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July 19, 2012
Project No. 04.62110136

University of California at Santa Barbara
Office of Planning and Construction, Building 439
Santa Barbara, California 93106

Attention: Ms. Deedee Ciancola

Subject: Fault Study, San Joaquin Residence Apartments and Precinct Improvements Planning Study, University of California, Santa Barbara, California

Dear Ms. Ciancola:

Fugro presents this report that summarizes the work completed and findings of our fault study performed for the proposed San Joaquin Residence Apartments and Precinct Improvements Planning Study for the University of California at Santa Barbara (UCSB). Our work for this project was performed in a phased approach over the course of several months and involved iterations of field work, interpretation and evaluation, and reporting efforts. This report incorporates work previously performed by Fugro for the project and integrates data provided in our report dated September 19, 2011 (Fugro, 2011). Our previous work was performed under Fugro project number 04.61110028 and authorization for our previous services was provided by UCSB's Contract No. FM 110384/293-85 Authorizations 001, 002, and 003.

Authorizations of our services for this study were provided by UCSB Contract No. FM 120230/293-85 Authorizations 001 through 007. Our services for this work (Fugro Project No. 04.62110136) were provided in general accordance with our proposals dated February 4, 2011, June 7, 2011, July 20, 2011, September 30, 2011, November 18, 2011, March 8, 2012, and May 2, 2012.

INTRODUCTION

PROJECT UNDERSTANDING AND APPROACH

We understand that the University of California Santa Barbara is evaluating options to expand the student housing at the existing Santa Catalina Residence Hall facility (Santa Catalina) located at the northeastern corner of Storke Road and El Colegio Road in the West Campus area. UCSB refers to the proposed housing expansion project as the San Joaquin Residence Apartments and Precinct Improvements Planning Study. The general location of the existing Santa Catalina facility is shown on Plate 1 - Vicinity Map. On a conceptual basis, we understand the proposed expansion project will consist of constructing multiple, 2- to 3-story apartment-type housing structures, a multi-story parking structure, and commercial buildings in areas of the site currently occupied by surface parking and open space.

In 2002, the University requested Fugro perform a preliminary geologic and geotechnical study at Santa Catalina (when the structure was under private ownership and known as the

Francisco Torres Apartments). The purpose of that study was to provide geotechnical and geologic input to UCSB's purchase of the property. The limited data acquired for that study identified a zone of potential south-side-up displacement in the soil and bedrock extending through the site that appeared to correlate with the zone of faulting and displacement identified in a study performed by CFS Consultants on the West Campus Apartments site located west of Storke Road (CFS, 2000).

Through discussions with UCSB, we concluded that the data acquired for the Fugro (2002) preliminary study were generally not sufficient for the San Joaquin planning study proposed by UCSB, and we recommended that additional fault evaluation work be performed to further define the extent of faulting on the project site.

The work scope for the project was developed through discussions with UCSB with the understanding that determining the presence or absence of faulting on developed sites underlain by deep alluvial soils and shallow groundwater can be extremely difficult and may require the evaluation be performed in an iterative or phased approach. Because the Santa Catalina site is mostly developed, has deep alluvial soils, shallow groundwater, and has a number of existing utilities and surface improvements, we concluded that excavating long, continuous, relatively deep trenches into the alluvium (with shallow groundwater and related dewatering) in the existing parking lot or the open space areas would be disruptive and very expensive. As an alternative to excavating fault trenches at the site, we recommended that our fault exploration effort focus on using closely spaced cone penetration test soundings to correlate geologic strata or layers across the site and assess the potential for faulting by evaluating anomalies or offsets in the correlated units. The CPT data acquired by CFS (2000) for the West Campus Apartments appeared to be of good quality and showed strong correlation between the geologic units (soil and bedrock units) and suggested that closely spaced CPT soundings would likely provide significant information regarding past faulting at the site and could significantly reduce the scope of subsequent phases of work (such as excavations).

Although closely spaced CPT data in areas with distinctive stratigraphy are able allow recognition of faults with several feet or more of offset, minor faults can be more difficult to detect. With the closest CPT spacing used for the San Joaquin planning study, we have been able to recognize apparent fault offsets as small as a foot or two.

After the majority of the CPT data were obtained and interpreted, we drilled soil borings at selected locations using the CME hollow-stem auger continuous coring method to obtain core samples that could be evaluated and compared with the CPT results. Radiocarbon dates were obtained from selected carbon samples extracted from the soil cores and those results suggested that focused fault trenches could be useful in determining the date of the latest fault offset and ultimately determine the activity of faulting at the site. Consequently, three relatively short fault trenches were excavated and logged in an effort to date fault offsets and evaluate the activity of the faults.

WORK PERFORMED

Previous Work and Background

Work performed for the project initially involved performing a series of closely spaced cone penetration test (CPT) soundings at the site along north-south oriented lines across the

property at two primary locations. An initial series of twenty nine CPT soundings was performed along the western side of the existing parking lot between about El Colegio Road and the north property line. The initial row of CPT soundings was performed in May 2001, and the CPTs were advanced to depths of about 50 to 70 feet below the ground surface. A second north-south-oriented row of twenty-six CPT soundings was performed on the eastern side of the site in the existing lawn/open space area and extended from about El Colegio Road to the north property line. Those soundings were performed in June 2011, and were advanced to depths of about 35 to 70 feet below the ground surface.

Several additional CPT soundings were performed later in June 2011, and in July and August 2011. Those additional CPT soundings were performed in the parking lot area west of the existing tennis court, in the bike path near the intersection of Storke Road and El Colegio Road, and on the east side of the site to help better define potential zones of faulting. The additional August 2011 CPT soundings were performed in Storke Road north of CPT-24, in El Colegio Road south of CPT-36, and north of the existing building tower east of the loading dock. Cone penetration test data, our preliminary interpretations of geologic and faulting conditions, and general recommendations for structural setbacks developed from those data were provided in our September 19, 2011, report to UCSB. In that report, we also provided recommendations for additional study focused on gathering additional data in the southeast portion of the site and in the area north of the tennis courts/loading dock area to further evaluate the potential and limits of faulting in those areas.

Current Study

Following the submittal and review of that report, UCSB prepared a request for proposals and solicited consulting services in an effort to address the potential uncertainties regarding the fault conditions at the site that remained following the submittal of our September 19, 2011, report. Fugro submitted a proposal and was authorized to perform the additional work. The additional work performed as part of this authorization also involved a phased approach and consisted of performing additional CPT soundings and assessing and (in some instances) reinterpreting the geologic conditions at the site. The CPT soundings for this authorization were performed in November and December 2011. Initially, fifty-seven additional CPT soundings were performed during that period.

A draft report of the findings and recommendations developed through December 2011 was provided to UCSB for review. UCSB also requested AMEC perform an independent, third-party review of the report. After several meetings and discussions between UCSB, AMEC, and Fugro in the first part of 2012, it was determined that a significant level of additional exploration was warranted at the site. Ultimately, 285 CPT soundings were performed and 17 drill holes were drilled and core samples collected in March and April 2012. Eleven sediment (carbon) samples were selected from the soil cores for radiocarbon dating. Following the acquisition of that additional data and information, Fugro staff met with UCSB and AMEC to discuss our interpretations and opinions regarding the fault conditions. From those meetings, it was determined that a focused fault trenching program be performed. In May 2012, three fault trenches were excavated and logged to date the time of latest fault offset at selected locations. At that time, an additional 9 sediment samples were selected from the trenches and borings for radiocarbon dating.

Survey control points for the fault exploration project were established from existing UCSB monuments located along Storke Road using a Topcon 3003 total station. After the project control points were set, each of the CPT, boring, and fault-trench locations was surveyed using the total station to acquire horizontal and vertical locations of the explorations. In addition, a Trimble ProXR mapping grade GPS receiver, which gathered and post-processed differentially corrected kinematic carrier-phase data, was used to map trench wall locations.

The CPT data were processed and detailed correlation cross sections were developed for each line of CPT soundings. Geologic strata and soil/rock layers were interpreted, evaluated, and correlated between adjacent CPT soundings and shown on the CPT-based geologic cross sections. The surveyed CPT locations were used to accurately locate and depict the CPT data on the cross sections.

Subcontracted Field Exploration Services

The CPT soundings for the project were performed by Fugro Consultants and Kehoe Testing, of Huntington Beach, California. The drill holes were excavated by Martini Drilling of Huntington Beach, California. Excavation, management and backfilling of the fault trenches as well as site restoration services were performed by Lash Construction of Santa Barbara.

SITE CONDITIONS

REGIONAL GEOLOGIC CONDITIONS

The Santa Catalina Residence Hall is situated on the coastal plain south of the Santa Ynez Mountains. The Santa Ynez Mountains are part of the western Transverse Ranges, a predominantly east-west trending mountain block extending from Point Arguello eastward for 75 miles into Ventura County. The Santa Ynez Mountains and adjacent piedmont alluvial plain are composed almost entirely of sedimentary rocks ranging in age from late Jurassic to Recent.

In the Santa Barbara and Goleta area, the structure of the Santa Ynez Mountains consists of a south-dipping homocline with east-west striking faults and related folds preserved on the coastal plain (Dibblee, 1966). Late Pleistocene uplift has created the elevated UCSB-Isla Vista-Devereaux marine terrace. The More Ranch/Mission Ridge/Arroyo Parida faults are the principal fault system on the coastal plain, and form the northern boundary of this marine terrace.

The project site is located near the northern boundary of the marine terrace. The marine terrace is a wave-abraded surface that is typically covered with a thin veneer of marine sands and overlying undifferentiated alluvium. The base of the marine terrace is gently sloping to the south to generally flat-lying. Stream erosion has subsequently dissected the terrace to produce the present isolated mesa surfaces with intervening drainages. The marine terrace is composed of late Pleistocene age marine sand, with discontinuous, basal, fossiliferous sand and is overlain locally by undifferentiated alluvium of estuarine and non-marine deposition. These units are undifferentiated and included with the classification of Quaternary Marine Terrace deposits as mapped by Minor et al. (2009) and Gurrola (2004).

In the vicinity of the West Campus Apartments, marine terrace sediments unconformably overlie a Quaternary/Tertiary age marine siltstone unit believed to be the Pico Formation

bedrock (QTp) shown on Gurrola (2004) or the siltstone unit (QTst) shown on Minor et al. (2009). That marine siltstone is referred to as Pico Formation (in quotes) by Dibblee (1966) because it is not directly traceable to the Pico Formation in Ventura County. We understand that microfaunal analyses of similar siltstone samples performed by the USGS and obtained from borings excavated for the San Clemente housing project east of the site confirm that the fossil assemblage in the bedrock is slightly older than the Santa Barbara Formation (email correspondence from Rick Stanley of the USGS to Roger Slayman of CFS in 2002). The Pico Formation rests unconformably on the Sisquoc Formation in the project area.

On the basis of data in Fugro (2002) and data from this study, the Pico Formation appears to consist of two distinct units consisting of 1) a fine-grained siltstone to clayey siltstone unit and 2) a coarse-grained silty sandstone to sandstone unit. On the basis of discussions with Larry Gurrola (and USGS microfaunal data from the San Clemente housing project), we have assumed the two units can be assigned to the Pico Formation. However, the siltstone and sandstone units from the site have not been directly correlated by others. Using sediment samples collected from the Santa Catalina site, we have obtained radiocarbon ages of >43,000 ybp from the Pico Formation, which indicates the deposits are older than the useful range of radiocarbon techniques.

LOCAL GEOLOGIC CONDITIONS

As encountered in the exploratory borings and CPT soundings, the site is underlain by artificial fill, undifferentiated alluvium, marine terrace deposits, and Pico Formation siltstone and sandstone. The following describes the geologic units encountered in the drill holes and CPT soundings. Specific descriptions of the geologic conditions encountered in the fault trench excavations are provided in a subsequent section of the report.

The logs for the individual CPT soundings are provided on the CD attached to the report. Logs of the drill holes are presented in Appendix A and logs of the fault trench excavations are provided in the body of the report. Age dating information and reports from Beta Analytic are provided in electronic format on the attached CD.

The locations of all the CPT soundings, drill holes, and fault trench excavations performed for the project are shown on Plate 2 - Exploration Location Plan.

Artificial Fill Materials (af)

We encountered up to about 3 feet of artificial fill material in the drill holes excavated for Fugro (2002) and a thin veneer was encountered in the (pre-punch) hand-auger excavations at the CPT locations performed for this study. The fill encountered consists of firm to stiff silty clay (CL-ML) to sandy clay (CL). The artificial fill materials encountered appear to be associated with previous site grading performed for utilities and parking areas, and driveways. In the parking lot areas, the fill appears to be covered by 2 to 3.5 inches of asphalt pavement. The artificial fill materials are underlain by undifferentiated alluvial deposits.

Undifferentiated Alluvium (Qal)

Undifferentiated alluvial deposits of non-marine and estuarine depositional origin are present at the site. In general, the undifferentiated alluvium consists of medium stiff to very stiff

lean clay, and sandy lean clay and clayey sand. On the basis of our data, the undifferentiated alluvium extends from near the ground surface to depths of up to about 20 to 30 feet. On the basis of the CPT and drill hole data acquired for the project, alluvial channel deposits are present in the southern portion of the site and consist of interlayered/interbedded medium stiff to stiff silty sand, silt, and lean to sandy lean clay. The undifferentiated channel deposits are present over a zone about 150 feet wide and extend from near the ground surface to a depth of about 25 to 30 feet. Channel deposits were also encountered in the northeast portion of the site. The channel deposits encountered in that location are present as a remnant narrow and incised channel that is most pronounced slightly northeast of the north tower.

Marine Terrace Deposits (Qt)

Marine terrace deposits consisting of dense to very dense silty sand to sand were encountered in our CPT soundings, borings, and trenches, and in previous explorations performed by Fugro. The marine terrace deposits were encountered in the CPT soundings performed in the northern portion of the site as a continuous, relatively uniformly thick (about 15 feet thick) stratum of silty sand to sand. Similar marine terrace deposits are also present in the southern portion of the site but appear to have been locally eroded and replaced by undifferentiated alluvial deposits. The base of the marine terrace deposit was encountered throughout the Santa Catalina site and was a valuable correlative horizon that we were able to use for the determination of fault locations. At a site near the coast, Gurrola (2004) indicates the deposition of the base of the marine terrace deposits was about 47,000 years before present (47 ka). On the Santa Catalina Residence Hall site, a sediment sample from a zone a few feet above the base of the marine terrace deposit collected from BH-01 yielded a radiocarbon date of about 38,620 years before present (ybp) and a sediment sample from a zone about 2 feet below the top of the marine terrace deposit, collected from trench T-3, yielded a radiocarbon date of about 35,170 ybp. The marine terrace deposits are underlain by Pico Formation bedrock.

Pico Formation (Qtp)

Pico Formation was encountered below the marine terrace deposits. The Pico Formation is composed of weakly to non-cemented units of dark gray siltstone to clayey siltstone and sandstone. The siltstone to clayey siltstone unit was generally encountered in the northern half of the site and within 50 to 200 feet of the southern boundary of the site. Sandstone bedrock units were encountered in the south-central portion of the site and are bounded by siltstone to clayey siltstone bedrock to the north and south.

Bedding observed in the soil cores obtained from the drill holes indicate that layers within the Pico Formation range in dip from flat-lying up to about 58 degrees.

GROUNDWATER CONDITIONS

Four vibrating wire piezometers were installed at the site in March 2012. The piezometers were installed in a vertically stacked arrangement with two piezometers grouted in BH-02 (at depths of 27 feet and 45 feet) and two grouted in BH-07 (at depths of 20 feet and 40 feet). Initial piezometer readings were obtained on March 21, 2012, and follow-up readings were obtained on May 15, 2012. The piezometers in BH-02 indicated that the groundwater was at about an elevation (El.) of 12.4 to 13.7 feet and the piezometers in BH-07 indicated that the

groundwater was at about an El. of 7.6 to 9.6 feet. Groundwater was also encountered at an El. of about 12 feet in fault trenches T-1 and T-2.

At the conclusion of most of the CPT soundings, the CPT holes were checked for evidence of groundwater using a tape measure. The depths of caving noted in each of those probed soundings are assumed to be indicative of the approximate depth of groundwater and were used when normalizing the CPT data for processing.

FAULTING

PREVIOUS FAULT DATA

Geologic maps published by various researchers (Dibblee, 1987; Olson, 1982; Minor et al., 2009; Gurrola, 2004) and previous geologic studies performed by various consultants (KC Geotechnical, Fugro, CFS Consultants, Hoover and Associates, Leroy Crandall) have mapped or identified faults in the project vicinity that are generally associated with the Arroyo Parida-Mission Ridge-More Ranch fault system. However, the mapped locations and names of the faults vary somewhat among the various researchers.

The most recent published geologic maps for the region (Gurrola, 2004; Minor at al., 2009) show the More Ranch fault zone as two separate traces consisting of a North and South Branch. The North Branch of the More Ranch fault is generally mapped extending roughly east-west through the drainage channel located south of the existing Ocean Meadows Clubhouse building and the South Branch is generally shown trending in an east-west to slightly northeast-southwest direction near the intersection of Storke Road and El Colegio Road.

The local geologic and fault conditions in the project area, as mapped by Gurrola (2004) and Minor et al. (2009), are shown on Plate 3 - Local Geologic Map - Gurrola (2004), and Plate 4 - Local Geologic Map - Minor et al. (2009), respectively. Both published maps show the North Branch of the More Ranch fault to be located about 1,000 feet north of the site. Minor et al. (2009) maps the South Branch of the More Ranch fault trending east-west and in the area of El Colegio Road immediately south of the site. Gurrola (2004) maps the fault as trending east-west to northeast-southwest through the southern portion of the Santa Catalina Student Residence Hall site. The location of the South Branch of the More Ranch fault, as shown in the University's Long Range Development Plan, is shown on Plate 5 - UCSB Long-Range Development Plan Local Fault Map.

A study performed by CFS Consultants (2000) reportedly encountered evidence suggestive of faulting in a north-south-oriented series of CPT soundings performed in the parking lot/access road of the West Campus Apartments complex located across Storke Road west of the Santa Catalina site. CFS (2000) reports that the fault offsets marine sands and the underlying bedrock contact on the order of 12 feet with the earth materials on the south side displaced upward relative to the north. The fault was projected to extend to the east through the Santa Catalina Student Housing facility. The fault trace as mapped in the CFS (2000) study is shown on Plate 6 - Site Plan - CFS (2000). Fugro (2002) used the data from the CFS (2000) study, together with some limited additional soil drill holes and CPT soundings performed at the site, to provide a general estimate of the fault trace through the Santa Catalina Student Residence Hall facility. The inferred trace of the fault as shown in Fugro (2002) is shown on Plate 7 - General Fault Conditions - Fugro (2002).

Fault trenches excavated by consultants for past projects in the area (KC Geotechnical, Fugro, Leroy Crandall) have exposed faults in the excavations. KC Geotechnical and Fugro (1995, 1996) describe the faults encountered in the area west of Storke Road (west of and adjacent to the Ocean Meadows Golf Course) as discontinuous features with relatively short fault lengths.

Fault trenches excavated for the existing Santa Ynez Student Housing facility by Leroy Crandall (Leroy Crandall, 1979) about 600 feet west of Los Carneros Road and about 1,000 feet north of El Colegio Road encountered a small east-west striking, north dipping, high-angle reverse fault with at least 10 feet of offset. The fault logged by Leroy Crandall has north-side-up offset that is opposite to the movement reported in CFS (2000) for the South Branch of the More Ranch fault. Leroy Crandall shows the fault terminating to the east and queried to the west. That segment of faulting is reflected in Gurrola (2004).

Hoover (1985) performed additional fault trenching and fault evaluation work at the Santa Ynez Student Housing facility east of the project site and provided fault setbacks from interpreted faults in the southwest corner of the housing facility site. Hoover (1985) maps two faults in an area about 450 feet east of the southeastern boundary of the San Joaquin project site. One fault was shown as striking roughly east-west and located about 100 feet north of El Colegio Road. Hoover maps a second fault north of the east-west trending fault. The second fault is mapped as striking northwest-southeast and intersecting with and terminating the east-west-trending fault on the east. The faults reported in Hoover (1985) were interpreted from widely-spaced drill holes and shallow trench excavations. Direct evidence of faulting was not encountered in the Hoover fault trench excavations.

INTERPRETATIONS OF FAULTING

Our interpretations of the fault conditions at the Santa Catalina site developed from the CPT profile lines and fault trenches generated from this study are shown on Plate 8 - Interpreted Fault Conditions. On the basis of the data obtained for this study, we have defined three faults that traverse the site, herein referred to as the northern, central, and southern faults.

PROJECT DATA

As noted above, we developed detailed geologic profiles from the new CPT data and fault trenches to help evaluate the presence, orientations, and limits of faulting on the site. The CPT-correlation profile lines were drawn in a general north-south orientation without vertical exaggeration (i.e., equal horizontal and vertical scales) to provide a true spatial representation of the data and to allow improved correlation of the soil data. Data from the borings and trenches are also included on the CPT-correlation profiles. The locations of the CPT profile lines (Line 1 through Line 14) are shown on Plate 8 and the CPT-based geologic profile lines are shown on Plates 9 through 15.

We were able to recognize and correlate the: 1) undifferentiated alluvium, 2) marine terrace deposits, and 3) siltstone and sandstone units of the Pico Formation. Correlations of the CPT data in the northern portion of the site are readily apparent and the data correlate well from one CPT to the next. The bedrock in that area consists of Pico Formation siltstone to clayey siltstone. However, the correlations are less clear in the southern portion of the site where the Pico Formation consists of silty sandstone to sandstone and where the marine terrace deposits

have been partially eroded away and replaced by undifferentiated channel alluvium. Observations from the drill-hole-cores and fault trenches were used to help resolve some of the CPT correlations. Our interpretations of the conditions encountered in the14 CPT profile lines are provided below. Summary discussions of each of the three fault trenches excavated and logged for the project are provided in a subsequent section of the report.

Line 1. On the western CPT profile line (Line 1) (Plate 9), the marine terrace deposits are recognizable in all of the CPT soundings across the site. On that line, the marine terrace deposits are typically about 15- to 18-feet thick, but in the northern portion of Line 1 the top of the marine terrace appears to have been eroded by about 2 to 3 feet prior to deposition of the overlying undifferentiated alluvium deposits and in the southern portion of Line 1 the top of the marine terrace appears to have been eroded down to within a few feet of the underlying bedrock before alluvial deposition.

A distinct, south-side-up, reverse-fault-offset of the marine terrace deposit (with a corresponding repeat of stratigraphic section) is apparent in CPT-10 and BH-11. On the southern side of that fault offset, between about CPT-220 and the southern end of Line 1, the marine terrace deposits appear to have been eroded down almost to the top of the Pico Formation bedrock and replaced by undifferentiated channel deposits.

Near the southern end of Line 1, the Pico Formation bedrock contact has been uplifted about 10 feet by a distinct south-side-up fault that has an estimated 3 feet of dip-slip separation. The higher bedrock elevation observed at the south end of Line 1 (approximately El. 19 feet) is consistent with the elevations (approximately El. 20 feet) reported south of El Colegio Road in CFS (1997).

A thin layer of artificial fill appears to be present along the top of most of Line 1. The Pico Formation in the southern portion of Line 1, between CPT-08A and CPT-213, generally consists of a sandstone unit. Pico Formation siltstone to silty claystone bedrock was encountered elsewhere in Line 1.

Line 2. On CPT profile Line 2 (Plate 10), the marine terrace deposits are recognizable in all of the CPT soundings across the site. The top of the marine terrace deposit in the central portion of Line 2 appears to have been eroded from about CPT-45 through CPT-40. That erosion extends downward to within a few feet of the underlying Pico Formation. The remainder of the marine terrace deposits appear to be of relatively uniform thickness (about 14 to 17 feet thick).

Between CPT-45A and CPT-46, the Pico Formation bedrock contact has been displaced (south-side-up) about 15 feet by a reverse fault (with a corresponding repeat of stratigraphic section) that probably correlates with the fault observed near CPT-10 and BH-11 on Line 1 and the fault observed between CPT-51 and CPT-54 on Line 3.

CPT data at the south end of Line 2 indicate that a generally south-side-up gradual change in bedrock elevation of about 17 feet occurs between CPT-45A and CPT-81. The bedrock contact between those soundings is undulatory, but does not appear to exhibit distinct fault steps recognizable in the CPT correlations (except at CPT-56 where a 2-foot-fault offset is inferred). Cumulatively, the gradual bedrock elevation change on Line 2 may correlate with the fault and warping elevation changes observed at the southern end of Line 1 between CPT-09

and CPT-53 and the southern end of Line 3 between CPT-55 and CPT-247. The 17-foot combined offsets and/or warping observed in Line 2 appear similar to the observed 15-foot displacement due to faulting and warping at the southern ends of Lines 1 and 3. Similar to observations in Line 7, the changes in the interpreted bedrock elevation near the southern end of Line 2 appear to be distributed over a longer distance, rather than concentrated in a smaller interval as observed at the south ends of Line 1 and Line 3.

On Line 2, between soundings CPT-47 and CPT-26, there is an elevation difference at both the top and bottom contacts of the marine terrace deposit. That elevation difference appears to have resulted from tilting associated with a south-dipping fault located at about CPT-25B and CPT-26. We performed additional CPT Lines 4, 5, 6, 8, 9, 10, and 12 to evaluate the lateral extension of that fault to the west and east of Line 2. We note that a similar offset in the top and bottom of the marine terrace deposits was not observed in Line 1 or Line 3, so the fault interpreted in Line 2 does not appear to extend entirely through the site. Based on the data provided by the additional CPT lines, the fault appears to either terminate westward before Line 12 or change dip direction (see Line 4 discussion below) and continue south of Line 12 to merge with the fault observed at CPT-51 and CPT-51A on Line 3.

Where recognizable, possible north-dipping bedding correlations are locally shown in the Pico Formation bedrock as shown on Plate 10. The Pico Formation in the southern portion of Line 2, between CPT-230 and CPT-45, generally consists of a sandstone unit.

Line 3. On CPT profile Line 3 (Plate 11) west of the existing tennis courts, the marine terrace deposits are recognizable in the CPT soundings and are about 16 to 18 feet thick. Undifferentiated alluvial deposits are present overlying the marine terrace deposits. South of CPT-262, the marine terrace deposits have been eroded to within about 7 feet of the underlying Pico Formation bedrock.

Between CPT-54 and CPT-51, the base of the marine terrace deposit is offset (south-side-up) about 12 feet by a reverse fault (with a corresponding repeat of stratigraphic section) that probably correlates with the faults observed at CPT-10 and BH-11 (Line1), and CPT-45A and CPT-46 (Line 2).

Near the southern end of Line 3, the Pico Formation bedrock contact has been uplifted about 10 feet by a distinct south-side-up fault that has an estimated 6 feet of dip-slip separation. The higher bedrock elevation observed at the south end of Line 3 (approximately El. 16 feet and rising) is generally consistent with the elevations (approximately El. 20 feet) reported south of El Colegio Road in CFS (1997).

Although the contact between the marine terrace and Pico Formation north of CPT-51 is not planar (an interpreted erosional step is present between CPT-82 and CPT-280), it appears that the geologic units in the area between CPT-51 and CPT-307 have not been offset by faulting. Our interpretation of the geologic conditions in that area is shown on Plate 11. The Pico Formation in the southern portion of Line 3, between CPT-257 and CPT-267, generally consists of a sandstone unit.

Line 4. CPT data were acquired east of the existing loading dock area in an attempt to determine whether the fault offset interpreted in Line 2 between CPT-25 and CPT-26 extended to the west at that location. Our interpretation of the data acquired in this area is shown on CPT

profile Line 4 (Plate 12). It appears that the contact between the marine terrace deposits and the Pico Formation bedrock between CPT-248 and CPT-75 is relatively planar and not impacted by faulting. However, the terrace-bedrock contact between CPT-248 and CPT-291 has been offset by a north-dipping reverse fault (with a corresponding repeat of stratigraphic section). The contact on the south side of the fault is about 2 feet lower than the contact on the north side of the fault. It appears that the fault offset may represent a westward continuation of the fault structure interpreted between CPT-25B and CPT-26 on Line 2, although the dip of the fault on Line 4 is the opposite direction. On the site map (Plate 8) the fault seen on Line 4 is shown eastward from Line 4 to about Line 12 where it is terminated and the fault identified on Lines 2, 5, and 6 begins and continues eastward.

Lines 5 and 6. CPT data were acquired for CPT profile lines 5 and 6 to confirm the continuation and lateral extent of the secondary faulting encountered in CPT profile Line 2 between CPT-25B and CPT-26. CPT profile lines and interpreted geologic conditions for Lines 5 and 6 are shown on Plate12. The marine terrace deposits are identifiable along the entire length of each line. The marine terrace is typically 18 feet thick on Line 5 and ranges from 14 to 16 feet thick on Line 6.

The top of the marine terrace appears to have been eroded on Line 5 at CPT-64 and on Line 6 at CPT-72. The erosion removed about 4 feet of the marine terrace deposit at CPT-64 and about 13 feet at CPT-72. Undifferentiated alluvial deposits are present overlying the marine terrace deposits.

CPT data near the middle of Line 5 indicate that a 1-1/2-foot south-side-up change in bedrock elevation occurs on a fault between CPT-63 and CPT-64. CPT data near the middle of Line 6 indicate that a 3-1/2-foot south-side-up change in bedrock elevation occurs on a south-dipping fault between CPT-72 and CPT-74.

The base of the marine terrace deposits observed on Line 5 from CPT-63 toward the south has a distinctly steeper southward tilt, similar to that observed in Line 2 between CPT-46 and CPT-25. This is interpreted in the same manner as on Line 2 (i.e., that the slope is probably a result of deformation in the vicinity of the fault observed near CPT-45). The base of the marine terrace on Line 5 north of CPT-64 and on Line 6 north of CPT-72 is relatively level.

Line 7. CPT data were acquired in the area south of the existing swimming pool to evaluate whether the faulting observed in Line 1, Line 3, and Line 2 extends across the southern portion of the property. Our interpretation of the data acquired in this area is shown on CPT profile Line 7 (Plate 13). The marine terrace deposits were observed along the entire section length and are about 13 to 14 feet thick. Undifferentiated alluvial deposits are present overlying the marine terrace deposits. Where recognizable, possible north-dipping bedding correlations are locally illustrated in the Pico Formation bedrock as shown on Plate 13.

The contact at the base of the marine terrace deposits generally slopes downward toward the north, with the contact on north end of the profile being about 9 feet lower than the contact on the south end. A small, about 1-foot-high, step in the base of the marine terrace deposit was observed in the CPT correlation data in the area of BH-14 and BH-17. To evaluate the origin of that apparent step, fault trench T-3 was excavated adjacent to Line 7. T-3 encountered several minor faults within the marine terrace deposits (typically with tenths of an inch of offset). Each of the observed faults was only visible within the marine terrace deposits and it was not possible to trace those shear offsets upward into the overlying nonmarine

sediments. Several carbon samples were collected from the sediments encountered in T-3 and the adjacent borings, and subjected to radiocarbon age determination. On the basis of the dates obtained from T-3, the faults observed in the marine terrace deposits do not cut the overlying nonmarine deposits that are of pre-Holocene age.

Lines 8, 9, and 10. CPT data were acquired between Line 3 and Line 4 to evaluate the western extension of faulting observed in Line 4. Our interpretation of the data acquired in that area is shown on CPT profile Lines 8 and 9 on Plate 13 and Line 10 on Plate 14. The marine terrace deposits were observed along the entire length of each section and are about 14 to 17 feet thick. Undifferentiated alluvial deposits are present overlying the marine terrace deposits.

The base of the marine terrace deposits slopes downward slightly to the south in Line 8. In Lines 9 and 10, the bedrock contact appears to be relatively level although an apparent erosional depression appears at about the location of CPT-287. No discontinuities indicative of faulting were observed within the CPT soundings advanced for Lines 8, 9, or 10.

Line11. CPT data were acquired between Line 3 and Line 7 to evaluate the eastern extension of faulting observed at the southern ends of Lines 1 and 3. Our interpretation of the data acquired in that area is shown on CPT profile Line 11 (Plate 14). The marine terrace deposits were observed along the entire length of the section, although erosion has removed the upper portion of the marine terrace deposits down to within a few feet of the underlying bedrock. Undifferentiated alluvial deposits are present overlying the marine terrace deposits.

The base of the marine terrace deposit slopes downward to the north in CPT Line 11. CPT data along Line 11 indicate that a generally south-side-up gradual change in bedrock elevation of about 5 feet occurs between CPT-243 and CPT-118. The bedrock contact between those soundings is undulatory, and possible small steps in the base of the marine terrace deposits can be interpreted in the CPT correlations between CPT-223 and CPT-111 as well as between CPT-292 and CPT-113. Those small steps appear similar to the step exposed in trench T-3 and observed on CPT Line 7. The gradual bedrock elevation change on Line 11 may correlate with part of the fault and warping elevation changes observed at the southern end of Line 1 between CPT-09 and CPT-53 and the southern end of Line 3 between CPT-55 and CPT-247. The 5-foot elevation change observed on Line 11 is smaller than the observed 15-foot elevation difference produced by faulting and warping at the southern end of Line 1 and Line 3, suggesting that the fault observed at the southern ends of Lines 1 and 3 may project to the north of Line 11, beneath the existing building, as shown on Plate 8.

Line12. CPT data were acquired between Line 4 and Line 6 to evaluate the western extension of faulting observed at the northern end of Line 2. Our interpretation of the data acquired in that area is shown on CPT profile Line 12 (Plate 14). The marine terrace deposits were observed along the entire length of the section, and range in thickness from about 12 to 16 feet. Undifferentiated alluvial deposits are present overlying the marine terrace deposits.

On Line 12, the bedrock contact appears to be relatively level, and no discontinuities indicative of faulting were observed within the CPT soundings advanced for Line 12.

Line13. Additional CPT data were acquired in the area south of the existing swimming pool and east of Line 7 to evaluate whether the faulting observed in Line 1 and Line 3 extends across the southern end of the property. Our interpretation of the data acquired in this area is

shown on CPT profile Line 13 (Plate 15). The marine terrace deposits were observed along the entire section length and are about 13 to 15 feet thick. Undifferentiated alluvial deposits are present overlying the marine terrace deposits.

The contact at the base of the marine terrace deposits generally slopes downward toward the north, with the contact on north end of the profile being about 9 feet lower than the contact on the south end. The basal contact of the marine terrace deposits is relatively planar, with no significant steps apparent in the CPT correlations.

Line14. Three additional CPTs were advanced in the area south of the existing swimming pool and west of Line 7 to help evaluate whether the faulting observed in Line 1 and Line 3 extends across the southern end of the property. Our interpretation of the data acquired in this area is shown on CPT profile Line 14 (Plate 15). The marine terrace deposits were observed in the southern two CPT soundings, but have apparently been eroded or removed by grading in the northern CPT. Undifferentiated alluvial deposits and/or artificial fill materials are present overlying the marine terrace deposits.

Fault Trench T-1. Fault trench T-1 was excavated across the projected surface trace of the fault referred to herein as the northern fault. T-1 was excavated approximately north-south, and was about 45 feet long and 8 feet deep. The walls of the trench were stepped using approximately 3-foot-high vertical cuts separated by 3-foot-wide horizontal benches. The trench depth was limited by the presence of shallow groundwater at the bottom of the trench. T-1 was located adjacent to the eastern side of CPT Line 2, in the vicinity of CPT-26 through CPT-28. The western wall of the trench was logged at a scale of 1 inch equals 5 feet and is shown on Plate 16 The southern extent of the trench was limited by the presence of a buried sewer line.

Fault trench T-1 exposes a sequence of thick-bedded fine- and coarse-grained alluvial deposits that are gently-dipping to the north, as shown on Plate 16. There are three main alluvial units, denoted from top to bottom, Qal_1, Qal_2, and Qal_3, each of which exhibit pedogenic soil development in the form of translocated argillic (clay) subhorizons (Bt_1, BC, Bt_2, and Bt_3). The lowermost alluvial unit, Qal_3, exhibits soil subhorizons; denoted Bt_2 and Bt_3. The lower portion of the Qal_3 unit was saturated by the presence of shallow groundwater. Unit Qal_2, which consists of soil subhorizons Bt_1 and BC, overlies unit Qal_3. Qal_2 is overlain by Qcol, which consists of colluvium-derived material that contains abundant gravel-sized shale clasts. The shale clasts and surrounding matrix material are believed to have initially formed as the result of (fold or fault) scarp degradation. The location of the scarp is inferred to be proximal to the location of T-1, because the gravel clasts exhibit a subangular texture. The colluvium was subsequently mobilized as alluvium and deposited in a channel that lies adjacent to the scarp. A margin of that channel is exposed in the adjacent fault trench T-2 and T-2 contains the same Qcol unit. The uppermost alluvial Qal_1 unit forms the upper part of the alluvial sequence and a portion of the Qal_1 unit has been removed by the addition of artificial fill material. The undifferentiated artificial fill consists of at least two types of material. The alluvial and colluvial units in trench T-1 form relatively planar and continuous bedding contacts, which indicate that they are not faulted.

Fault Trench T-2. Fault trench T-2 was excavated across the projected surface trace of the fault referred to herein as the central fault. T-2 was excavated approximately north-south and was about 75 feet long and 7 to 8 feet deep. The walls of the trench were stepped using

approximately 3-foot-high vertical cuts separated by 3-foot-wide horizontal benches. The trench depth was limited by the presence of shallow groundwater at the bottom of the trench. The centerline of T-2 was located about 40 feet east of CPT Line 2, in the vicinity of CPT-45 through CPT-49. The eastern wall of the trench was logged at a scale of 1 inch equals 5 feet and is shown on Plate 17.

Fault trenchT-2 revealed a sequence of two main alluvial deposits that are denoted Qal_1 and Qal_2 as shown on Plate 17. The two alluvial units can be subdivided into older alluvial deposits (Qal_2) with a younger, incised section of colluvial ($Qcol_1$ and $Qcol_2$) and alluvial deposits (Qal_1). The older alluvial deposits form thick-bedded units south of Station 0+33 and exhibit pedogenic soil development in the form of translocated argillic (clay) subhorizons (Bt_1, Bt_2, Bt_3, BC_1, and BC_2). The younger alluvial deposits form thin- and thick-bedded units denoted Qal_1, $Qcol_1$, and $Qcol_2$, which are positioned north of Station 0+33. The basal Qal_2 unit that is exposed south of Station 0+33 exhibits Bt_1, Bt_2, Bt_3, and BC_2 soil subhorizons that consist of massive clayey sand and sandy clay. The Qal_2 units are overlain by the Qal_1 unit and partially overlain, through an onlap relationship, by the $Qcol_1$ unit at Station 0+35. The $Qcol_1$ and $Qcol_2$ units consist of sand with gravel that represents a channelized sequence that has eroded the Bt_1, and partially eroded Bt_2 units north of Station 0+33. The uppermost alluvial Qal_1 unit overlies the $Qcol_1$ unit north of Station 0+33 and the Bt_1 portion of the Qal_2 unit south of Station 0+33. A layer of artificial fill overlies the Qal_1 unit and has truncated a portion of the Qal_1 unit. The Qal_1, $Qcol_1$, and $Qcol_2$ units exposed in fault trench T-2 correlate to Qal_1 and Qcol that were exposed in fault trench T-1.

There are four fault-related features exposed and mapped in trench T-2. First, a shear was identified between Station 0+47 and Station 0+57, which included two distinct and developed gouge zones. Partings within the gouge zones exhibited shear surfaces with preserved straie, slickenlines, and mullions. The attitude of the shear is approximately N85E/18SE and the rake of slickenlines is approximately 14@N25E. Second, a diffuse shear zone was mapped at approximately Station 0+44, which was characterized by diffuse to moderately developed and polished shear surfaces. Third, a monoclinal fold was logged between Station 0+37 and Station 0+45 that forms a topographic step down to the north with approximately 1.5 feet of vertical relief. That fold is not related to the shear previously discussed because the soil subhorizon contact between Bt_2 and Bt_3 is not deformed on the hanging wall of the shear. Therefore, the fold is not related to slip on the exposed shear but is most likely related to slip on a fault that is below the bottom of the T-2 excavation (on the basis of projections made from CPT correlations). Fourth, a channel bank margin is positioned at Station 0+33 that juxtaposes dissimilar alluvial units is believed to be the result of surface uplift associated with the tectonic development of a fold scarp. A fold scarp is an escarpment that results from the topographic expression of a fold, and in this case, is the surface expression of the monoclinal fold. The monoclinal fold produced a subtly-expressed north-facing escarpment that likely controlled the position of the channel bank margin.

The colluvial-derived $Qcol_1$ and $Qcol_2$ units that form the channel-fill deposits, were likely produced from degradation of a (fault or fold) scarp along the same fault zone. That material was subsequently mobilized as alluvium within the channel margin. The faulting event that produced the monoclinal fold is inferred to be the same event that produced the scarp, which ultimately produced the $Qcol_1$ and $Qcol_2$ units.

Fault Trench T-3. Fault trench T-3 was excavated across an area where correlations from CPT Line 7 suggested there was a 1-foot-high step in the contact between the alluvium and the underlying marine terrace deposits. T-3 was excavated north-south and was about 55

feet long and 12 to 14 feet deep. The walls of the trench were cut vertically and shored with hydraulic shores. The trench depth was limited by the presence of caving sand within the marine terrace sand deposit encountered at the bottom of the trench. Because localized caving of the marine terrace within the southern part of the trench caused potentially unsafe conditions to develop in that area, the southern 30 feet of the trench was widened using an approximately 1:1 slope on the east side and a series of vertical cuts with horizontal benches on the west side to facilitate logging. The centerline of T-3 was located a few feet west of CPT Line 7, in the vicinity of CPT-228 through CPT-95. The western wall of the trench was logged at a scale of 1 inch equals 5 feet and is shown on Plate 18.

Fault trench T-3 exposes a stratigraphic sequence of marine and alluvial terrace deposits as shown on Plate 18. The deposits consist of thin- and thick-bedded fine- and coarse-grained units that are gently-dipping to the north. Marine terrace deposits (Qt), which consist of poorly graded medium- to fine-grained sand, form the lowermost unit exposed in the trench. Alluvial deposits consisting of both coarse- and fine-grained sediments overlie the terrace unit and exhibit pedogenic soil development in the form of translocated argillic (clay) subhorizons (Bt_1, Bt_2, Bt_3, and Bt_4). There are three main alluvial units that are subdivided into pedogenic subhorizons, denoted from top to bottom, Qal_1, Qal_2, and Qal_3. The lowermost alluvial unit, Qal_3, contains soil subhorizons, denoted as Paleosol 2 (P_2), Bt_3, and Bt_4, and directly overlies the marine terrace deposit. Unit Qal_3 is overlain by the Qal_2 unit, which consists of Paleosol 1 (P_1) and Bt_2. Qal_2 is overlain by Qal_1, which consists of Bt_1, BC_{1a}, and BC_{1b}. The paleosol units in Qal_2 and Qal_3 have been mostly removed by erosion, however, where present, they consist of upper soil horizons that suggest a former (and now buried) ground surface. Artificial fill material caps the alluvial materials and emplacement of that fill material resulted in the removal of the uppermost soil horizons associated with the Qal_1 unit.

Trench T-3 exposed a total of sixteen shears that form a diffuse fault zone. The shears displace pedogenic clay bands (Bt bands) that have formed subsequent to the deposition of the terrace deposits. The shears form 1/8- to 1-inch wide zones composed of clayey silt and vertically displace the clay Bt bands approximately 1/8- to ½-inch. The observed apparent offsets exhibit both normal- and reverse-slip motion and in some cases, both senses of slip were observed along the same shear feature, suggesting that there may have been a component of horizontal slip associated with the fault motion. Alternatively, the slip on the individual faults may have been reverse and produced apparent normal-slip offsets as a result of the wavy and undulating geometry of the clay bands in the marine terrace unit.

The vertical extent of shearing for most of the fault zone exposed in trench T-3 extends into the upper portion of the marine terrace unit (Qt) as shown on Plate 18. Shears S4, S5, S6, and S7 located in the area between Station 0+11 and Station 0+14 displace the entire terrace unit and extend up to but do not displace the contact with the overlying Bt_4 soil subhorizon of unit Qal_3. The shears associated with S4, S5, S6, and S7 appear to terminate at the contact with the overlying Qal_3 unit, and cannot be traced into that overlying unit.

FINDINGS AND CONCLUSIONS

FAULT-RUPTURE MITIGATION

Introduction

There are three principal means of mitigating the potential hazards associated with earthquake fault rupture: 1) avoidance (setbacks), 2) geotechnical engineering, and 3) structural engineering (Bray, 2001). The first approach is avoidance, which commonly takes the form of building setbacks. Typically, avoidance methods are employed where there is sufficient development space available to accommodate the setbacks or where the potential amount of fault-related slip is anticipated to be large. The second approach is the use of unconsolidated geomaterials to "locally absorb" and distribute tectonic movements. With geotechnical engineering mitigations, reinforced fills can be used to dissipate the shear rupture plane as it rises through the fill, thereby spreading the displacement across a wider zone in the overlying fill. Unless the potential offsets are expected to be very small, geotechnical mitigations are typically accompanied by the third approach, which is the structural design of the constructed facility to undergo some limited amount of ground deformation without collapse or significant structural damage. Common structural mitigation measures include the use of appropriately designed structural mat foundations.

The choice as to which mitigation measure(s) should be employed at a site is typically based on the estimated magnitude of ground displacement and the potential consequences that the development can tolerate. For large potential offsets on major well-defined faults (especially on sites that have significant available development space) avoidance is the most common approach. However, when the potential offsets are likely to be small or only warping is anticipated (and development space is limited), consideration can be given to the use of geotechnical and/or structural mitigations. Faults or warping areas that may have small anticipated displacements may be candidates for the use of geotechnical and/or structural mitigations on some sites.

Site Observations

Our interpretations of the fault conditions at the Santa Catalina site developed from this study are shown on Plate 8. On the basis of the data obtained for this study, there are three faults that have been recognized at the site; herein referred to as the northern, central, and southern faults.

The most significant of those three faults is the central fault, which can be traced across the site between Lines 1, 3, and 2. That south-side-up reverse fault offsets the base of the marine terrace deposits by about 10 to 11 feet on the western side of the site (Lines 1 and 3) and by about 15 feet on the eastern side of the site (Line 2). The central fault appears to have about 13 to 14 feet of dip-slip separation and the fault dips to the south at about 40 to 50 degrees. On the western side of the project site, two surface traces of the fault are interpreted from the CPT data (Lines 1 and 3) and on the eastern side of the site two surface traces are suggested by the CPT data in conjunction with near-surface observations made in trench T-2 (Line 2).

The fault referred to herein as the northern fault was observed on CPT profile Lines 4, 6, 2, and 5. Where observed near the southern end Line 4, that north-side-up reverse fault dips to the north at about 50 to 55 degrees and it offsets the base of the marine terrace deposits by about 2 to 3 feet. In Line 4, the fault appears to have about 5 feet of dip-slip separation at the base of the marine terrace deposit. We attempted to trace fault observed on Line 4 eastward using CPT profile Line 12, however, either the fault projects south of Line 12 or the fault dies out before it reaches Line 12. In the next CPT profile line to the east of Line 12, Line 6, a south-dipping fault is observed in about the area of an eastward projection of the north-dipping fault observed on Line 4. That south-dipping fault can then be traced further eastward crossing Lines 2 and 5. Although the dip of the fault feature observed on Line 4 is northward and the dip of the northerly fault feature observed on Lines 6, 2, and 5 is southward, we believe that the faults may be related because they form the northern boundary of a down-dropped graben structure on the northern side of the central fault. On the basis of a slight depression of the contact at the base of the marine terrace observed on Line 3, directly north of the central fault, we believe that the northern fault is likely to be a splay off of the central fault that branches off in the area east of Line 3.

The fault referred to herein as the southern fault was observed in CPT profile Lines 1 and 3. Where observed near the southern end of Line 1, that south-side-up reverse fault dips to the south at about 50 degrees and it offsets the base of the marine terrace deposits by about 10 feet. At the southern end of Line 3, that south-side-up reverse fault dips to the south at about 65 degrees and offsets the base of the marine terrace deposits by about 10 feet. In Line 1, the fault appears to have about 3 feet of dip-slip separation at the base of the marine terrace deposit and at Line 3 there appears to be about 6 feet of dip-slip separation. We attempted to trace the fault observed on Lines 1 and 3 eastward using CPT profile Lines 11, 7, 13, and 2, however, none of those lines encountered the fault. On the basis of the fault's positions in Lines 1 and 3, it appears that the eastward projection of the fault would generally be north of Line 11, beneath the existing building. Further eastward projection should place the fault within Lines 7, 13, and 2; however, the distinct fault structure observed in Lines 1 and 3 was not visible on Lines 7, 13, or 2. Instead of the distinct fault offset of the base of the marine terrace as observed on Lines 1 and 3, Lines 7, 13, and 2 suggest that a similar north to south elevation change occurs gradually over a broad zone of warping over 200 feet wide, without recognizable fault offset. Trench T-3 was excavated across a portion of that broad zone of elevation change and encountered numerous minor shears visible in the marine terrace sand (with small offsets on the order of tenths of an inch where offset Bt bands could be correlated). Efforts were made in the trench-wall exposures to follow those shears from the marine terrace sand into the overlying alluvial deposits, but shears were not visible within the alluvial deposits.

A three-dimensional surface diagram was prepared to illustrate the general spatial relationships of the three faults and their offset of the base of the marine terrace deposits (Plate 19). As shown on that diagram, in the northern portion of the site (north of the northern fault), the base of the marine terrace deposit is inclined gently eastward at about 2 to 3 percent (sloping from about El. -7 feet on the western side of the site to about -24 feet on the eastern side). The northern fault and the central fault bound a wedge-shaped graben-like feature in which the base of the marine terrace is inclined toward the north (about 4 percent) and to the east (about 10 percent). At the southern edge of that graben block, the base of the marine terrace deposit north of the central fault is lower than the base of the marine terrace deposit south of the central fault. In the area between the central fault and the southern fault, the base

of the marine terrace deposit is inclined generally northward (at about 4 to 6 percent) and northeastward (at about 6 to 8 percent). South of the southern fault, the base of the marine terrace is gently inclined to the north and northeast (at about 4 to 6 percent).

Radiocarbon Age Determinations

Twenty samples of sediment that contained detrital-charcoal and/or -organics were collected from the borings and trench-wall exposures. Eleven samples came from the boring cores and nine samples were extracted from the trench walls. The samples were shipped to Beta Analytic, in Miami, Florida and processed using Accelerator Mass Spectrometry (AMS) techniques to yield conventional radiocarbon ages. Those conventional radiocarbon ages were then calendar calibrated using the journal Radiocarbon's 2009 INTCAL09 standard calibration curve to produce calendar dates expressed as years before present (ybp). The results of the radiocarbon testing are summarized in Table 1 and plotted on the corresponding CPT profiles and trench logs. Reports from Beta analytic are provided on the attached CD.

Table 1. Radiocarbon Dating Results

Sample Name	Sample Number	Material	Location	Depth (Ft)	Calibrated Radiocarbon Age (Ybp)	Range Of Calibrated Radiocarbon Age ± 2 Sigma (Ybp)
BH-1 @ 24.6ft	C-36	Marine Terrace	BH-1	24.6	38,620	38,840 - 37,980
BH-1 @ 34.2ft	C-33	Pico Formation	BH-1	34.2	25,640	25,960 - 25,150
BH-2 @ 27.8ft	C-35	Pico Formation	BH-2	27.8	>43,500	-
BH-5 @ 29.5ft	C-28	Pico Formation	BH-5	29.5	>43,500	-
BH-9 @ 14.13ft	C-25	Alluvium	BH-9	14.13	17,660	17,850 - 17,550
BH-11 @ 7.5ft	C-30	Alluvium	BH-11	7.5	21,340	21,440 - 21,220
BH-8 @ 6.77ft	C-40 + C-41	Alluvium	BH-8	6.77	17,180	17,440 - 17,070
BH-8 @ 8.13ft	C-42	Alluvium	BH-8	8.13	9,530	9,540 - 9,480
BH-8 @ 9.71ft	C-44	Alluvium	BH-8	9.71	8,400	8,440 - 8,360
BH-8 @ 11.75ft	C-45	Alluvium	BH-8	11.75	18,550	18,590 - 18,500
BH-8 @ 17.75ft	C-49	Alluvium	BH-8	17.75	24,770	24,970 - 24,480
T-3 @ 9.05ft	C-42	Alluvium	Trench T-3	9.05	17,010	17,160 - 16,910
T-3 @ 9.25ft	C-43	Alluvium	Trench T-3	9.25	8,010	8,150 - 7,950
T-1 @ 4.05ft	C-53	Alluvium	Trench T-1	4.05	5,800	5,900 - 5,660
T-1 @ 6.35ft	C-55	Alluvium	Trench T-1	6.35	11,320	11,610 - 11,240
T-2 @ 3.55ft	C-50	Alluvium	Trench T-2	3.55	13,300	13,380 - 13,240
T-3 @ 8.0ft	C-41	Marine Terrace	Trench T-3	12.95	35,170	36,380 - 34,770
T-3 @ 9.10ft	C-45	Alluvium	Trench T-3	8.0	26,700	26,890 - 26,230
T-3 @ 12.95ft	C-47	Alluvium	Trench T-3	9.1	14,240	14,880 - 14,130
B-17 @ 8.35ft	C-57	Alluvium	BH-17	8.35	5,540	5,590 - 5,330

A schematic diagram was prepared to illustrate the generalized stratigraphic relationships on the site and the relative positions of the radiocarbon samples (Plate 20). On the basis of the radiocarbon dates obtained at the site, we have concluded the following:

- The Pico Formation (QTp) bedrock is too old to be dated by radiocarbon techniques. Two of the three Pico samples tested yielded results that indicated their age was in excess of 43,000 ybp (the maximum age for radiocarbon testing) and the third sample yielded an age of 25,640 ypb. Because of its stratigraphic position, the 25,640 ybp date is believed to be too young for that formation, therefore that sample is believed to have been contaminated.
- A radiocarbon date from near the base of the marine terrace deposit (Qt) indicates that the base of that unit is older than 38,620 ybp. A radiocarbon date from near the top of that marine terrace deposit indicates that the top of that unit is younger than 35,170 ybp.
- Radiocarbon dates from the alluvial deposits indicate that near their base, those alluvial deposits are in the range of about 20,000 to 26,000 ybp. Near-surface dates within those alluvial deposits suggest that the Holocene/Pleistocene boundary varies in depth from about 4 to 10 feet below the present ground surface.

As noted above, because of its stratigraphic position, the 25,640 ypb date obtained from within the Pico Formation is believed to be an order of magnitude or more too young for that formation, therefore that sample is believed to have been contaminated. In addition, there are some minor inconsistencies in the stratigraphic order of some of the dates obtained from trench T-3, but (except for the 8,010 ybp and 5,540 ybp dates) those dates are generally similar and significantly pre-Holocene. We believe that those inconsistencies in T-3 may be the result of bioturbation, groundwater contamination, and/or reworking of older sediments. Also, the 8,010 ybp and 5,540 ybp dates obtained near the base of the alluvial deposit (at depths of 9.25 and 8.35 feet, respectively, in T-3) appear to have been contaminated because, by their stratigraphic position near the base of the alluvial deposits, comparison with other lower-portion-of-alluvium radiocarbon dates on the site indicates that dates 2 to 3 times as old as those would be expected. Overall, despite those minor inconsistencies, the radiocarbon dates obtained at this site provide a consistent and useful characterization of the age of the deposits.

The age of the base of the marine terrace deposits has been determined using solitary coral fossils by Gurrola (2005) at a sea cliff exposure about 0.75 mile southeast of the subject site to be approximately -47,000 +/- 500 ybp, which is consistent with the radiocarbon ages determined at the Santa Catalina site. Additional terrace chronology and fault data were acquired from a fault trench located on the Ellwood terrace about a mile southwest of the subject site. The upper terrace deposits were determined to be approximately 37,000 +/- 600 ybp and the overlying alluvial deposits were determined to be 35,900 +/- 600 ybp. This terrace-alluvial contact also defined an earthquake horizon which separates faulted units from overlying non-faulted units. Based on the established terrace chronology on the San Joaquin site and faulting relationships, the timing of the faulting event at about 35,000 ybp in T-3 may be the same faulting event recognized by Gurrola (2005).

Age of Faulting

Historically, Gurrola and Keller (2000) reported that the More Ranch segment of the More Ranch-Mission Ridge-Arroyo Parida fault zone is "apparently active." They define the term "apparently active" as having very young (probably Holocene) topographic expression of activity. Although they consider the fault to be "apparently active," the State Geologist has not yet designated an Alquist-Priolo Earthquake Hazard Zone for the More Ranch fault.

The radiocarbon dates we obtained from the Santa Catalina site indicate that tectonic uplift on the fault herein referred to as the central fault juxtaposes strata of Holocene age against strata of Pleistocene age, thus indicating the fault should be considered active (i.e., it offsets strata of Holocene age).

Pleistocene radiocarbon dates (in the range of about 17,000 to 27,000 ybp) from the uncut alluvial layers that overly the faulted marine terrace deposits in T-3 indicate that the faulting observed at the base of trench T-3 is pre-Holocene and can be considered inactive. That pre-Holocene fault-age determined in T-3 is considered to apply to similarly north-tilted (but not demonstrably faulted) strata observed on CPT Lines 7 and 11, and near the south end of CPT Line 2.

To the west of trench T-3, the age of faulting for the fault referred to herein as the southern fault has not been determined. Consequently, unless sediments of Holocene age can be demonstrated to be uncut by that fault, it should be considered active for purposes of fault-rupture mitigation.

Because the absence of Holocene fault offset cannot be demonstrated for the fault referred to herein as the northern fault, and that fault appears to be a splay of the central fault, the northern fault should be considered active for purposes of fault-rupture mitigation.

Recommendations

We understand that it is UCSB's policy that structures should not be sited on active faults and that the design and construction of new structures should comply with the current requirements CCR Title 24, California Building Standards Code or local seismic requirements, whichever is more stringent. Consequently, for the faults on the site that are noted above to be active, we recommend that no structure be constructed across their fault trace.

Consistent with the general standard of practice, we recommend that building setbacks be established within 50 feet of the active fault traces. Building setback zones from the active faults we identified in this study are indicated on Plate 8. The setbacks were generally plotted about 50-feet wide on either side of the fault traces.

Because Holocene strata are not cut by active faults in an area within the southeastern portion of the site, structural setbacks are not required there. However, because there is a potential for near-surface deformation and uplift caused by tectonic movement at depth that has not yet propagated through to the surface, we recommend that geotechnical and/or structural mitigations be implemented for structures planned in that area. We recommend that the proposed planning study include an engineering effort to evaluate geotechnical/structural

mitigations for vertical deformations that may be associated with the potential deformation area designated in the southeastern portion of the site as indicated on Plate 8.

CLOSURE

We appreciate the opportunity to provide our services on the project and to assist UCSB in their planning effort for the Santa Catalina Student Residence Hall facility. If you have any questions or need additional input regarding our findings and conclusions, please call the undersigned at (805) 650-7000.

Sincerely,

FUGRO CONSULTANTS, INC.

Gregory S. Denlinger, GE
Principal Engineer

Thomas F. Blake, GE, CEG
Principal Engineering Geologist/Geotechnical Engineer

Attachments: References
Plates 1 through 20
Appendix A - Logs of Drill Holes
Logs of the CPT Soundings (Appendix B) and Reports from Beta Analytic provided on the attached CD

Copies Submitted: (6) Addressee and Pdf on CD

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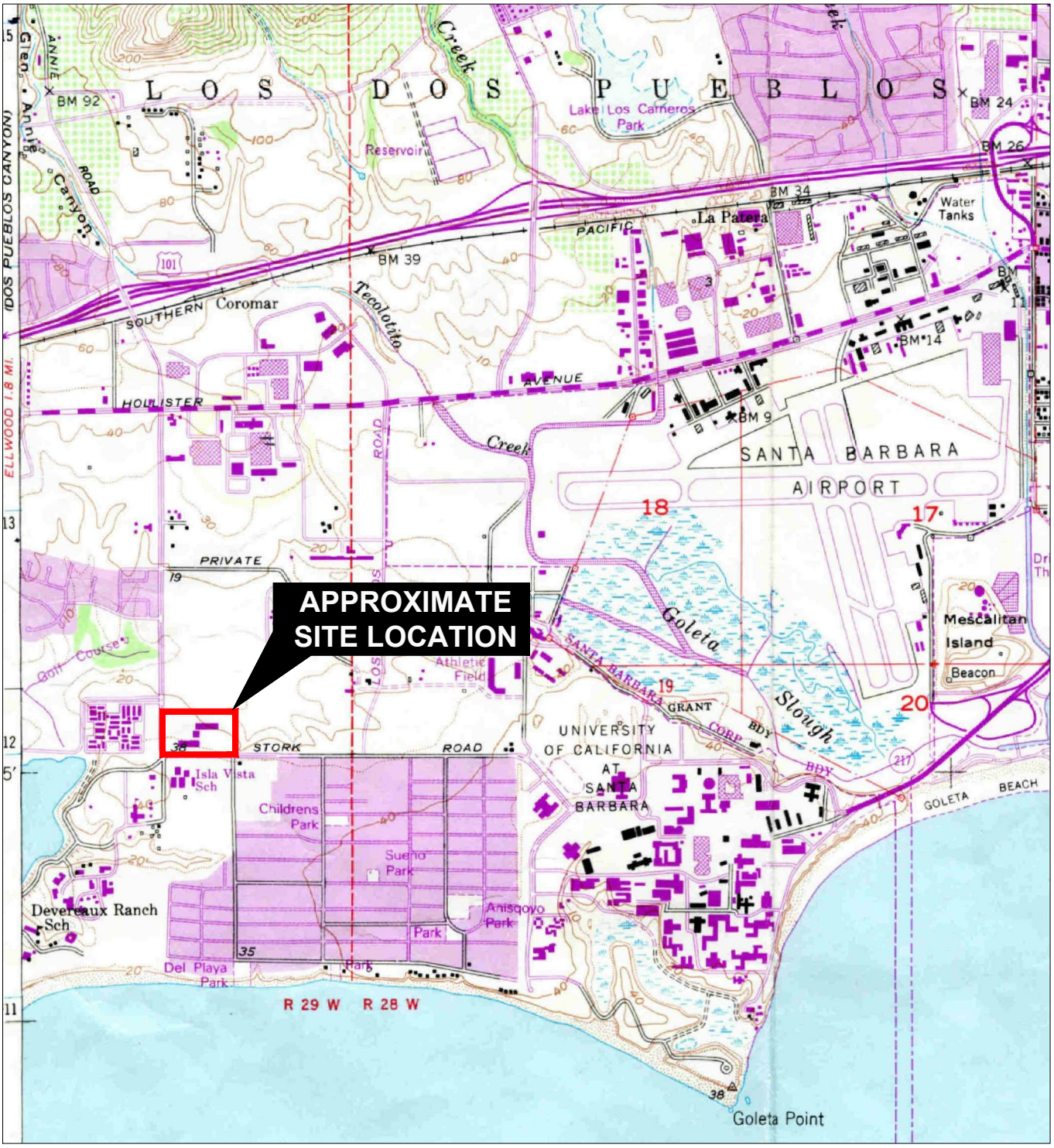
PLATES



BASE MAP SOURCE: USGS Topographic Map, 7.5 Minute Series, Goleta Quadrangle (1950, revised 1982).

VICINITY MAP

San Joaquin Apartments and Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

PLATE 1

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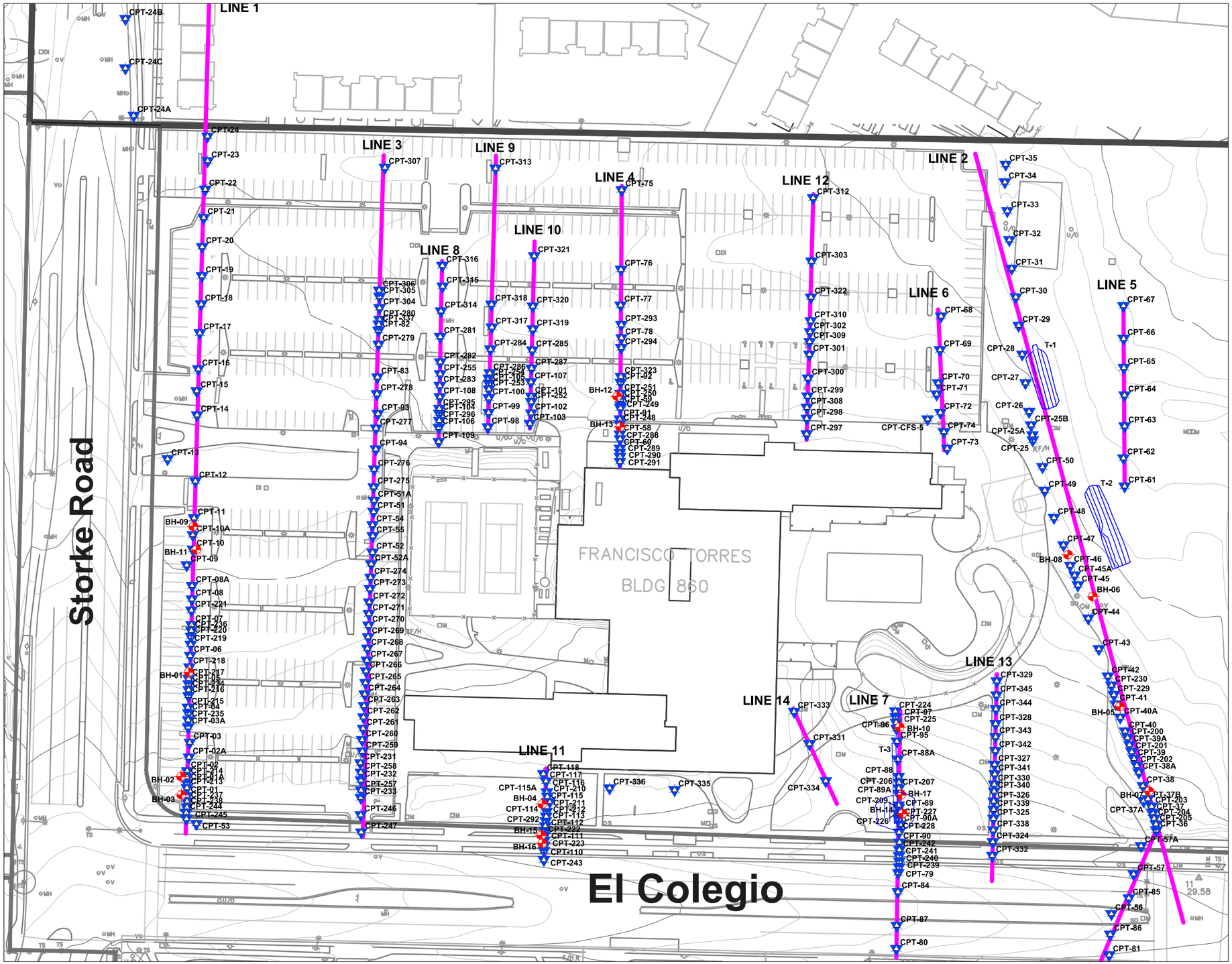

LEGEND

CPT-337 Approximate CPT location

BH-17 Approximate Boring location

T-1 Fault Trench

NORTH

0 100 200

FEET

BASE MAP SOURCE: Santa Catalina base map from UCSB.

EXPLORATION LOCATION PLAN
San Joaquin Apartments and Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

PLATE 2

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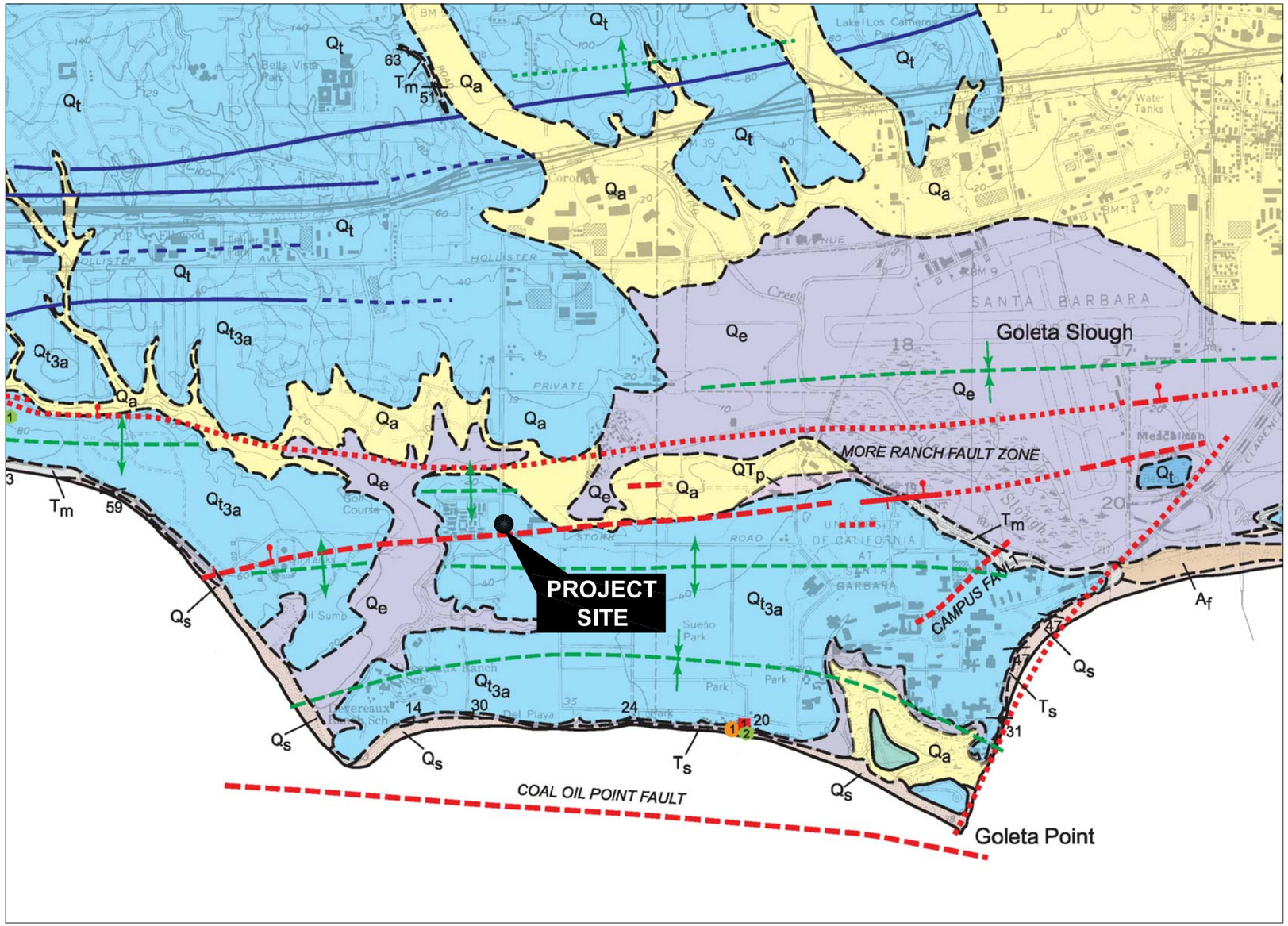


BASE MAP SOURCE: Geologic Map of the Western Santa Barbara Fold Belt, Santa Barbara, California (Gurrola, 2004).

LEGEND

Af	Artificial fill
Qs	Beach Sand - Unconsolidated marine and aeolian sand
Qa	Alluvium - Undifferentiated alluvial, stream channel, and flood plain deposits composed of silty sands to sandy gravels
Qe	Estuarine Deposits - Commonly estuarine silts and clays with sand interbeds and lenses
Qt3a	Marine Terrace Deposits - Second marine terrace associated with oxygen isotope substage 5a with Qt5a1 indicating youngest terrace
Qt	Marine Terrace Deposits (unknown age) - medial to nearshore marine sands with aeolian silts
QTp	Pico Formation - Marine conglomerates, sandstones, and siltstone with minor fossils
Ts	Sespe Formation - Undifferentiated gravel conglomerate, sandstone, and shale deposits

Geologic contact, location approximate, concealed or inferred

Fault, location approximate where dashed, location concealed (blind) or inferred where dotted; ball and bar on downthrown side, tic indicates dip of fault; single arrow indicates minor component of strike-slip, double arrows indicate strike-slip fault

Anticline, location approximate where dashed, inferred where dotted; plunge direction indicated

Syncline, location approximate where dashed, inferred where dotted; plunge direction indicated

Marine terrace shoreline or strandline, location approximate

35 Strike and dip of inclined beds

Vertical beds

85 Strike and dip of overturned beds

2 Optical stimulated luminescence sample site number 5

1 Uranium-series sample site number 2

3 Radiocarbon sample site number 3

NORTH

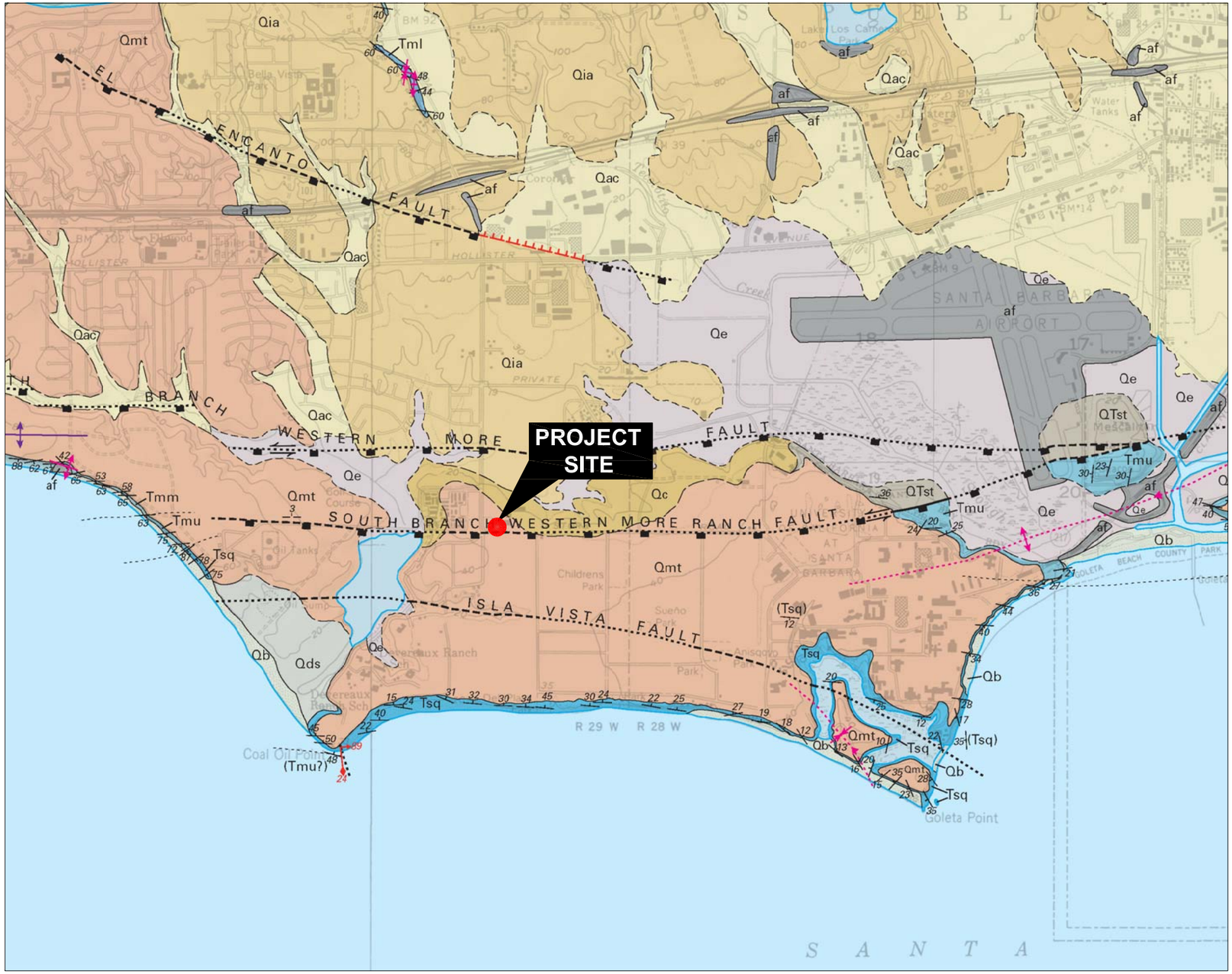
0 2000 4000

FEET

LOCAL GEOLOGIC MAP - GURROLA (2004)
San Joaquin Apartments and Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

PLATE 3

M:\Drafting\JOBFILES\2012\04.62110136\Drawings\B04.62110136-03 geo-Gurrola.dwg 06-18-2012 - 3:28pm



BASE MAP SOURCE: Geologic Map ot the Santa Barbara Coastal Plain Area, Santa Barbara County, California, (Minor, Kellogg, Stanley, Gurrola, Keller and Brandt, 2009).

LEGEND

af	Artificial Fill	Qmt	Marine terrace deposits
Qb	Beach deposits	QTst	Siltstone unit
Qds	Dune sand	Tsq	Sisquoc Formation
Qe	Estuarine deposits	Tmu	Upper siliceous unit
Qac	Alluvium and Colluvium	Tmm	Middle shale unit
Qc	Colluvium	Tml	Lower calcareous unit
Qia	Intermediate alluvial deposits		

Contact - Long-dashed where approximately located; short-dashed where inferred; dotted where concealed; tic shows direction and angle of dip

Fault - Long-dashed where approximately located; short dashed where inferred; dotted where concealed; queried where uncertain; bi-directional arrows indicate superposed dextral and sinistral slip on same fault

Fault-line scrap - Inferred from aerial photographs; hachures point downscrap

Reverse Fault - Rectangles on apparent upthrown side

Anticline - Large arrow indicates plunge direction

Syncline - Large arrow indicates plunge direction

Strike and dip of beds:

40 Inclined

35 Inclined (approximate)

NORTH

0 2000 4000

FEET

LOCAL GEOLOGIC MAP - MINOR et al. (2009)
San Joaquin Apartments and Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

PLATE 4

M:\Drafting\JOBFILES\2012\04.62110136\Drawings\B04.62110136-04 geo-Minor.dwg 06-18-2012 - 3:29pm

MAP SOURCE: UCSB Long Range Development Plan, Crawford, Multari & Clark Associates (October 2007).

LEGEND

- Fault Concealed
- Approxiamate Fault Location
- UC Santa Barbra Campus Boundary

NORTH
0 1000 2000
FEET

UCSB LONG-RANGE DEVELOPMENT PLAN
LOCAL FAULT MAP
San Joaquin Apartments and Precinet Improvements
University of California Santa Barbara
Santa Barbara, California

PLATE 5

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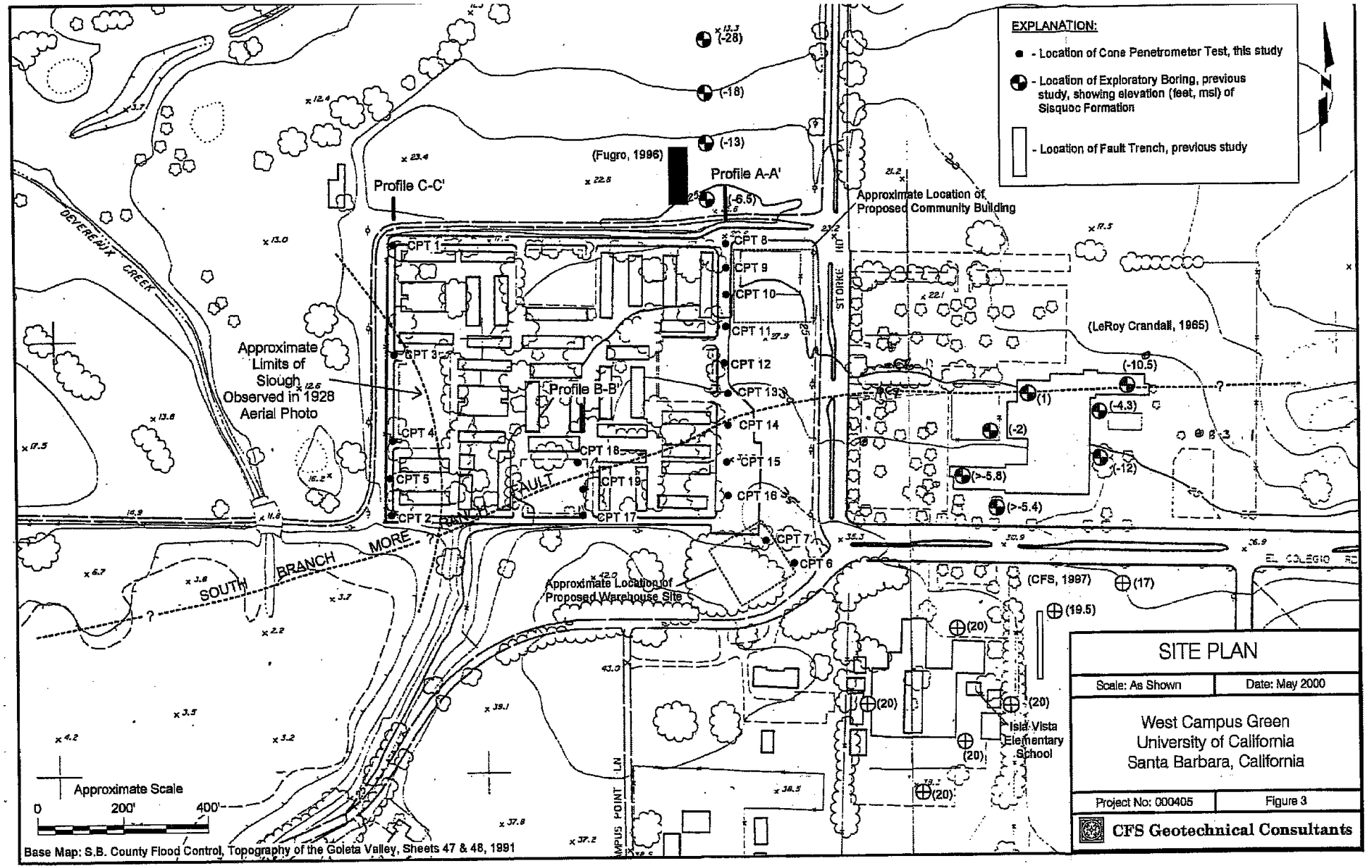

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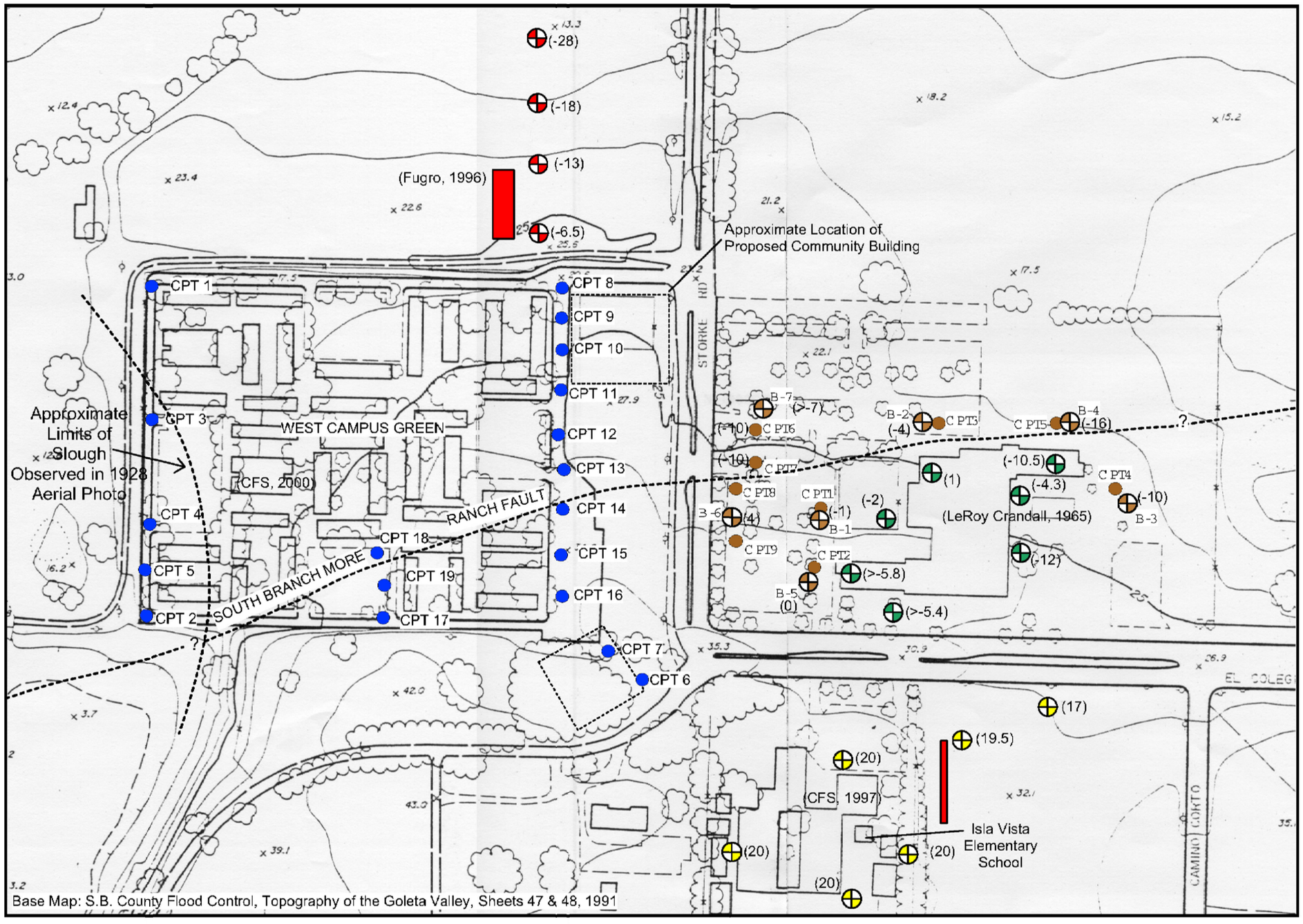
BASE MAP SOURCE: Site Plan, West Campus Green University of California, Santa Barbara, California, CFS Geotechnical Consultants (May 2000).

SITE PLAN - CFS (2000)
San Joaquin Apartments and Precinct Improvements
University of California Santa Barbara
Santa Barbara, California



LEGEND

- CPT Sounding Cone Penetrometer Test Location
- Boring Location, previous study, showing elevation (feet, msl) of bedrock
- Fault Trench Location
- LeRoy Crandall 1965 Study
- Fugro 1996 Study
- Fugro 2002 Study
- CFS 1997 Study
- CFS 2000 Study
- ------- Inferred location of fault
- (-4.3) Underlying bedrock elevation

All locations and dimensions are approximate.

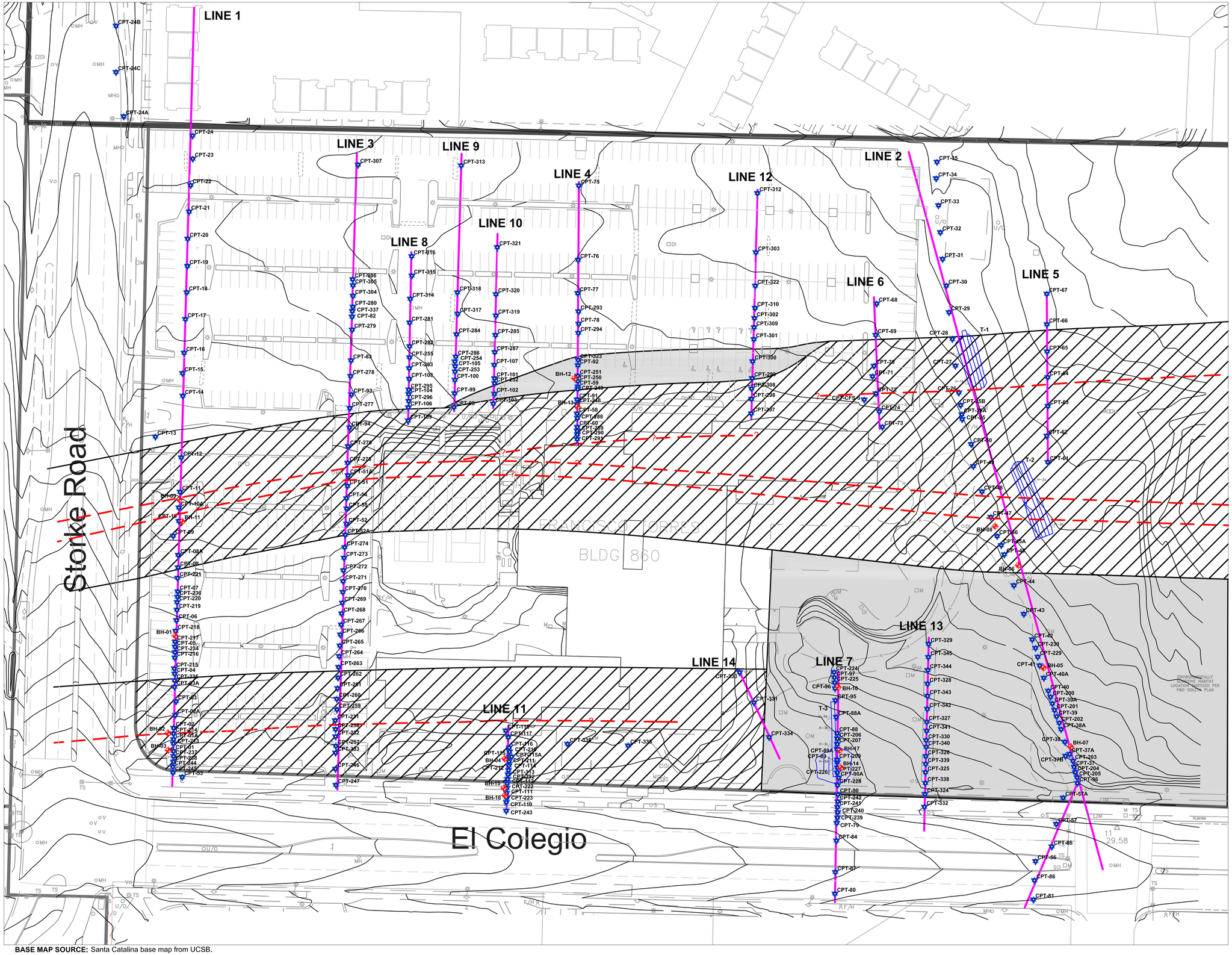
Approximate Scale
0 200' 400'

GENERAL FAULT CONDITIONS - FUGRO (2002)
San Joaquin Apartments
and Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

BASE MAP SOURCE: Site Plan from Fugro 2002 report.

PLATE 7

M:\Drafting\JOBFILES\2012\04.62110136\Drawings\B04.62110136-07 Gen Fault.dwg 06-18-2012 - 3:33pm



LEGEND

- CPT-109 — Approximate CPT location
- DH-17 — Approximate Boring location
- LINE 14 — Section Line
- ? — Estimated fault location (queried where uncertain)
- Recommended fault setback
- Setback Zone
- T-1 — Fault Trench
- H=36 — Trench Control Point Survey Hub
- Zone of Pleistocene faulting or warping, where foundation mitigation measures should be used

BASE MAP SOURCE: Santa Catalina base map from UCSB.

