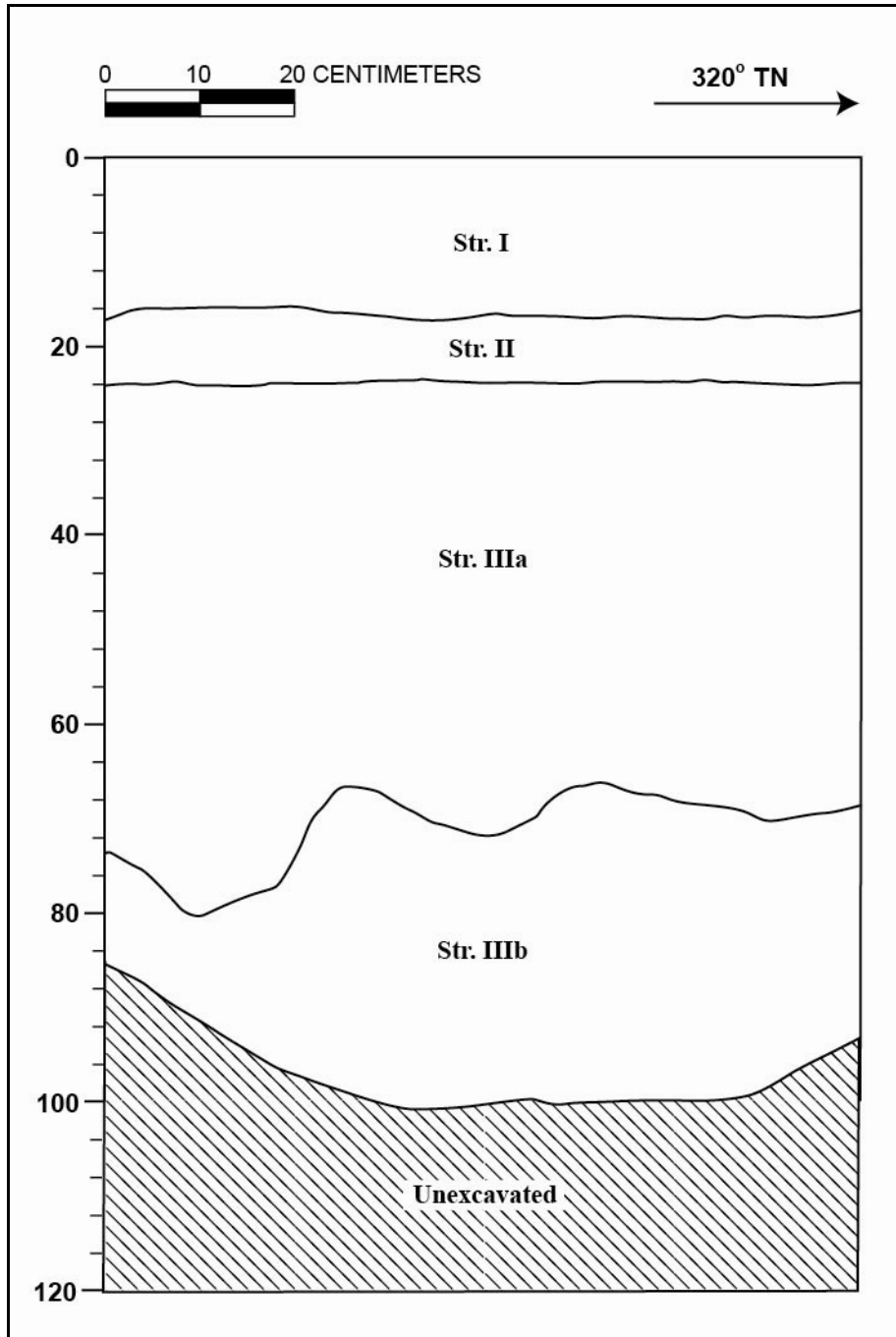


Figure 91. Shovel Test 19 profile, northeast wall of excavation

Table 34. Stratigraphy Observed at Shovel Test 19

Stratum	Depth (cmbs)	Description of Sediments
I	0-17	Grass and topsoil; 10YR 3/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots.
II	17-24	Natural; 10YR 6/4, light yellowish brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; few fine roots; possibly deposited by high surf.
IIIa	24-80	Buried A horizon; 10YR 3/1, very dark gray; sandy loam; moderate, medium granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, wavy lower boundary; few fine roots; charcoal, basalt flakes, and shell midden present; cultural layer, incorporated into SIHP # - 1800.
IIIb	60-100 (BOE)	Natural jaucas sand; 10YR 7/3, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.30 Shovel Test 20

Shovel Test 20 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 0.96 m deep. The stratigraphy of Shovel Test 20 consisted of grass over sandy loam (Stratum I) overlying a loamy sand buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 92, Figure 93, and Table 35). The buried A horizon (Stratum IIa) is incorporated into SIHP # -1800, pre-Contact cultural layers and burials originally identified by Rosendahl and Kai (1990).



Figure 92. Photograph of Shovel Test 20, southwest wall of excavation

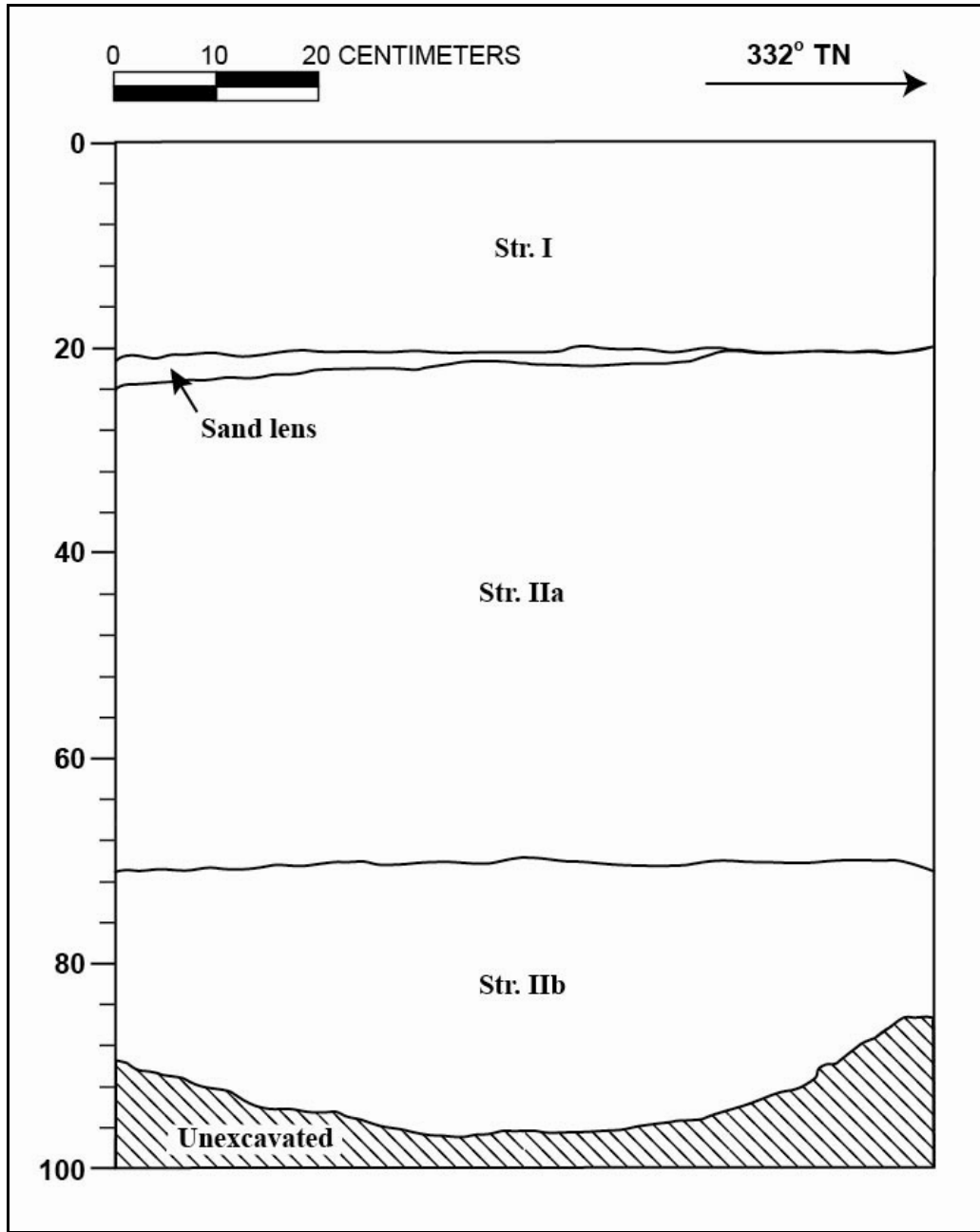


Figure 93. Shovel Test 20 profile, southwest wall of excavation

Table 35. Stratigraphy Observed at Shovel Test 20

Stratum	Depth (cmbs)	Description of Sediments
I	0-20	Grass and topsoil; 10YR 4/2, dark grayish brown; sandy loam; weak, medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots.
IIa	20-70	Buried A horizon; 10YR 5/2, grayish brown; loamy sand; weak, medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; diffuse, smooth lower boundary; charcoal present; thin sand lens at top of layer; cultural layer, incorporated into SIHP # -1800.
IIb	70-96 (BOE)	Natural jauca sand; 10YR 7/3, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.31 Shovel Test 21

Shovel Test 21 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 1.10 m deep. The stratigraphy of Shovel Test 21 consisted of grass over sandy loam (Stratum Ia) overlying clay loam fill (Stratum Ib) overlying a loamy sand buried A horizon (Stratum IIa) overlying natural sand that has possibly been deposited by high surf (Stratum IIb) overlying a second loamy sand buried A horizon (Stratum IIIa) overlying natural sand (Stratum IIIb) (Figure 94, Figure 95, and Table 36). The buried A horizons (Strata IIa and IIIa) are incorporated into SIHP # -1800, pre-Contact cultural layers and burials originally identified by Rosendahl and Kai (1990).



Figure 94. Photograph of Shovel Test 21, southwest wall of excavation

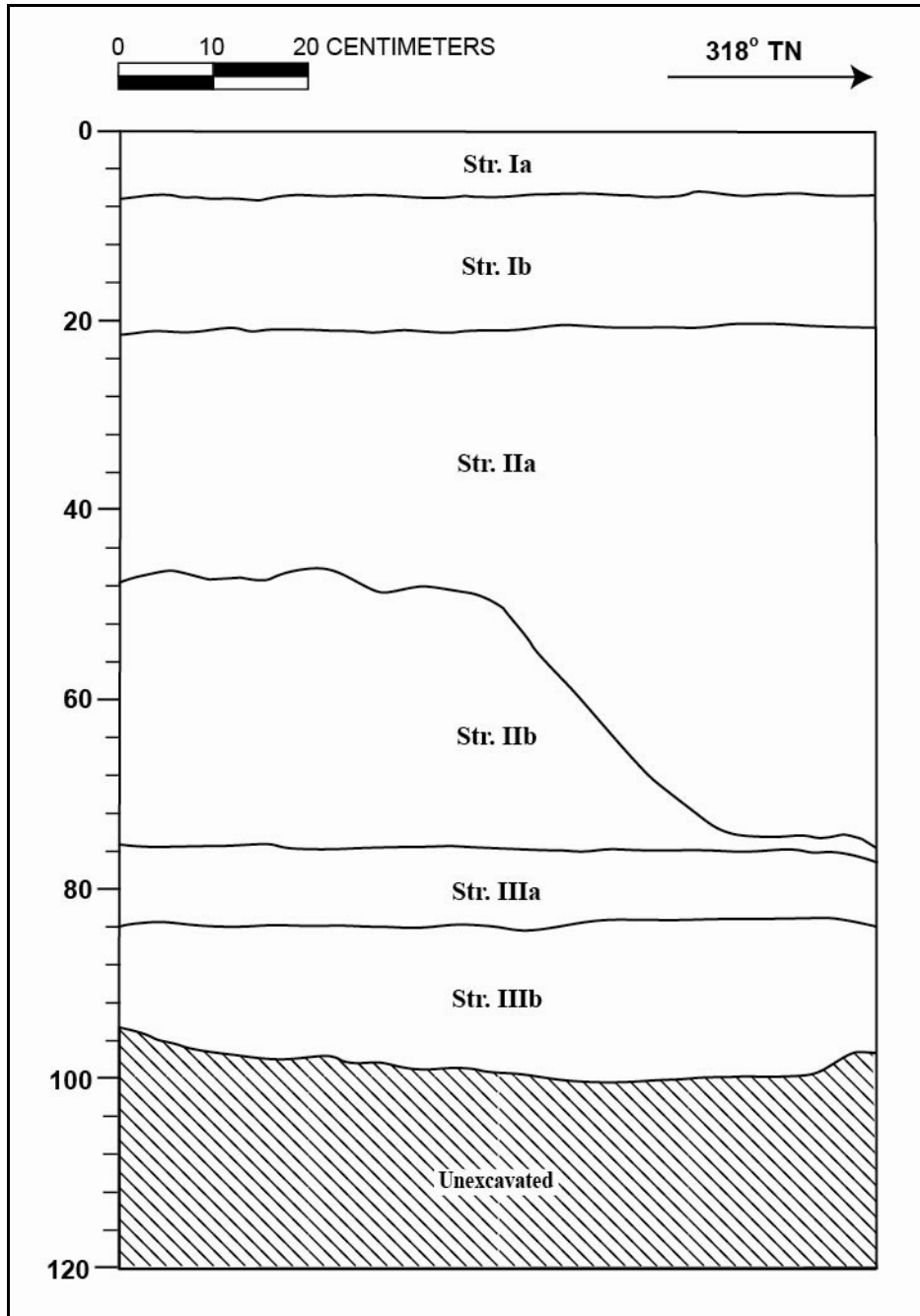


Figure 95. Shovel Test 21 profile, southwest wall of excavation

Table 36. Stratigraphy Observed at Shovel Test 21

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-7	Grass and topsoil; 10YR 3/3, dark brown; sandy loam; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine roots.
Ib	7-21	Fill; 5YR 4/4, reddish brown; clay loam; moderate, medium, crumb structure; dry, hard consistency; plastic; terrestrial origin; very abrupt, smooth lower boundary; few fine to medium roots.
IIa	21-75	Buried A horizon; 10YR 4/2, dark grayish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few fine roots; charcoal present; cultural layer, incorporated into SIHP # - 1800.
IIb	48-76	Natural; 10YR 6/4, light yellowish brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; clear, smooth lower boundary; few fine roots; possibly deposited by high surf.
IIIa	76-84	Buried A horizon; 10YR 5/2, grayish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots; charcoal present; cultural layer, incorporated into SIHP # -1800.
IIIb	84-110 (BOE)	Natural jaucas sand; 10YR 7/3, very pale brown; medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.32 Shovel Test 22

Shovel Test 22 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 0.95 m deep. The stratigraphy of Shovel Test 22 consisted of grass over loamy sand (Stratum I) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 96, Figure 97, and Table 37). The buried A horizon (Stratum IIa) is incorporated into SIHP # -1800, pre-Contact cultural layers and burials originally identified by Rosendahl and Kai (1990).



Figure 96. Photograph of Shovel Test 22, southeast wall of excavation

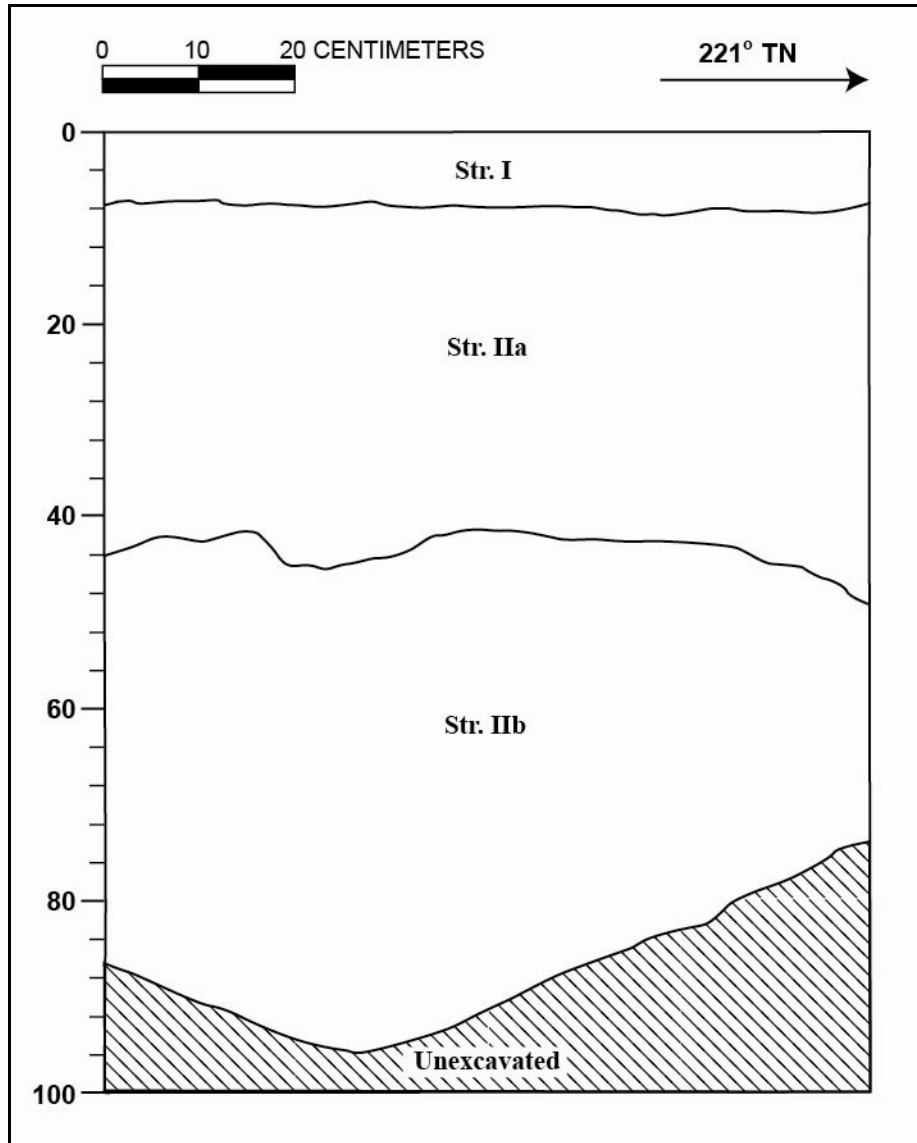


Figure 97. Shovel Test 22 profile, southeast wall of excavation

Table 37. Stratigraphy Observed at Shovel Test 22

Stratum	Depth (cmbs)	Description of Sediments
I	0-20	Grass and topsoil; 10YR 4/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine roots.
IIa	13-66	Buried A horizon; 10YR 3/2, very dark grayish brown; sandy loam; weak, medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, wavy lower boundary; few fine roots; charcoal, basalt flakes, and shell midden present; cultural layer, incorporated into SIHP # - 1800.
IIb	100-118 (BOE)	Natural jaucas sand; 10YR 7/4, very pale brown; fine- to medium grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine roots.