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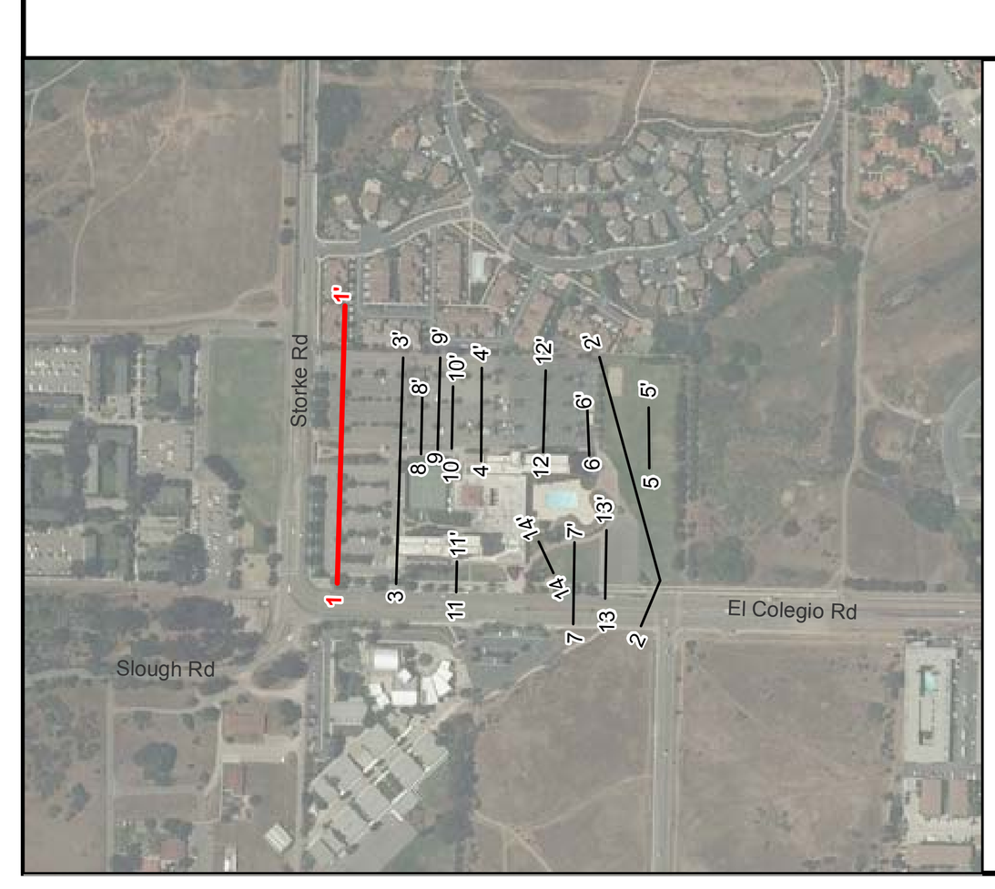
INTERPRETED FAULT CONDITIONS

San Joaquin Apartments
and Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

University of California Santa Barbara

04.62110136 | July 19, 2012 | Plate 8

Line 1



Map Legend

- Borings
- CPTs
- Survey Hubs
- Current Profile
- Profile Line
- Topography
- Trench

Profile Legend

- RC=5,660 ybp — Calibrated Radiocarbon Age in Years Before Present (ybp)
- Dip in Degrees Measured from Core
- Range of Dip Orientations
- Minor correlation line
- Top of Marine Terrace
- Bedrock contact
- Interpreted fault (arrows show direction of apparent slip)
- Topography

Geologic Legend

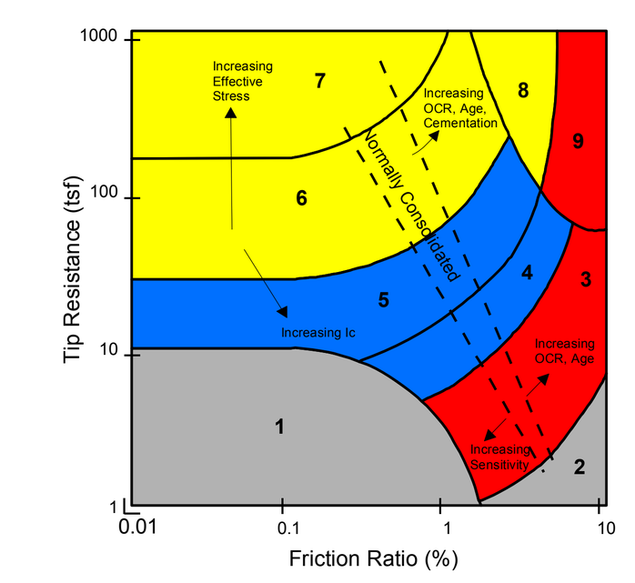
- af — Artifical Fill
- Qc — Undifferentiated non-marine, alluvial deposits
- Qt — Marine Terrace deposit
- QTp (slts) — Pico Formation (siltstone)
- QTp (ss) — Pico Formation (sandstone)

FN= Normalized fricton ratio

Qc1N = Normalized tip resistance

Note: All Legend items may not appear on all plan and profiles.

CPT Correlation Chart



(Robertson and Wride, 1990)

Zone	Soil Behavior Type
1	Sensitive Fine-grained
2	Peats
3	Silty Clay to Clay
4	Clayey Silt to Silty Clay
5	Silty Sand to Sandy Silt
6	Clean Sand to Silty Sand
7	Gravelly Sand to Dense Sand
8	Very Stiff Sand to Clayey Sand*
9	Very Stiff Fine-Grained*

*heavily overconsolidated or cemented

Boring Lithology

- Lean CLAY (CL)
- Lean CLAY with Sand (CL)
- Sandy Lean Clay (CL)
- Lean to Fat CLAY (CL-CH)
- Fat CLAY (CH)
- Fat CLAY with SAND (CH)
- Sandy Fat CLAY (CH)
- Gravelly Fat CLAY (CH)
- Silt (ML)
- Poorly-Graded SAND (SP)
- Poorly-Graded SAND with Clay (SP-SC)
- Clayey SAND (SC)
- Clayey SAND to Lean CLAY (SC-CL)
- Clayey to Silty SAND (SC-SM)
- Silty SAND (SM)
- Silty SAND to Sandy SILT (SM-ML)
- Fill
- MUDSTONE
- SILTSTONE
- SANDSTONE
- SANDSTONE to SILTSTONE
- Conglomerate
- Asphaltic Concrete
- Base Material

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LINE 1 PROFILE

Fault Study
San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

NO:	DATE:	DESCRIPTION:	DRAWN:	CHKD:	APPR:
1	July 19, 2012	Profiles	CBD	TFB	TFB

JOB NUMBER: 04.62110136 PLATE: 9

Line 2

Map Legend

- Borings
- CPTs
- Survey Hubs
- Current Profile
- Profile Line
- Topography
- Trench

Profile Legend

- RC=5,660 ybp — Calibrated Radiocarbon Age in Years Before Present (ybp)
- Dip in Degrees Measured from Core
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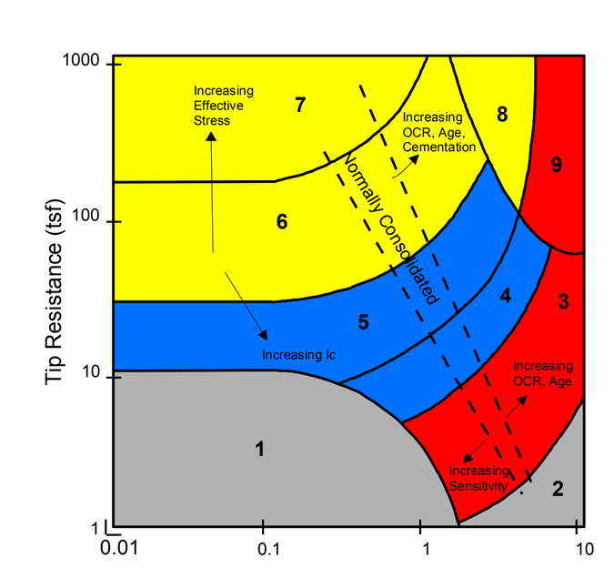
Note: All Legend items may not appear on all plan and profiles.

CPT Correlation Chart



(Robertson and Wride, 1990)

Zone	Soil Behavior Type
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5	Silty Sand to Sandy Silt
6	Clean Sand to Silty Sand
7	Gravelly Sand to Dense Sand
8	Very Stiff Sand to Clayey Sand*
9	Very Stiff Fine-Grained*

*heavily overconsolidated or cemented

Boring Lithology

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- SILTSTONE
- SANDSTONE
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- Asphaltic Concrete
- Base Material

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LINE 2 PROFILE

Fault Study

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

NO:	DATE:	DESCRIPTION:	DRAWN:	CHKD:	APPR:
1	July 19, 2012	Profiles	CBD	TFB	TFB

JOB NUMBER: 04.62110136

PLATE.: 10

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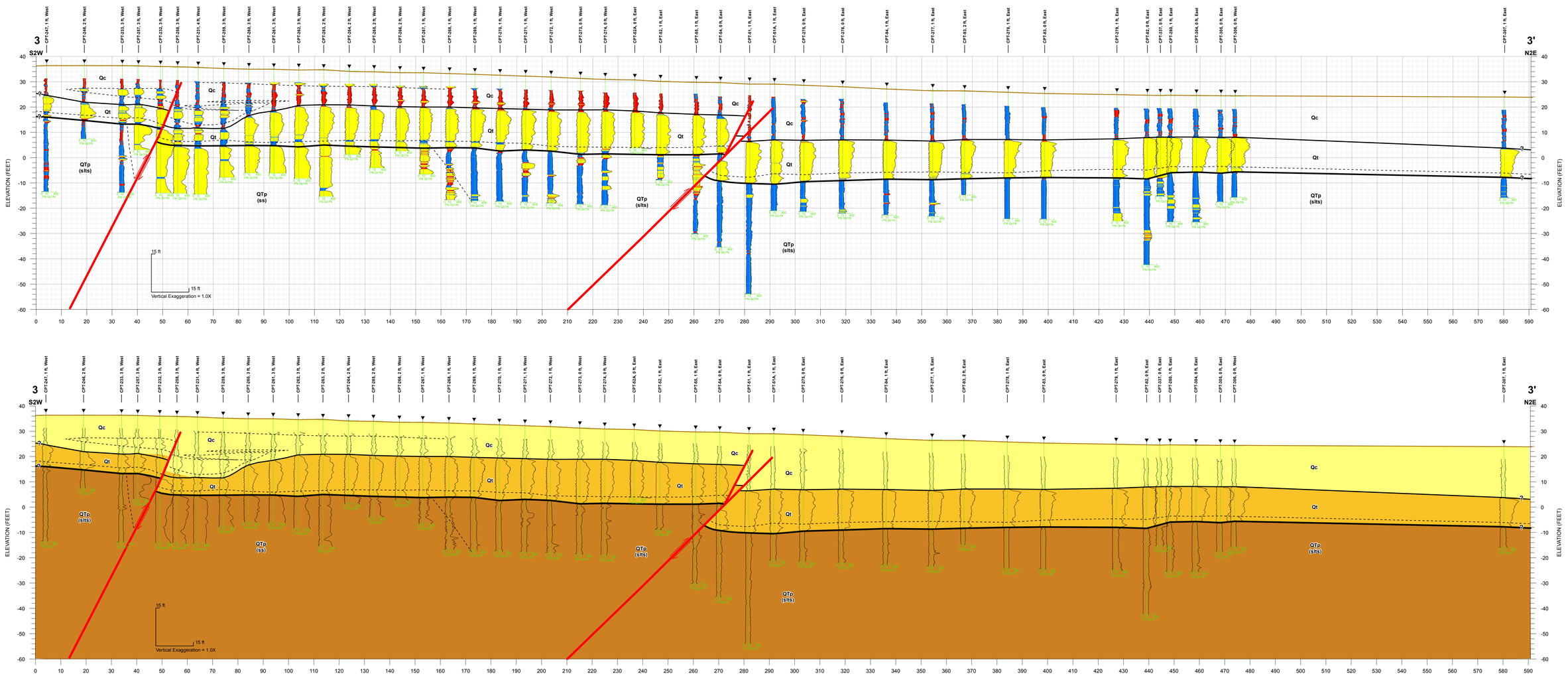

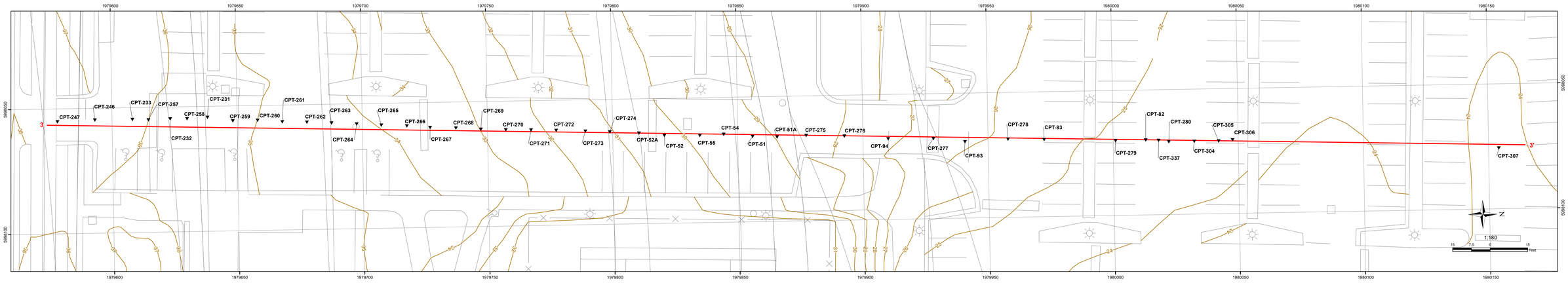

Map Legend

- Borings
- CPTs
- Survey Hubs
- Current Profile
- Profile Line
- Topography
- Trench

Profile Legend

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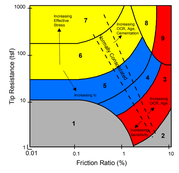
QTp (ss)	Pico Formation (sandstone)

FN= Normalized fricton ratio

Qc1N = Normalized tip resistance

Note: All Legend items may not appear on all plan and profiles.

CPT Correlation Chart



(Robertson and Wride, 1990)

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5	Silty Sand to Sandy Silt
6	Clean Sand to Silty Sand
7	Gravelly Sand to Dense Sand
8	Very Stiff Sand to Clayey Sand*
9	Very Stiff Fine-Grained*

*heavily overconsolidated or cemented

Boring Lithology

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- Lean CLAY with Sand (CL)
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- Clayey to Silty SAND (SC-SM)
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- Silty SAND to Sandy SILT (SM-ML)
- Fill
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- SILTSTONE
- SANDSTONE
- SANDSTONE to SILTSTONE
- Conglomerate
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- Base Material

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LINE 3 PROFILE

Fault Study
San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

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1	July 19, 2012	Profiles	CBD	TFB	TFB

JOB NUMBER: 04.62110136

PLATE.: 11

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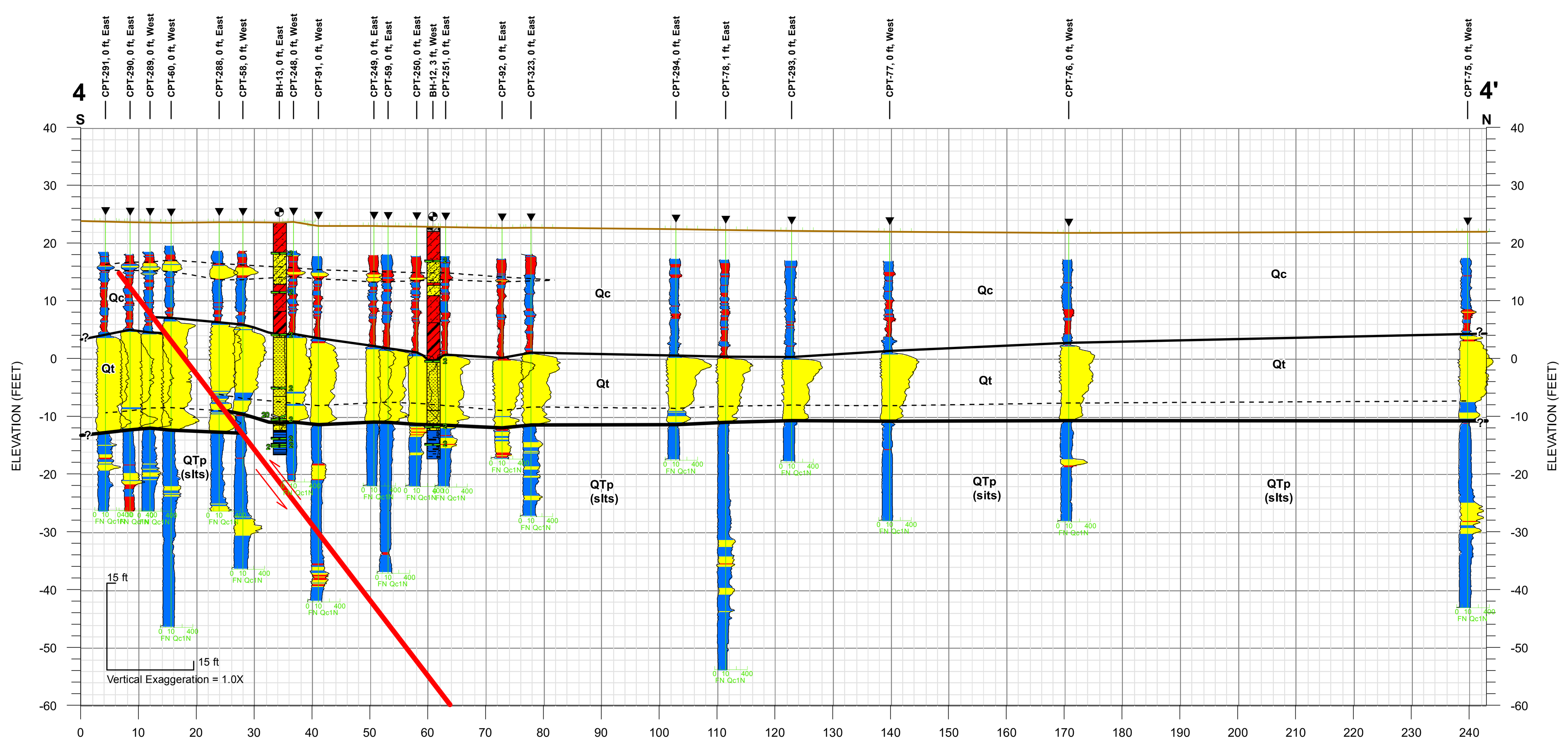

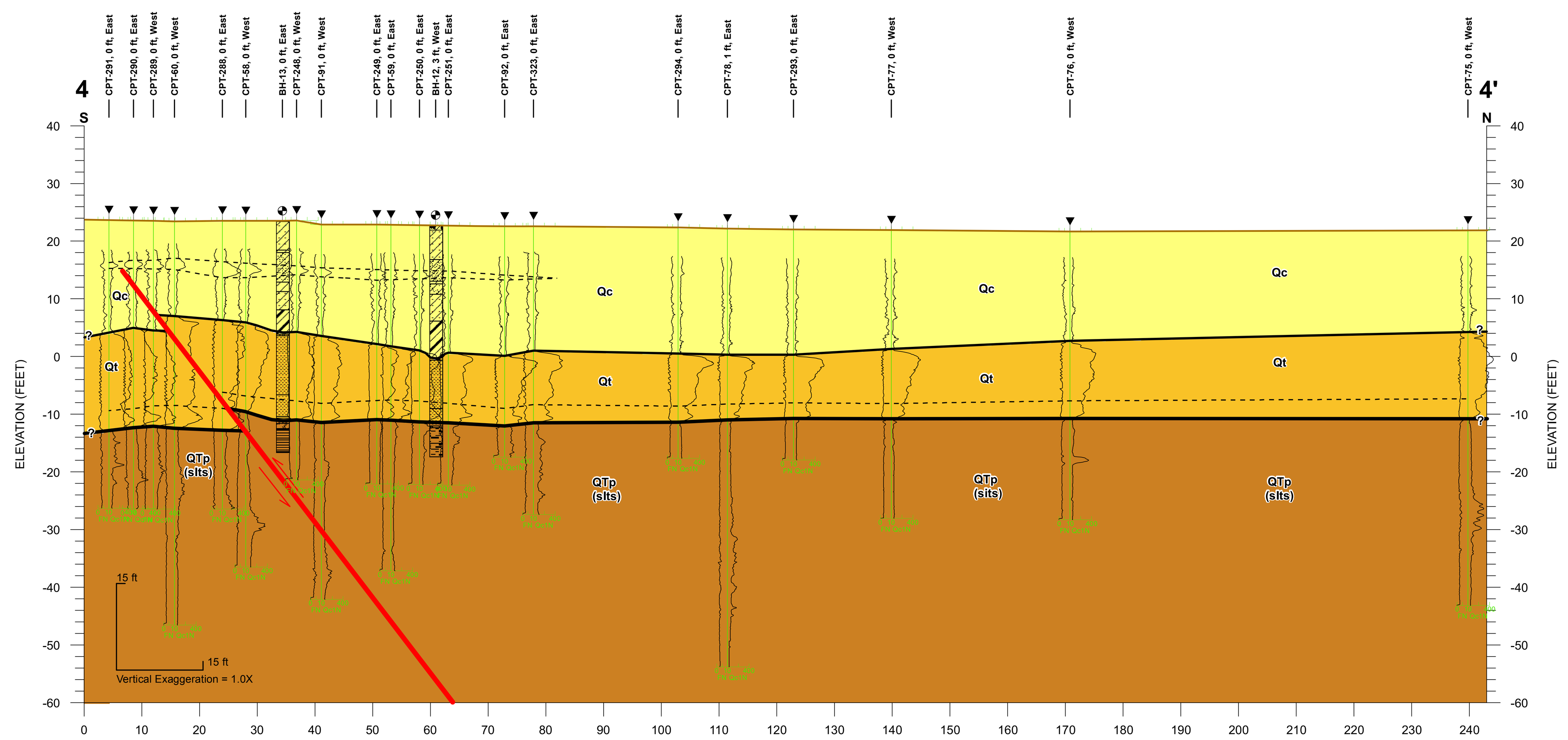

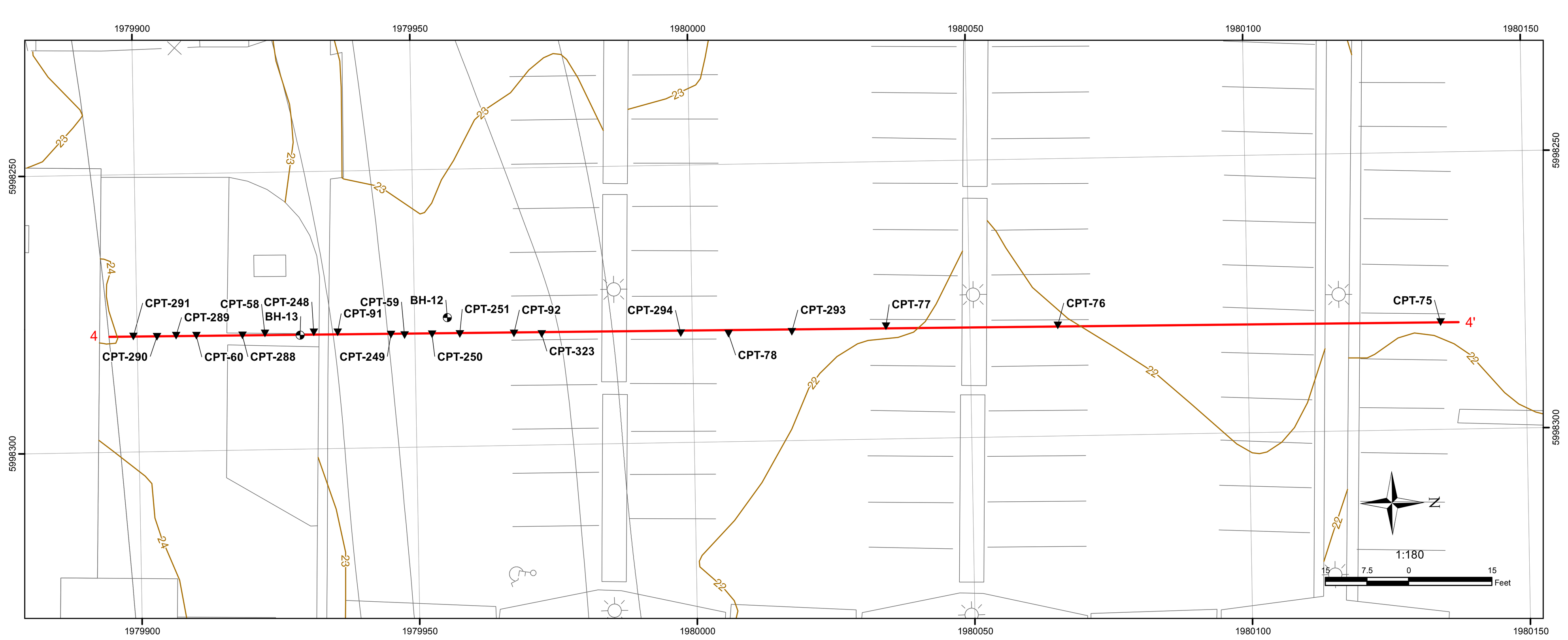

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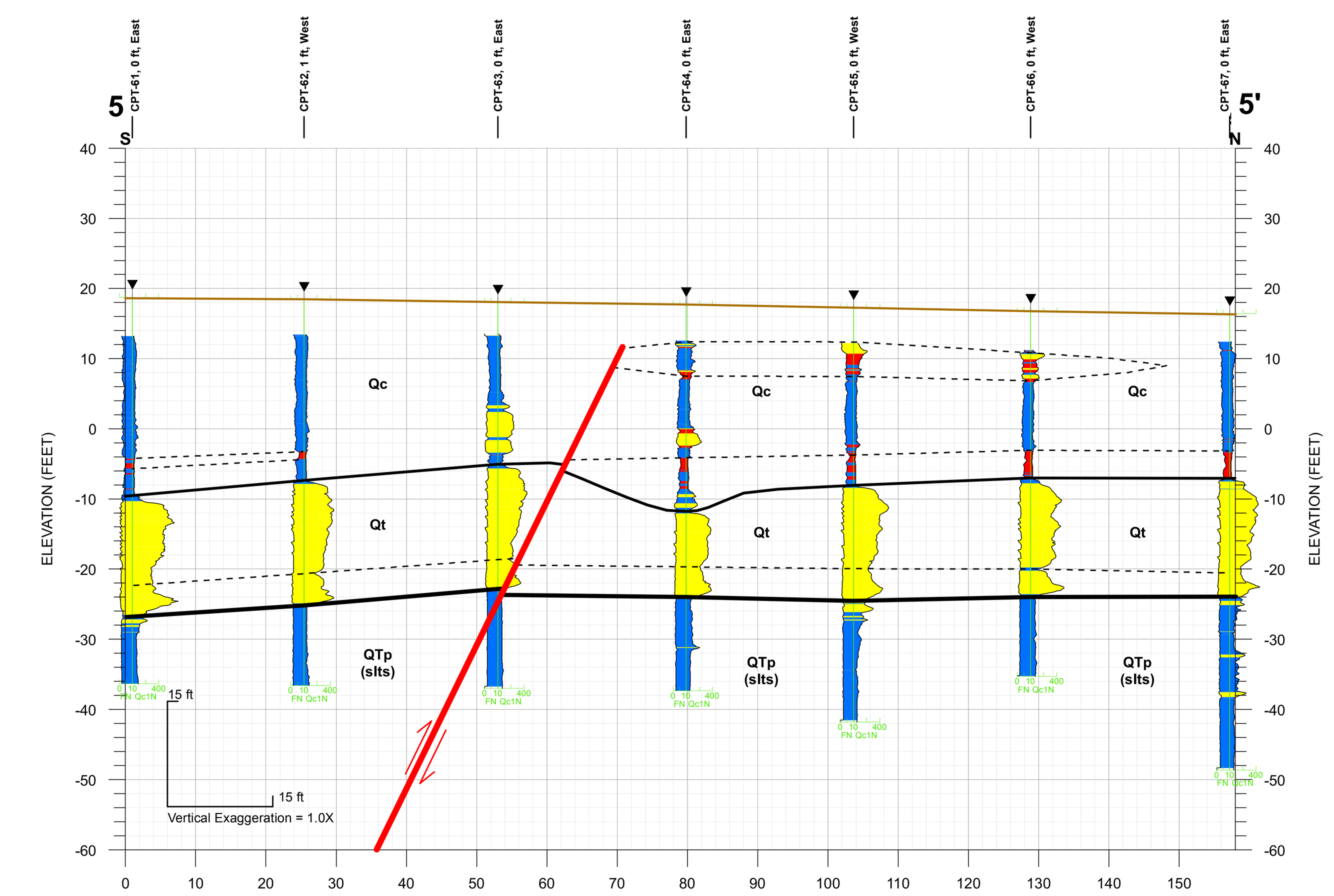

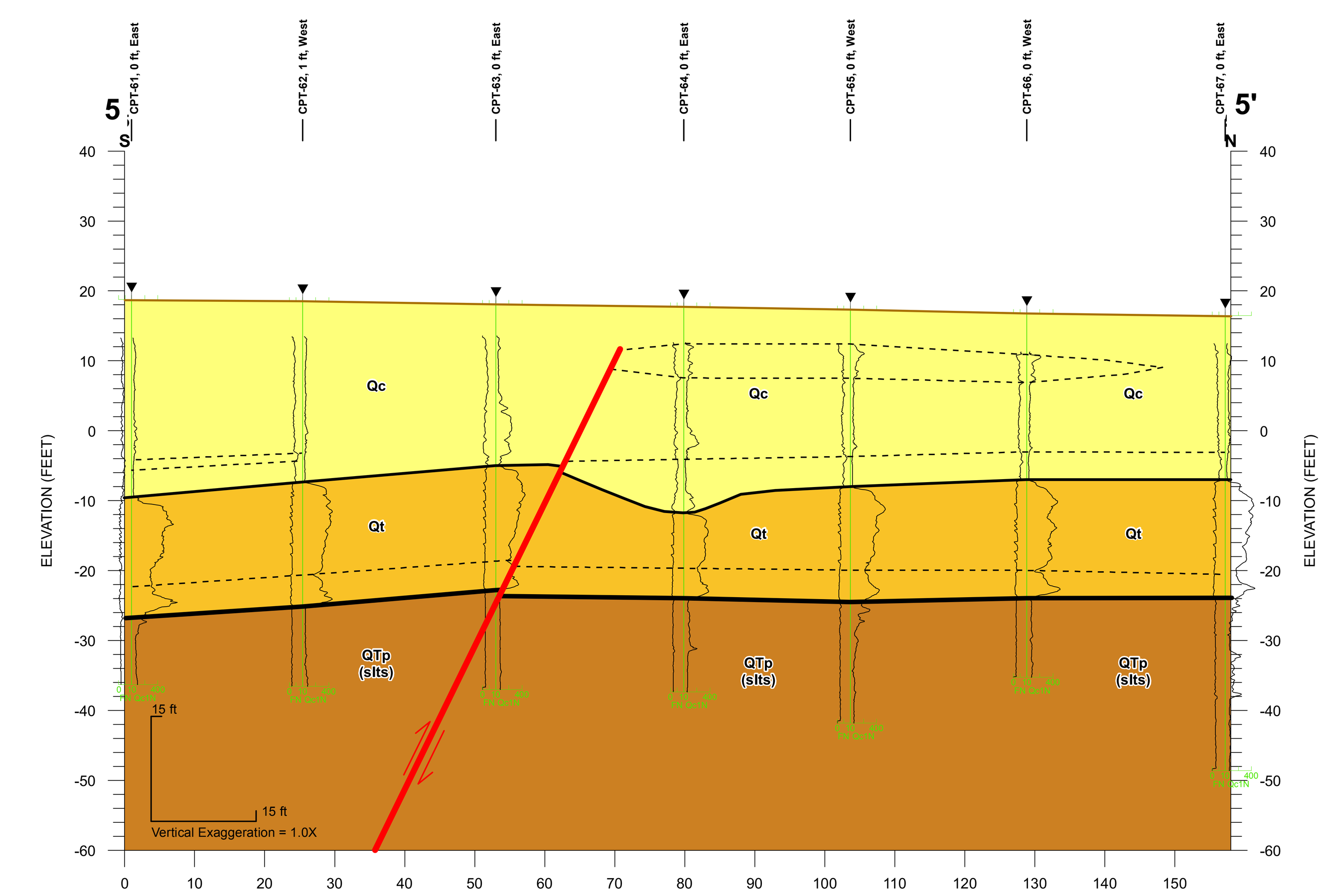

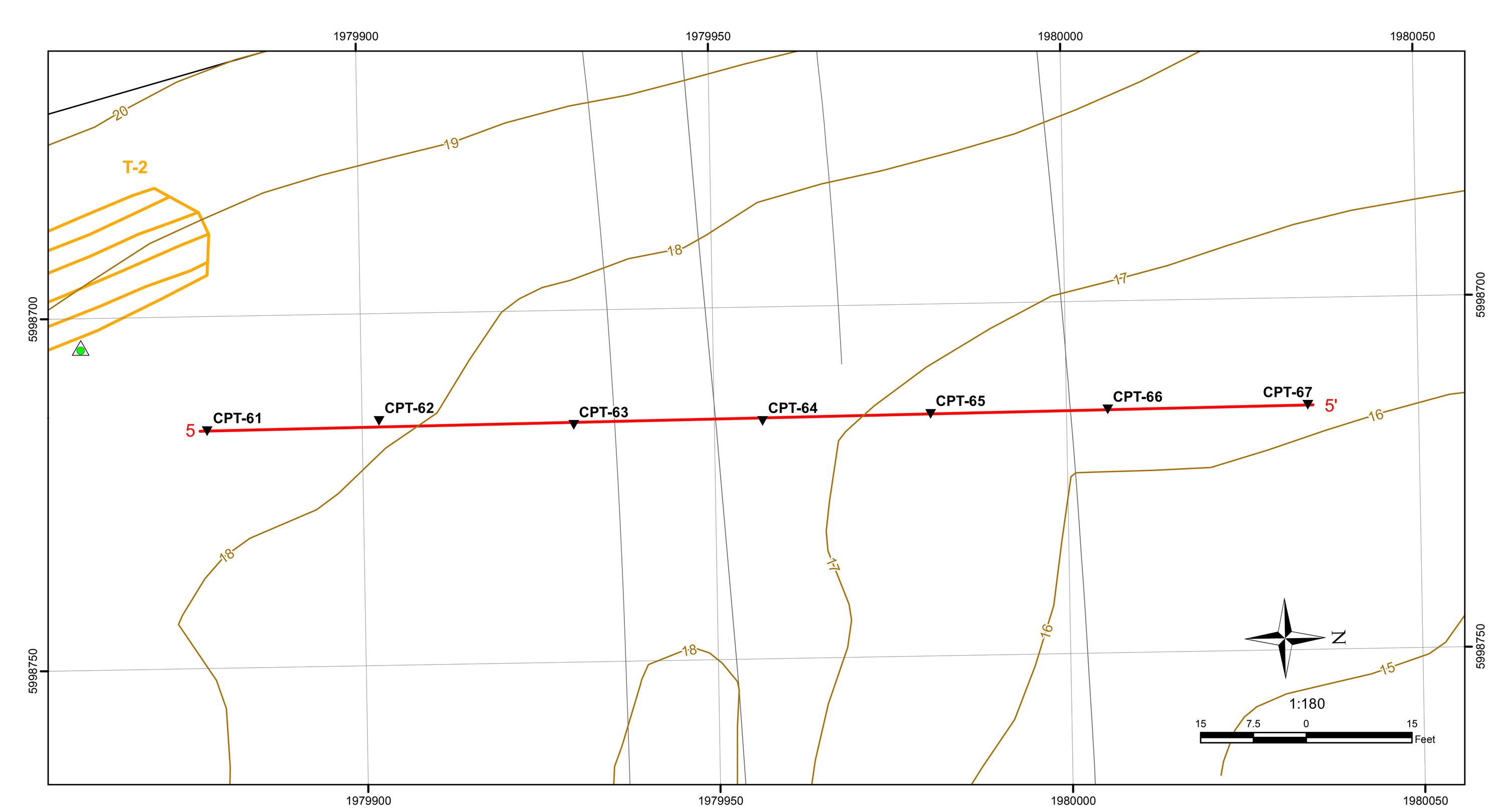

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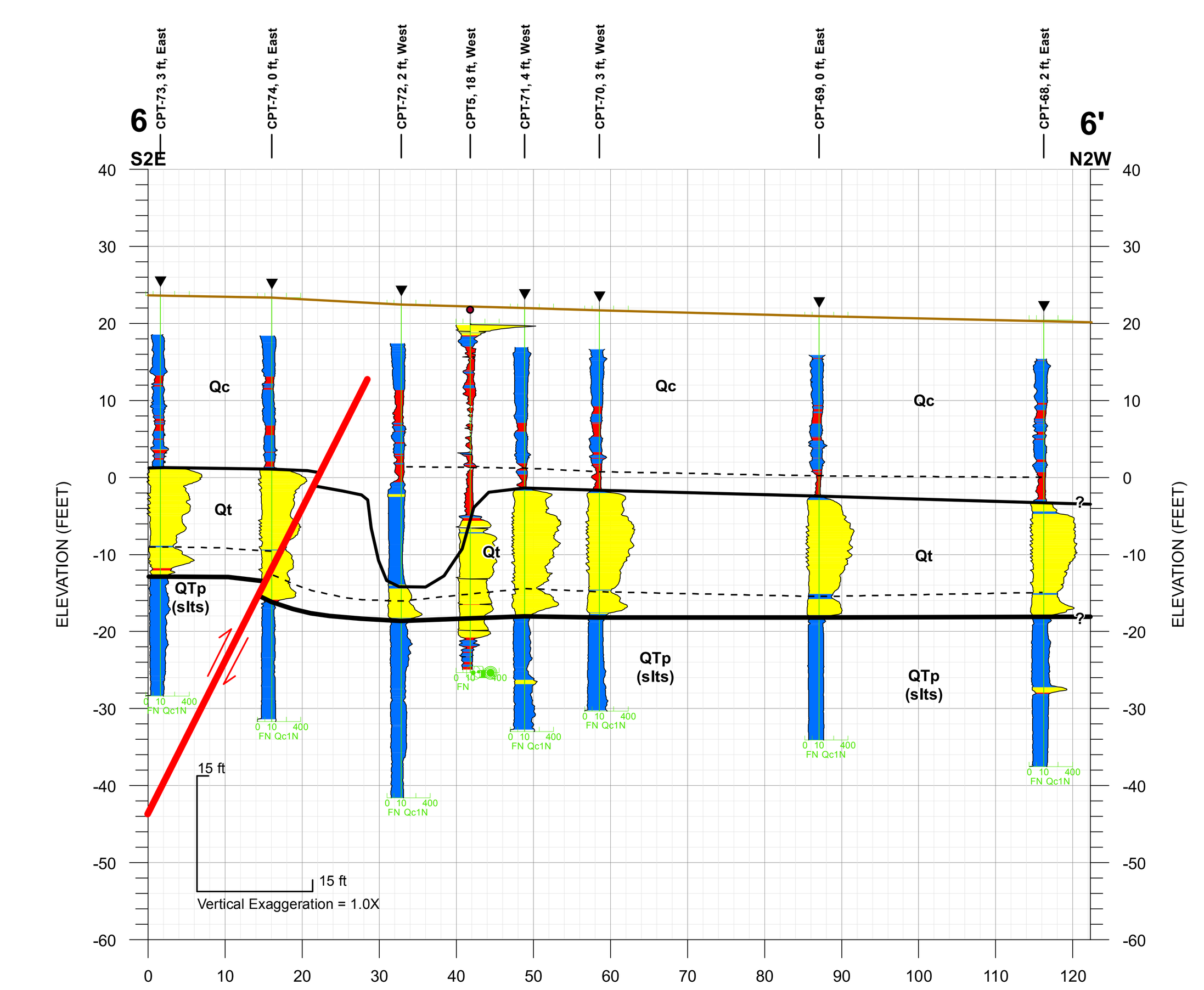

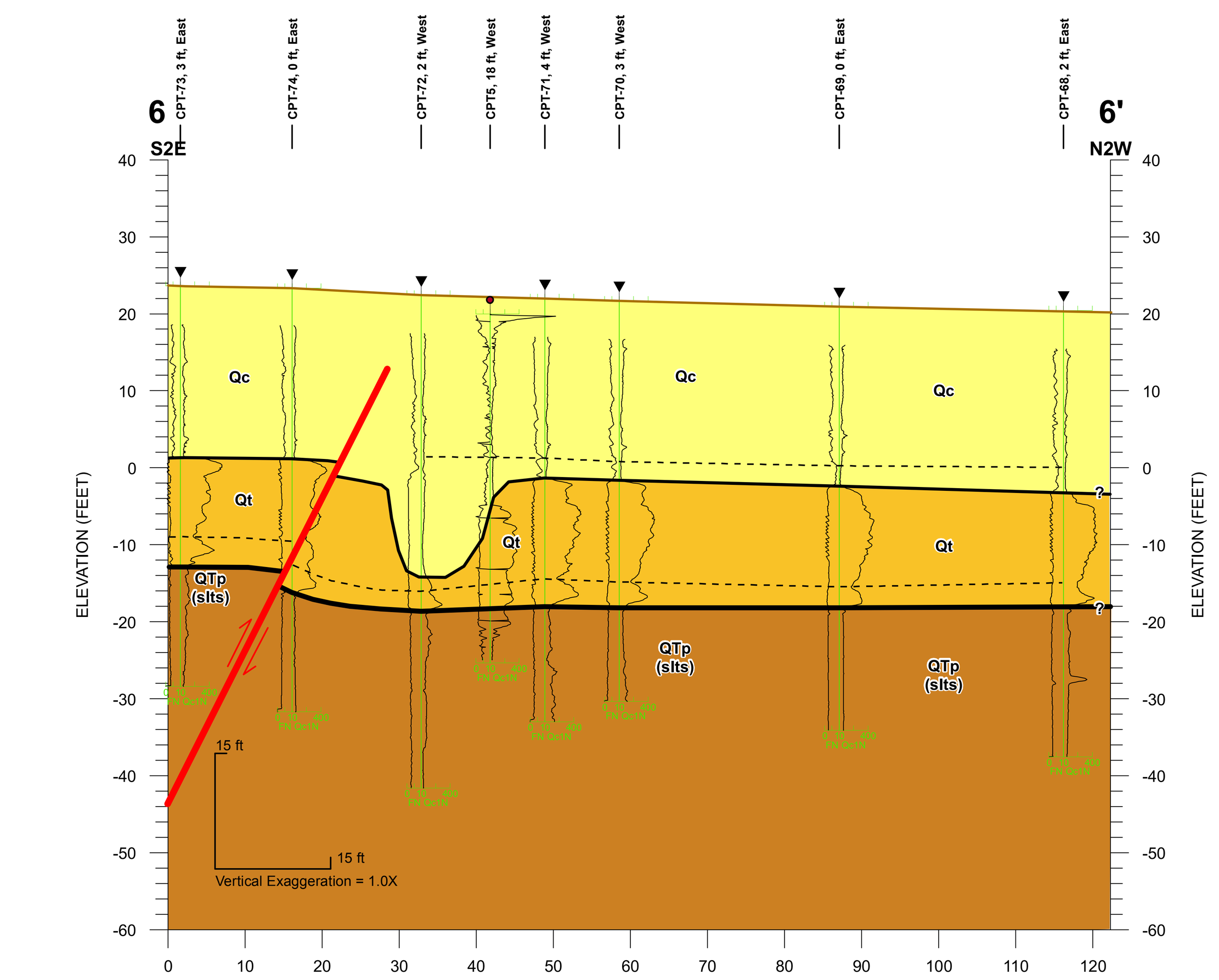

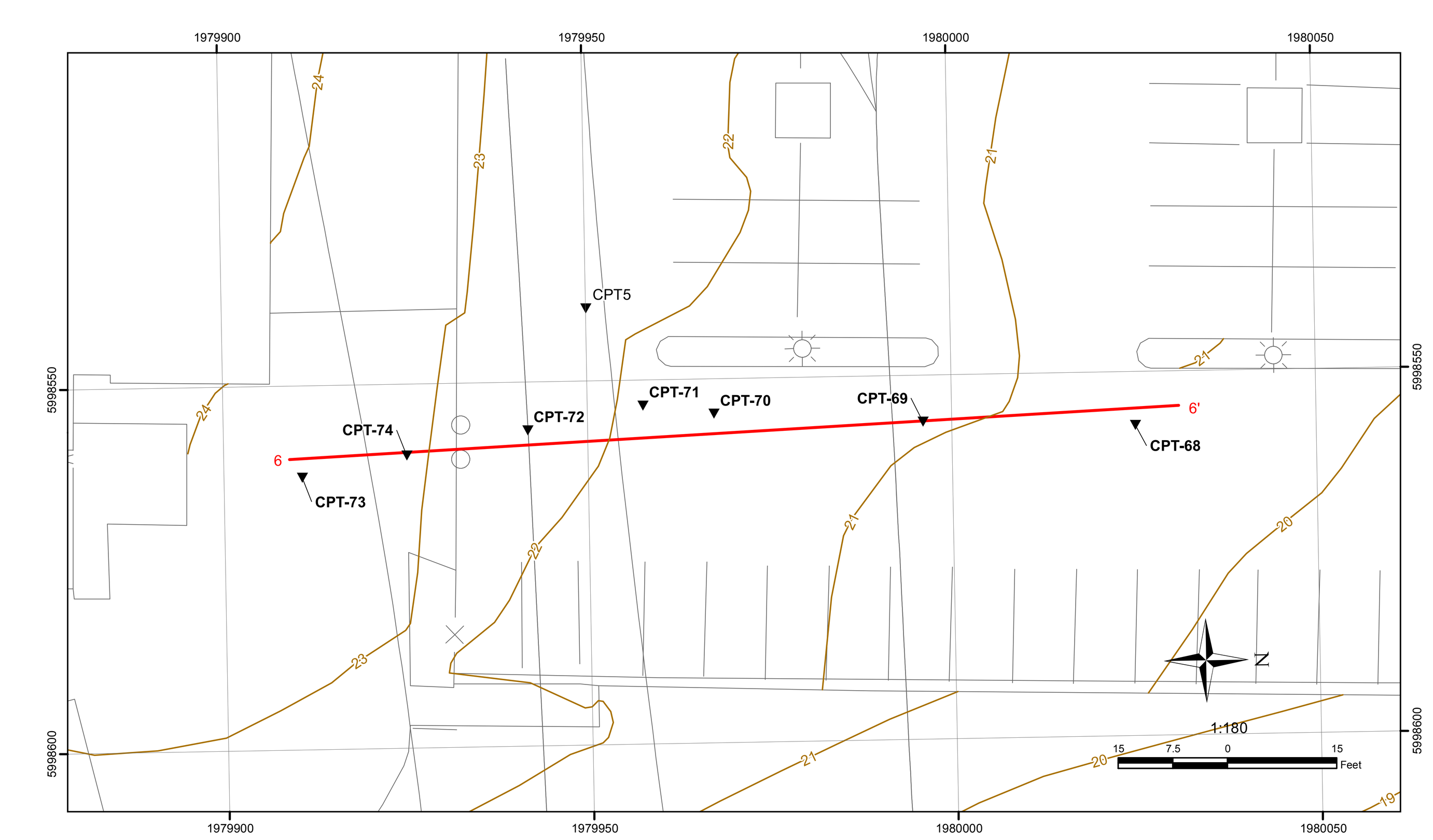

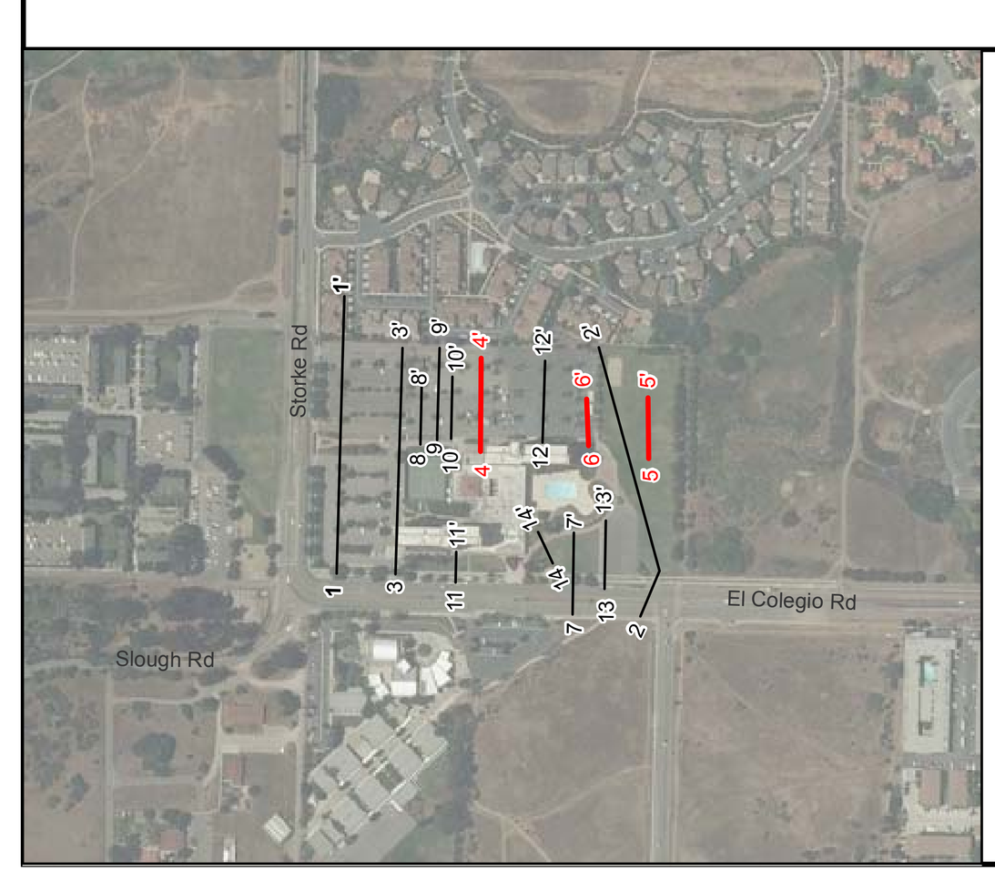

Map Legend

- Borings
- CPTs
- Survey Hubs
- Current Profile
- Profile Line
- Topography
- Trench

Profile Legend

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- Interpreted fault (arrows show direction of apparent slip)
- Topography

Geologic Legend

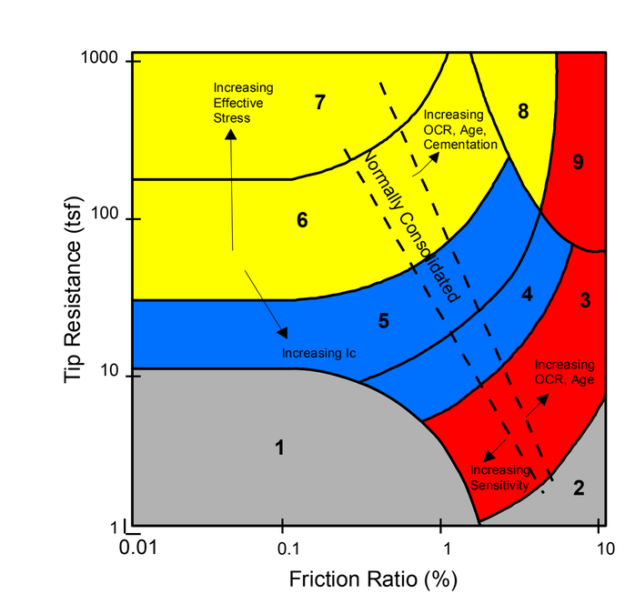
- af — Artifical Fill
- Qc — Undifferentiated non-marine, alluvial deposits
- Qt — Marine Terrace deposit
- QTp (slts) — Pico Formation (siltstone)
- QTp (ss) — Pico Formation (sandstone)

FN= Normalized fricton ratio

Qc1N = Normalized tip resistance

Note: All Legend items may not appear on all plans and profiles.

CPT Correlation Chart



(Robertson and Wride, 1990)

Zone	Soil Behavior Type
1	Sensitive Fine-grained
2	Peats
3	Silty Clay to Clay
4	Clayey Silt to Silty Clay
5	Silty Sand to Sandy Silt
6	Clean Sand to Silty Sand
7	Gravelly Sand to Dense Sand
8	Very Stiff Sand to Clayey Sand*
9	Very Stiff Fine-Grained*

*heavily overconsolidated or cemented

Boring Lithology

- Lean CLAY (CL)
- Lean CLAY with Sand (CL)
- Sandy Lean Clay (CL)
- Lean to Fat CLAY (CL-CH)
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- SANDSTONE to SILTSTONE
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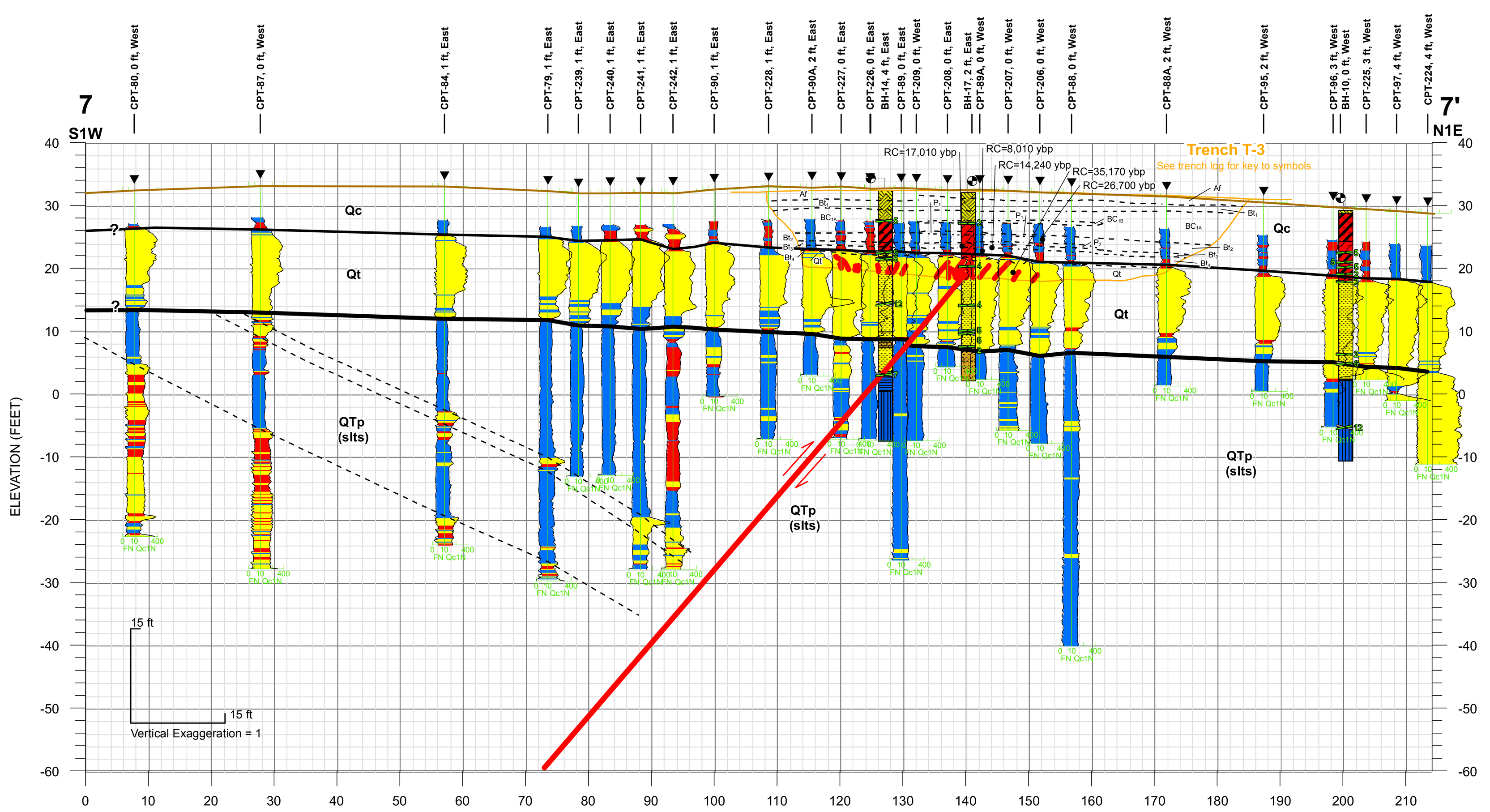
LINE 4, 5, and 6 PROFILES
Fault Study
San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

NO:	DATE:	DESCRIPTION:	DRAWN:	CHKD:	APPR:
1	July 19, 2012	Profiles	CBD	TFB	TFB

JOB NUMBER: 04.62110136 PLATE.: 12

Line 7



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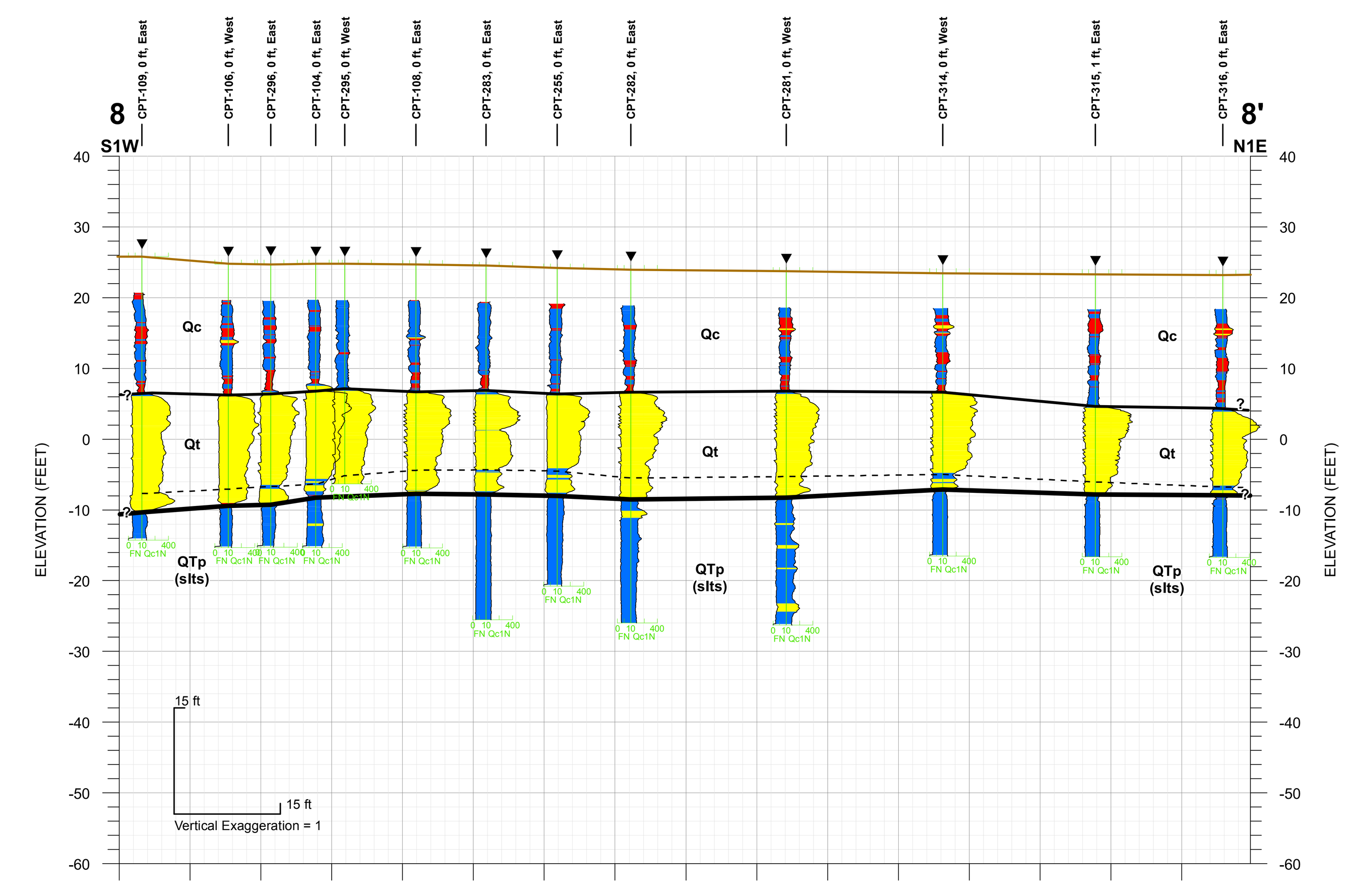

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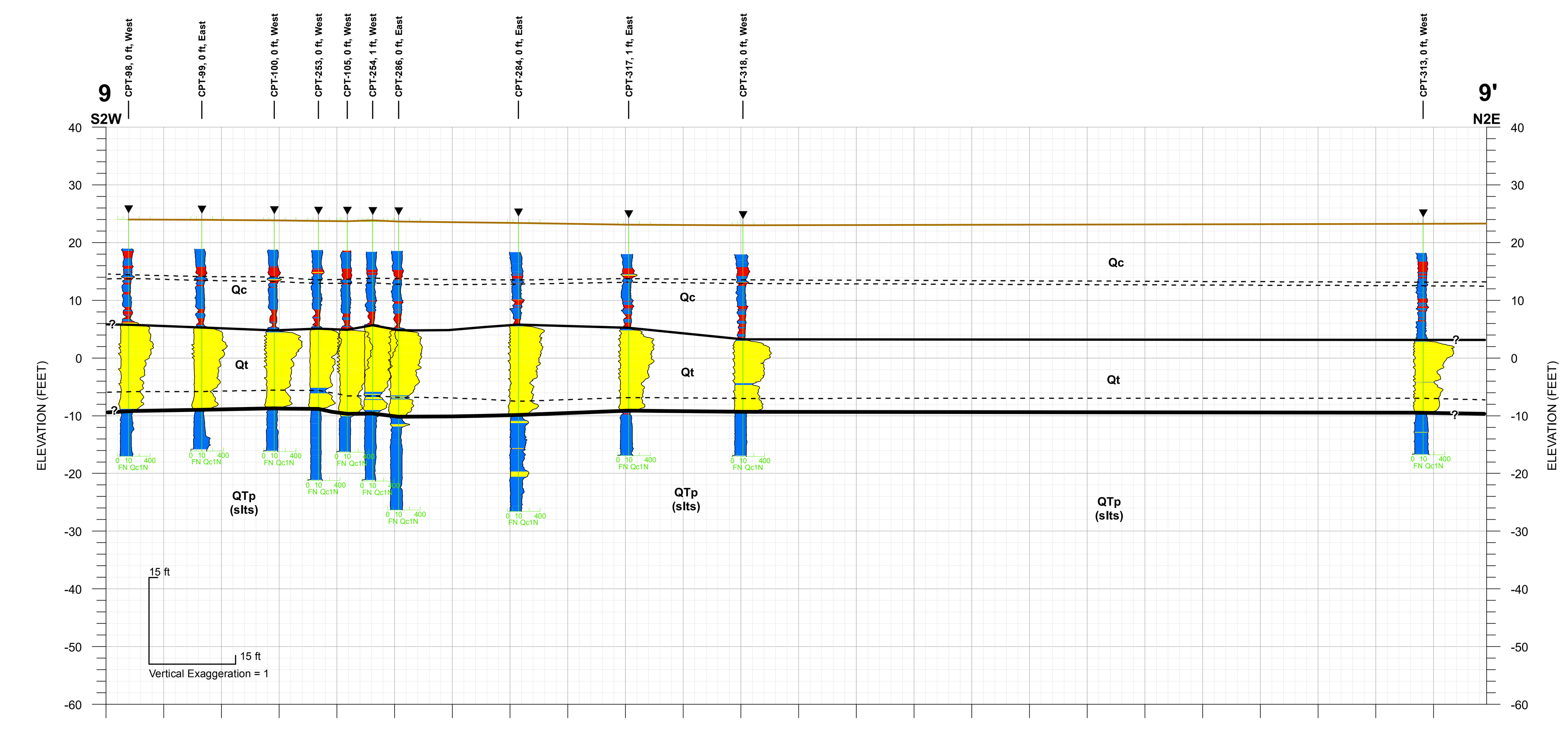

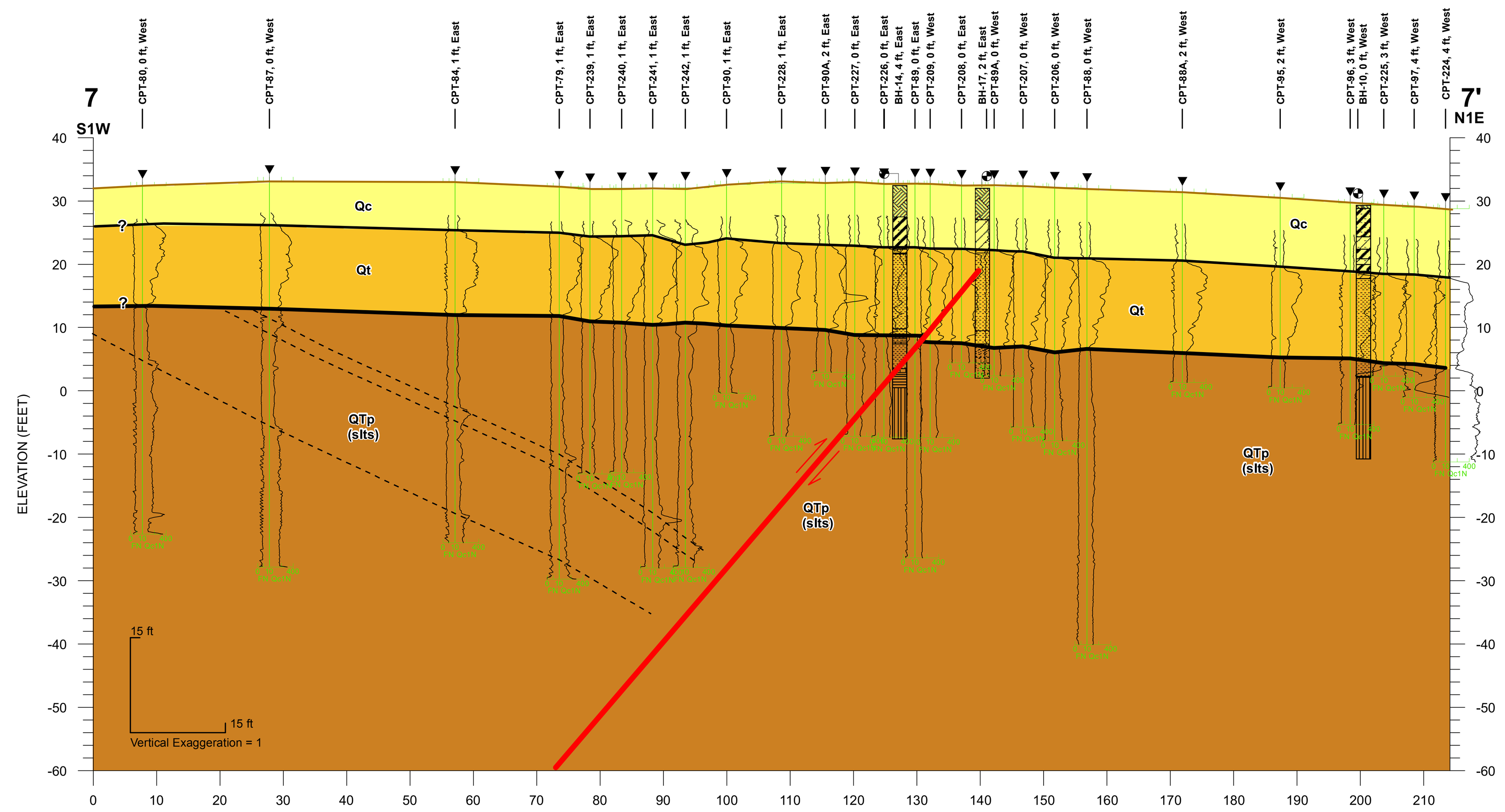

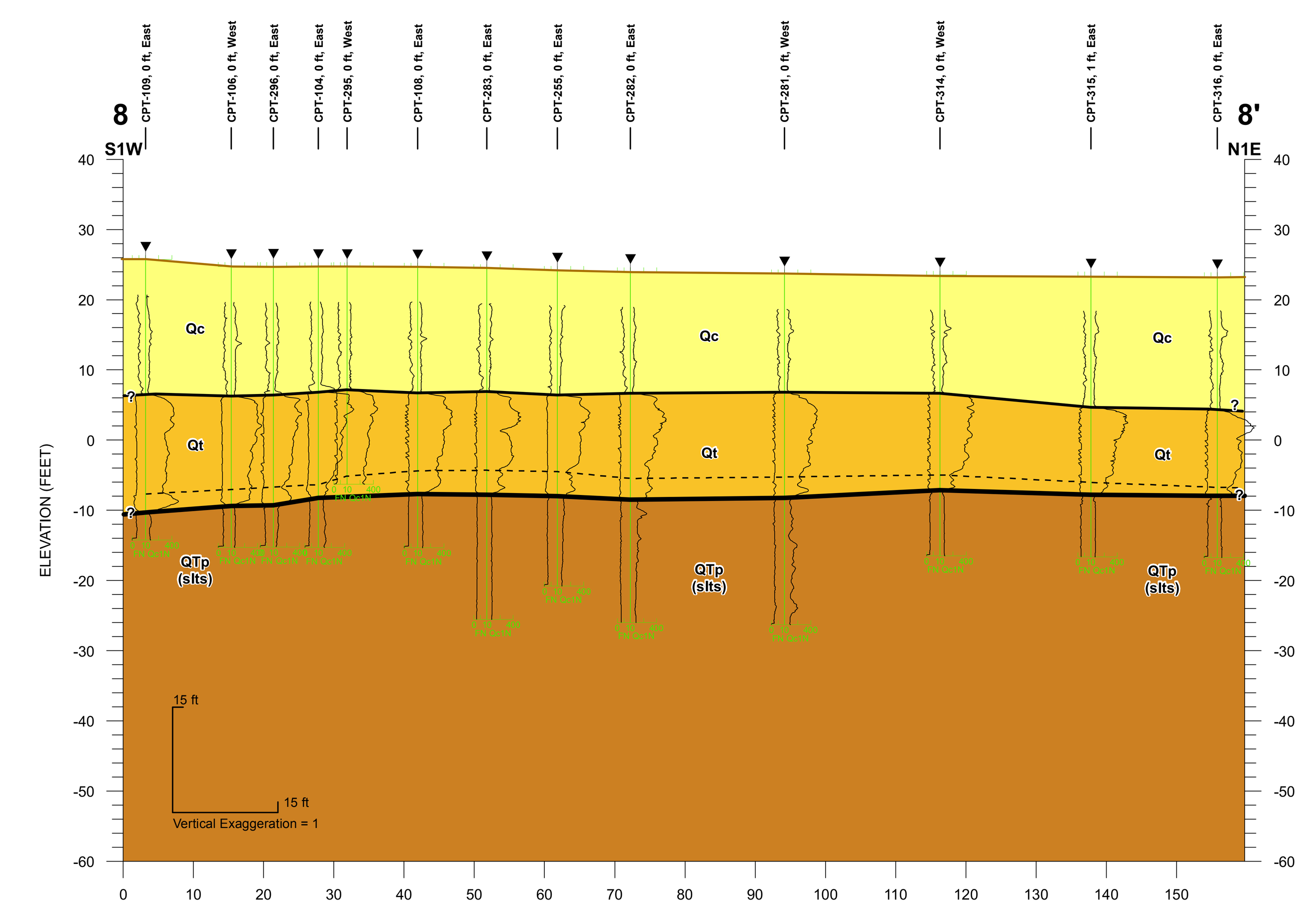

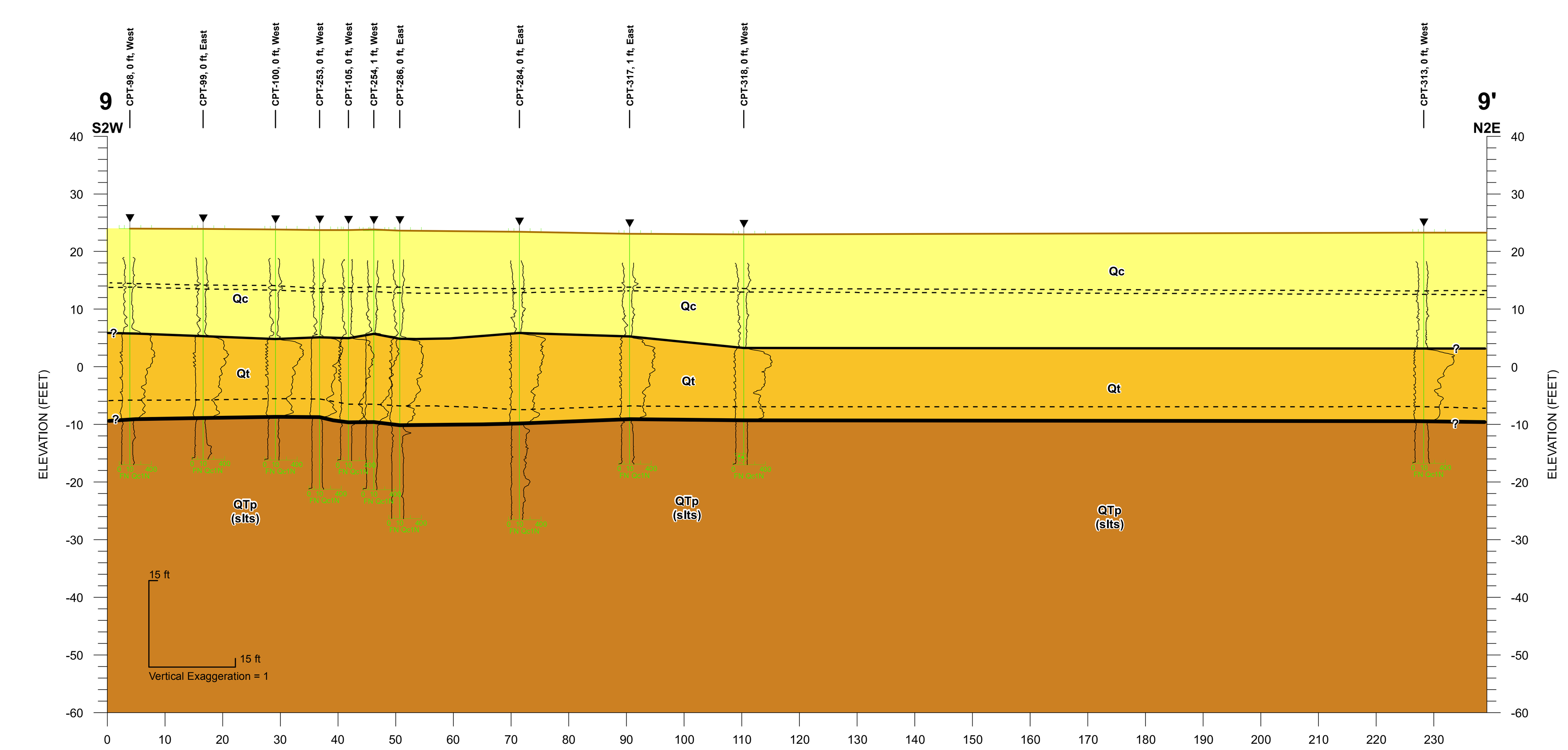

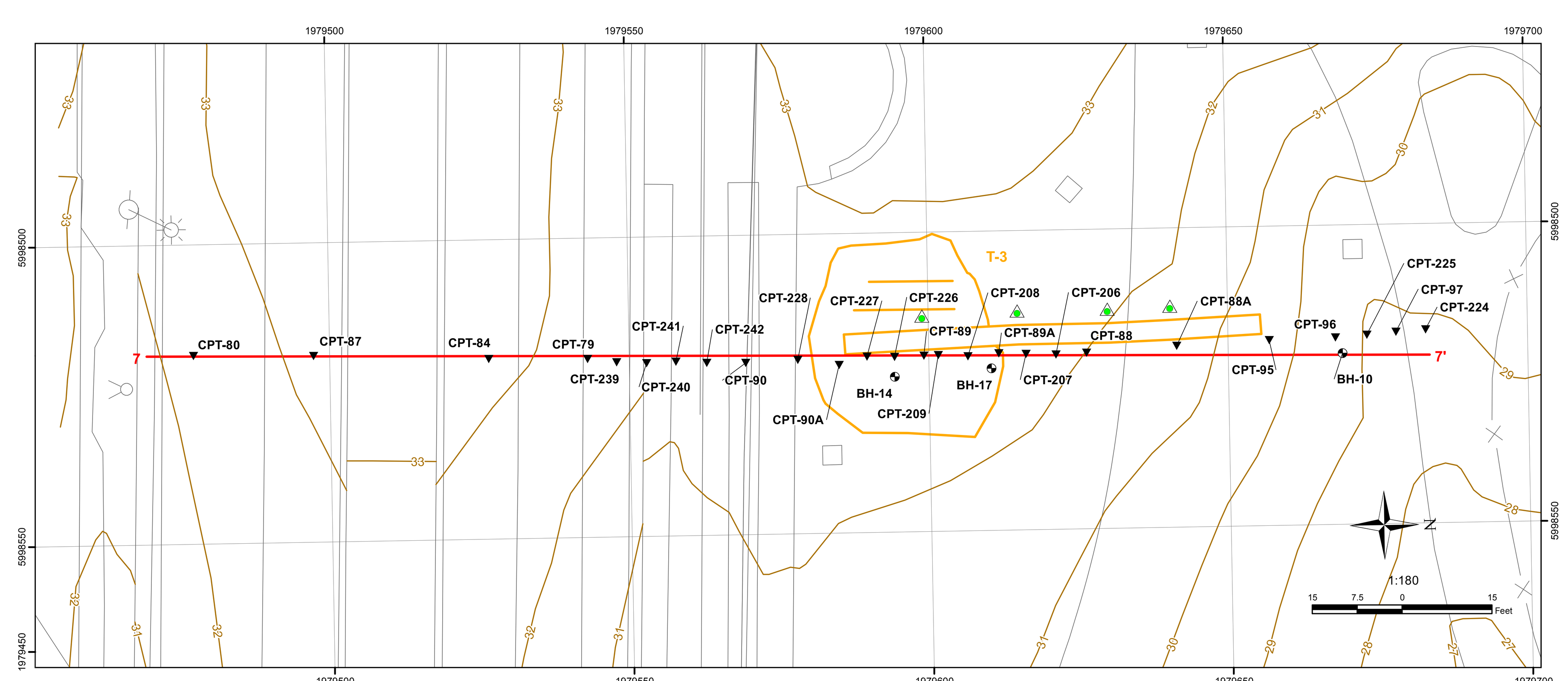

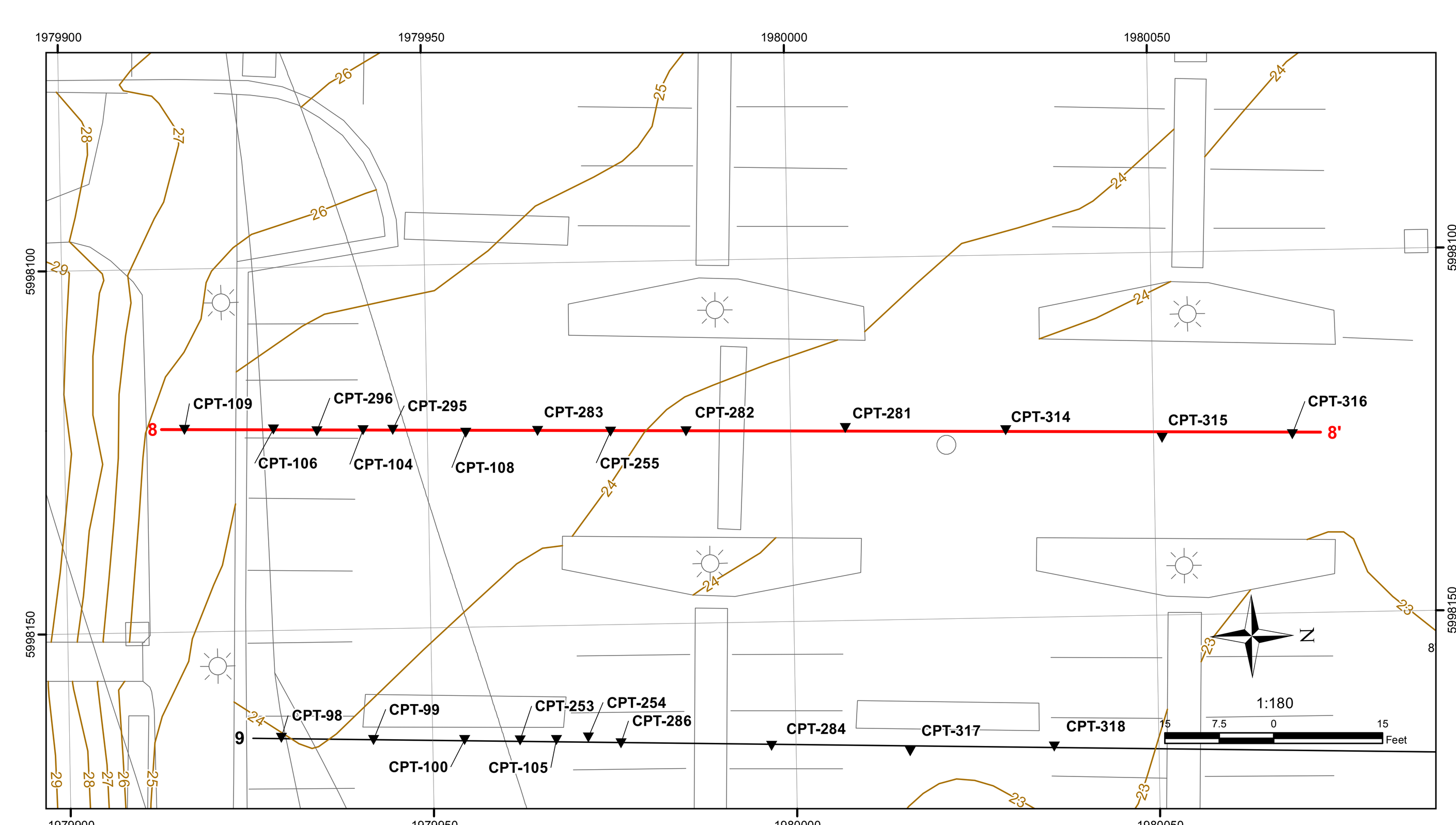

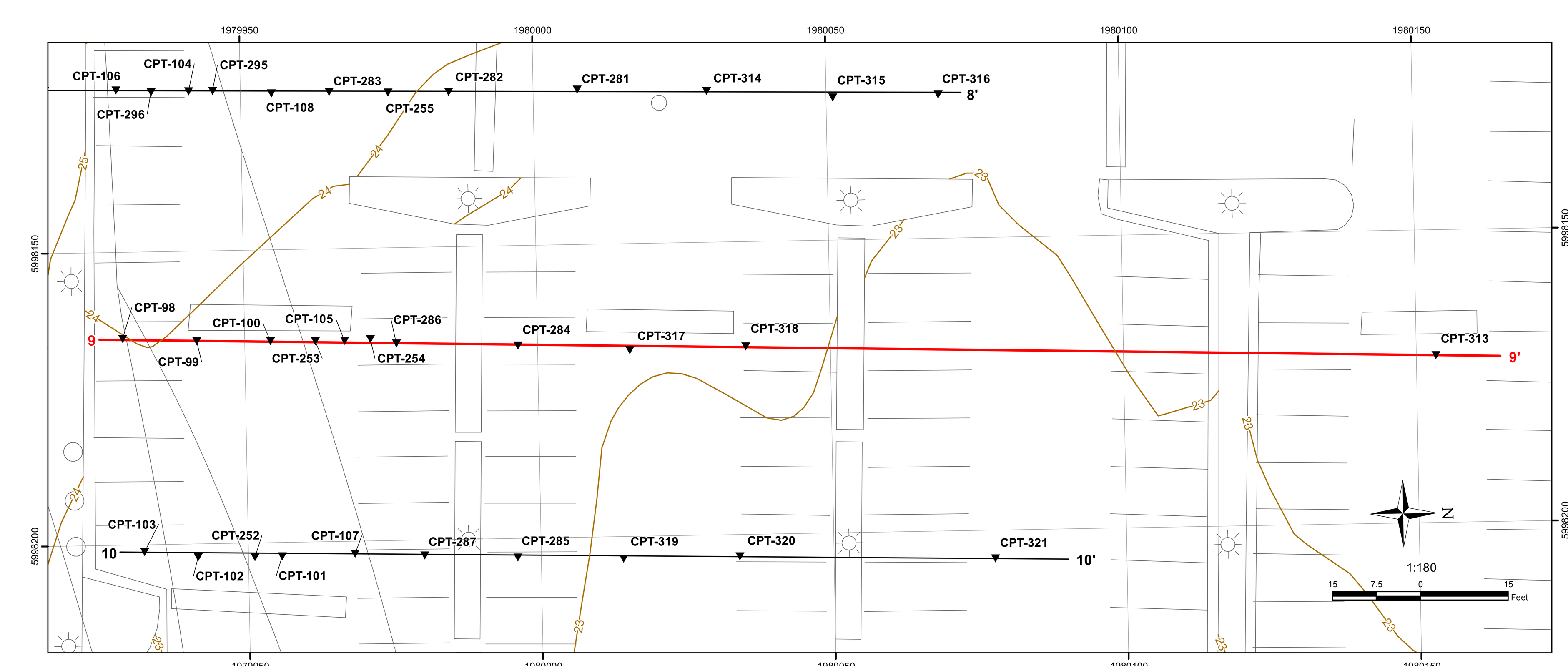

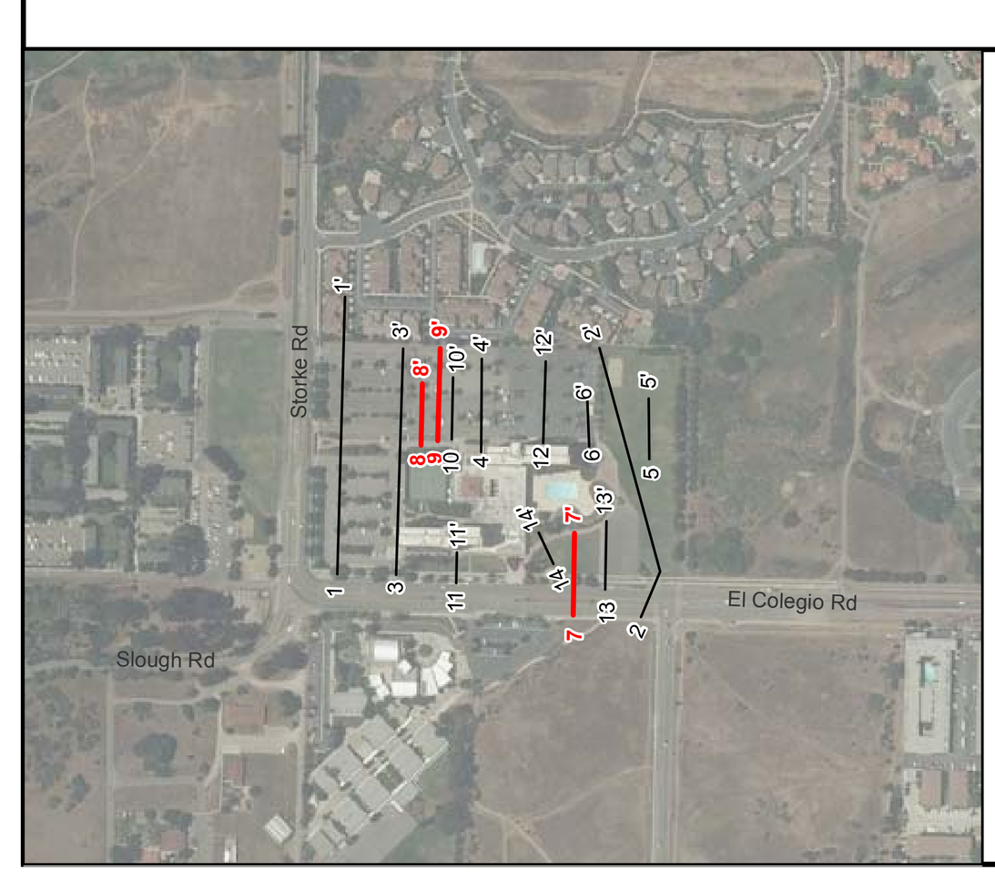

Map Legend

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Profile Legend

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Geologic Legend

af	Artifical Fill
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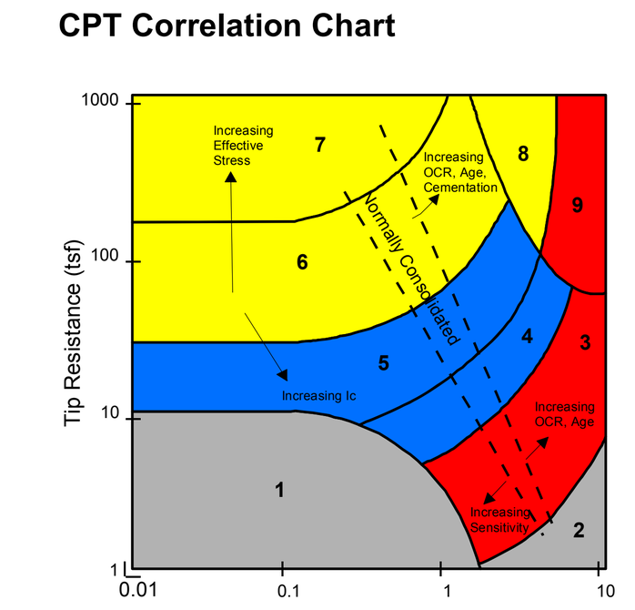
Qc1N = Normalized tip resistance

Note: All Legend items may not appear on all plans and profiles.

CPT Correlation Chart



(Robertson and Wride, 1990)

Zone	Soil Behavior Type
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*heavily overconsolidated or cemented

Boring Lithology

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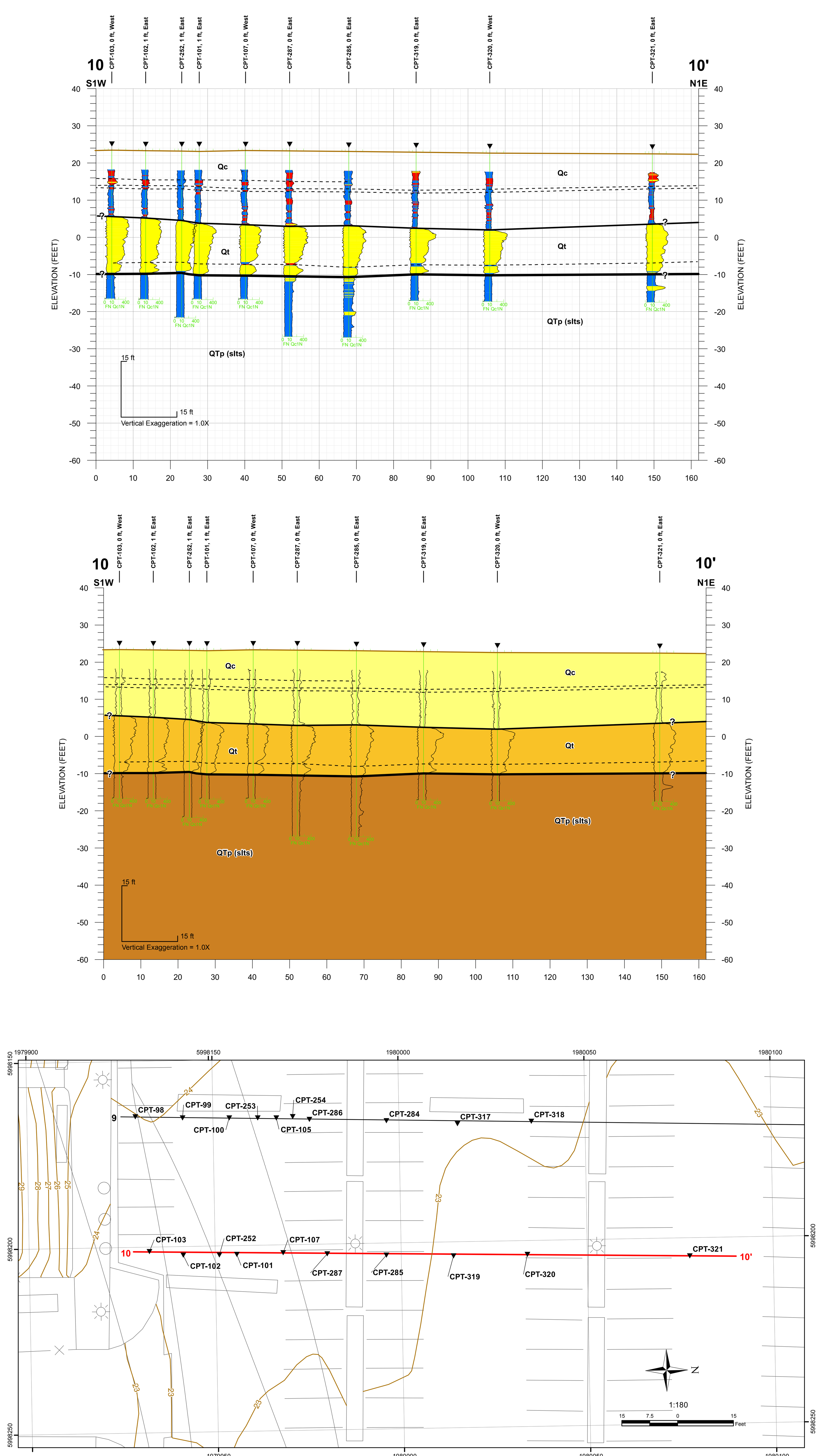
LINE 7, 8, and 9 PROFILES
Fault Study
San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

NO:	DATE:	DESCRIPTION:	DRAWN:	CHKD:	APPR:
1	July 19, 2012	Profiles	CBD	TFB	TFB

JOB NUMBER: 04.62110136

PLATE.: 13

Line 10



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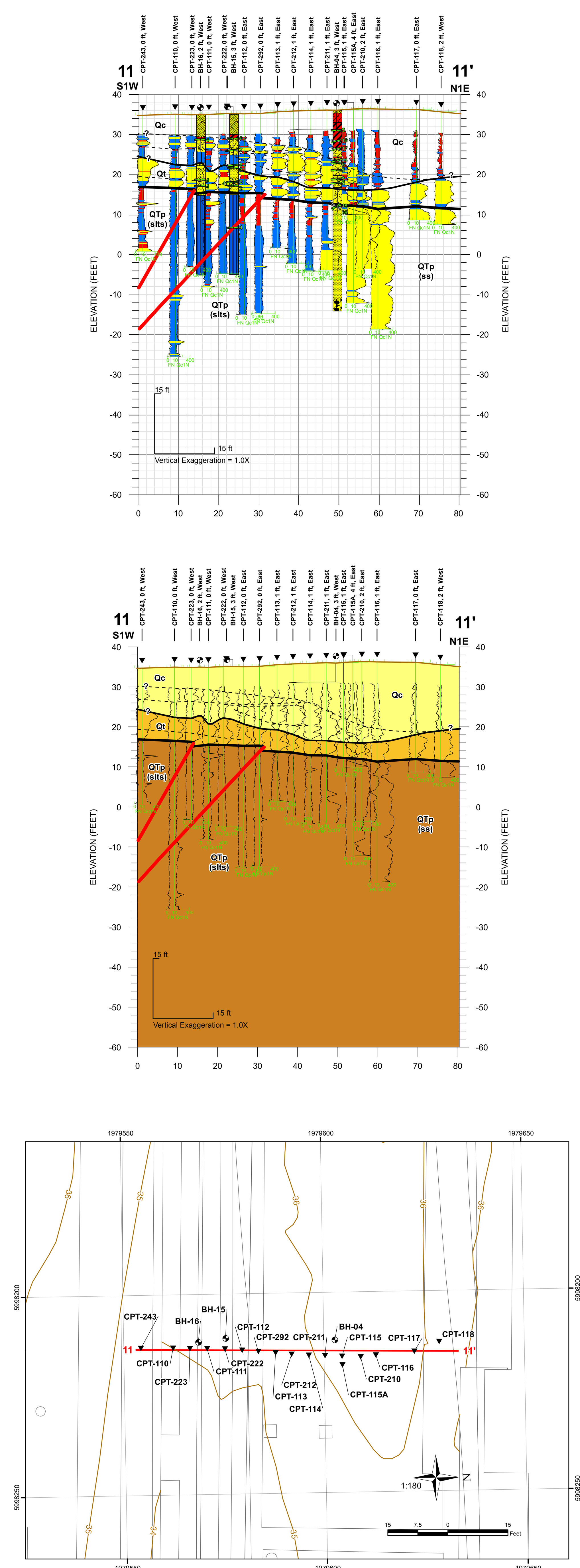

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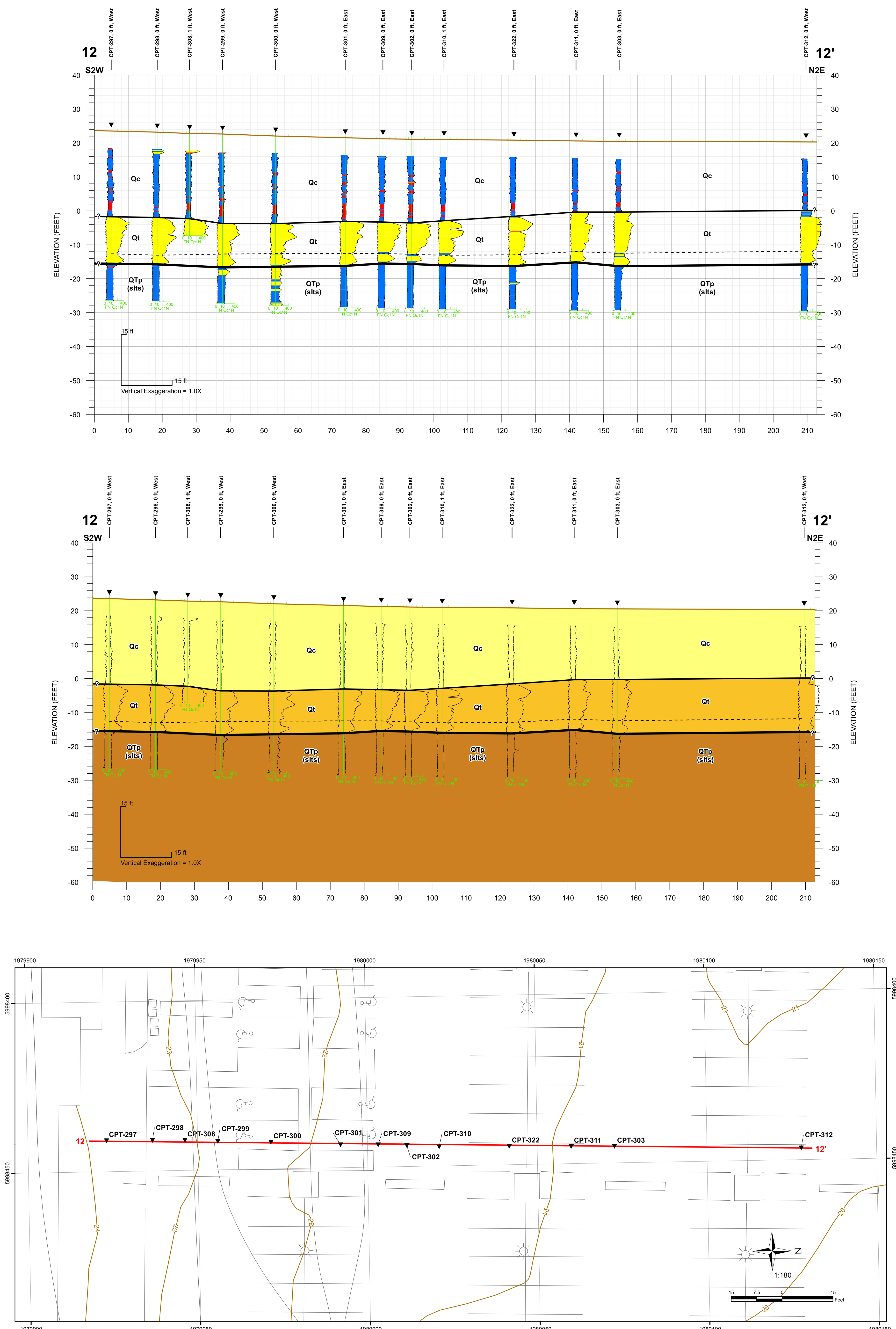

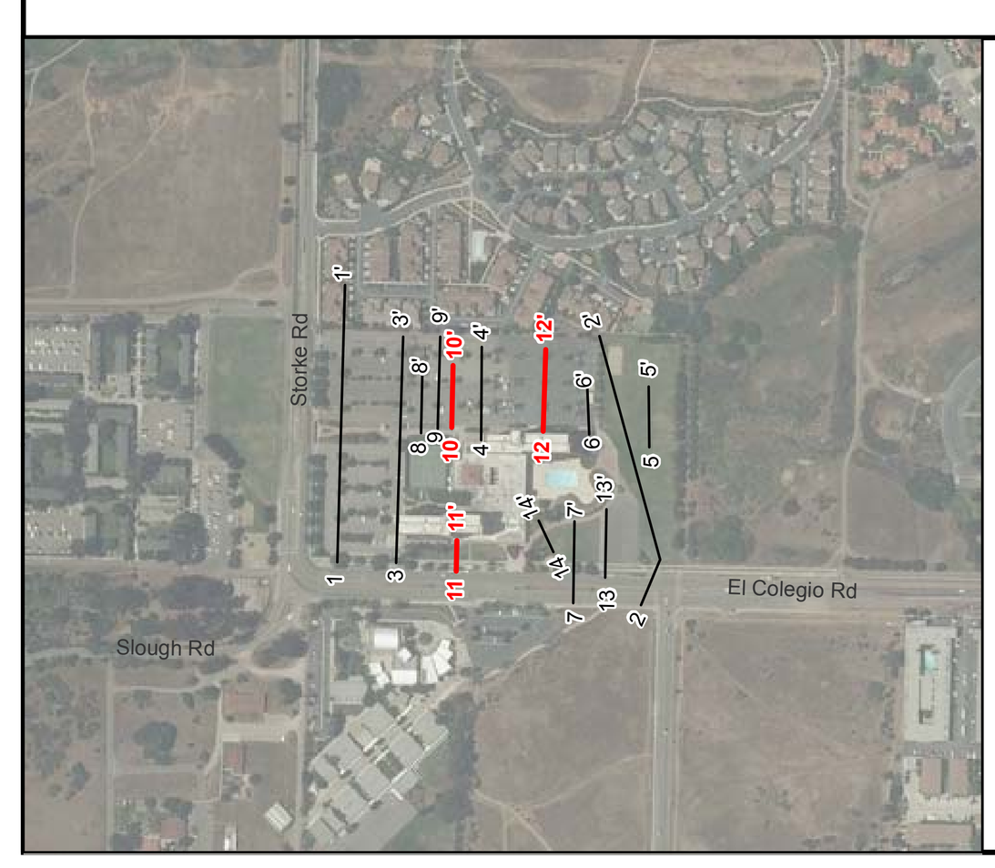

Map Legend

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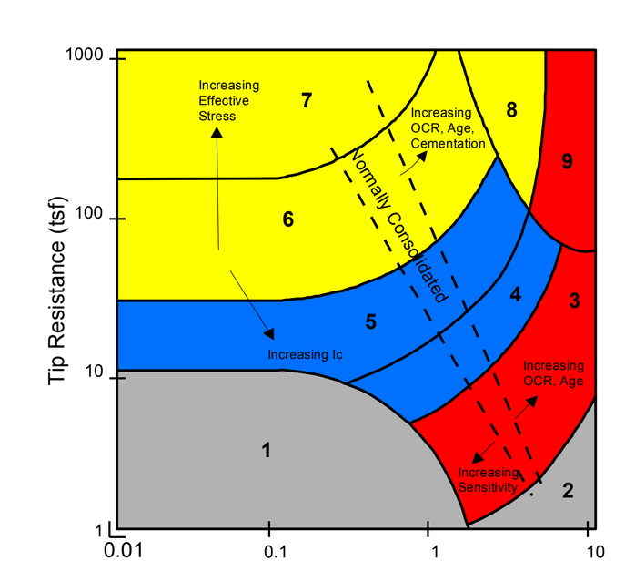

(Robertson and Wride, 1990)

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5	Silty Sand to Sandy Silt
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7	Gravelly Sand to Dense Sand
8	Very Stiff Sand to Clayey Sand*
9	Very Stiff Fine-Grained*

*heavily overconsolidated or cemented

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- Lean to Fat CLAY (CL-CH)
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LINE 10, 11, and 12 PROFILES

Fault Study

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

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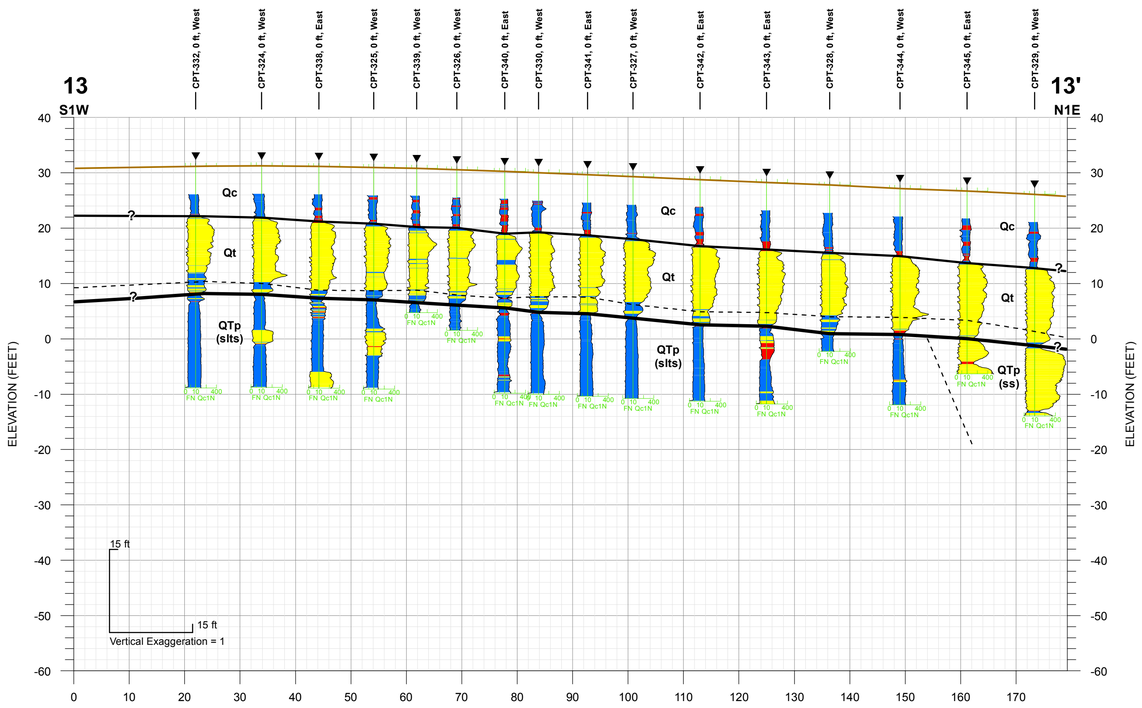
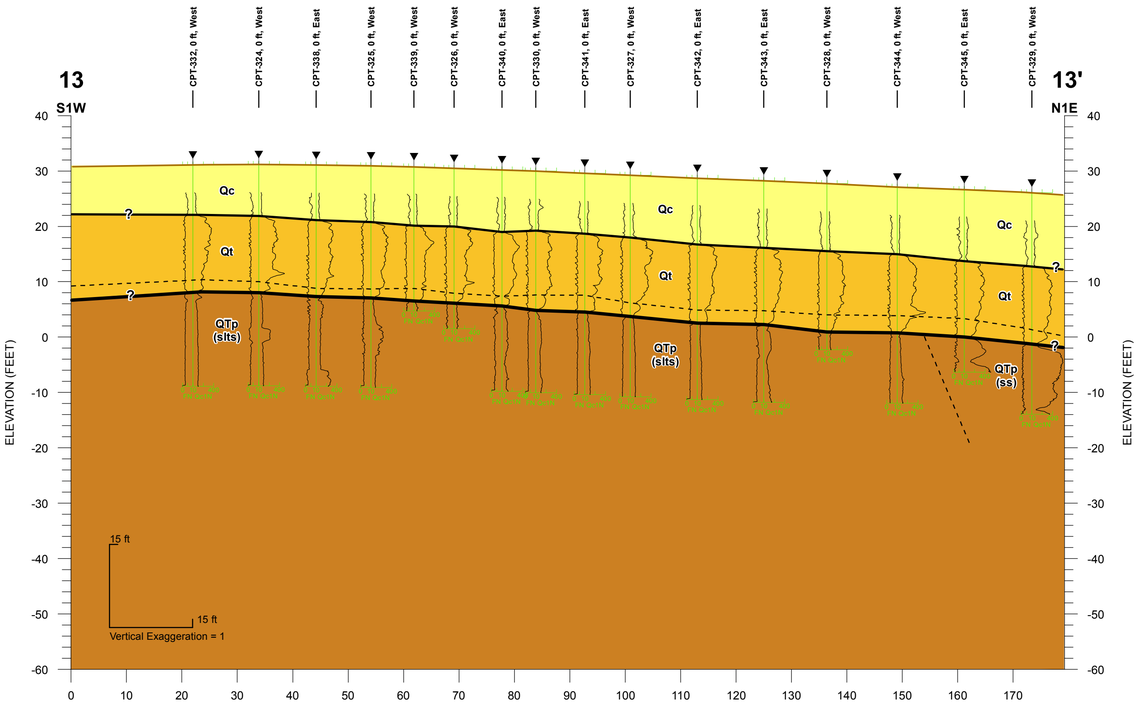
1	July 19, 2012	Profiles	CBD	TFB	TFB

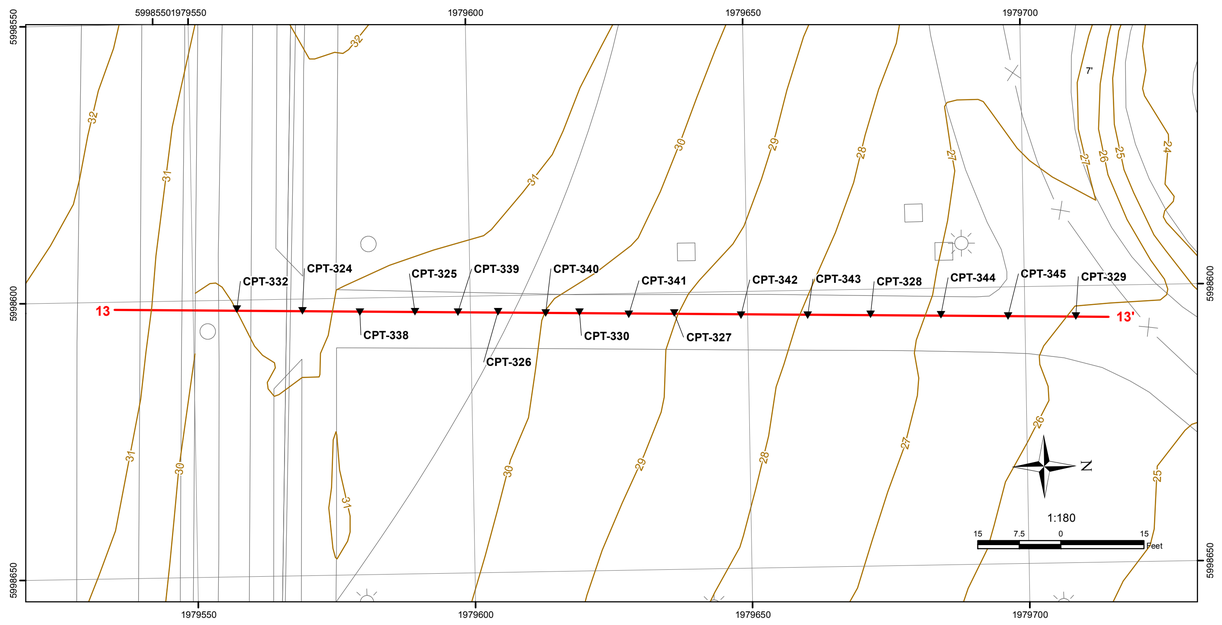
JOB NUMBER: 04.62110136

PLATE.: 14

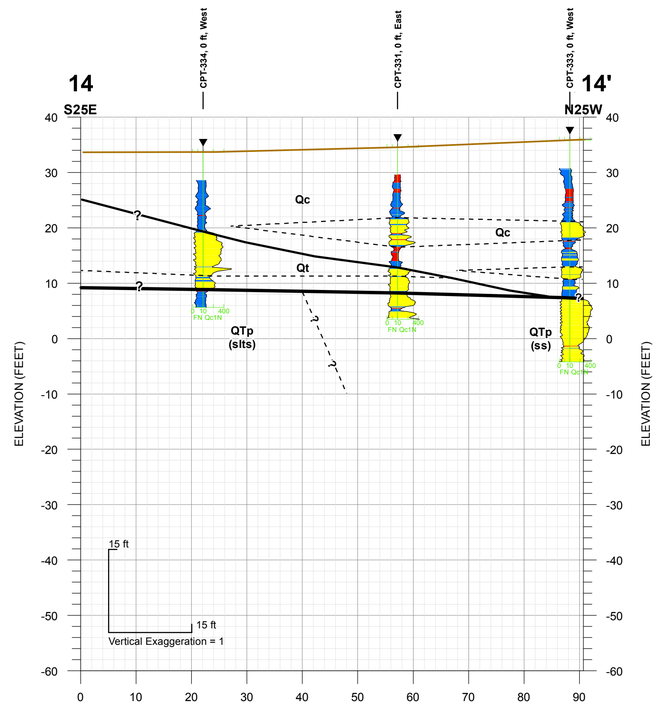
Line 13

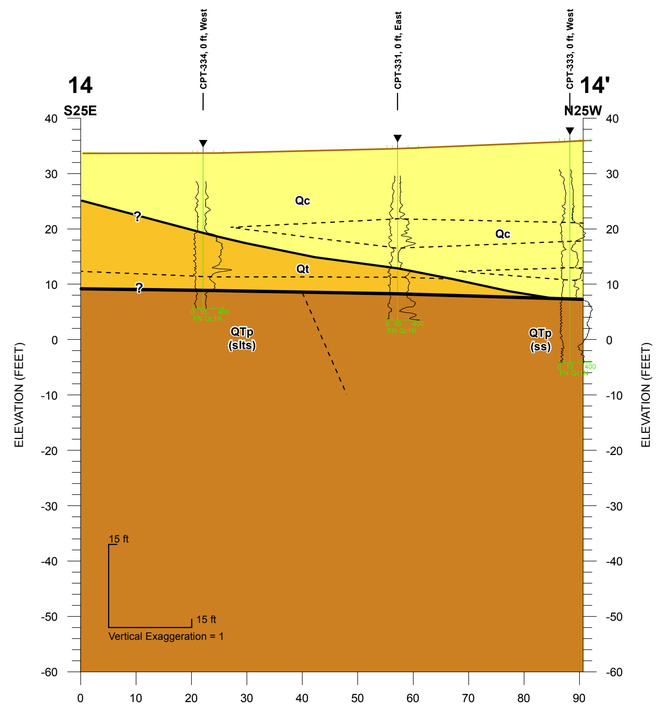


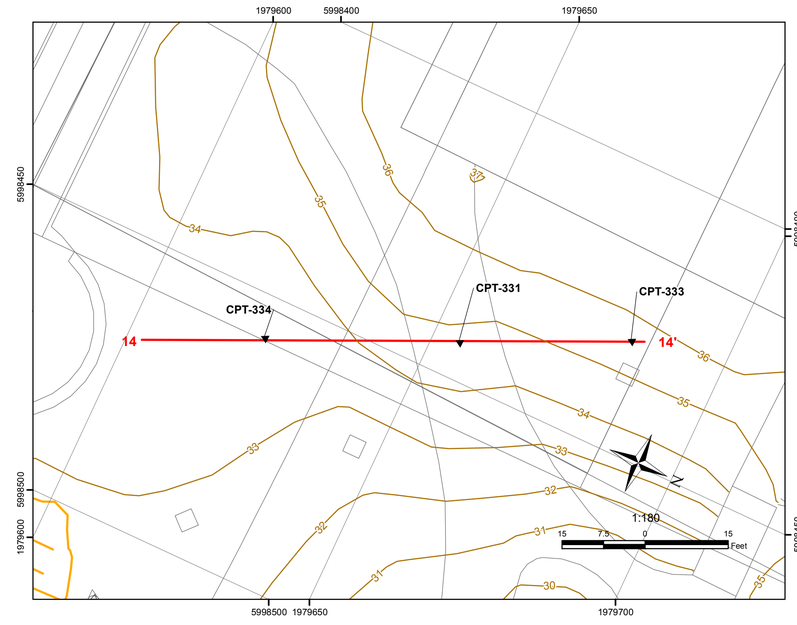


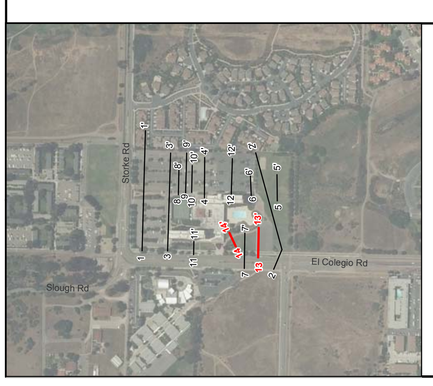


Line 14









Map Legend

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Profile Legend

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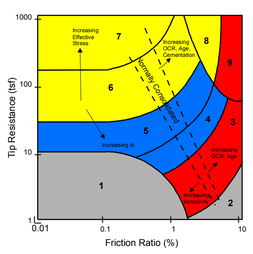
CPT Correlation Chart



(Robertson and Wride, 1990)

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LINE 13 AND 14 PROFILES

Fault Study

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

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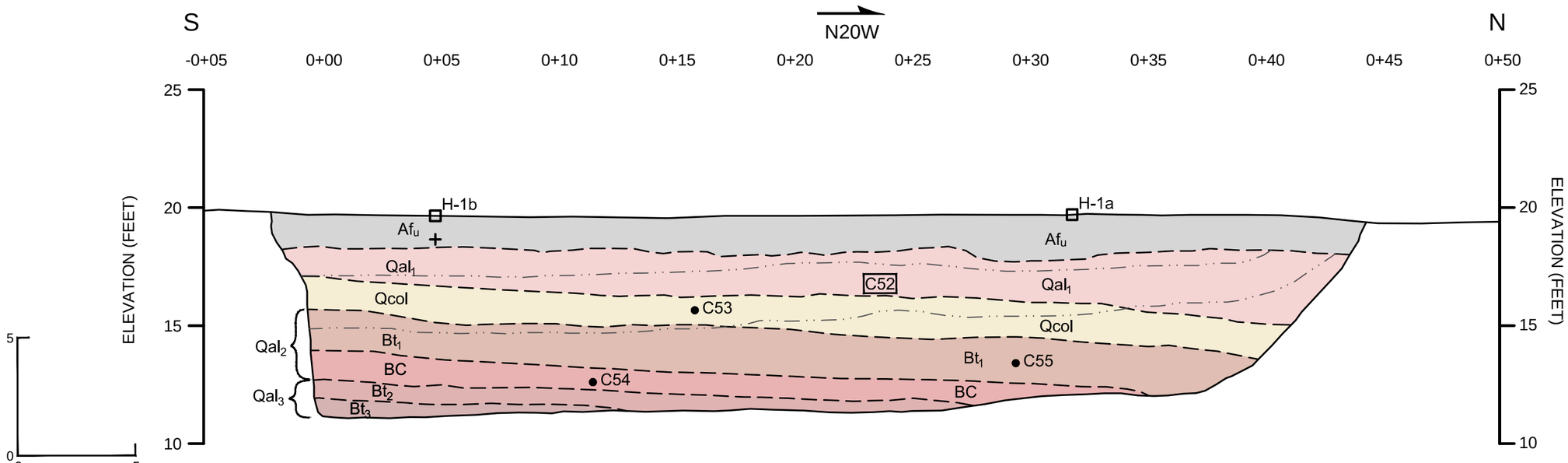
JOB NUMBER: 04.62110136

PLATE.: 15

Trench (T-1)



LEGEND

Afu — Undifferentiated artificial fill; very dark grayish brown 10 YR 3/2 slightly sandy clayey silt; dry to slightly moist; soft in upper 3-inch, deeper it is firm to very firm; with light yellowish brown silty very fine sand; 10 YR 6/4 medium dense; locally sandy with fine gravel and pockets of gravelly sand with white shale clasts; slightly moist

Qal1 — Alluvium; Brown to dark brown 10 Y/R 4/3 very fine sandy silt with sand; firm to very firm; common very fine pores with voids very fine roots in upper 3-6 inches; planar abrupt contact with Qcol

Qcol — Colluvial scarp-derived alluvium; very pale brown to light yellowish brown 10YR 6.5/4 silty sand with clayey gravel; clasts of subangular to subrounded oxidized shale clasts and black manganese oxide sediment (?) including minor calcium-carbonate-cement-filled voids; few to common pores; massive; lower portion of unit forms dense hardpan; slightly moist to dry; very fine roots in upper 6 inches

Qal2

Bt1 — Argillic Bt-soil subhorizon unit 1; strong brown 7.5 YR 4.5/6 sandy clay; very stiff to stiff; moderate granular to subangular pedogenic structure; many to continuous thick clay films to fully engulfed sand grains and filled pores; strong clay cementation; sticky to plastic; very few discontinuous, random, and vesicular pores; transitional contact to BC subhorizon

BC — BC-soil subhorizon; dark yellowish brown 10 YR 4/4 slightly clayey sand to clayey sand very firm to stiff; slightly moist; oxidized organic-brown oxidized streaks; planar abrupt contact to Bt_2 soil subhorizon

Qal3

Bt2 — Argillic Bt-soil subhorizon 2; dark yellowish brown 10 YR 4/6 clayey sand to locally sandy clay; moist, stiff; and massive; weak to moderate medium to coarse subangular structure; slightly sticky and slightly plastic; few to common clay-plugged pores and common thick to moderately thick clay bridges; common thin clay films on sand grains; discontinuous, random, and vesicular pores; moderate clay cementation; transitional contact to Bt3 soil subhorizon

Bt3 — Argillic Bt-soil subhorizon 3; dark brown to yellowish brown 10 YR 4.5/6 to 10 YR 5/6 fine sand with some clay; moist; massive

Geologic contact

Trench wall bench

C53 — Organic sediment sample

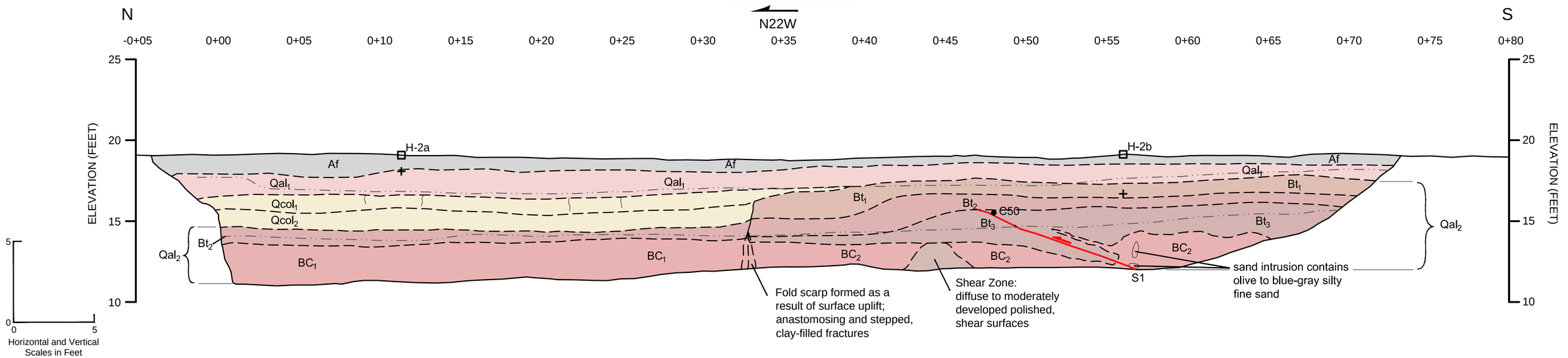
C52 — Bulk organic sediment sample

H-1a — HUB2 Survey Point

\+ — Reference Nail

FAULT TRENCH LOG (TRENCH 1)
San Joaquin Apartments
and Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

Trench (T-2)



LEGEND

Af — Dark gray 10 YR 4.5/1 silty sand; trace to minor clay moderately loose; locally clayey silt; dry to slightly moist; very fine roots; trace gravel; ½ - 1-inch thick line at bed; planar contact

Qal_1 — Brown 5/3 silty very fine sand to fine silty sand with silt; slightly moist to moist; fining upward to silty sand, locally sandy silt; very fine pores/ voids, medium dense to locally dense; massive

$Qcol_1$ — Colluvial scarp-derived alluvium; very pale brown to light yellowish brown 10YR 65/4 silty sand with gravel; clasts of subangular to subrounded oxidized shale and black manganese oxide (?) including minor calcium-carbonate-cement-filled voids; few-common pores massive; unit $Qcol_2$ and Qal_2 forms hardpan; slightly moist to dry; very fine roots in upper 6 inches

$Qcol_2$ — $Qcol_1$ that is moderately cemented to form hardpan

Qal_2

Bt_1 — Argillic soil subhorizon unit 1; brown to dark brown 10 YR 4/4 sandy clay; moist, stiff to very stiff, and massive; medium to course angular structure; sticky to plastic; strong clay cementation; many clay-plugged pores; common moderately thick clay films on sand grains; few discontinuous, random, vesicular pores

Bt_2 — Argillic soil subhorizon unit 2; reddish yellow to strong brown sandy clay to clay with sand; moist, very stiff, and massive; moderate granular to subangular pedogenic structure; many to continuous thick clay films to fully engulfed sand grains and filled pores; strong clay cementation; sticky to plastic; very few discontinuous, random, and vesicular pores

Bt_3 — Argillic soil subhorizon unit 3; dark brown 7.5 YR 3/4 sandy clay to clay with sand; moist, stiff, and massive; medium to coarse subangular pedogenic structure; common to many, moderately thick clay bridges in pores and faces; common thick bridges; discontinuous, random, and vesicular pores; slightly sticky and slightly plastic; strong clay cementation

Qal_2 - cont.

BC_1 — BC- soil subhorizon unit 1; dark brownish sand with clay and some silt; moist to wet, massive, and dense; weak granular structure; non sticky and non plastic; very few clay stains on sand grains; fine continuous, random vesicular pores

BC_2 — BC- soil subhorizon unit 2; 10 YR 3.5/6 dark yellowish brown clayey sand with some silt; moist to wet, massive, and dense; weak to moderate granular structure; slightly sticky and slightly plastic; very few to few clay stains on sand grains; fine continuous, random vesicular pores; weak clay cementation

- Geologic contact
- Trench wall bench
- C50 — Organic Sediment Sample
- Shear; left-lateral reverse slip fault; arrow indicates reverse-slip component
- H-2a — HUB2 Survey Point
- Reference Nail

SHEAR CHARACTERISTICS

S1 - N85E/18SE Shear; ⅛ - 3/16-inch wide clay gouge with slickenlines and mullions; two distinct shear surfaces; rake of straie is 14@N25E.

FAULT TRENCH LOG (TRENCH 2)
San Joaquin Apartments
and Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

PLATE 17

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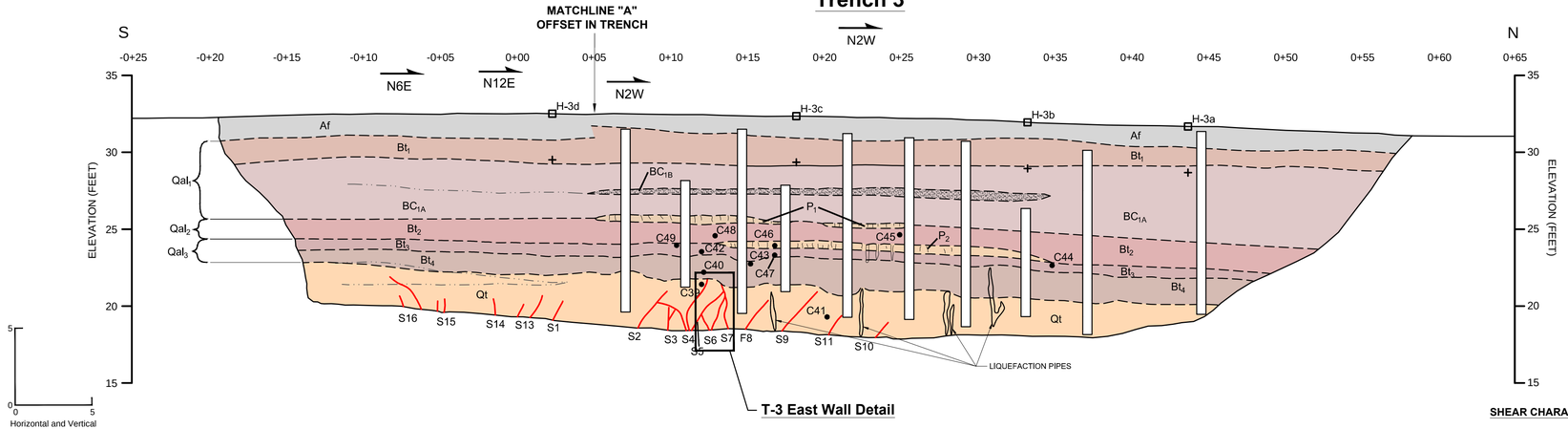
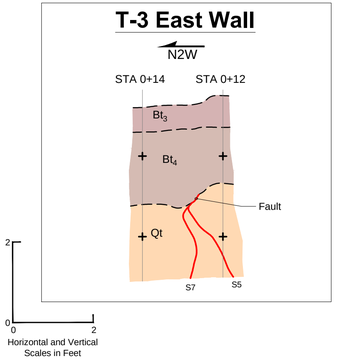
Trench 3





LEGEND

Af — Artificial fill; Pale brown 10 YR 6/3 silt with minor very fine sand; trace to few fine gravel, firm to very firm, slightly moist; with 10 YR 4/3 brown to dark brown silt with minor clay, many very fine roots; locally platy structure, planar basal abrupt contact with Bt_1

Qal_1

Bt_1 — Argillic soil subhorizon unit 1; dark brown 10 YR 3/3 slightly sandy clay with silt; trace salt crystals; very stiff; moist, massive; weak to moderate clay; moderately formed subangular pedogenic structure

BC_{1A} — BC- soil subhorizon unit 1A; yellowish brown to dark yellowish brown 10YR 4.5/4 sandy clay with silt to locally silty clay with sand; very stiff; thin lenses or pockets of white 10YR 8/1 and yellow 10YR 8/6 fine sand

BC_{1B} — BC- soil subhorizon unit 1B; yellowish brown 10YR 4.5/4 coarse to medium sand with clay; massive, medium dense, and slightly moist

Qal_2

P_1 — Paleosol unit 1A consisting of AB-soil subhorizon; dark brown 7.5YR 3.5/4 silty clay; AB-horizon; stiff; moist, and massive; ¼-inch to ½-inch wide root casts that taper downward and terminate at upper bounding contact of unit; partially to completely eroded in places; slightly wavy to planar gradational basal contact with unit Bt_2

Bt_2 — Argillic soil subhorizon unit 2; brown to dark brown 7.5YR sandy clay with silt; massive, very stiff, and moist; common root casts; planar gradational basal contact with unit Paleosol unit 2

Qal_3

P_2 — Paleosol AB-horizon paleosol; dark brown 7.5YR 3/4silty clay with minor sand; very stiff; moist, and massive; ¼-inch to 1-inch wide root casts that taper downward and terminate at upper bounding contact of unit; partially to completely eroded in places; slightly wavy to planar gradational basal contact with unit Bt_3

Bt_3 — Argillic soil subhorizon unit 3; strong brown 7.5YR 4/6 clayey medium sand to sand with clay; moist, dense, and massive; slightly wavy gradual basal contact with unit Bt_4

Bt_4 — Argillic soil subhorizon unit 4; strong brown 7.5YR 4/6 clay with sand, locally becomes sandy clay along base of unit; moist, stiff to very stiff, and massive; common to many root structures and root casts; scattered liquefaction pipes; wavy transitional contact with Qt

Qt — Marine Terrace Formation; pale yellow 2.5Y 7/4 fine to very fine sand; medium dense, slightly moist, and massive; common to many yellowish-brown 10YR 5/7 argillic bands consisting of slightly clayey very fine to fine sand with a trace of silt; approximately 1/32- to ½-inch thick, commonly 1/16- to ¾-inch thick in upper 18- to 24-inches of unit; argillic bands may or may not reflect laminations; locally convoluted argillic bands forming pillar and dish structures

Trench Shore

Geologic Contact

Trench wall bench

C53 — Organic Sediment Sample

Fault; left-lateral reverse slip fault

Liquefaction pipe

H-3c — HUB2 Survey Point

Reference Nail

SHEAR CHARACTERISTICS

S1 - N67E/52SE shear; ¼-inch wide zone of clayey silt; juxtaposes offset and mismatched 1/16 - ⅜-inch thick argillic bands.

S2 - N78E/57SE shear; ⅛ wide zone of silt; ½-inch apparent south-side up vertical offset.

S3 - N84W/90-73SW shear zone; 2-inch wide zone composed of 3 shears approximately ½ - ¼-inch wide; ½-inch apparent north-side up vertical offset.

S4 - N73W/60SW shear; 1/16-inch wide zone of silt; apparent ⅜-inch south-side up offset.

S5 - N84E/66NW shear; ⅛ - 3/16 wide zone of clayey-silt; anastomosing shears form approximately 1-inch wide zone.

$S6_{North}$ - N76E/68SE shear; ⅛ - 3/16-inch wide zone of clayey-silt.

$S6_{South}$ - N82W/77NE shear; apparent ½-inch north-side up offset 1/16 - 3/16-inch wide zone of silt.

S7 - N79W/73-80NE shear; 1/16-inch wide zone of clayey-silt.

S8 - N78W/55NE shear; ⅛-inch wide zone of silt.

S9 - N88E/53SE shear; 1/16-inch wide zone of slightly clay silt; terminates 1.25-inch thick argillic band.

S10 - E-W/49S shear; 1/16-inch wide zone of silt; truncate 1-inch thick argillic band on south side.

S11 - N84W/54SW shear; observed on both walls; west wall: 1/16-inch to ⅜-inch wide.

S13 - N86W/74SW shear; 1/16-inch wide zone of silt extends upward as hairline fracture.

S14 - N77W/81NE shear; ⅛-inch wide zone of clayey silt.

S15 - N78W/84NE shear; ⅛-inch wide zone of clayey silt.

S16 - N58W/75NE shear; ¼-inch wide zone of clayey silt.

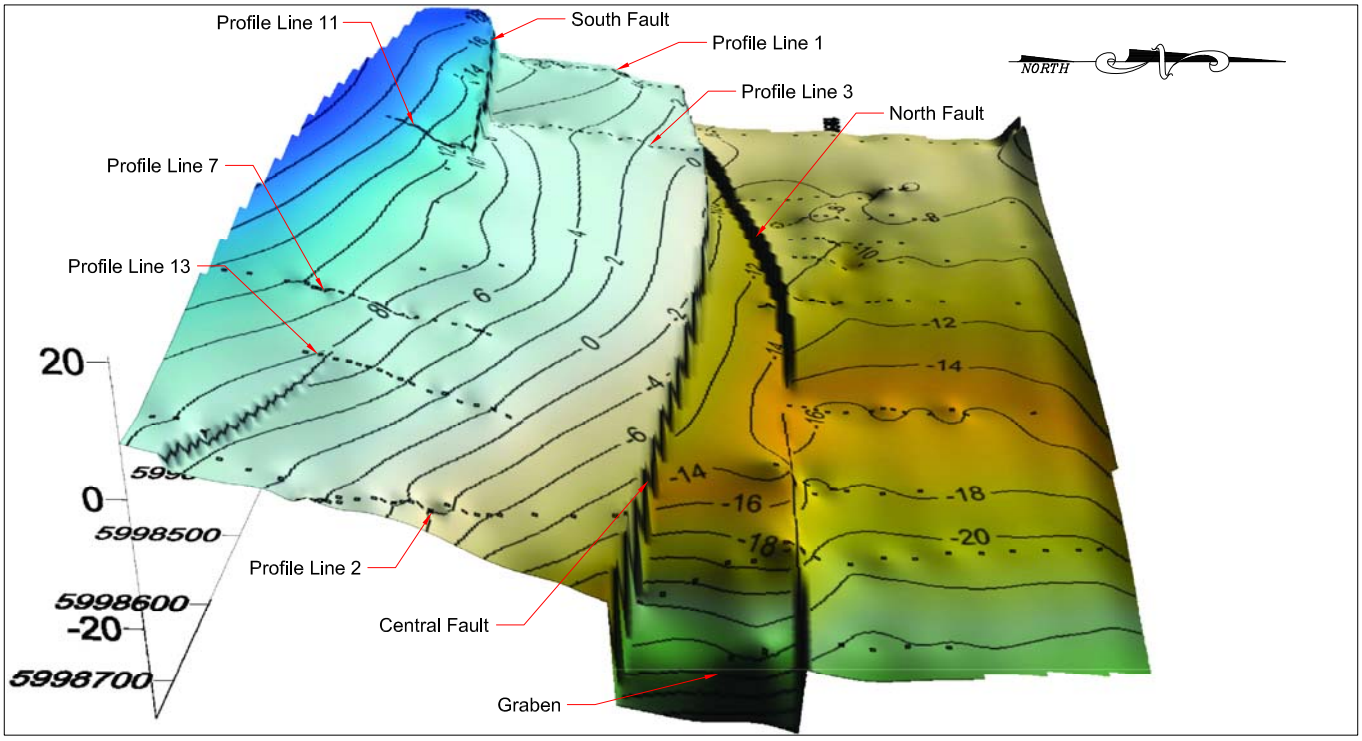
SHEAR CHARACTERISTICS IN DETAIL

S5 - N89E/64SE shear; ⅛ - 3/16-inch wide zone of silt.

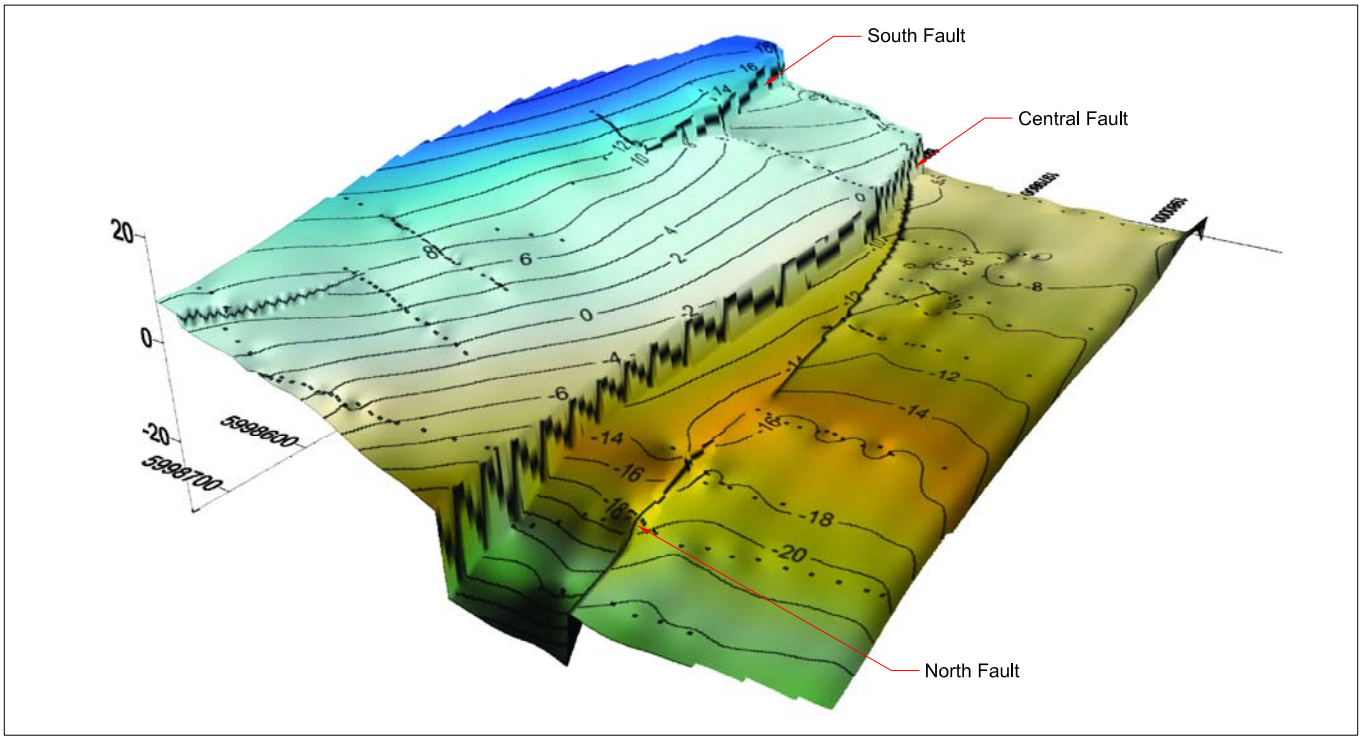
S7 - N88E/77NW shear; ⅜-inch wide zone of silt; truncates argillic band.

FAULT TRENCH LOG (TRENCH 3)
San Joaquin Apartments
and Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

PLATE 18



View looking west

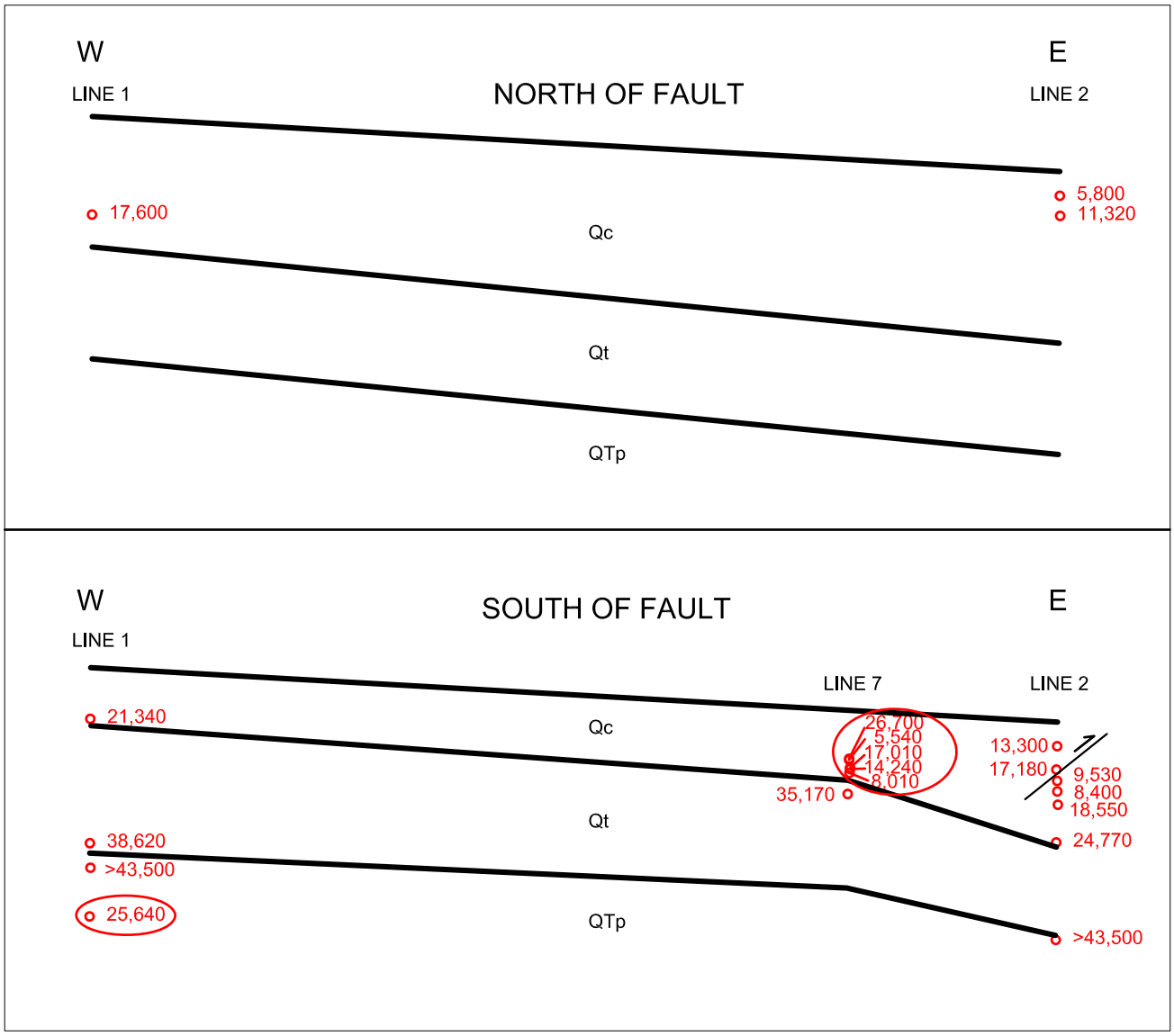


View looking southwest.

Surface and contours illustrate the base of the marine terrace deposits.

3-D SURFACE DIAGRAM SHOWING FAULTING
San Joaquin Apartments and Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

PLATE 19



Indicates anomalous dates that may be out of stratigraphic order.

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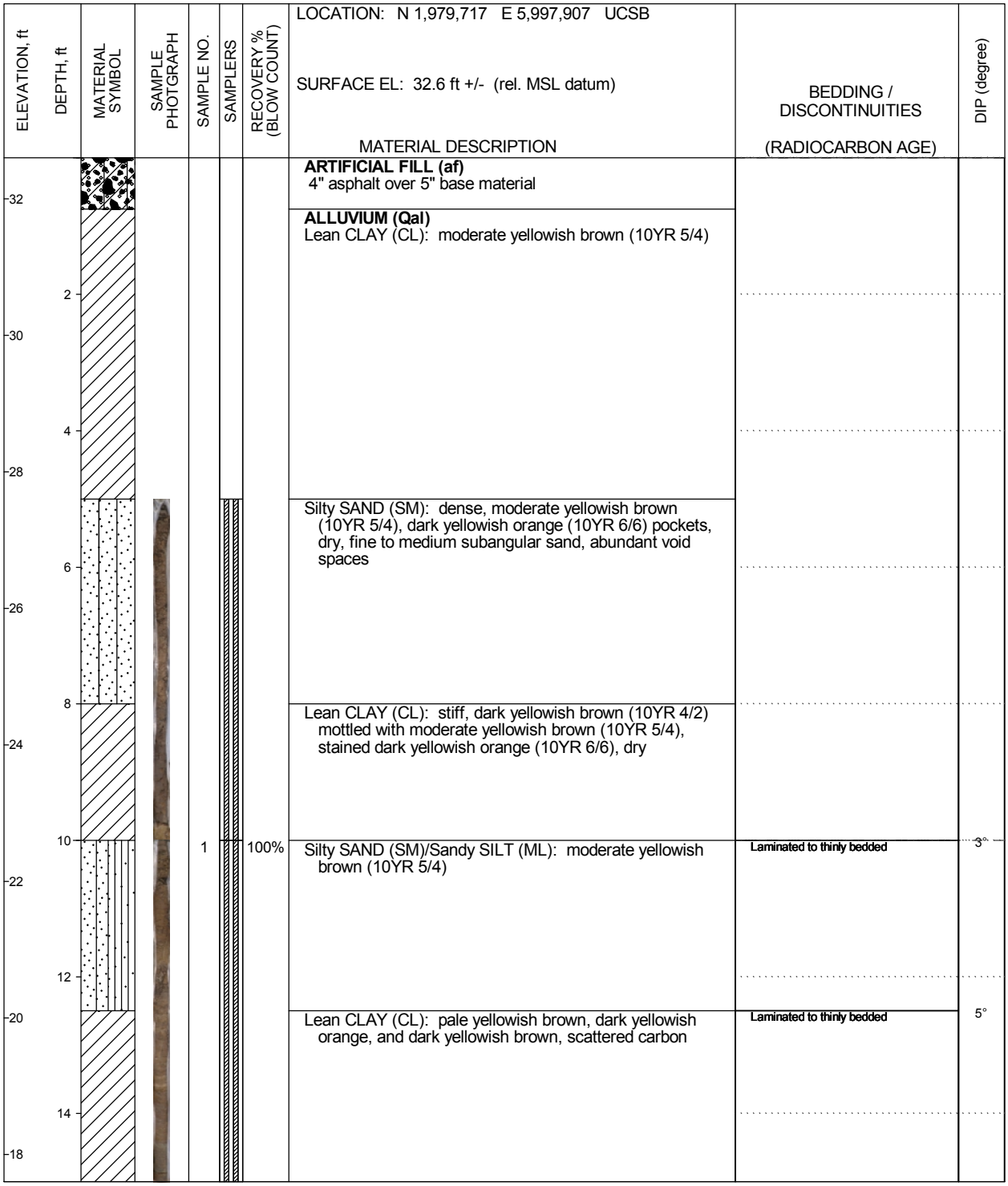
SCHEMATIC DIAGRAM OF RADIOCARBON DATES
San Joaquin Apartments and Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

PLATE 20

APPENDIX A - LOGS OF DRILL HOLES



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

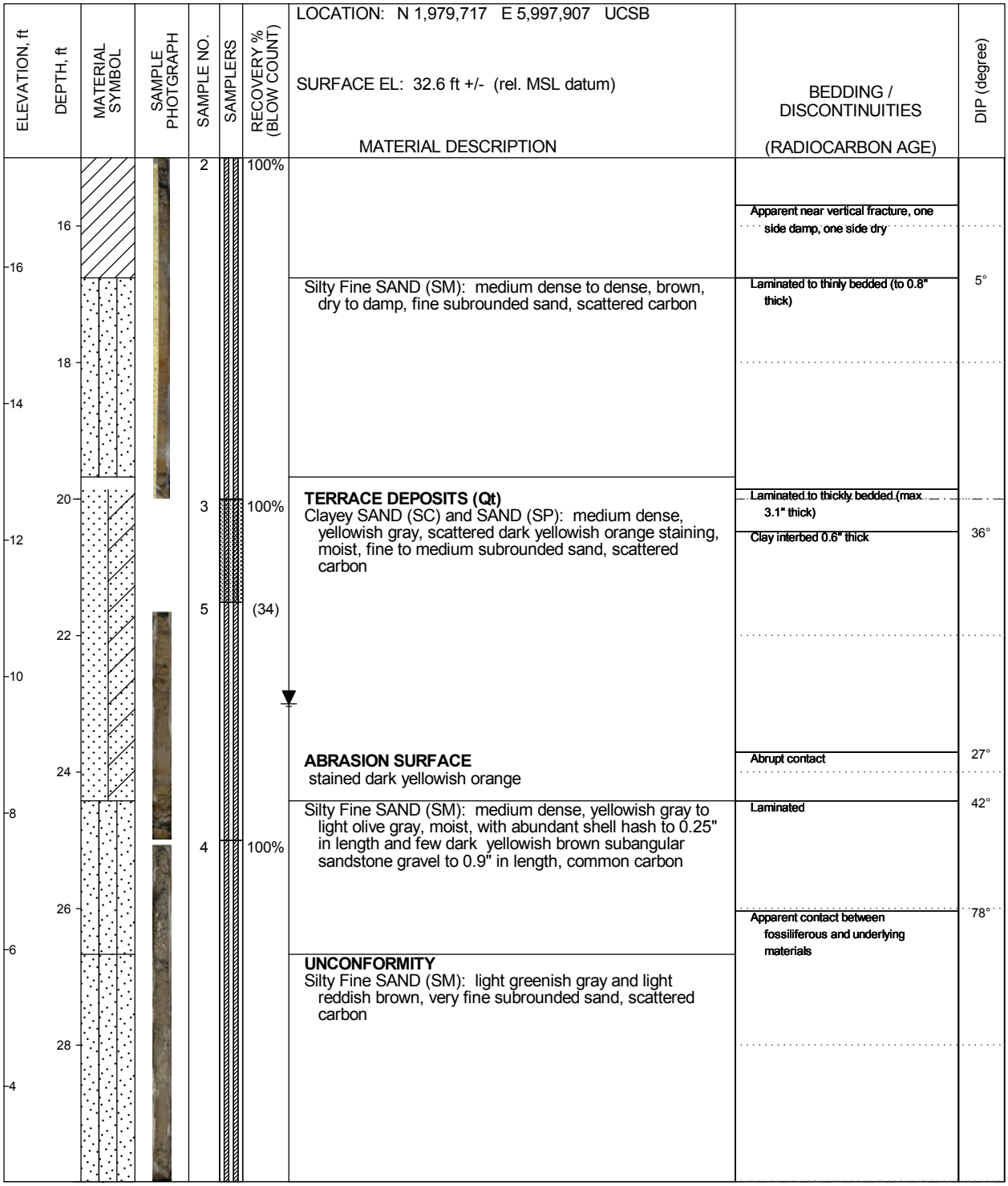
COMPLETION DEPTH: 33.0 ft
DEPTH TO WATER: 23.0 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 15, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-01

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-1a



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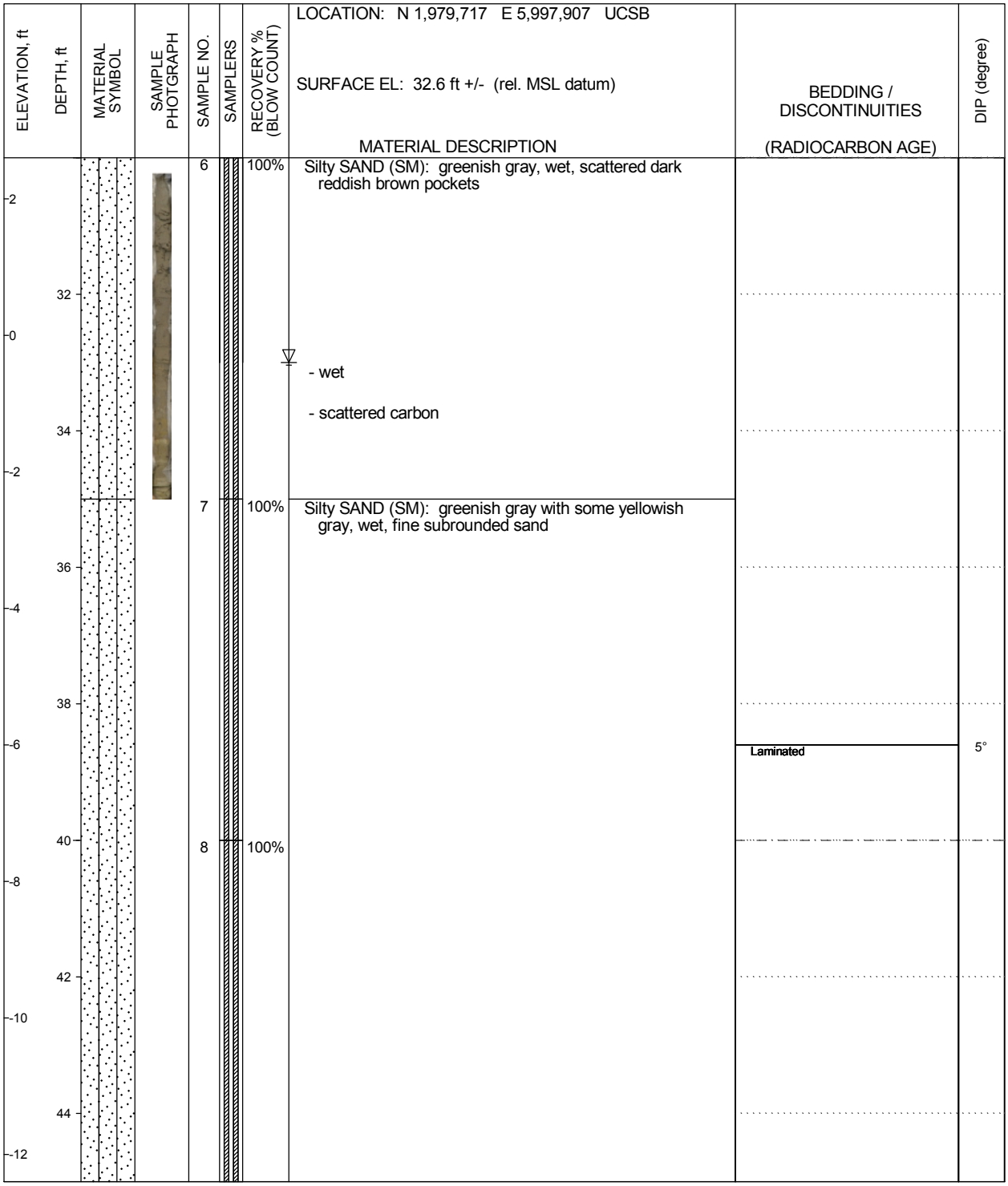
COMPLETION DEPTH: 33.0 ft
DEPTH TO WATER: 23.0 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 15, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-01

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-1b



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

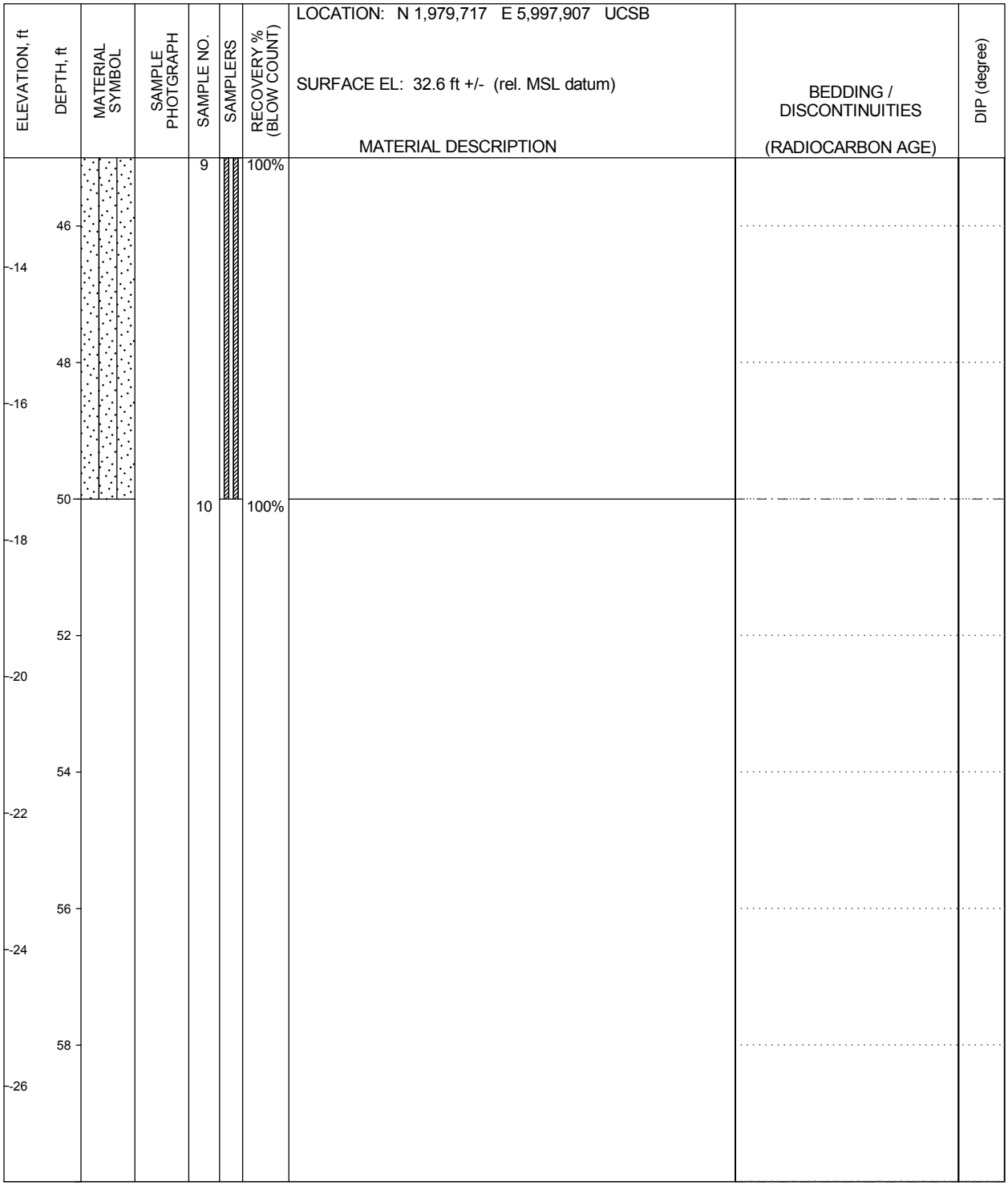
COMPLETION DEPTH: 33.0 ft
DEPTH TO WATER: 23.0 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 15, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-01

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-1c



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

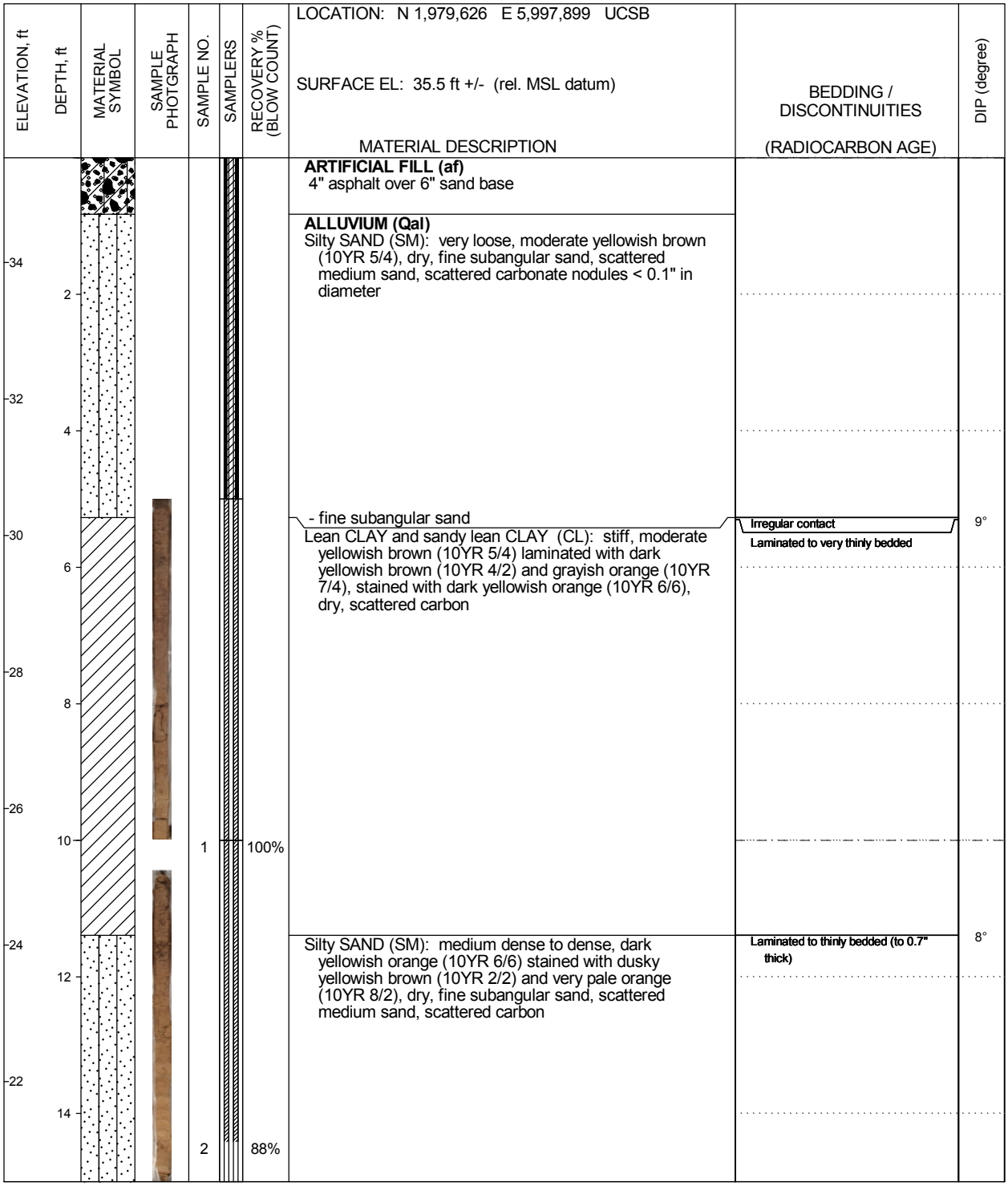
COMPLETION DEPTH: 33.0 ft
DEPTH TO WATER: 23.0 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 15, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-01

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-1d



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

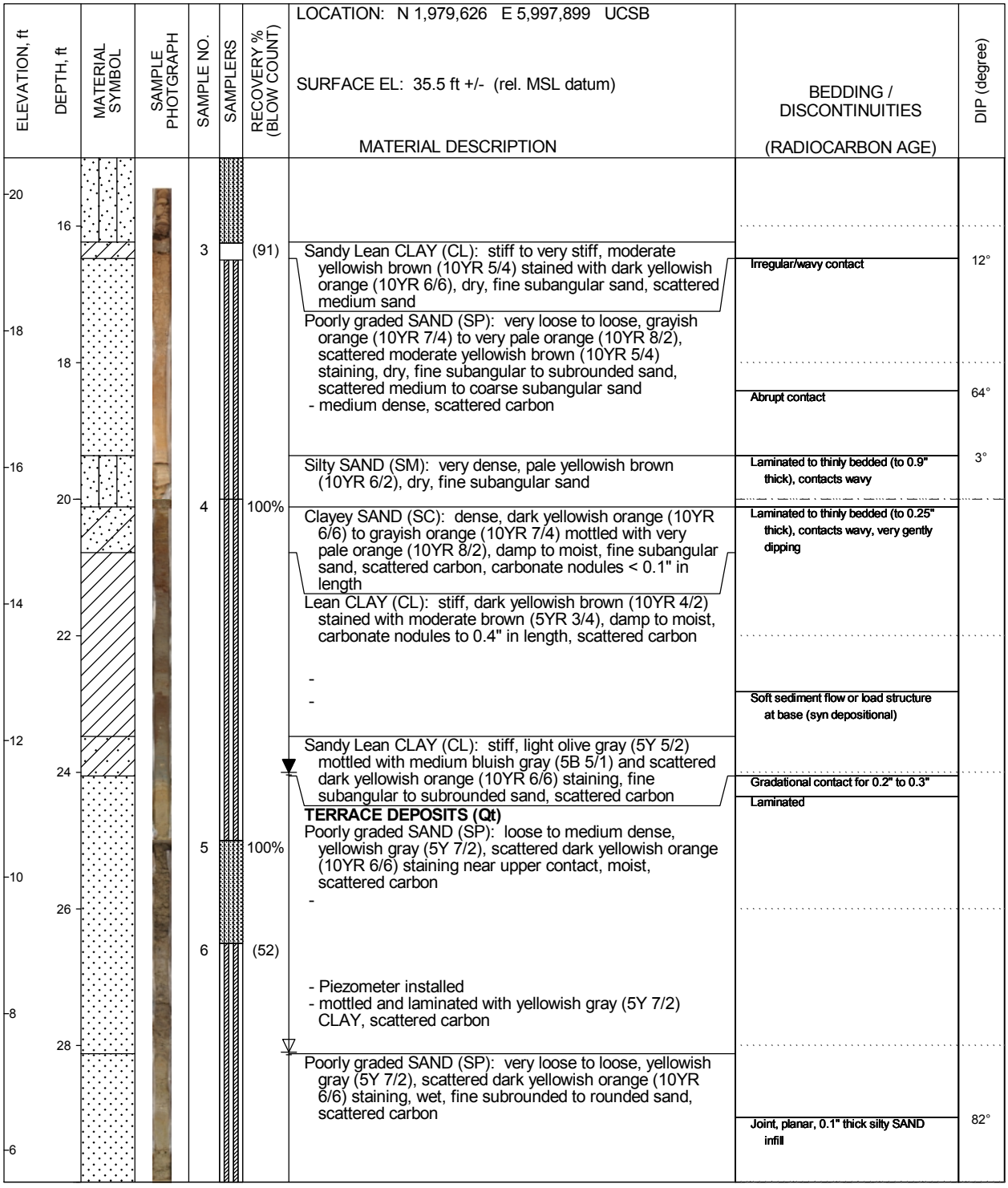
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 24.0 ft
BACKFILLED WITH: Grout
DRILLING DATE: March 15, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-02

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-2a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

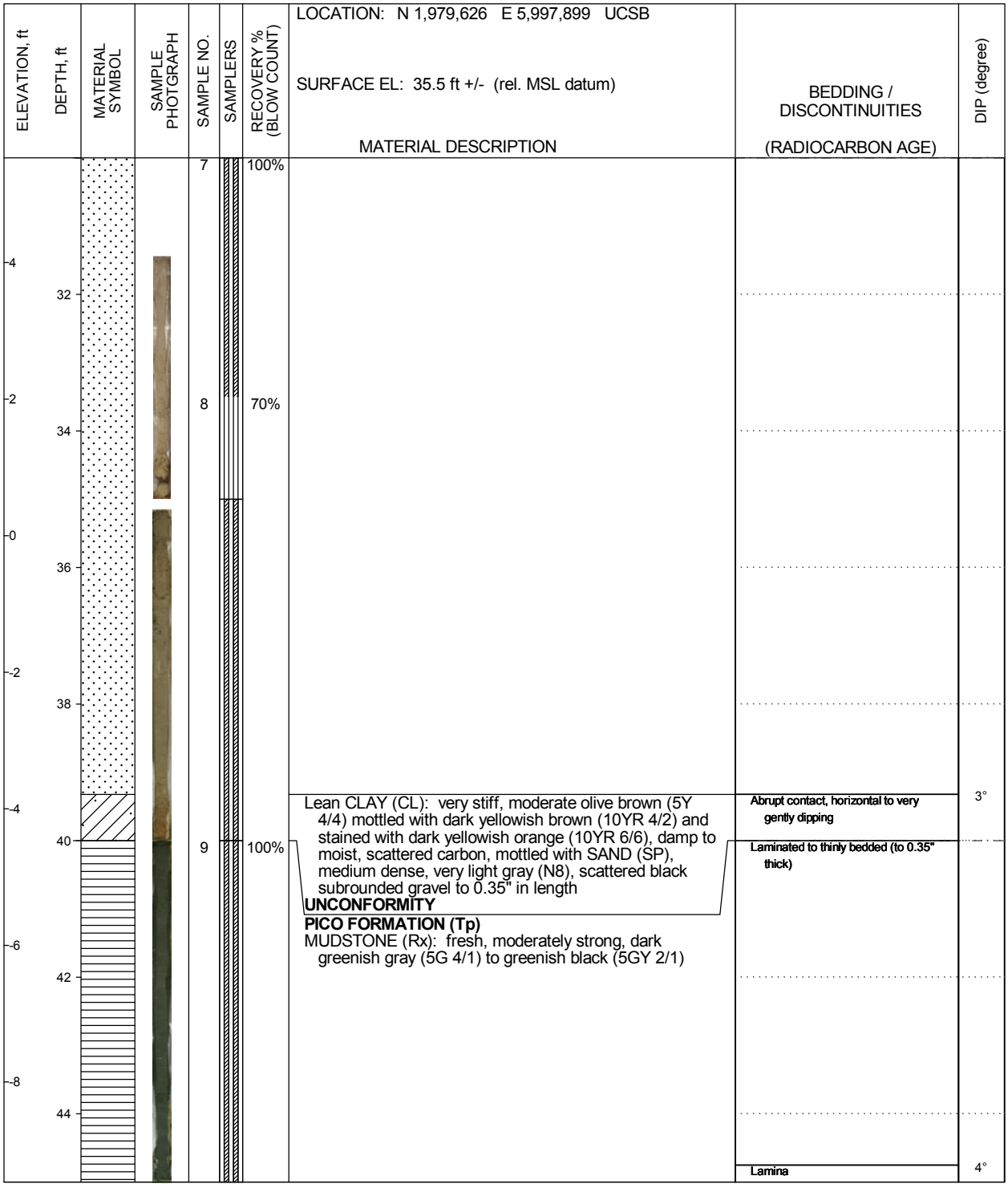
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 24.0 ft
BACKFILLED WITH: Grout
DRILLING DATE: March 15, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-02

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-2b



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

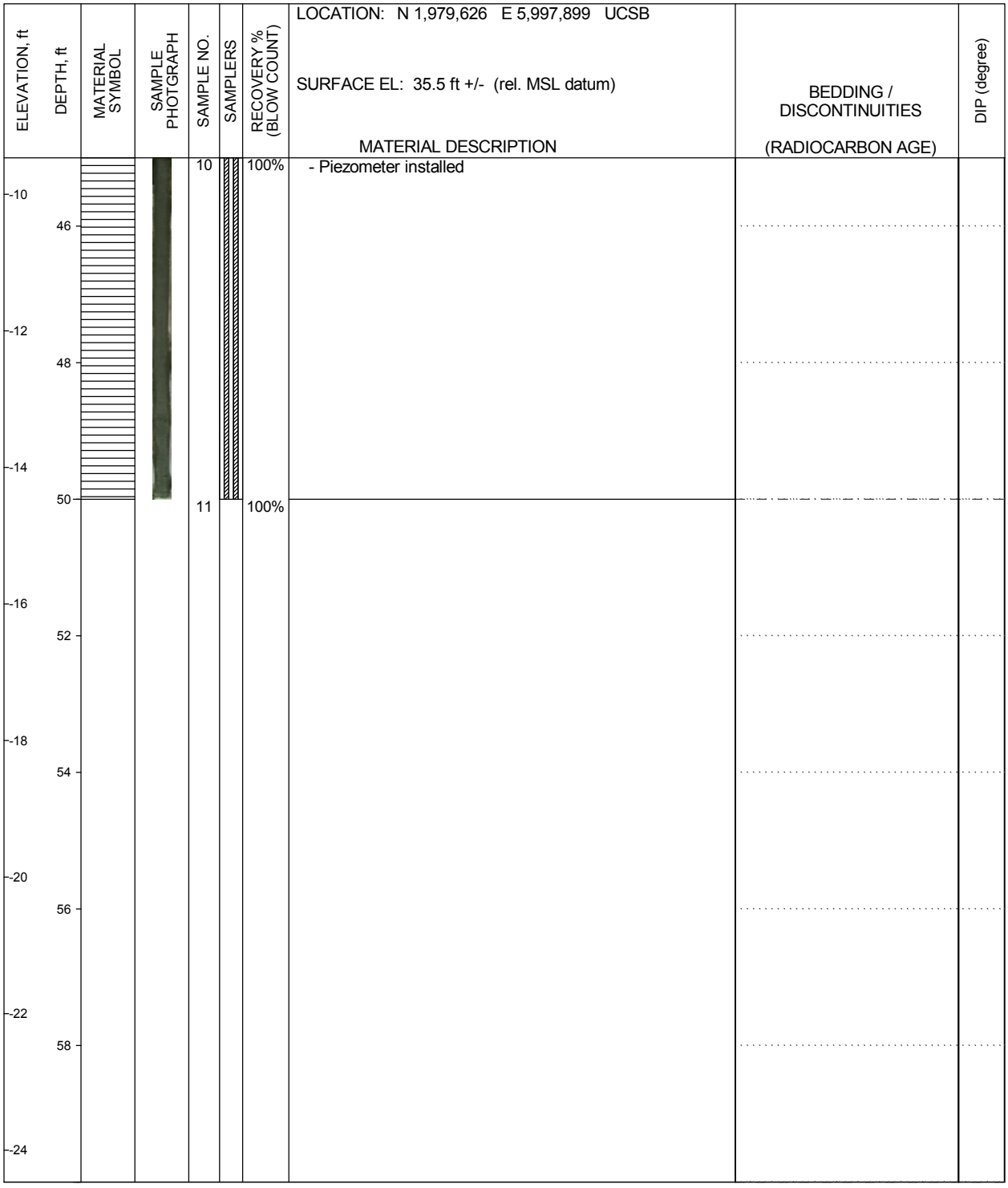
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 24.0 ft
BACKFILLED WITH: Grout
DRILLING DATE: March 15, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-02

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-2c



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

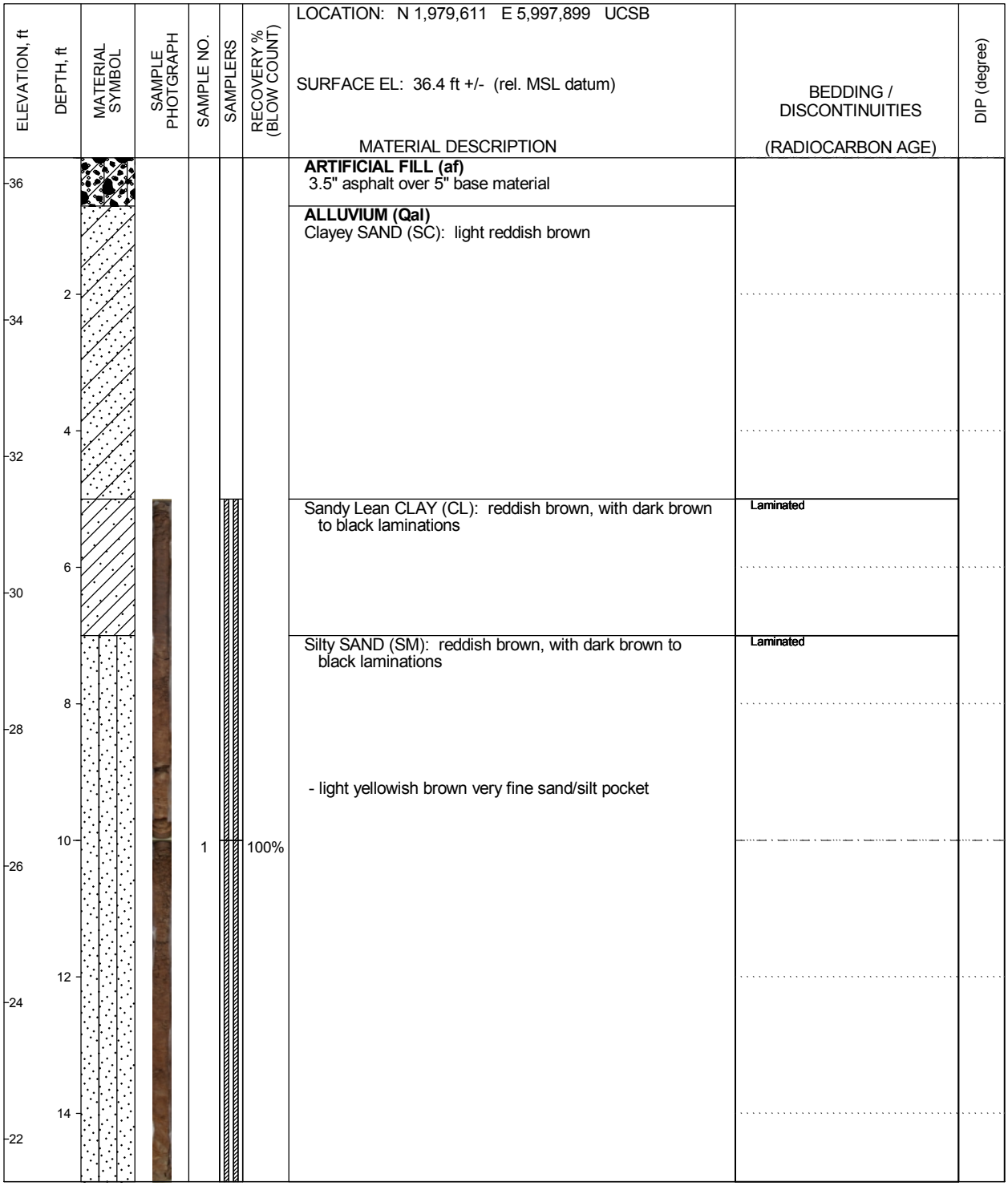
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 24.0 ft
BACKFILLED WITH: Grout
DRILLING DATE: March 15, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-02

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-2d



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

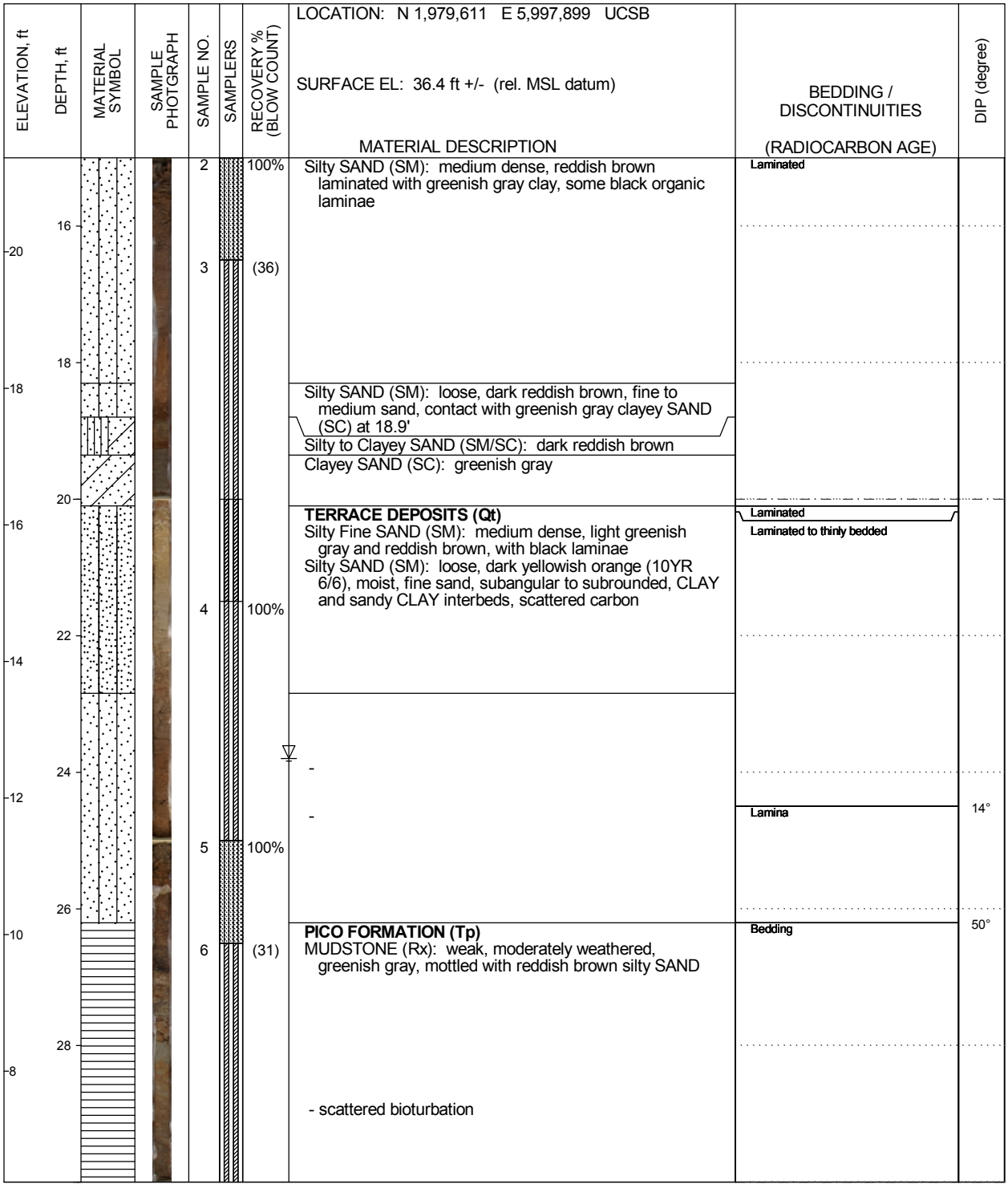
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 23.8 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 14, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-03