4.2.33 Shovel Test 23

Shovel Test 23 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 0.76 m deep. The stratigraphy of Shovel Test 23 consisted of grass over loamy sand (Stratum I) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 98, Figure 99, and Table 38). The buried A horizon (Stratum IIa) is incorporated into SIHP # -1801, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 98. Photograph of Shovel Test 23, southeast wall of excavation

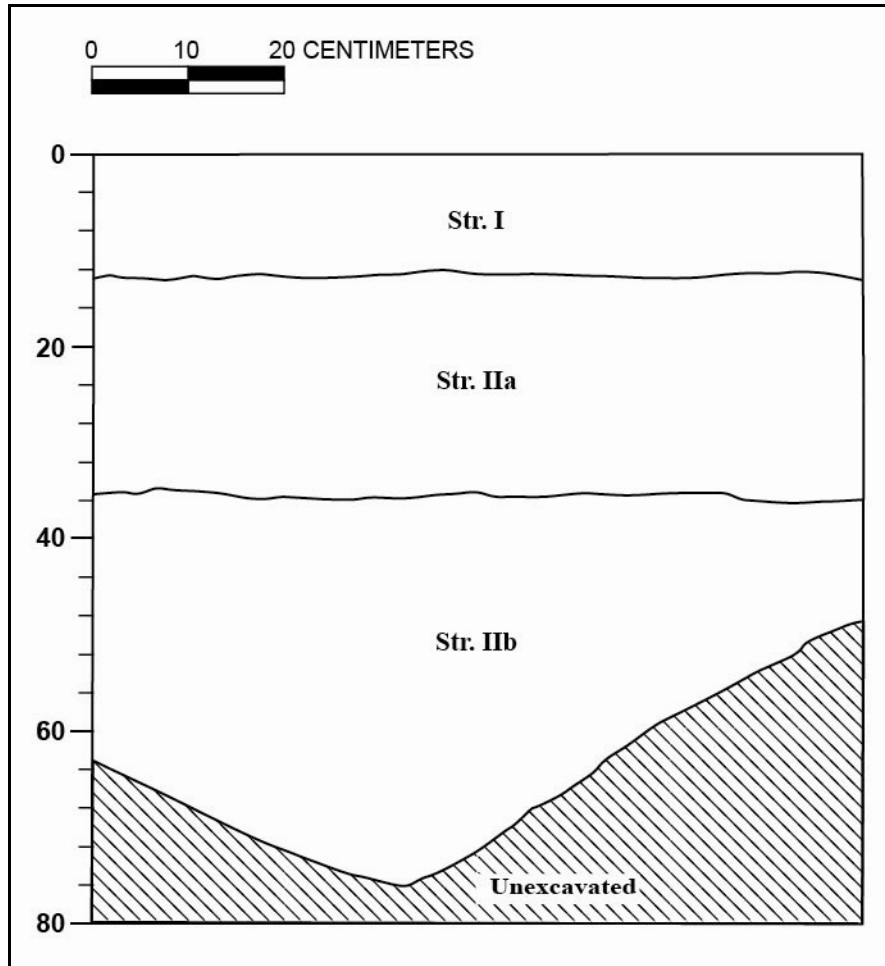


Figure 99. Shovel Test 23 profile, southeast wall of excavation

Table 38. Stratigraphy Observed at Shovel Test 23

Stratum	Depth (cmbs)	Description of Sediments
I	0-12	Grass and topsoil; 10YR 4/, dark yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; diffuse, smooth lower boundary; common fine roots.
IIa	12-35	Buried A horizon; 10YR 5/2, grayish brown; sandy loam; weak, fine granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots; charcoal and shell midden present; cultural layer, incorporated into SIHP # -1801.
IIb	35-76 (BOE)	Natural jaucas sand; 10YR 7/4, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine roots.

4.2.34 Shovel Test 24

Shovel Test 24 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 0.96 m deep. The stratigraphy of Shovel Test 24 consisted of grass over loamy sand (Stratum I) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 100, Figure 101, and Table 39). The buried A horizon (Stratum IIa) is incorporated into SIHP # -1801, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 100. Photograph of Shovel Test 24, west wall of excavation

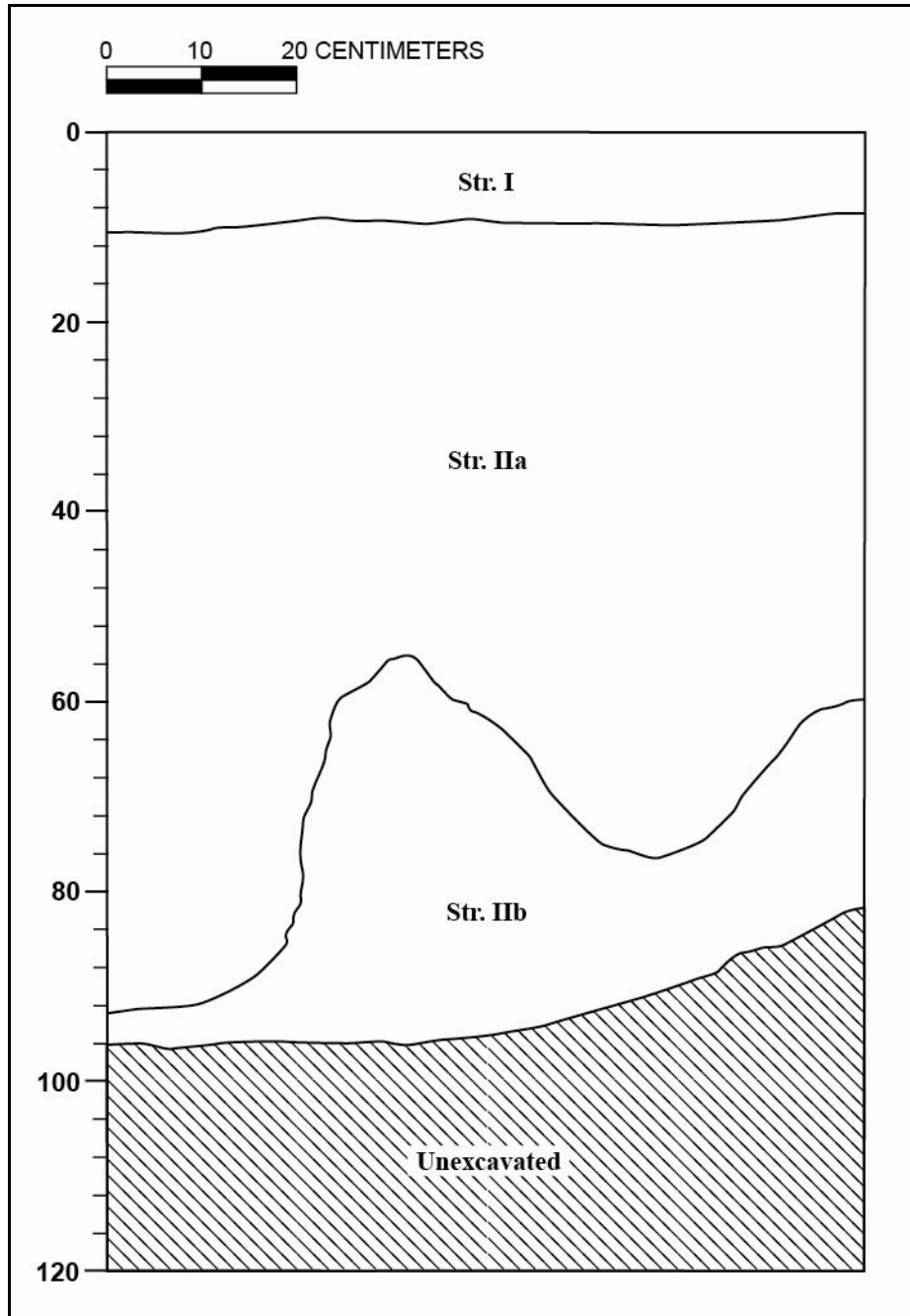


Figure 101. Shovel Test 24 profile, west wall of excavation

Table 39. Stratigraphy Observed at Shovel Test 24

Stratum	Depth (cmbs)	Description of Sediments
I	0-10	Grass and topsoil; 10YR 4/6, dark yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine roots.
IIa	10-93	Buried A horizon; 10YR 3/2, very dark grayish brown; sandy loam; weak, fine to medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, wavy lower boundary; many fine roots; charcoal, fire-cracked rock, and shell midden present; cultural layer, incorporated into SIHP # -1801.
IIb	56-96 (BOE)	Natural jaucas sand; 10YR 7/4, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine roots.

4.2.35 Shovel Test 25

Shovel Test 25 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 1.04 m deep. The stratigraphy of Shovel Test 25 consisted of grass over loamy sand (Stratum Ia) overlying loamy sand that is a re-deposited mix of a Pre-Contact cultural layer and sand (Stratum Ib) overlying clay loam fill (Stratum Ic) overlying natural sand (Stratum II) (Figure 102, Figure 103, and Table 40). Stratum Ib is a disturbed and re-deposited pre-Contact cultural layer and is incorporated into SIHP # -1801, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 102. Photograph of Shovel Test 25, east wall of excavation

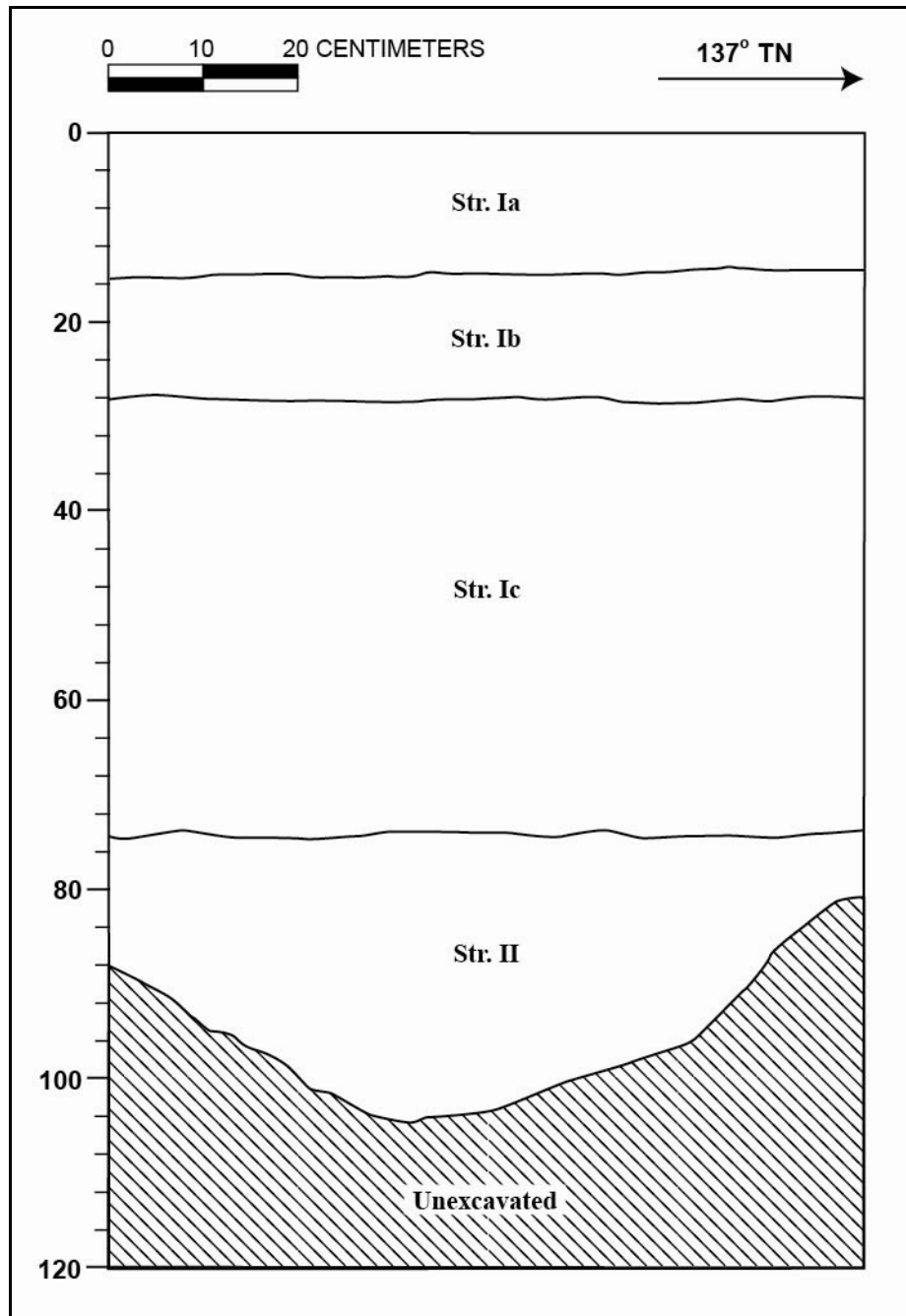


Figure 103. Shovel Test 25 profile, east wall of excavation

Table 40. Stratigraphy Observed at Shovel Test 25

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-15	Grass and topsoil; 10YR 4/6, dark yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine roots.
Ib	15-28	Re-deposited/mixed natural; 10YR 4/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few fine roots; charcoal, shell midden, and plastic trash present; re-deposited mix of a Pre-Contact cultural layer and sand, incorporated into SIHP # -1801.
Ic	28-74	Fill; 5YR 4/6, yellowish red; clay loam; strong, coarse, blocky structure; dry, hard consistency; plastic; terrestrial origin; very abrupt, smooth lower boundary.
II	74-104 (BOE)	Natural; 10YR 7/4, very pale brown; fine-to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.36 Shovel Test 26

Shovel Test 26 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 1.09 m deep. The stratigraphy of Shovel Test 26 consisted of grass over loamy sand (Stratum I) overlying a loamy sand buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 104, Figure 105, and Table 41). A modern trench was observed on the north edge of the profile wall, starting below the topsoil layer. The buried A horizon (Stratum IIa) is incorporated into SIHP # -1801, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 104. Photograph of Shovel Test 26, east wall of excavation

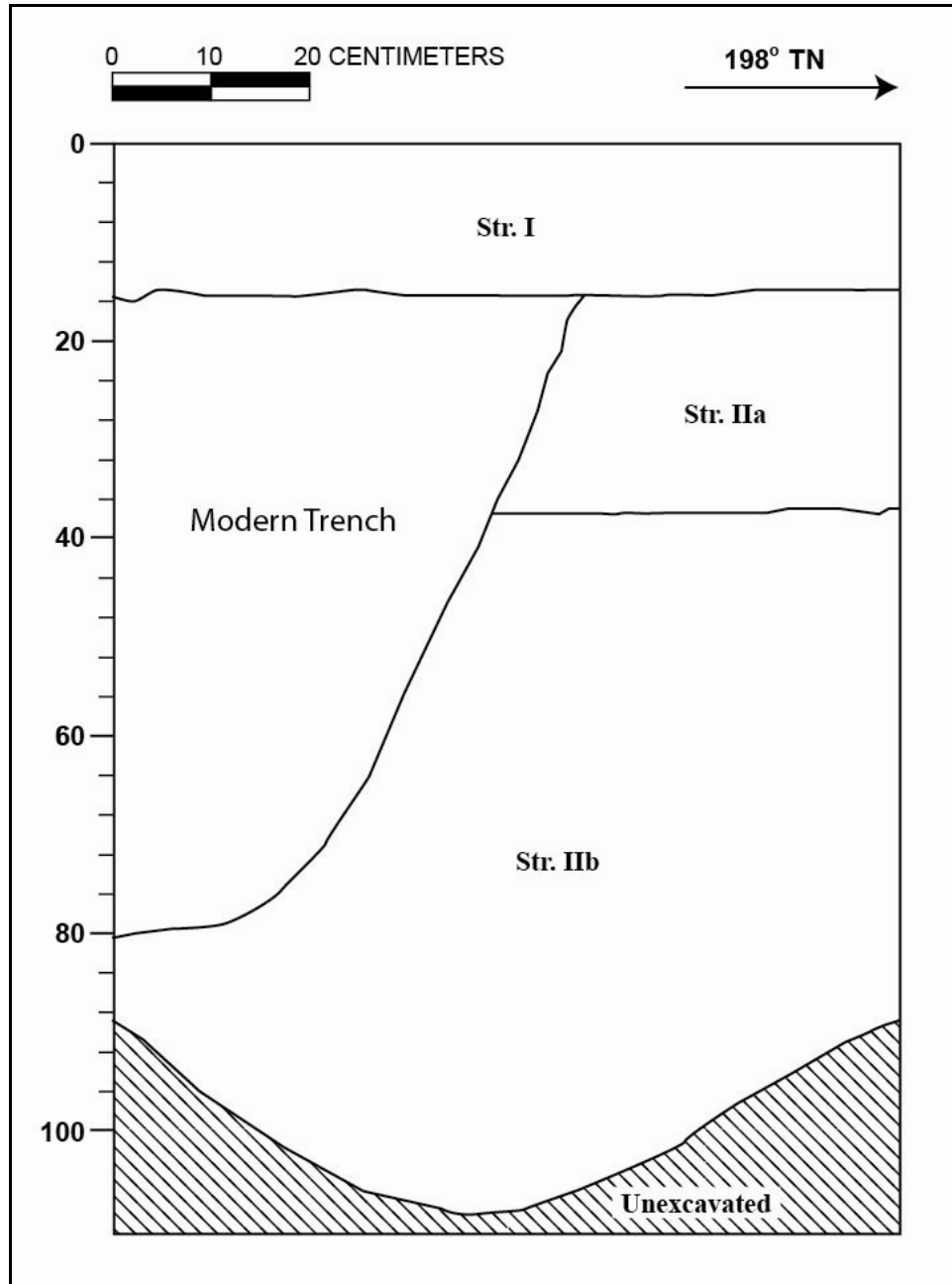


Figure 105. Shovel Test 26 profile, east wall of excavation

Table 41. Stratigraphy Observed at Shovel Test 26

Stratum	Depth (cmbs)	Description of Sediments
I	0-15	Grass and topsoil; 10YR 4/6, dark yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots.
Ia	15-37	Buried A horizon; 10YR 5/2, grayish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots; charcoal present; cultural layer, part of SIHP # -1801.
Ib	37-109 (BOE)	Natural jaucas sand; 10YR 7/4, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine roots.