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-3a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

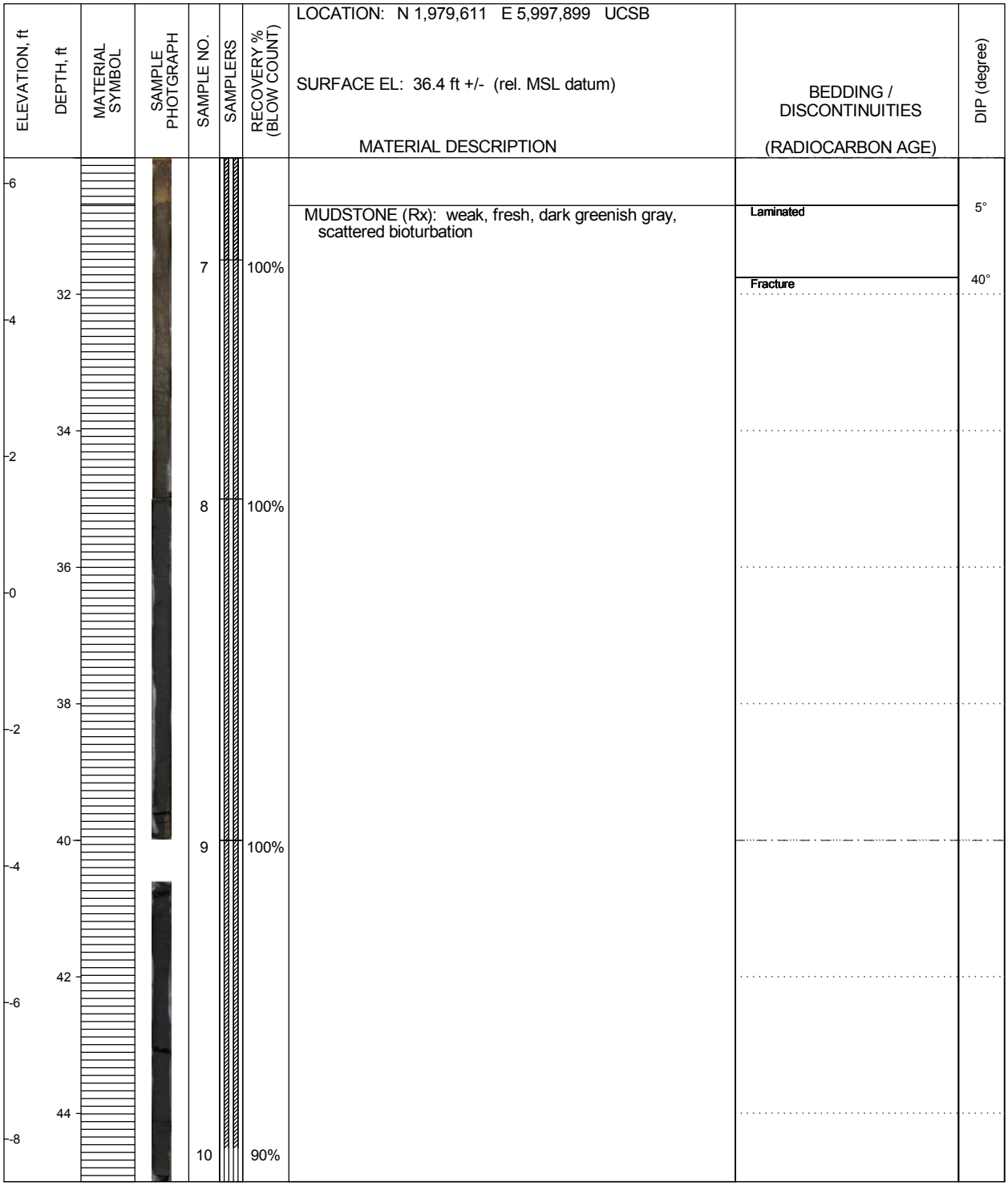
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 23.8 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 14, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-03

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-3b



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

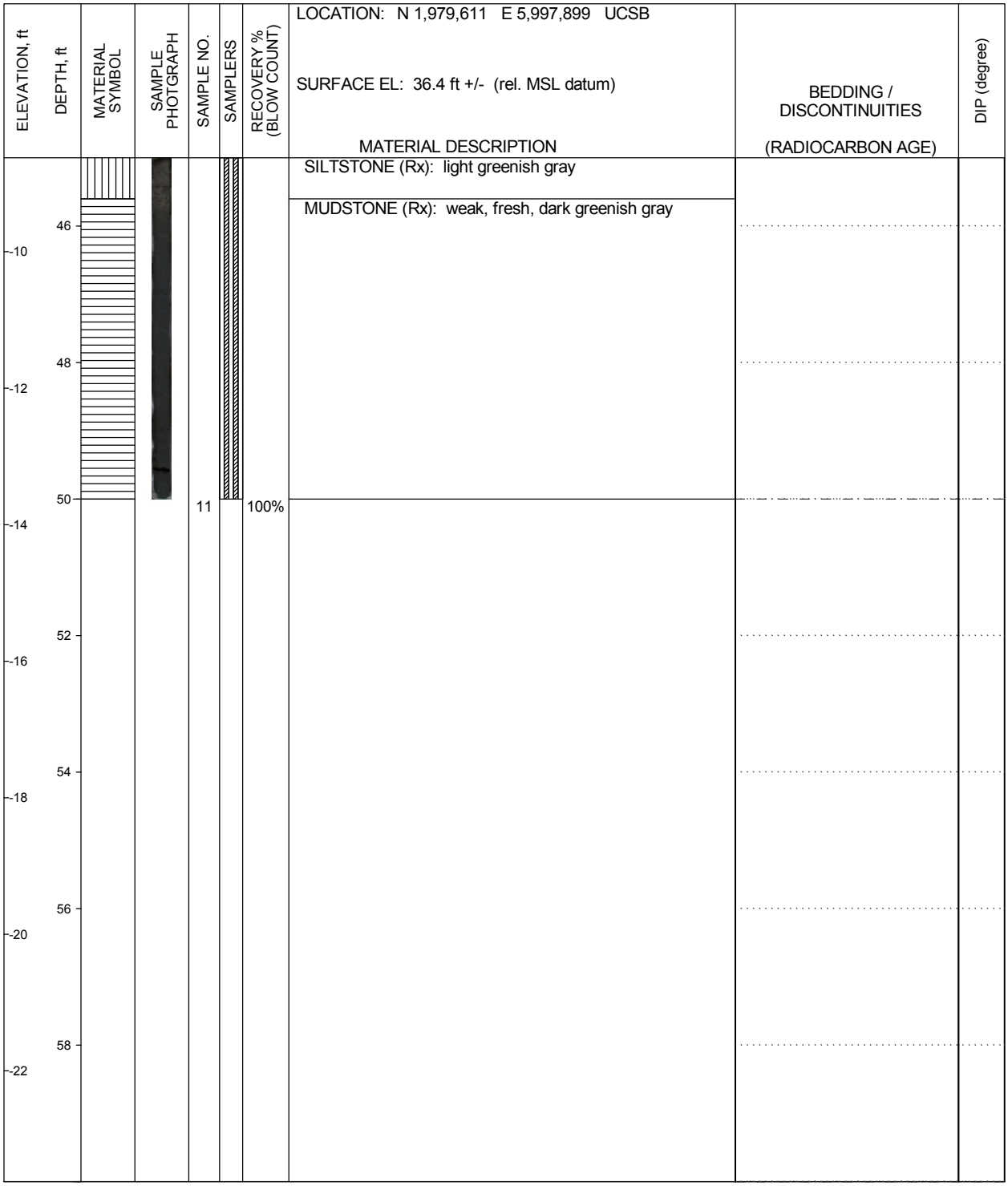
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 23.8 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 14, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-03

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-3c



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

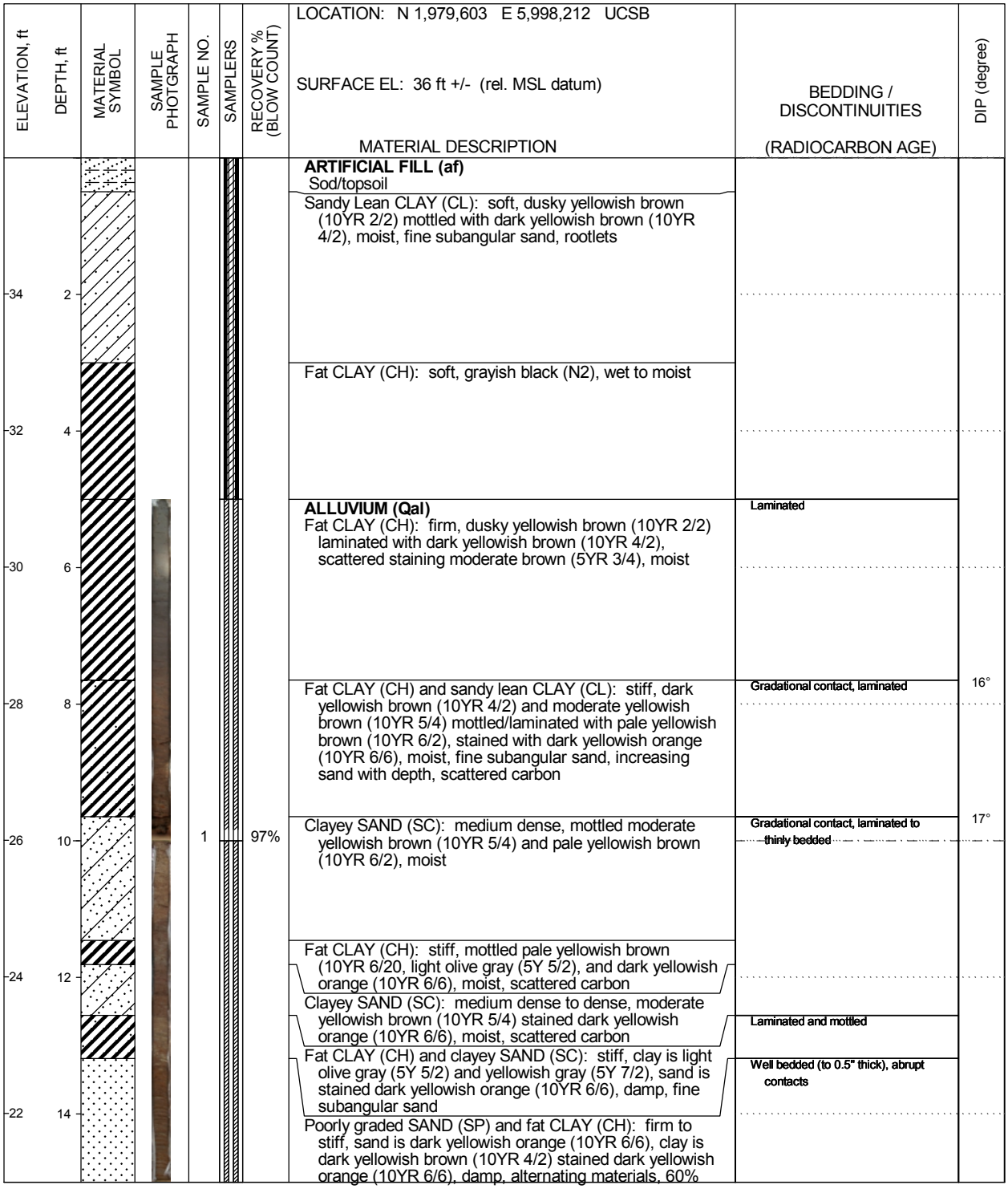
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 23.8 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 14, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-03

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-3d



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

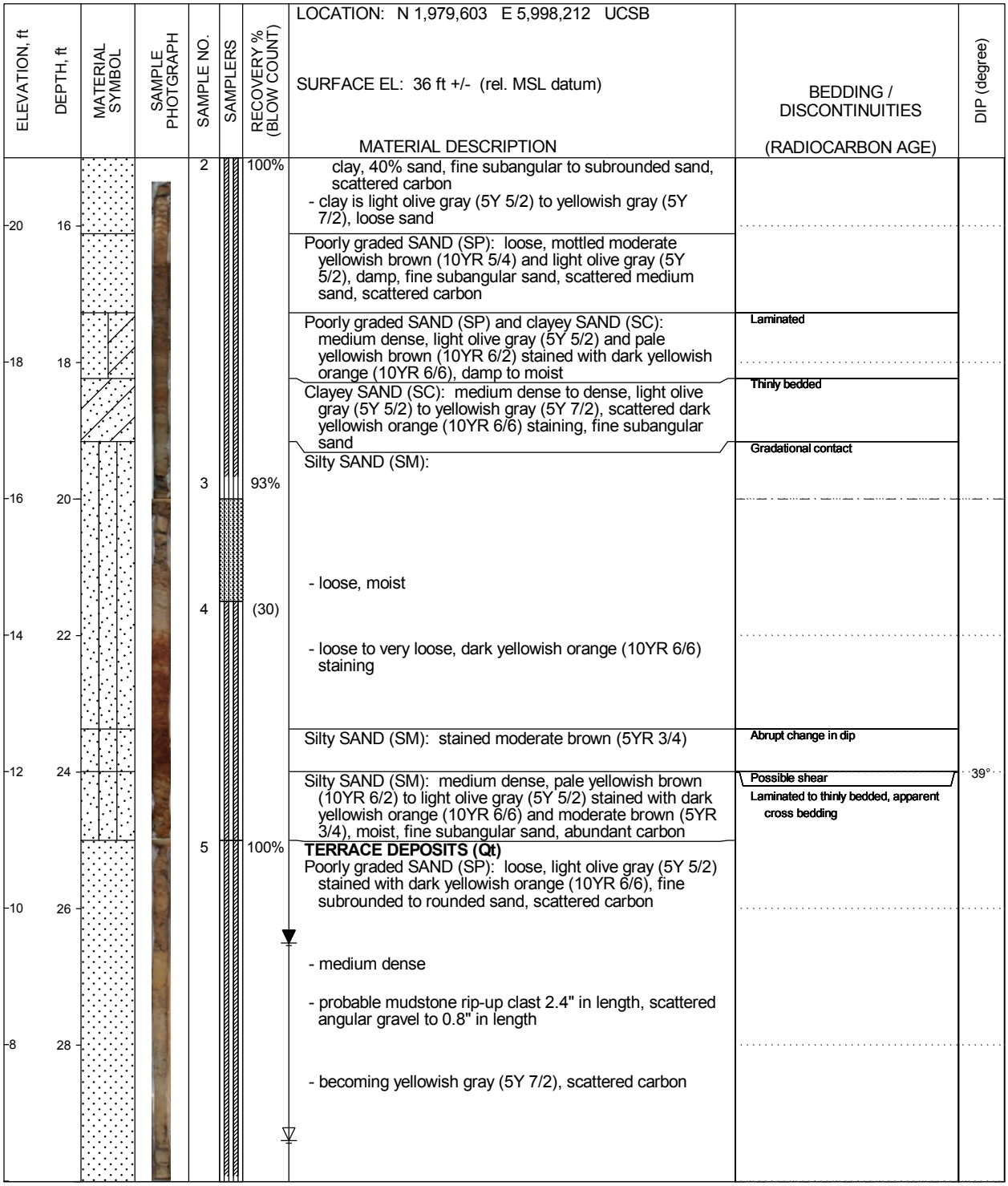
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 26.5 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 16, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-04

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-4a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 26.5 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 16, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-04

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-4b

LOCATION: N 1,979,603 E 5,998,212 UCSB

SURFACE EL: 36 ft +/- (rel. MSL datum)

ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE PHOTGRAPH	SAMPLE NO.	SAMPLERS	RECOVERY % (BLOW COUNT)	MATERIAL DESCRIPTION	BEDDING / DISCONTINUITIES (RADIOCARBON AGE)	DIP (degree)
				6		98%			
-4	32								
				7		70%			
-2	34								
0	36			8		(77)			
-2	38								
				9		90%			
-4	40								
-6	42								
				10		67%			
-8	44								

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

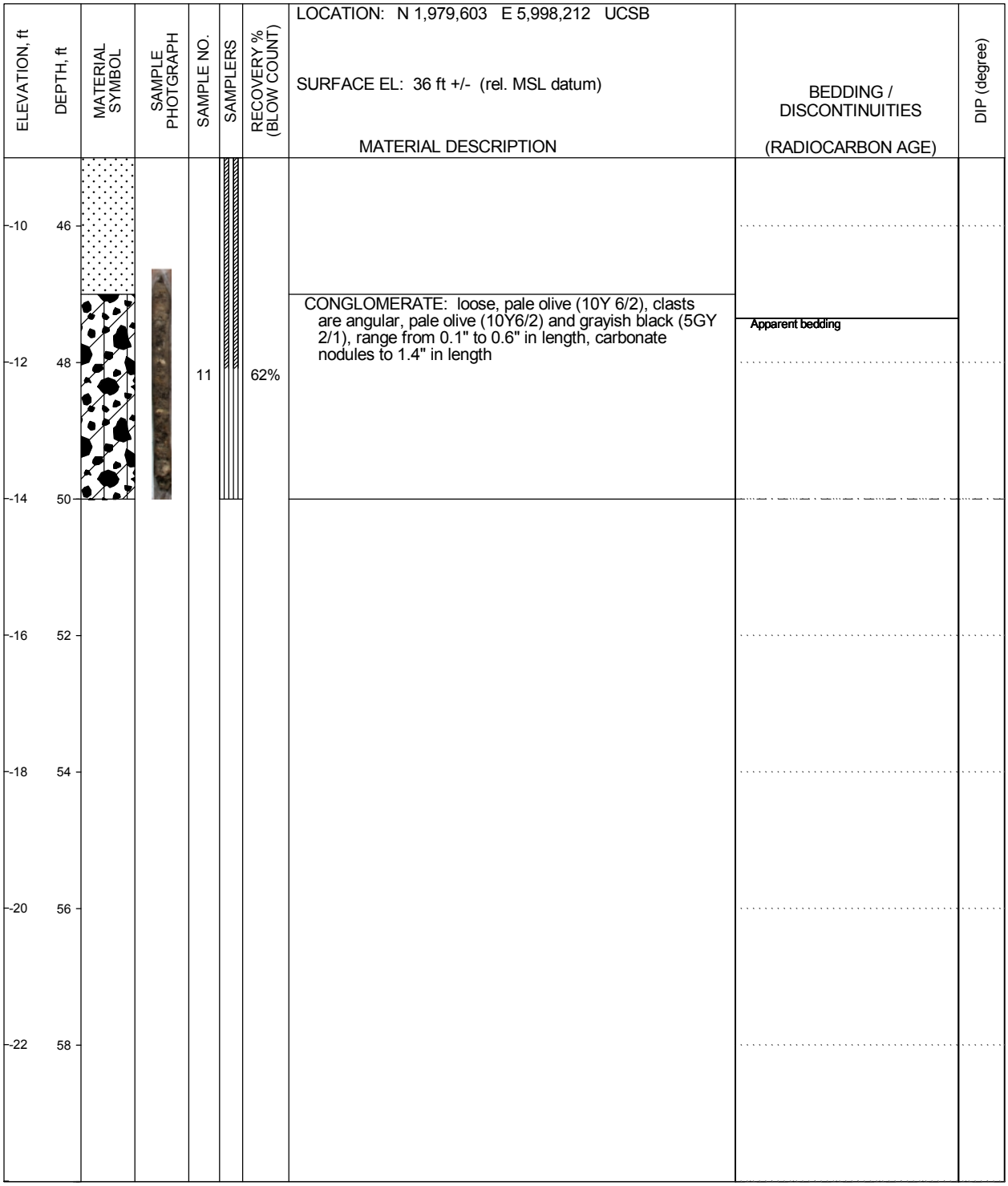
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 26.5 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 16, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-04

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-4c



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

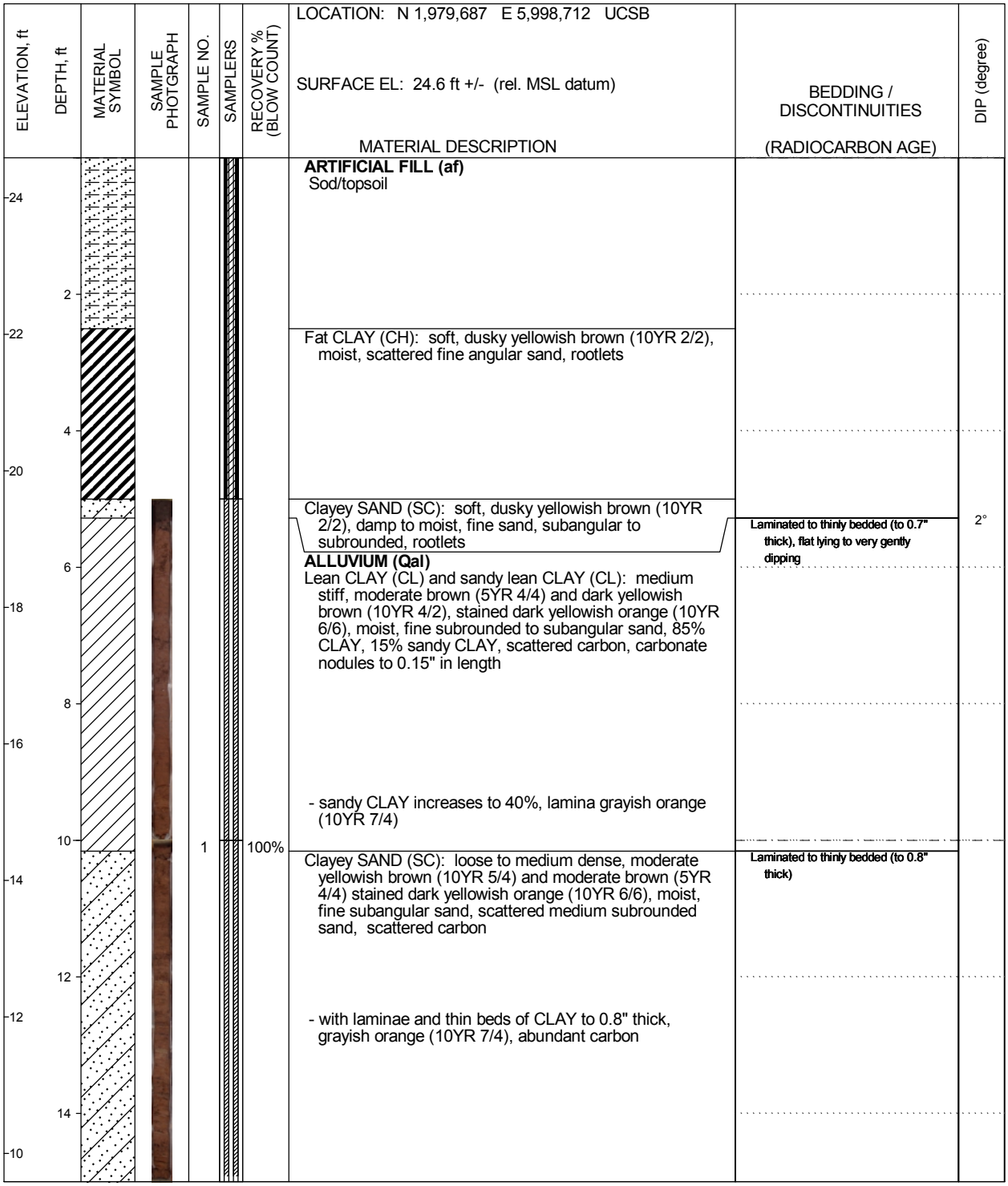
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 26.5 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 16, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-04

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-4d



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

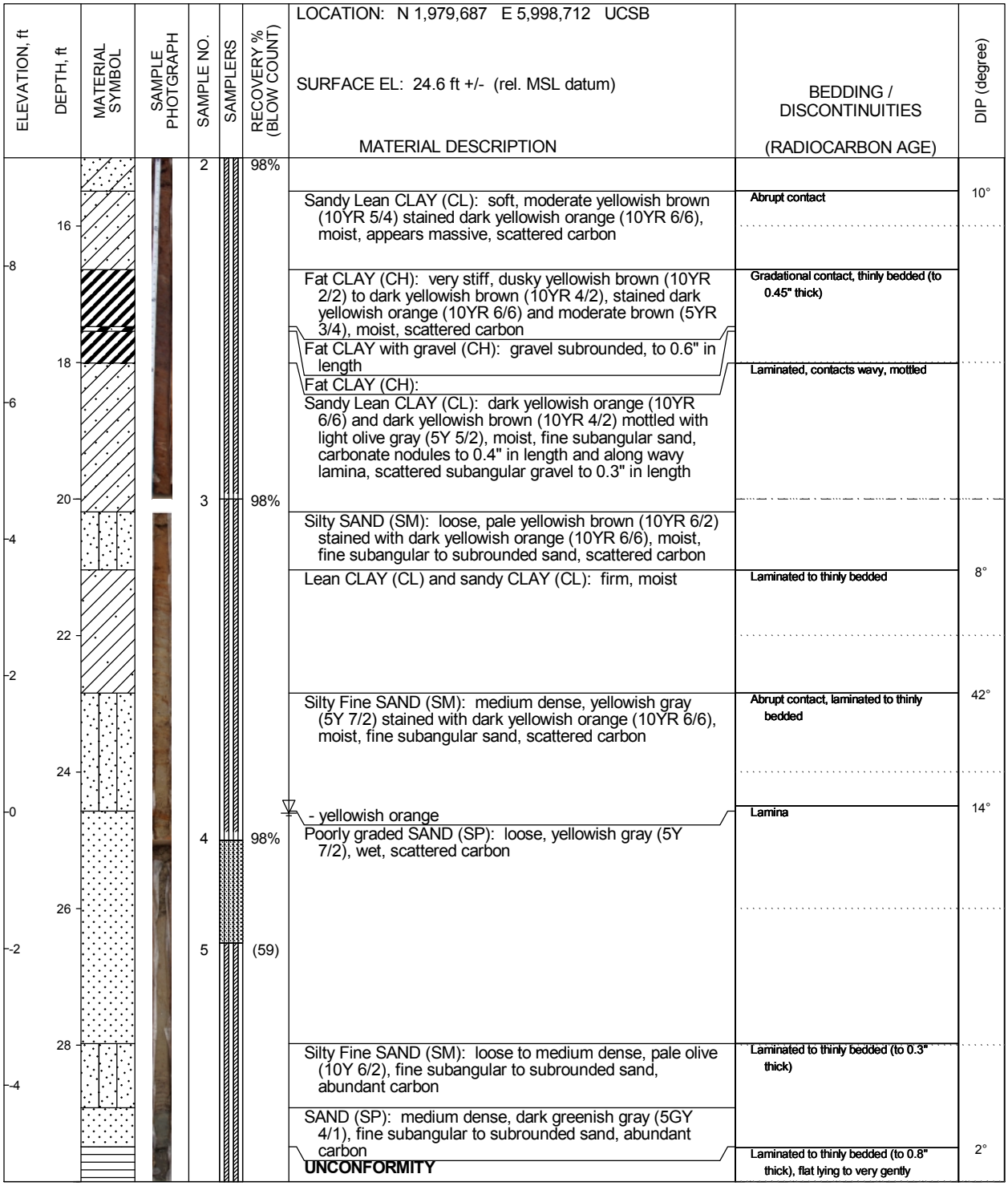
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 24.6 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 16, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-05

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-5a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 24.6 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 16, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-05

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-5b

LOCATION: N 1,979,687 E 5,998,712 UCSB

SURFACE EL: 24.6 ft +/- (rel. MSL datum)

ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE PHOTGRAPH	SAMPLE NO.	SAMPLERS	RECOVERY % (BLOW COUNT)	MATERIAL DESCRIPTION	BEDDING / DISCONTINUITIES (RADIOCARBON AGE)	DIP (degree)
-6	32			6		100%	**PICO FORMATION (Tp)** MUDSTONE (Rx): fresh, moderately weak to moderately strong, greenish black (5GY 2/1) - overlying MUDSTONE grades to SILTSTONE, greenish black (5GY 2/1), fresh, moderately strong, moist	dipping Laminated to thinly bedded Possible shear, apparent offset 0.4"	58°
-8	34								
-10	36			7		98%			
-12	38								
-14	40			8		100%			
-16	42								
-18	44								
-20									

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

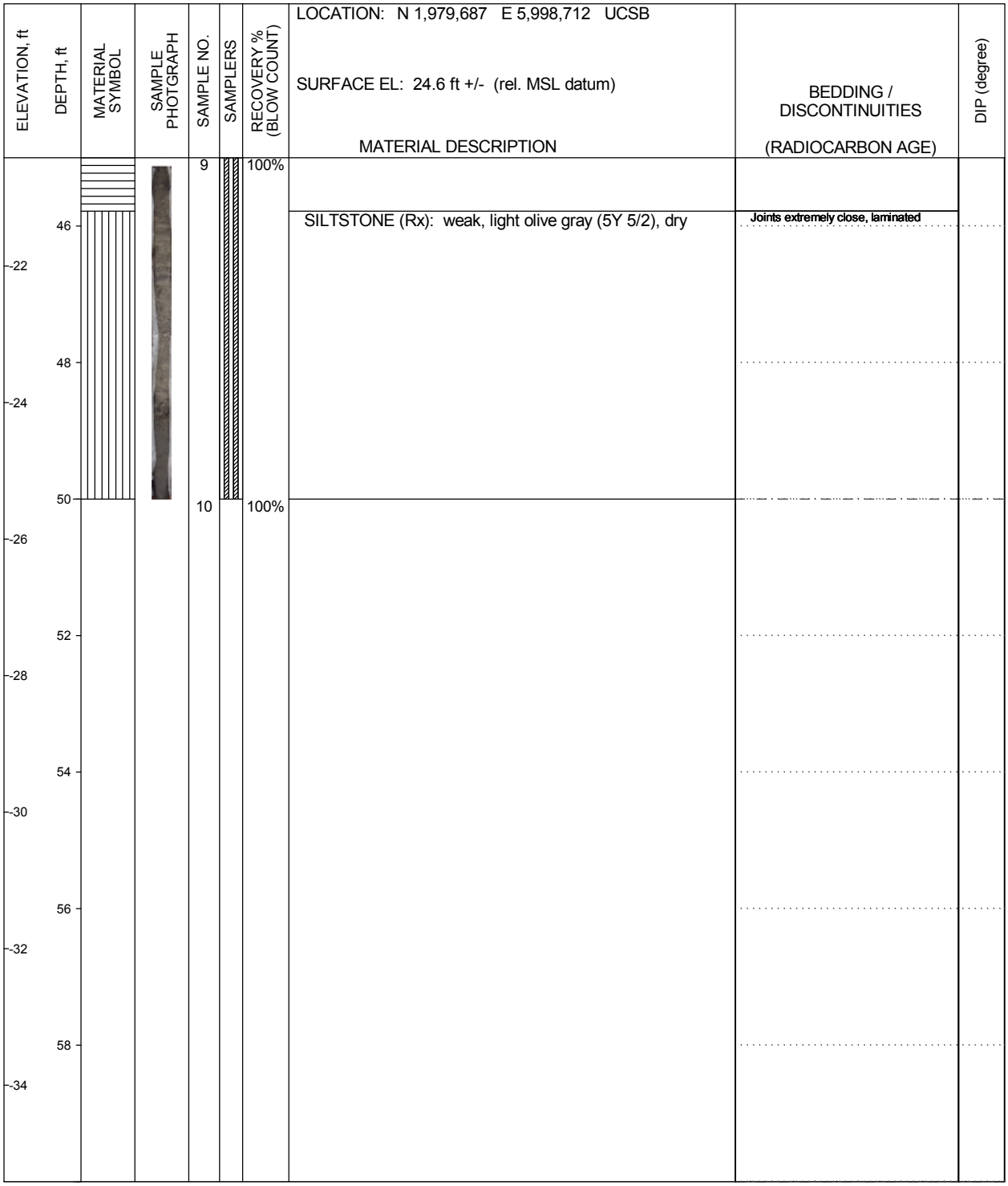
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 24.6 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 16, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-05

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-5c



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

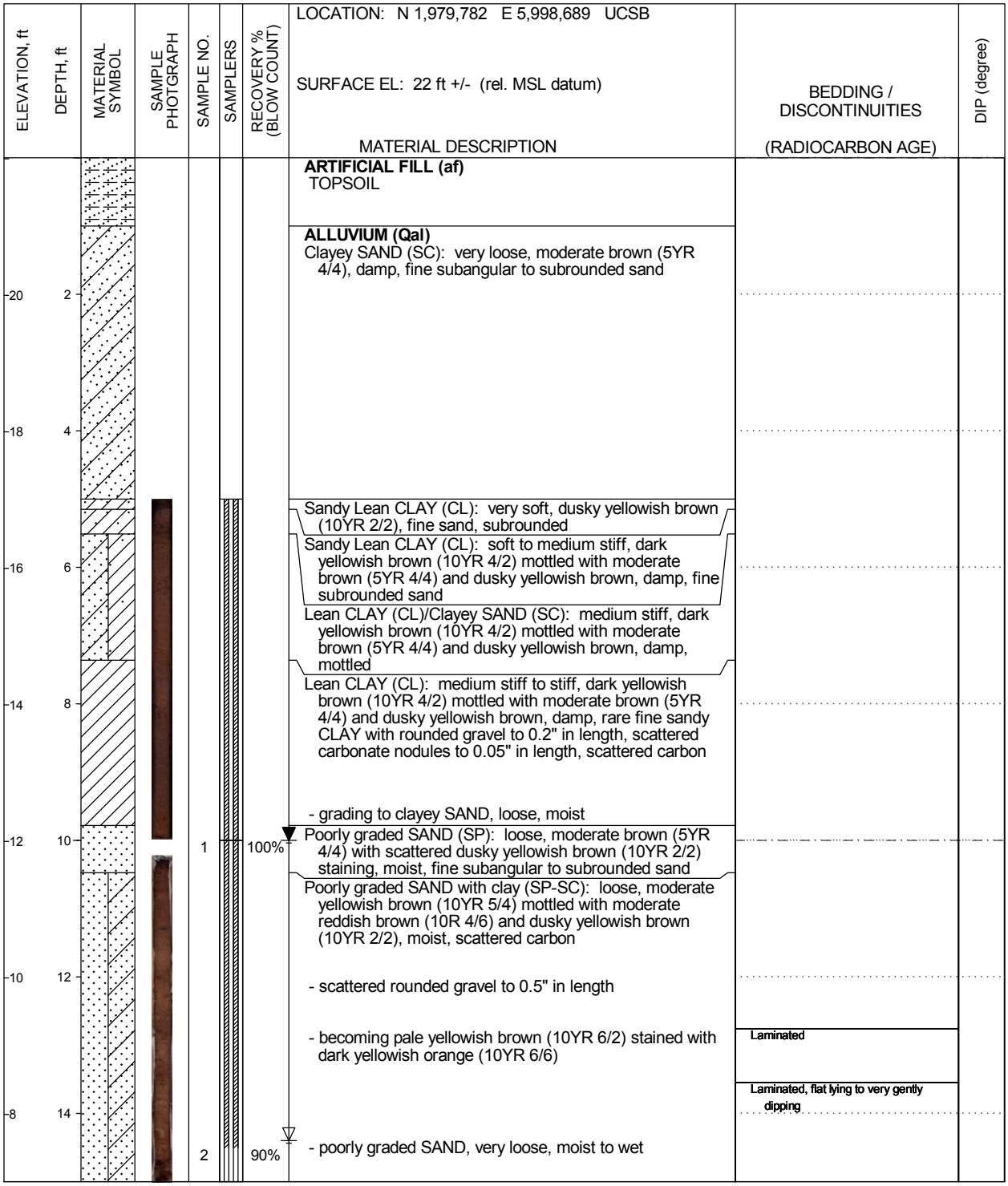
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 24.6 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 16, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-05

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-5d



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

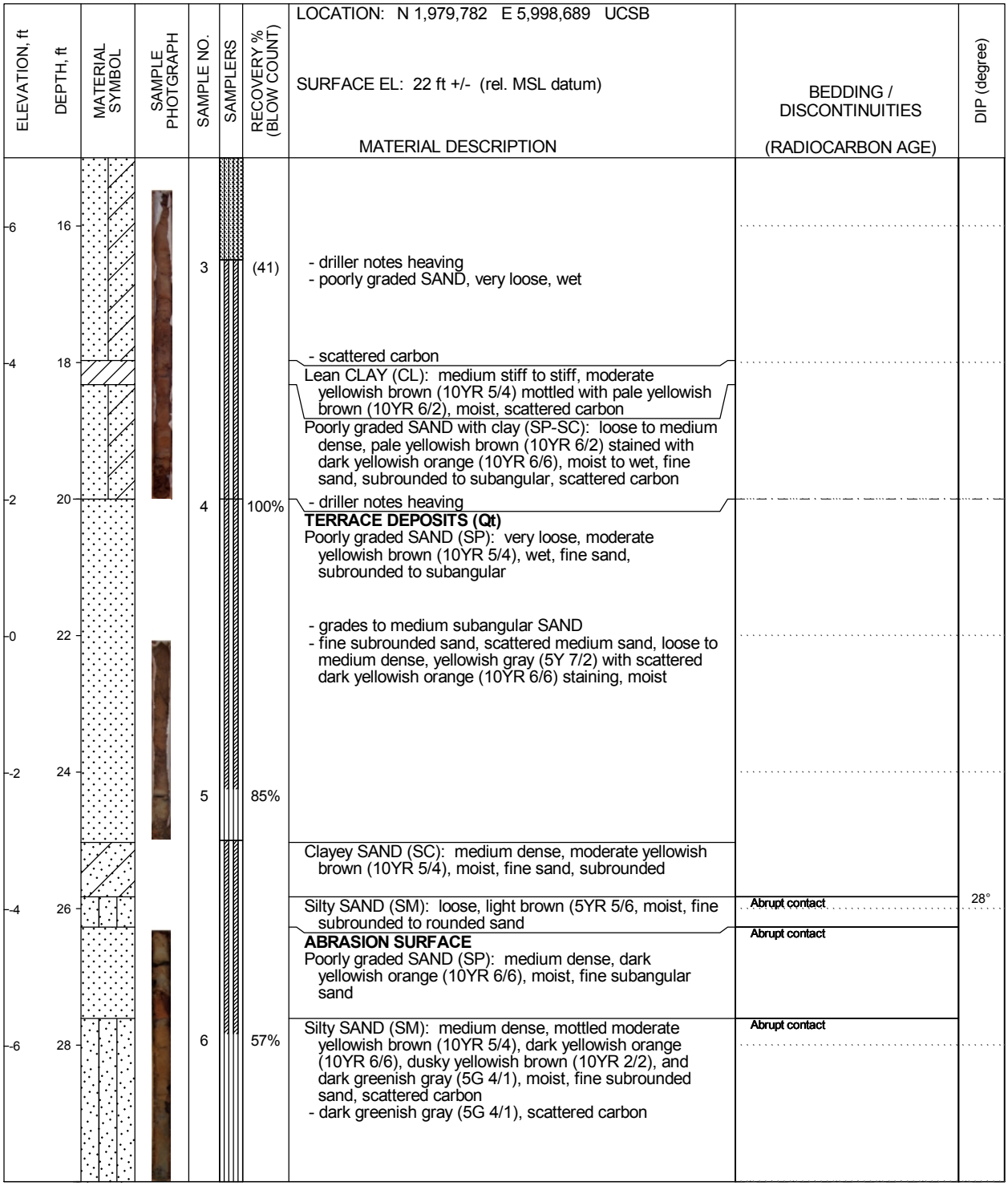
COMPLETION DEPTH: 45.0 ft
DEPTH TO WATER: 10.0 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 12, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-06

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-6a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

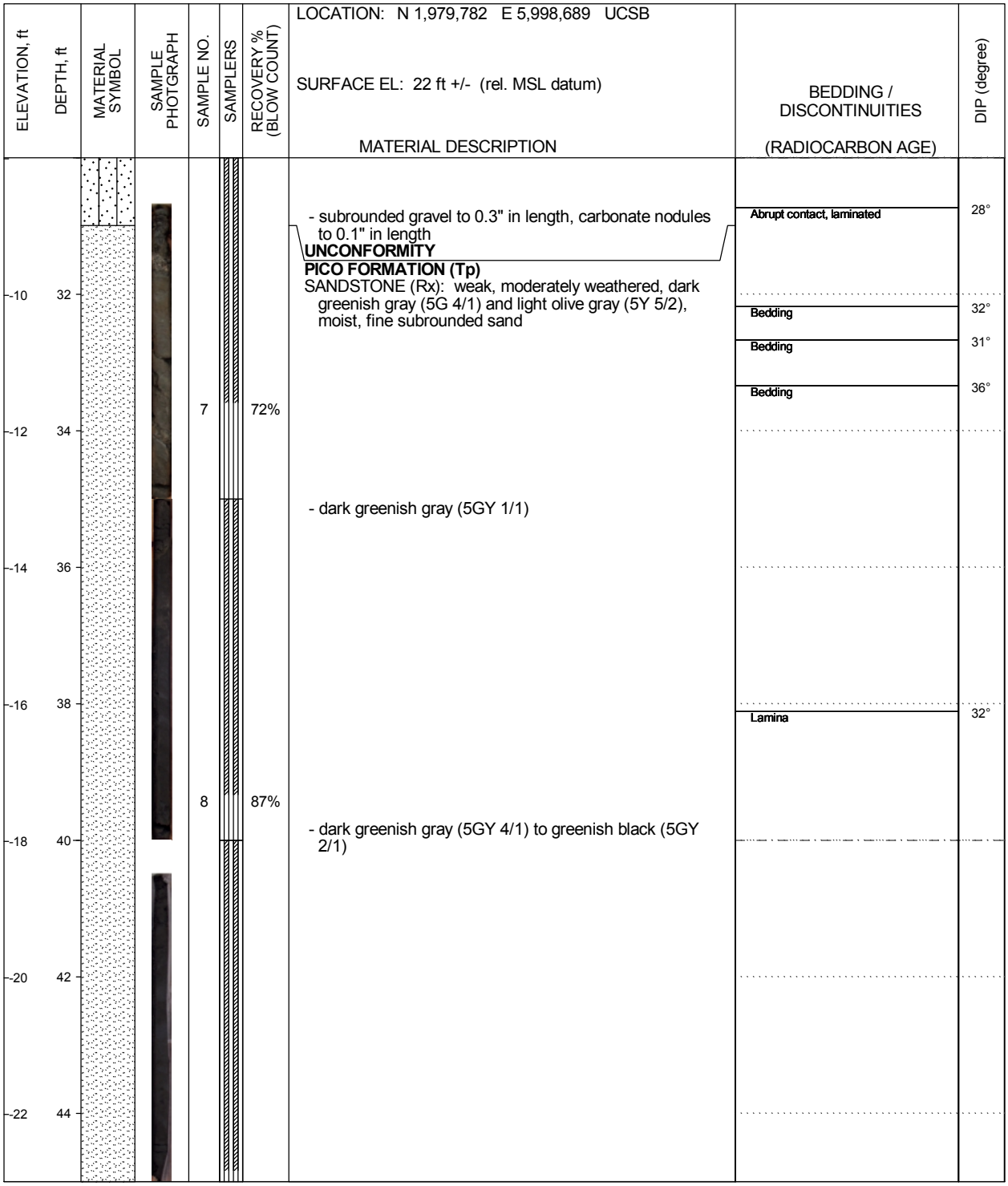
COMPLETION DEPTH: 45.0 ft
DEPTH TO WATER: 10.0 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 12, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-06

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-6b



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 45.0 ft
DEPTH TO WATER: 10.0 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 12, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-06

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-6c

LOCATION: N 1,979,782 E 5,998,689 UCSB

SURFACE EL: 22 ft +/- (rel. MSL datum)

ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE PHOTGRAPH	SAMPLE NO.	SAMPLERS	RECOVERY % (BLOW COUNT)	MATERIAL DESCRIPTION	BEDDING / DISCONTINUITIES (RADIOCARBON AGE)	DIP (degree)
				9		97%			
-24	46								
-26	48								
				10		87%			
-28	50								
-30	52								
-32	54								
-34	56								
-36	58								

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

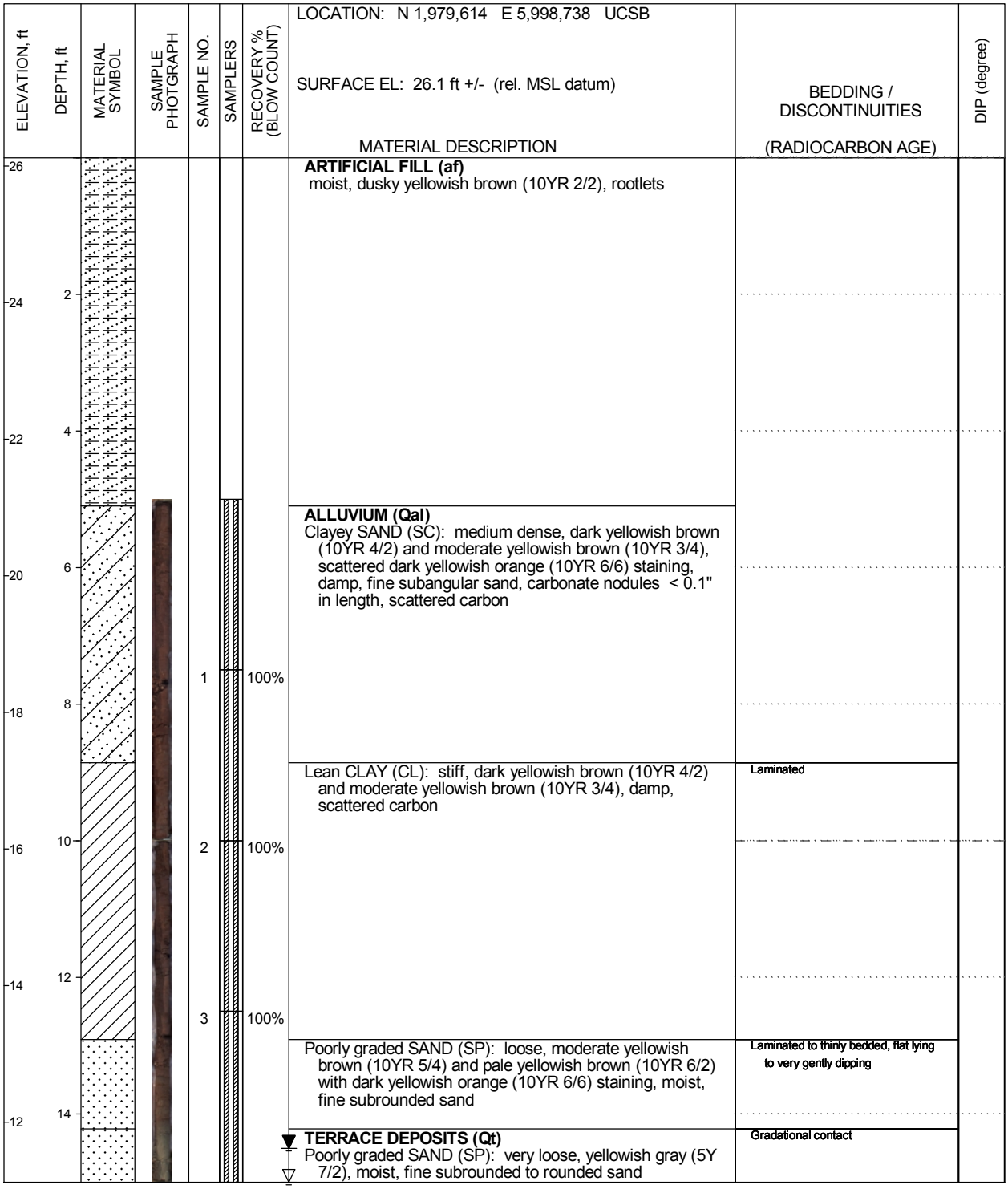
COMPLETION DEPTH: 45.0 ft
DEPTH TO WATER: 10.0 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 12, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-06

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-6d



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

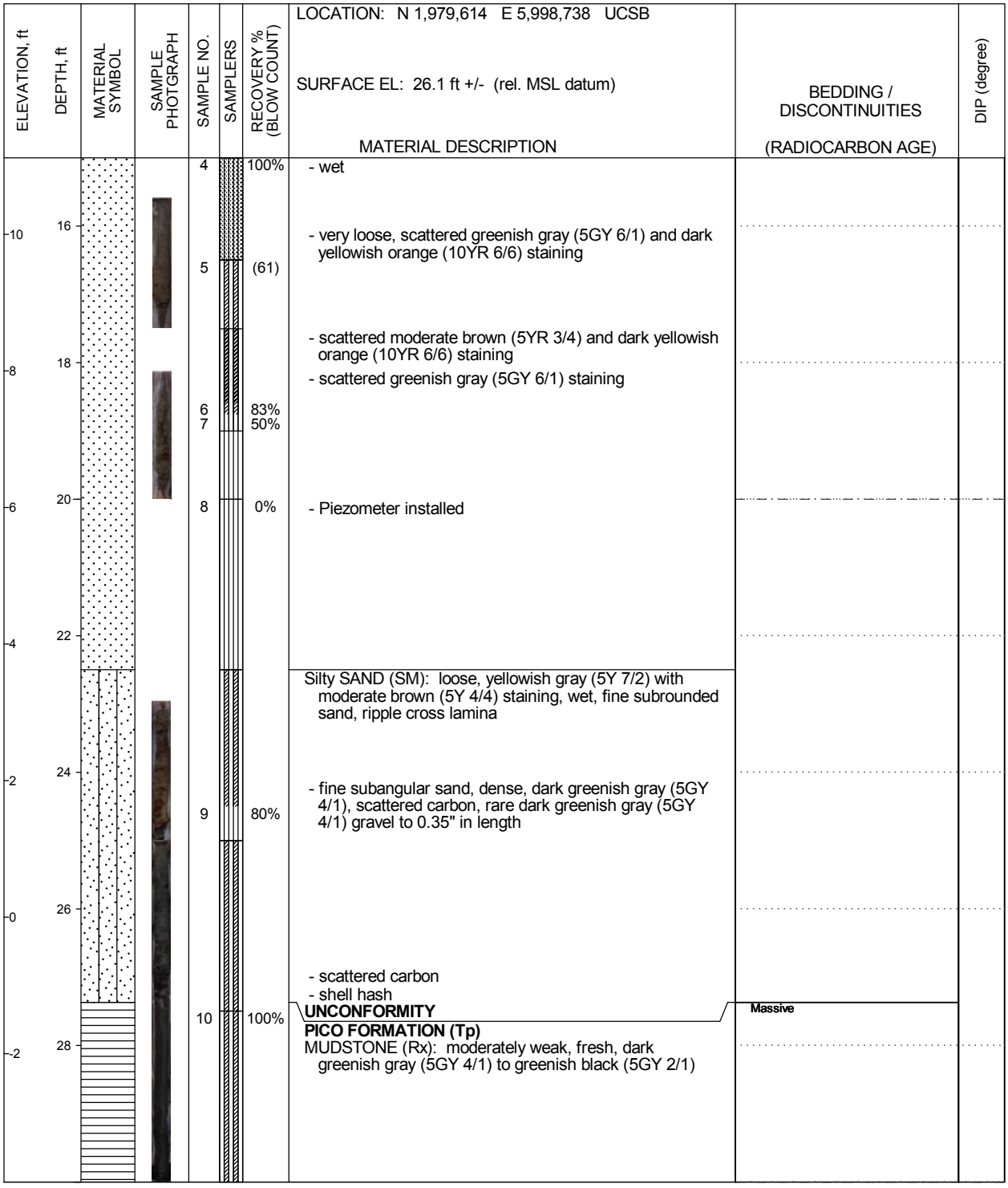
COMPLETION DEPTH: 49.0 ft
DEPTH TO WATER: 14.5 ft
BACKFILLED WITH: Grout
DRILLING DATE: March 13, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-07

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-7a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

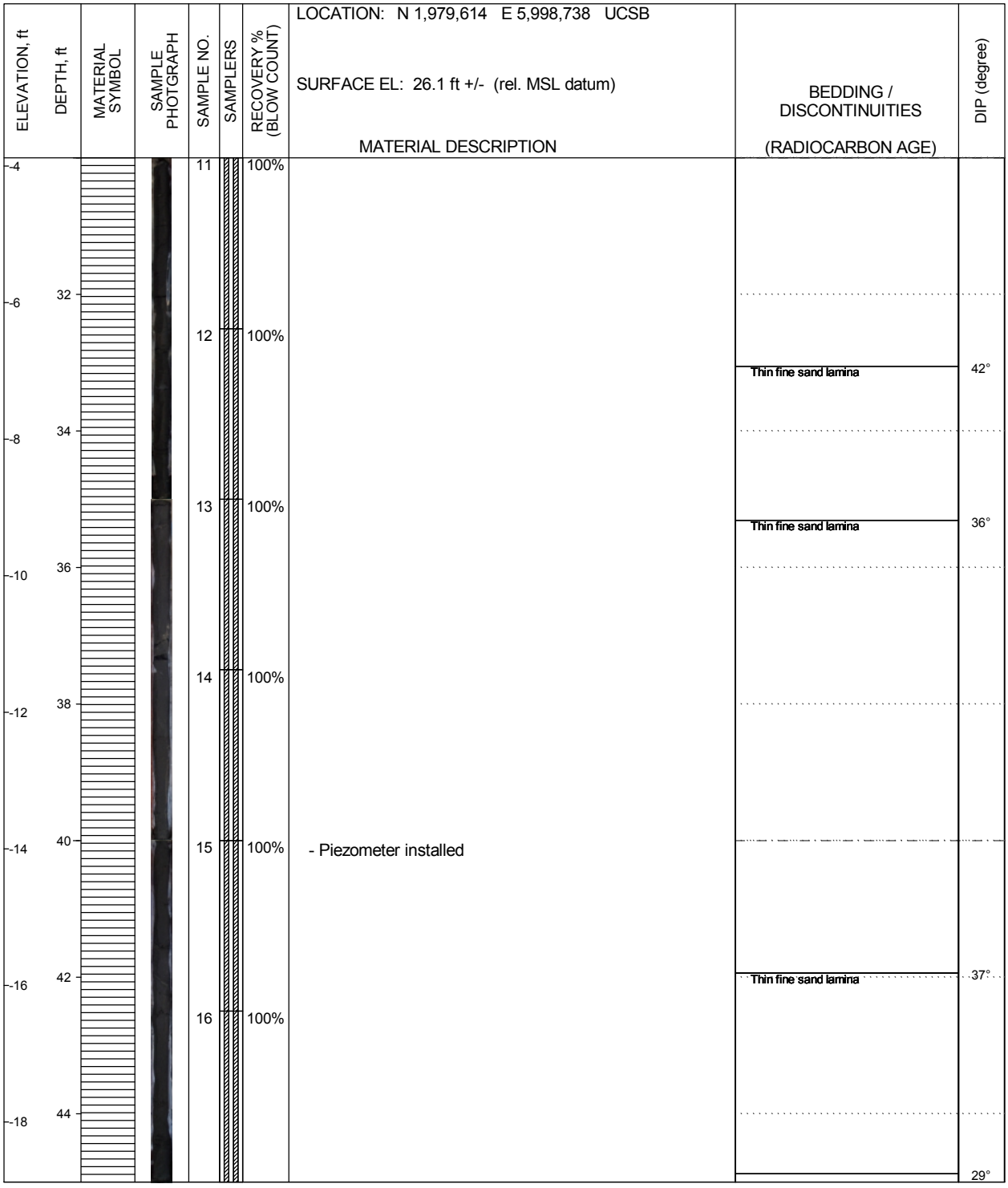
COMPLETION DEPTH: 49.0 ft
DEPTH TO WATER: 14.5 ft
BACKFILLED WITH: Grout
DRILLING DATE: March 13, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-07

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-7b



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 49.0 ft
DEPTH TO WATER: 14.5 ft
BACKFILLED WITH: Grout
DRILLING DATE: March 13, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-07

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-7c

LOCATION: N 1,979,614 E 5,998,738 UCSB

SURFACE EL: 26.1 ft +/- (rel. MSL datum)

ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE PHOTGRAPH	SAMPLE NO.	SAMPLERS	RECOVERY % (BLOW COUNT)	MATERIAL DESCRIPTION	BEDDING / DISCONTINUITIES (RADIOCARBON AGE)	DIP (degree)
-20	46			17		100%	- increase in sand	Thin fine sand bed	
								Fine sandstone lamina	39°
							- interbedded dark greenish gray (5GY 6/1) and greenish gray (5GY 4/1), bioturbated		
-22	48						- scattered shell hash		
-24	50								
-26	52								
-28	54								
-30	56								
-32	58								

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

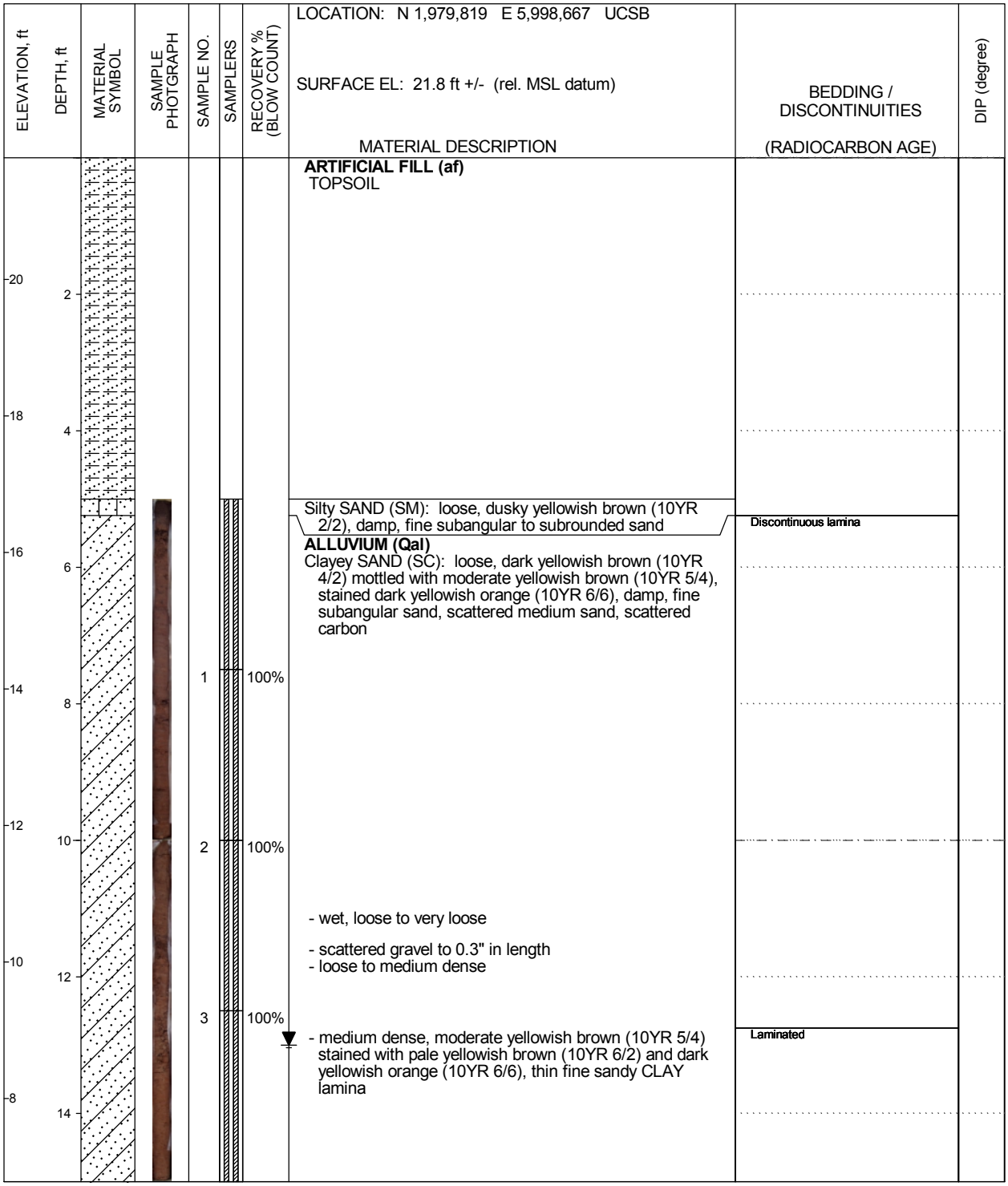
COMPLETION DEPTH: 49.0 ft
DEPTH TO WATER: 14.5 ft
BACKFILLED WITH: Grout
DRILLING DATE: March 13, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-07

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-7d



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

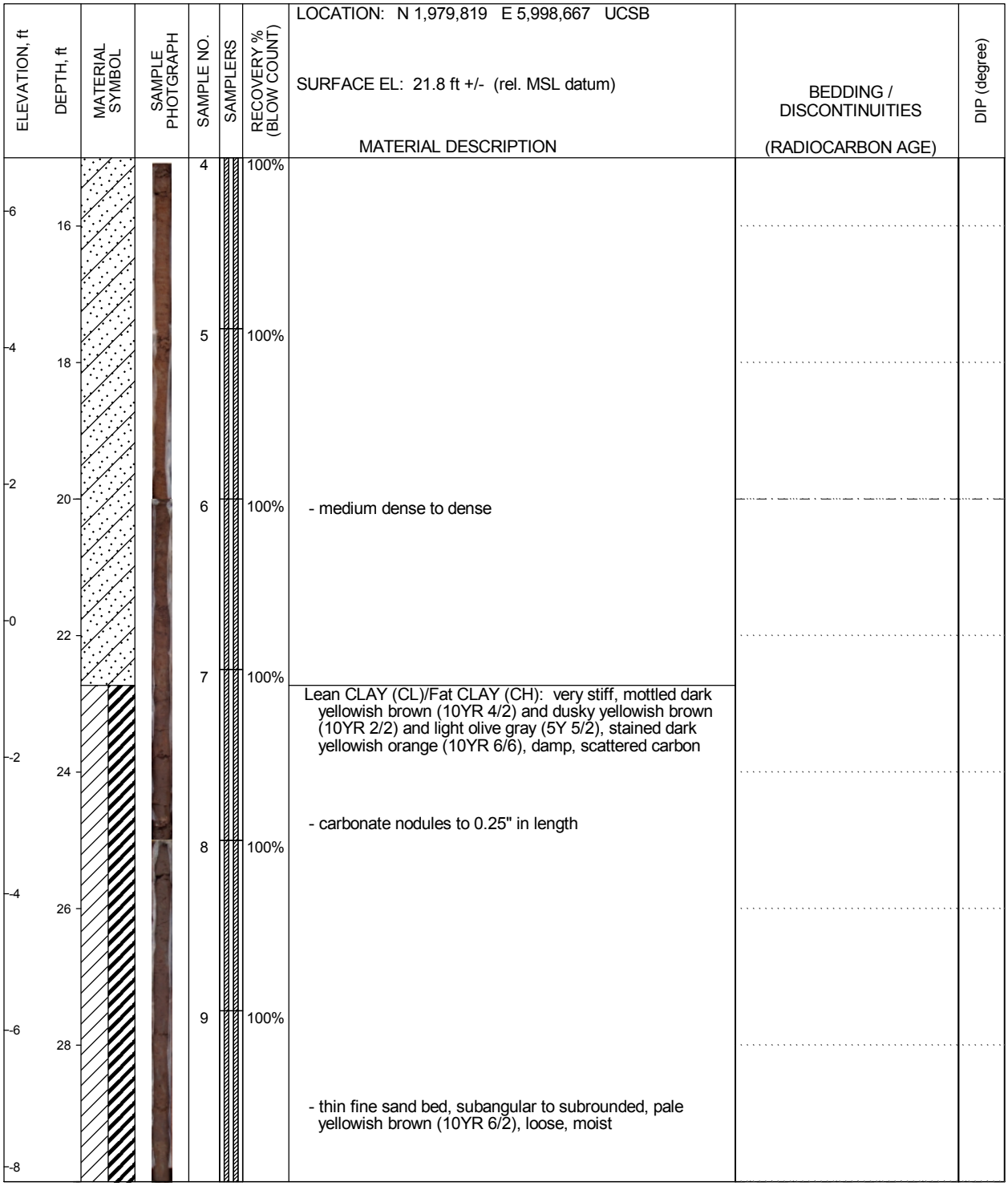
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 13.0 ft
BACKFILLED WITH: Cuttings and grout
DRILLING DATE: March 12, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-08

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-8a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

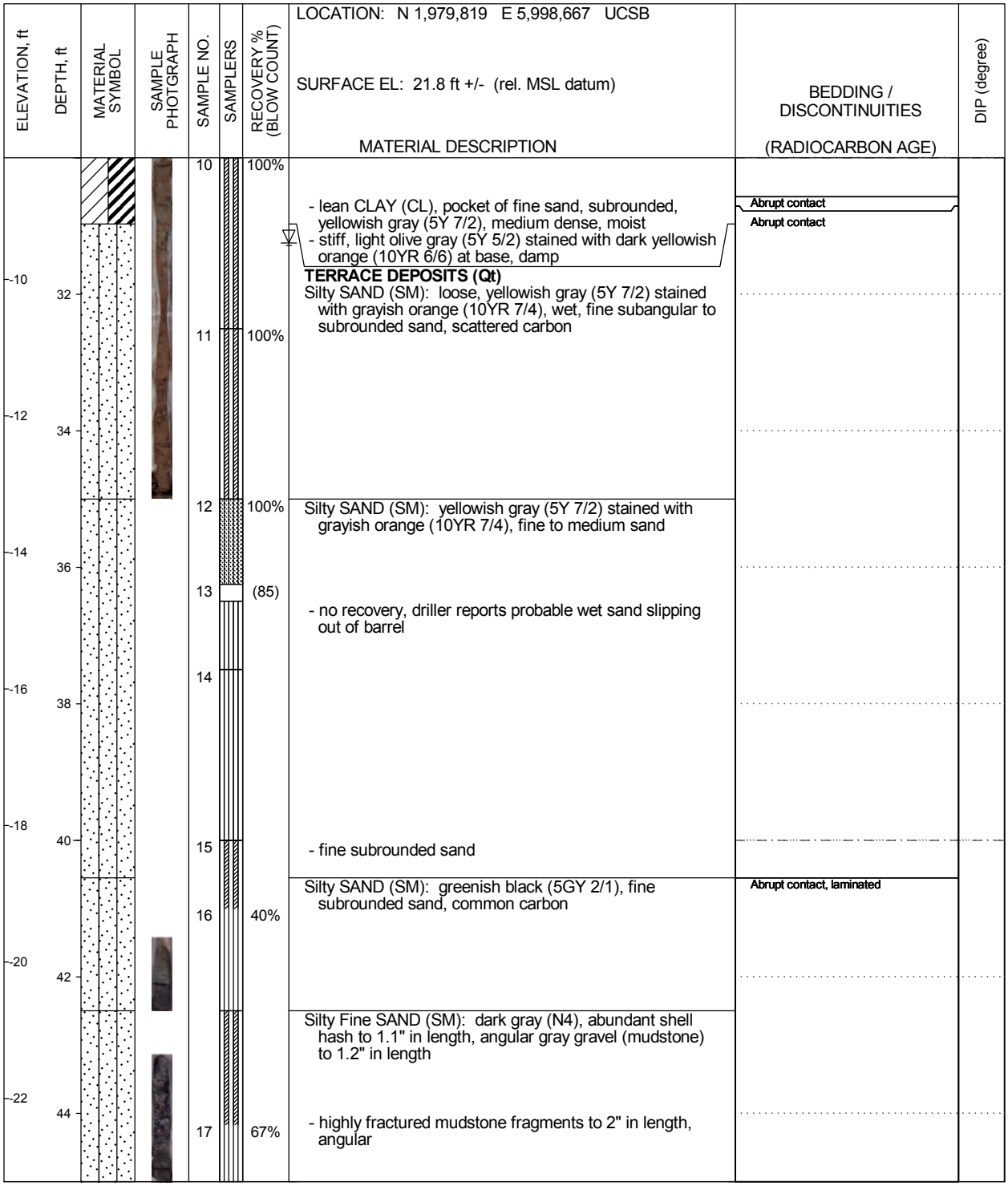
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 13.0 ft
BACKFILLED WITH: Cuttings and grout
DRILLING DATE: March 12, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-08

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-8b



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

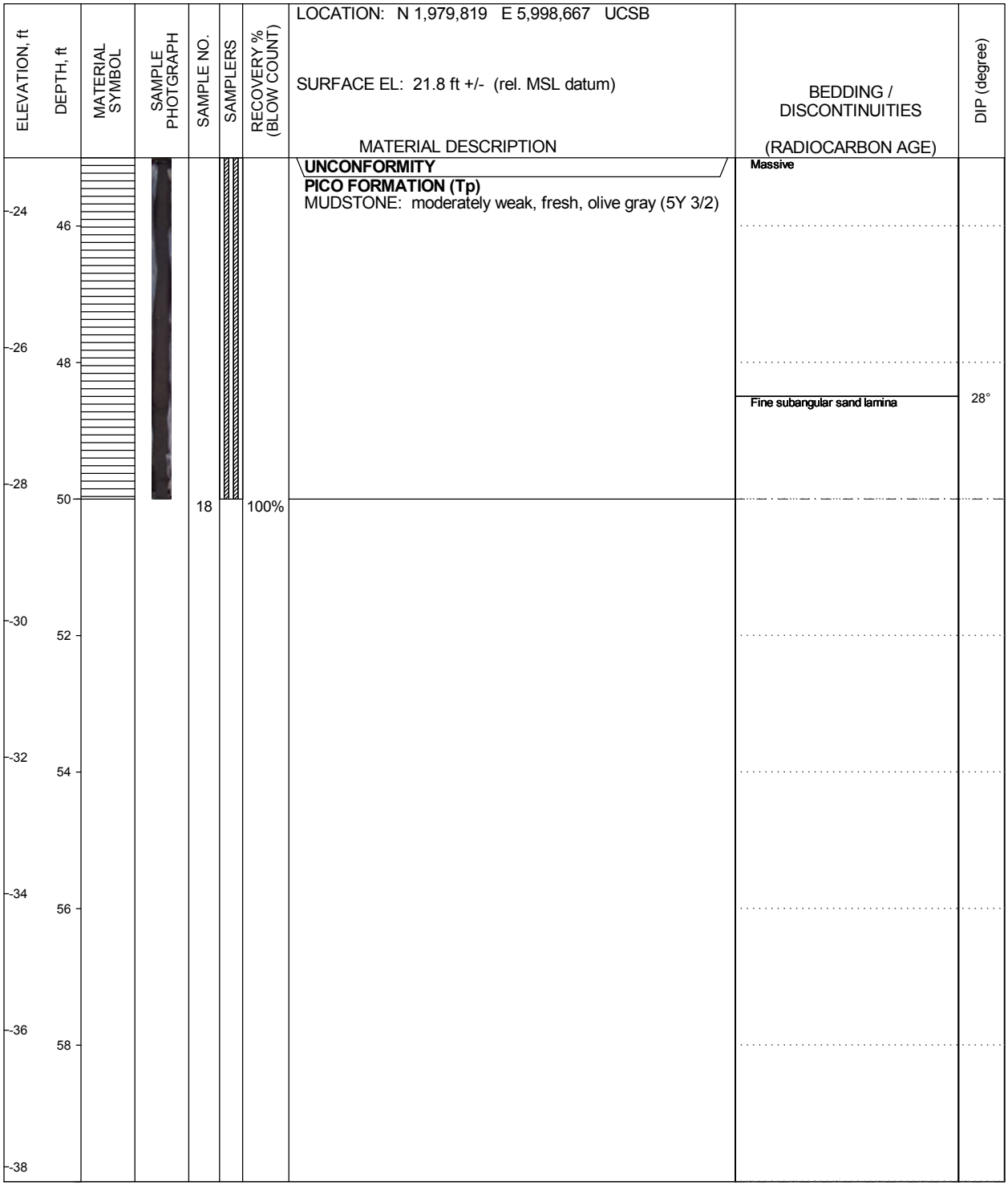
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 13.0 ft
BACKFILLED WITH: Cuttings and grout
DRILLING DATE: March 12, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-08

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-8c



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

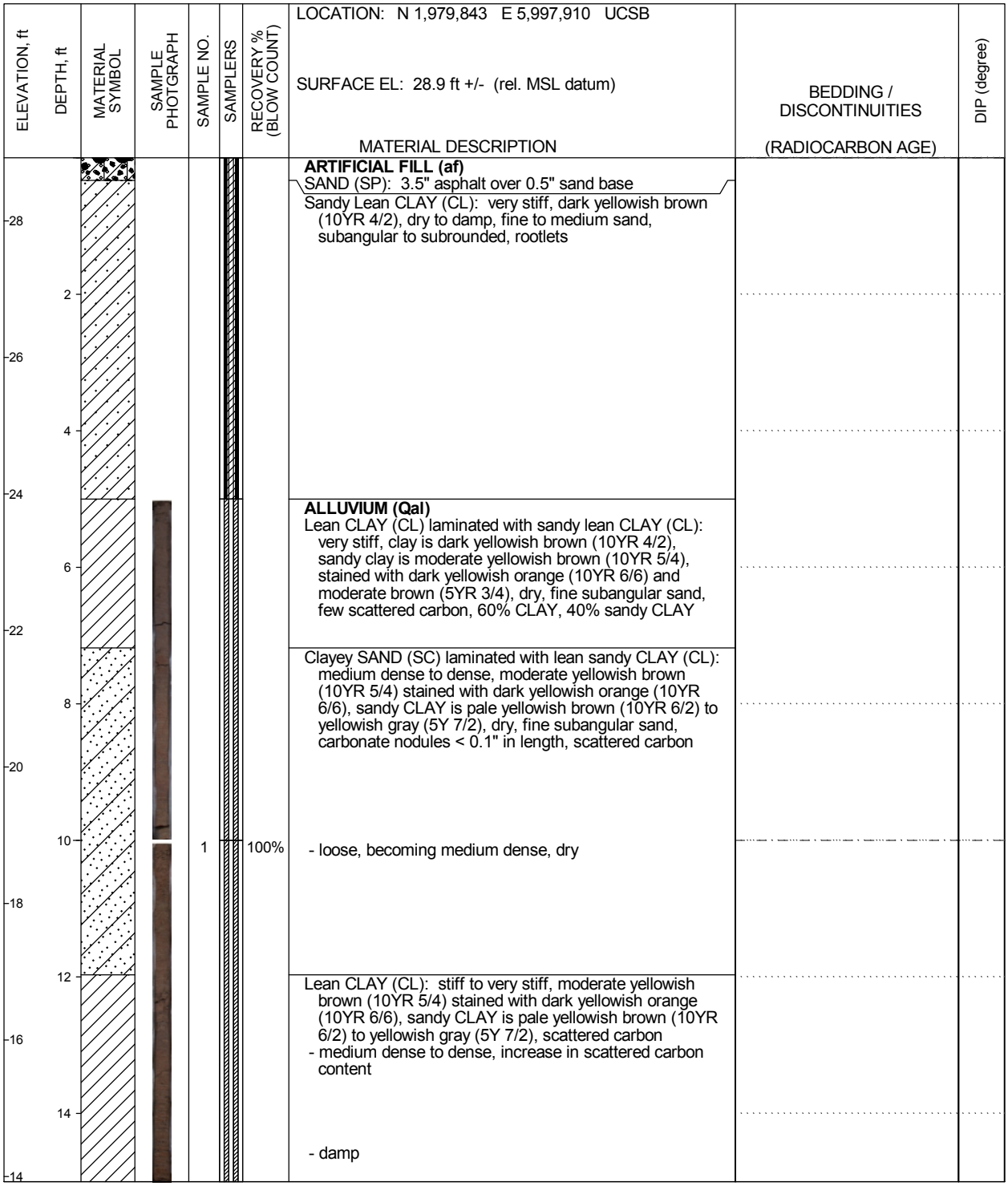
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: 13.0 ft
BACKFILLED WITH: Cuttings and grout
DRILLING DATE: March 12, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: T Ferro/G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-08

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-8d



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

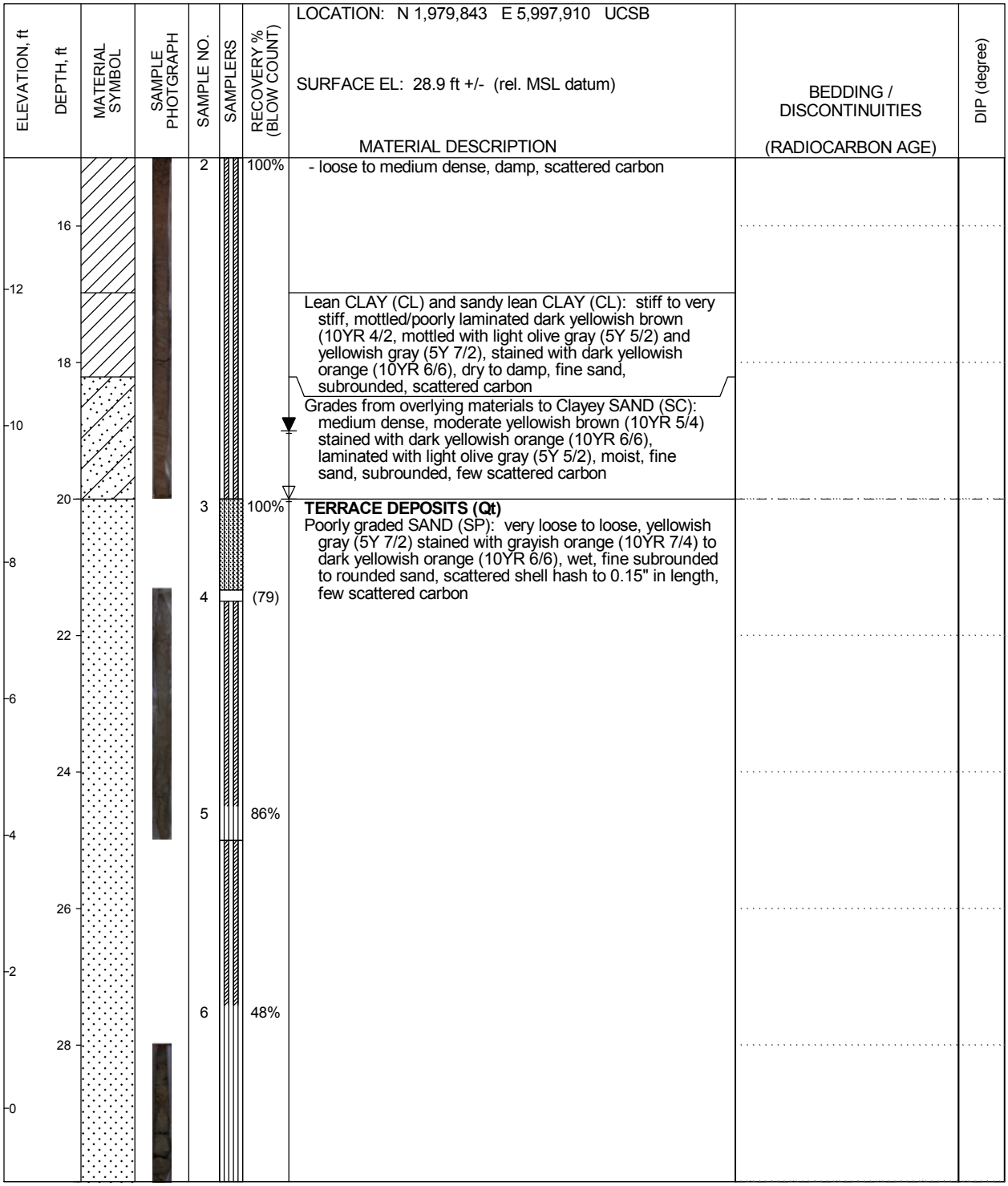
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 19.0 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 14, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-09

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-9a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

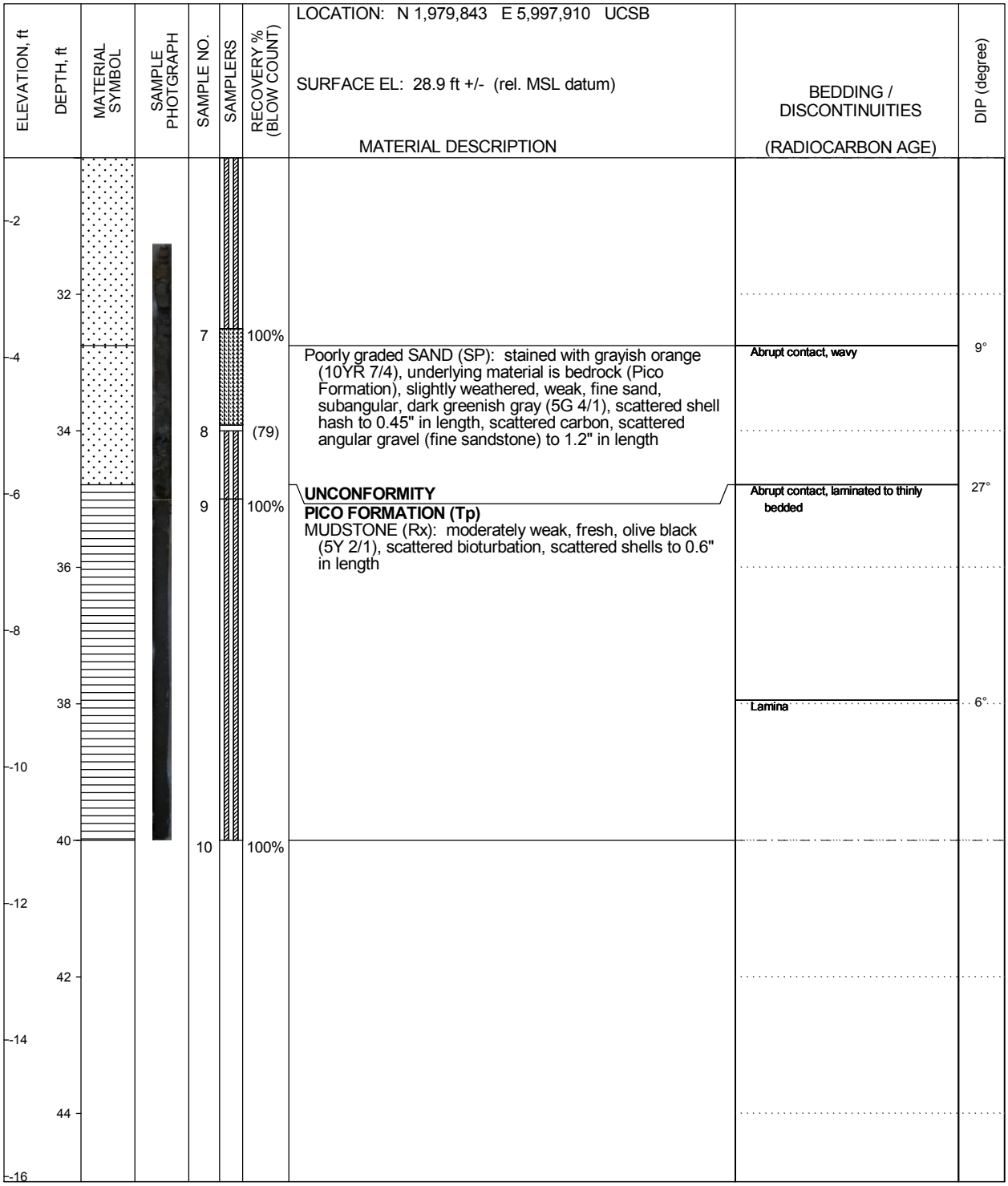
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 19.0 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 14, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-09

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-9b



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

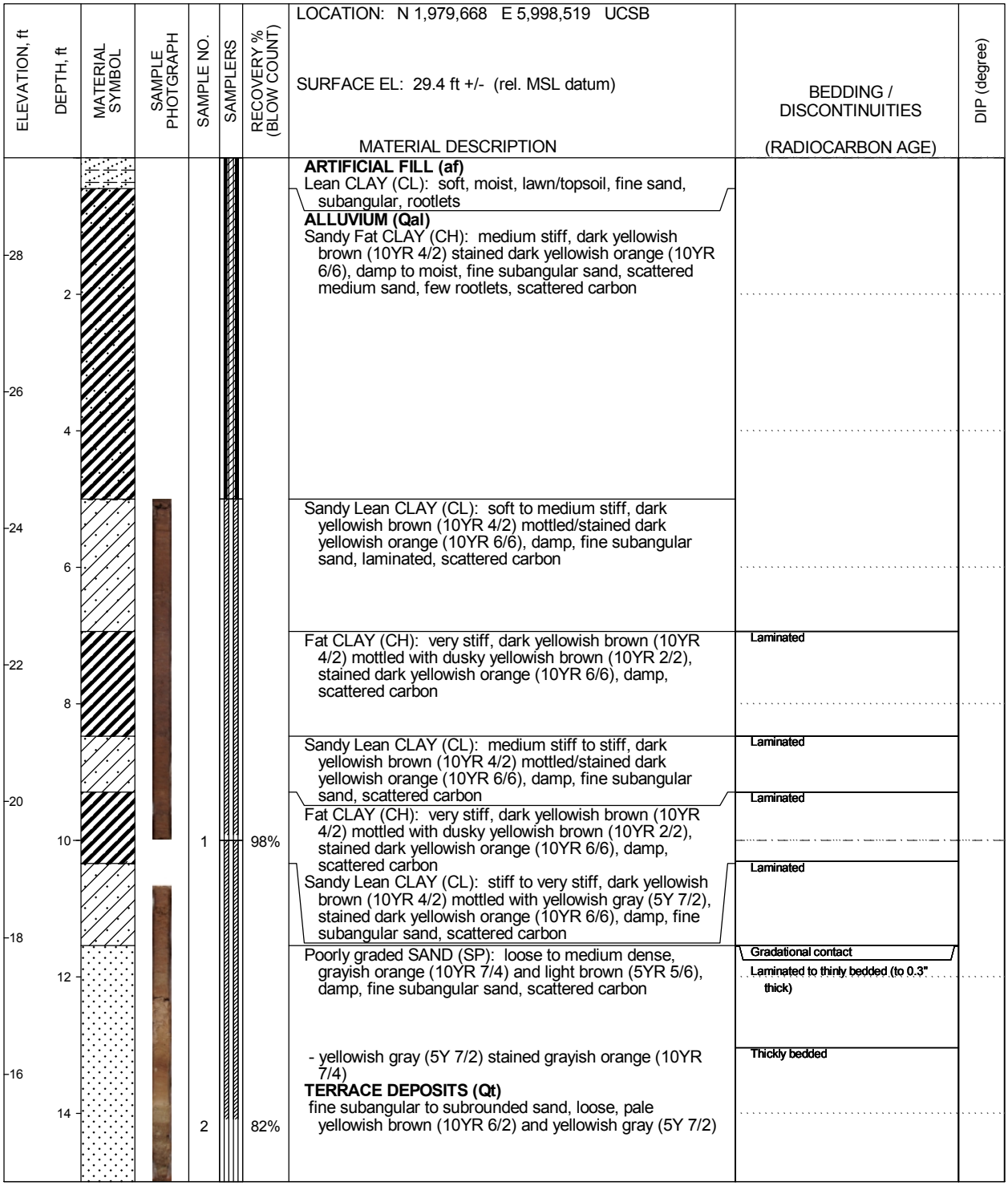
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 19.0 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 14, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-09

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-9c



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

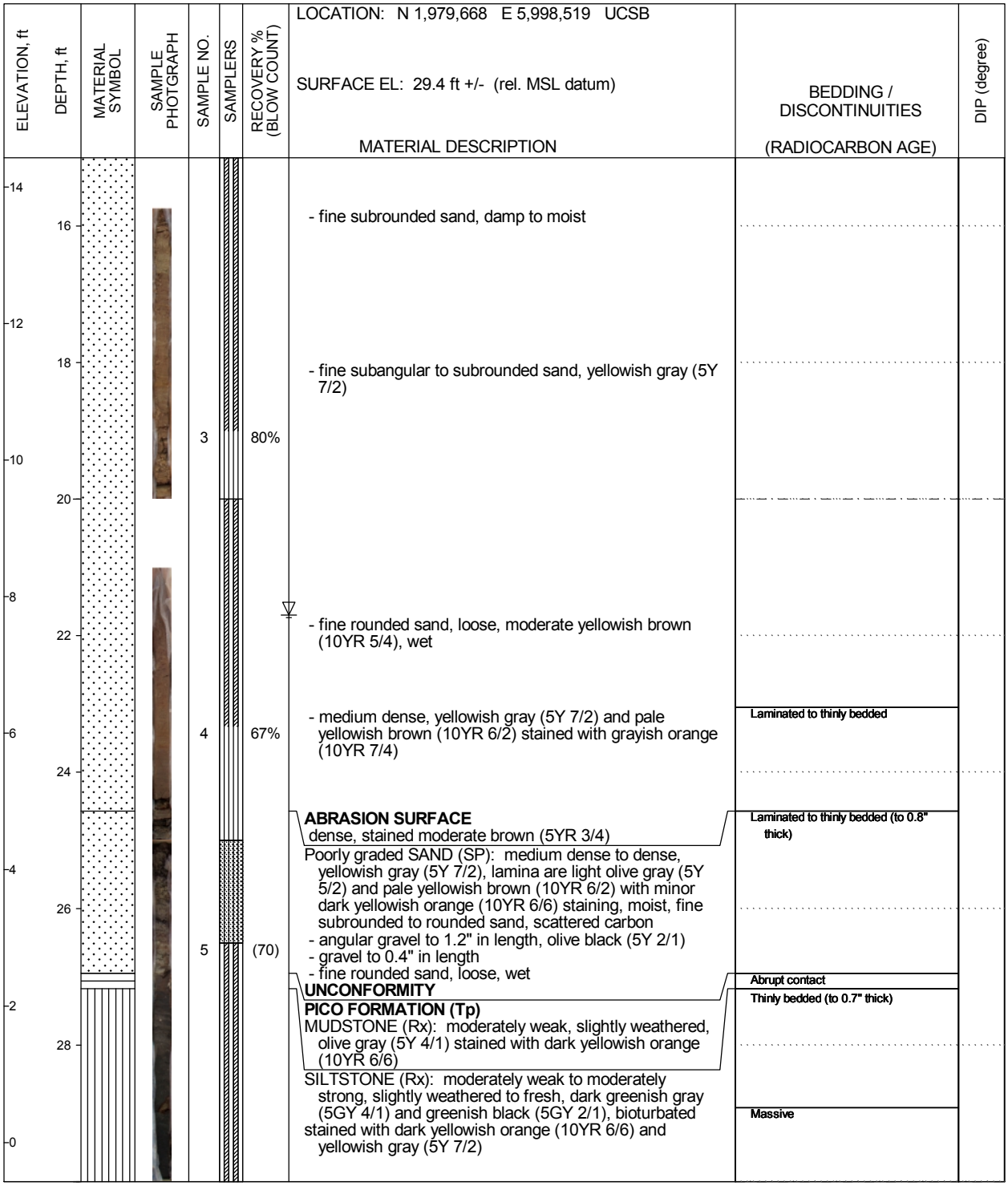
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 21.7 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 19, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-10

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-10a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