4.2.37 Shovel Test 27

Shovel Test 27 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 0.72 m deep. The stratigraphy of Shovel Test 27 consisted of grass over sandy loam (Stratum I) overlying loamy sand (a mix of an old A horizon and natural sand) (Stratum II) overlying a sandy loam buried A horizon, the top of which has been graded off (Stratum IIIa) overlying natural sand (Stratum IIIb) (Figure 106, Figure 107, and Table 42). The buried A horizon (Stratum IIIa) is incorporated into SIHP # -1801, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 106. Photograph of Shovel Test 27, southeast wall of excavation

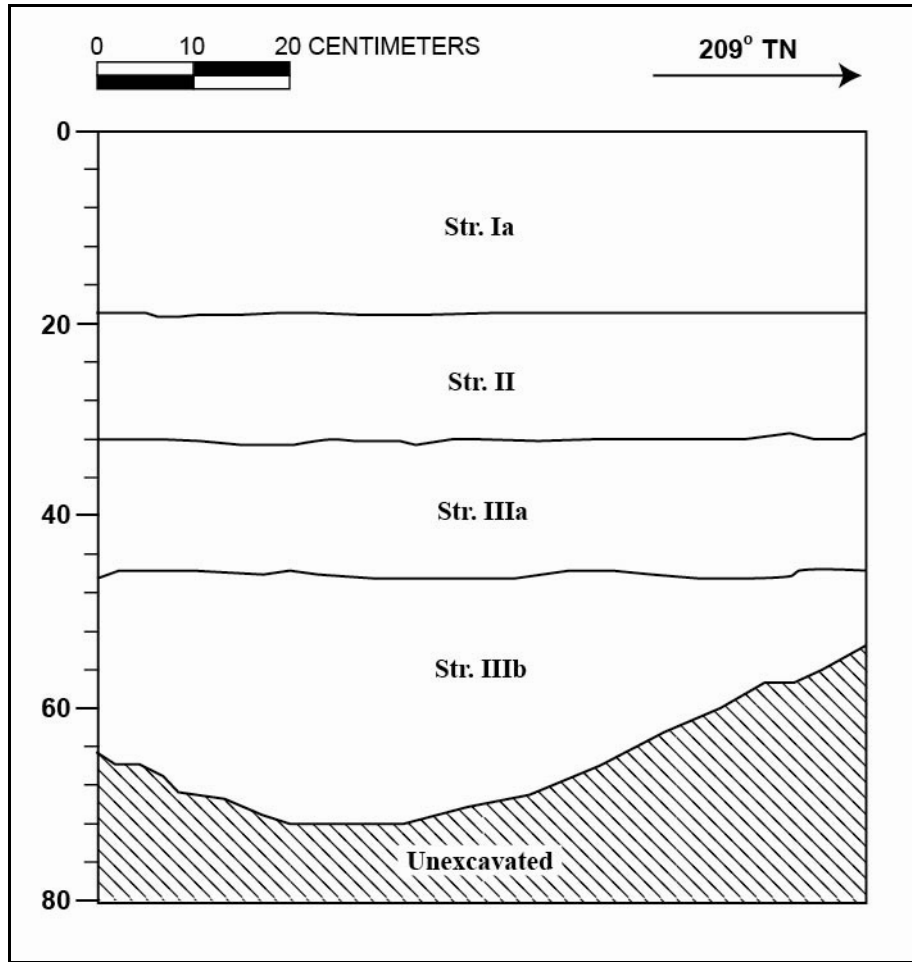


Figure 107. Shovel Test 27 profile, southeast wall of excavation

Table 42. Stratigraphy Observed at Shovel Test 27

Stratum	Depth (cmbs)	Description of Sediments
I	0-19	Grass and topsoil; 10YR 4/6, dark yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots.
II	19-33	Disturbed and mixed; 10YR 4/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few fine roots; charcoal present; mix of a Pre-Contact cultural layer and natural sand.
IIIa	33-46	Buried A horizon; 10YR 5/2, grayish brown; sandy loam; moderate, medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots; charcoal present; cultural layer, incorporated into SIHP # -1801.
IIIb	46-72 (BOE)	Natural jaucas sand; 10YR 7/4, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine roots.

4.2.38 Shovel Test 28

Shovel Test 28 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 0.60 m deep. The stratigraphy of Shovel Test 28 consisted of grass over loamy sand (Stratum I) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 108, Figure 109, and Table 43). The buried A horizon (Stratum IIa) is incorporated into SIHP # -1800, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 108. Photograph of Shovel Test 28, southeast wall of excavation

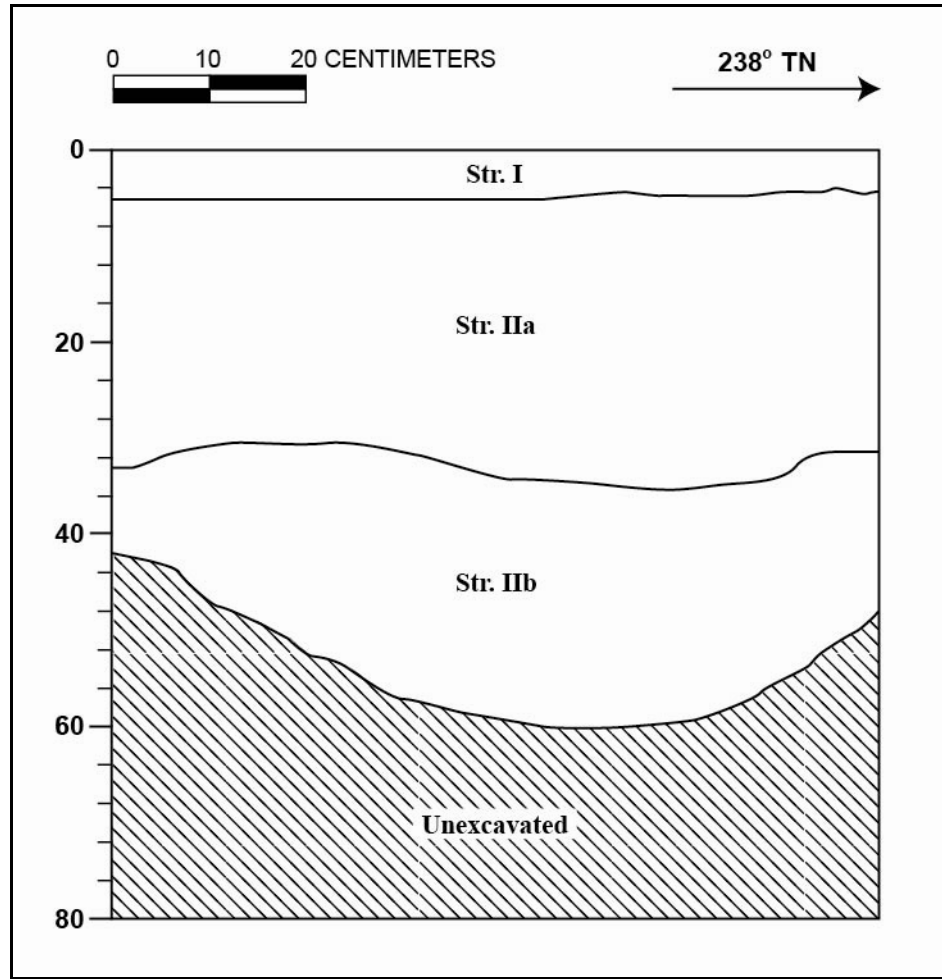


Figure 109. Shovel Test 28 profile, southeast wall of excavation

Table 43. Stratigraphy Observed at Shovel Test 28

Stratum	Depth (cmbs)	Description of Sediments
I	0-5	Grass and topsoil; 10YR 4/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine roots.
IIa	5-34	Buried A horizon; 10YR 5/2, grayish brown; sandy loam; weak, medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots; charcoal present; cultural layer, incorporated into SIHP # -1800.
IIb	30-60 (BOE)	Natural jaucas sand; 10YR 7/4, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine roots.

4.2.39 Shovel Test 29

Shovel Test 29 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 0.74 m deep. The stratigraphy of Shovel Test 29 consisted of grass over loamy sand (Stratum I) overlying loamy sand (a mix of A horizon and natural sand) (Stratum II) overlying a sandy loam buried A horizon, the top of which appears to have been graded off (Stratum IIIa) overlying loamy sand (a mix of an old A horizon and natural sand) (Stratum IIIb) overlying a sandy loam buried A horizon (Stratum IVa) overlying natural sand (Stratum IVb) (Figure 110, Figure 111, and Table 44). The buried A horizons (Strata IIIa and IVa) are incorporated into SIHP # -1800, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 110. Photograph of Shovel Test 29, west wall of excavation

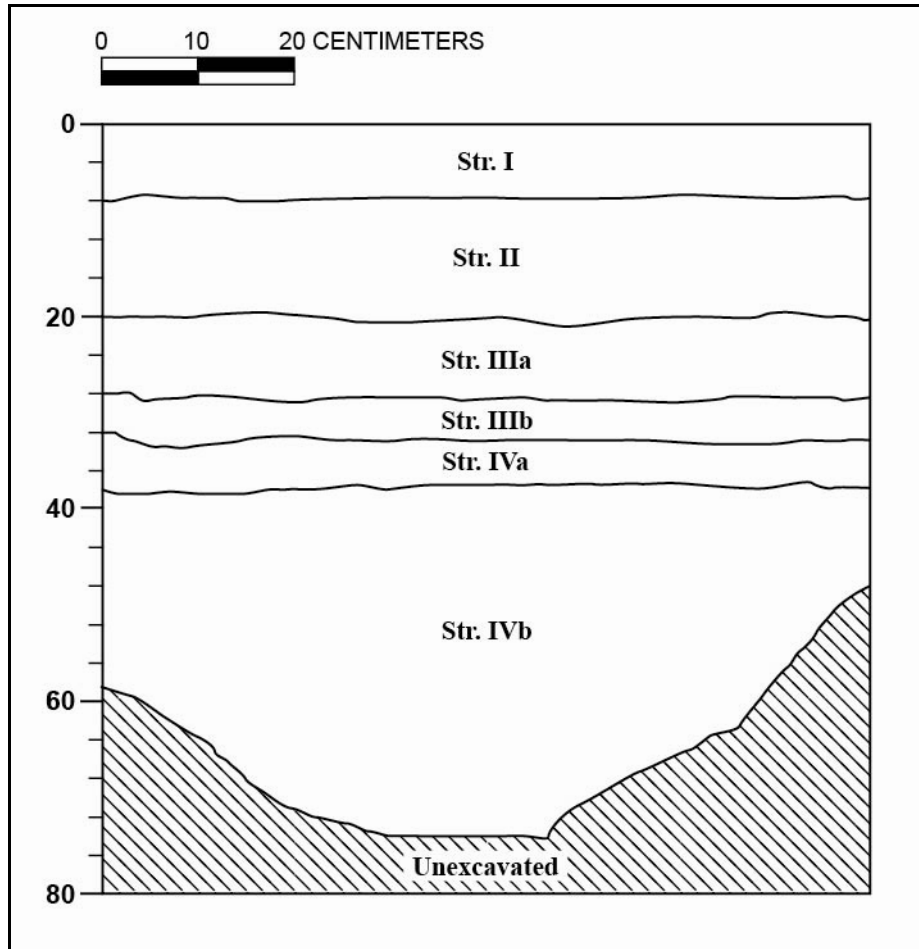


Figure 111. Shovel Test 29 profile, west wall of excavation

Table 44. Stratigraphy Observed at Shovel Test 29

Stratum	Depth (cmbs)	Description of Sediments
I	0-7	Grass and topsoil; 10YR 4/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots.
II	7-20	Mixed fill; 10YR 4/3, dark brown; loamy sand; single-grain; dry, weakly coherent consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine roots; mix of A horizon and natural sand.
IIIa	20-28	Buried A horizon; 10YR 5/2, grayish brown; sandy loam; weak, medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots; charcoal present; cultural layer, incorporated into SIHP # -1800.
IIIb	28-32	Mixed; 10YR 4/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots; mix of an old A horizon and natural sand.
IVa	32-38	Buried A horizon; 10YR 5/2, grayish brown; sandy loam; weak, fine to medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots; charcoal present; cultural layer, incorporated into SIHP # -1800.
IVb	38-74 (BOE)	Natural jaucas sand; 10YR 7/4, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.40 Shovel Test 30

Shovel Test 30 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 1.08 m deep. The stratigraphy of Shovel Test 30 consisted of organic matter over loamy sand (Stratum I) overlying loamy sand that has likely been wind-deposited (Stratum II) overlying a sandy loam buried A horizon (Stratum IIIa) overlying sand that has likely been deposited by high surf (Stratum IIIb) overlying a sandy loam buried A horizon (Stratum IVa) overlying natural sand (Stratum IVb) (Figure 112, Figure 113, and Table 45). The buried A horizons (Strata IIIa and IVa) are incorporated into SIHP # -1800, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 112. Photograph of Shovel Test 30, southeast wall of excavation

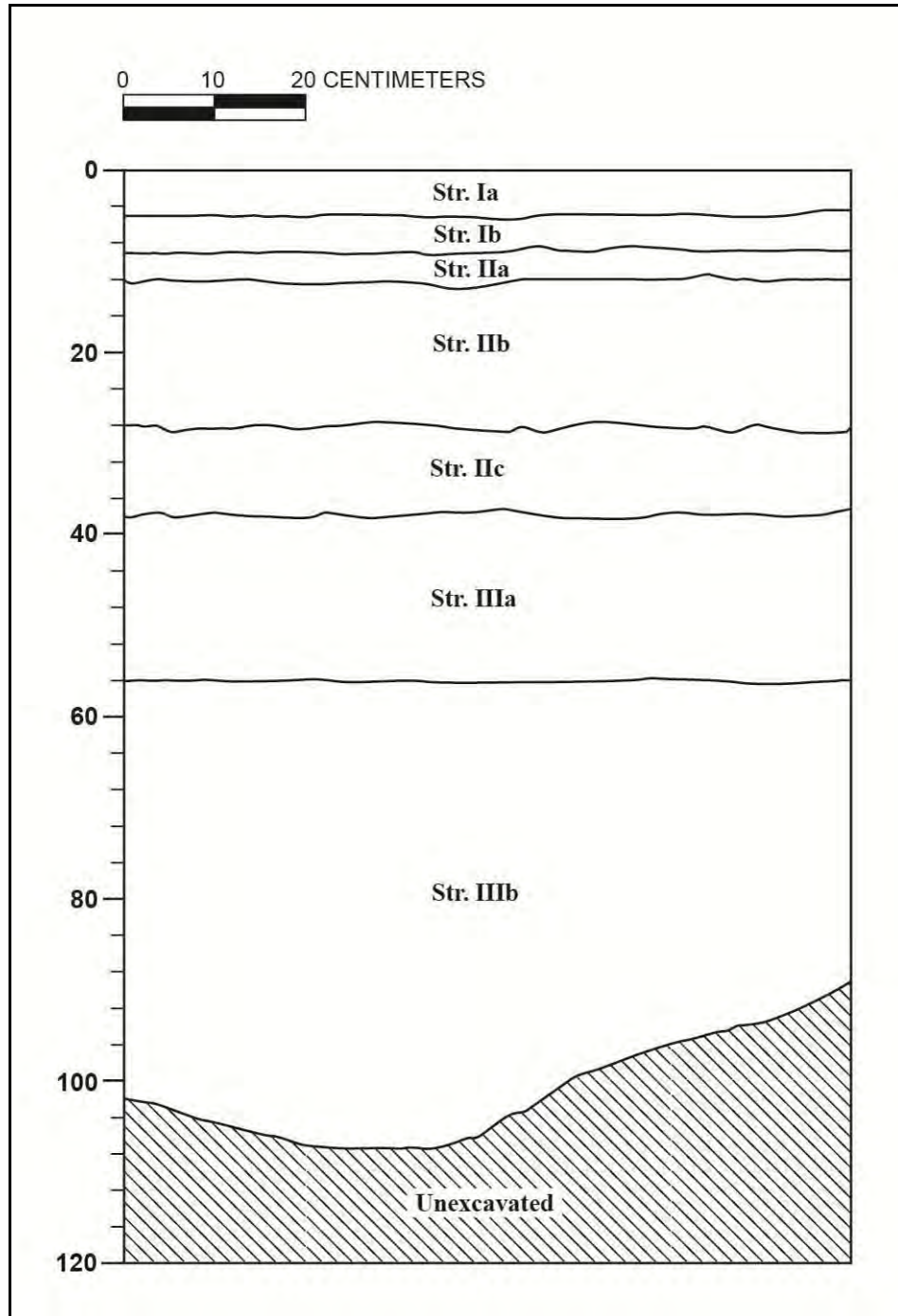


Figure 113. Shovel Test 30 profile, southeast wall of excavation

Table 45. Stratigraphy Observed at Shovel Test 30

Stratum	Depth (cmbs)	Description of Sediments
I	0-7	Organic matter and topsoil; 10YR 2/2, very dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine to medium roots.
II	7-20	Natural; 10YR 4/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine roots; possibly wind-deposited.
IIIa	20-28	Buried A horizon; 10YR 5/2, grayish brown; sandy loam; weak, fine to medium, granular structure; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; common medium roots; charcoal present; cultural layer, incorporated into SIHP # -1800.
IIIb	28-32	Natural; 10YR 5/4, yellowish brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; few fine roots; possibly deposited by high surf.
IVa	32-38	Buried A horizon; 10YR 4/2, dark grayish brown; sandy loam; weak, fine to medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; diffuse, smooth lower boundary; few medium roots; charcoal present; cultural layer, incorporated into SIHP # -1800.
IVb	38-74 (BOE)	Natural jaucas sand; 10YR 8/6, yellow; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine roots.