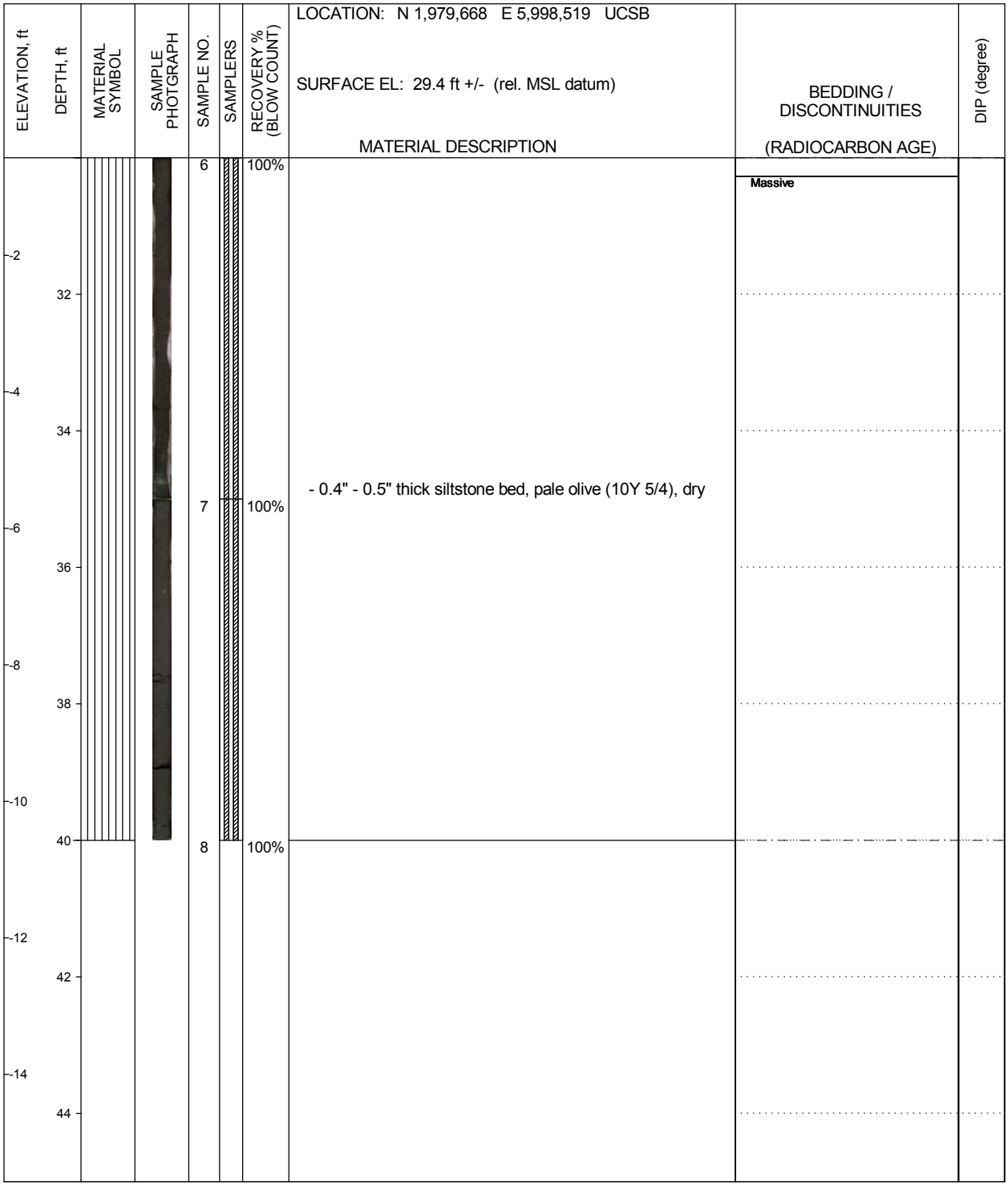
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 21.7 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 19, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-10

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-10b



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

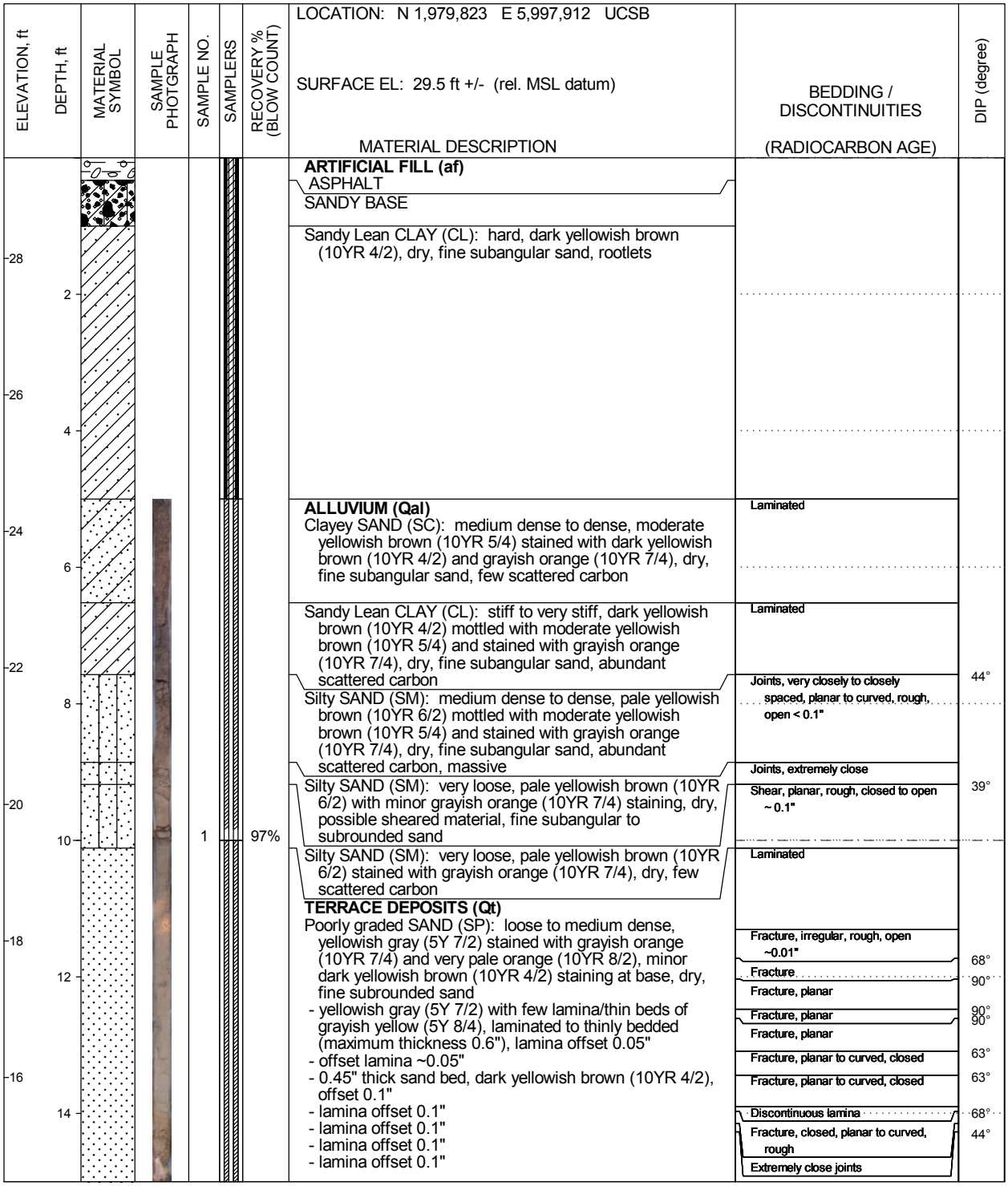
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 21.7 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 19, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-10

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-10c



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

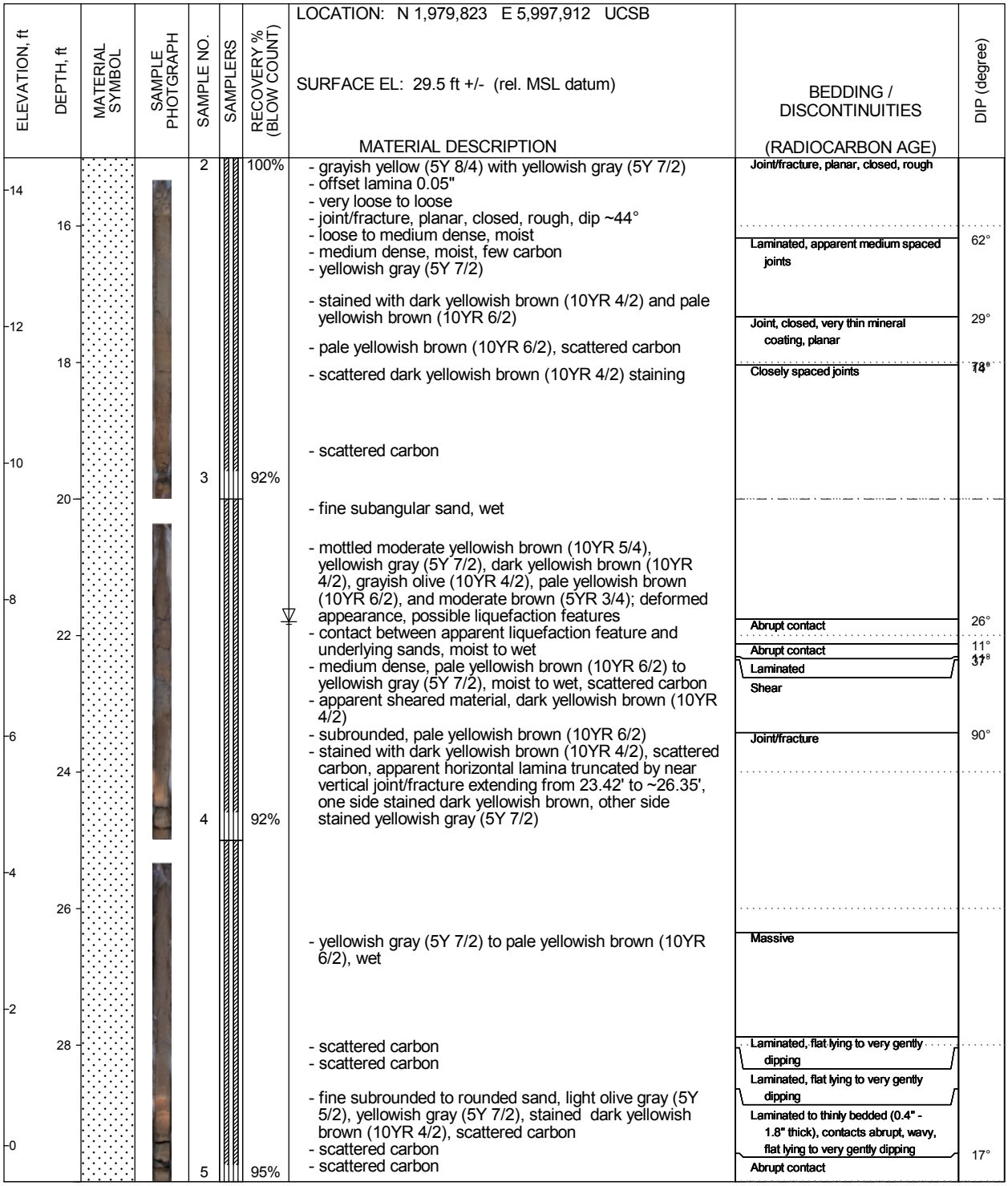
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 21.8 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 19, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-11

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-11a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

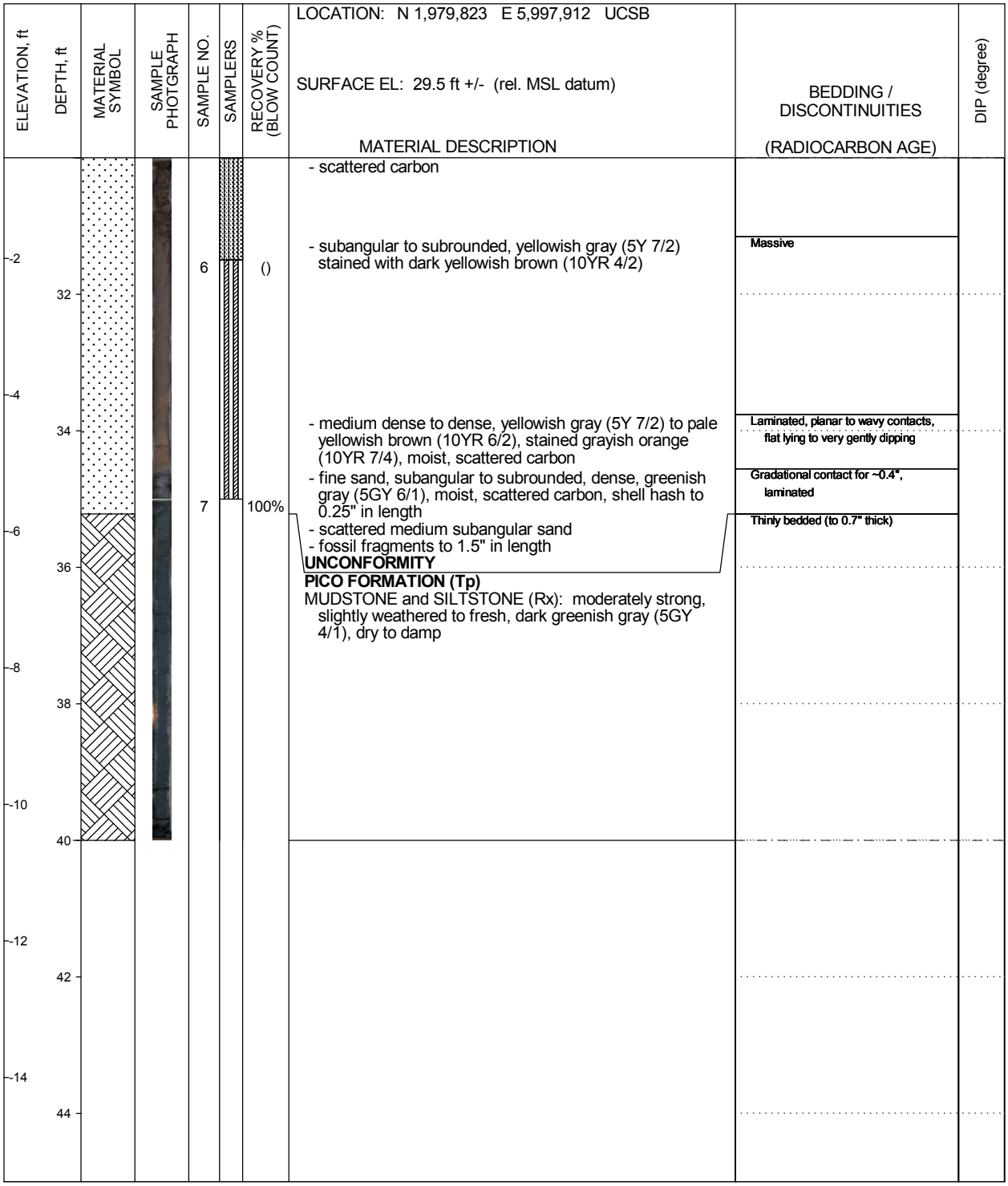
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 21.8 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 19, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-11

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-11b



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

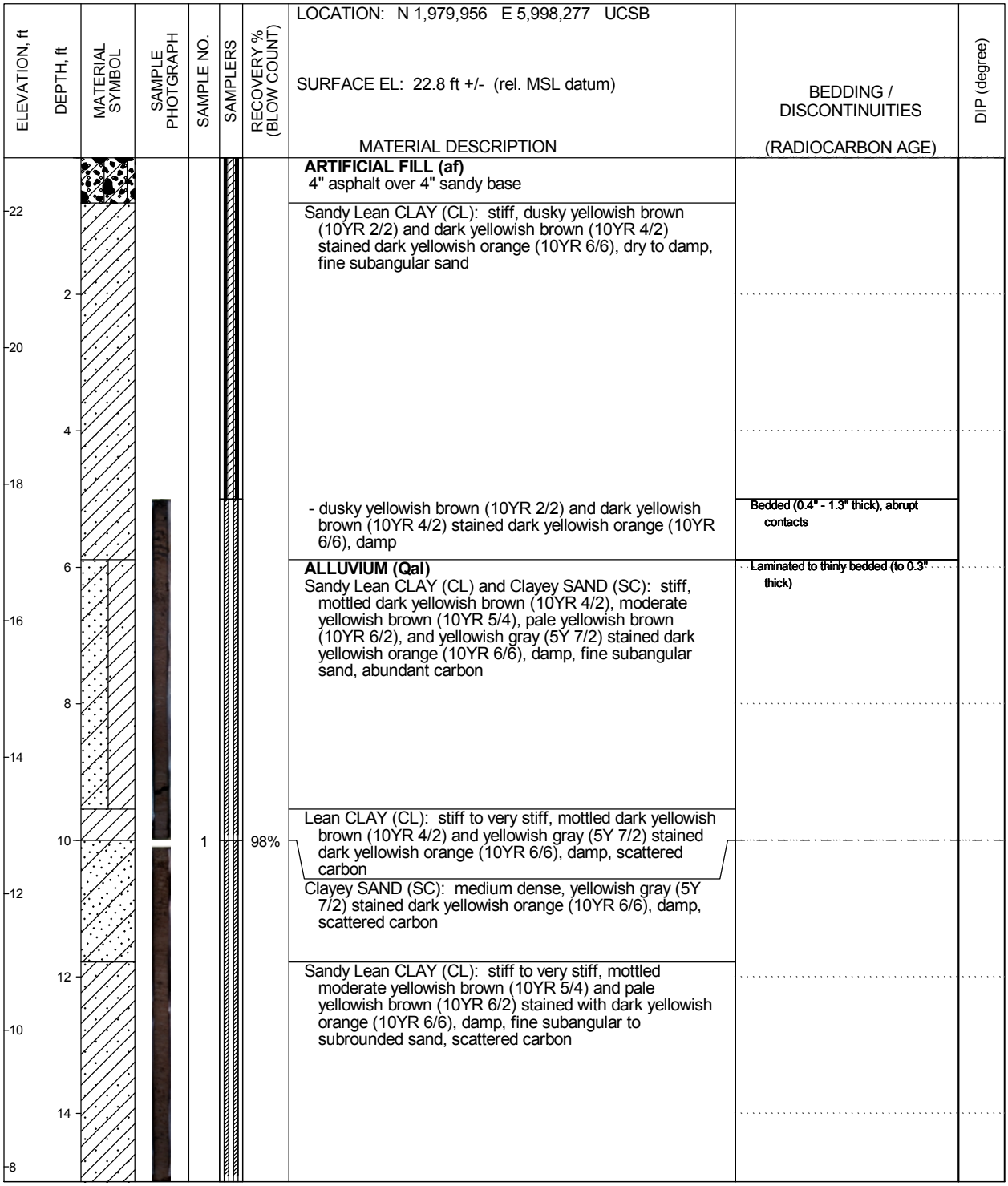
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 21.8 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 19, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-11

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-11c



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

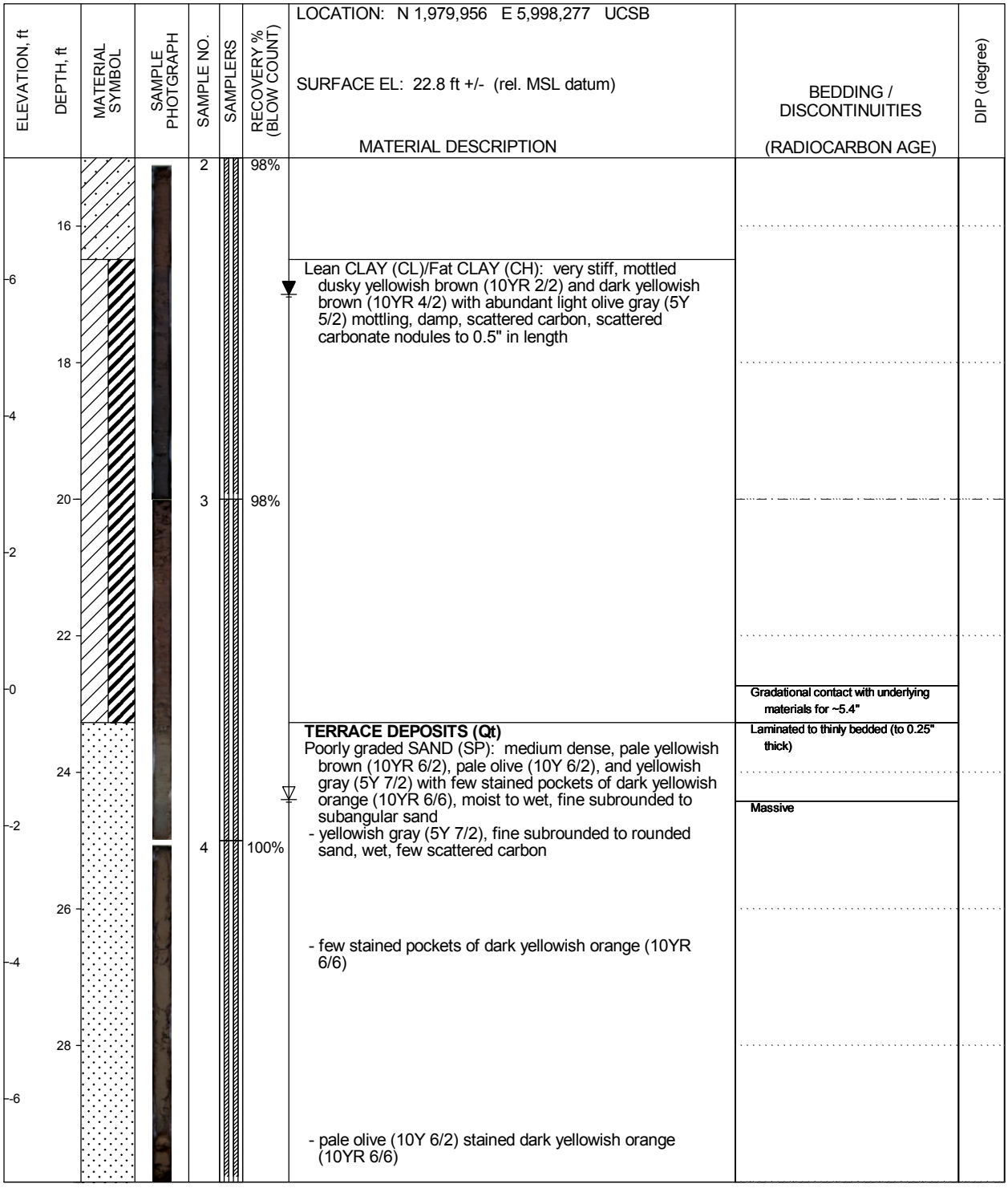
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 17.0 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 20, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-12

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-12a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

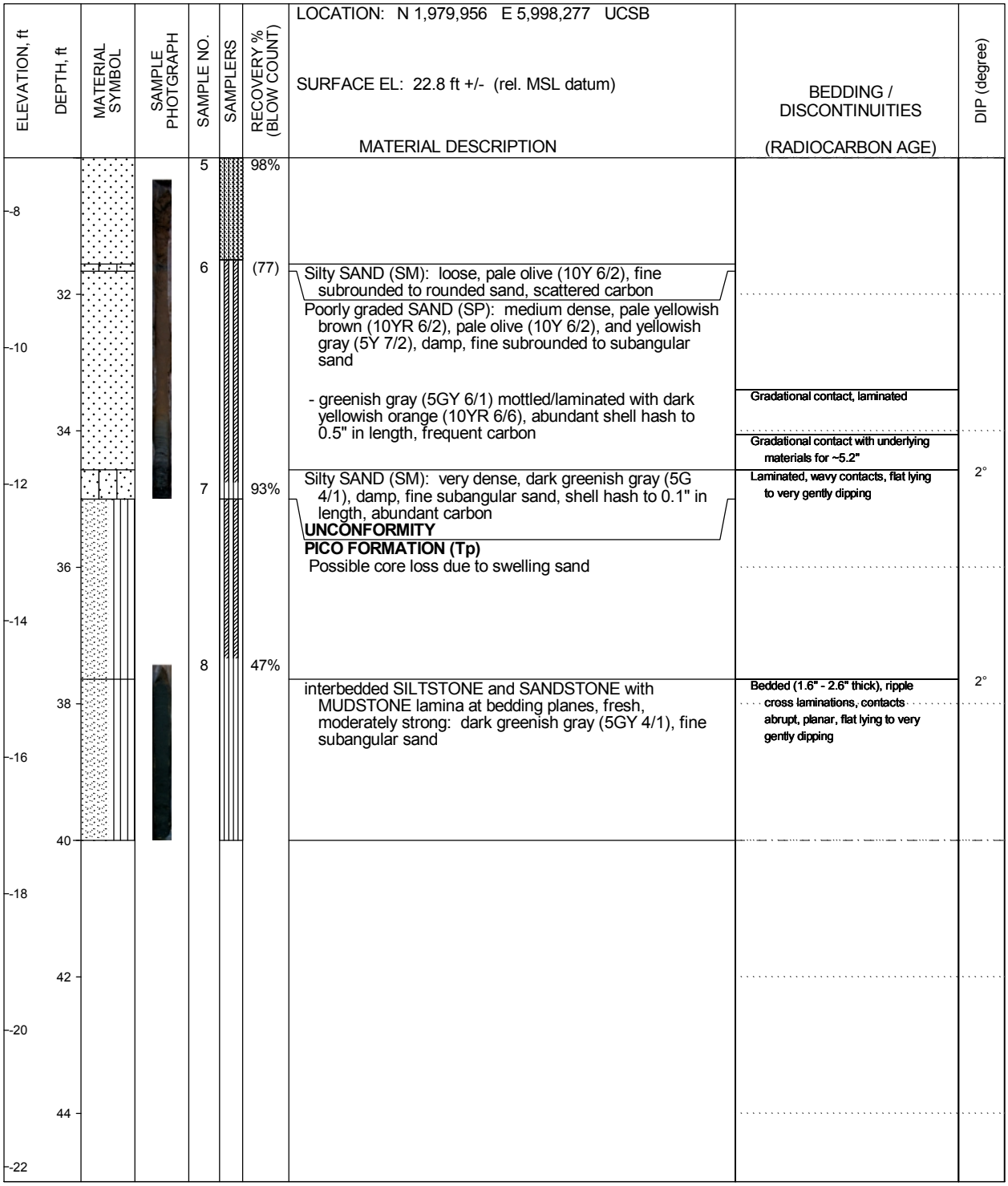
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 17.0 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 20, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-12

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-12b



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

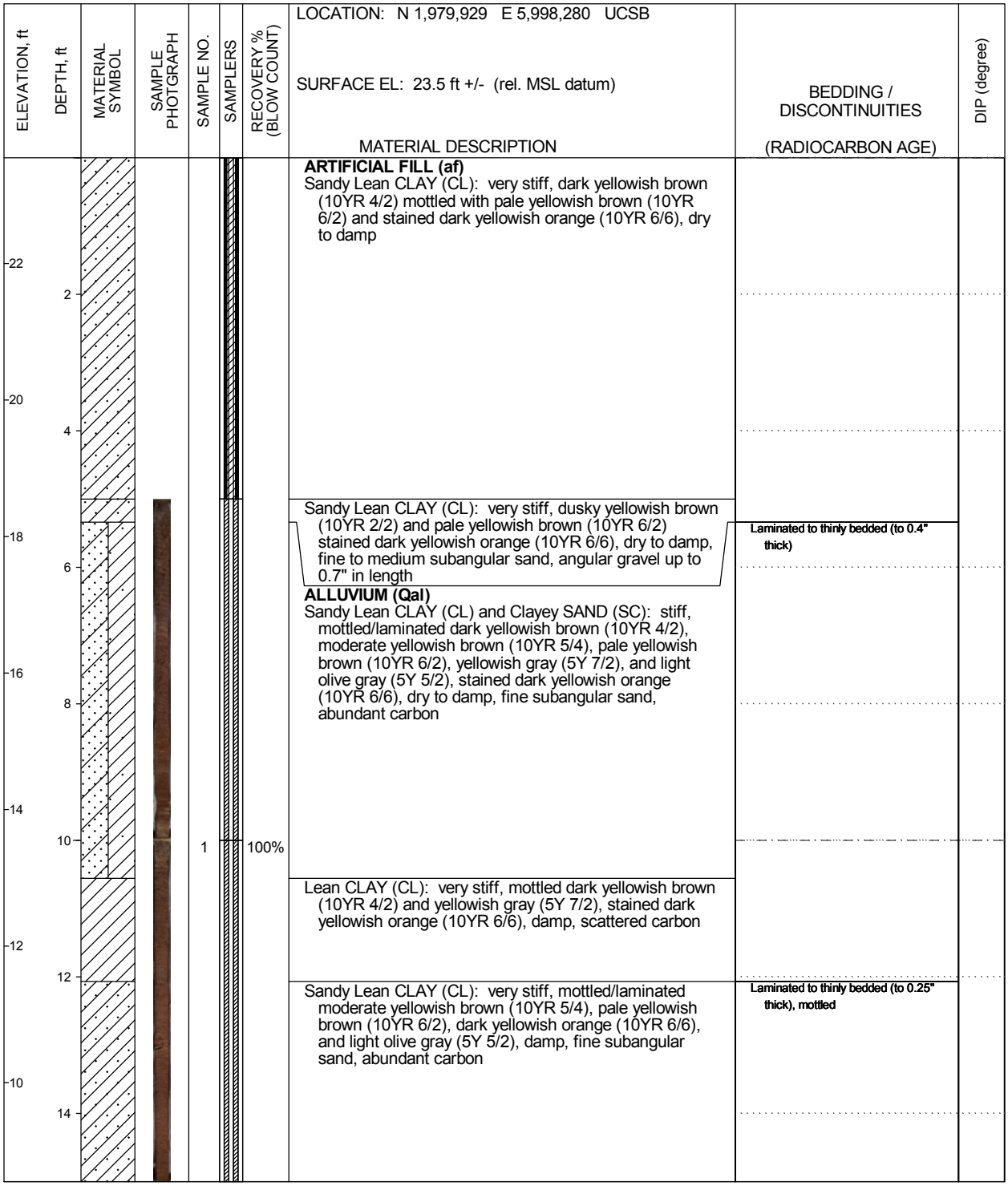
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 17.0 ft
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: March 20, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-12

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-12c



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

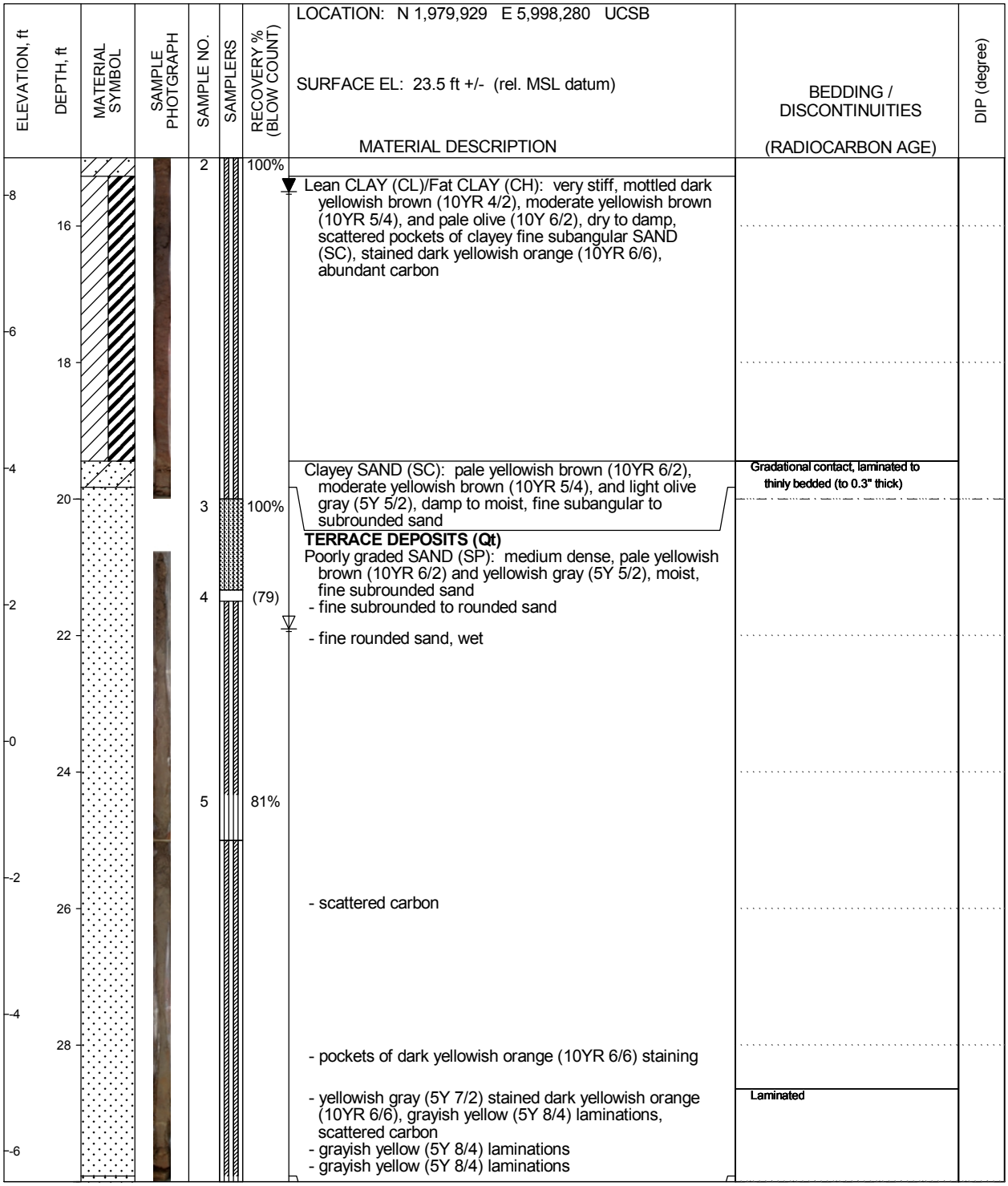
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 15.5 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 20, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-13

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-13a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

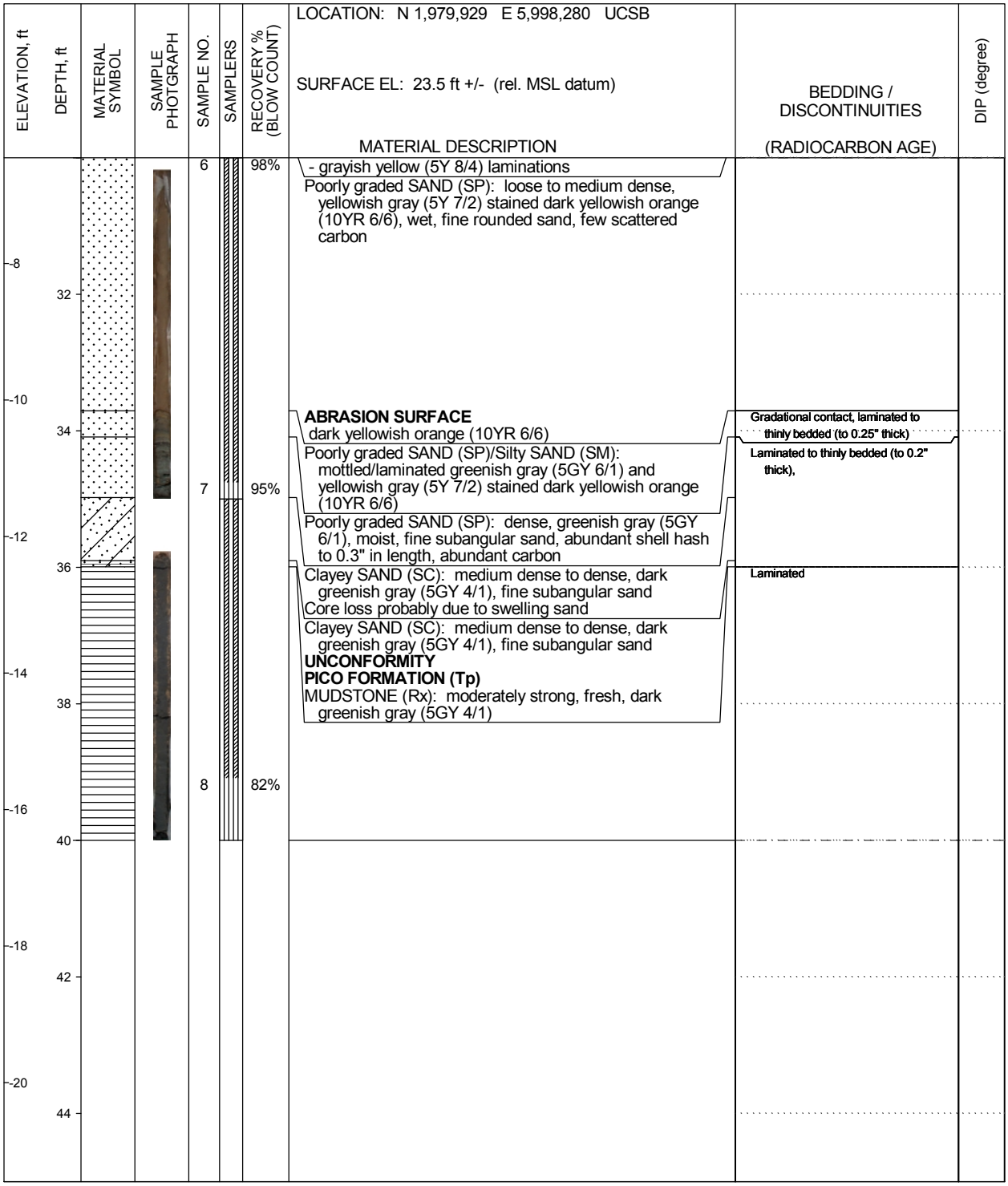
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 15.5 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 20, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-13

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-13b



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

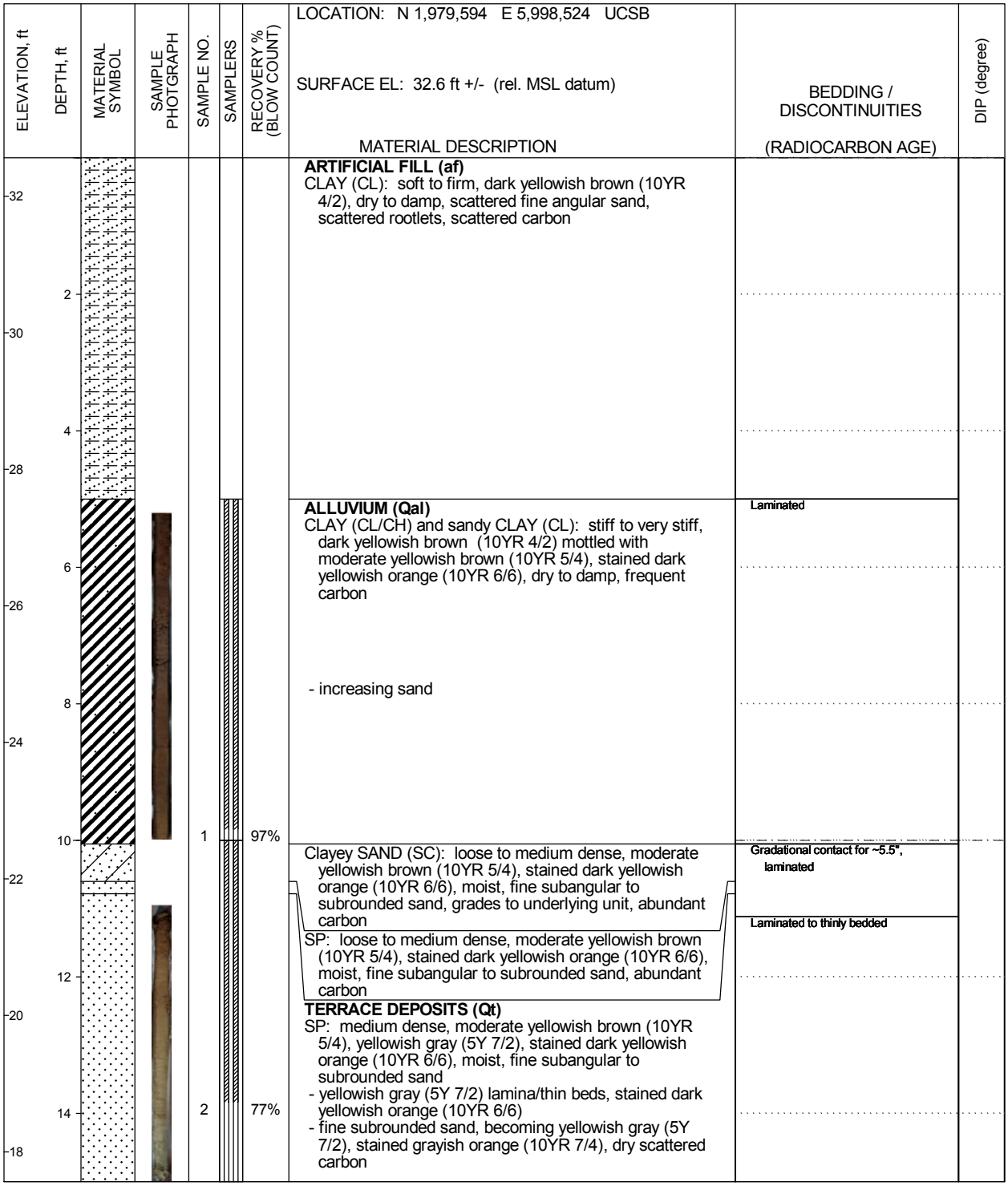
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 15.5 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: March 20, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-13

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-13c



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

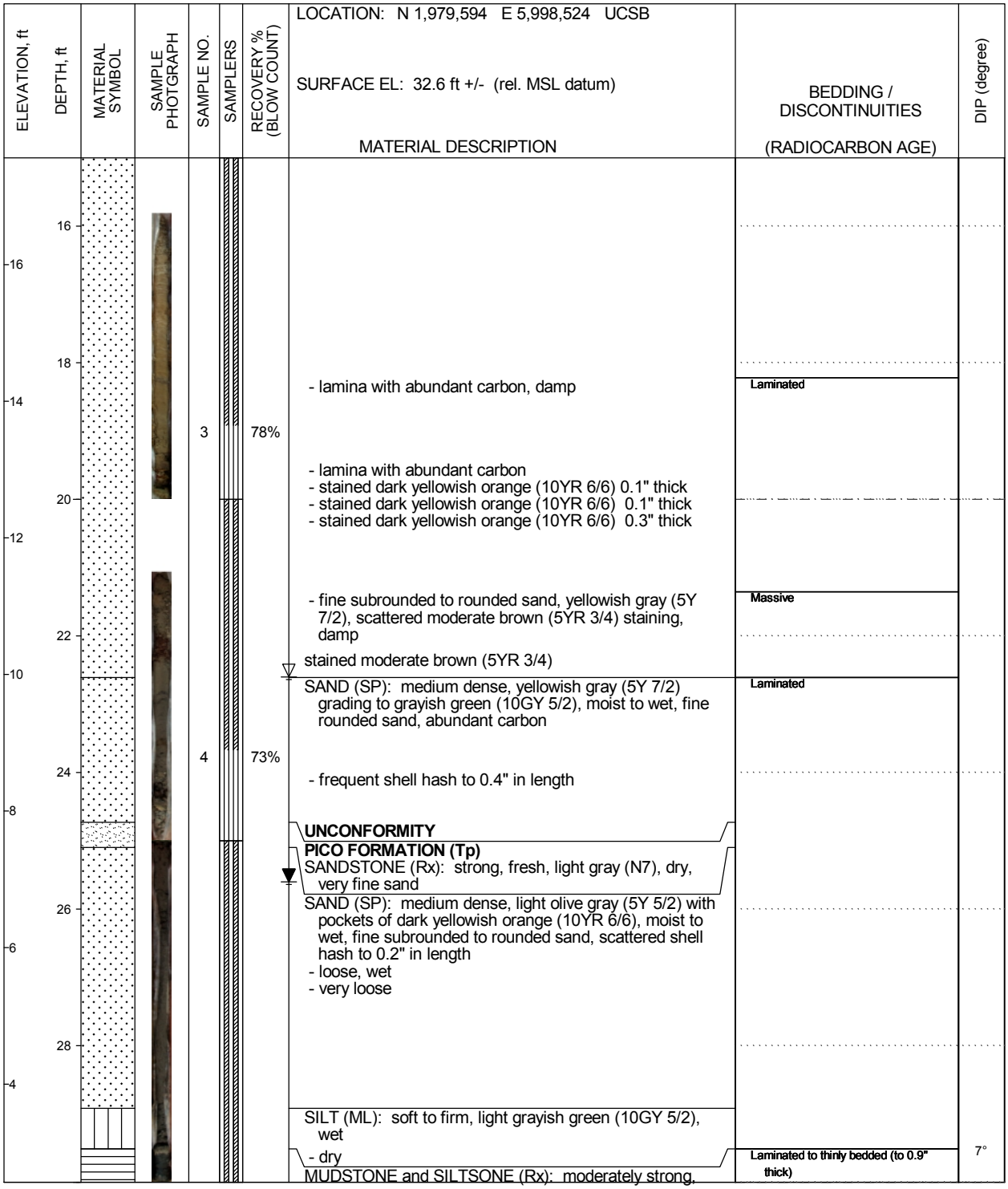
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 25.6 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: April 9, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-14

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-14a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

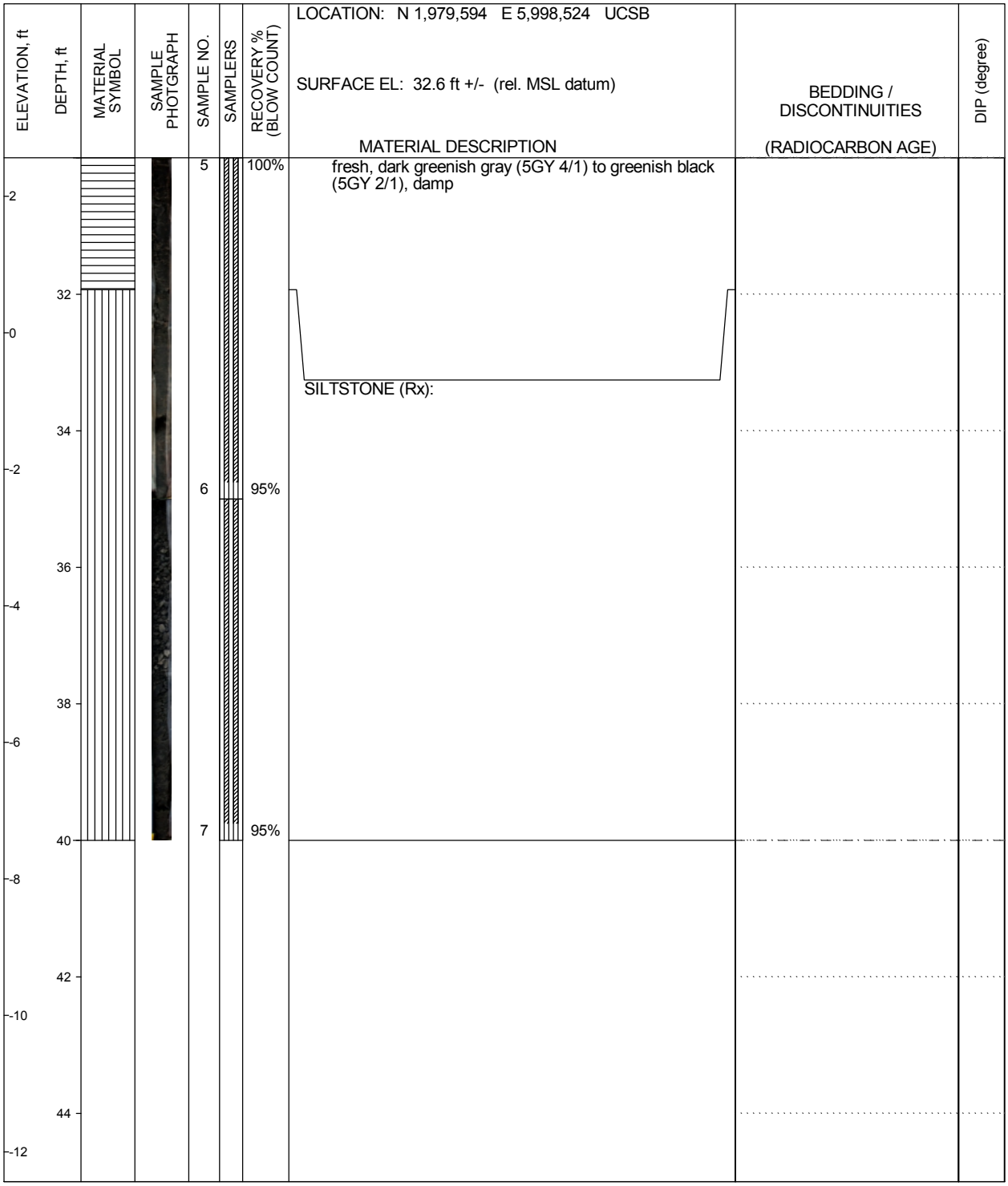
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 25.6 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: April 9, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-14

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-14b



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

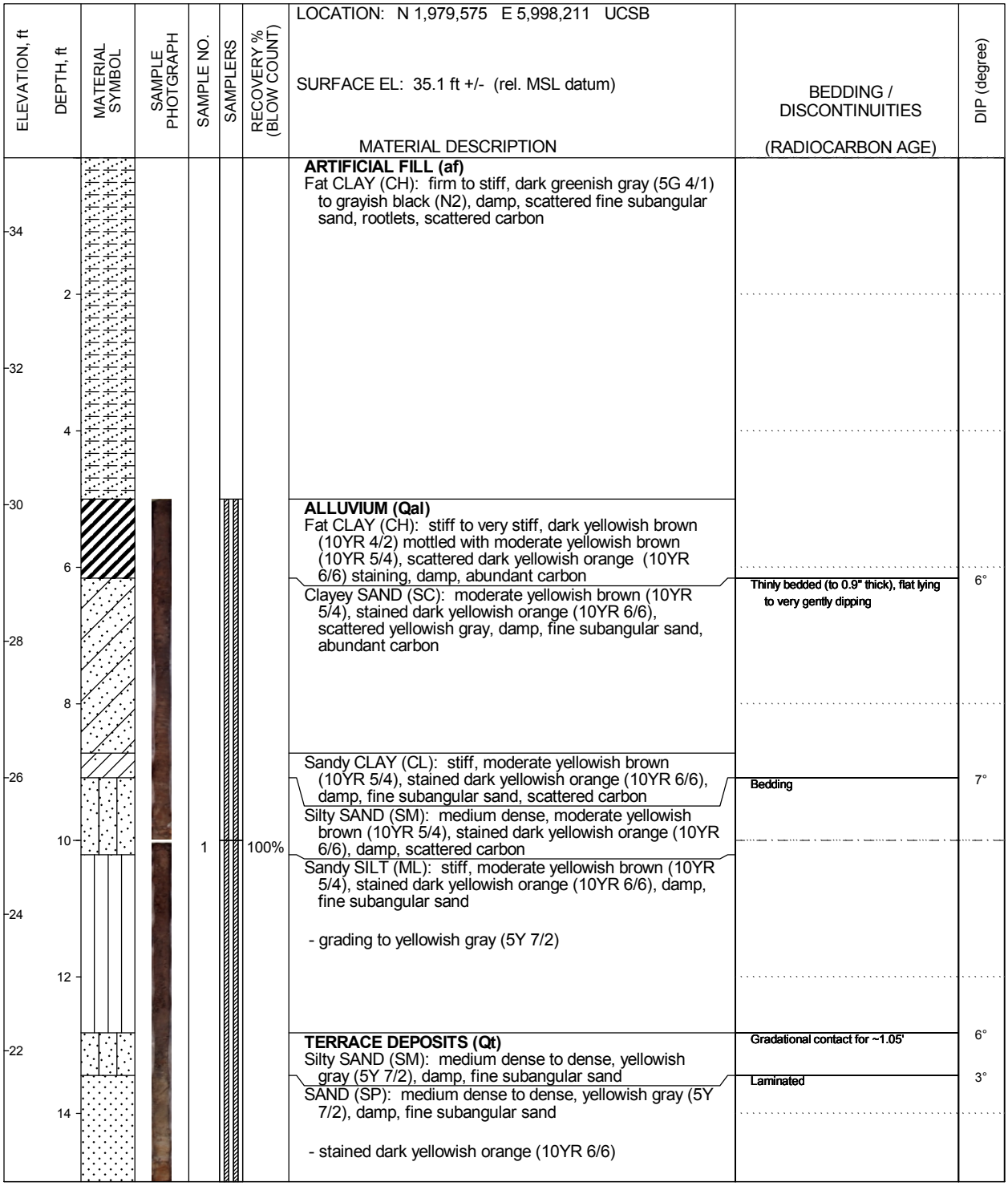
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: 25.6 ft
BACKFILLED WITH: Cuttings
DRILLING DATE: April 9, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-14

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-14c



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

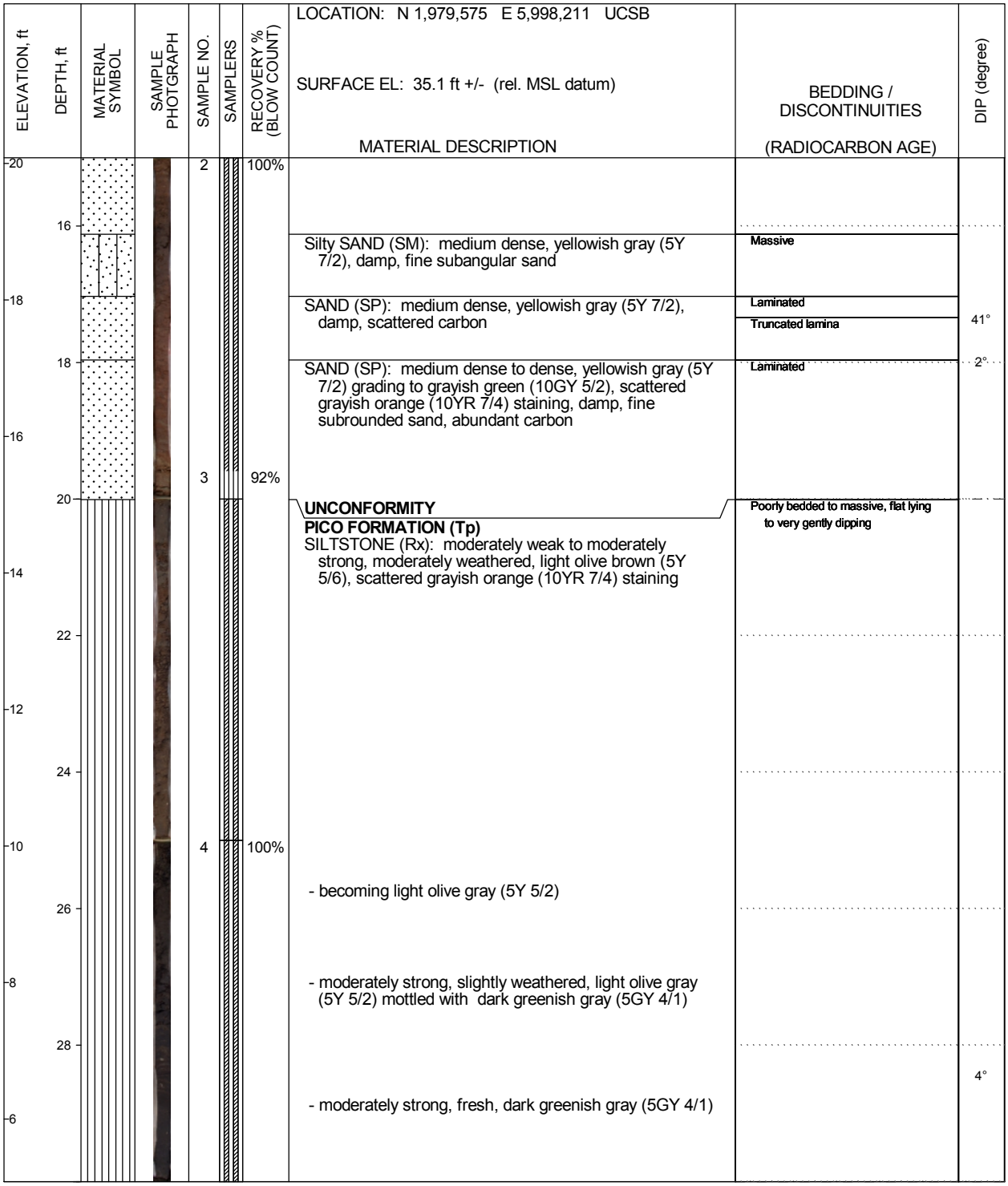
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Cuttings
DRILLING DATE: April 9, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-15

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-15a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

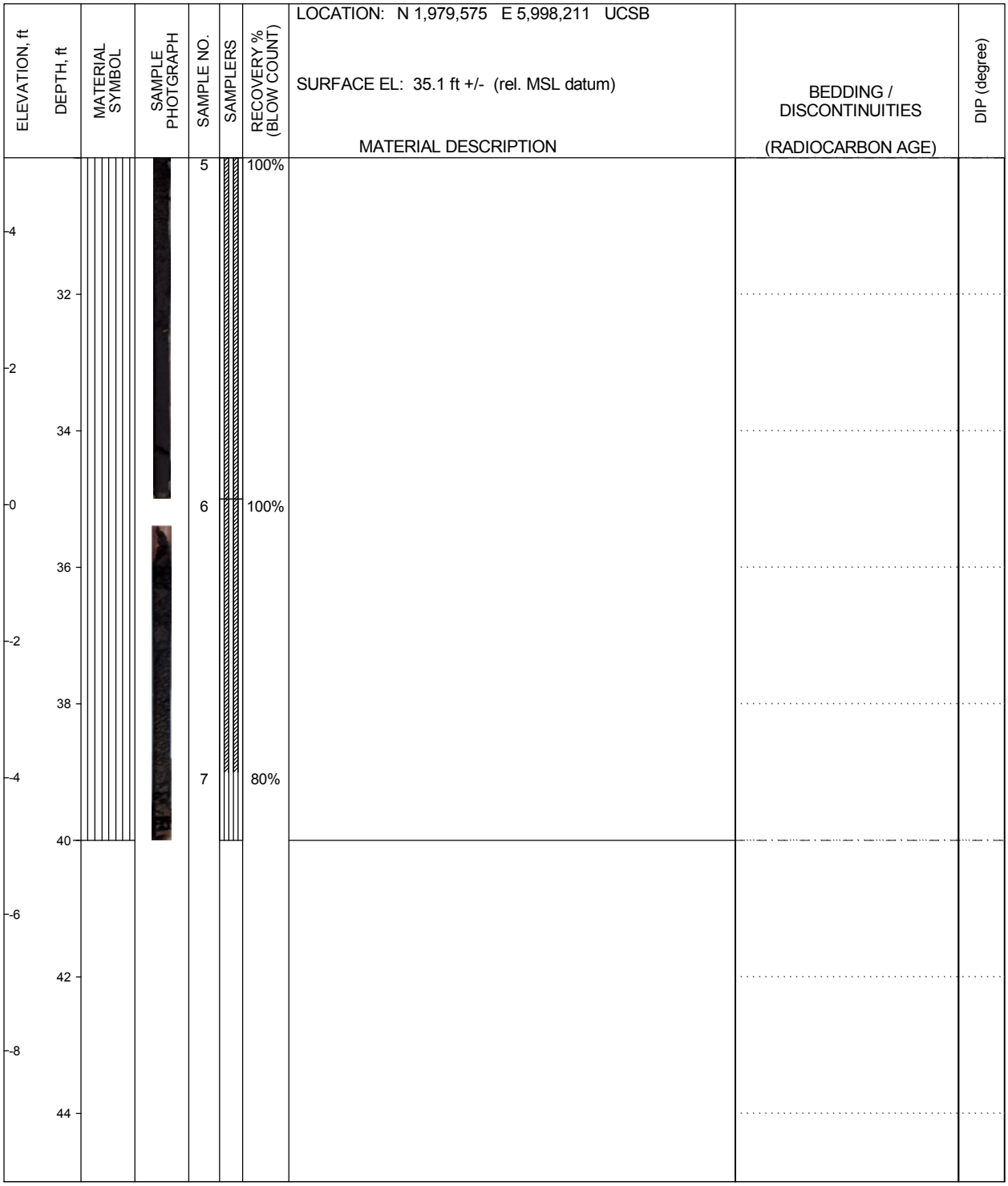
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Cuttings
DRILLING DATE: April 9, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-15

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-15b



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

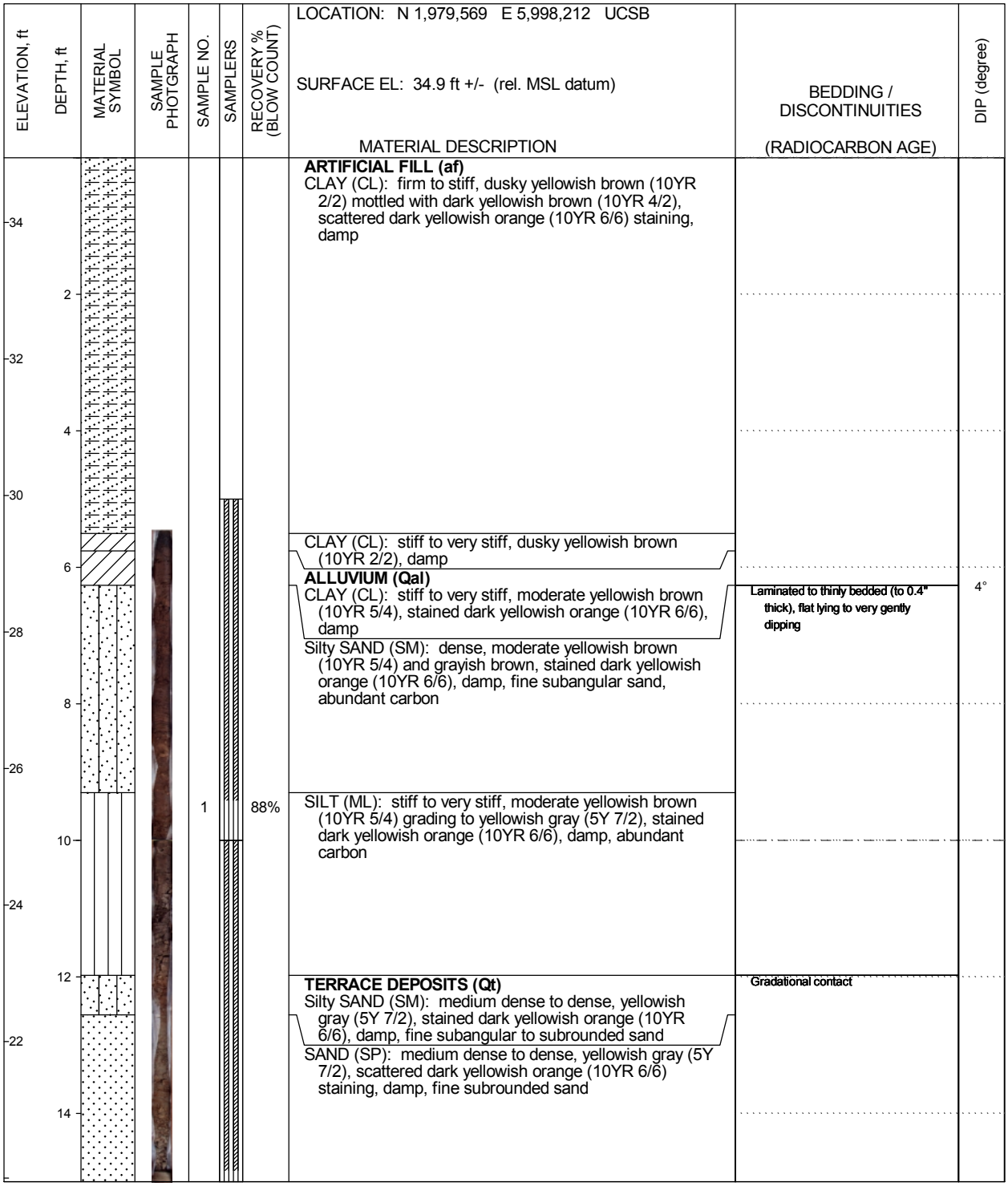
COMPLETION DEPTH: 40.0 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Cuttings
DRILLING DATE: April 9, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-15

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-15c



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

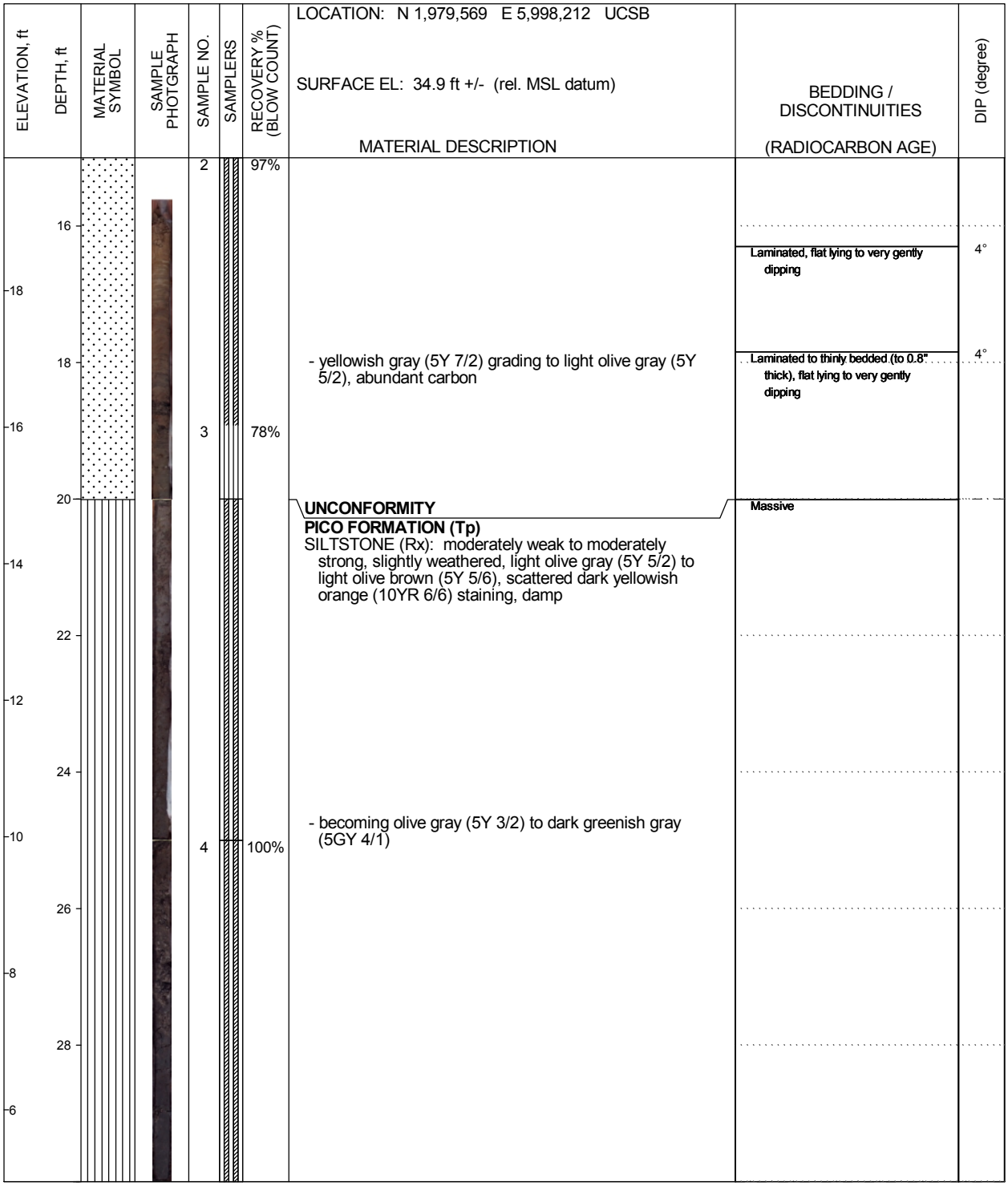
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: April 9, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-16

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-16a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

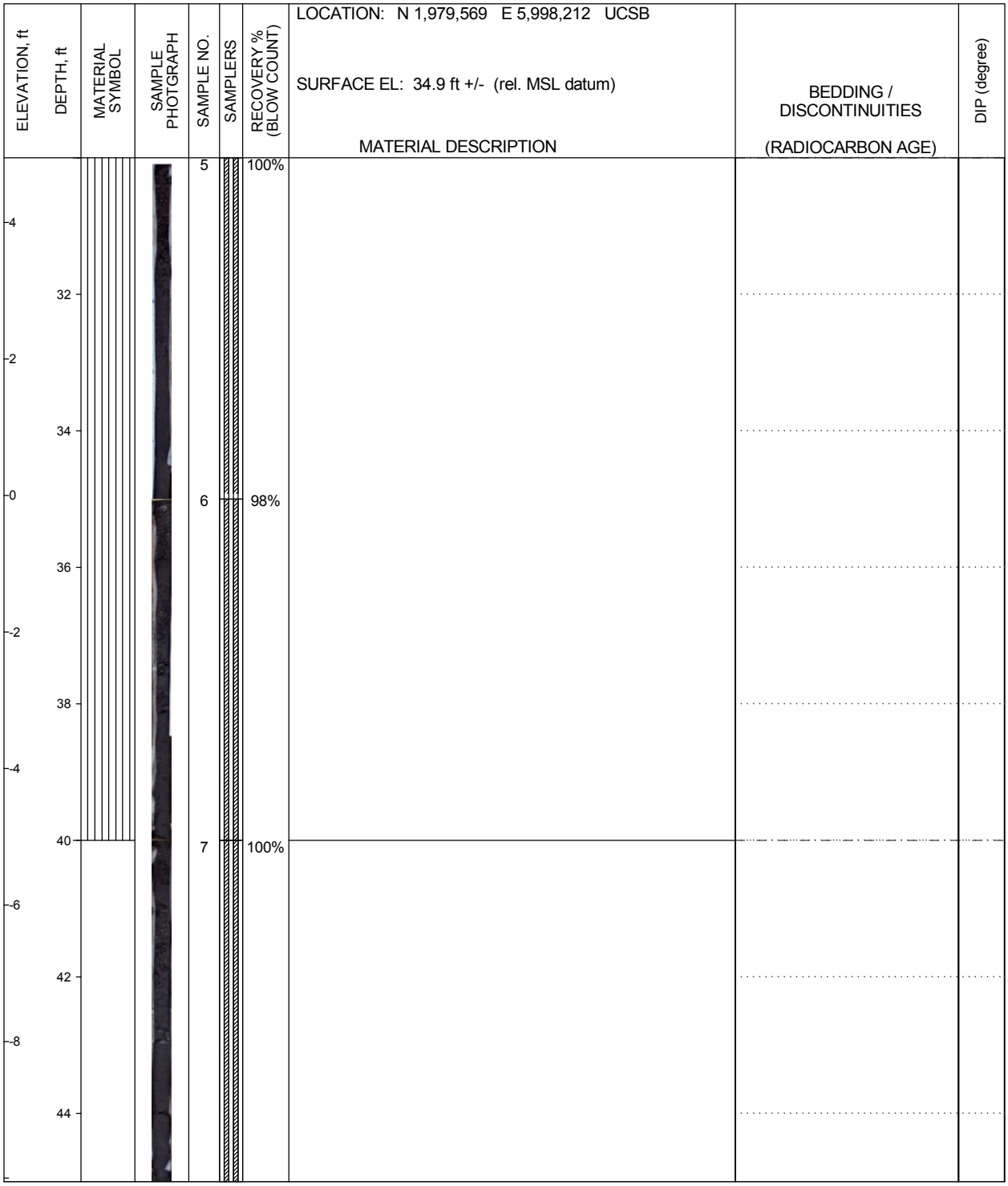
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: April 9, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-16

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-16b



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: April 9, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-16

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-16c

LOCATION: N 1,979,569 E 5,998,212 UCSB

SURFACE EL: 34.9 ft +/- (rel. MSL datum)

ELEVATION, ft	DEPTH, ft	MATERIAL SYMBOL	SAMPLE PHOTGRAPH	SAMPLE NO.	SAMPLERS	RECOVERY % (BLOW COUNT)	MATERIAL DESCRIPTION	BEDDING / DISCONTINUITIES (RADIOCARBON AGE)	DIP (degree)
	46			8		100%			
-12									
	48			9		63%			
-14									
	50								
-16									
	52								
-18									
	54								
-20									
	56								
-22									
	58								
-24									

The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

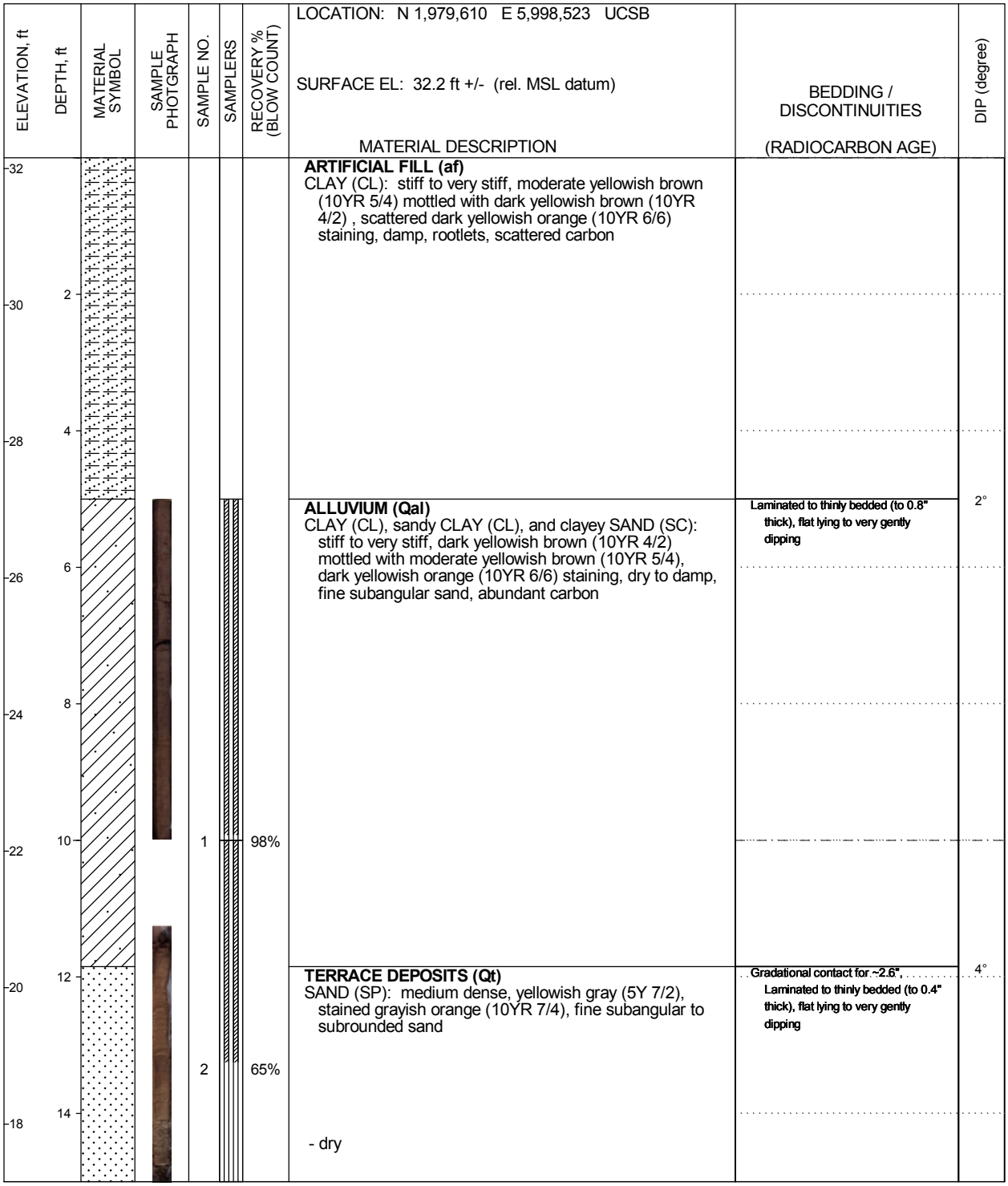
COMPLETION DEPTH: 50.0 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Cuttings, AC Patch
DRILLING DATE: April 9, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-16

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-16d



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

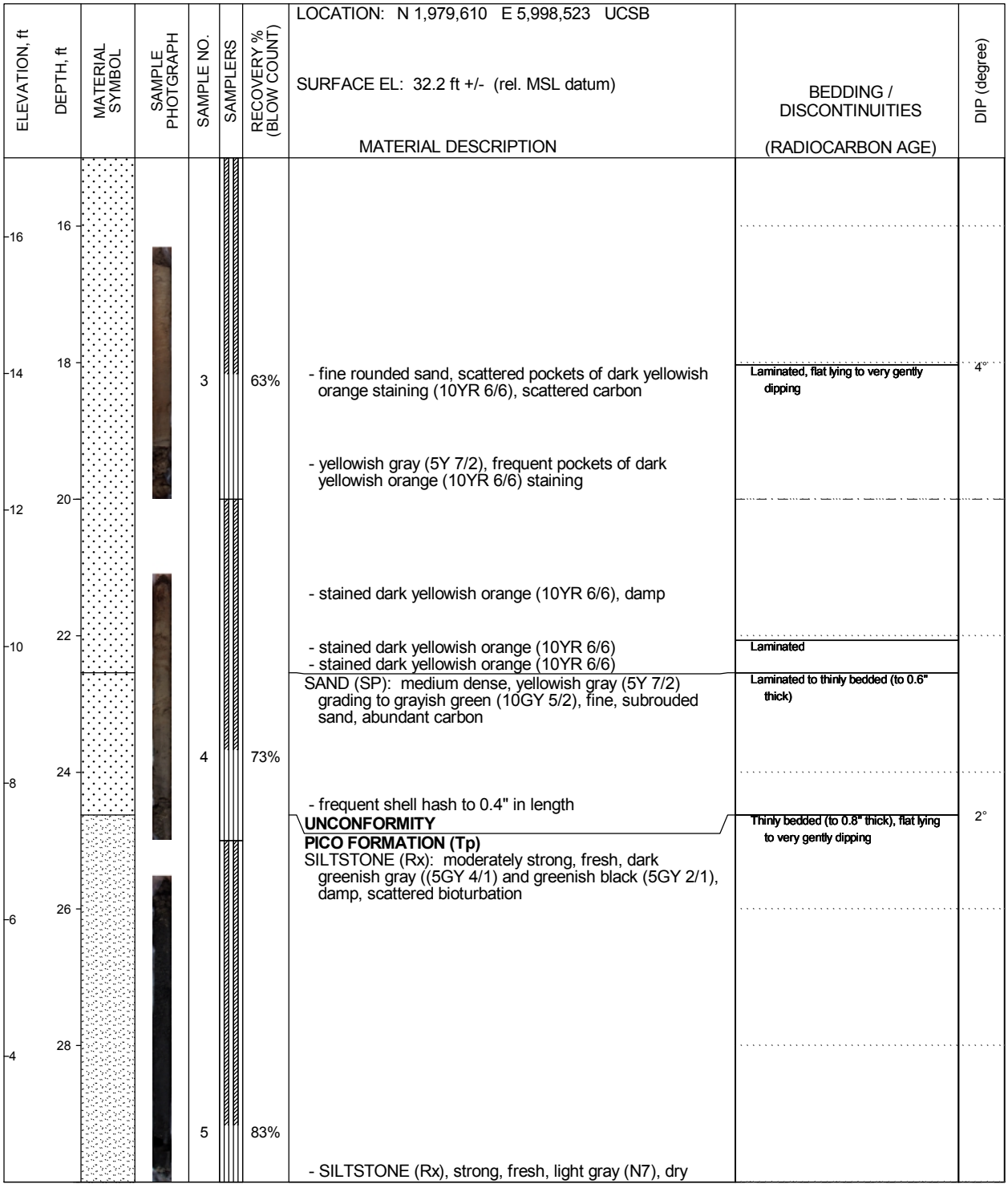
COMPLETION DEPTH: 30.0 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Cuttings
DRILLING DATE: April 10, 2012

DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-17

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-17a



The log and data presented are a simplification of actual conditions encountered at the time of drilling at the drilled location. Subsurface conditions may differ at other locations and with the passage of time.