4.2.41 Shovel Test 31

Shovel Test 31 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 0.82 m deep. The stratigraphy of Shovel Test 31 consisted of grass over loamy sand (Stratum I) overlying a loamy sand buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 114, Figure 115, and Table 46). The buried A horizon (Stratum IIa) is incorporated into SIHP # -1800, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 114. Photograph of Shovel Test 31, northeast wall of excavation

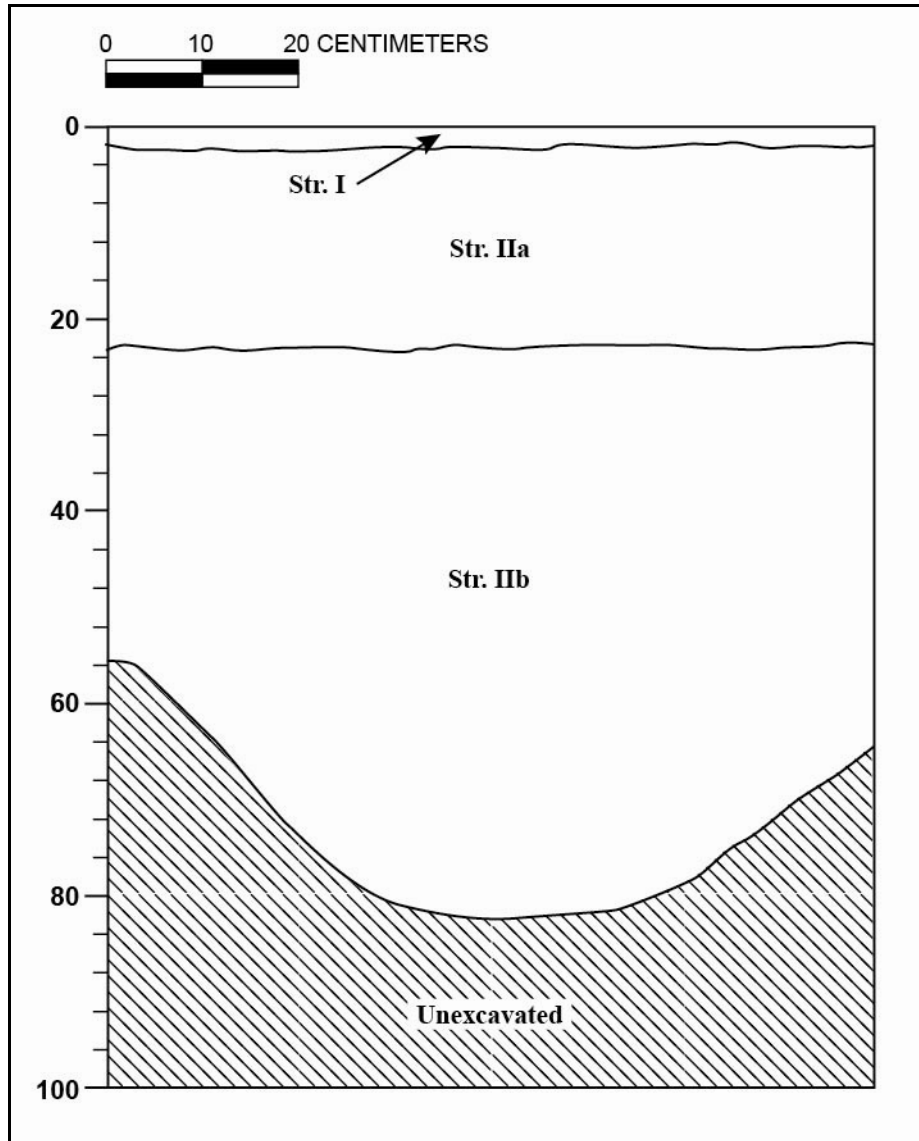


Figure 115. Shovel Test 31 profile, northeast wall of excavation

Table 46. Stratigraphy Observed at Shovel Test 31

Stratum	Depth (cmbs)	Description of Sediments
I	0-2	Grass and topsoil; 10YR 5/4, yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine roots.
IIa	2-23	Buried A horizon; 10YR 5/2, grayish brown; loamy sand; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine roots; charcoal present; cultural layer, incorporated into SIHP # -1800.
IIb	23-82 (BOE)	Natural jaucas sand; 10YR 7/4, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.42 Shovel Test 32

Shovel Test 32 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 1.07 m deep. The stratigraphy of Shovel Test 32 consisted of grass over loamy sand (Stratum I) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 116, Figure 117, and Table 47). The buried A horizon (Stratum IIa) is incorporated into SIHP # -1800, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 116. Photograph of Shovel Test 32, east wall of excavation

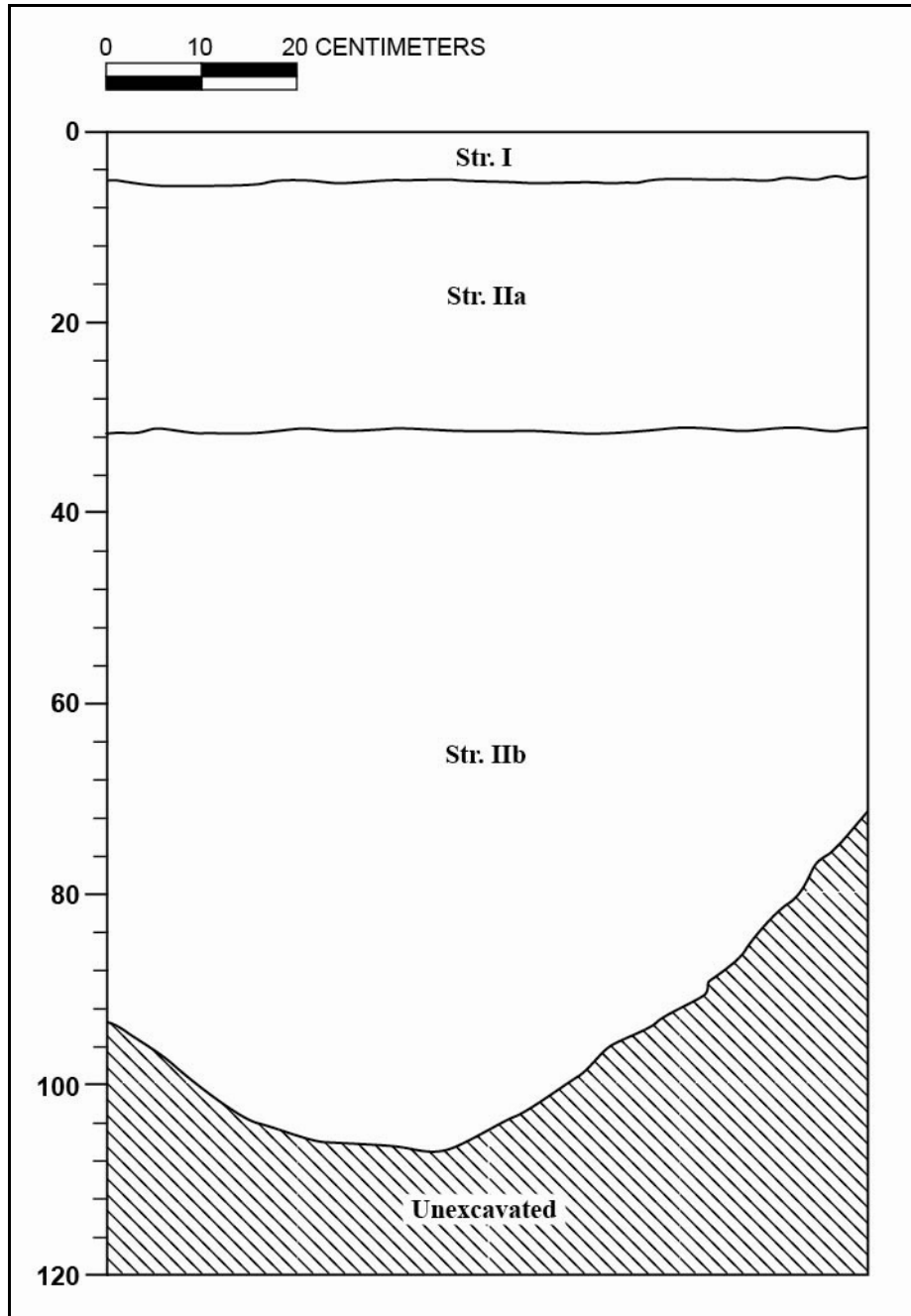


Figure 117. Shovel Test 32 profile, east wall of excavation

Table 47. Stratigraphy Observed at Shovel Test 32

Stratum	Depth (cmbs)	Description of Sediments
I	0-5	Grass and topsoil; 10YR 5/4, yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; many medium roots.
IIa	5-31	Buried A horizon; 10YR 5/2, grayish brown; sandy loam; weak, fine, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots; charcoal present; cultural layer, incorporated into SIHP # -1800.
IIb	26-107 (BOE)	Natural jaucas sand; 10YR 7/4, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.43 Shovel Test 33

Shovel Test 33 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 0.91 m deep. The stratigraphy of Shovel Test 33 consisted of grass over loamy sand (Stratum I) overlying natural sand that has likely been wind-deposited (Stratum II) overlying mixed loamy sand fill (Stratum III) overlying disturbed and mixed loamy sand (Stratum IV) overlying a sandy loam buried A horizon (Stratum Va) overlying natural sand (Stratum Vb) (Figure 118, Figure 119, and Table 48). The buried A horizon (Stratum Va) is incorporated into SIHP # -1800, a pre-Contact cultural layer and burials originally identified by Rosendahl and Kai (1990).



Figure 118. Photograph of Shovel Test 33, northeast wall of excavation

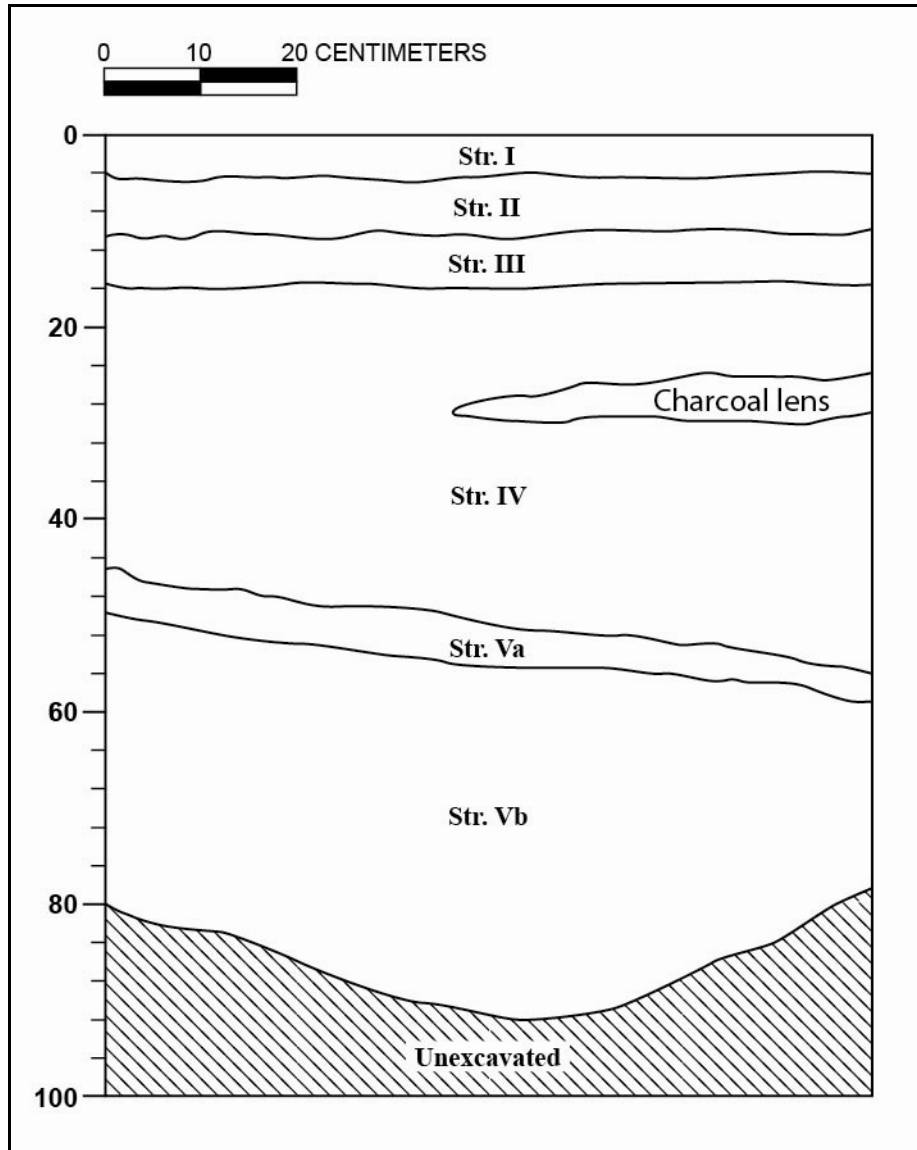


Figure 119. Shovel Test 33 profile, northeast wall of excavation

Table 48. Stratigraphy Observed at Shovel Test 33

Stratum	Depth (cmbs)	Description of Sediments
I	0-4	Organic matter and topsoil; 10YR 2/2, very dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine roots.
II	4-10	Natural; 10YR 5/6, yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots; possibly wind-deposited.
III	10-15	Mixed fill; 10YR 4/6, dark yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary.
IV	15-52	Disturbed and mixed; 10YR 6/6, brownish yellow; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots; charcoal and two bricks present; ash lens (10YR 5/3, brown) present.
Va	34-59	Buried A horizon; 10YR 4/2, dark grayish brown; sandy loam; weak, fine to medium, granular structure; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots; charcoal present; cultural layer, incorporated into SIHP # -1800.
Vb	42-91 (BOE)	Natural jaucas sand; 10YR 6/3, pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.44 Shovel Test 34

Shovel Test 34 was located along the eastern edge of the project area along the ocean. The profile wall measured 0.46 m long and 0.94 m deep. The stratigraphy of Shovel Test 34 consisted of grass over loamy sand (Stratum I) overlying natural sand that has likely been wind-deposited (Stratum II) overlying a loamy sand buried A horizon (Stratum IIIa) overlying natural sand (Stratum IIIb) (Figure 120, Figure 121, and Table 49).



Figure 120. Photograph of Shovel Test 34, southeast wall of excavation

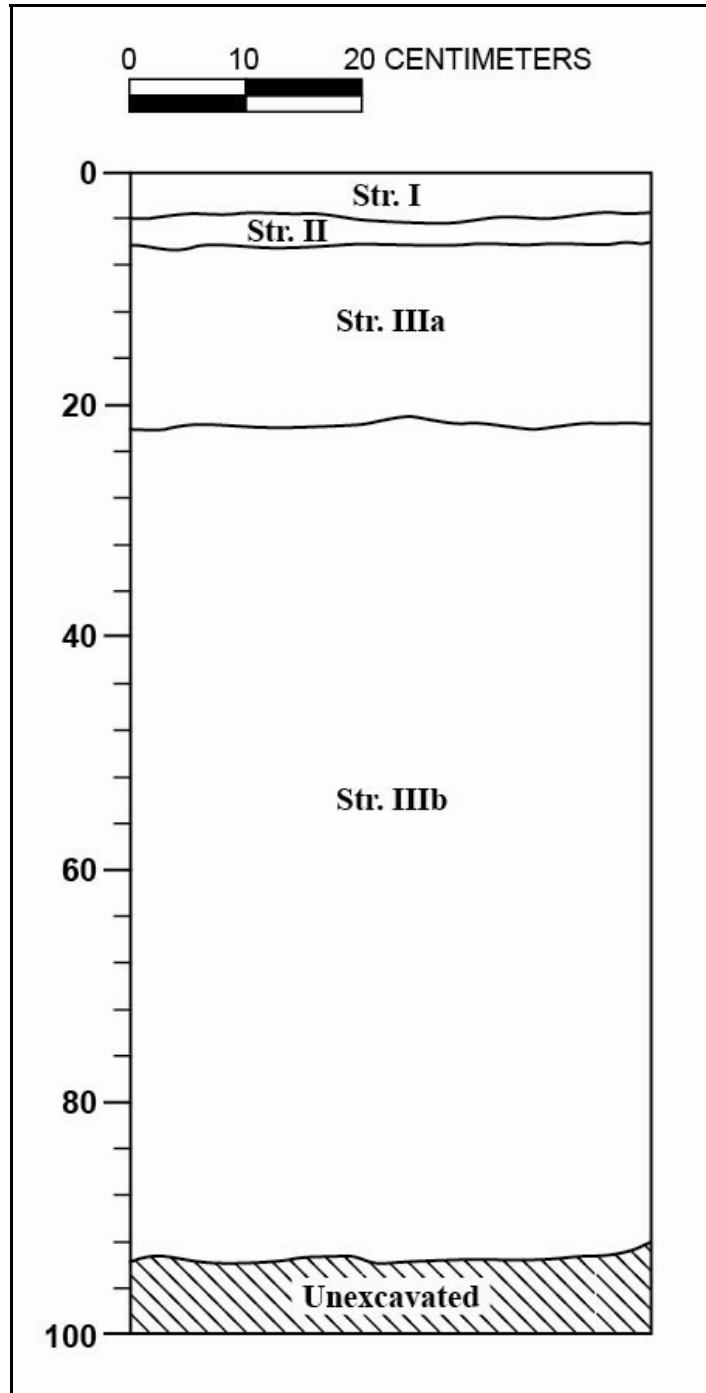


Figure 121. Shovel Test 34 profile, southeast wall of excavation

Table 49. Stratigraphy Observed at Shovel Test 34

Stratum	Depth (cmbs)	Description of Sediments
I	0-4	Organic matter and topsoil; 10YR 4/4, dark yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots.
II	4-7	Natural; 10YR 5/6, yellowish brown; sand; single-grain; dry, loose consistency; non-plastic; marine origin; clear, smooth lower boundary; few fine roots; possibly wind-deposited.
IIIa	7-22	Buried A horizon; 10YR 4/4, dark yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots.
IIIb	22-94 (BOE)	Natural jaucas sand; 10YR 5/6, yellowish brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.45 Shovel Test 35

Shovel Test 35 was located along the southeastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 1.06 m deep. The stratigraphy of Shovel Test 35 consisted of grass over loamy sand (Stratum Ia) overlying loamy sand landscaping fill (Stratum Ib) overlying three layers of loamy sand fill (Strata Ic-Ie) overlying natural sand (Stratum II) (Figure 122, Figure 123, and Table 50).



Figure 122. Photograph of Shovel Test 35, northeast wall of excavation

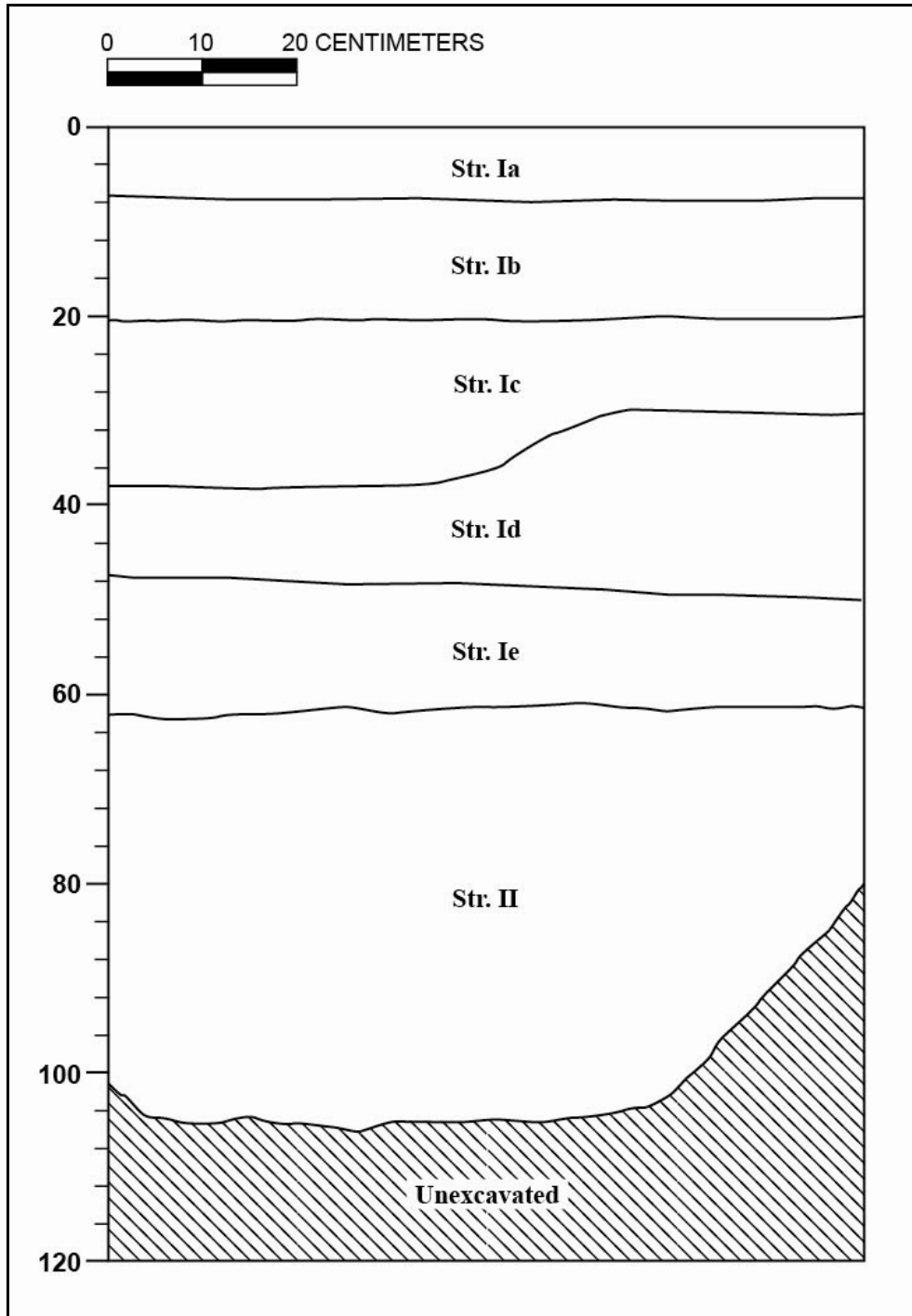


Figure 123. Shovel Test 35 profile, northeast wall of excavation

Table 50. Stratigraphy Observed at Shovel Test 35

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-7	Grass and topsoil; 10YR 3/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine roots.
Ib	7-20	Landscaping fill; 10YR 4/3, brown; sandy loam; weak, fine, granular structure; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine roots.
Ic	20-38	Mixed fill; 10YR 3/4, dark yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few fine roots.
Id	30-50	Mixed fill; 10YR 6/4, light yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few fine roots.
Ie	48-62	Mixed fill; 10YR 3/4, dark yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; few fine roots.
II	61-106 (BOE)	Natural jaucas sand; 10YR 4/6, dark yellowish brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.46 Shovel Test 36

Shovel Test 36 was located along the southeastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 0.93 m deep. The stratigraphy of Shovel Test 36 consisted of grass over loamy sand (Stratum Ia) overlying loamy sand landscaping fill (Stratum Ib) overlying a loamy sand buried A horizon, the top of which appears to have been graded off (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 124, Figure 125, and Table 51). The buried A horizon (Stratum IIa) is incorporated into SIHP # -791, a pre-Contact cultural layer and burials originally identified by Perzinski et al. (2001).



Figure 124. Photograph of Shovel Test 36, east wall of excavation

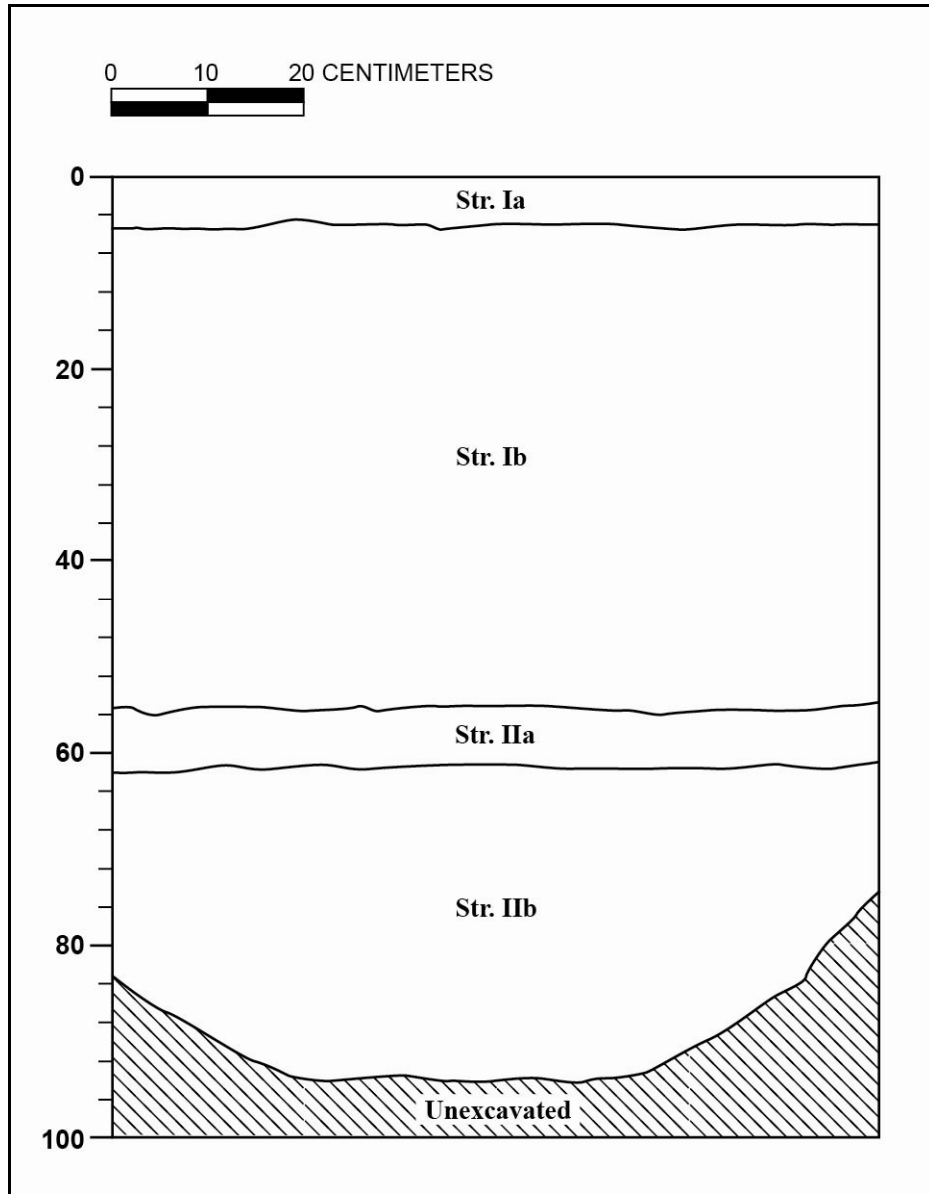


Figure 125. Shovel Test 36 profile, east wall of excavation

Table 51. Stratigraphy Observed at Shovel Test 36

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-5	Grass and topsoil; 10YR 3/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine roots.
Ib	5-55	Landscaping fill; 10YR 3/2, very dark grayish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine roots.
IIa	55-61	Buried A horizon; 10YR 2/2, very dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots; charcoal present; cultural layer, incorporated into SIHP # -791.
IIb	61-93 (BOE)	Natural jaucas sand; 10YR 5/6, yellowish brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.47 Shovel Test 37

Shovel Test 37 was located along the southeastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 0.56 m deep. The stratigraphy of Shovel Test 37 consisted of grass over loamy sand (Stratum Ia) overlying loamy sand landscaping fill (Stratum Ib) overlying natural sand (Stratum II) (Figure 126, Figure 127, and Table 52).



Figure 126. Photograph of Shovel Test 37, southeast wall of excavation

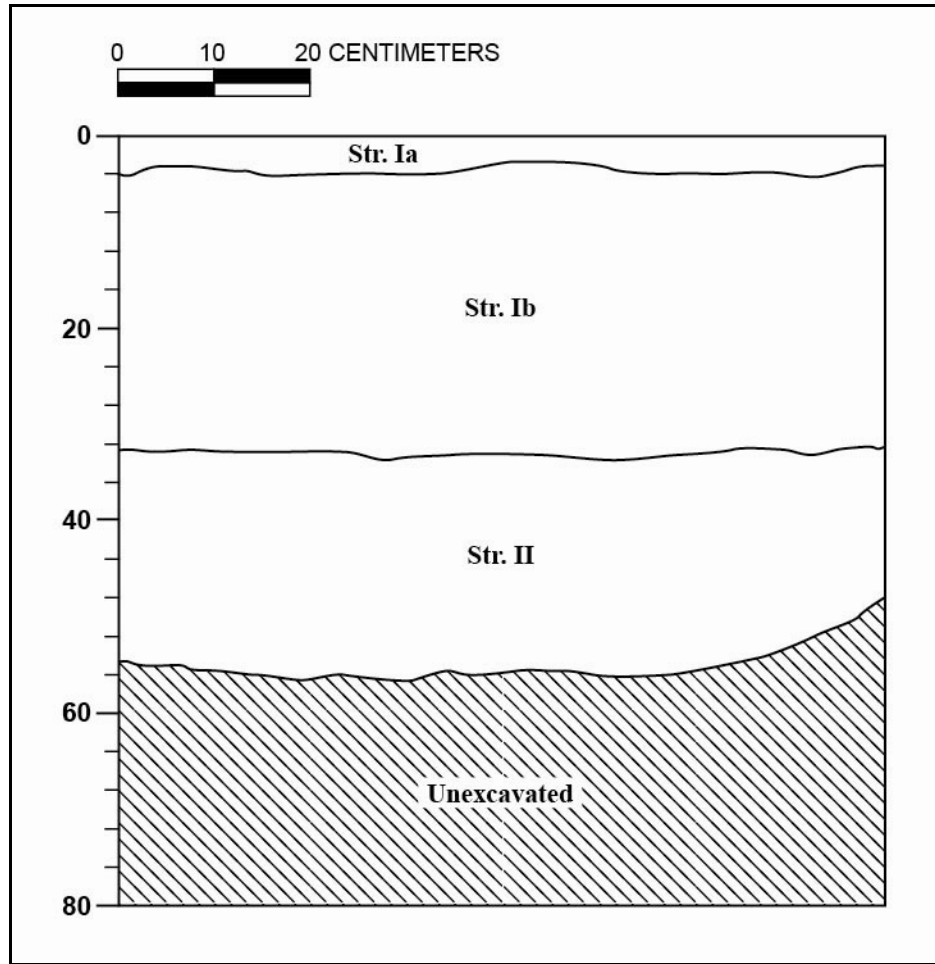


Figure 127. Shovel Test 37 profile, southeast wall of excavation

Table 52. Stratigraphy Observed at Shovel Test 37

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-4	Grass and topsoil; 10YR 3/4, dark yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine roots.
Ib	4-33	Landscaping fill; 10YR 3/6, dark yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; many fine to coarse roots.
II	33-56 (BOE)	Natural jaucas sand; 10YR 4/6, dark yellowish brown; medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few fine roots.

4.2.48 Shovel Test 38

Shovel Test 38 was located along the southeastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 0.86 m deep. The stratigraphy of Shovel Test 38 consisted of grass over loamy sand (Stratum Ia) overlying loamy sand landscaping fill (Stratum Ib) overlying natural sand (Stratum II) (Figure 128, Figure 129, and Table 53).



Figure 128. Photograph of Shovel Test 38, east wall of excavation

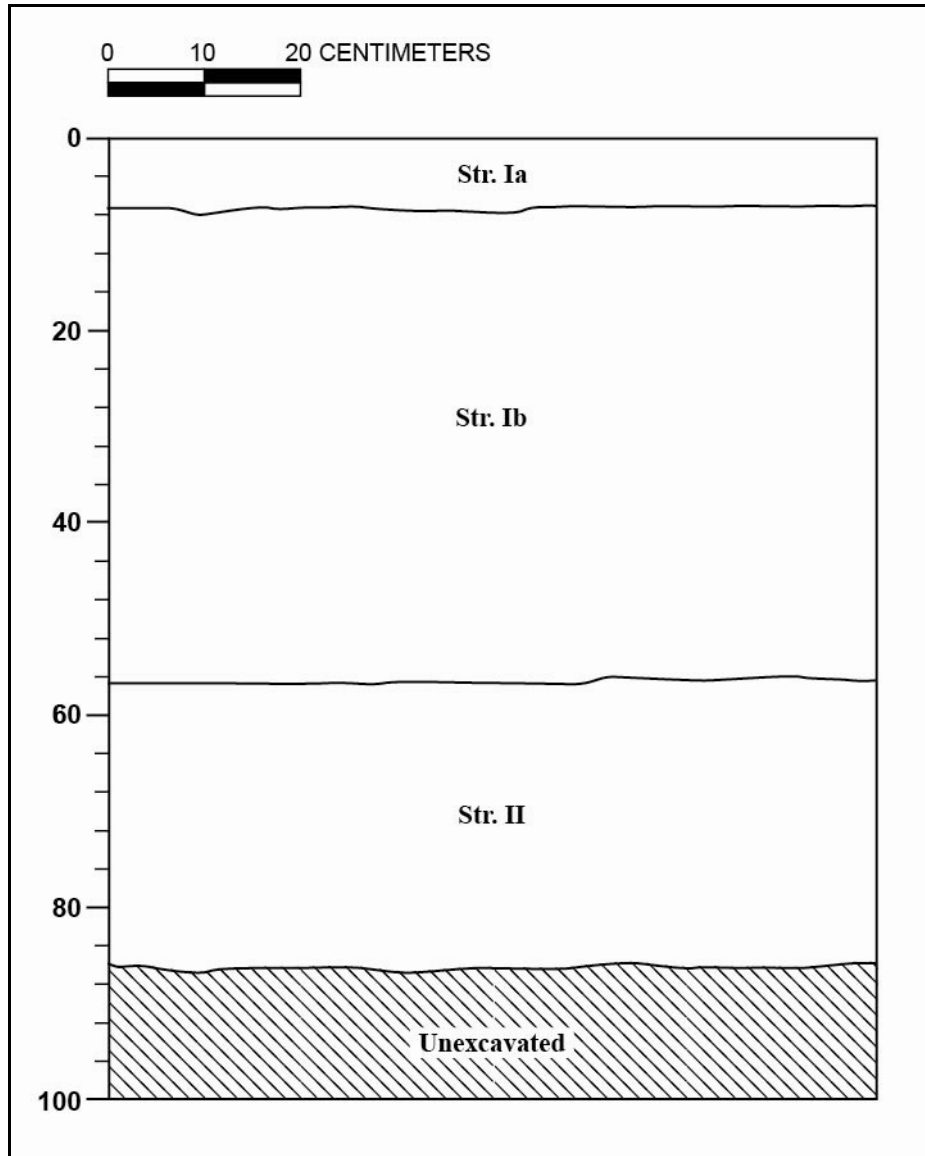


Figure 129. Shovel Test 38 profile, east wall of excavation

Table 53. Stratigraphy Observed at Shovel Test 38

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-7	Grass and topsoil; 10YR 2/2, very dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine to coarse roots.
Ib	7-56	Landscaping fill; 10YR 3/4, dark yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine to coarse roots.
II	56-86 (BOE)	Natural jaucas sand; 10YR 5/4, yellowish brown; medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few coarse roots.

4.2.49 Shovel Test 39

Shovel Test 39 was located along the southeastern edge of the project area along the ocean. The profile wall measured 0.80 m long and 0.78 m deep. The stratigraphy of Shovel Test 39 consisted of grass over sandy loam (Stratum Ia) overlying loamy sand landscaping fill (Stratum Ib) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 130, Figure 131, and Table 54). The buried A horizon (Stratum IIa) is incorporated into SIHP # -791, a pre-Contact cultural layer and burials originally identified by Perzinski et al. (2001).