COMPLETION DEPTH: 30.0 ft
DEPTH TO WATER: Not Encountered
BACKFILLED WITH: Cuttings
DRILLING DATE: April 10, 2012

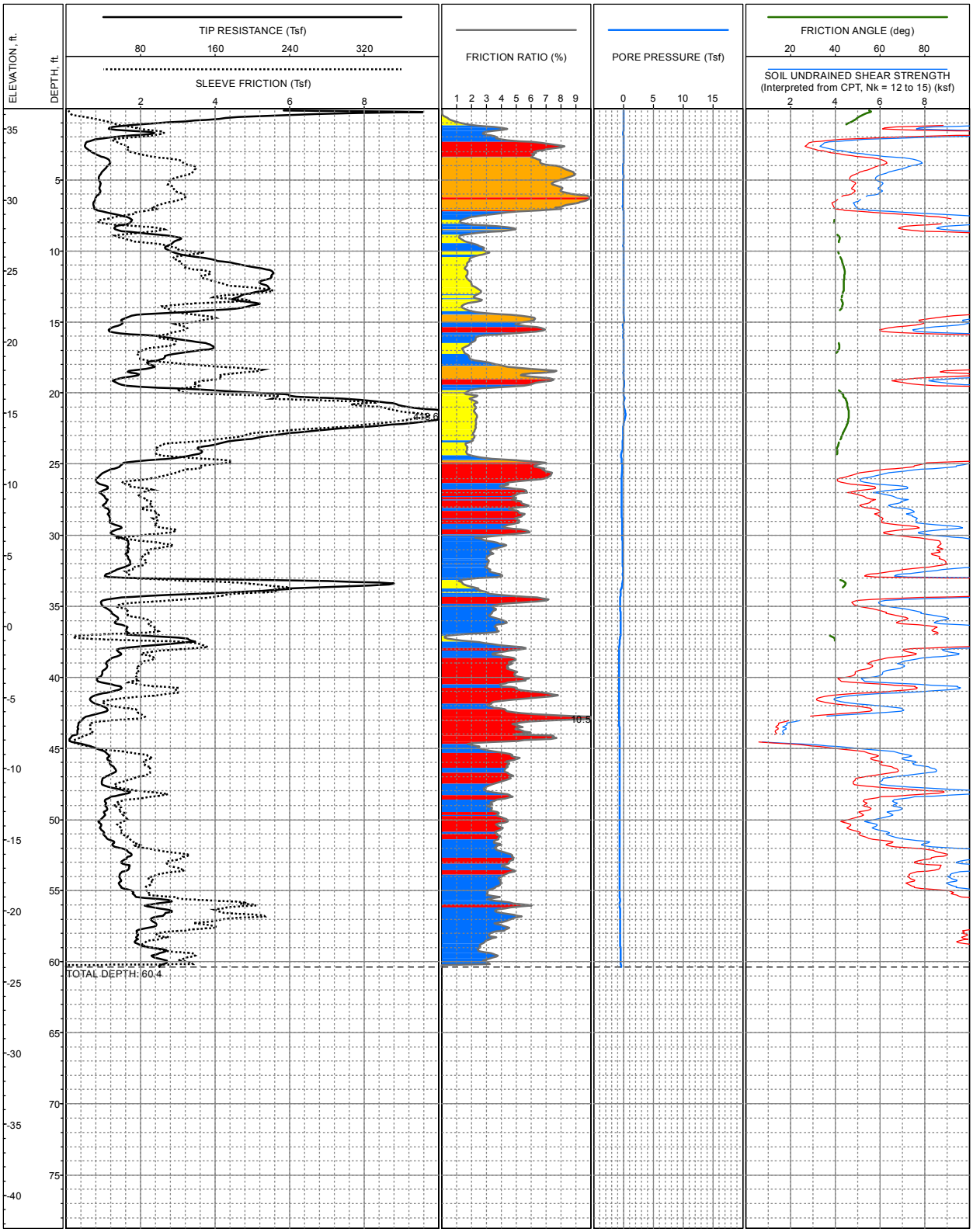
DRILLING METHOD: 8-inch-dia. Hollow Stem Auger
HAMMER TYPE: Automatic Trip
DRILLED BY: Martini
LOGGED BY: G Faneros
CHECKED BY: G S Denlinger

LOG OF BORING NO. BH-17

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara, Santa Barbara, California

PLATE A-17b

APPENDIX B - LOGS OF THE CPT SOUNDINGS
(On Attached Cd)



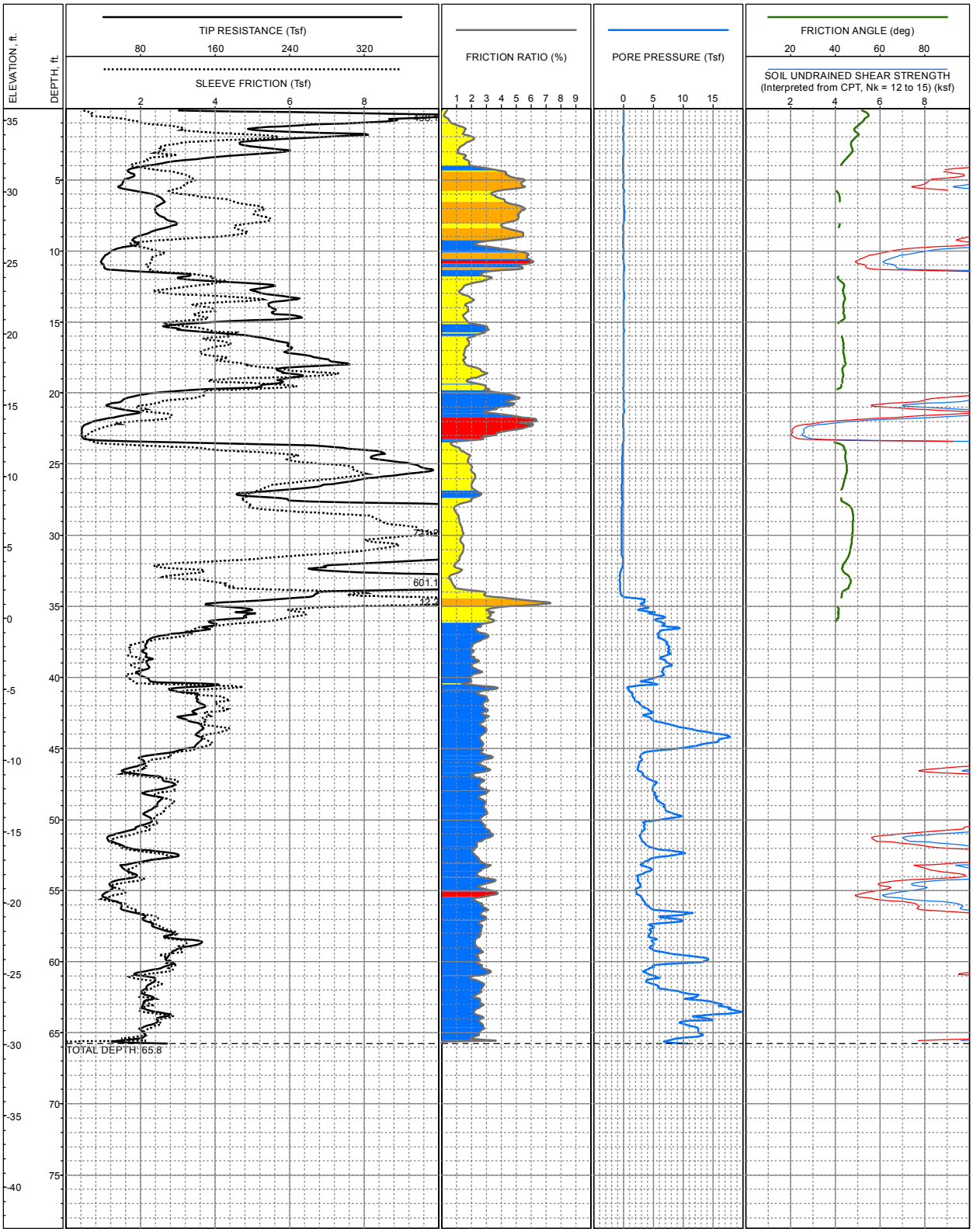
LOCATION: E5,997,904, N 1,979,610, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 36.4ft +/- ()
COMPLETION DEPTH: 60.4ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-01

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

N:\Projects\04_2011\04_6211_0136_UCSB_SCatalina_Housing\Explorations\CPT\2012\Logs\2012_06_18_Logs_SuF\MXD\CPT_Proc_VK12C.mxd,06/19/2012,CDean



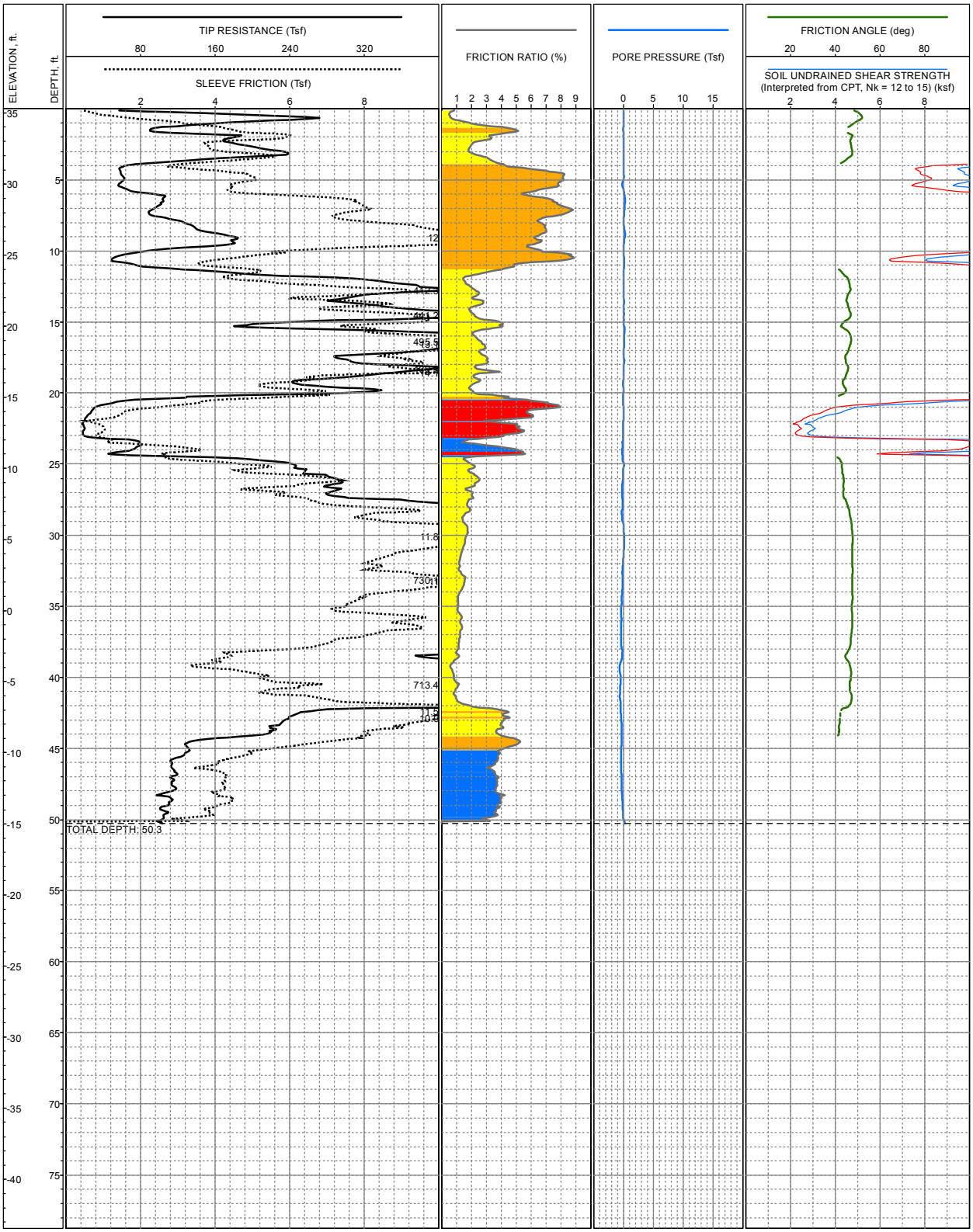
LOCATION: E5,997,904, N 1,979,621, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.8ft +/- ()
COMPLETION DEPTH: 65.8ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-01A

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

N:\Projects\04_2011\04_6211_0136_UCSB_SCatalina_Housing\Explorations\CPT\2012\Logs\2012_06_18_Logs_SuF\MXD\CPT_Proc_VK12C.mxd,06/19/2012,CDean



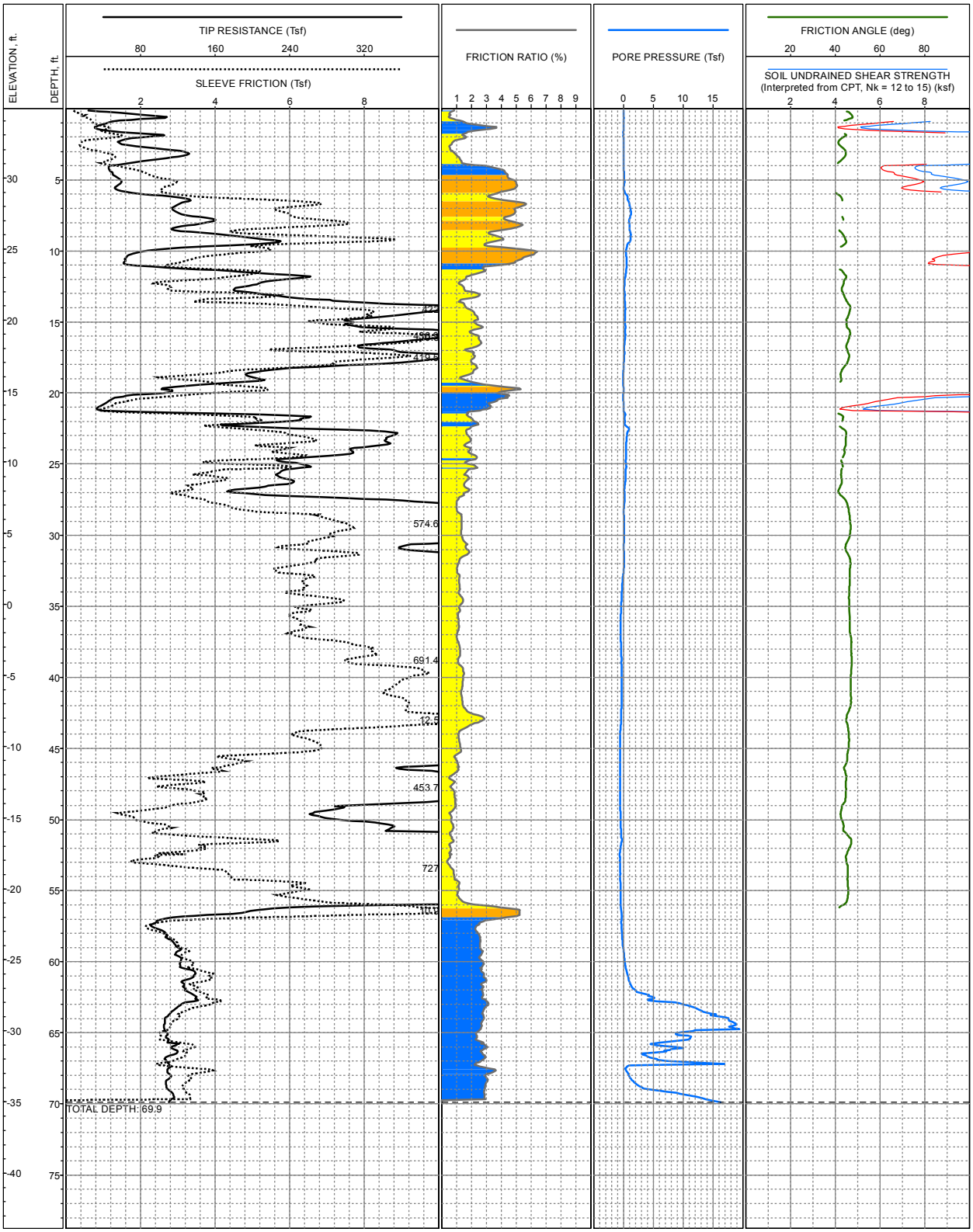
LOCATION: E5,997,904, N 1,979,631, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.3ft +/- ()
COMPLETION DEPTH: 50.3ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-02

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

N:\Projects\04_2011\04_6211_0136_UCSB_SCatalina_Housing\Explorations\CPT\2012\Logs\2012_06_18_Logs_SuF\MXD\CPT_Proc_VK12C.mxd,06/19/2012,CDean



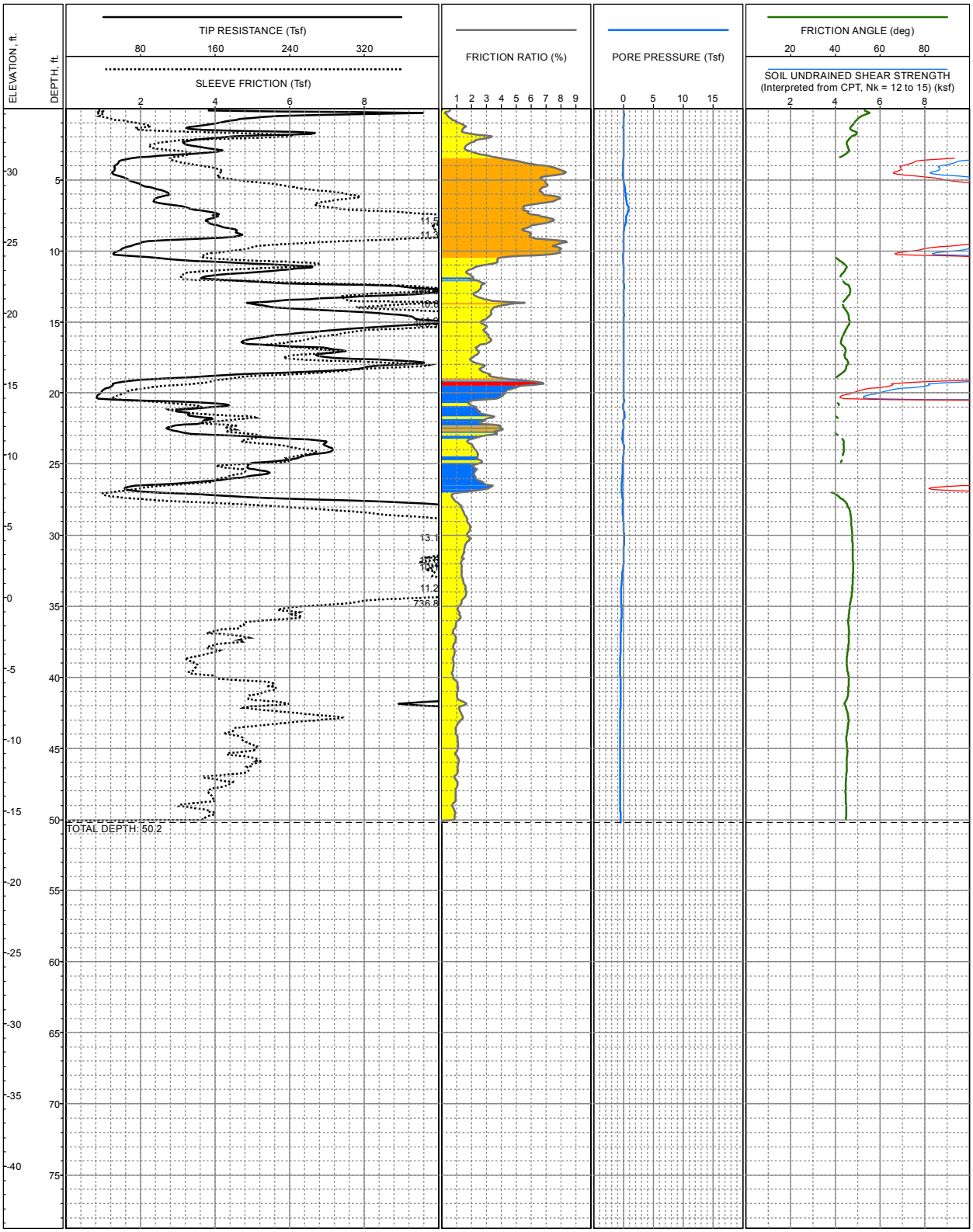
LOCATION: E5,997,906, N 1,979,643, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 34.9ft +/- ()
COMPLETION DEPTH: 69.9ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-02A

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

N:\Projects\04_2011\04_6211_0136_UCSB_SCatalina_Housing\Explorations\CPT\2012\Logs\2012_06_18_Logs_SuF\MXD\CPT_Proc_VK12C.mxd,06/19/2012,CDean



LOCATION: E5,997,907, N 1,979,656, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 34.4ft +/- ()
COMPLETION DEPTH: 50.2ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-03

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

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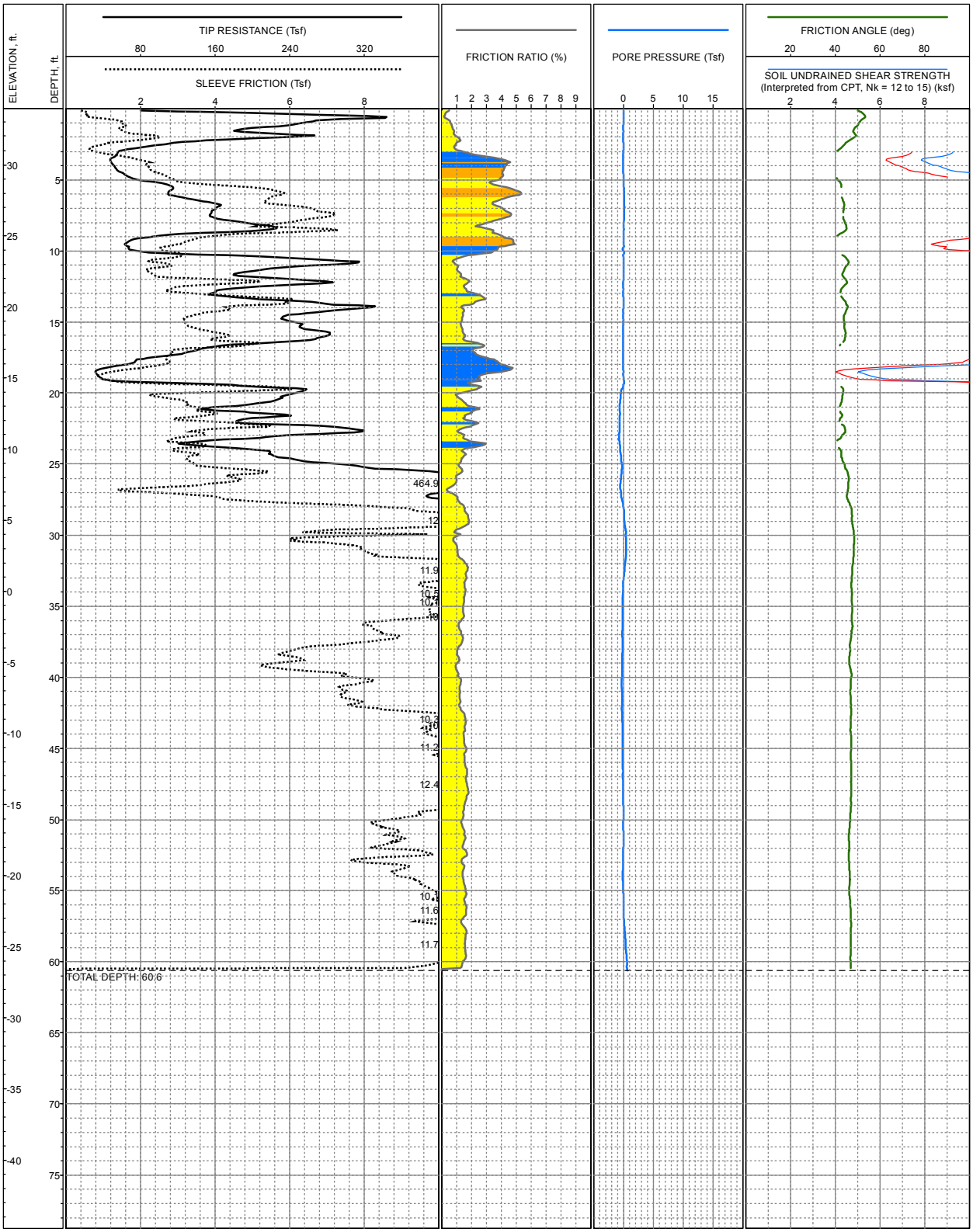

LOCATION: E5,997,905, N 1,979,669, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 33.9ft +/- ()
COMPLETION DEPTH: 60.6ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-03A

San Joaquin Apartments & Precinct Improvements
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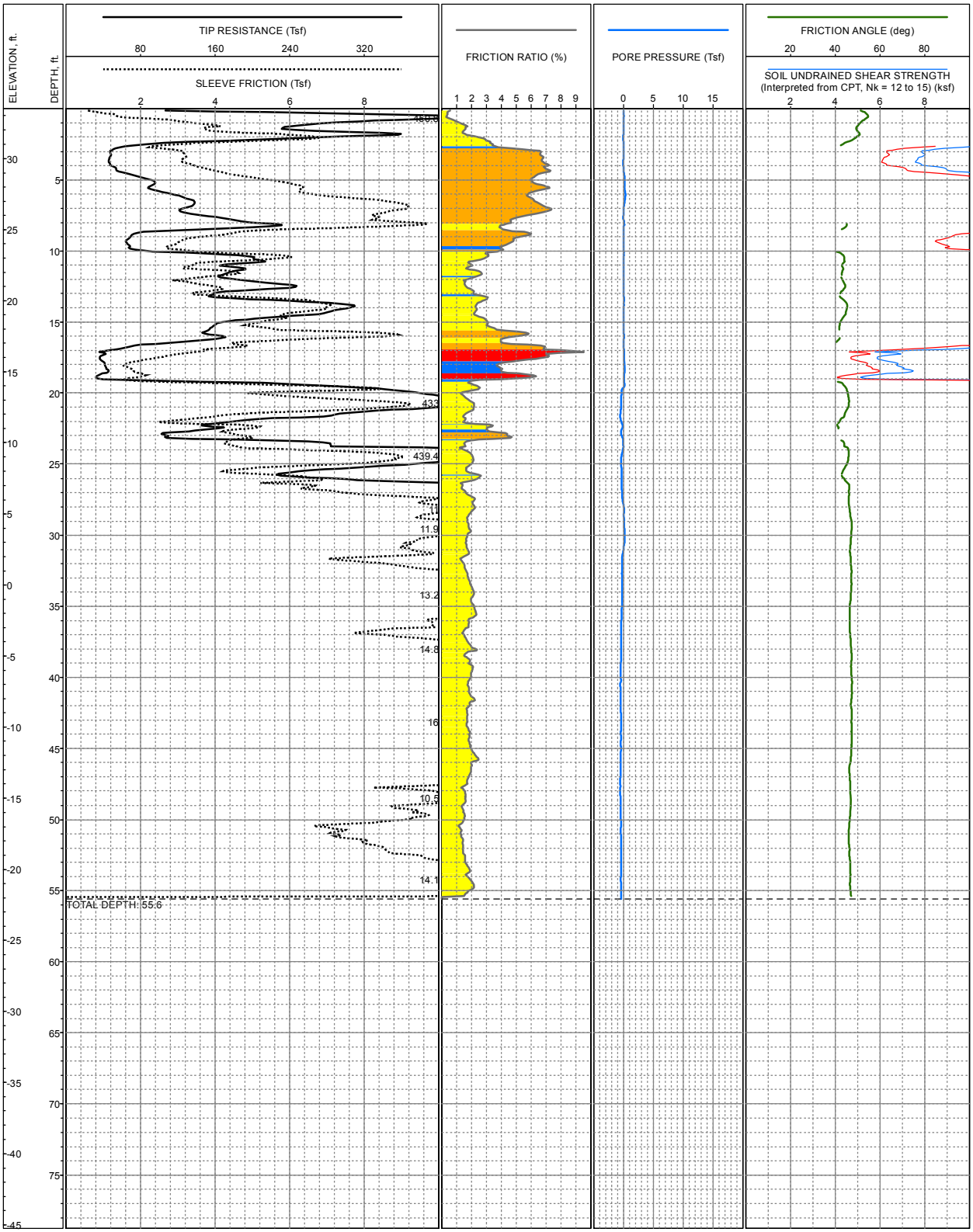

LOCATION: E5,997,905, N 1,979,681, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 33.5ft +/- ()
COMPLETION DEPTH: 55.6ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-04

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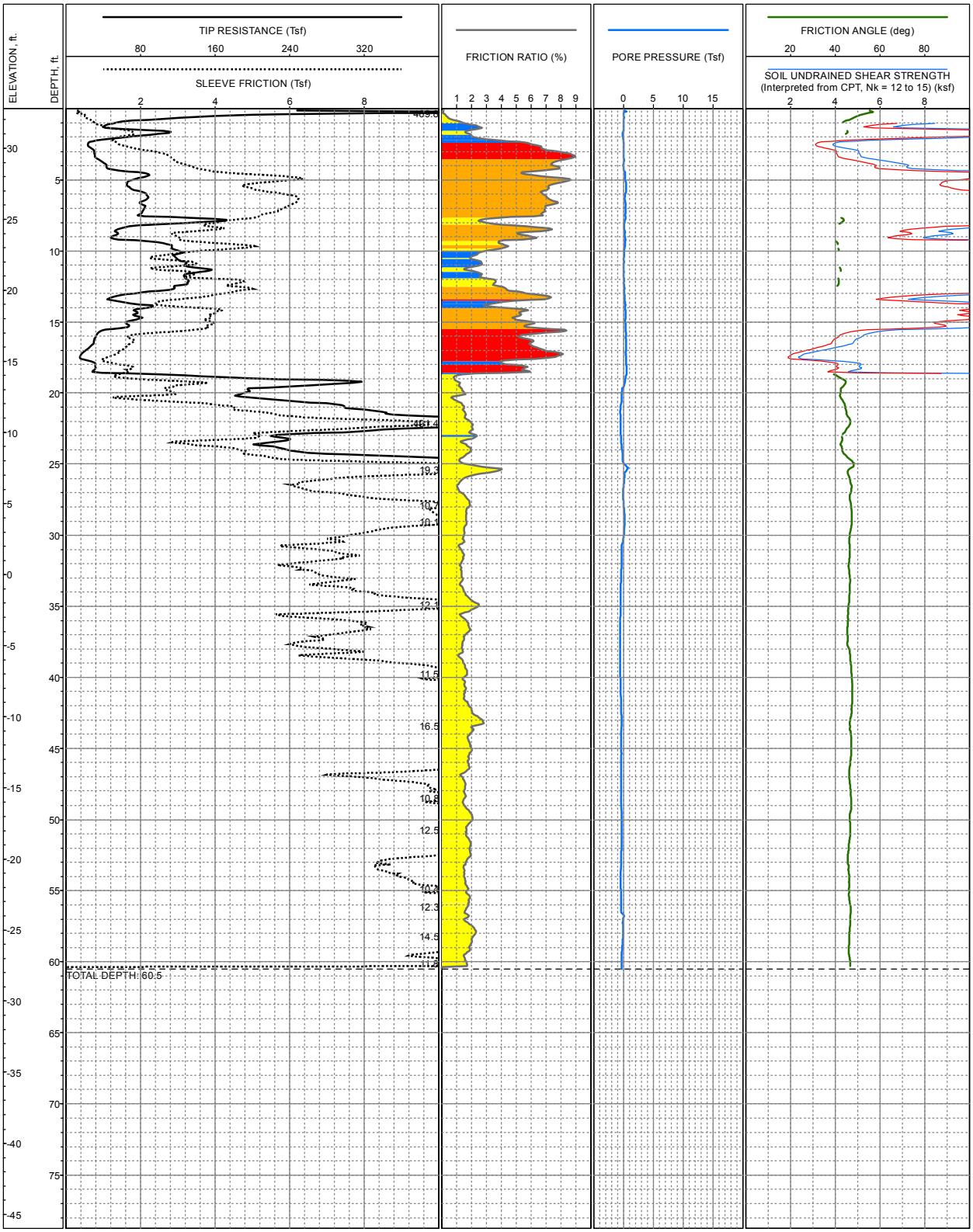

LOCATION: E5,997,906, N 1,979,706, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.8ft +/- ()
COMPLETION DEPTH: 60.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-05

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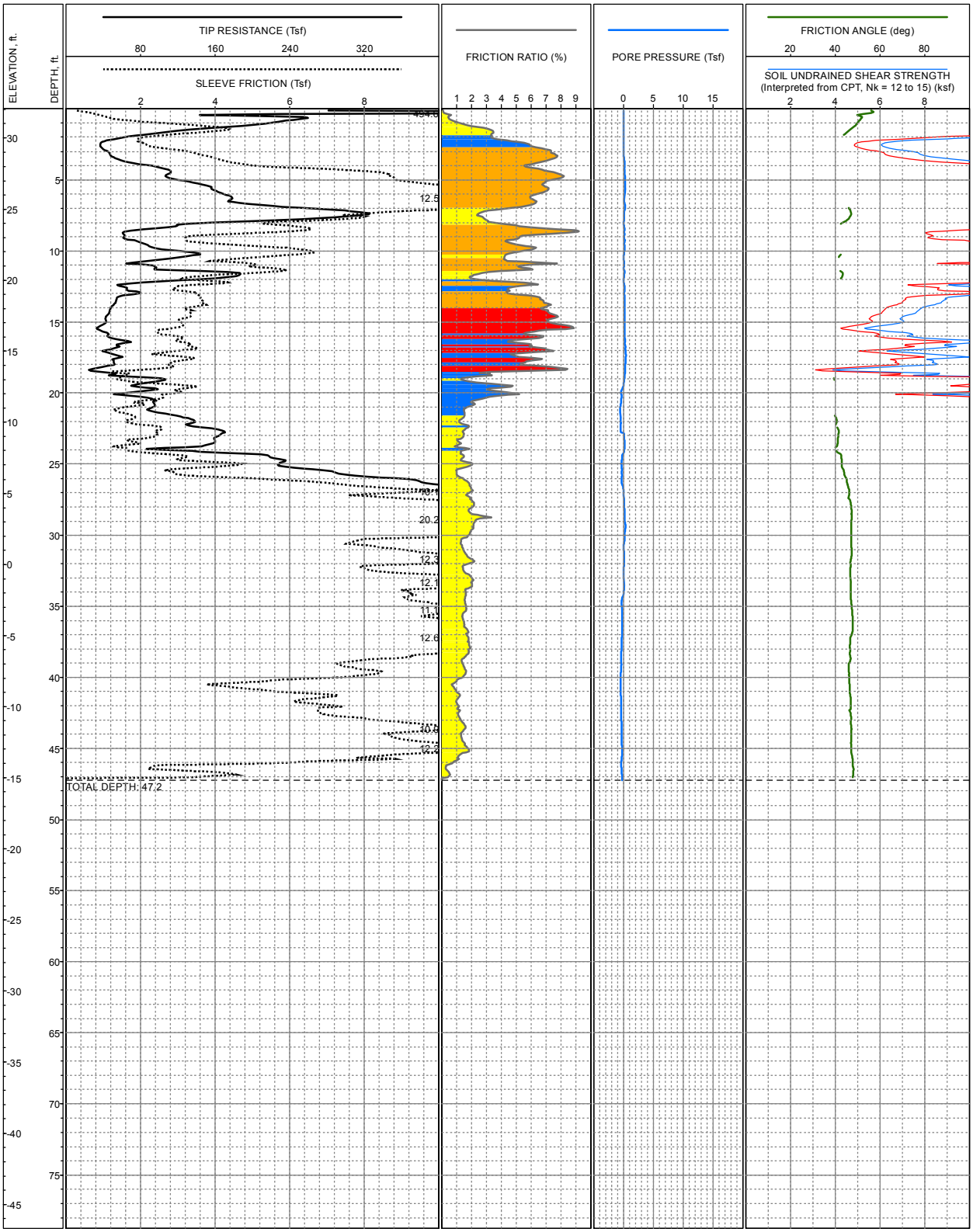

LOCATION: E5,997,907, N 1,979,731, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.1ft +/- ()
COMPLETION DEPTH: 47.2ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-06

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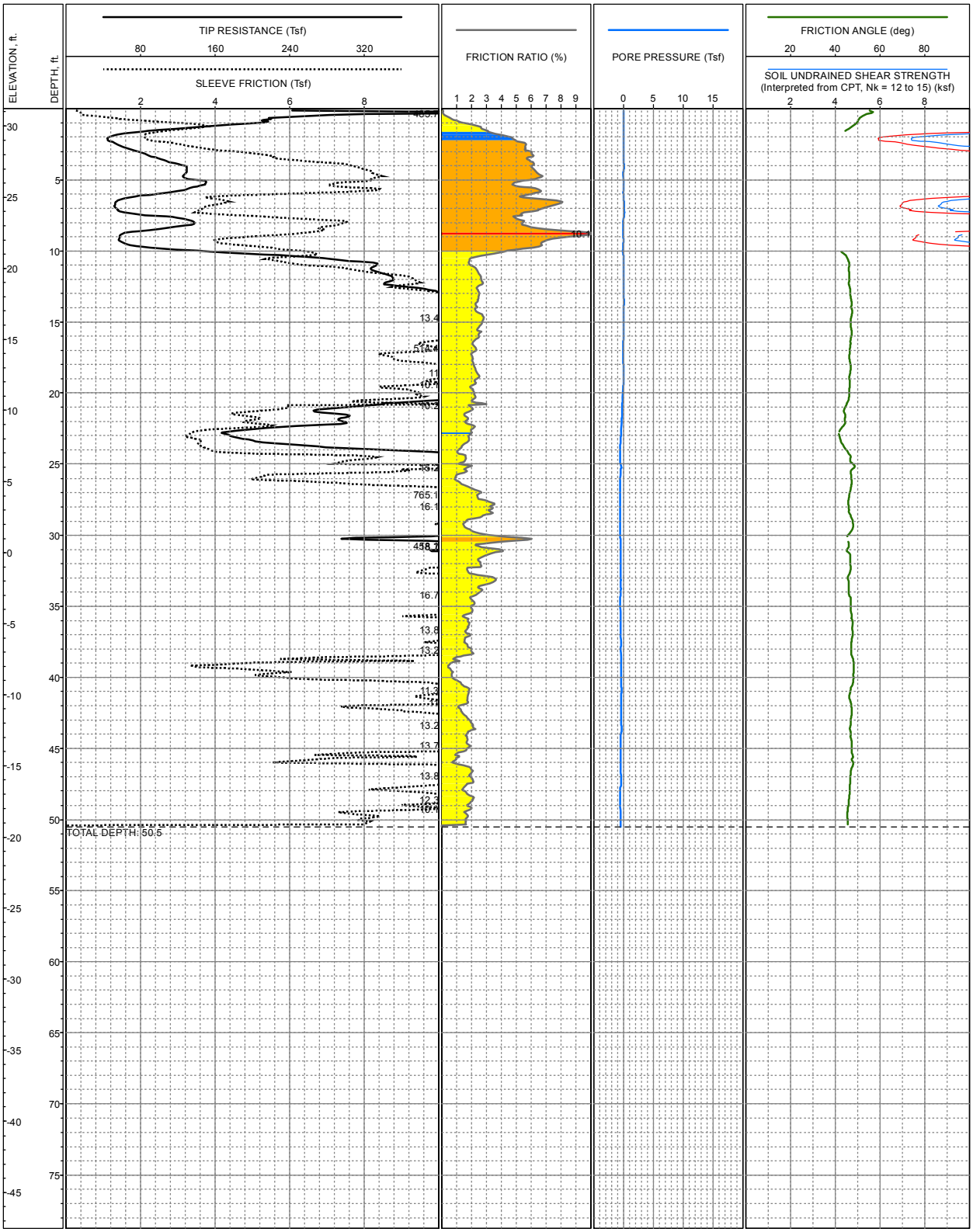

LOCATION: E5,997,908, N 1,979,758, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.2ft +/- ()
COMPLETION DEPTH: 50.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-07

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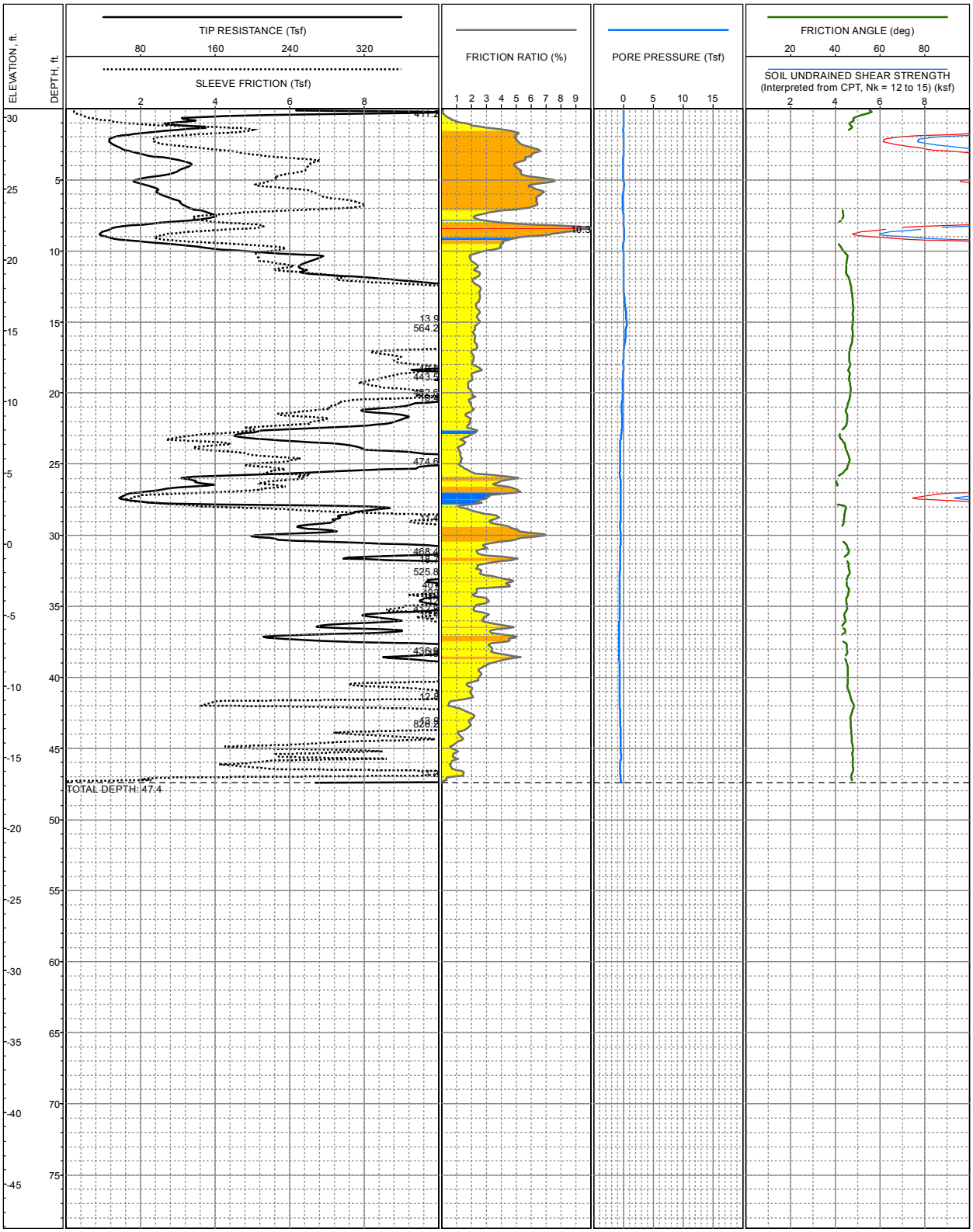

LOCATION: E5,997,908, N 1,979,780, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 30.6ft +/- ()
COMPLETION DEPTH: 47.4ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-08

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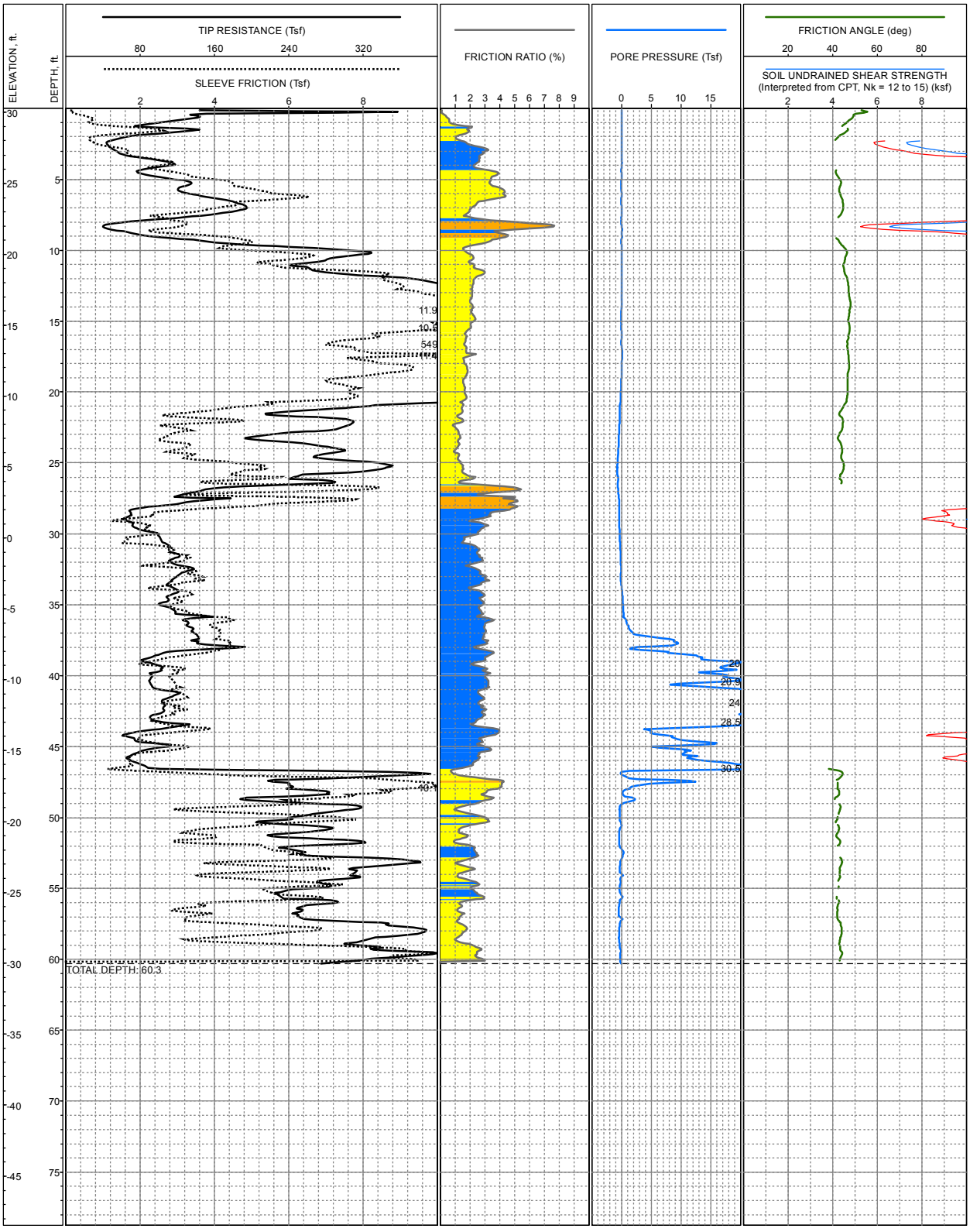

LOCATION: E5,997,909, N 1,979,792, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 30.3ft +/- ()
COMPLETION DEPTH: 60.3ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-08A

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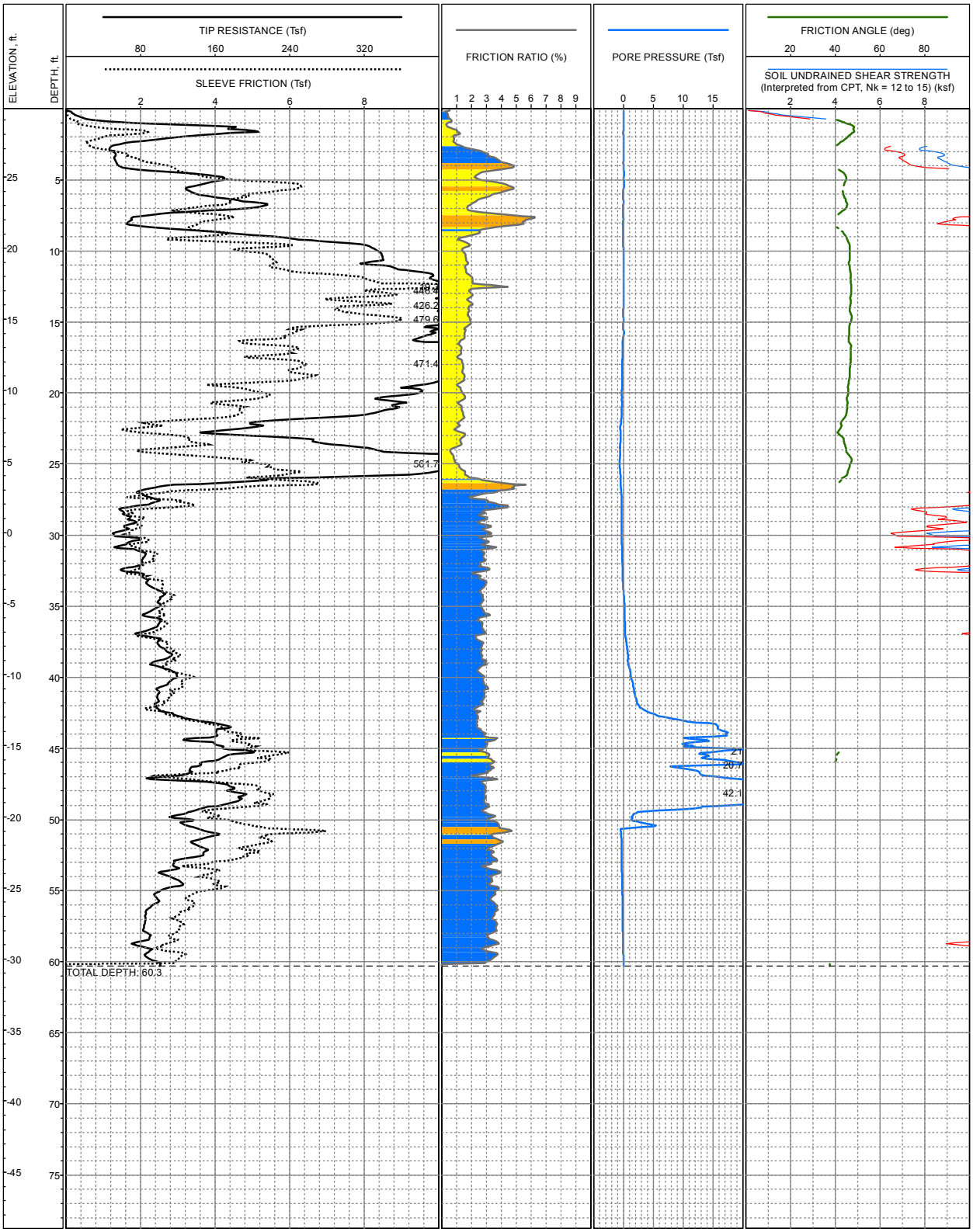

LOCATION: E5,997,904, N 1,979,810, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 29.8ft +/- ()
COMPLETION DEPTH: 60.3ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-09

San Joaquin Apartments & Precinct Improvements
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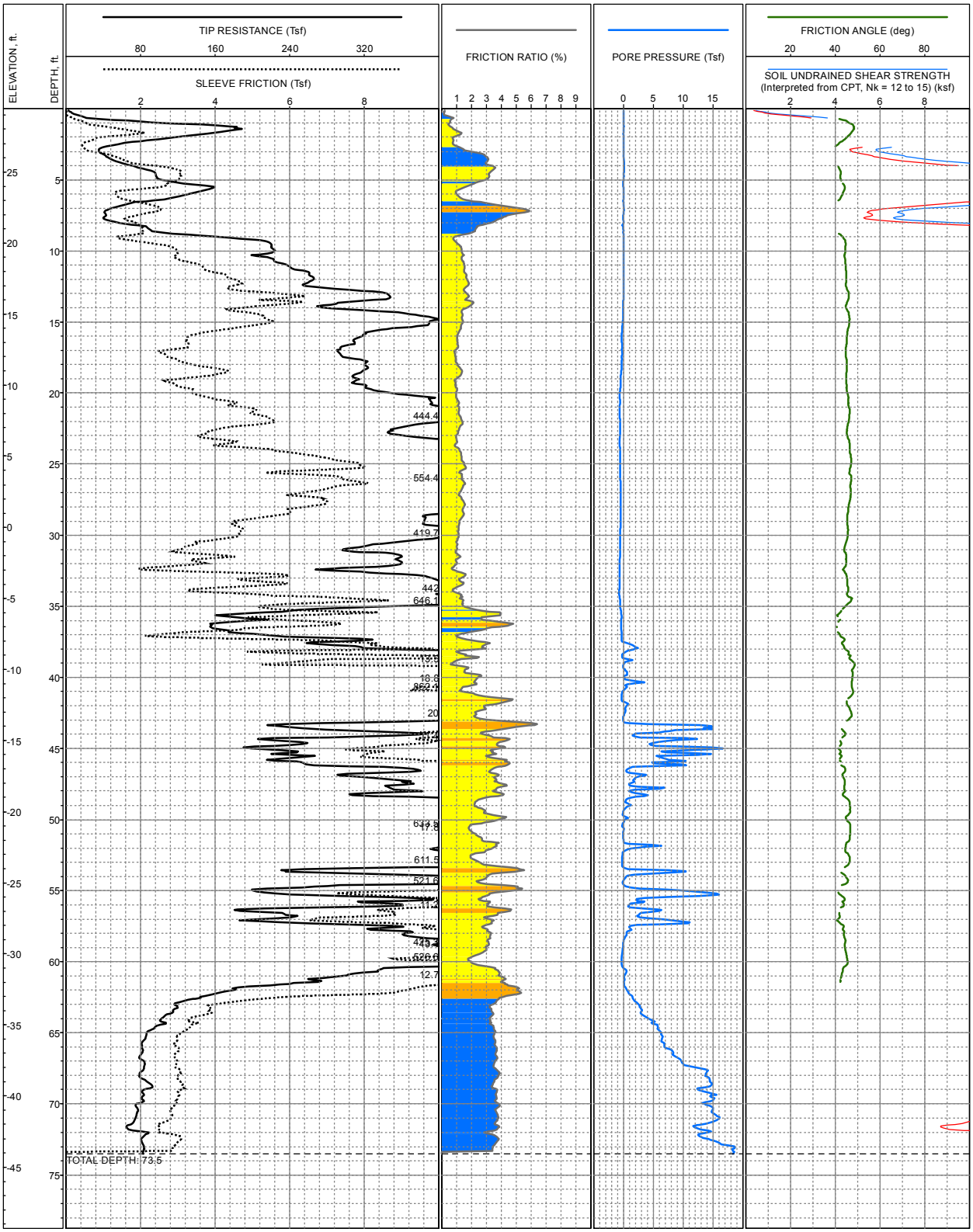

LOCATION: E5,997,909, N 1,979,823, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 29.4ft +/- ()
COMPLETION DEPTH: 73.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-10

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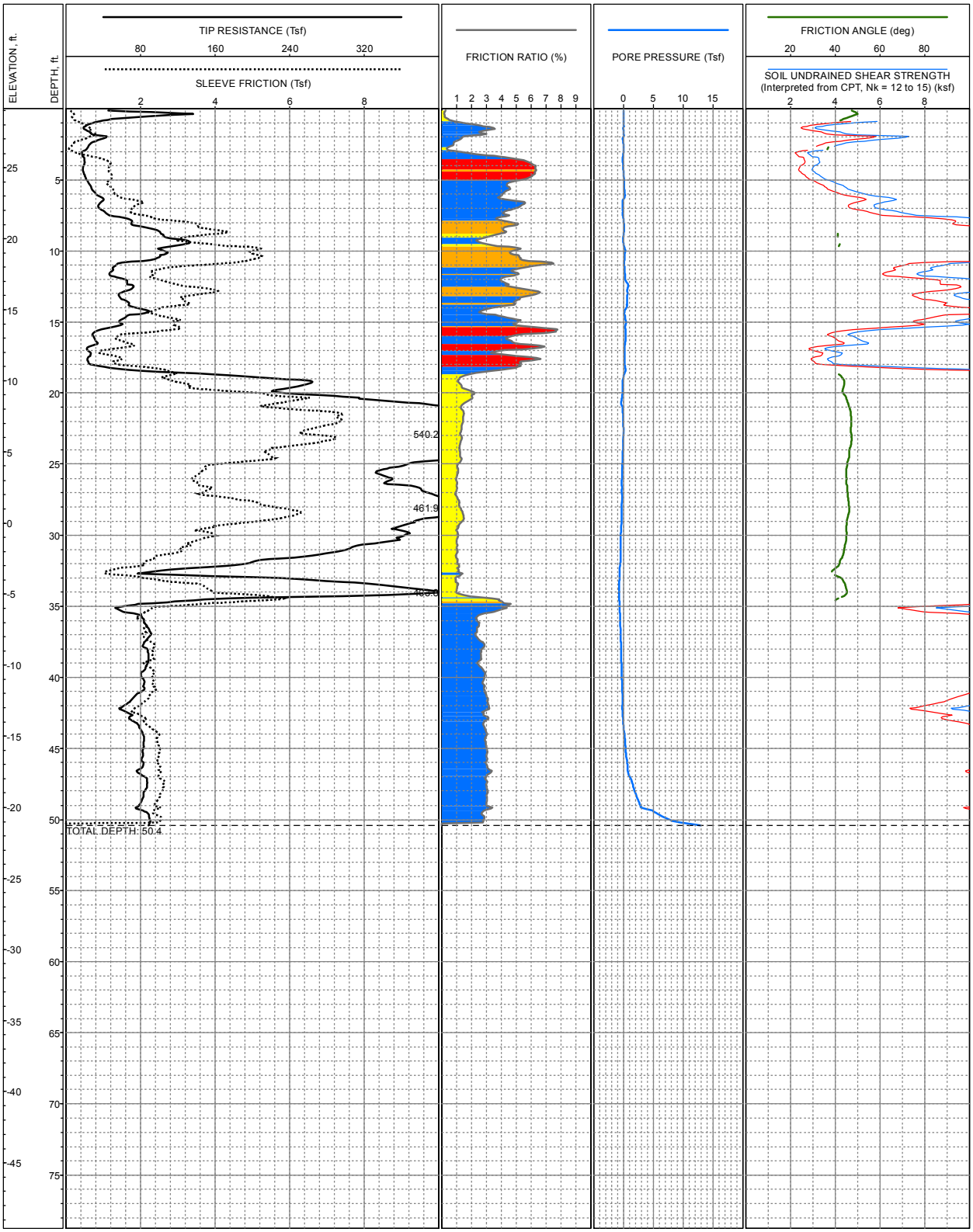

LOCATION: E5,997,909, N 1,979,836, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 29.1ft +/- ()
COMPLETION DEPTH: 50.4ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-10A

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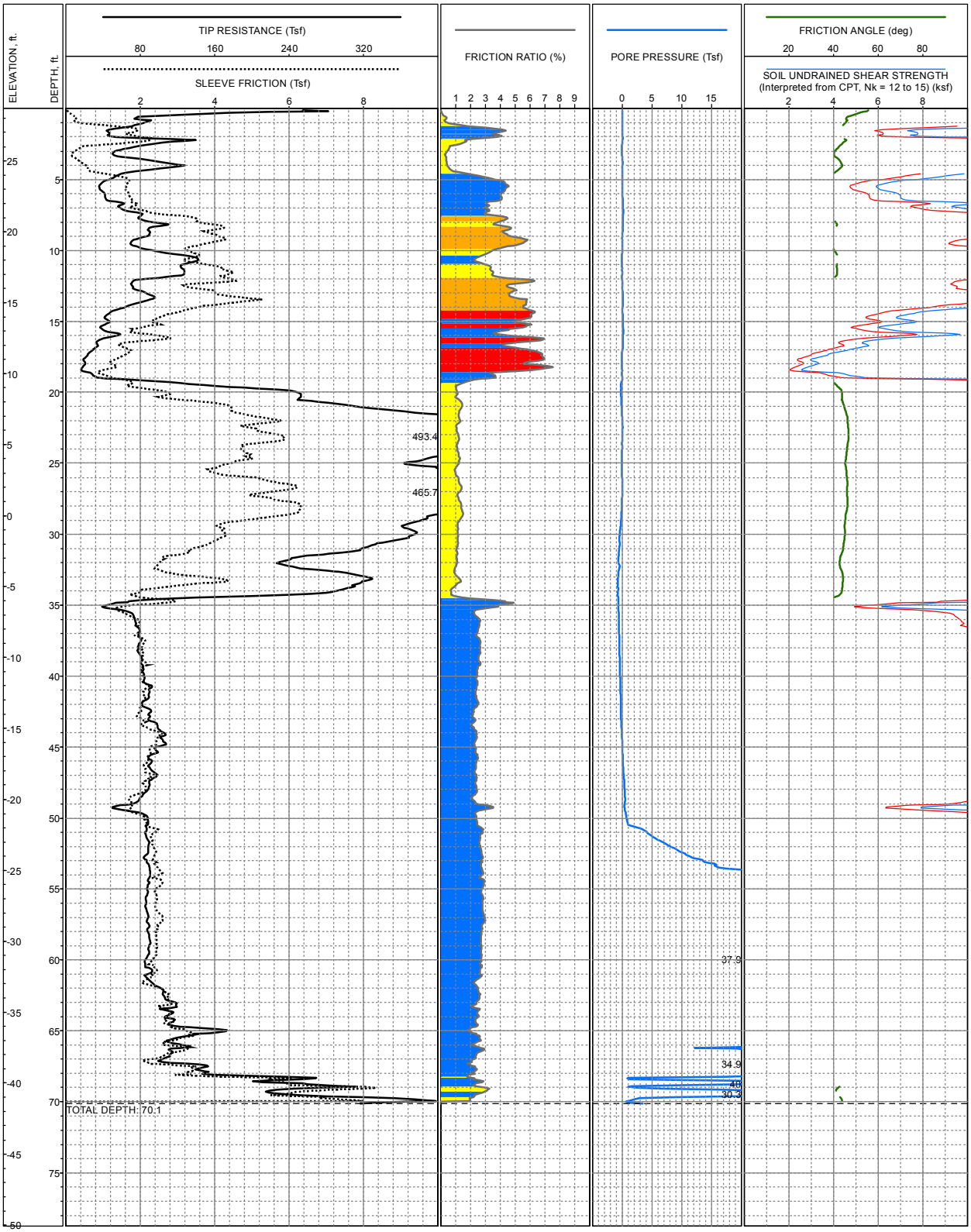

LOCATION: E5,997,910, N 1,979,850, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 28.7ft +/- ()
COMPLETION DEPTH: 70.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-11

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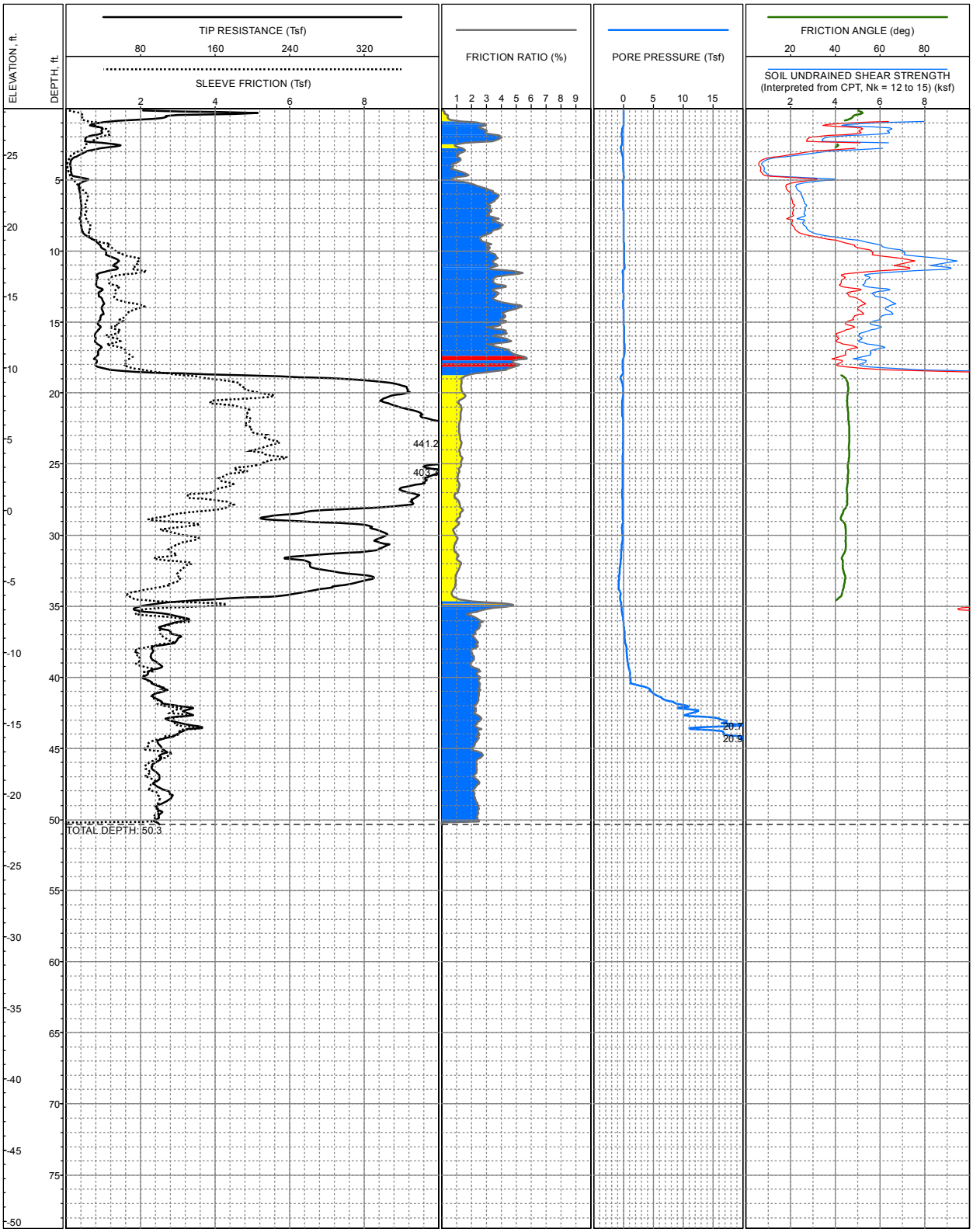

LOCATION: E5,997,911, N 1,979,882, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 28.2ft +/- ()
COMPLETION DEPTH: 50.3ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-12

San Joaquin Apartments & Precinct Improvements
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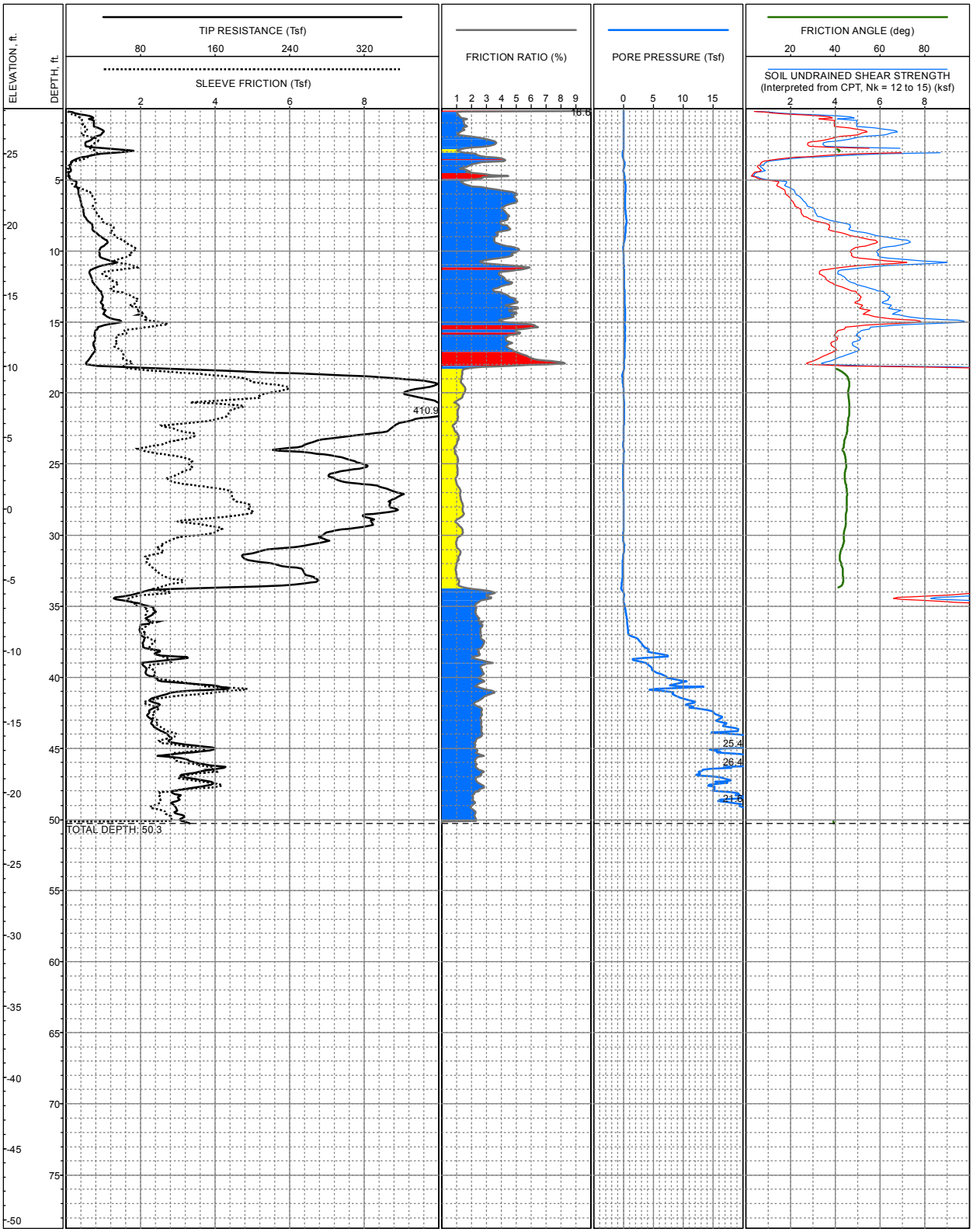

LOCATION: E5,997,887, N 1,979,902, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 28.1ft +/- ()
COMPLETION DEPTH: 50.3ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-13

San Joaquin Apartments & Precinct Improvements
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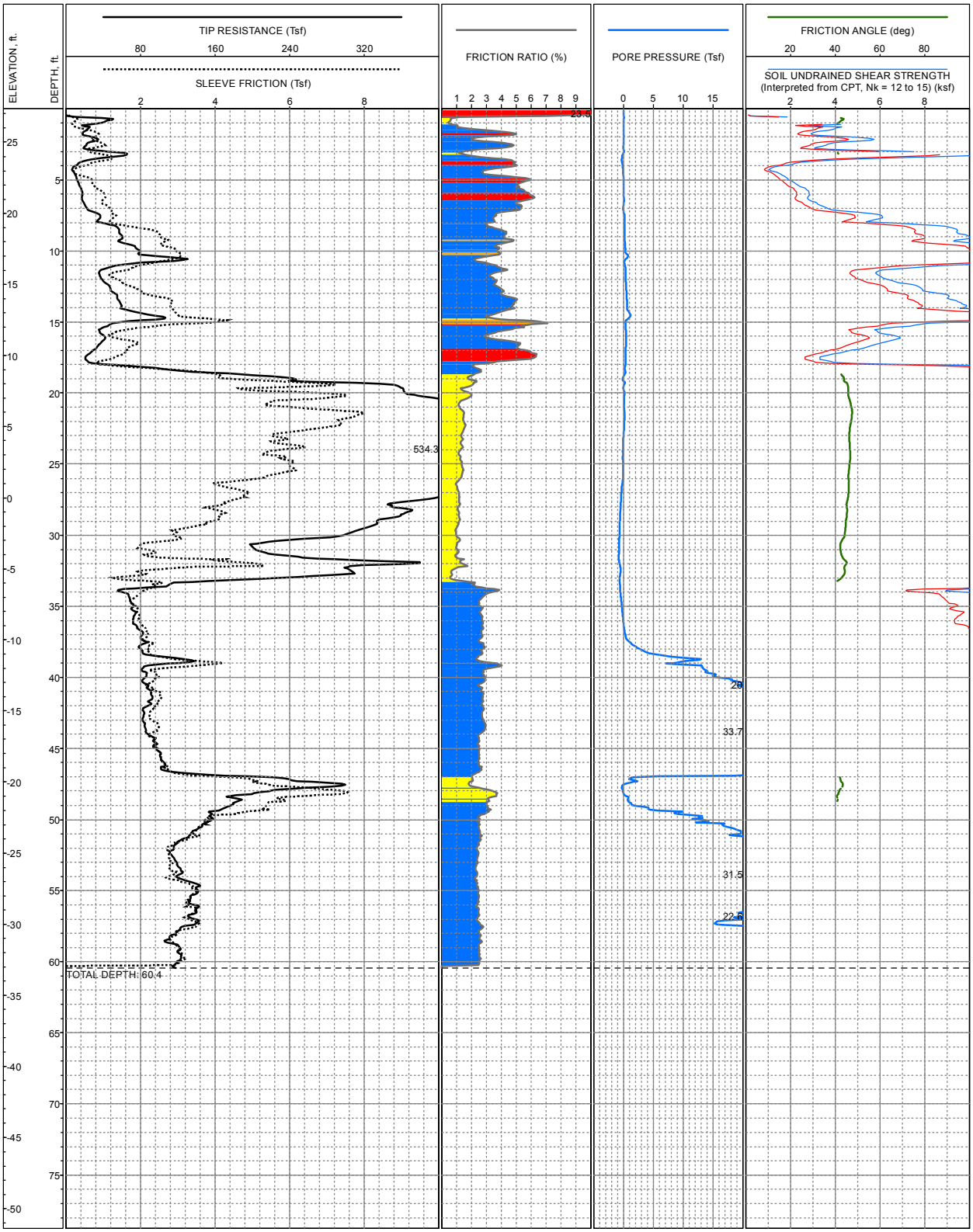

LOCATION: E5,997,913, N 1,979,940, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 27.4ft +/- ()
COMPLETION DEPTH: 60.4ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-14

San Joaquin Apartments & Precinct Improvements
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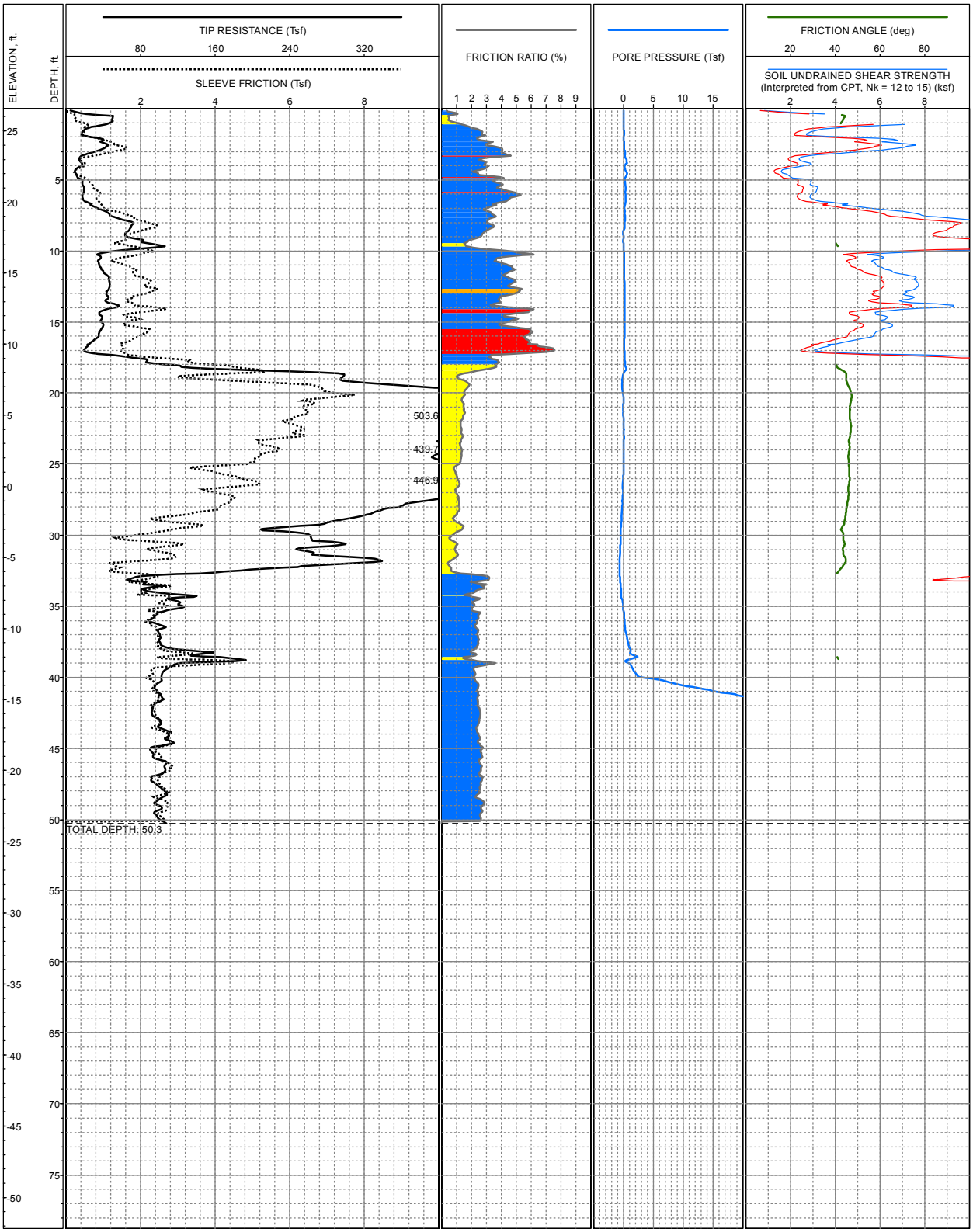

LOCATION: E5,997,913, N 1,979,961, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 26.6ft +/- ()
COMPLETION DEPTH: 50.3ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-15

San Joaquin Apartments & Precinct Improvements
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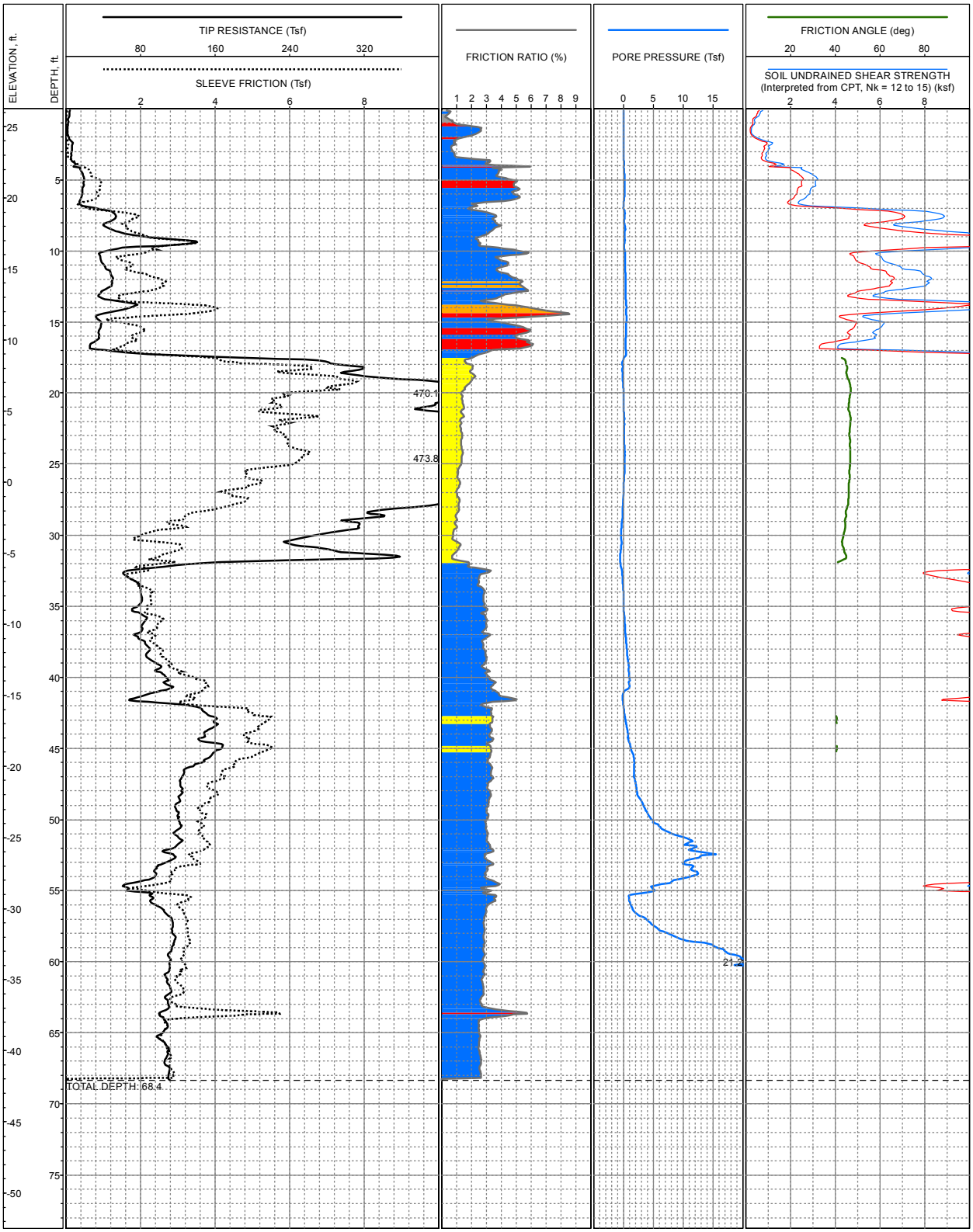

LOCATION: E5,997,914, N 1,979,979, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 26.3ft +/- ()
COMPLETION DEPTH: 68.4ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-16

San Joaquin Apartments & Precinct Improvements
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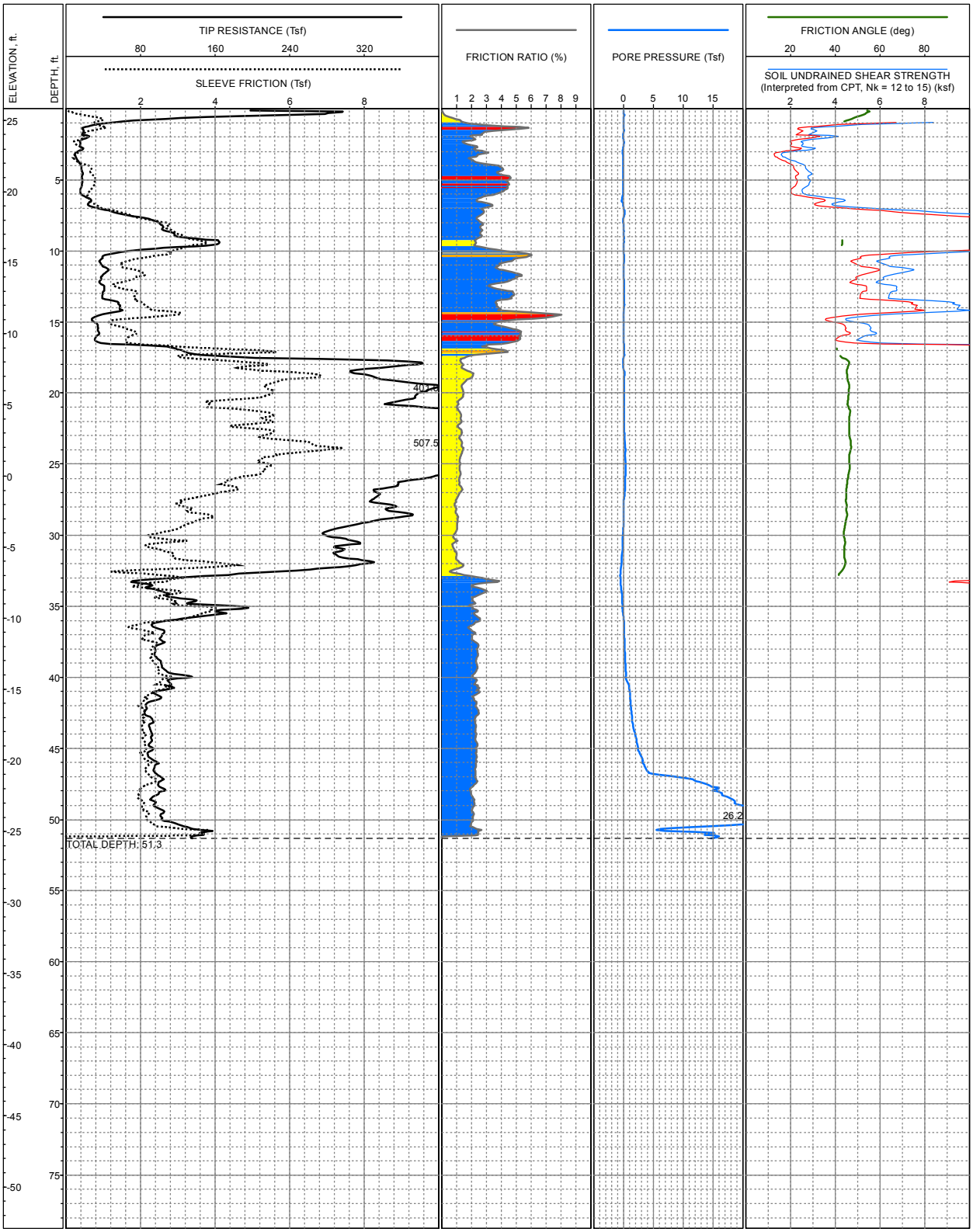

LOCATION: E5,997,915, N 1,980,011, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.8ft +/- ()
COMPLETION DEPTH: 51.3ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-17

San Joaquin Apartments & Precinct Improvements
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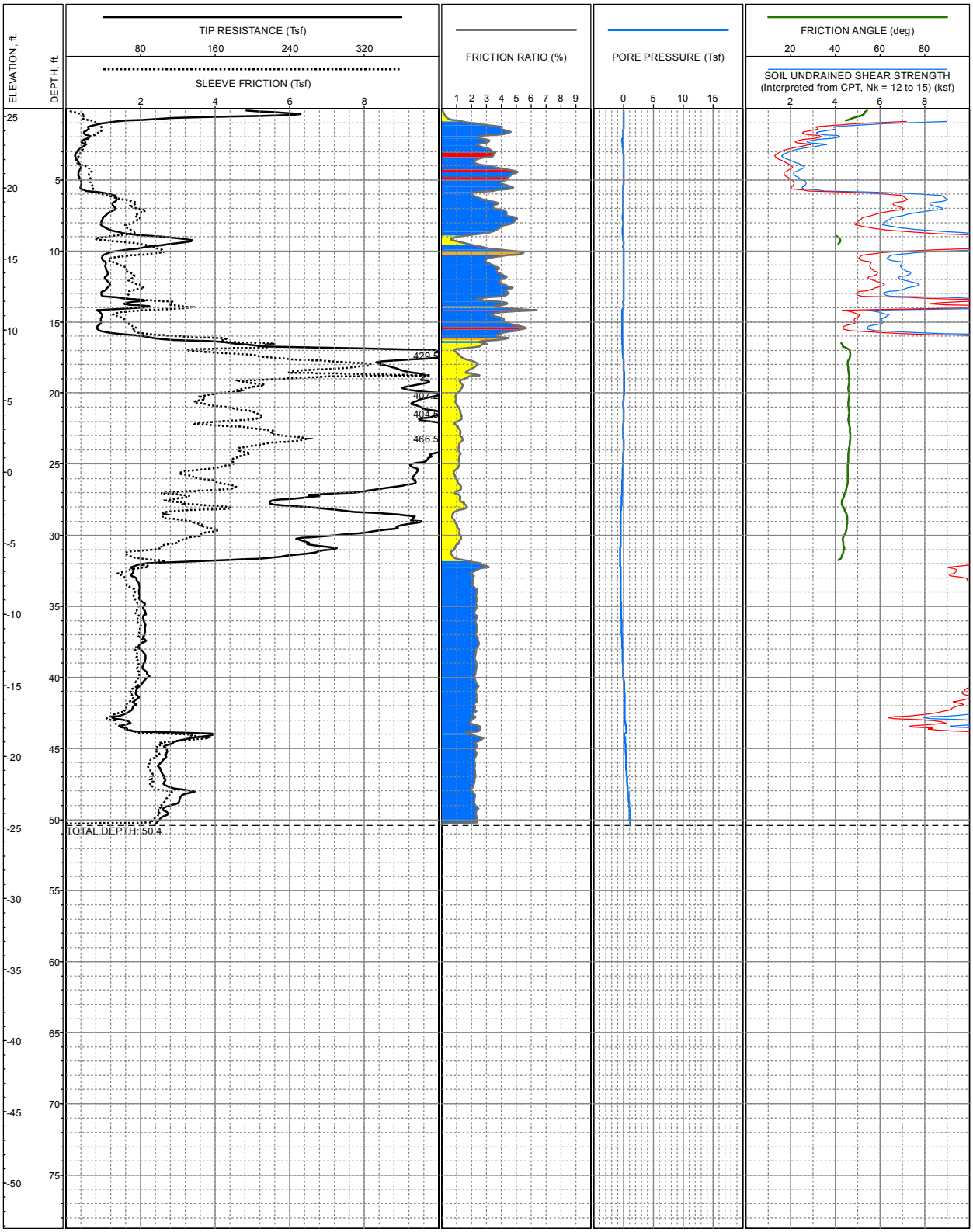

LOCATION: E5,997,917, N 1,980,036, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.6ft +/- ()
COMPLETION DEPTH: 50.4ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-18

San Joaquin Apartments & Precinct Improvements
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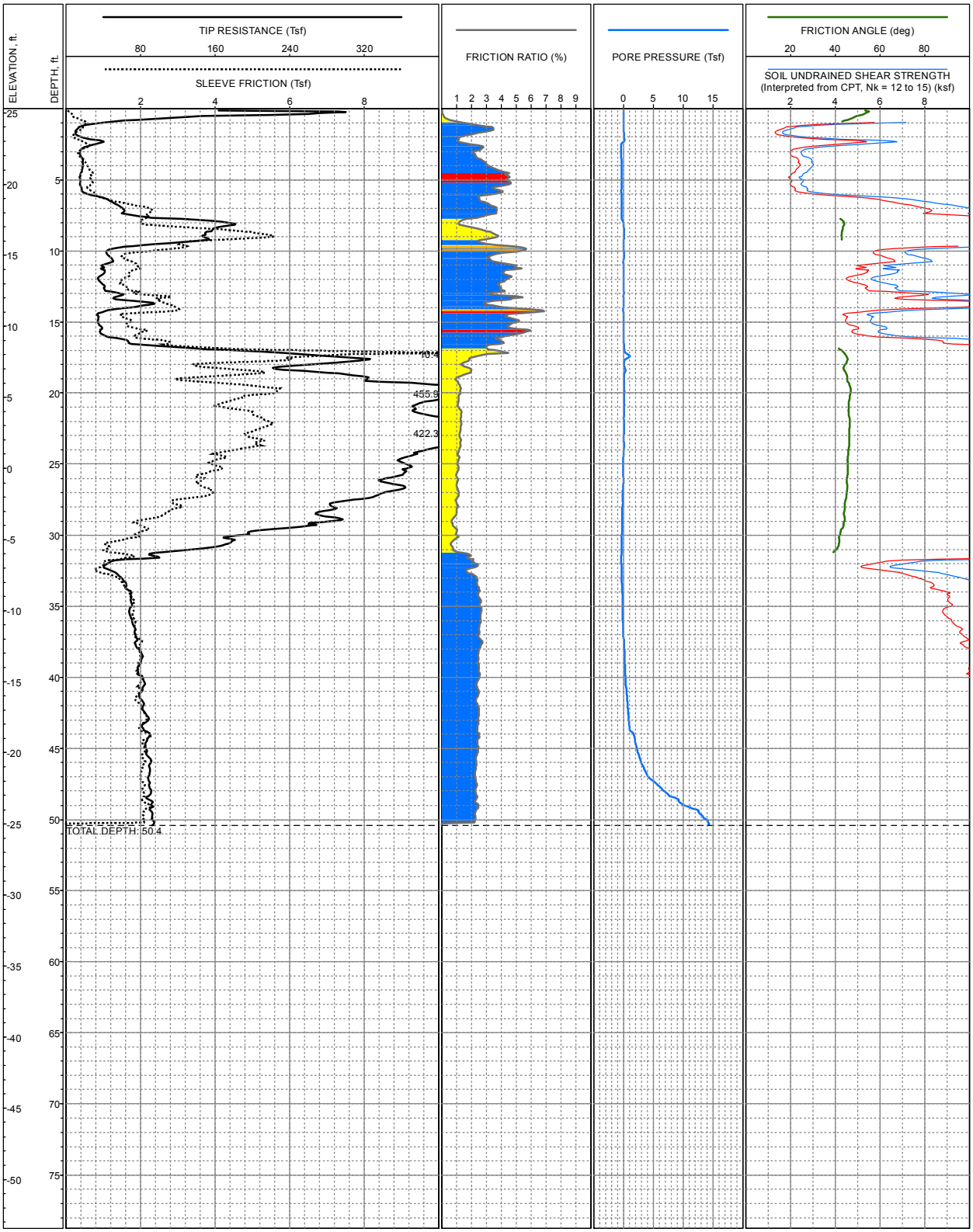

LOCATION: E5,997,917, N 1,980,060, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.3ft +/- ()
COMPLETION DEPTH: 50.4ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-19

San Joaquin Apartments & Precinct Improvements
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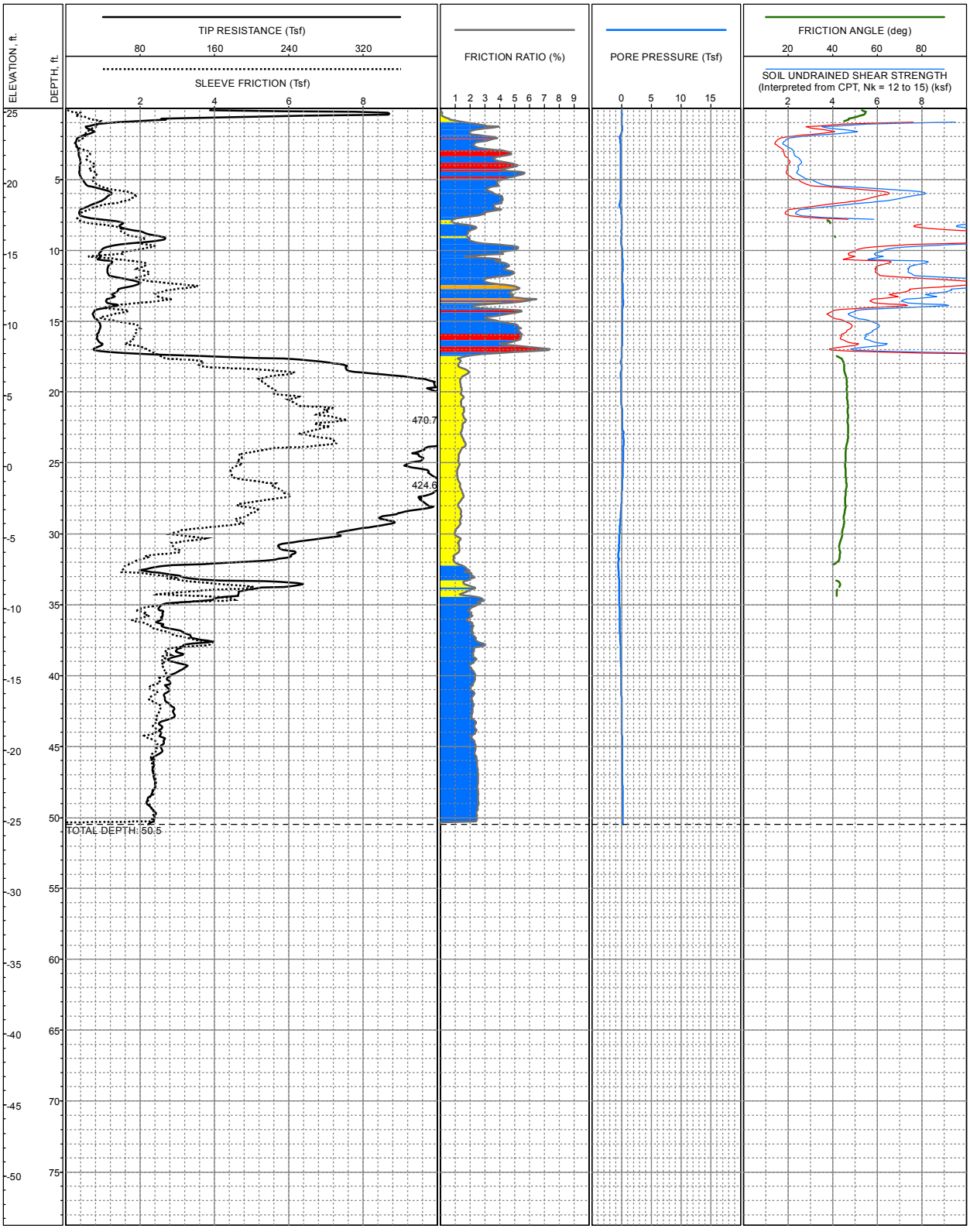

LOCATION: E5,997,917, N 1,980,085, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.3ft +/- ()
COMPLETION DEPTH: 50.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-20

San Joaquin Apartments & Precinct Improvements
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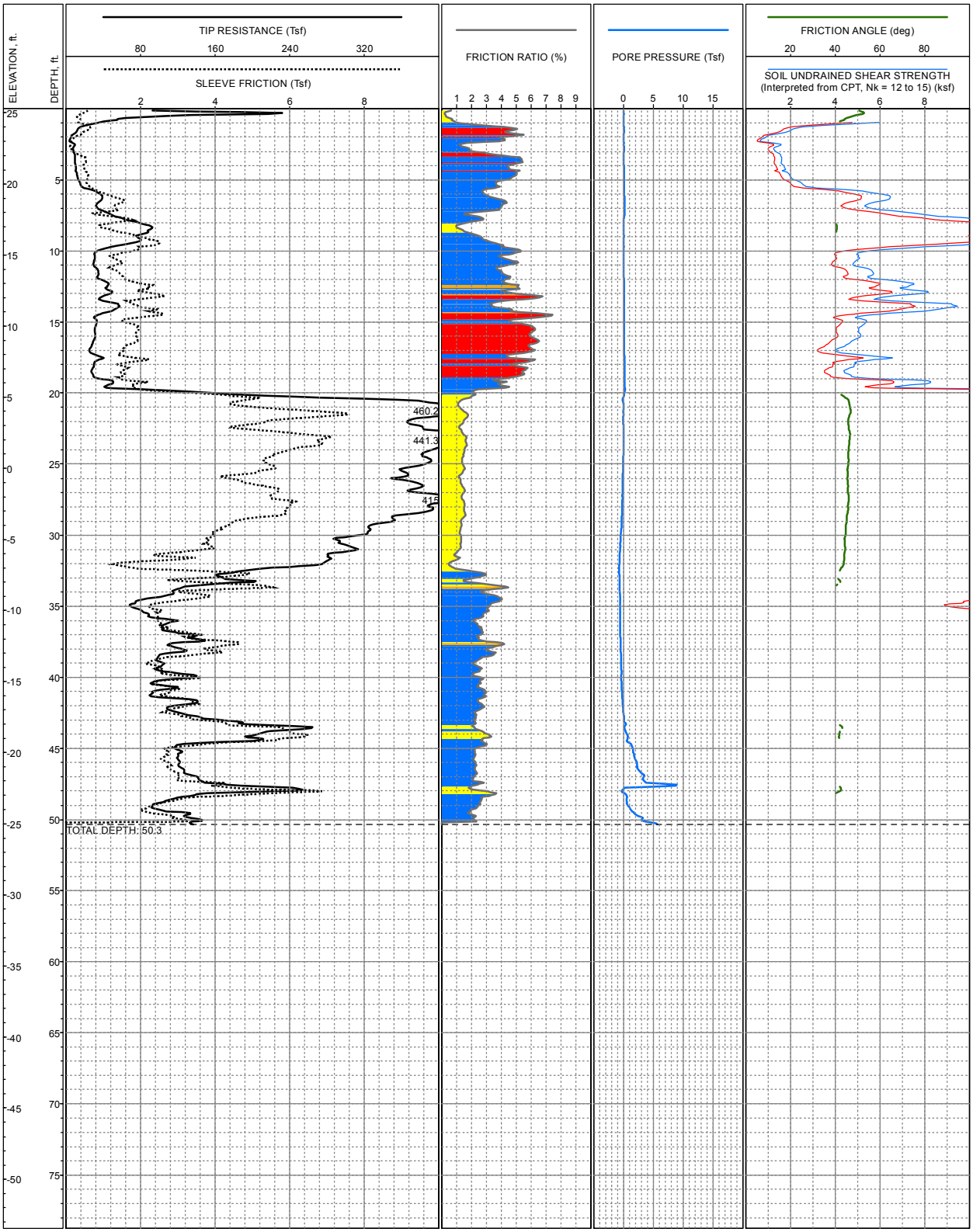

LOCATION: E5,997,919, N 1,980,111, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.3ft +/- ()
COMPLETION DEPTH: 50.3ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-21