Figure 130. Photograph of Shovel Test 39, northwest wall of excavation

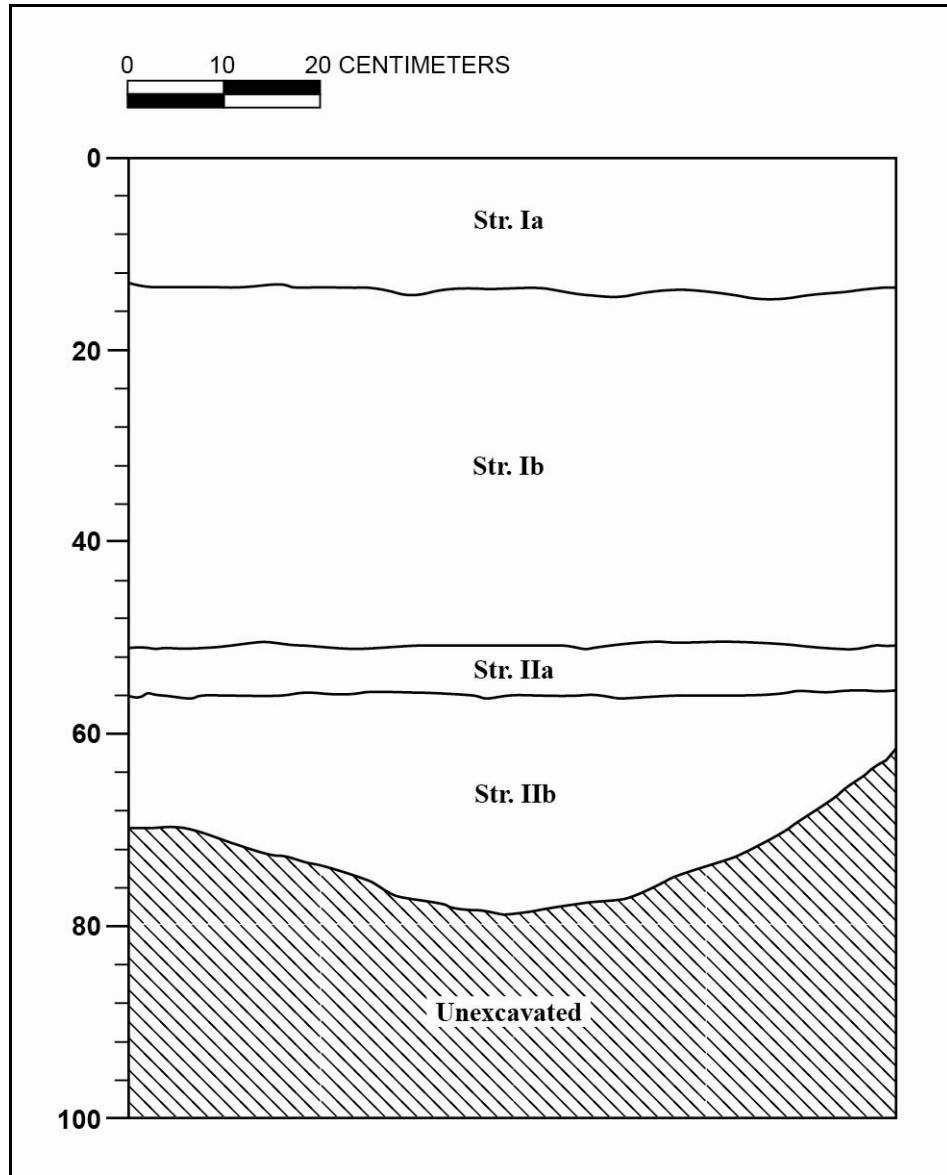


Figure 131. Shovel Test 39 profile, northwest wall of excavation

Table 54. Stratigraphy Observed at Shovel Test 39

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-13	Grass and topsoil; 10YR 3/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine roots.
Ib	13-51	Landscaping fill; 10YR 5/4, yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; common fine roots.
IIa	51-56	Buried A horizon; 10YR 3/2, very dark grayish brown; sandy loam; weak, fine granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, smooth lower boundary; charcoal and shell midden present; cultural layer, incorporated into SIHP # -791.
IIb	56-78 (BOE)	Natural jaucas sand; 10YR 5/6, yellowish brown; medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.50 Shovel Test 40

Shovel Test 40 was located at the south corner of the project area along the ocean. The profile wall measured 0.80 m long and 0.82 m deep. The stratigraphy of Shovel Test 40 consisted of grass over sandy loam (Stratum Ia) overlying sandy loam landscaping fill (Stratum Ib) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 132, Figure 133, and Table 55). The buried A horizon (Stratum IIa) is incorporated into SIHP # -791, a pre-Contact cultural layer and burials originally identified by Perzinski et al. (2001).



Figure 132. Photograph of Shovel Test 40, west wall of excavation

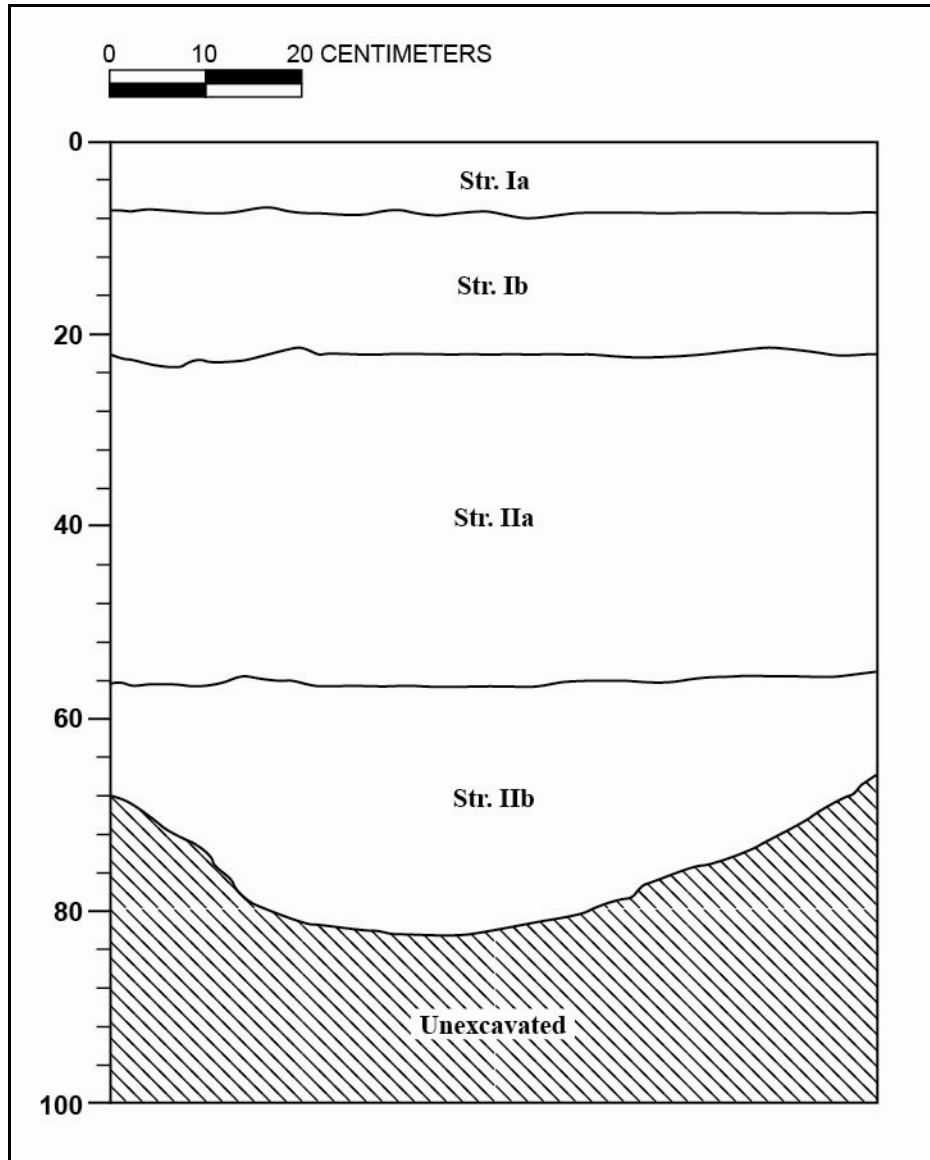


Figure 133. Shovel Test 40 profile, west wall of excavation

Table 55. Stratigraphy Observed at Shovel Test 40

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-6	Grass and topsoil; 10YR 2/2, very dark brown; loamy sand; weak, fine granular structure; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots.
Ib	6-22	Landscaping fill; 10YR 3/3, dark brown; sandy loam; weak, fine granular structure; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots.
IIa	22-56	Buried A horizon; 10YR 3/2, very dark grayish brown; sandy loam; weak, fine granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots; charcoal present; cultural layer, incorporated into SIHP # -791.
IIb	56-82 (BOE)	Natural jaucas sand; 10YR 6/4, light yellowish brown; medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.51 Shovel Test 41

Shovel Test 41 was located at the south corner of the project area along the ocean. The profile wall measured 0.80 m long and 0.68 m deep. The stratigraphy of Shovel Test 41 consisted of grass over sandy loam (Stratum Ia) overlying loamy sand landscaping fill (Stratum Ib) overlying a natural sand (Stratum II) (Figure 134, Figure 135, and Table 56).



Figure 134. Photograph of Shovel Test 41, southeast wall of excavation

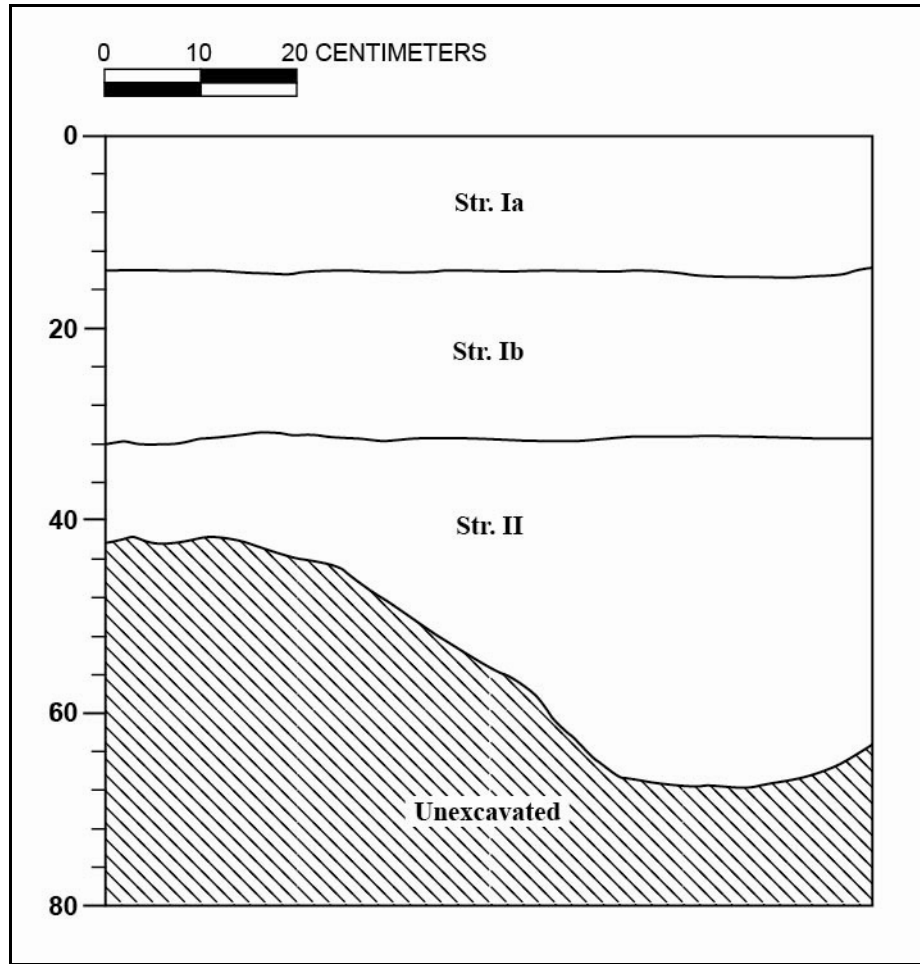


Figure 135. Shovel Test 41 profile, southeast wall of excavation

Table 56. Stratigraphy Observed at Shovel Test 41

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-14	Grass and topsoil; 10YR 2/2, very dark brown; loamy sand; weak, fine granular structure; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots.
Ib	14-32	Landscaping fill; 10YR 3/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots.
II	32-68 (BOE)	Natural jaucas sand; 10YR 5/6, yellowish brown; medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.52 Shovel Test 42

Shovel Test 42 was located at the south corner of the project area along the ocean. The profile wall measured 0.80 m long and 0.72 m deep. The stratigraphy of Shovel Test 42 consisted of organic matter over sandy loam (Stratum I) overlying natural sand (Stratum II) (Figure 136, Figure 137, and Table 57).



Figure 136. Photograph of Shovel Test 42, southeast wall of excavation

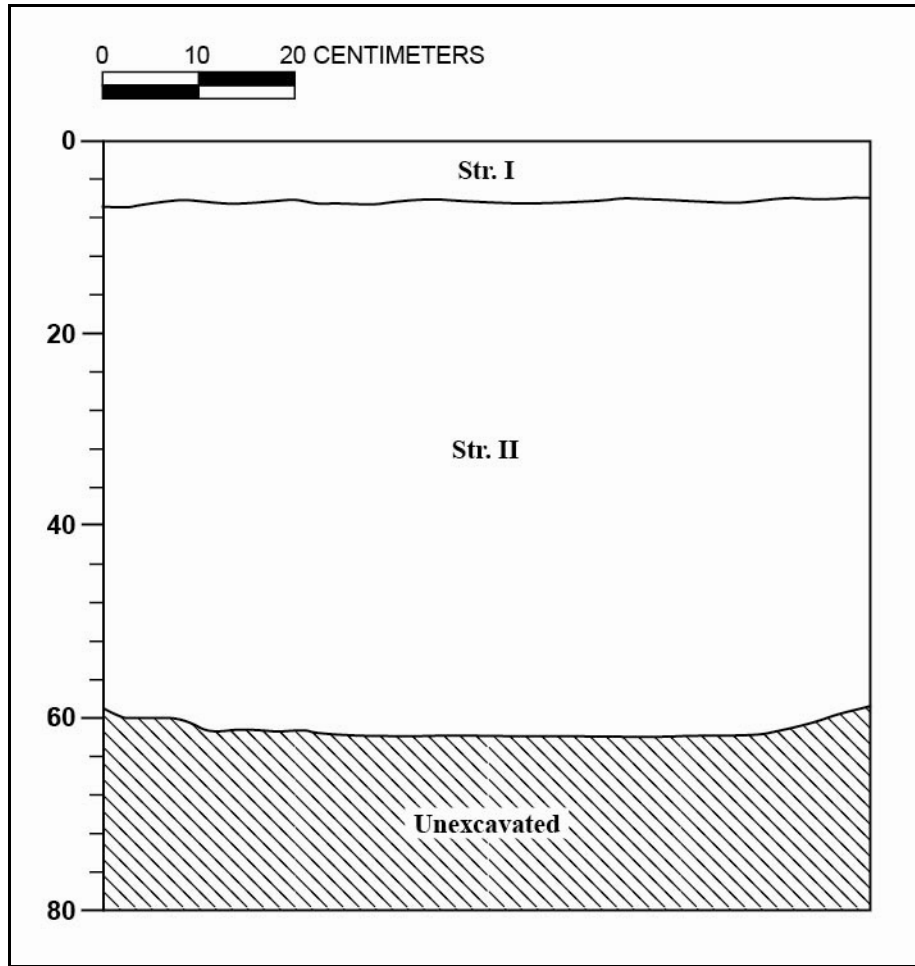


Figure 137. Shovel Test 42 profile, southeast wall of excavation

Table 57. Stratigraphy Observed at Shovel Test 42

Stratum	Depth (cmbs)	Description of Sediments
I	0-6	Organic matter and topsoil; 10YR 3/2, very dark grayish brown; sandy loam; weak, fine granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots.
II	6-62 (BOE)	Natural jaucas sand; 10YR 5/4, yellowish brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; common medium to coarse roots.

4.2.53 Shovel Test 43

Shovel Test 43 was located at the northwest end of the project area. The profile wall measured 0.70 m long and 0.52 m deep. The stratigraphy of Shovel Test 43 consisted of grass over loamy sand (Stratum I) overlying loamy sand (a mix of an old A horizon and natural sand) (Stratum II) (Figure 138 and Table 58). CSH Burial 2 (SIHP # TBD) was located at the base of Stratum II adjacent to a modern utility trench in the west end of the trench. For a detailed description of the burial, see Section 4.4.2, below. The disturbed buried A horizon (Stratum II) is incorporated into SIHP # -791, a pre-Contact cultural layer and burials originally identified by Perzinski et al. (2001). A photograph of the trench was not taken due to the presence of the burial.

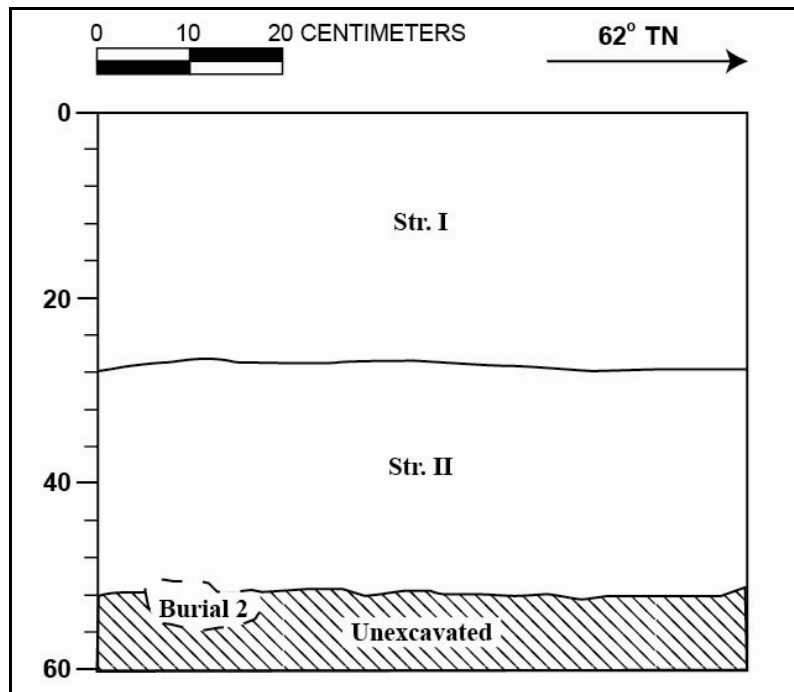


Figure 138. Shovel Test 43 profile, northeast wall of excavation

Table 58. Stratigraphy Observed at Shovel Test 43

Stratum	Depth (cmbs)	Description of Sediments
I	0-27	Grass and utility trench fill; 10YR 3/4, dark yellowish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots.
II	27-52 (BOE)	Disturbed/mixed old A horizon and sand; 10YR 4/2, dark grayish brown; fine- to medium-grain loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; lower boundary not visible; common fine roots; contained CSH Burial 2 (SIHP # TBD) and basalt flakes; cultural layer, incorporated into SIHP # -791.

4.2.54 Shovel Test 44

Shovel Test 44 was located at the northwest end of the project area. The profile wall measured 0.80 m long and 0.56 m deep. The stratigraphy of Shovel Test 44 consisted of grass over loamy sand (Stratum Ia) overlying sandy loam grading fill with crushed coral inclusions (Stratum Ib) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 139, Figure 140, and Table 59). The buried A horizon (Stratum IIa) is incorporated into SIHP # -791, a pre-Contact cultural layer and burials originally identified by Perzinski et al. (2001).



Figure 139. Photograph of Shovel Test 44, north wall of excavation

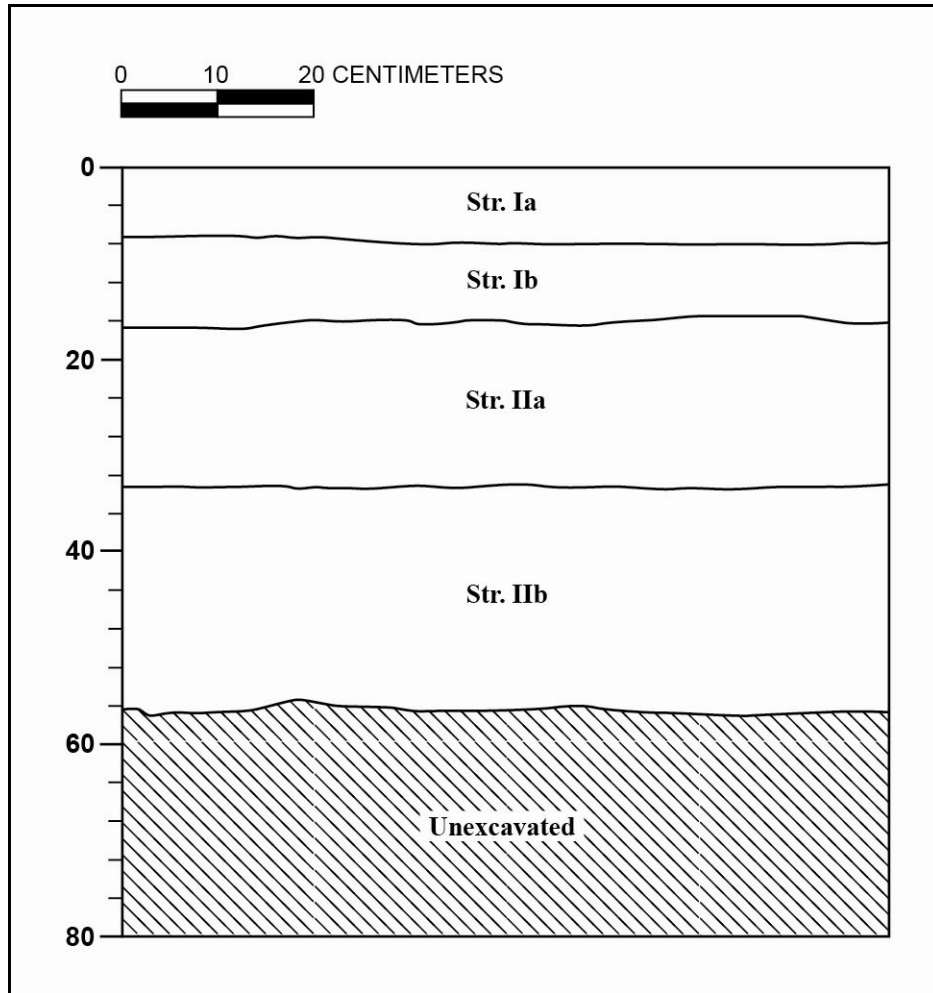


Figure 140. Shovel Test 44 profile, north wall of excavation

Table 59. Stratigraphy Observed at Shovel Test 44

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-7	Grass and topsoil; 10YR 3/2, very dark grayish brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine roots.
Ib	7-16	Grading fill; 10YR 3/3, dark brown; loamy sand with crushed coral inclusions; weak, medium, crumb structure; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine roots.
IIa	16-32	Buried A horizon; 10YR 3/1, very dark gray; sandy loam; weak, fine granular structure; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; few fine roots; charcoal, shell midden, and coral present; cultural layer, incorporated into SIHP # -791.
IIb	32-56 (BOE)	Natural jaucas sand; 10YR 6/3, pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.55 Shovel Test 45

Shovel Test 45 was located at the northwest end of the project area. The profile wall measured 0.80 m long and 0.94 m deep. The stratigraphy of Shovel Test 45 consisted of grass over loamy sand (Stratum Ia) overlying disturbed sand fill (Stratum Ib) overlying a loamy sand buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 141, Figure 142, and Table 60). The buried A horizon (Stratum IIa) is incorporated into SIHP # -791, a pre-Contact cultural layer and burials originally identified by Perzinski et al. (2001).



Figure 141. Photograph of Shovel Test 45, south wall of excavation

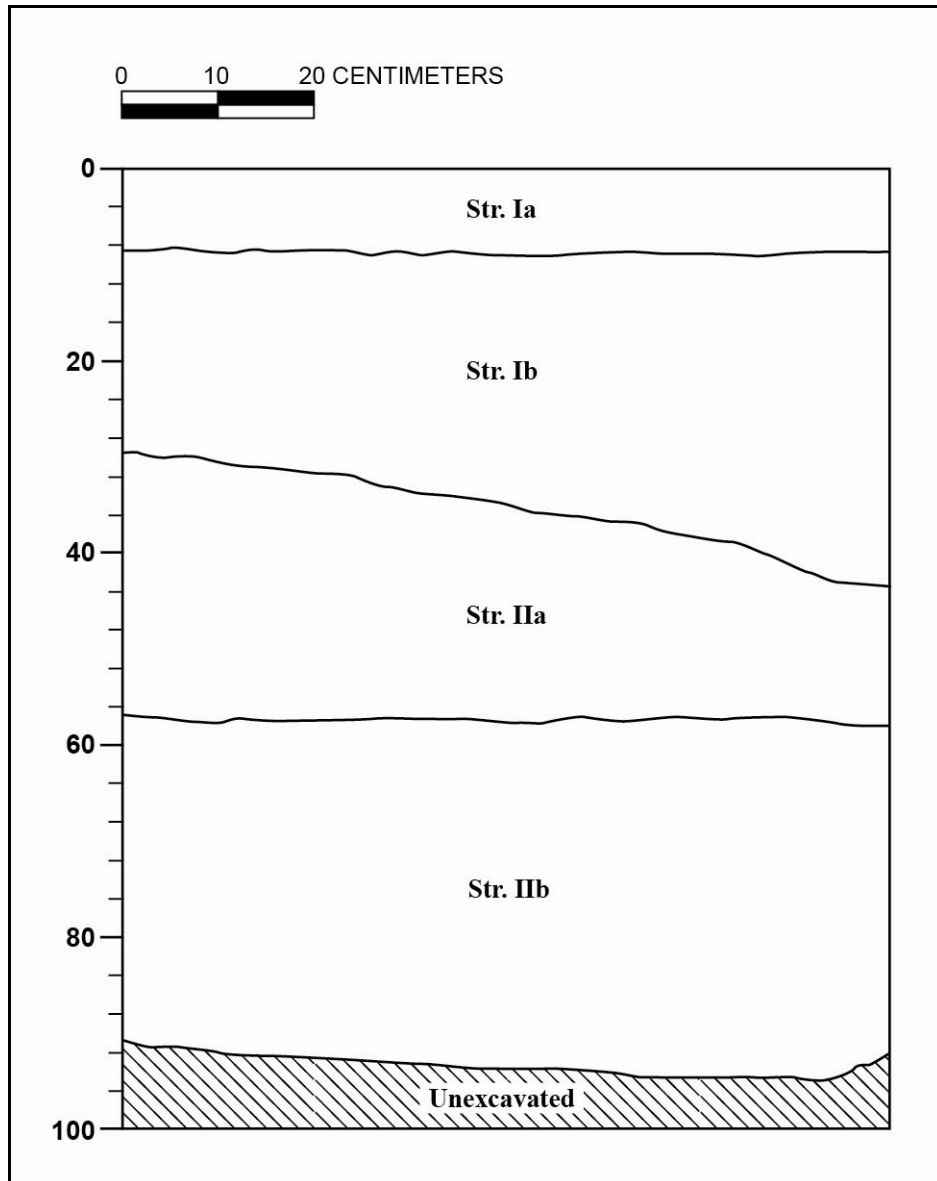


Figure 142. Shovel Test 45 profile, south wall of excavation

Table 60. Stratigraphy Observed at Shovel Test 45

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-9	Grass and topsoil; 10YR 3/3, dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine roots.
Ib	9-43	Fill; 10YR 5/3, brown; fine-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; clear, smooth lower boundary; common fine roots.
IIa	30-58	Buried A horizon; 10YR 3/1, very dark gray; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; diffuse, smooth lower boundary; few fine roots; charcoal present; cultural layer, incorporated into SIHP # - 791.
IIb	57-94 (BOE)	Natural jaucas sand; 10YR 6/3, pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible.

4.2.56 Shovel Test 46

Shovel Test 46 was located at the south corner of the project area. The shovel test had a diameter of 0.50 m and was 0.60 m deep. The stratigraphy of Shovel Test 46 consisted of grass over sandy loam (Stratum Ia) overlying a thin layer of cement washout (Stratum Ib) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 143, Figure 144, and Table 61). The buried A horizon (Stratum IIa) is incorporated into SIHP # -791, a pre-Contact cultural layer and burials originally identified by Perzinski et al. (2001).



Figure 143. Photograph of Shovel Test 46, view northeast

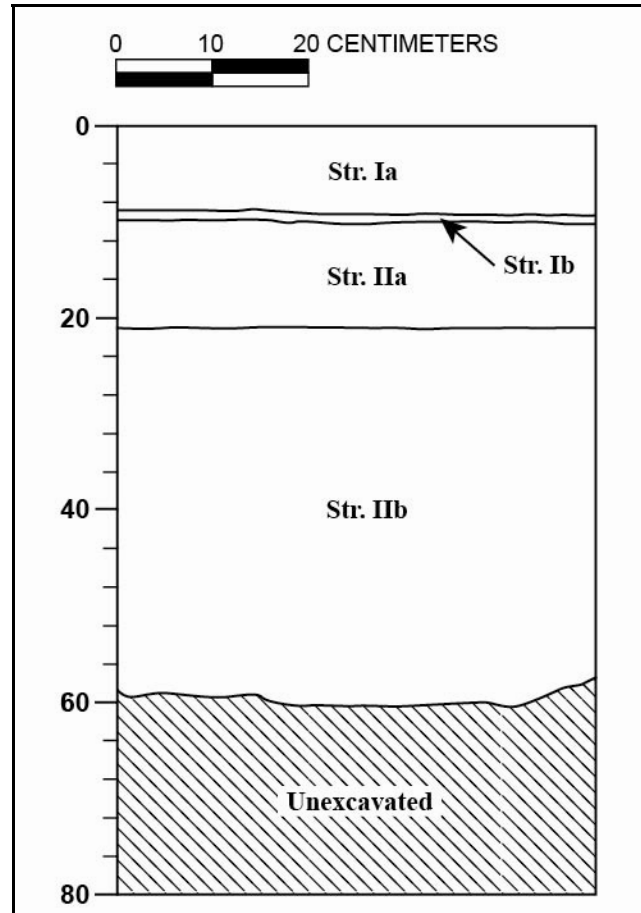


Figure 144. Shovel Test 46 profile

Table 61. Stratigraphy Observed at Shovel Test 46

Stratum	Depth (cmbs)	Description of Sediments
Ia	0-9	Grass and topsoil; 10YR 3/3, dark brown; sandy loam; weak, fine to medium, granular structure; dry, loose consistency; non-plastic; mixed origin; very abrupt, smooth lower boundary; few fine to medium roots.
Ib	9-10	Cement washout
IIa	10-21	Disturbed buried A horizon; 10YR 3/1, very dark gray; sandy loam; weak, fine to medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, smooth lower boundary; common medium to coarse roots; charcoal present; cultural layer, incorporated into SIHP # -791.
IIb	21-60 (BOE)	Natural jaucas sand; 10YR 7/4, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few medium to coarse roots.

4.2.57 Shovel Test 47

Shovel Test 47 was located at the south corner of the project area. The shovel test had a diameter of 0.30 m and was 0.62 m deep. The stratigraphy of Shovel Test 47 consisted of organic matter over sandy loam (Stratum I) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 145, Figure 146, and Table 62).



Figure 145. Photograph of Shovel Test 47, view west

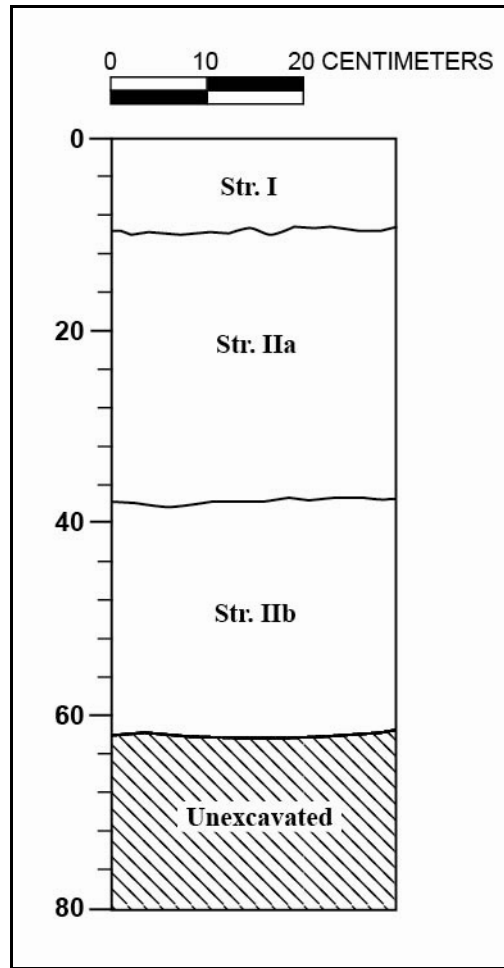


Figure 146. Shovel Test 47 profile

Table 62. Stratigraphy Observed at Shovel Test 47

Stratum	Depth (cmbs)	Description of Sediments
I	0-10	Grass and topsoil; 10YR 3/3, dark brown; sandy loam; weak, medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine to coarse roots.
IIa	10-38	Buried A horizon; 10YR 3/3, dark brown; sandy loam; weak, fine to medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, smooth lower boundary; many fine to coarse roots;
IIb	38-62 (BOE)	Natural jaucas sand; 10YR 6/6, brownish yellow; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few medium to coarse roots.

4.2.58 Shovel Test 48

Shovel Test 48 was located at the northwest end of the project area. The shovel test had a diameter of 0.40 m and was 0.50 m deep. The stratigraphy of Shovel Test 48 consisted of grass over sandy loam (Stratum I) overlying a sandy loam buried A horizon (Stratum IIa) overlying natural sand (Stratum IIb) (Figure 147, Figure 148, and Table 63). The buried A horizon (Stratum IIa) is incorporated into SIHP # -791, a pre-Contact cultural layer and burials originally identified by Perzinski et al. (2001).



Figure 147. Photograph of Shovel Test 48, view north

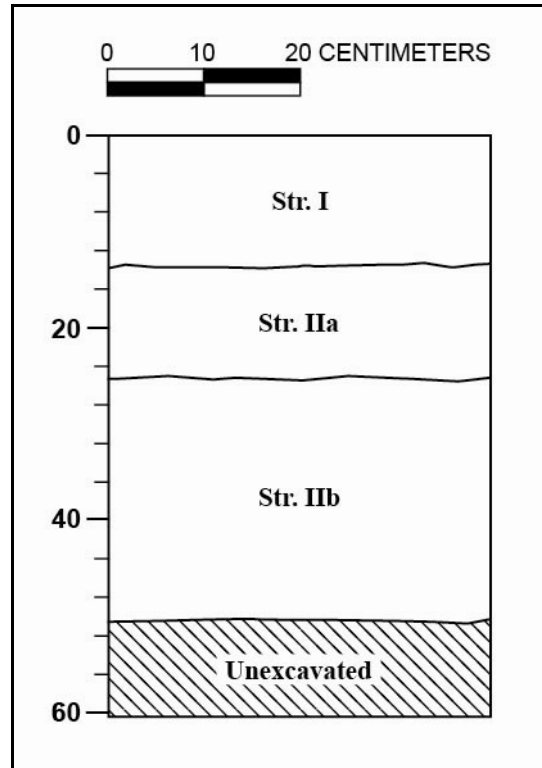


Figure 148. Shovel Test 48 profile

Table 63. Stratigraphy Observed at Shovel Test 48

Stratum	Depth (cmbs)	Description of Sediments
I	0-13	Grass and topsoil; 10YR 4/3, brown; sandy loam; weak, fine to medium, granular structure; dry, weakly coherent consistency; non-plastic; mixed origin; clear, smooth lower boundary; common fine to coarse roots.
IIa	13-25	Buried A horizon; 10YR 2/2, very dark brown; loamy sand; single-grain; dry, loose consistency; non-plastic; mixed origin; diffuse, smooth lower boundary; few fine roots; charcoal present; cultural layer, incorporated into SIHP # - 791.
IIb	25-50 (BOE)	Natural jaucas sand; 10YR 8/2, very pale brown; fine- to medium-grain sand; single-grain; dry, loose consistency; non-plastic; marine origin; lower boundary not visible; few very fine to medium roots.

4.3 Site Descriptions

Two new historic properties (burials) were documented within the project area during this AIS. Additionally, one, and sometimes two, pre-Contact cultural layers were observed in most test units excavated within the project area. These cultural layers were incorporated into existing SIHP designations that were present in or near the project area. The historic properties are summarized in Table 64, descriptions are given below, and their locations are depicted on Figure 149.