San Joaquin Apartments & Precinct Improvements
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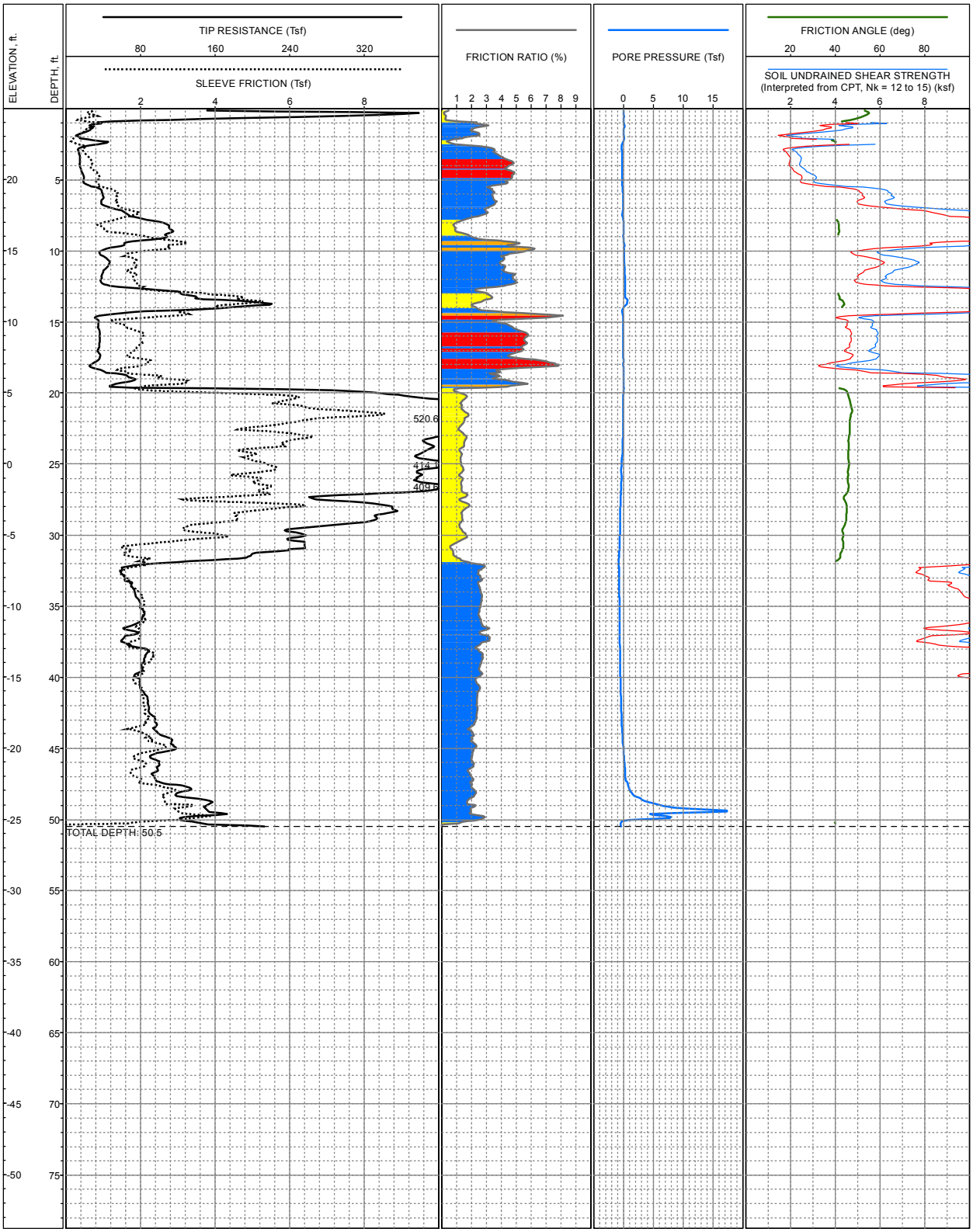

LOCATION: E5,997,920, N 1,980,135, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.0ft +/- ()
COMPLETION DEPTH: 50.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-22

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Santa Barbara, California

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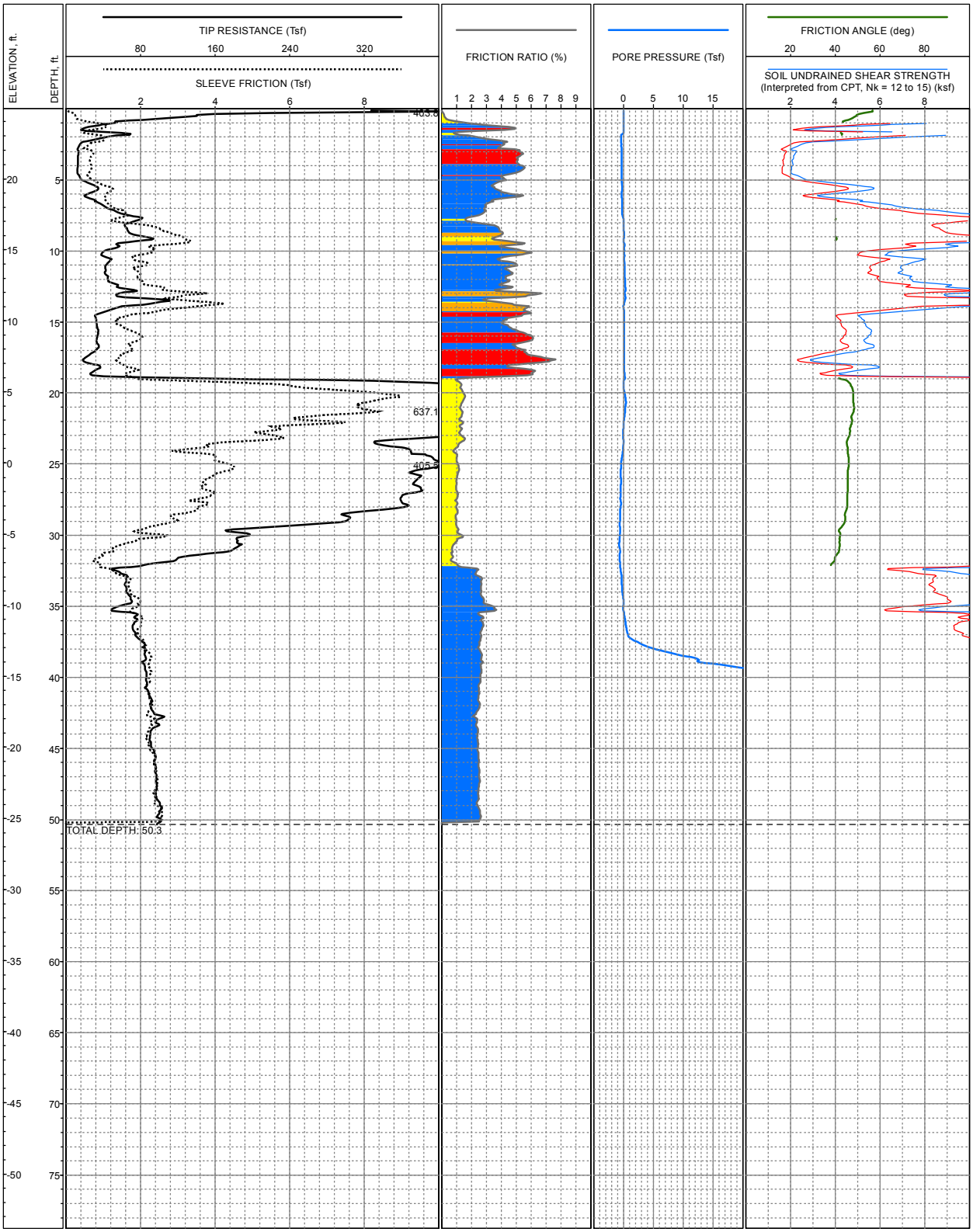

LOCATION: E5,997,922, N 1,980,160, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.9ft +/- ()
COMPLETION DEPTH: 50.3ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-23

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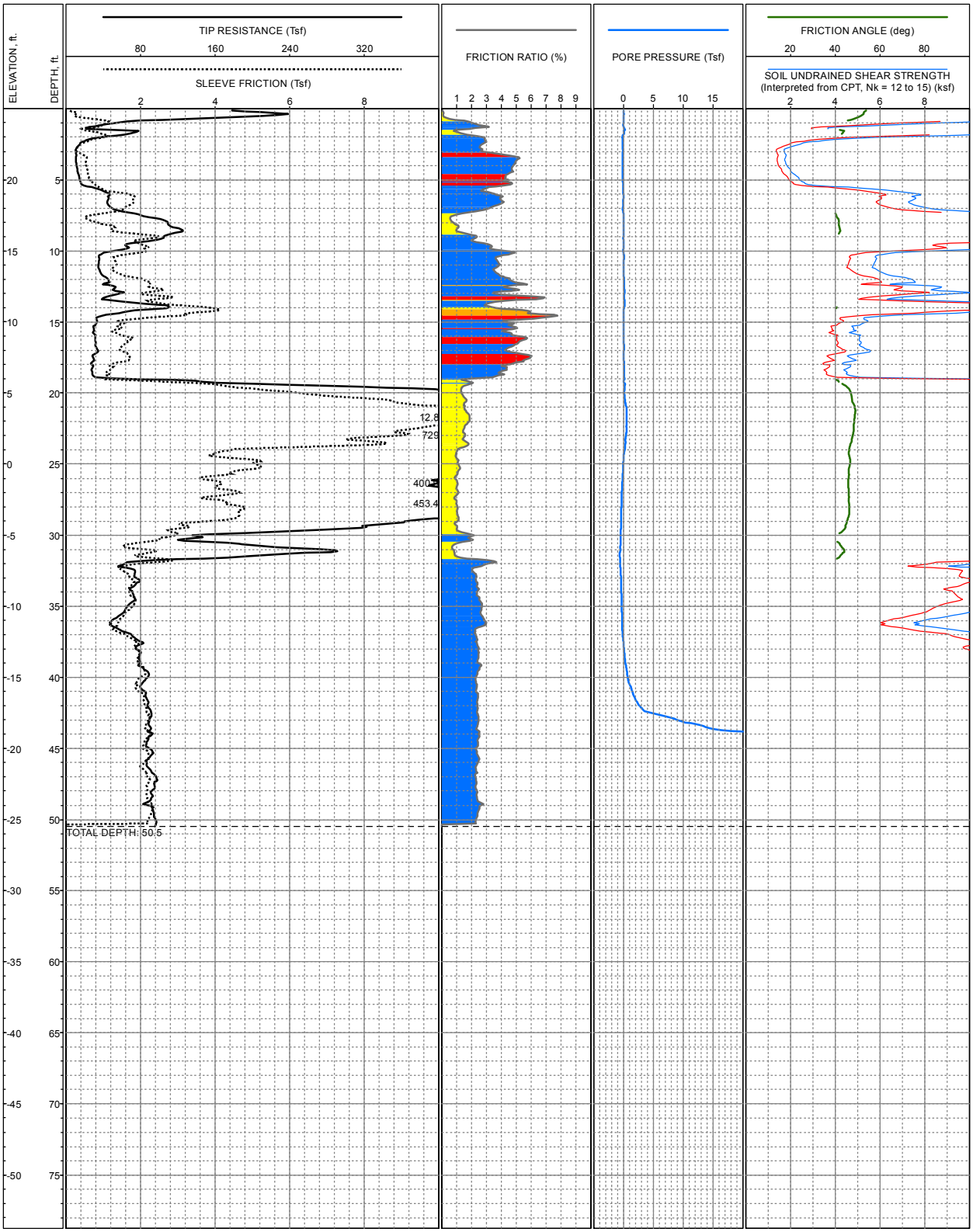

LOCATION: E5,997,922, N 1,980,181, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.0ft +/- ()
COMPLETION DEPTH: 50.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-24

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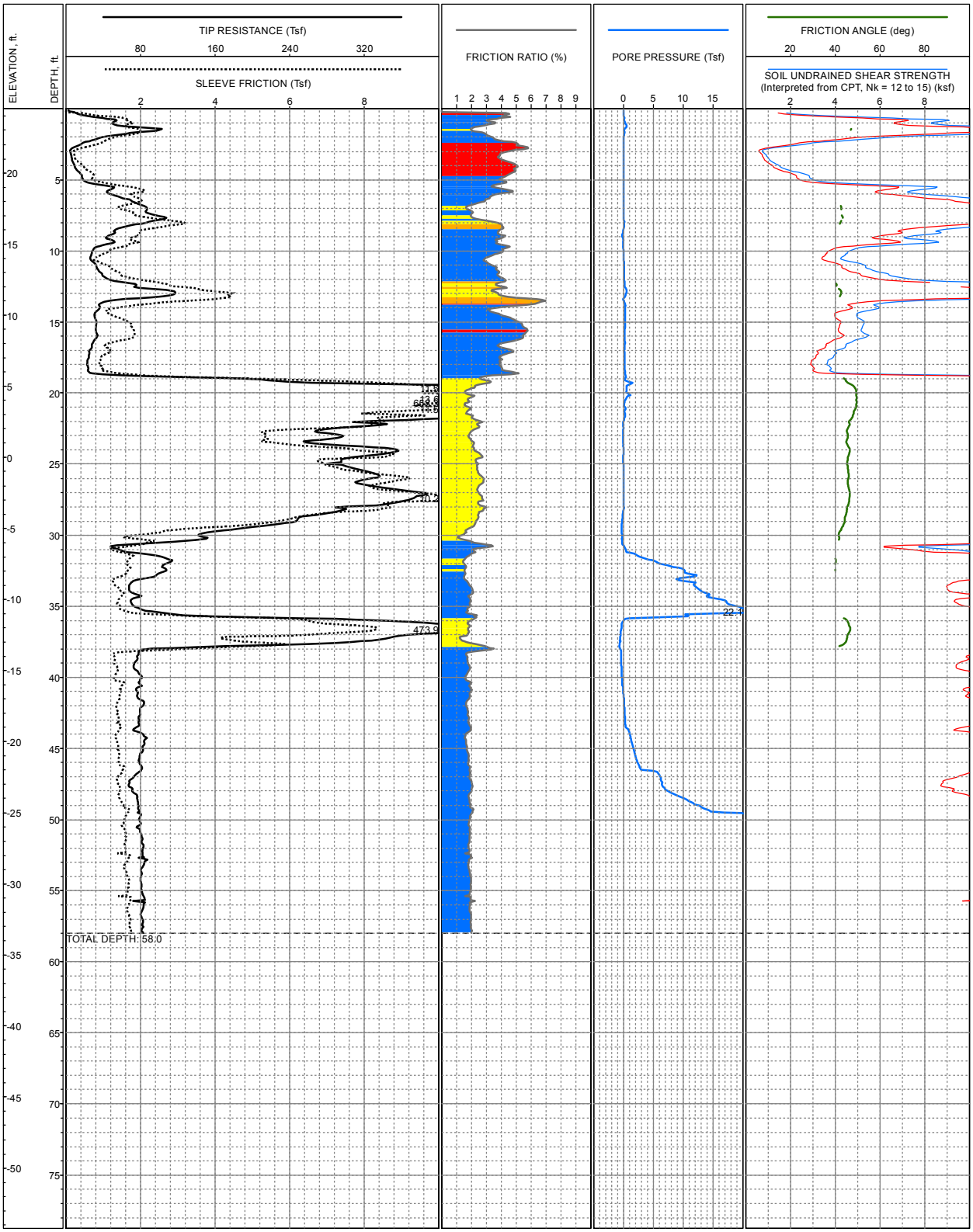

LOCATION: E5,997,858, N 1,980,199, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.5ft +/- ()
COMPLETION DEPTH: 58.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-24A

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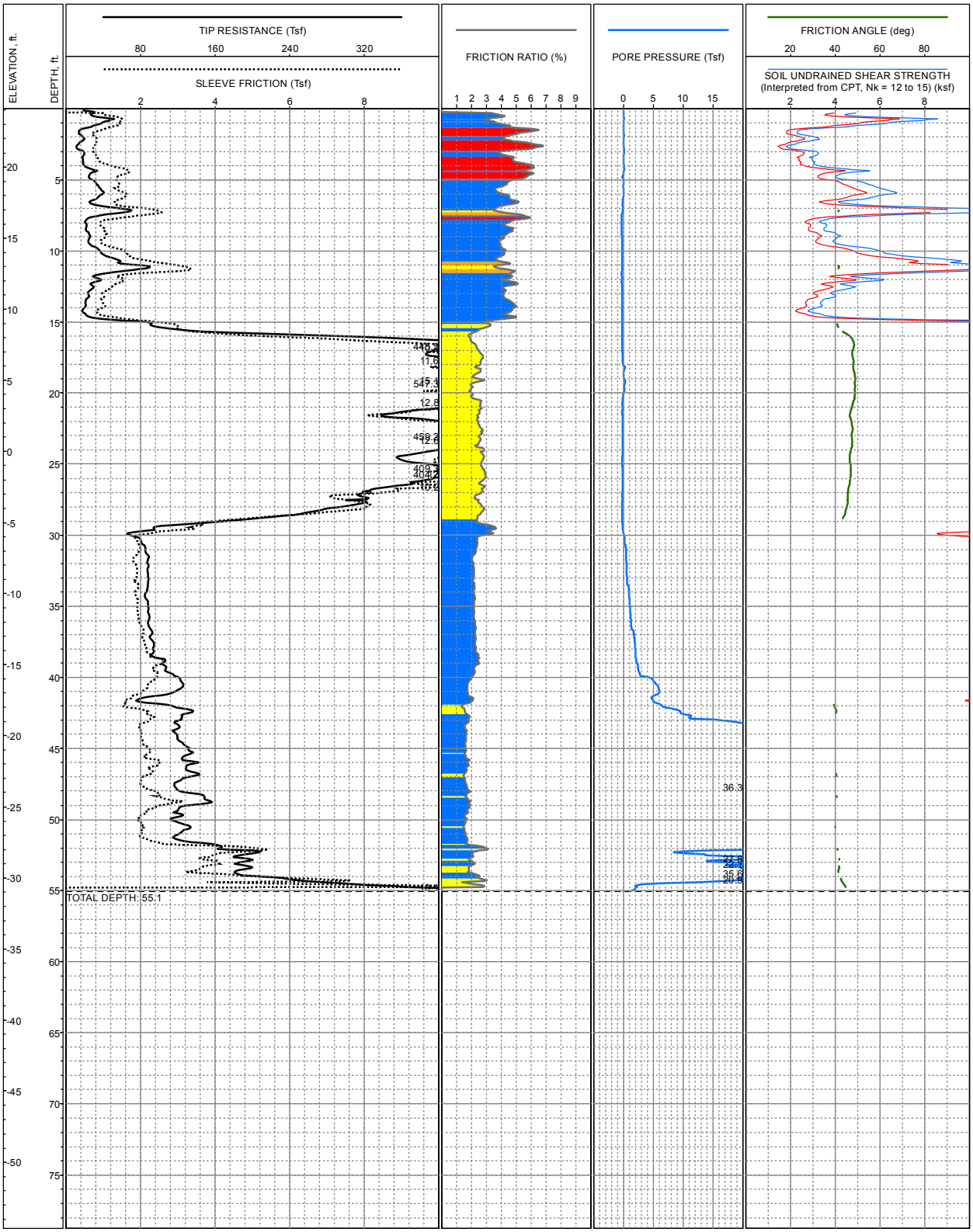

LOCATION: E5,997,851, N 1,980,283, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.1ft +/- ()
COMPLETION DEPTH: 55.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-24B

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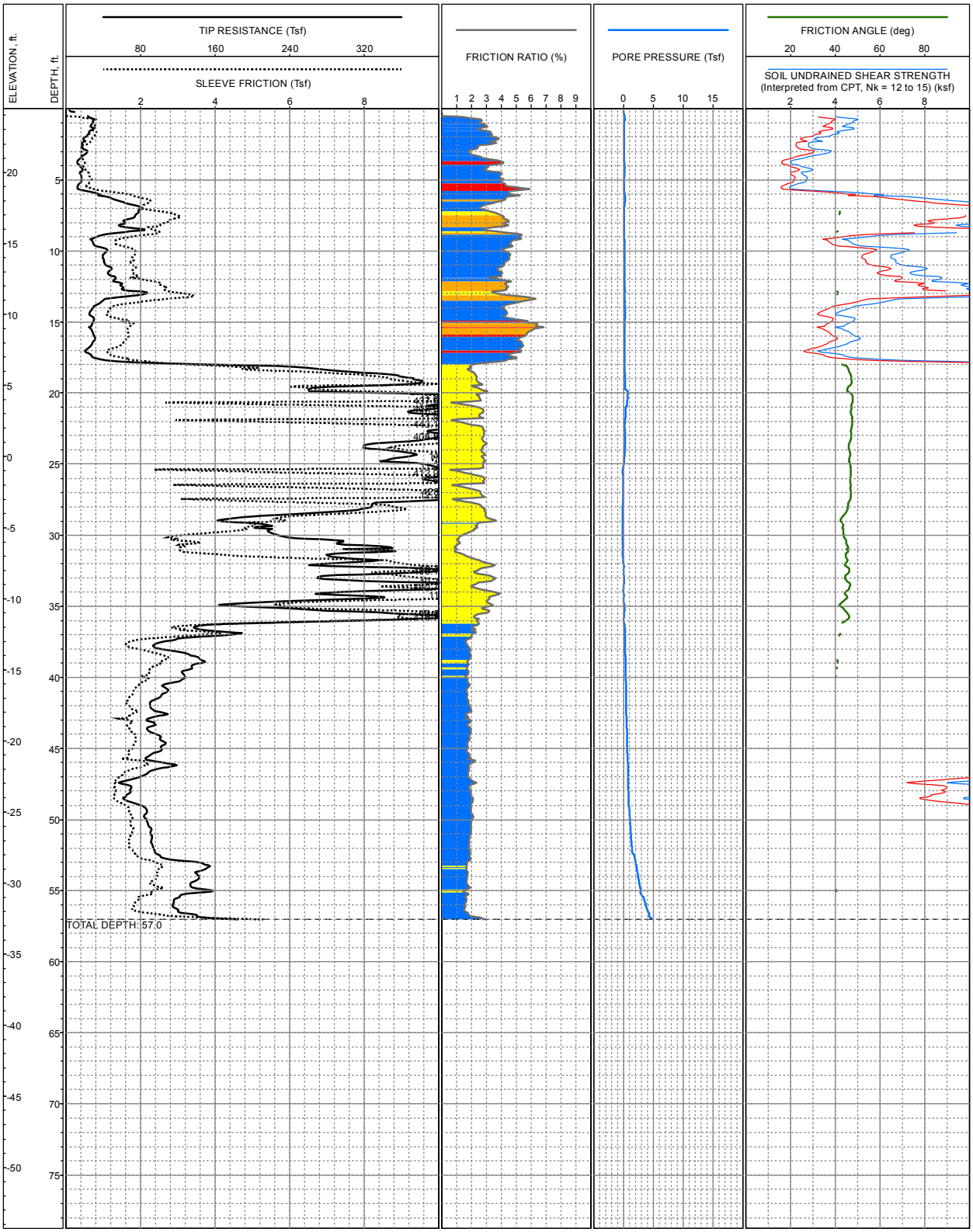

LOCATION: E5,997,851, N 1,980,240, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.5ft +/- ()
COMPLETION DEPTH: 57.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-24C

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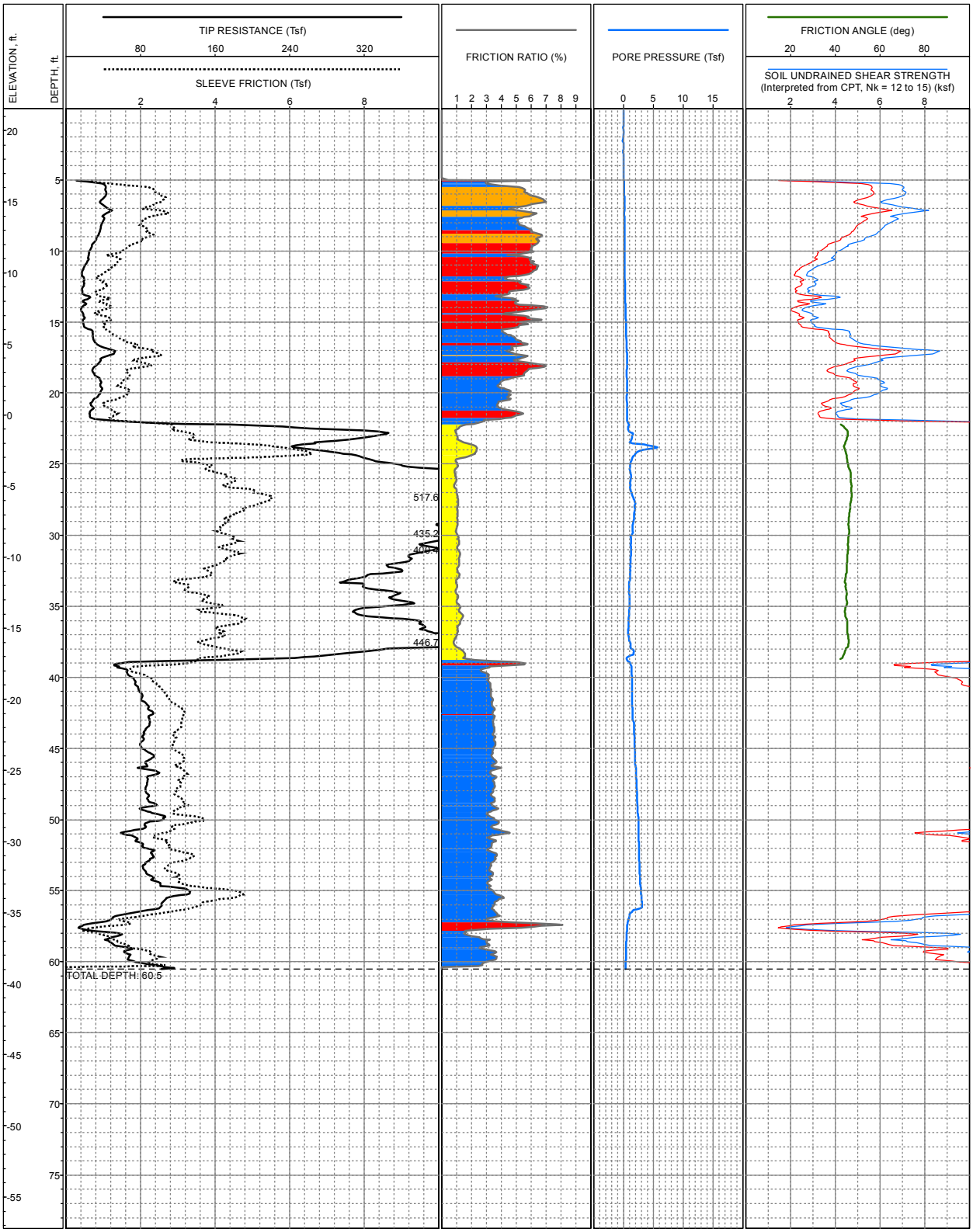

LOCATION: E5,998,637, N 1,979,918, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 21.5ft +/- ()
COMPLETION DEPTH: 60.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-25

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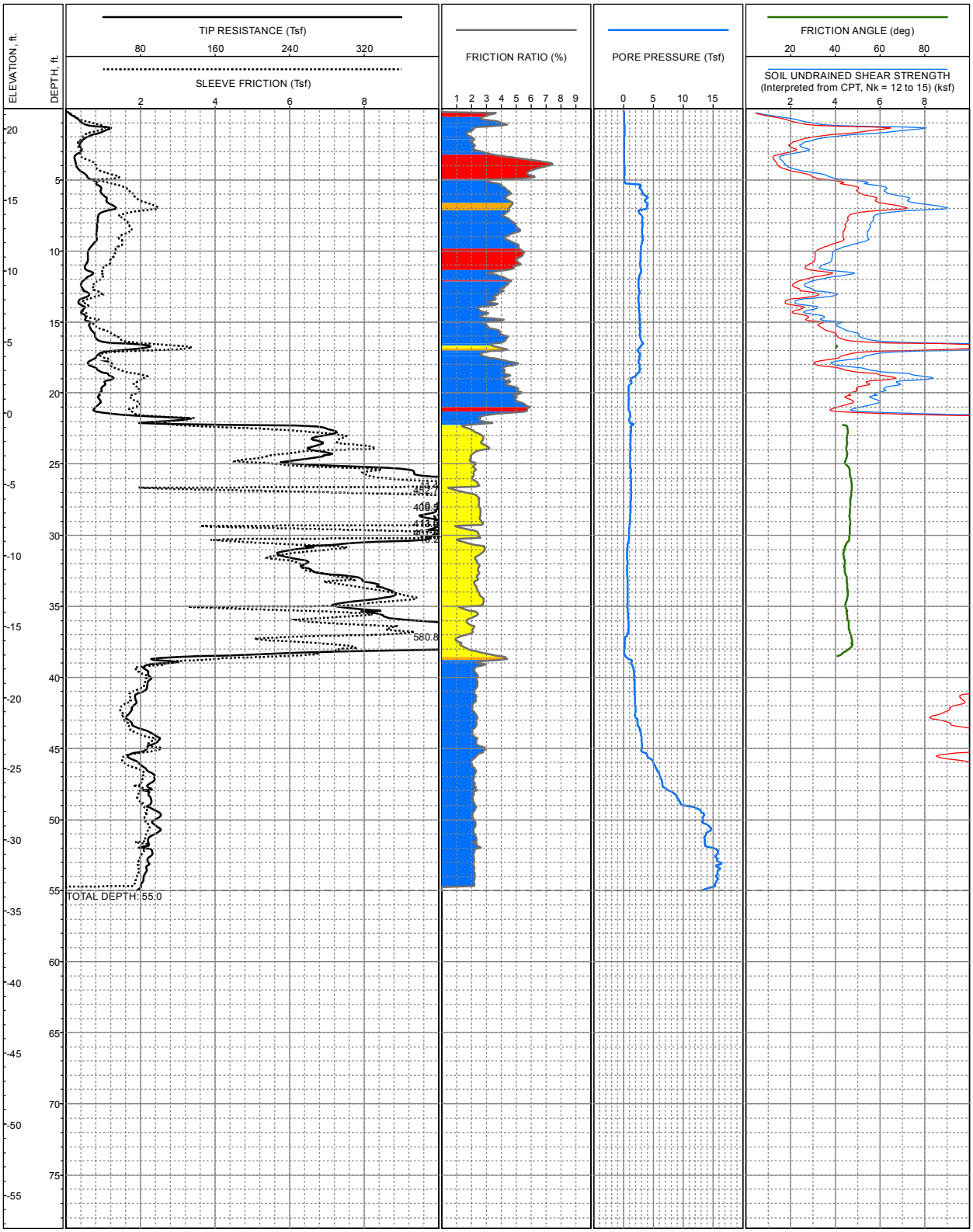

LOCATION: E5,998,636, N 1,979,922, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 21.4ft +/- ()
COMPLETION DEPTH: 55.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-25A

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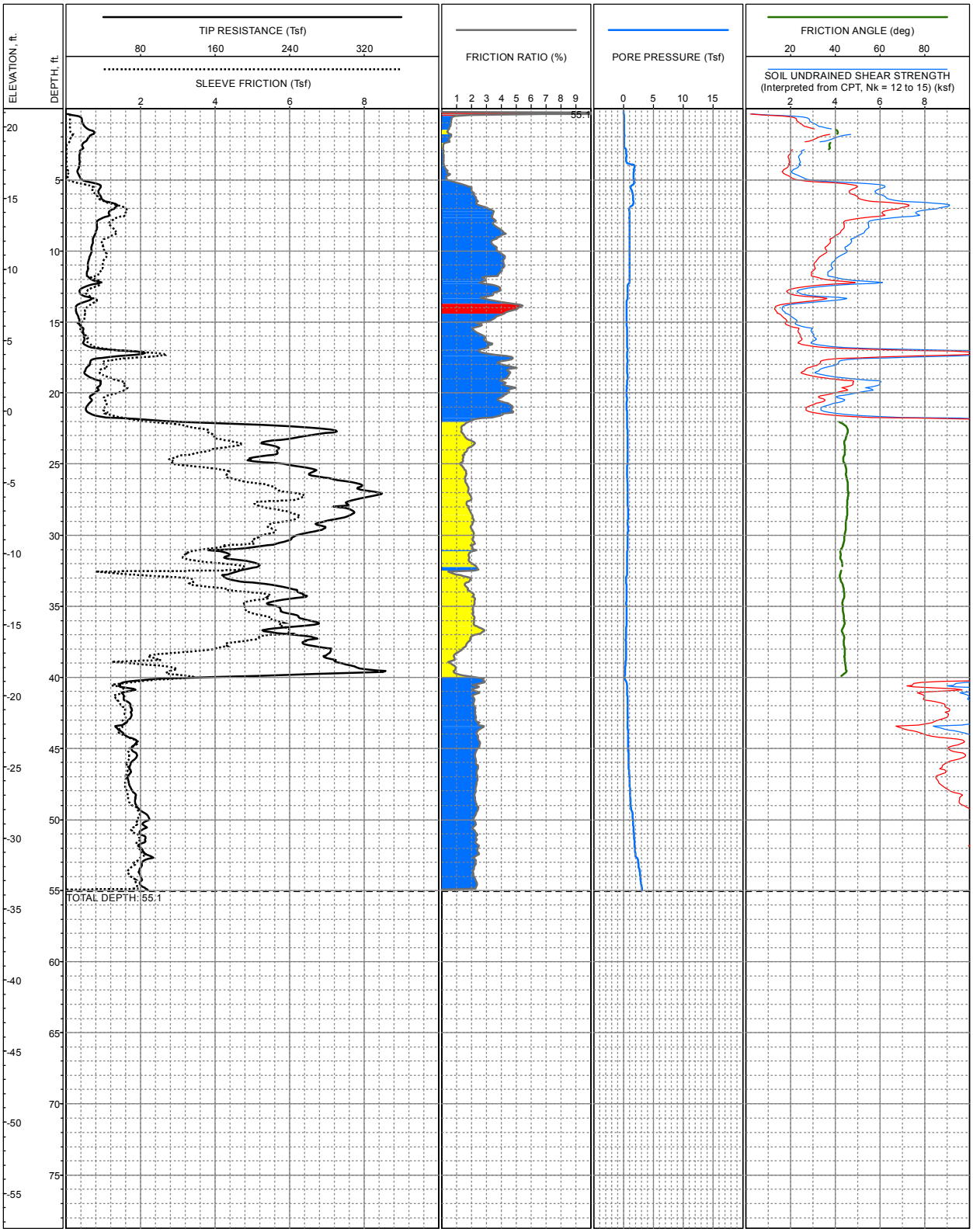

LOCATION: E5,998,635, N 1,979,931, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 21.3ft +/- ()
COMPLETION DEPTH: 55.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-25B

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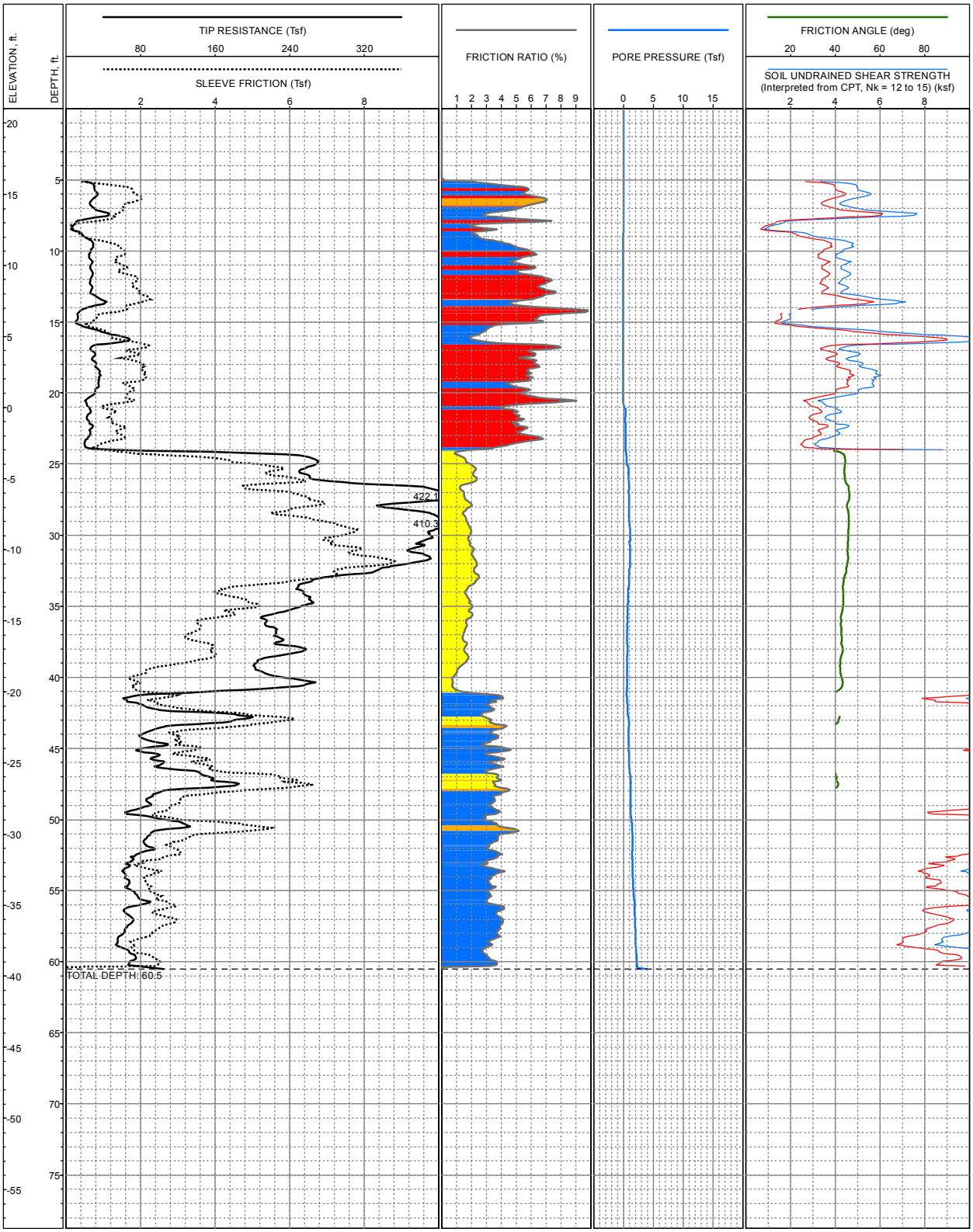

LOCATION: E5,998,634, N 1,979,942, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 21.0ft +/- ()
COMPLETION DEPTH: 60.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-26

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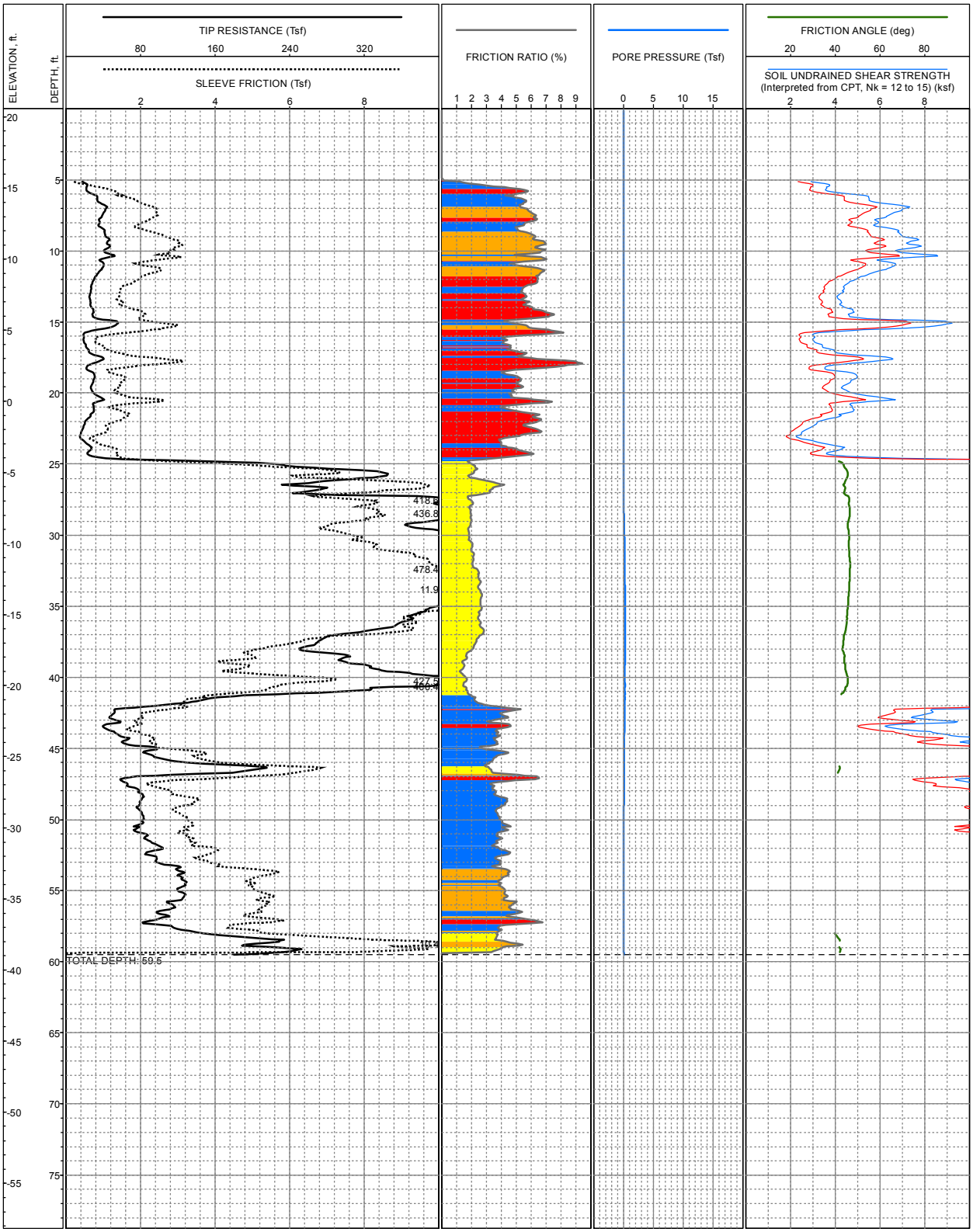

LOCATION: E5,998,630, N 1,979,967, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 20.6ft +/- ()
COMPLETION DEPTH: 59.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-27

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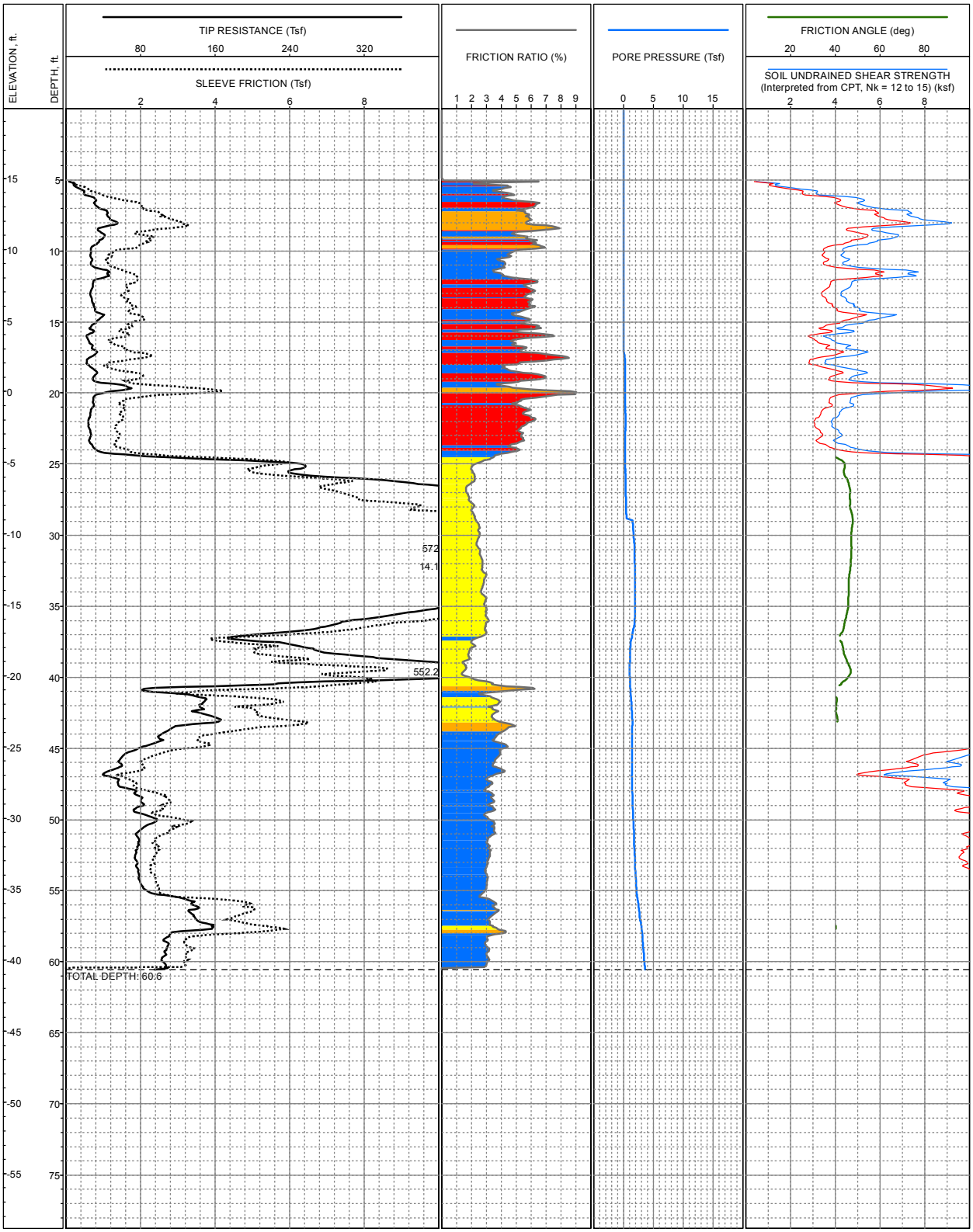

LOCATION: E5,998,628, N 1,979,992, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 19.9ft +/- ()
COMPLETION DEPTH: 60.6ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-28

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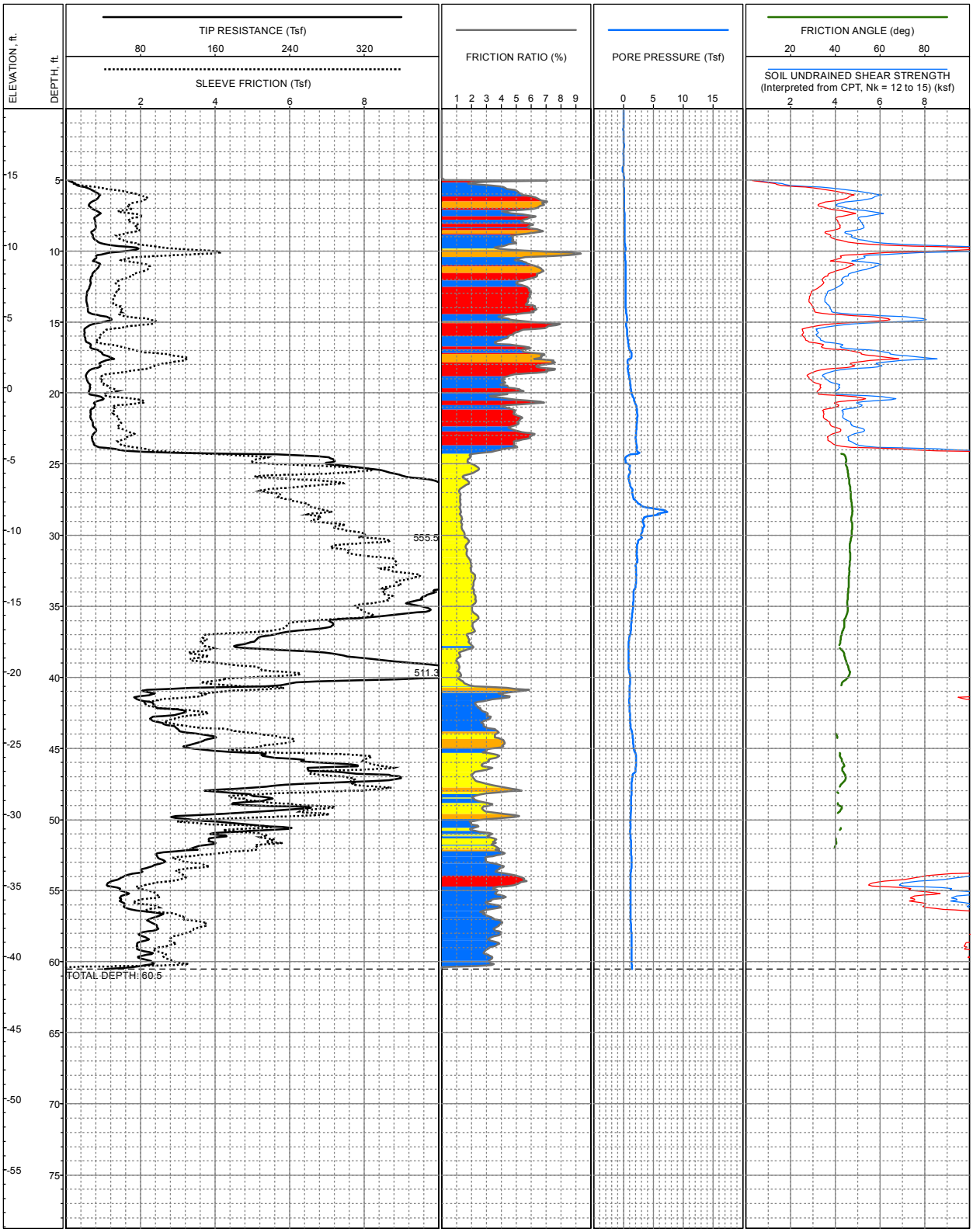

LOCATION: E5,998,625, N 1,980,017, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 19.6ft +/- ()
COMPLETION DEPTH: 60.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-29

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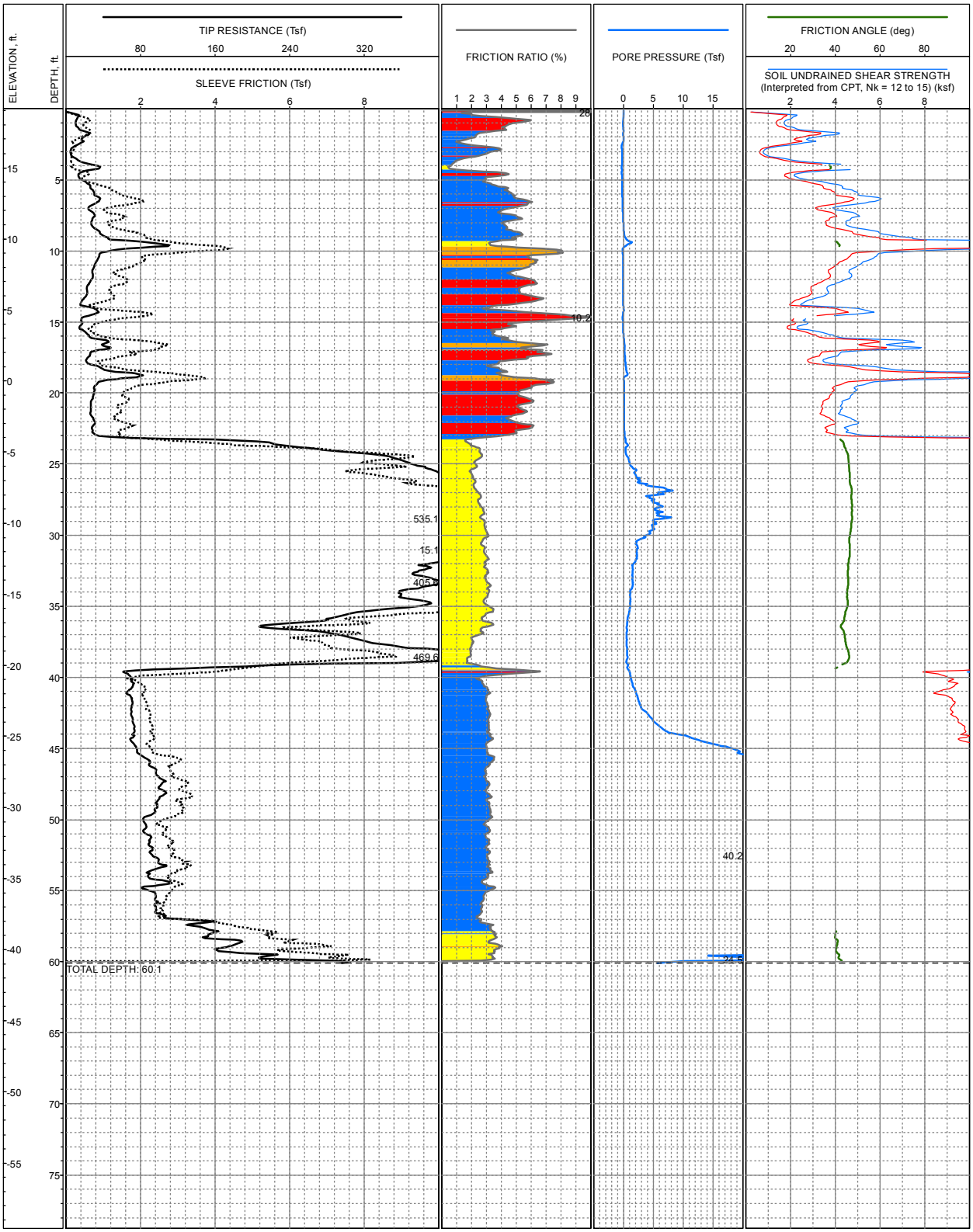

LOCATION: E5,998,622, N 1,980,042, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 19.2ft +/- ()
COMPLETION DEPTH: 60.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-30

San Joaquin Apartments & Precinct Improvements
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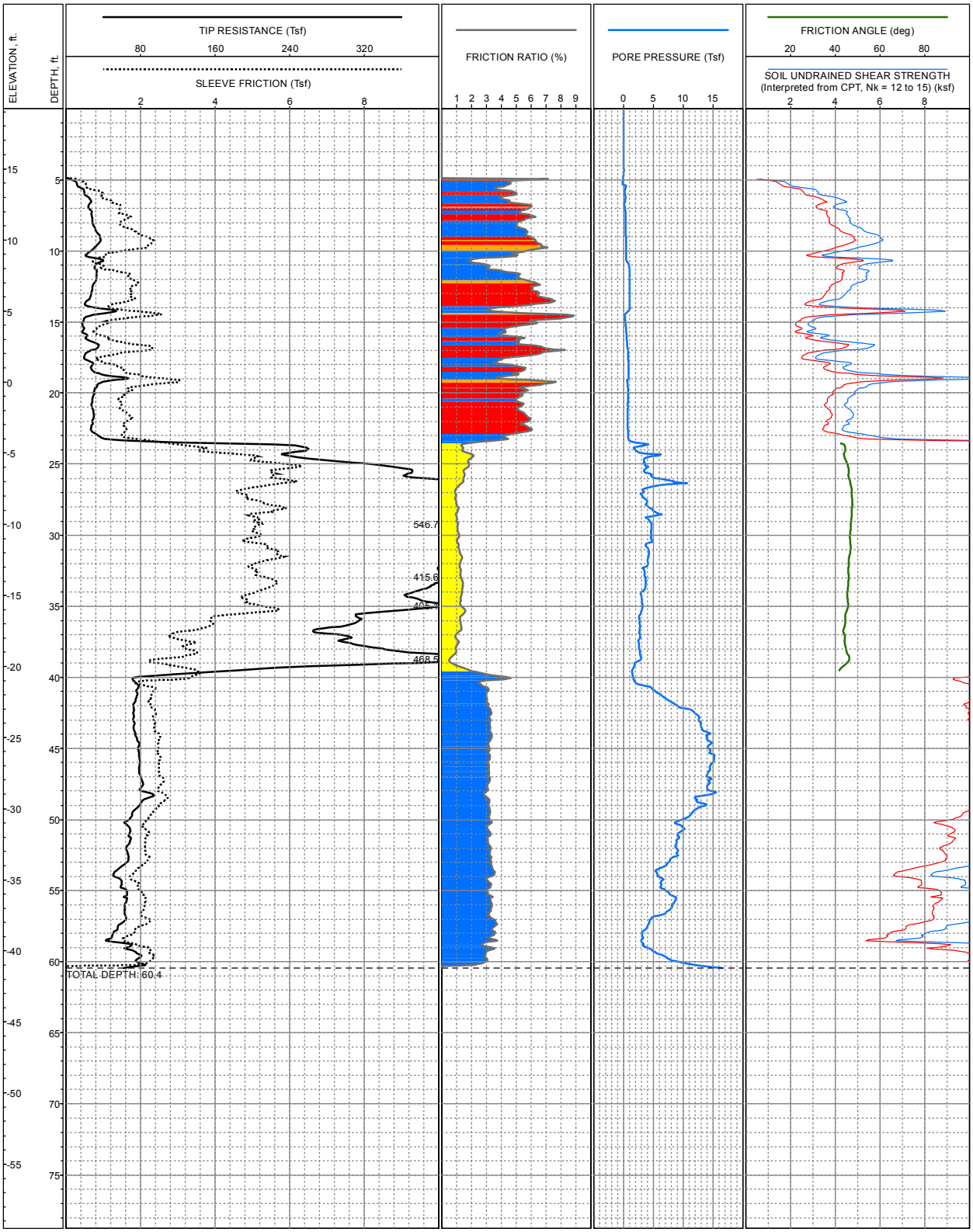

LOCATION: E5,998,619, N 1,980,067, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 19.2ft +/- ()
COMPLETION DEPTH: 60.4ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-31

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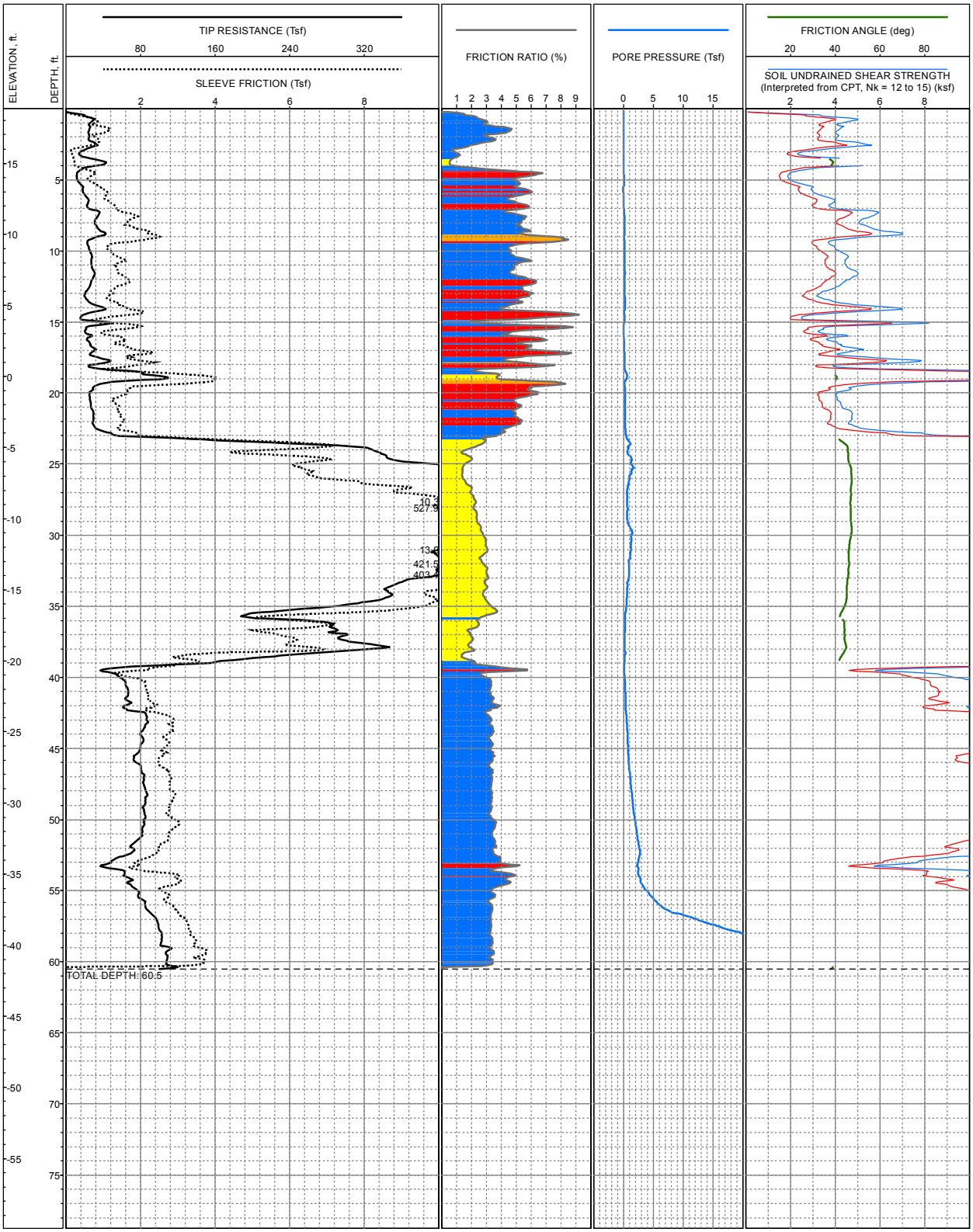

LOCATION: E5,998,616, N 1,980,091, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 18.8ft +/- ()
COMPLETION DEPTH: 60.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-32

San Joaquin Apartments & Precinct Improvements
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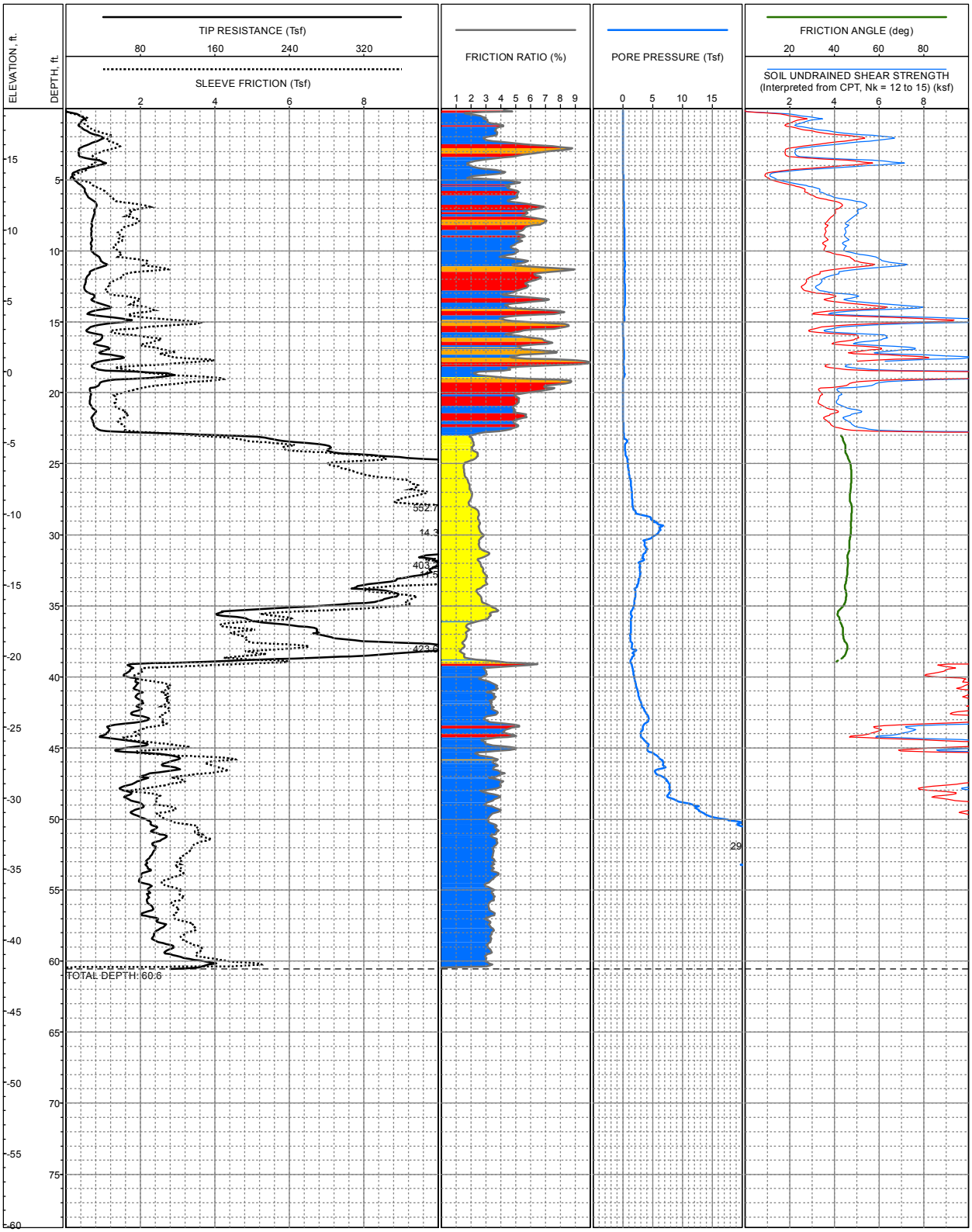

LOCATION: E5,998,615, N 1,980,116, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 18.5ft +/- ()
COMPLETION DEPTH: 60.6ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-33

San Joaquin Apartments & Precinct Improvements
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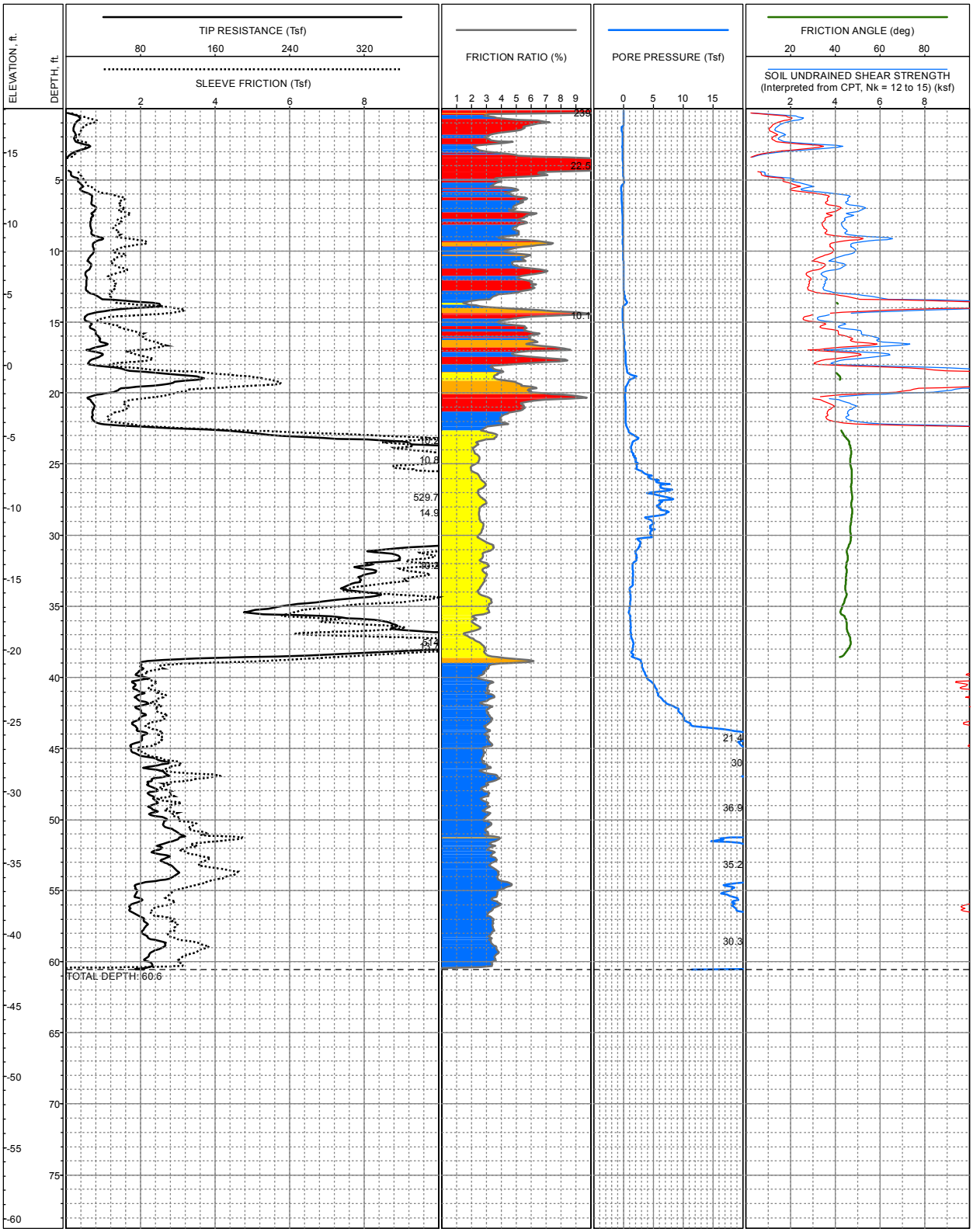

LOCATION: E5,998,613, N 1,980,141, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 18.1ft +/- ()
COMPLETION DEPTH: 60.6ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-34

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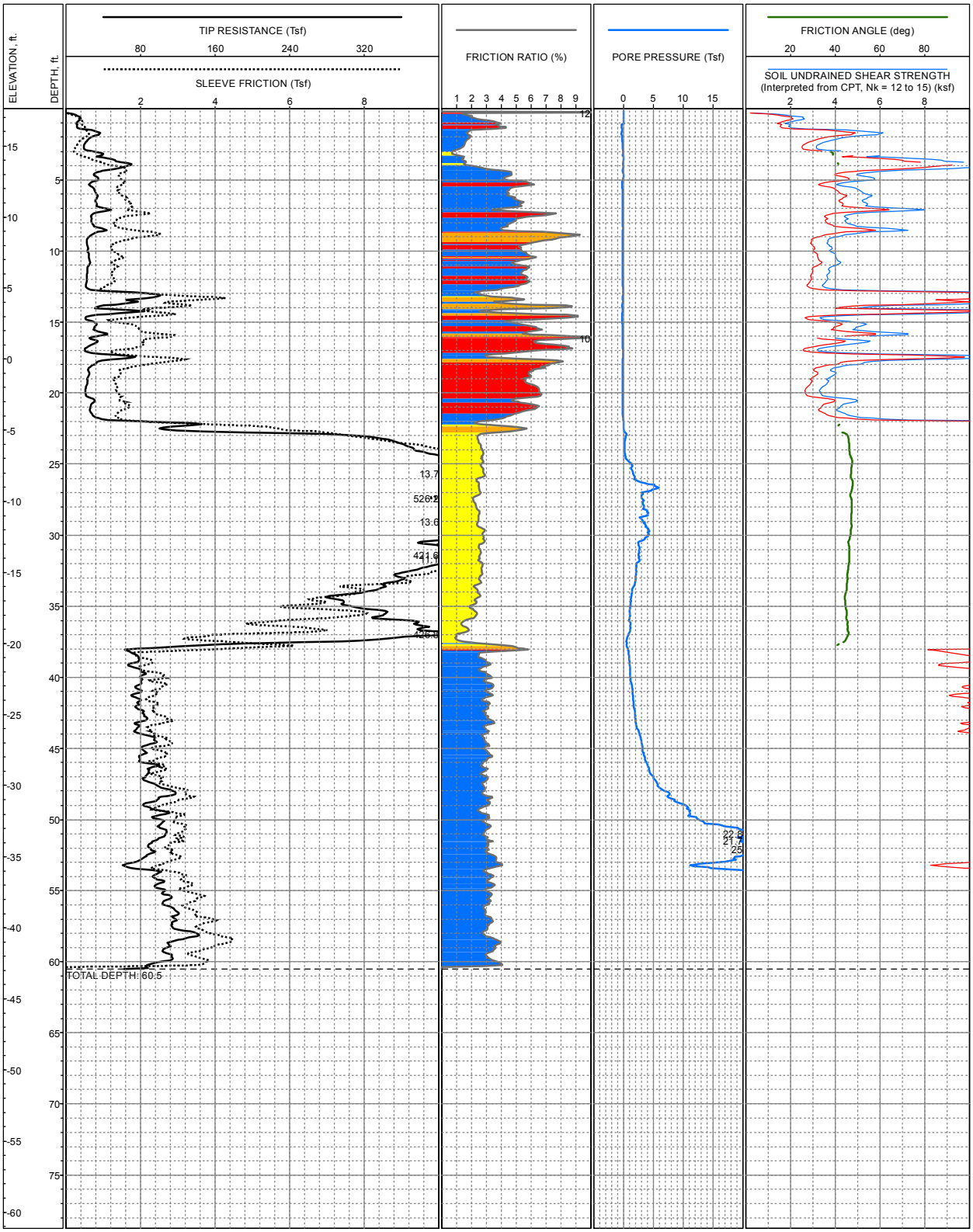

LOCATION: E5,998,613, N 1,980,157, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 17.6ft +/- ()
COMPLETION DEPTH: 60.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-35

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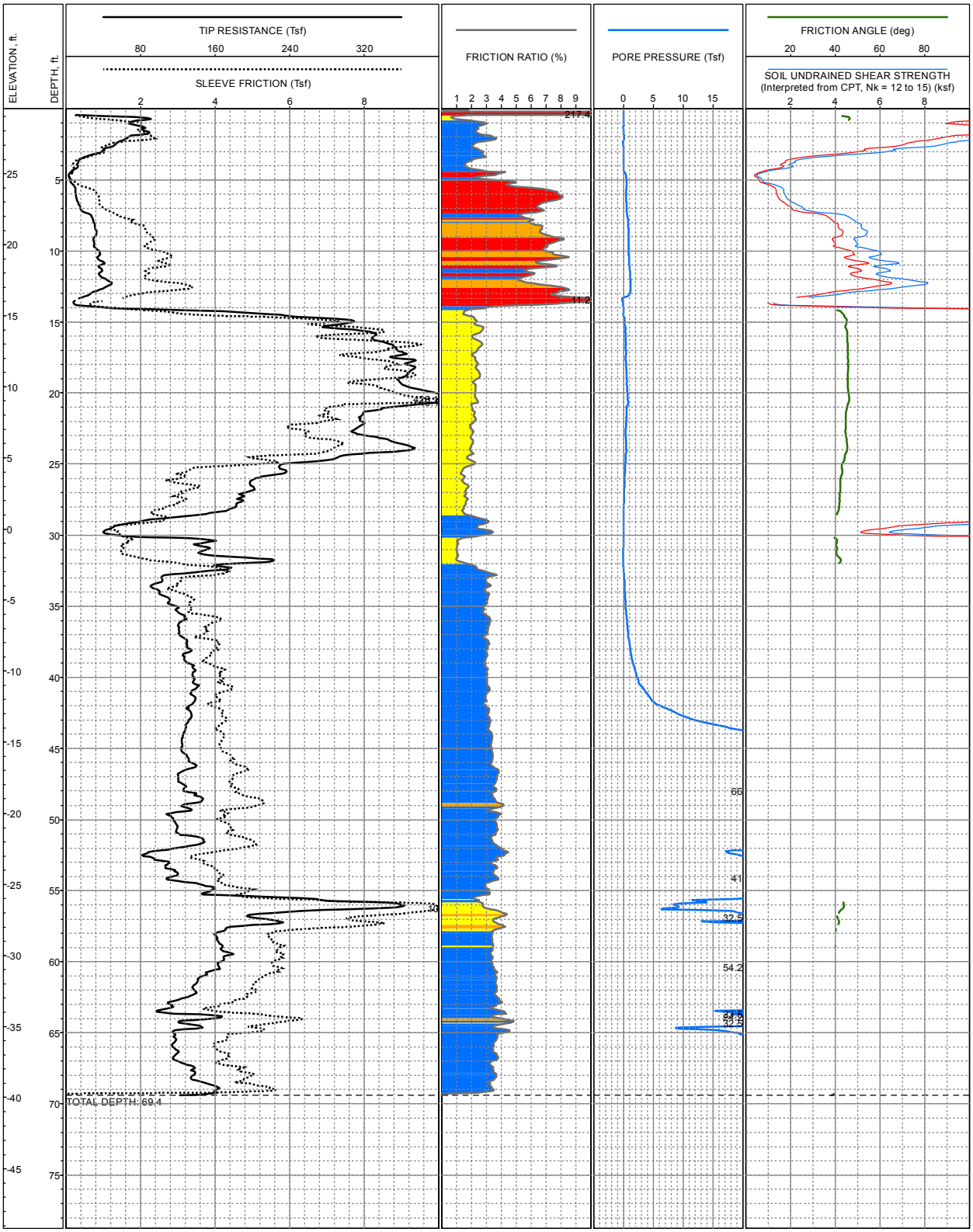

LOCATION: E5,998,744, N 1,979,580, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 29.6ft +/- ()
COMPLETION DEPTH: 69.4ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-36

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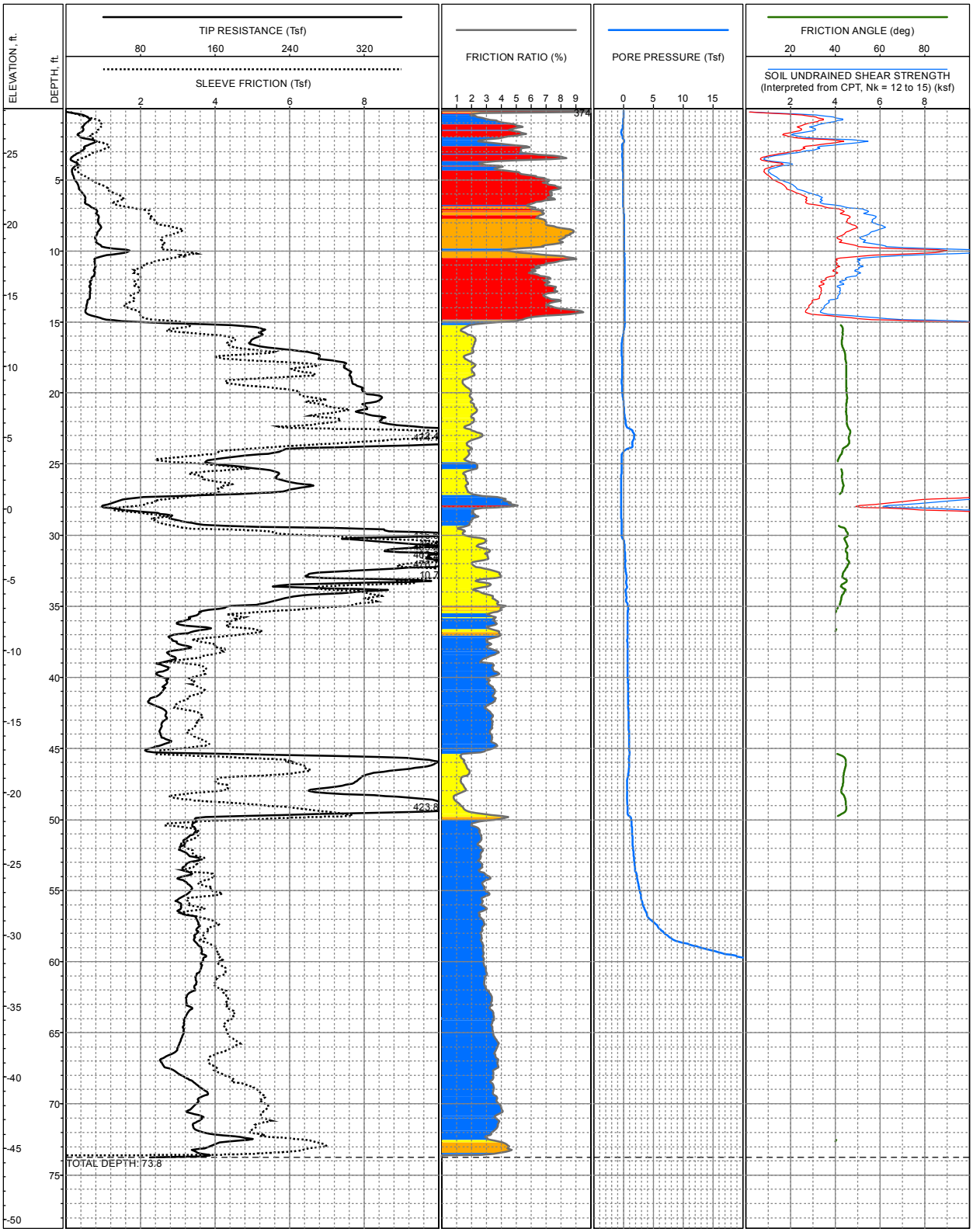

LOCATION: E5,998,741, N 1,979,595, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 28.1ft +/- ()
COMPLETION DEPTH: 73.8ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-37

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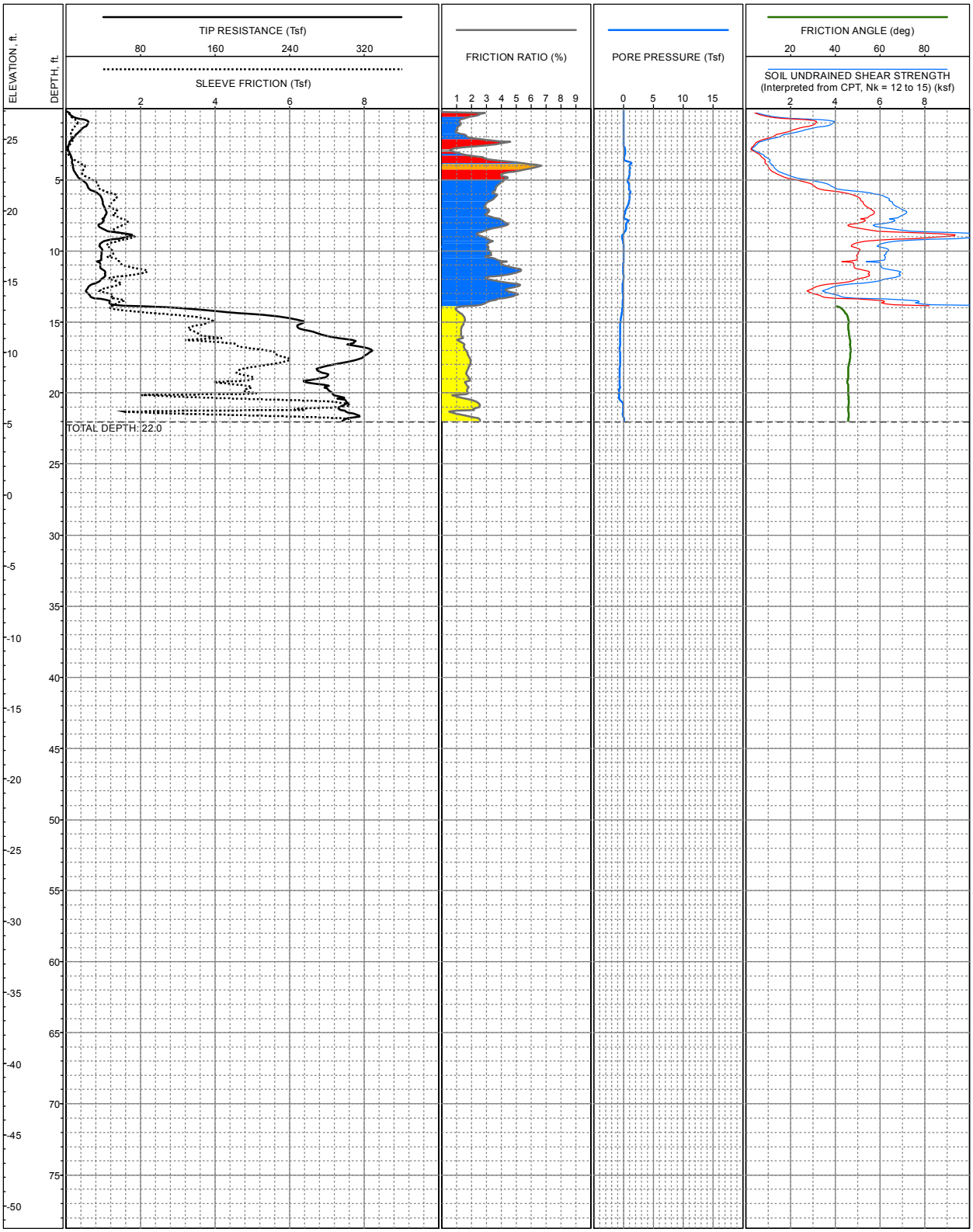

LOCATION: E5,998,736, N 1,979,607, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 27.2ft +/- ()
COMPLETION DEPTH: 22.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-37A

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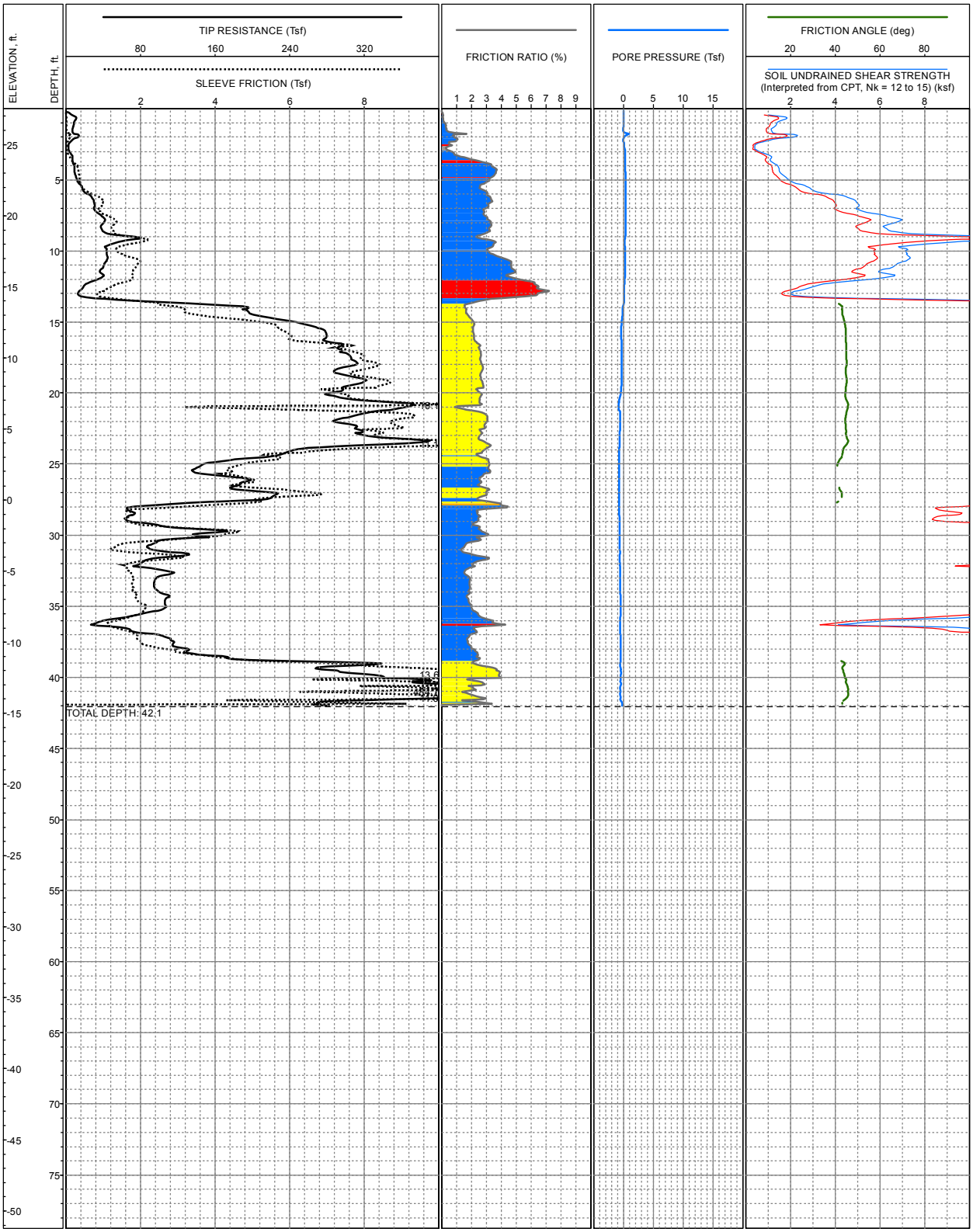

LOCATION: E5,998,733, N 1,979,605, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 27.5ft +/- ()
COMPLETION DEPTH: 42.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-37B

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Santa Barbara, California

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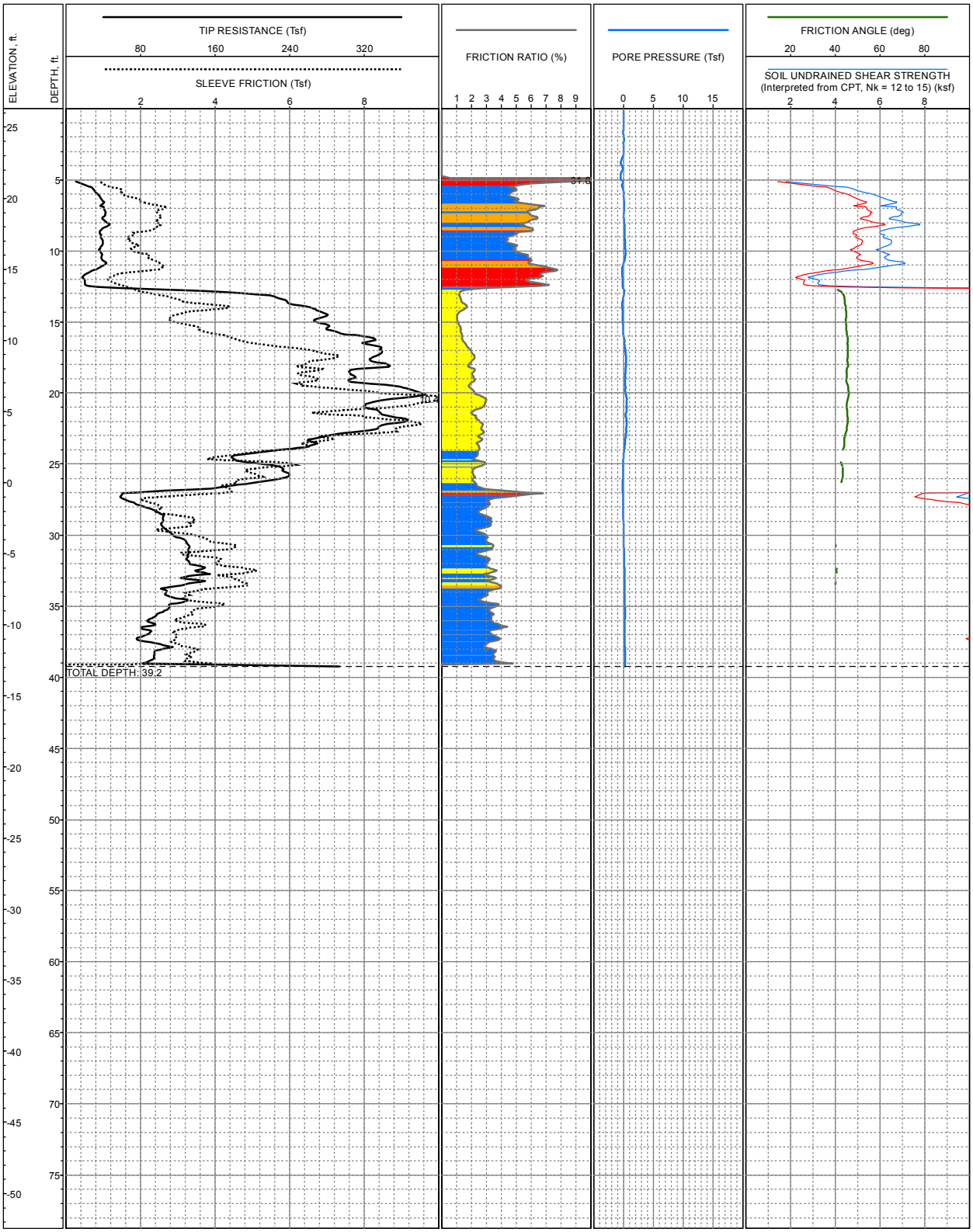

LOCATION: E5,998,732, N 1,979,618, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 26.3ft +/- ()
COMPLETION DEPTH: 39.2ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-38