Table 64. Table of Historic Properties Identified within the Current Project Area

SIHP #	Description
TBD	CSH Burial 1 (human interment)
TBD	CSH Burial 2 (human interment)
50-30-08-791	Subsurface cultural layer (activity area) and associated burials (human interment)
50-30-08-1800	Subsurface cultural layers (activity areas) and associated burials (human interment)
50-30-08-1801	Subsurface cultural layer (activity area) and associated burials (human interment)

4.3.1 CSH Burial 1 (SIHP # TBD)

CSH Burial 1 (SIHP # TBD) is a primary human burial that was observed within Trench 2 near the north end of the project area (Table 65). The burial was encountered within a burial pit at a depth of 113 cmbs. The burial appears to be flexed, with the head towards the west. This burial is likely pre-Contact to early post-Contact in age. The individual appears to have been a juvenile at time of death, based on observed unfused epiphyses. A complete analysis of the burial was not undertaken. This site is significant according to Criteria D and E of the Hawai'i Register of Historic Places.

Table 65. CSH Burial 1 (SIHP # TBD) description

Formal Type	Inhumation
Functional Interpretation	Human Burial
No. of Features	1
Age:	Pre-Contact/Early Post-Contact
Current Dimensions	Approximately 70-x-55 cm
Location	Trench 2 near the north end of the project area
Tax Map Key	[4] 4-3-007:026
Land Jurisdiction	State of Hawai'i, County of Kaua'i

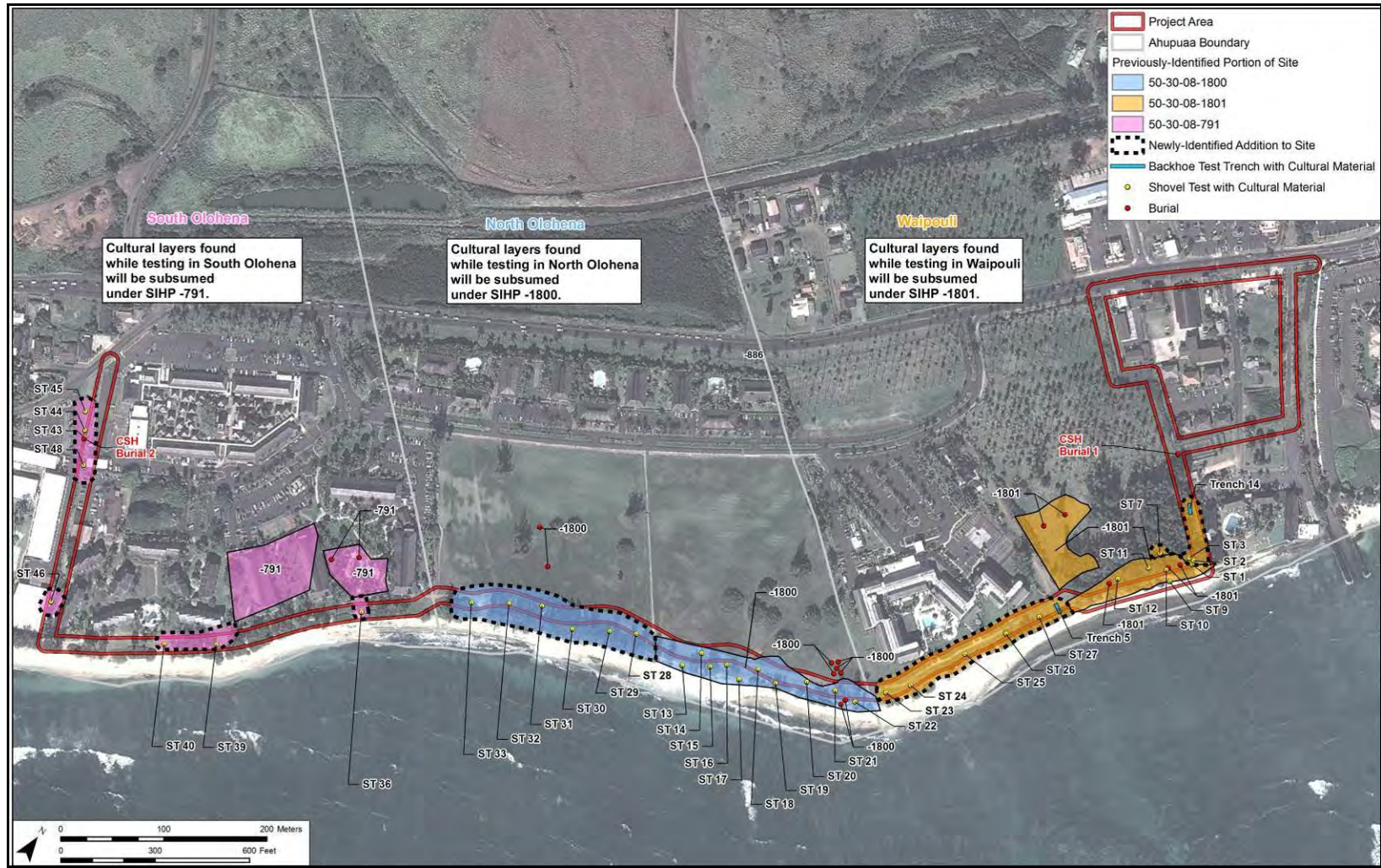


Figure 149. Locations of new historic properties and newly-identified portions of historic properties within the project area (base map: 1996 U.S. Geological Survey 7.5-minute topographic map, Kapa‘a quadrangle)

4.3.1 CSH Burial 2 (SIHP # TBD)

CSH Burial 2 (SIHP # TBD) is a previously disturbed human burial that was observed within Shovel Test 43 in the southwest corner of the project area (Table 66). The burial was located adjacent to an old utility line; the installation of the utility line appears to have disturbed the burial. A partial, disturbed burial pit was also observed. The burial was encountered at a depth of 50 cmbs. The positioning of the body is unknown due to the previous and the fact that once the burial was identified as human it was not further uncovered or examined. The individual appears to have been an adult at time of death. Basalt flakes were observed in the vicinity of the burial, but not directly associated with it. This burial is likely pre-Contact to early post-Contact in age. This site is significant according to Criteria D and E of the Hawai'i Register of Historic Places.

Table 66. CSH Burial 2 (SIHP # TBD) description

Formal Type	Inhumation
Functional Interpretation	Human burial
No. of Features	1
Age:	Pre-Contact/Early Post-Contact
Current Dimensions	Approximately 18-x-4 cm
Location	Shovel Test 43 near the west end of the project area
Tax Map Key	[4] 4-3-002:012
Land Jurisdiction	State of Hawai'i, County of Kaua'i

4.3.2 SIHP # 50-30-08-791

SIHP # 50-30-08-791 was originally designated by Perzinski et al. (2001) to refer to “a cultural layer in the northeastern portion of the Kaua‘i Coast Resort property” in South Olohena Ahupua‘a (Perzinski et al. 2001:36). Subsequently, all identified cultural layers within test units excavated in South Olohena Ahupua‘a during the current project have been subsumed under this SIHP designation.

According to Perzinski and colleagues, the cultural layer contained charcoal, shell midden, and fish bone, as well as several traditional Hawaiian artifacts (2001:36-38). Additionally, two human burials, believed to be pre-Contact, were observed within SIHP # -791. One burial consisted of an isolated humerus portion, while the other burial was a complete, primary burial (Perzinski et al. 2001:36-38). Radiocarbon dating of a charcoal sample returned a date range of A.D. 1275 to 1645.

During the current investigation, cultural layers were observed in eight test units (Shovel Tests 36, 39-40, 43-46, 48) within South Olohena Ahupua‘a. The cultural layer began from 10-55 cmbs and ended from 21-61 cmbs. The cultural layer contained variable amounts of charcoal, shell midden, basalt flakes, and coral. Additionally, one primary human burial was observed at the base of the cultural layer (see Section 4.3.2, above). This site is significant according to Criteria D and E of the Hawai‘i Register of Historic Places.

Table 67. SIHP # 50-30-08-791 description

Formal Type	Cultural layer
Functional Interpretation	Activity area
No. of Features	1
Age:	Pre-Contact
Current Dimensions	Roughly 327-x-160 m
Location	South Olohena Ahupua‘a, along the coast
Tax Map Key	[4] 4-3-001
Land Jurisdiction	State of Hawai‘i, County of Kaua‘i

4.3.1 SIHP # 50-30-08-1800

SIHP # 50-30-08-1800 was originally designated by Rosendahl and Kai (1990) to refer to “two subsurface cultural deposits (upper and lower) present at the shoreline” within their Development Site 4 project area parcel in North Olohena Ahupua‘a (Rosendahl and Kai 1990:8). Subsequently, all identified cultural layers within test units excavated in North Olohena Ahupua‘a during the current project have been subsumed under this SIHP designation.

According to Rosendahl and Kai, their deposits contained variable amounts of charcoal, ash, fire-cracked rock, shell midden, and fish bone, and the lower deposit contained a number of traditional Hawaiian artifacts (1990:8). Additionally, three primary human burials, believed to be pre-Contact, were observed within SIHP # -1800, and left in place (Rosendahl and Kai 1990:12). Radiocarbon dating of several charcoal samples returned a date range of A.D. 1270 to 1954; however, “the dates should be viewed with some caution, as the chronological sequence they present is not congruent with the stratigraphic sequence of the layers from which the samples were derived” (Rosendahl and Kai 1990:13).

During the current investigation, cultural layers were observed in 16 test units within North Olohena Ahupua‘a. Eleven test units (Shovel Tests 13-14, 16, 18-20, 22, 28, 31-33) contained one cultural layer, while five test units (Shovel Tests 15, 17, 21, 29-30) contained two cultural layers. In test units with only one cultural layer, the stratum began from 2-47 cmbs and ended from 23-128 cmbs. In test units with two cultural layers, the upper stratum began from 9-20 cmbs and ended from 28-75 cmbs, while the lower stratum began from 32-76 cmbs and ended from 38-84 cmbs. The cultural layers contained variable amounts of charcoal, shell midden, fire-cracked rock, and basalt flakes. One traditional Hawaiian artifact, a coral file, was identified. This site is significant according to Criteria D and E of the Hawai'i Register of Historic Places.

Table 68. SIHP # 50-30-08-1800 description

Formal Type	Cultural layer
Functional Interpretation	Activity area
No. of Features	1
Age:	Pre-Contact
Current Dimensions	Roughly 405-x-62 m
Location	North Olohena Ahupua‘a, along the coast
Tax Map Key	[4] 4-3-002
Land Jurisdiction	State of Hawai‘i, County of Kaua‘i

4.3.1 SIHP # 50-30-08-1801

SIHP # 50-30-08-1801 was originally designated by Rosendahl and Kai (1990) to refer to “one (possibly two) subsurface cultural deposit(s)” within their Development Site 6 project area parcel in Waipouli Ahupua‘a (Rosendahl and Kai 1990:8). Subsequently, all identified cultural layers within test units excavated in Waipouli Ahupua‘a during the current project have been subsumed under this SIHP designation.

According to Rosendahl and Kai, the deposit(s) contained variable amounts of charcoal, fire-cracked rock, shell midden, and fish and mammal bone, as well as a number of traditional Hawaiian artifacts (1990:8). Additionally, five primary human burials, believed to be pre-Contact, were observed within SIHP # -1801, and left in place (Rosendahl and Kai 1990:12). Radiocarbon dating of several charcoal samples returned a date range of A.D. 1430 to 1955; however, “the dates should be viewed with some caution, as the chronological sequence they present is not congruent with the stratigraphic sequence of the layers from which the samples were derived” (Rosendahl and Kai 1990:13).

A subsequent data recovery project of SIHP # -1801 by Toenjes et al. (1991) indicated the presence of shell midden and numerous traditional Hawaiian artifacts, including basalt flakes and adze fragments, hematite flakes, volcanic glass, coral and urchin spine tools, fishhooks and modified bone and shell, and several bone awls or picks (Toenjes et al. 1991:i). Radiocarbon dating of several charcoal samples returned a date range of A.D. 1420 to 1950.

During the current investigation, a cultural layer was observed in 18 test units (Test Trenches 5, 14 and Shovel Tests 1-3, 7, 9-12, 23-27) within Waipouli Ahupua‘a. The cultural layer began from 0-33 cmbs and ended from 28-70 cmbs. The cultural layer contained variable amounts of charcoal, shell midden, fire-cracked rock, and coral cobbles. This site is significant according to Criteria D and E of the Hawai‘i Register of Historic Places.

Table 69. SIHP # 50-30-08-1801 description

Formal Type	Cultural layer
Functional Interpretation	Activity area
No. of Features	1
Age:	Pre-Contact
Current Dimensions	Roughly 350-x-135 m
Location	Waipouli Ahupua‘a, along the coast
Tax Map Key	[4] 4-3-007
Land Jurisdiction	State of Hawai‘i, County of Kaua‘i

Section 5 Results of Laboratory Analysis

One isolated find was observed during the current AIS and was collected and transported to the CSH laboratory in Waimānalo, O'ahu for detailed analysis. This item will remain temporarily curated at the CSH storage facility in Waimānalo until a permanent facility is determined in consultation with the landowner. The find is described below.

A single artifact, a coral file, was observed during fieldwork activities for the current project (Figure 150). The coral file was found within Stratum IIa (cultural layer, part of SIHP # -1801) of Shovel Test 14 (see Figure 149 for location). The file has maximum dimensions of 60 mm long, 29 mm wide, and 13 mm thick, and it has a mass of 19.1 grams. The long edges of the file have been filed. This artifact has characteristics which indicate traditional Hawaiian manufacture.



Figure 150. Photograph of coral file found within Stratum IIa (cultural layer, part of SIHP # 50-30-08-1801) of Shovel Test 14

Section 6 Summary and Interpretation

In compliance with and to fulfill applicable Hawai'i State historic preservation legislation, CSH conducted an archaeological inventory survey for Phases C and D of the Lydgate-Kapa'a Bike and Pedestrian Path Project, located in South Olohena, North Olohena, and Waipouli Ahupua'a, on the island of Kaua'i. The fieldwork component of the AIS was conducted between July 25 and August 6, 2012 and on September 11, 2012. The subsurface testing program included the excavation of 58 test units (48 small shovel tests and 10 larger test trenches).

The project area's subsurface deposits are fairly undisturbed. In most cases, only landscaping and grading fill has disturbed, partially removed, or been placed on top of the natural sandy loam or sand sediments, much of which has been related to resort development along the coast. Buried, pre-Contact A horizons were evident in many of the test units. In general, the observed and documented stratigraphy consisted of the following sequence: 1) grass, organic matter, or asphalt; 2) various fill layers, such as landscaping and grading fill; 3) a sandy, buried A horizon; and 4) natural jaucas sand. In some instances, layers of wind-deposited or high surf-deposited natural sand were observed.

The majority of documented buried A horizons encountered within the project area contained cultural material. This included charcoal, shell midden, fire-cracked rock, basalt flakes, coral, and one human burial. This cultural layer was designated into three separate SIHP numbers based on pre-existing historic properties and location: SIHP #s 50-30-08-791, 50-30-08-1800, and 50-30-08-1801. Due to the lack of discrete features appropriate samples for carbon dating were not recovered.

Two new historic properties were documented within the project area during the current AIS investigation (SIHP #s TBD), both believed to be traditional Hawaiian burials.

The findings of the current study are consistent with findings reported in previous archaeological investigations: intact, subsurface cultural layers and a high frequency of burials. These suggest a long occupation spanning several centuries, with evidence of a range of activities. The observed cultural layers and human burials suggest extensive use of the coastline in this area, beginning approximately A.D. 1400–1500.

Section 7 Significance Assessments

Two new historic properties were identified within the current project area. Additionally, cultural layers observed during the current AIS were incorporated into three pre-existing SIHP designations. Table 70 lists all historic properties encountered within the project area along with their significance assessment and mitigation recommendation. To be considered eligible for listing on the Hawai'i Register of Historic Places, a historic property must possess one or more of the following: integrity of location, design, setting, materials, workmanship, feeling, and/or association, and meet one or more of the following broad cultural/historic significance criteria:

- A Historic property reflects major trends or events in the history of the state or nation.
- B Historic property is associated with the lives of persons significant in our past.
- C Historic property is an excellent example of a site type.
- D Historic property has yielded or may be likely to yield information important in prehistory or history.
- E Historic property has cultural significance to an ethnic group, including, but not limited to, religious structures, burials, and traditional cultural properties.

Table 70. Description of Historic Properties Encountered within the Current Project Area

SIHP #	Description	Significance Assessment	Mitigation Recommendation
TBD	CSH Burial 1 (human interment)	Significant according to Criteria D and E	Preparation of a burial treatment plan and an archaeological monitoring program for the vicinity
TBD	CSH Burial 2 (human interment)	Significant according to Criteria D and E	Preparation of a burial treatment plan and an archaeological monitoring program for the vicinity
50-30-08-791	Subsurface cultural layer (activity area) and associated burials (human interment)	Significant according to Criteria D and E	No further site-specific work but an archaeological monitoring program for the vicinity
50-30-08-1800	Subsurface cultural layers (activity areas) and associated burials (human interment)	Significant according to Criteria D and E	No further site-specific work but an archaeological monitoring program for the vicinity
50-30-08-1801	Subsurface cultural layer (activity area) and associated burials (human interment)	Significant according to Criteria D and E	No further site-specific work but an archaeological monitoring program for the vicinity

Section 8 Project Effect and Mitigation Recommendations

8.1 Project Effect

CSH's project-specific effect recommendation is "effect, with proposed mitigation commitments" (in accordance with HAR 13-284-7). The recommended mitigation measures will reduce the project's effect on significant historic properties that were identified within the project area and be pro-active in addressing possible community concerns.

8.2 Mitigation Recommendations

This archaeological inventory survey represents a good-faith effort to identify and document the historic properties within the project area. Due to inherent limitations of any sampling strategy, it is possible that additional historic properties, potentially including additional human skeletal remains and non-burial archaeological deposits, may be encountered during project-related development. In order to mitigate any potential damage to known documented or yet unidentified historic properties, it is recommended that project construction proceed under an archaeological monitoring program. This monitoring program will facilitate the identification and proper treatment of any additional burials that might be discovered during project construction, and will gather additional information regarding the project's non-burial archaeological deposits, should any be discovered.

CSH recommends that the two burials identified during the AIS (SIHP #s TBD) be treated in accordance to the provisions of a burial treatment plan prepared in compliance with HAR 13-300-33. The multi-use path should also be situated to avoid, as much as possible, SIHP #s 50-30-08-791, 50-30-08-1800, and 50-30-08-1801 (cultural layers and associated burials identified by previous studies).

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