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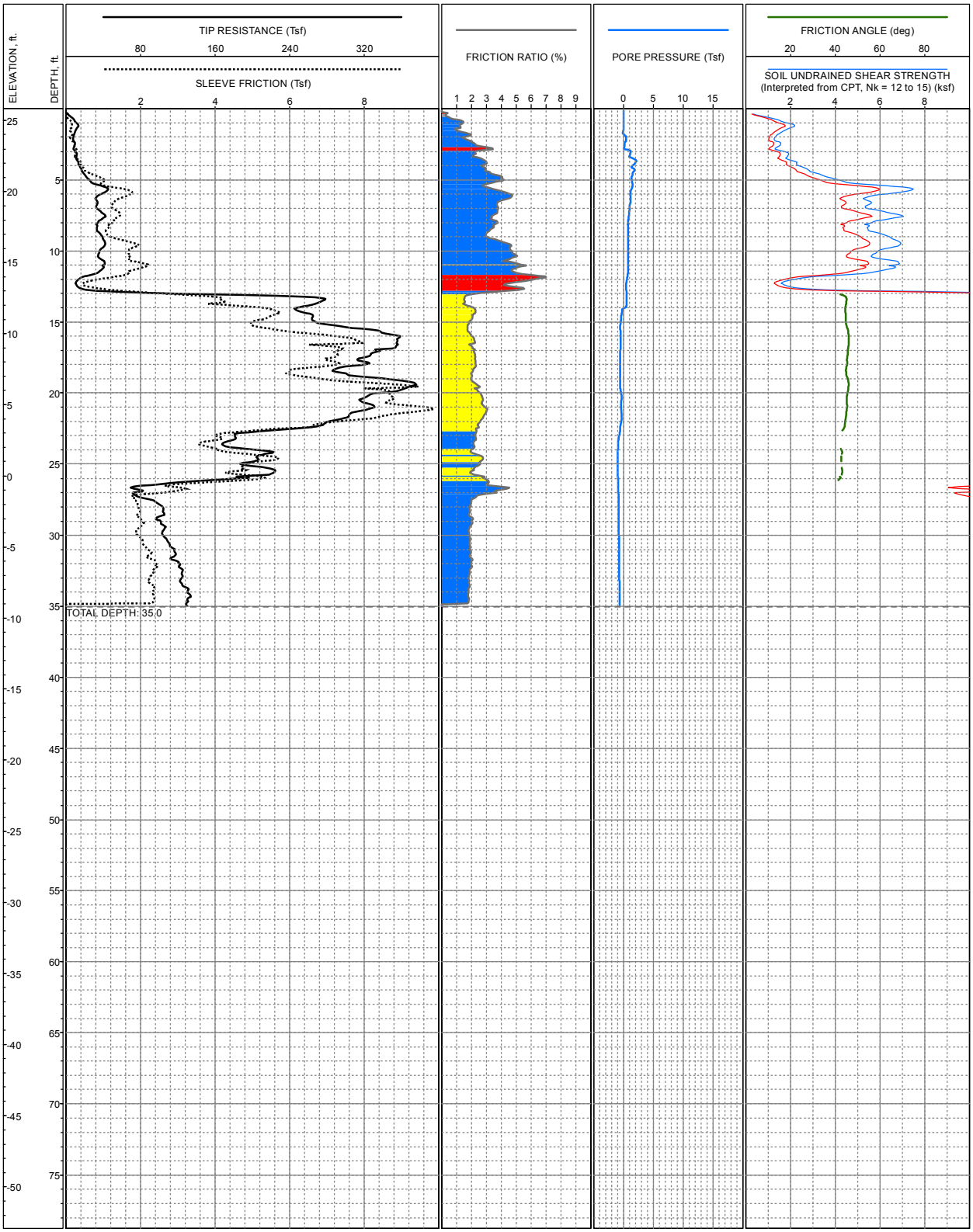

LOCATION: E5,998,729, N 1,979,630, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.8ft +/- ()
COMPLETION DEPTH: 35.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-38A

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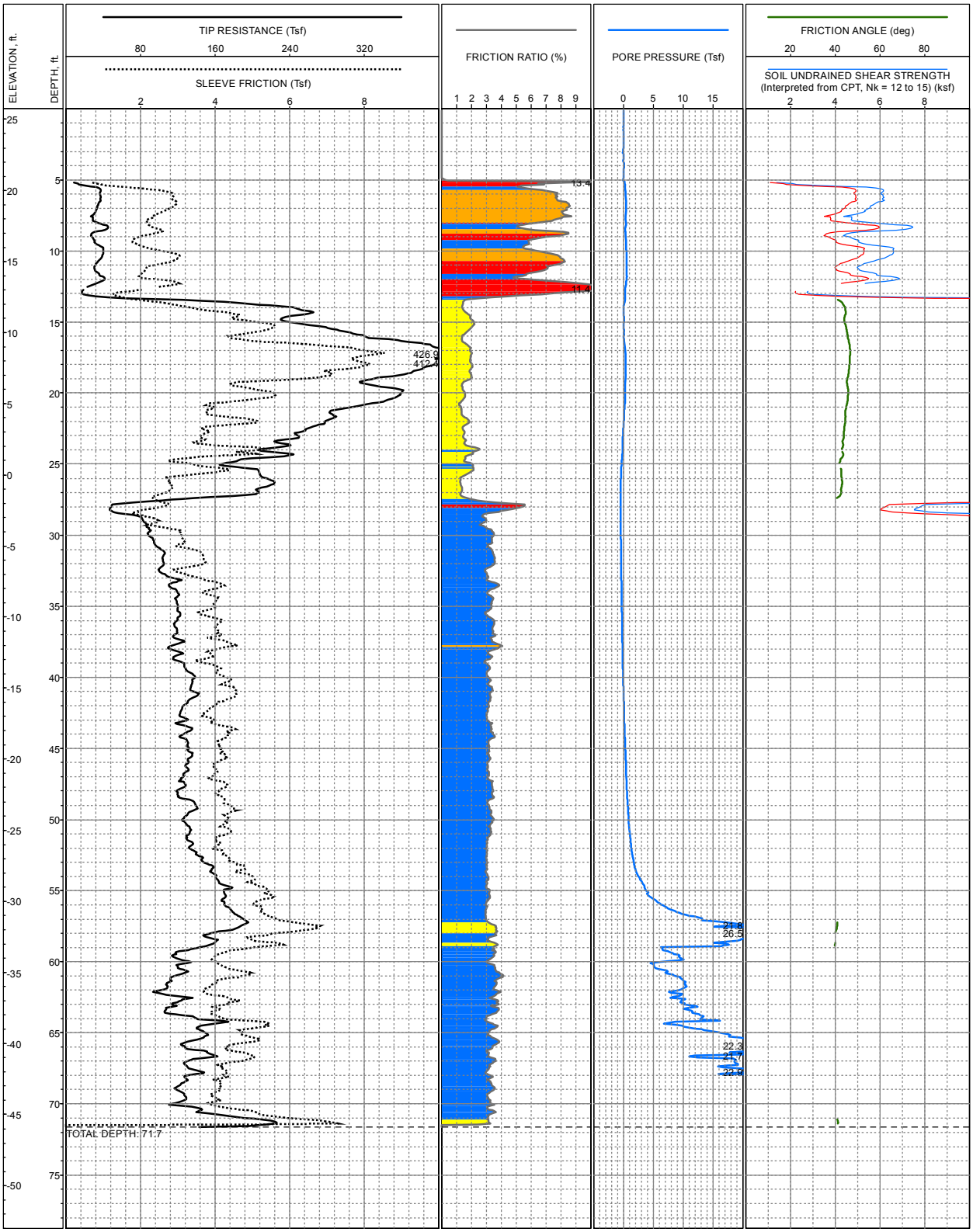

LOCATION: E5,998,724, N 1,979,642, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.7ft +/- ()
COMPLETION DEPTH: 71.7ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-39

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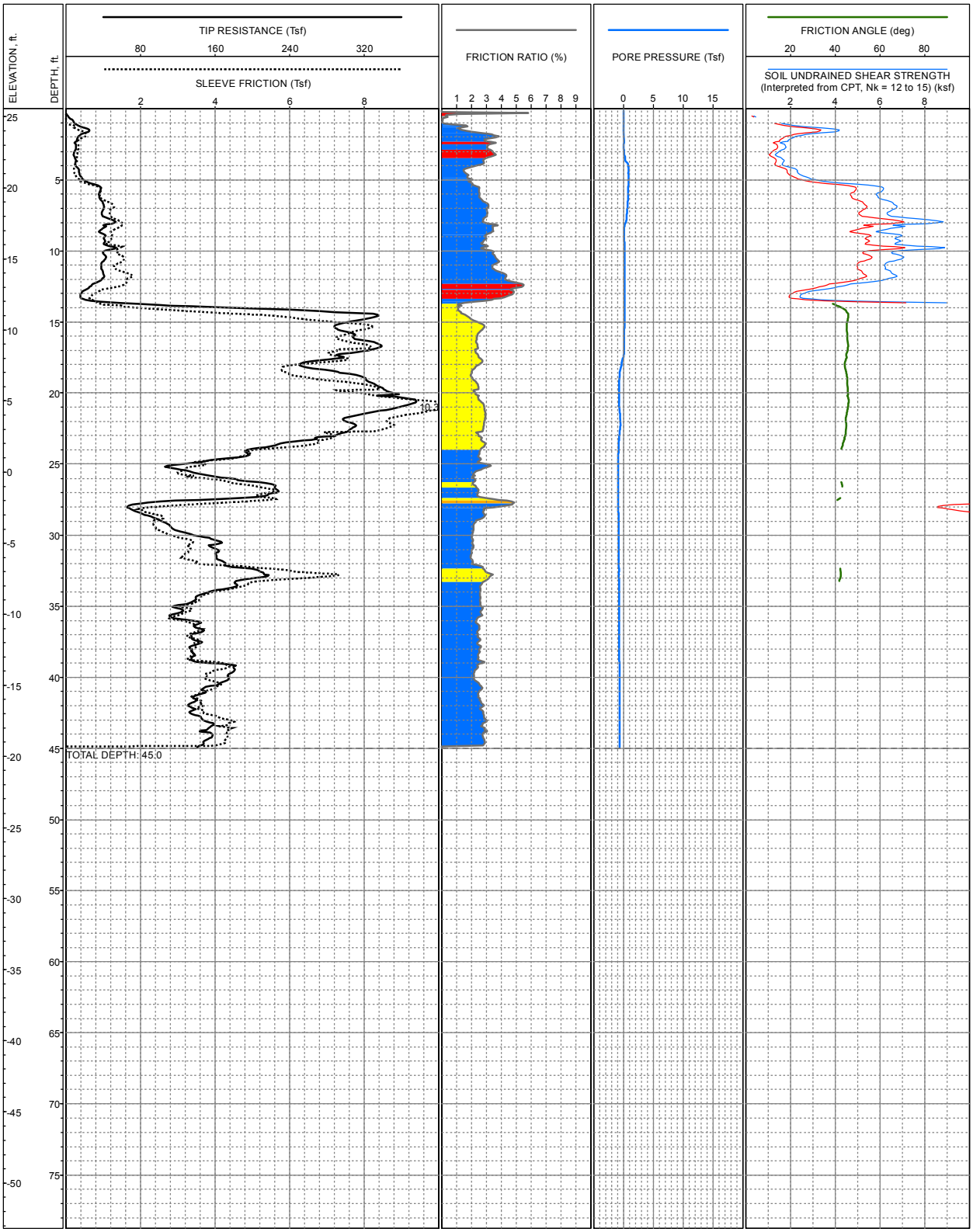

LOCATION: E5,998,720, N 1,979,654, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.6ft +/- ()
COMPLETION DEPTH: 45.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-39A

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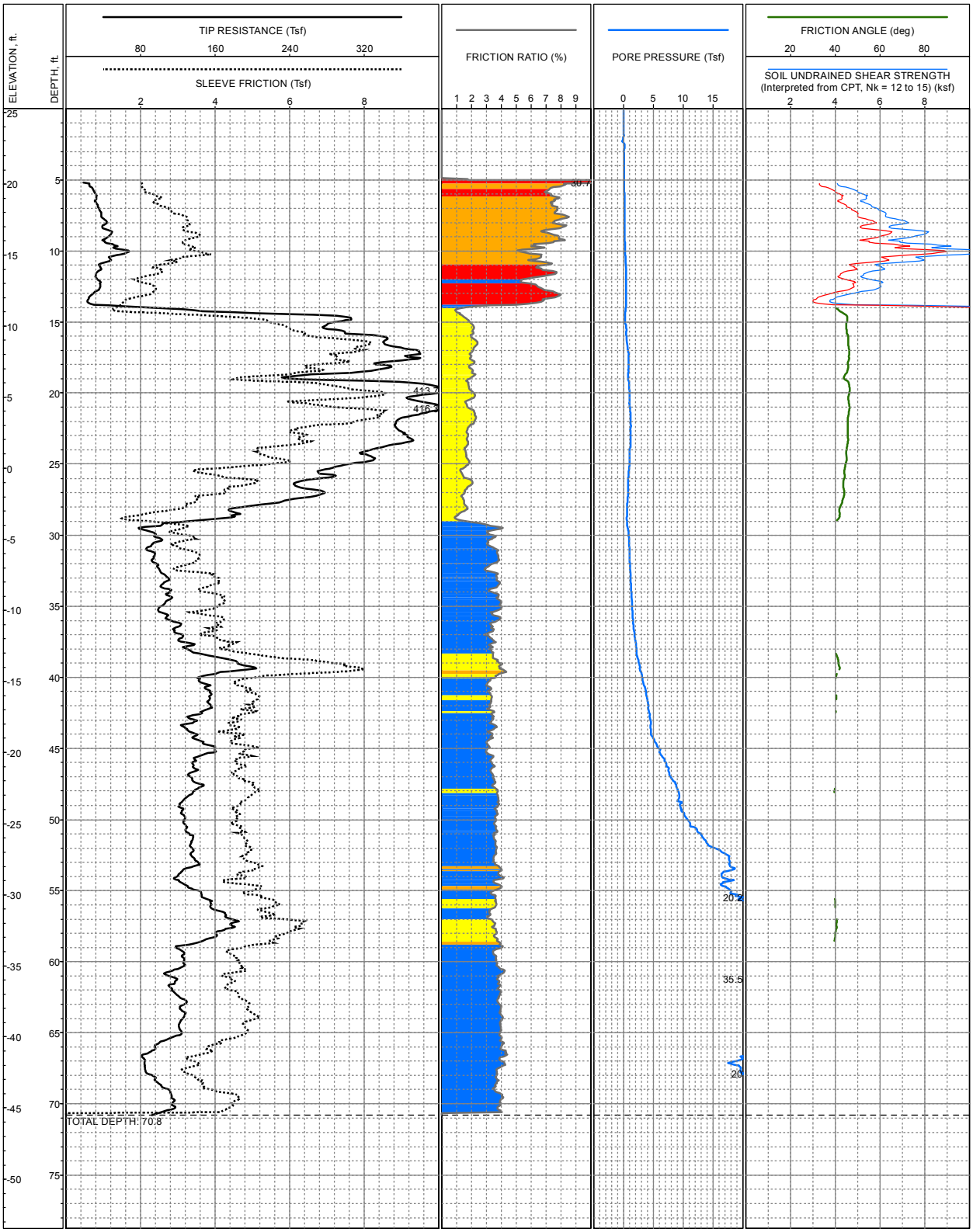

LOCATION: E5,998,717, N 1,979,666, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.3ft +/- ()
COMPLETION DEPTH: 70.8ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-40

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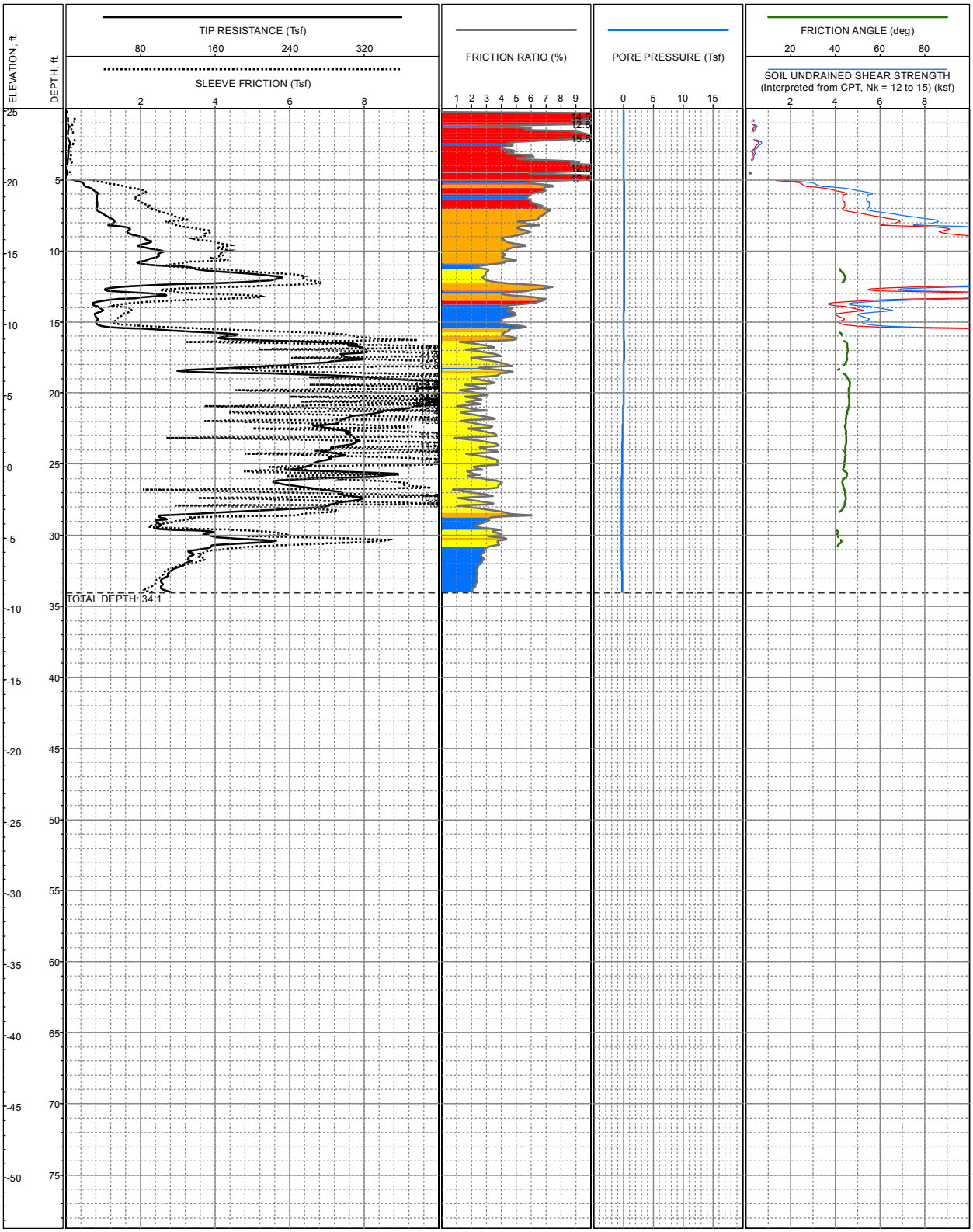

LOCATION: E5,998,713, N 1,979,678, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.2ft +/- ()
COMPLETION DEPTH: 34.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-40A

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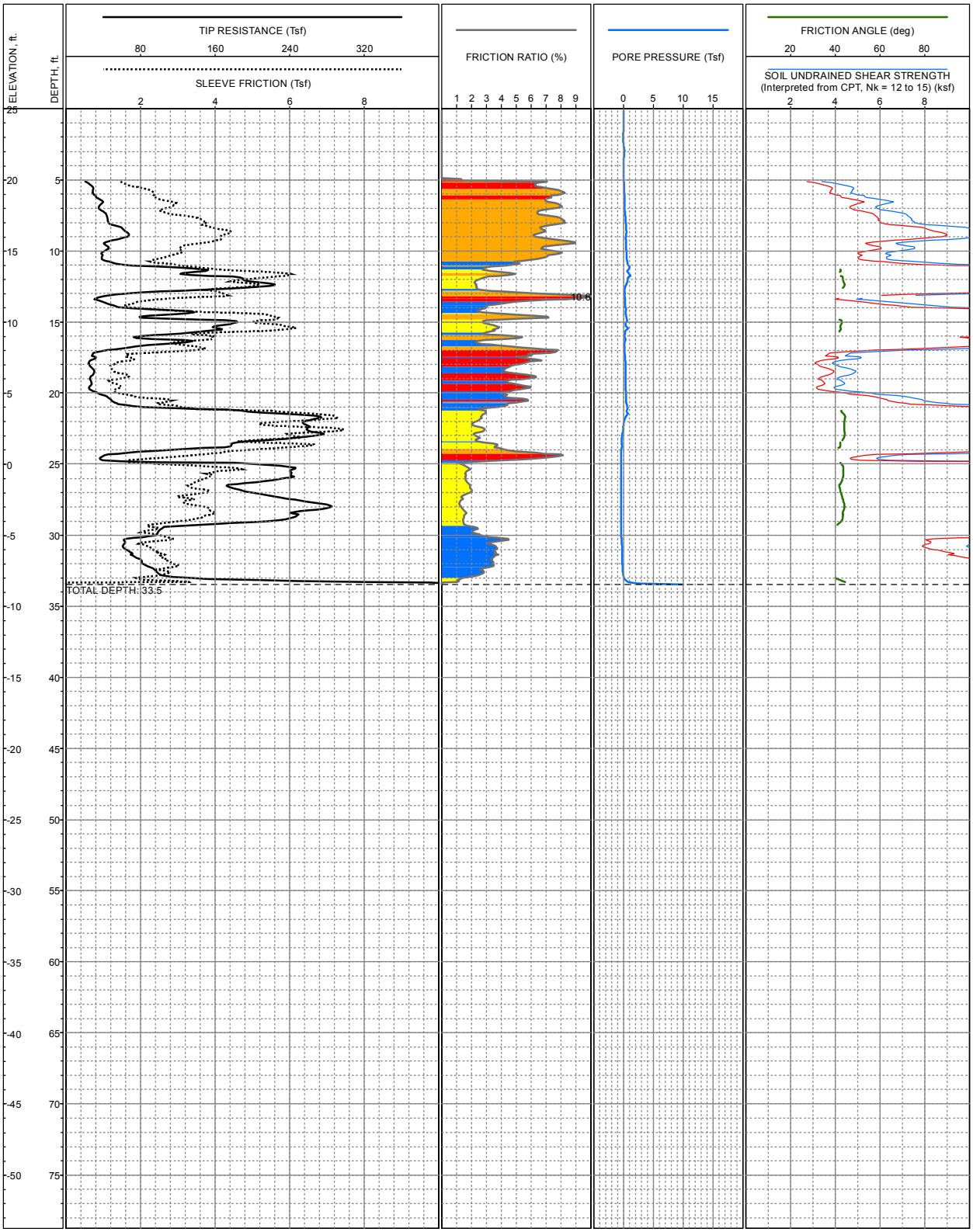

LOCATION: E5,998,709, N 1,979,689, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.0ft +/- ()
COMPLETION DEPTH: 33.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-41

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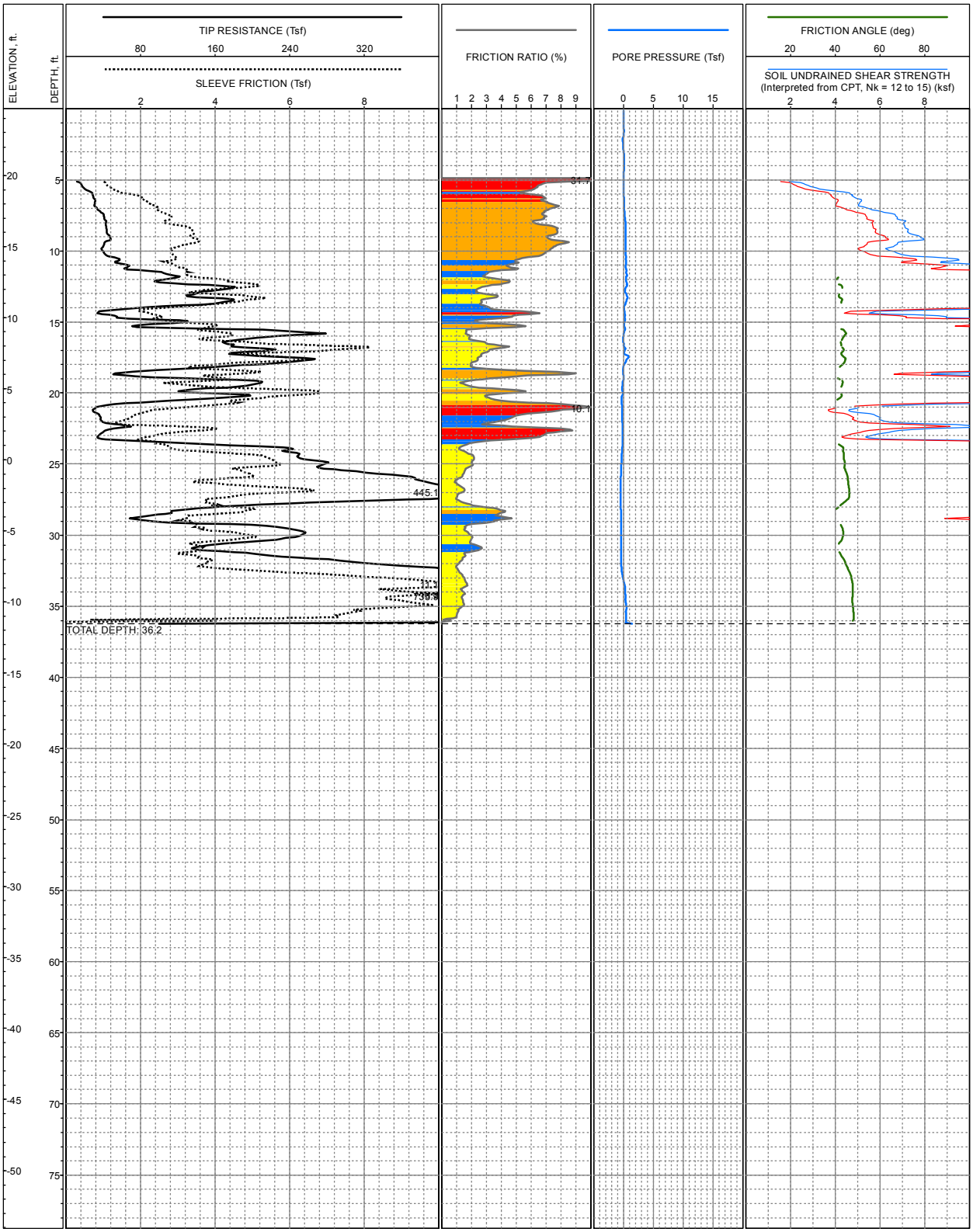

LOCATION: E5,998,702, N 1,979,713, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.7ft +/- ()
COMPLETION DEPTH: 36.2ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-42

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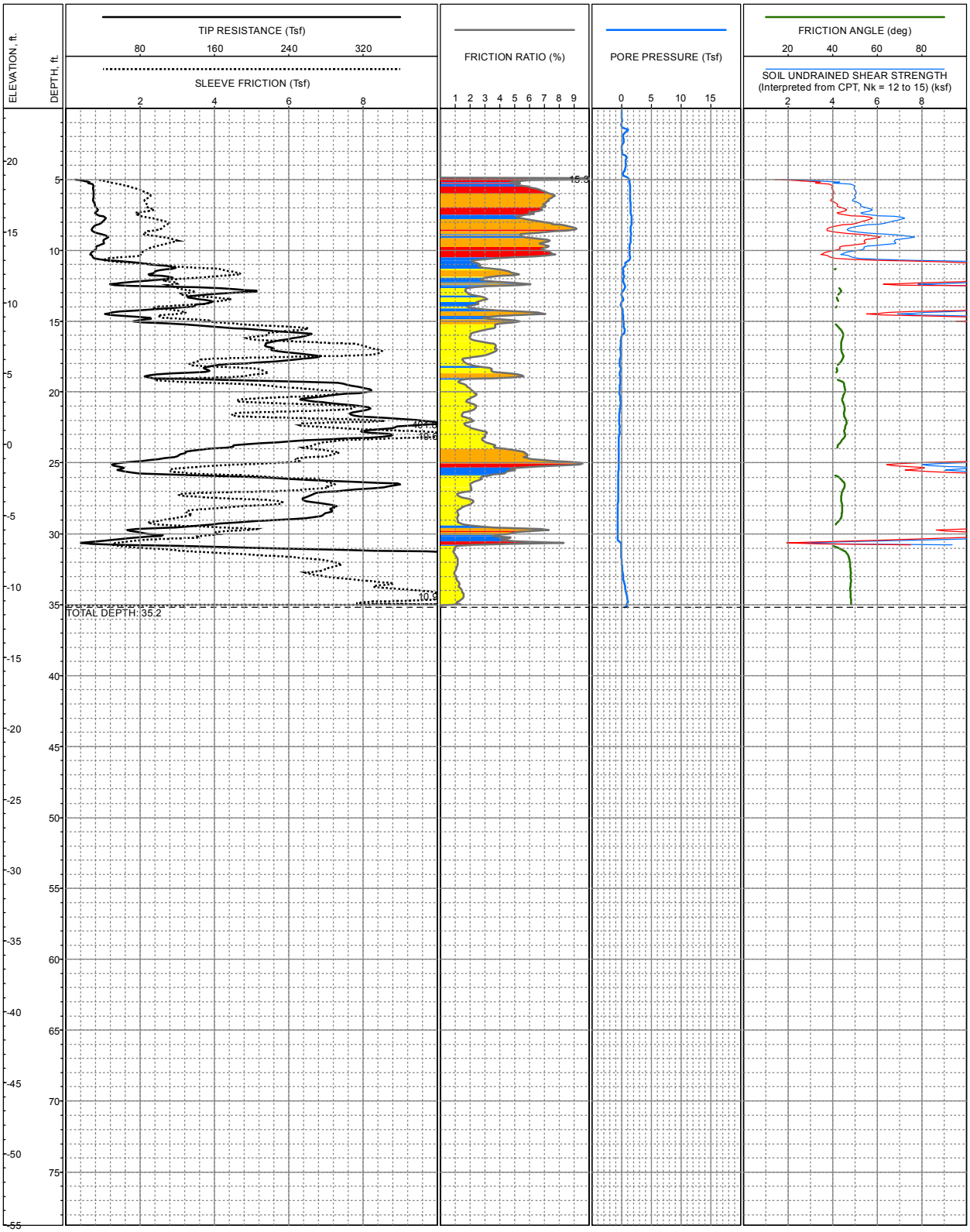

LOCATION: E5,998,694, N 1,979,737, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.7ft +/- ()
COMPLETION DEPTH: 35.2ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-43

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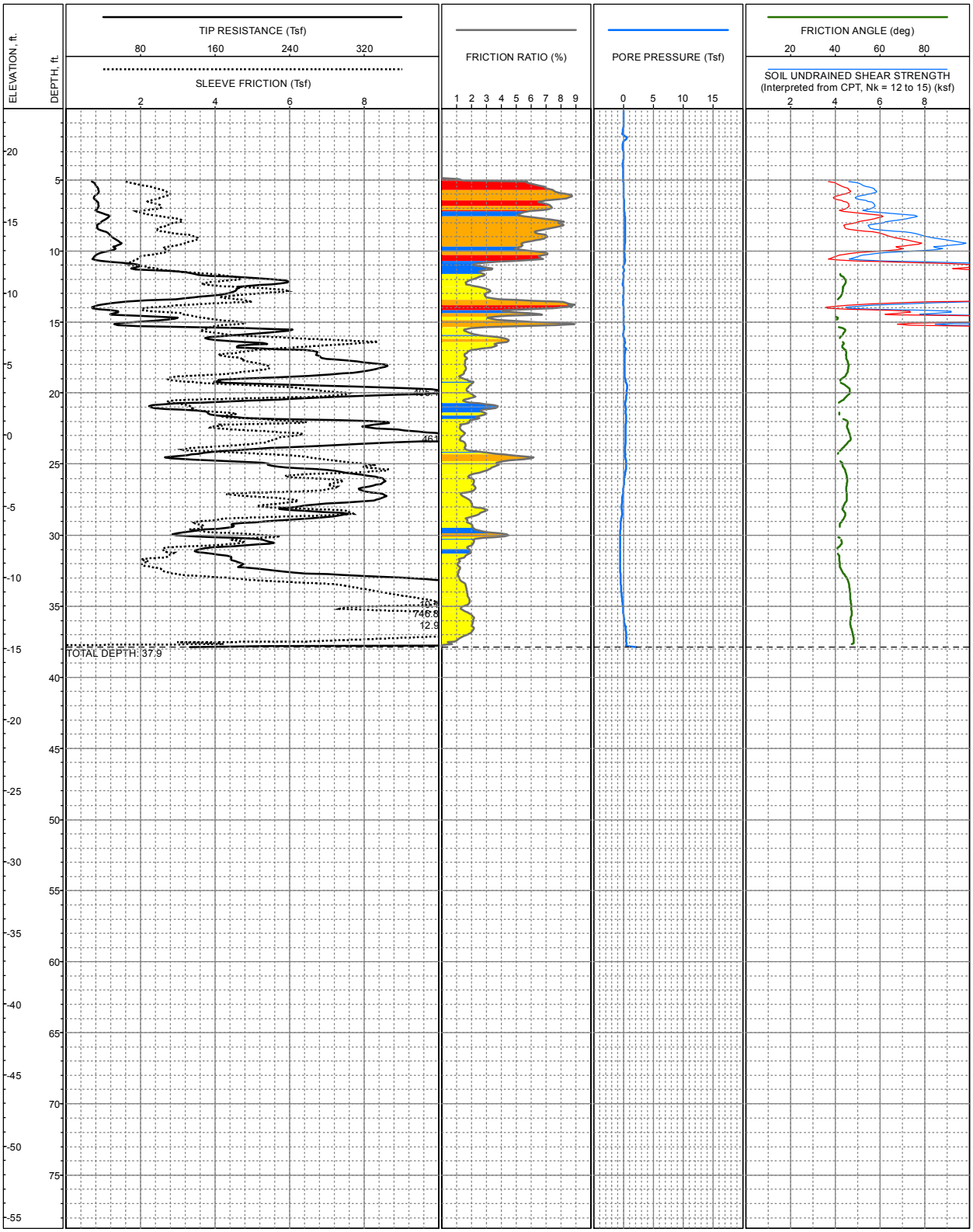

LOCATION: E5,998,685, N 1,979,764, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.0ft +/- ()
COMPLETION DEPTH: 37.9ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-44

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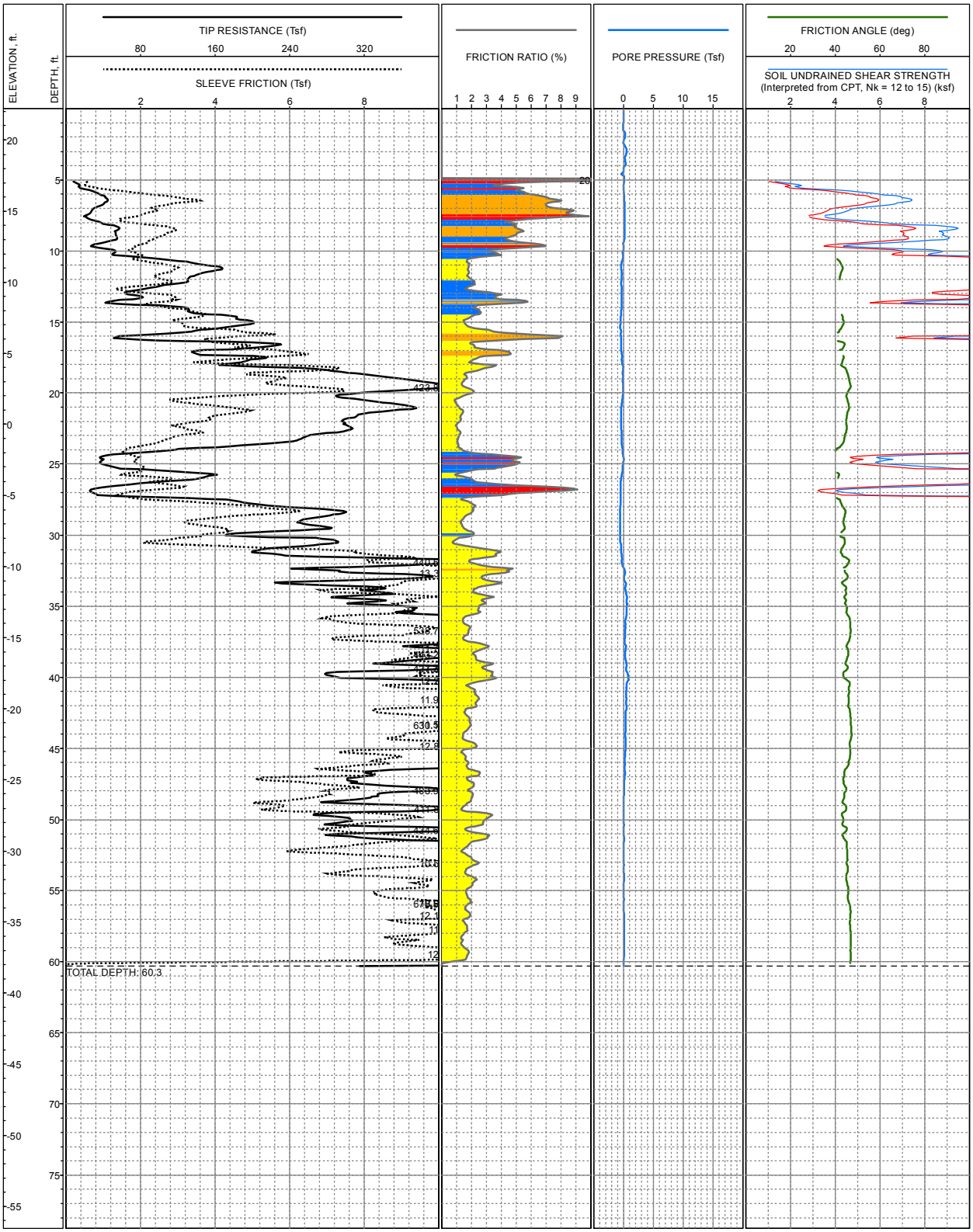

LOCATION: E5,998,676, N 1,979,792, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.2ft +/- ()
COMPLETION DEPTH: 60.3ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-45

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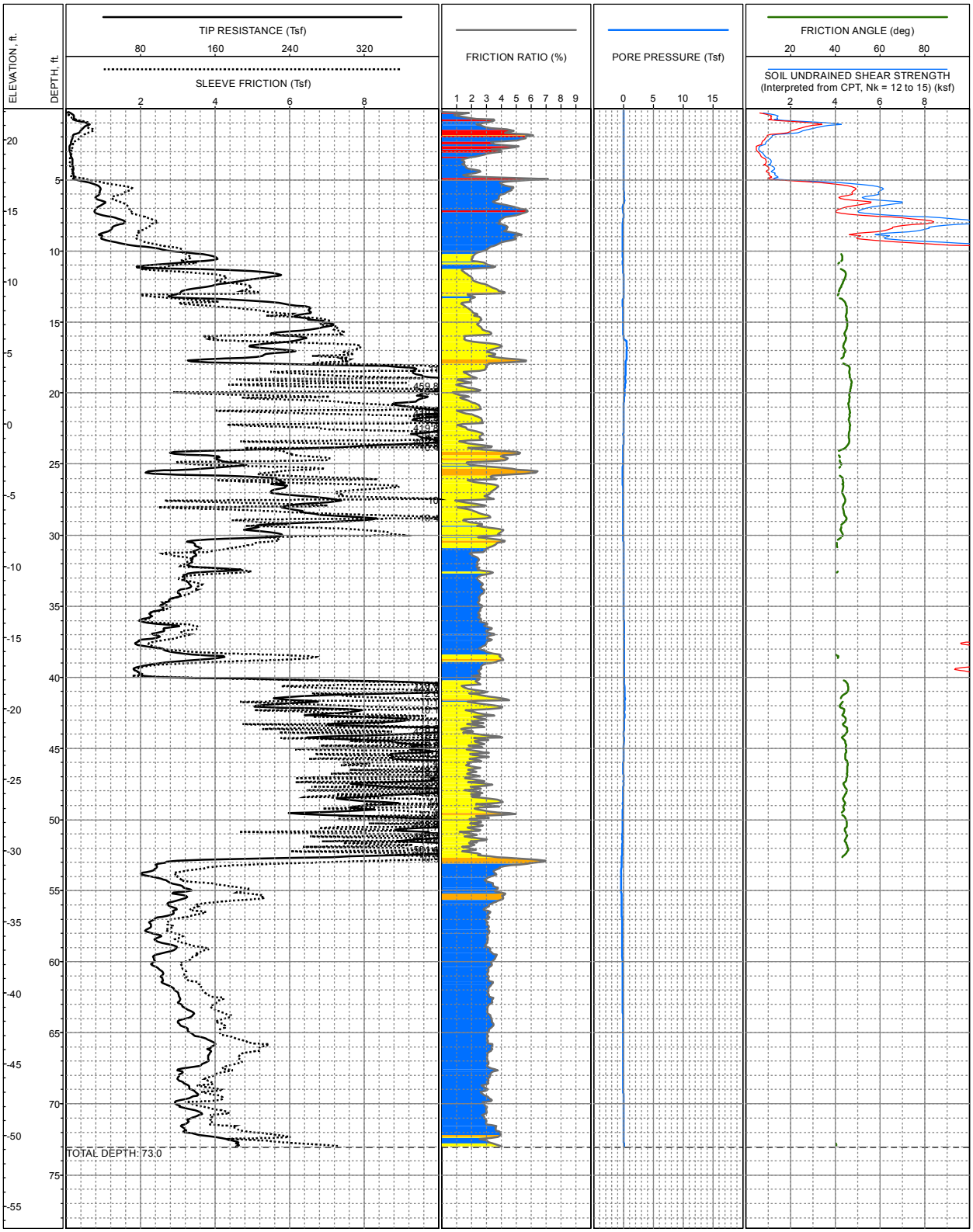

LOCATION: E5,998,673, N 1,979,801, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.2ft +/- ()
COMPLETION DEPTH: 73.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-45A

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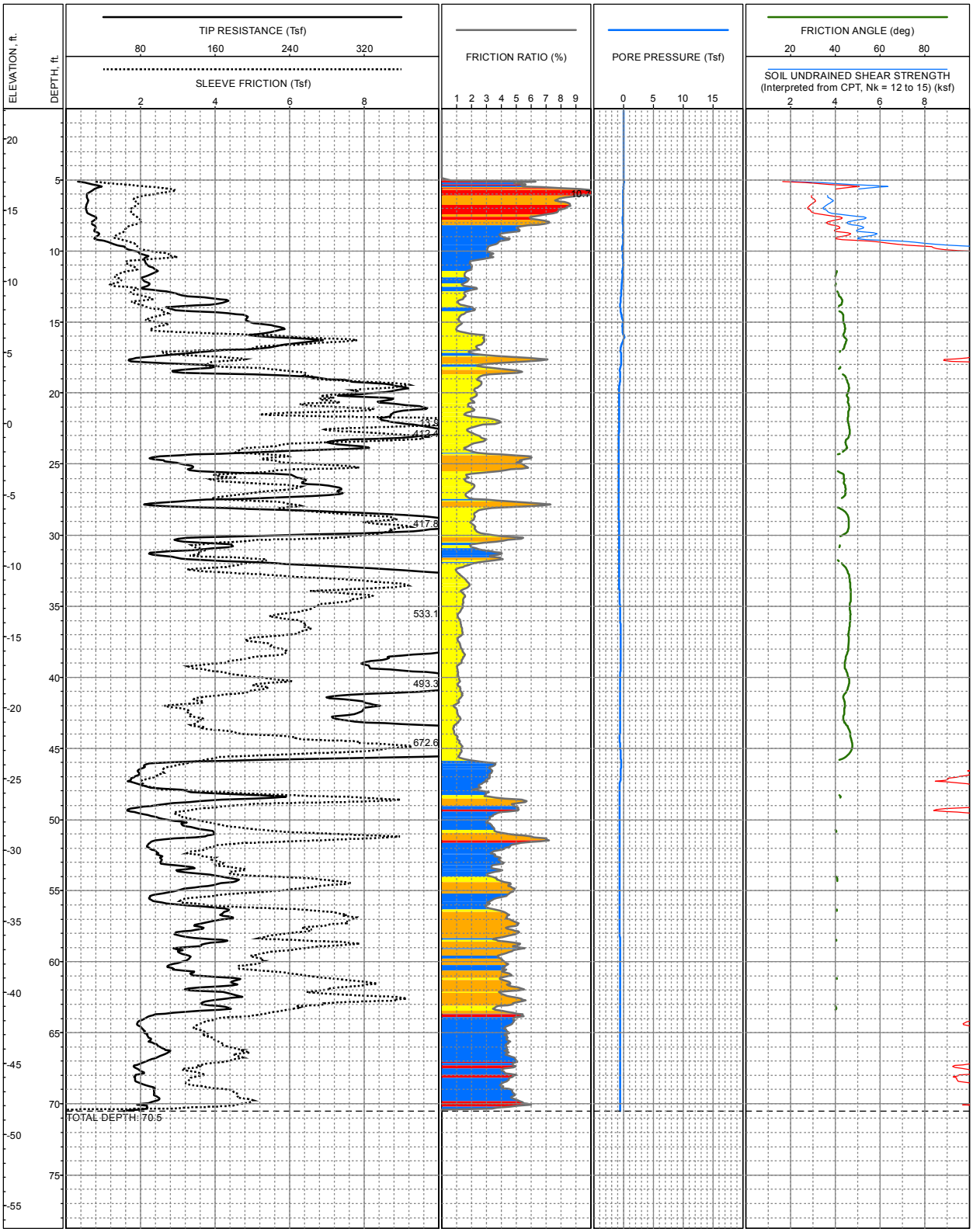

LOCATION: E5,998,669, N 1,979,809, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.1ft +/- ()
COMPLETION DEPTH: 70.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-46

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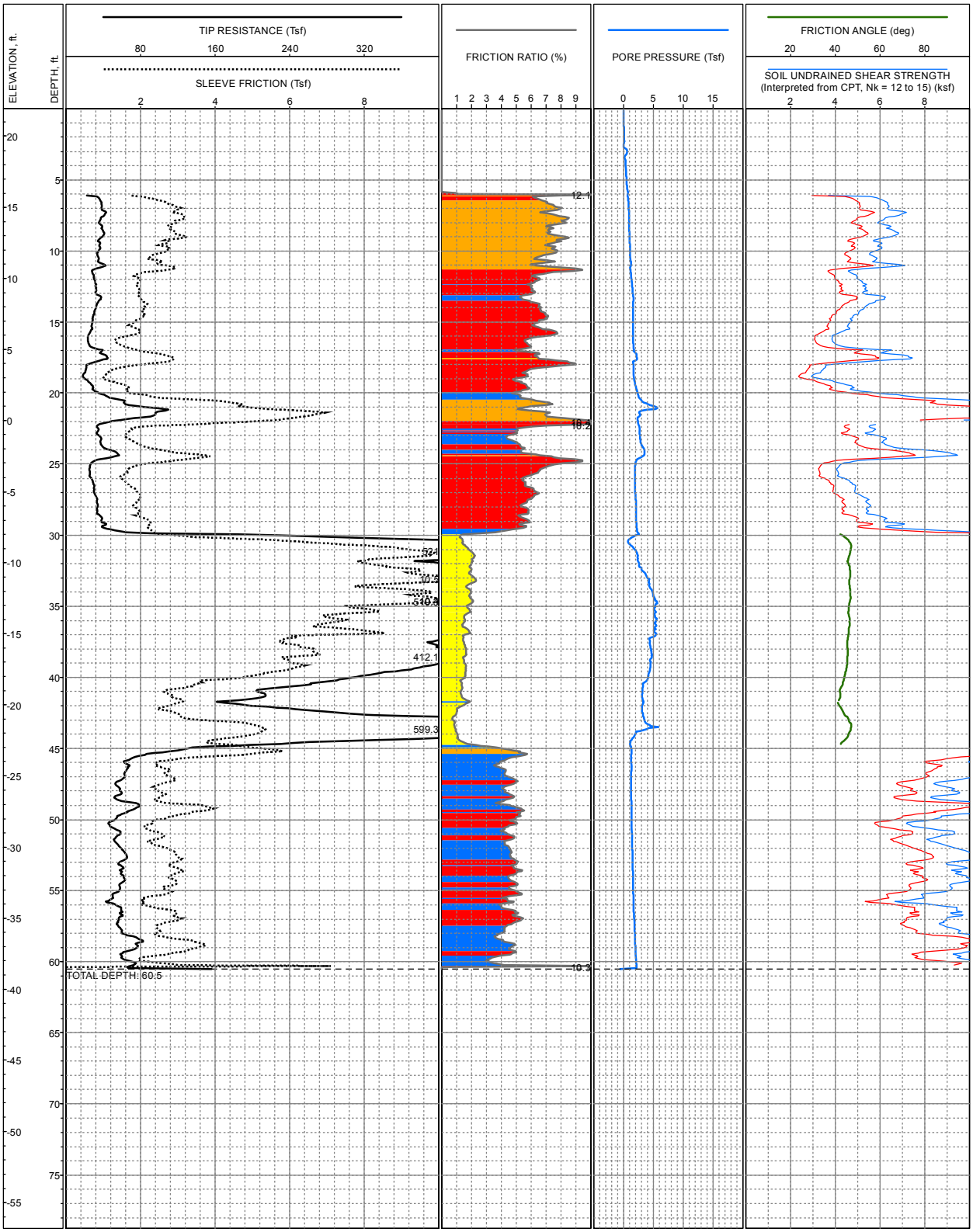

LOCATION: E5,998,663, N 1,979,827, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 21.9ft +/- ()
COMPLETION DEPTH: 60.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-47

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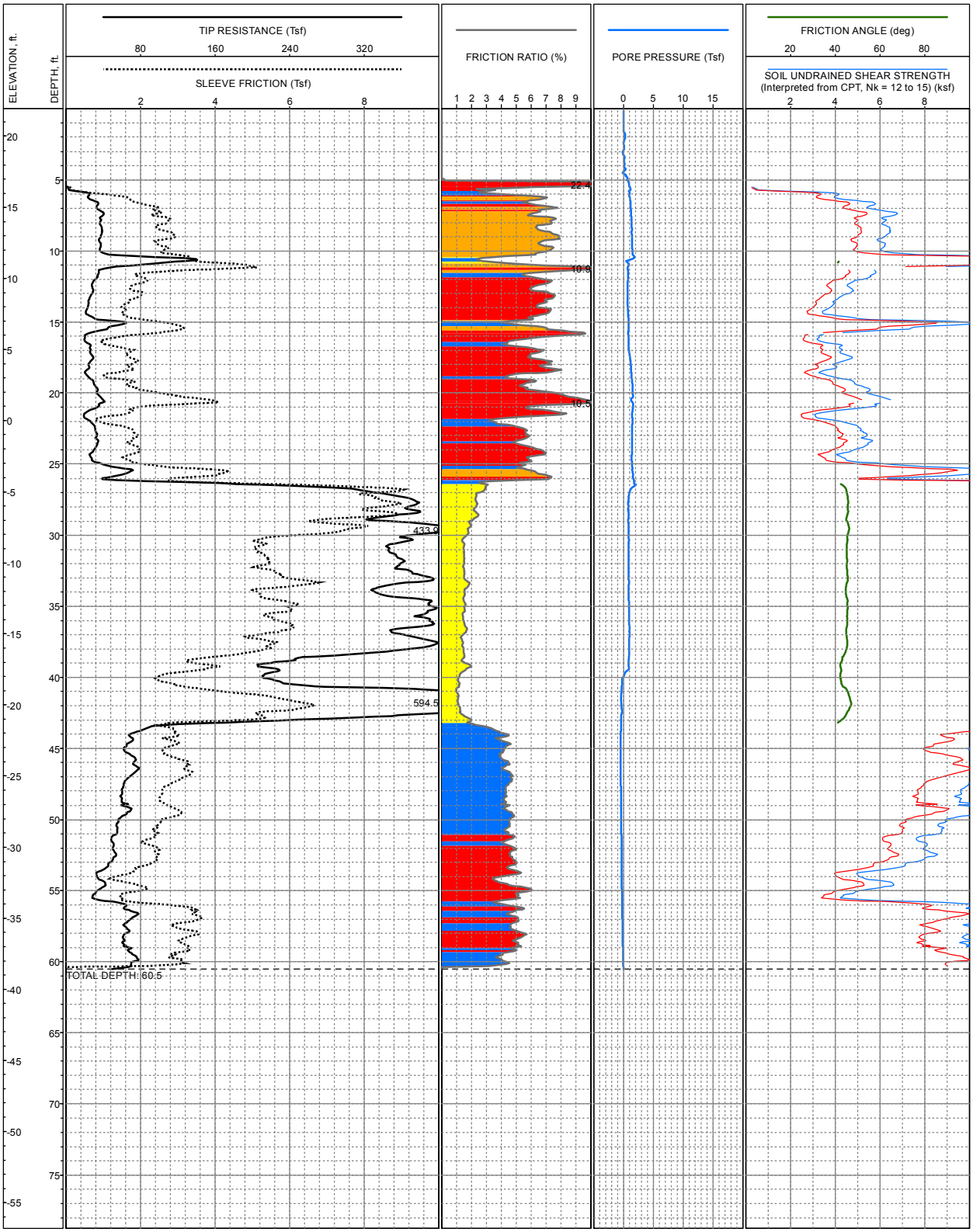

LOCATION: E5,998,655, N 1,979,851, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 21.9ft +/- ()
COMPLETION DEPTH: 60.5ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-48

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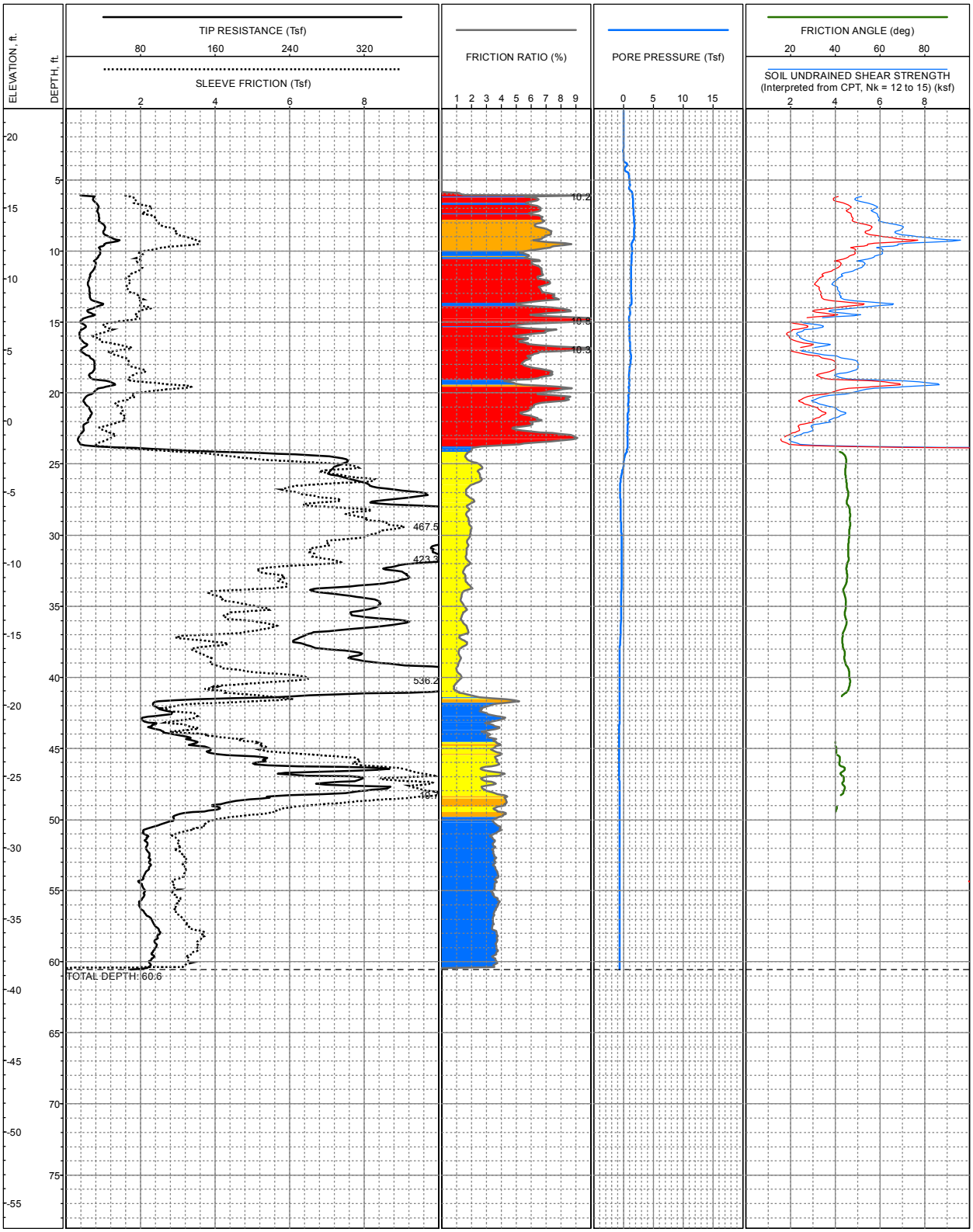

LOCATION: E5,998,647, N 1,979,874, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.0ft +/- ()
COMPLETION DEPTH: 60.6ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-49

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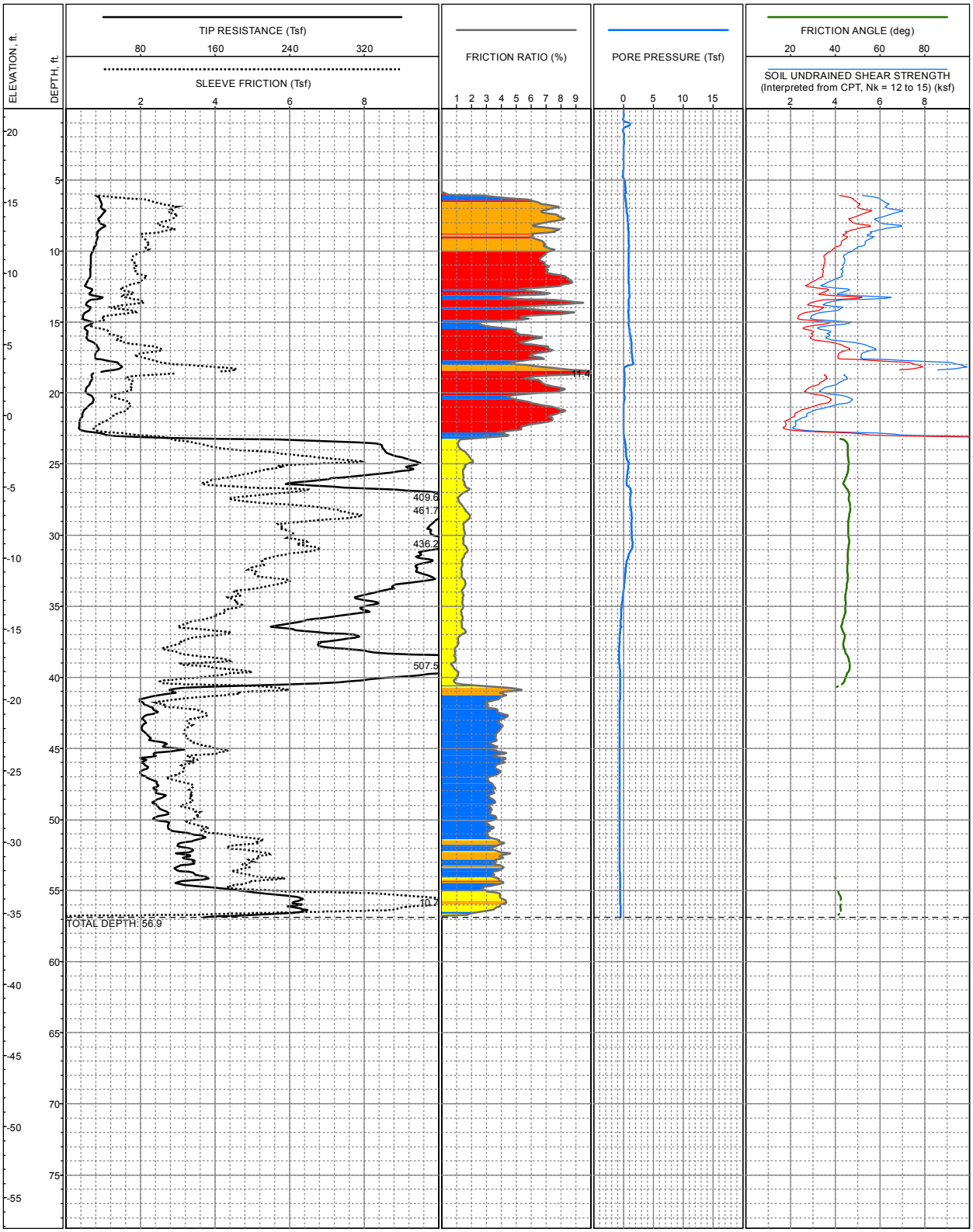

LOCATION: E5,998,645, N 1,979,895, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 21.6ft +/- ()
COMPLETION DEPTH: 56.9ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-50

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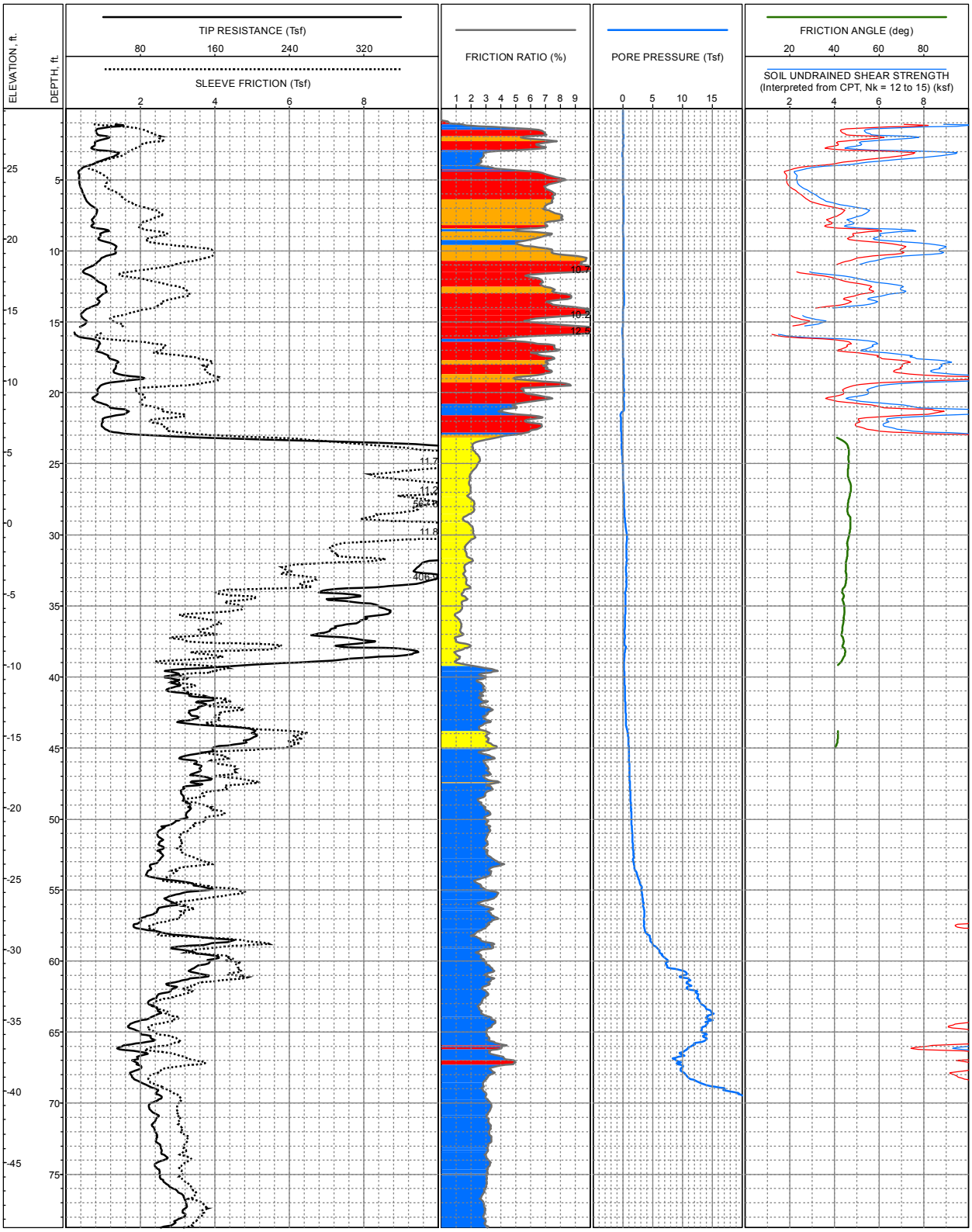

LOCATION: E5,998,066, N 1,979,856, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 29.2ft +/- ()
COMPLETION DEPTH: 83.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-51

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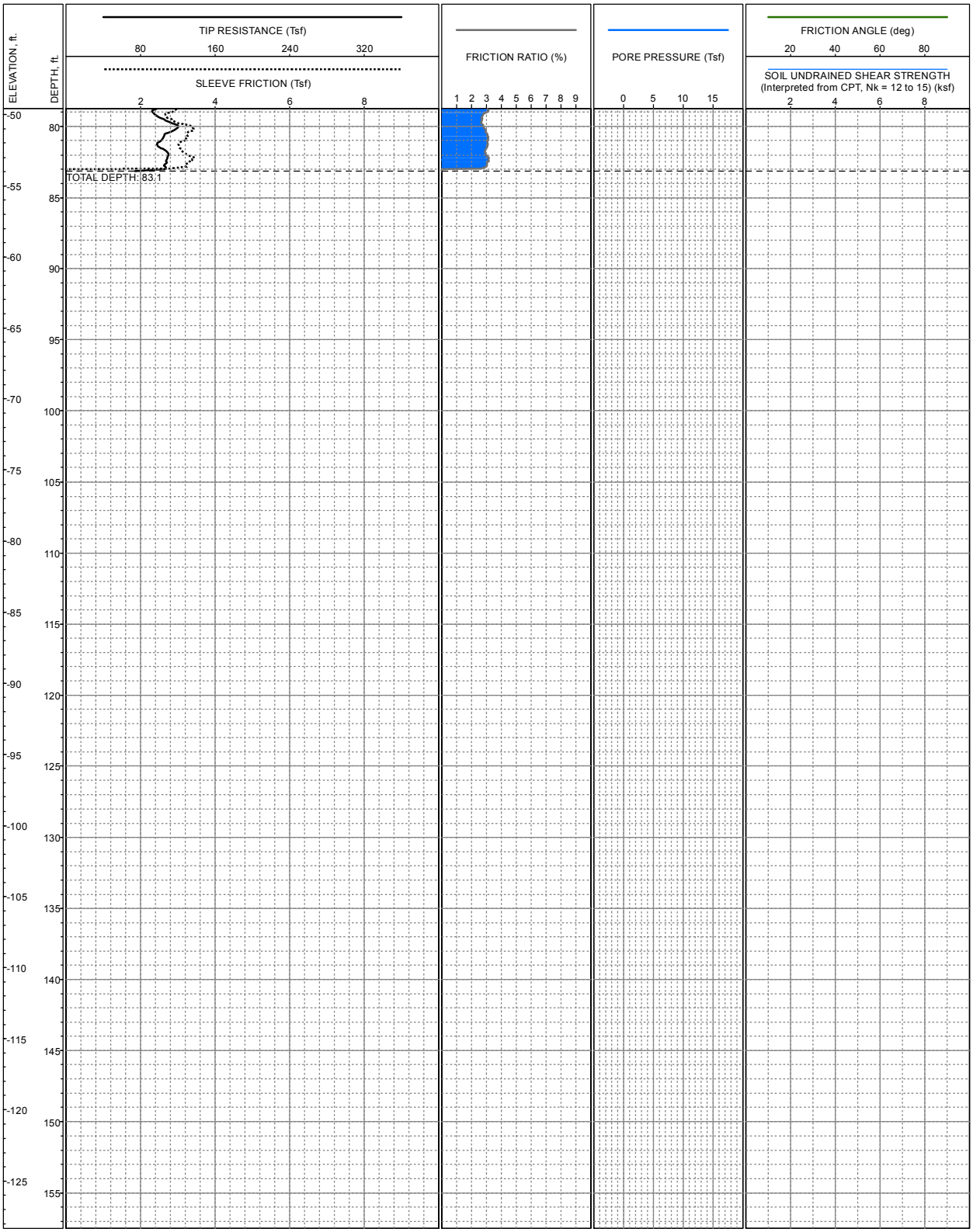

LOCATION: E5,998,066, N 1,979,856, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 29.2ft +/- ()
COMPLETION DEPTH: 83.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-51

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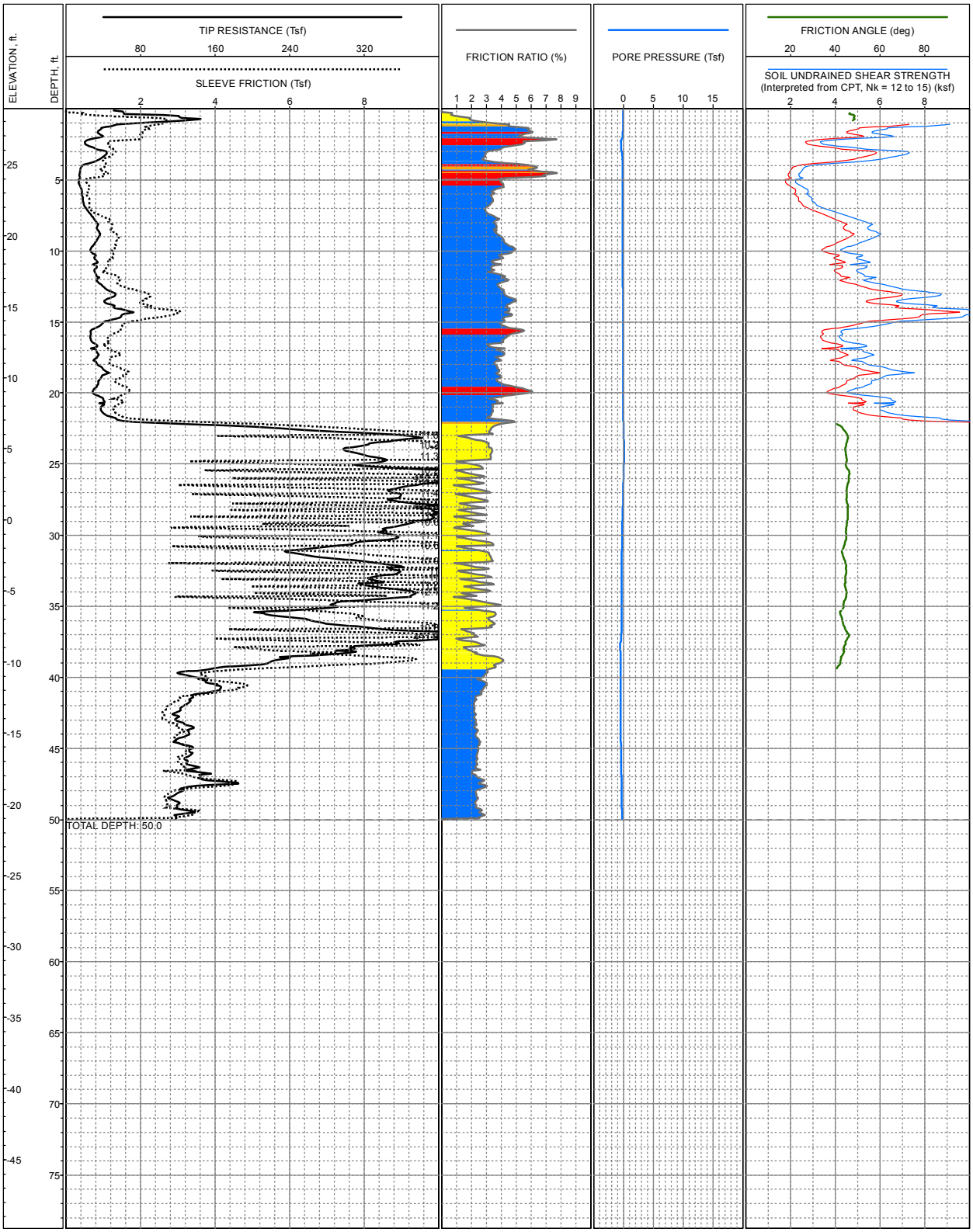

LOCATION: E5,998,066, N 1,979,866, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 28.9ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-51A

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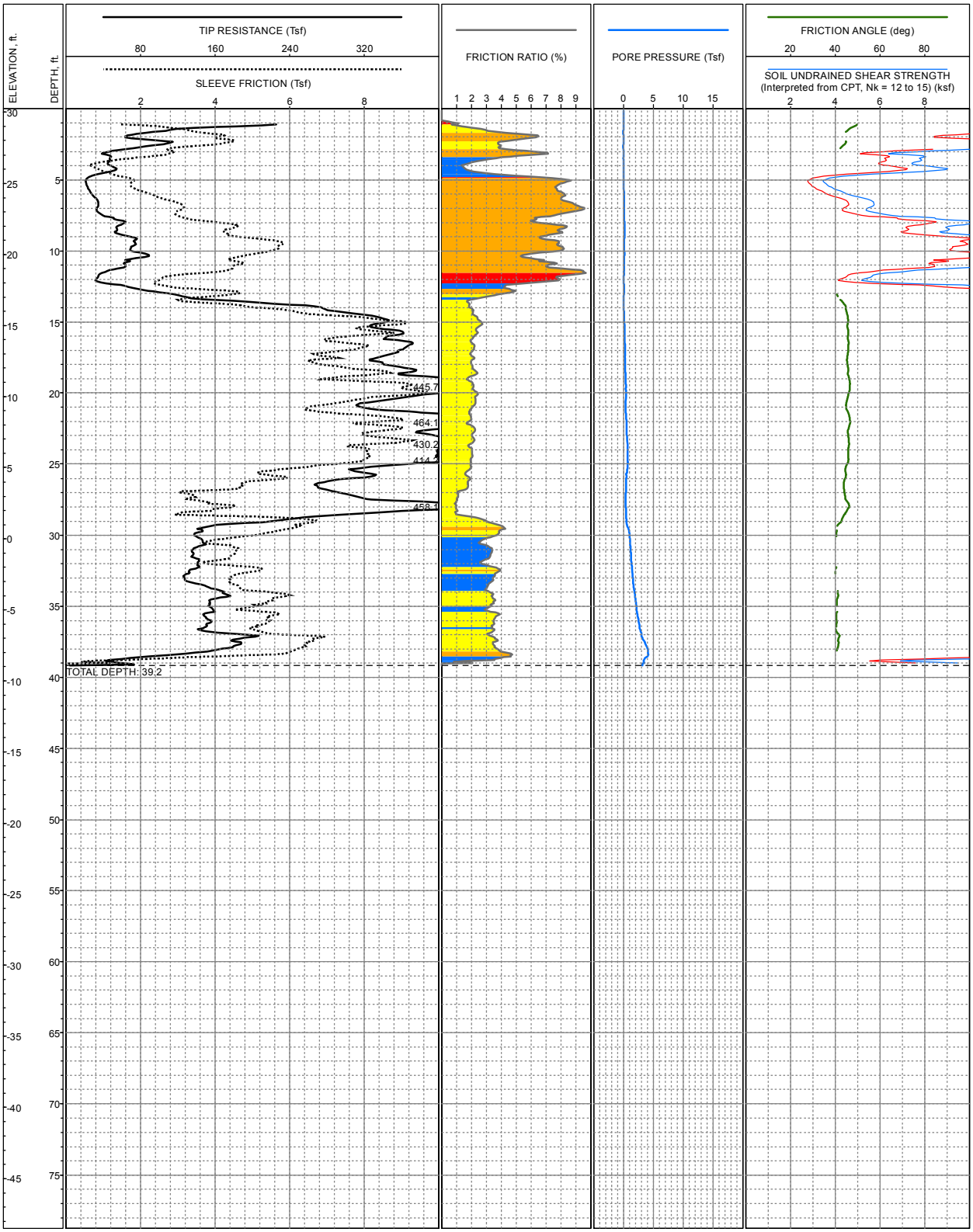

LOCATION: E5,998,065, N 1,979,821, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 30.3ft +/- ()
COMPLETION DEPTH: 39.2ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-52

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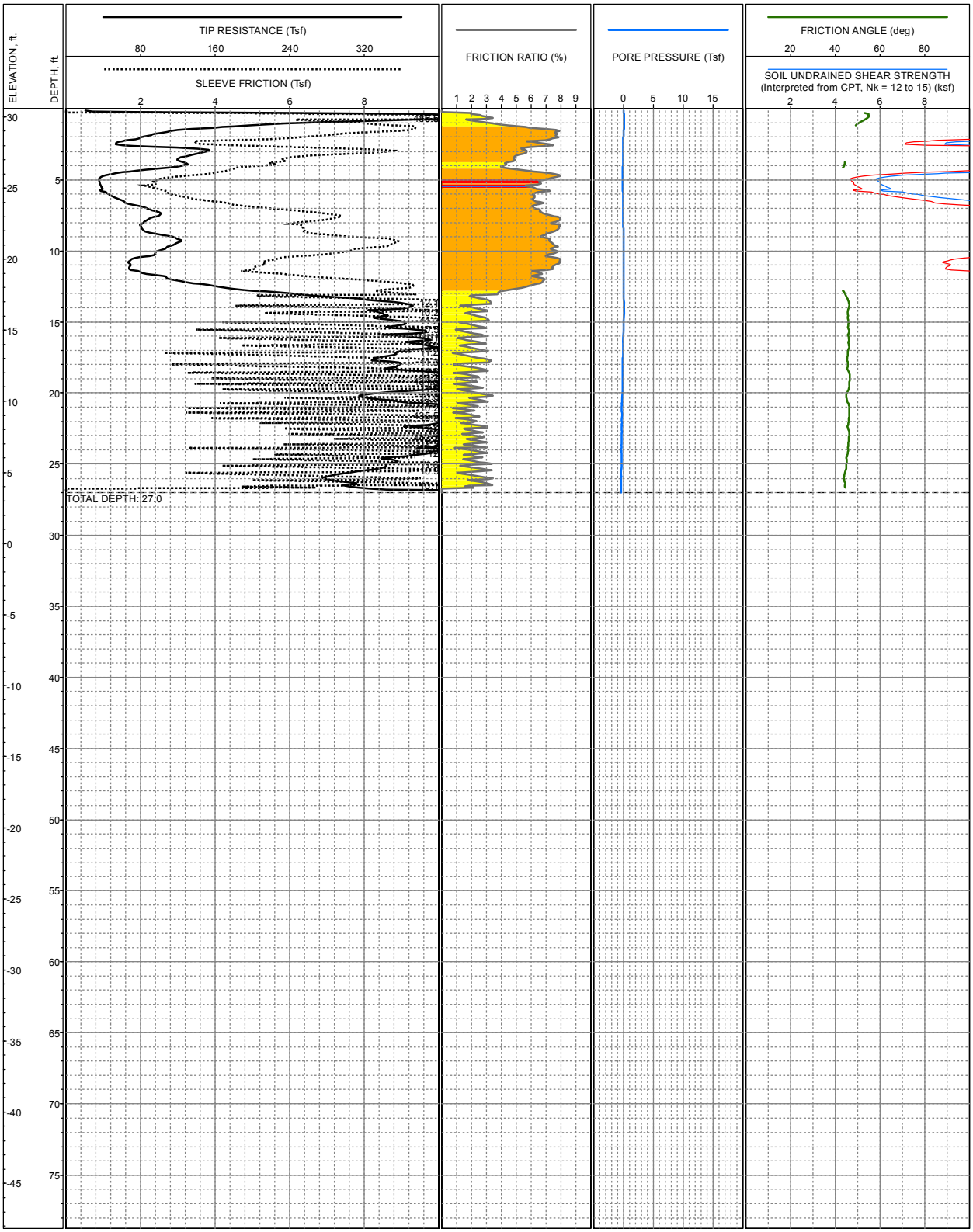

LOCATION: E5,998,064, N 1,979,811, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 30.6ft +/- ()
COMPLETION DEPTH: 27.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-52A

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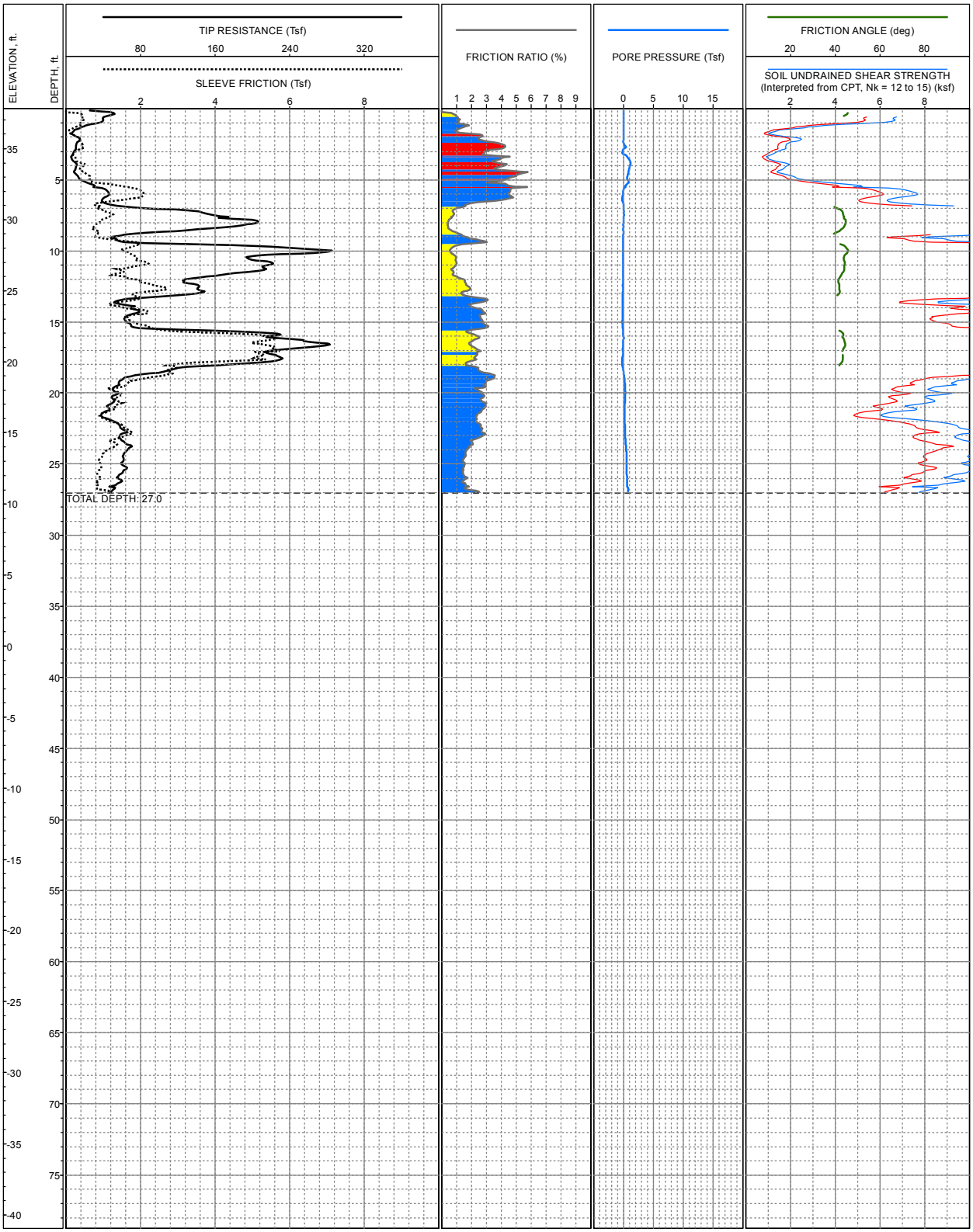

LOCATION: E5,997,912, N 1,979,586, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 37.8ft +/- ()
COMPLETION DEPTH: 27.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-53

San Joaquin Apartments & Precinct Improvements
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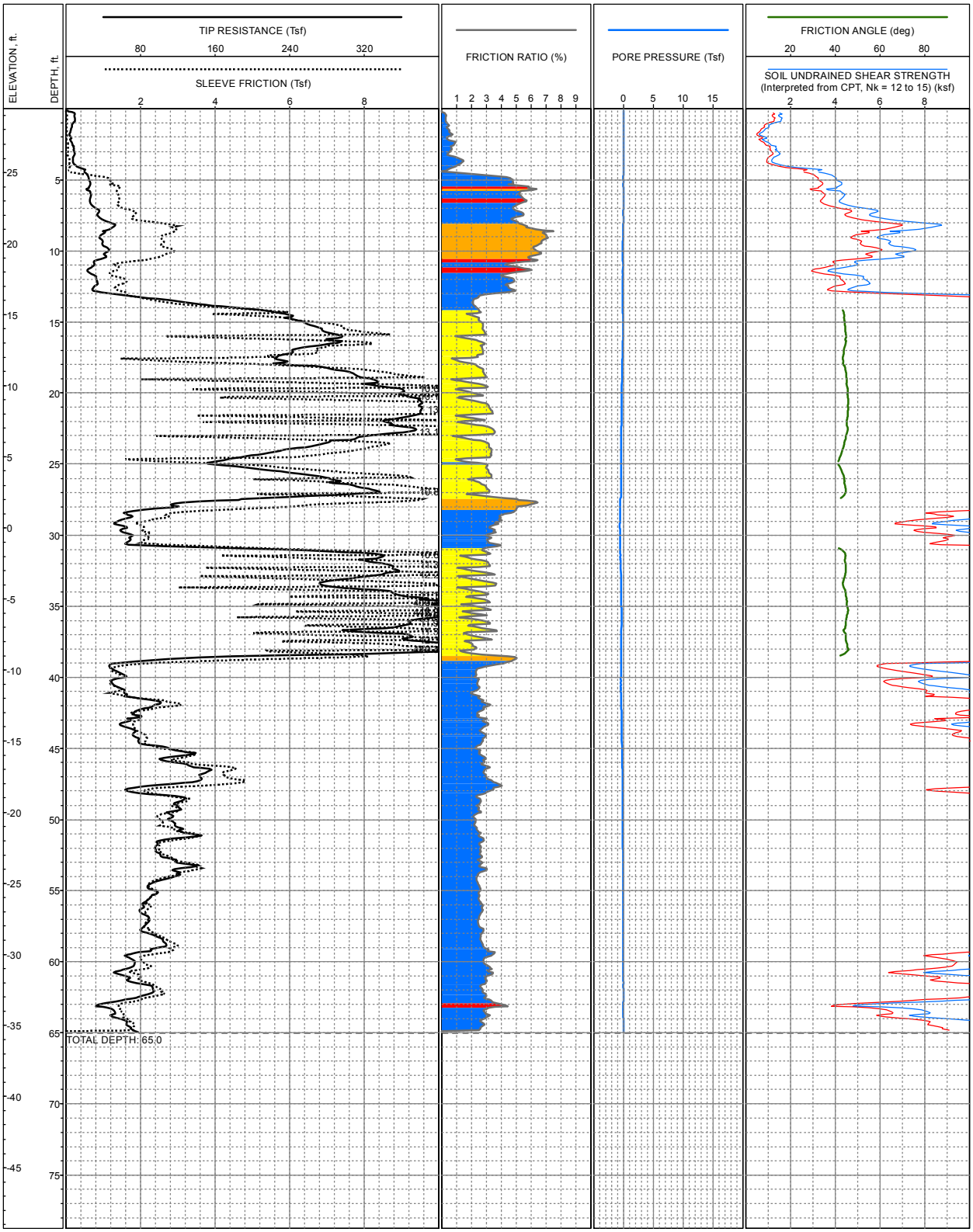

LOCATION: E5,998,065, N 1,979,844, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 29.5ft +/- ()
COMPLETION DEPTH: 65.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-54

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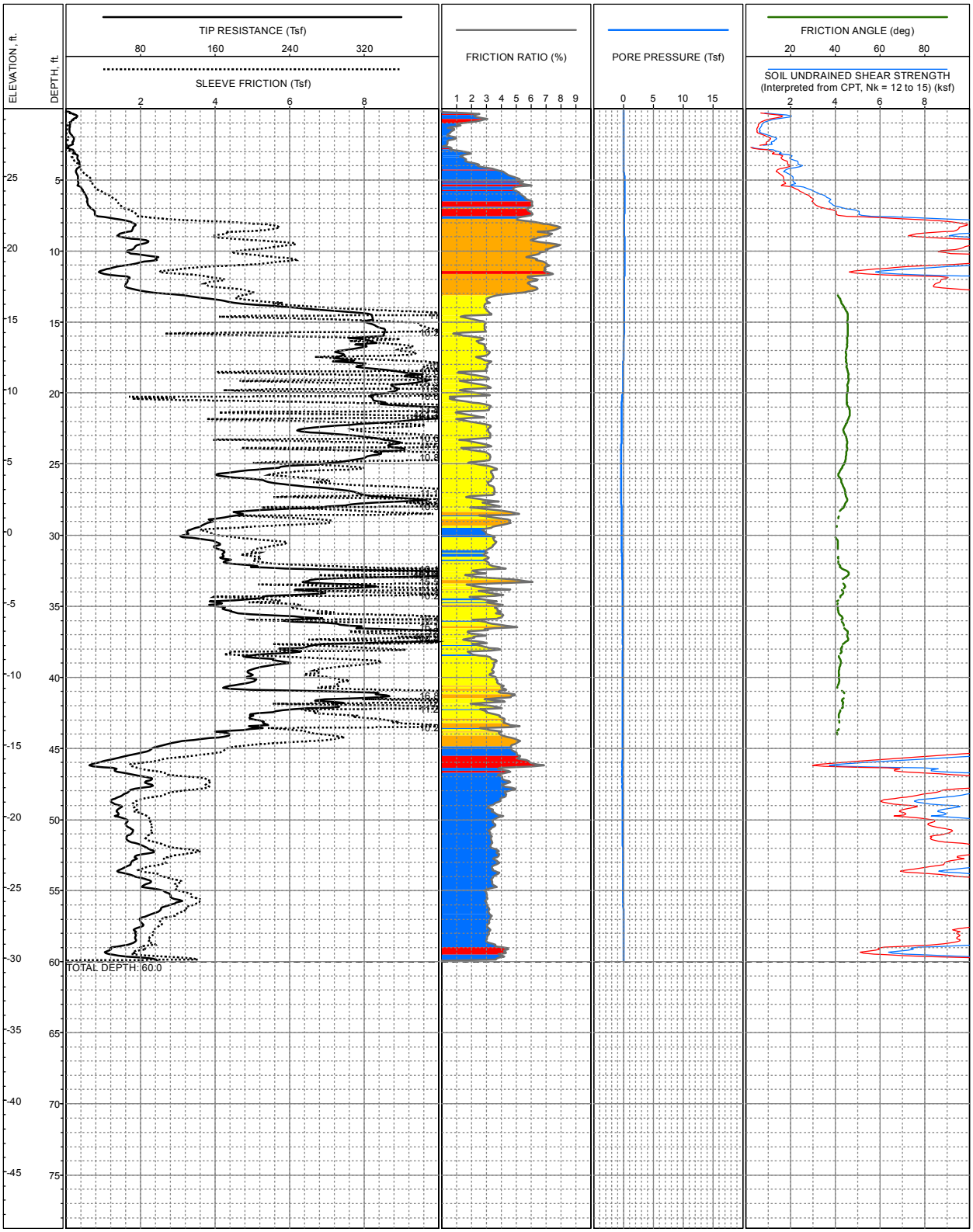

LOCATION: E5,998,065, N 1,979,835, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 29.8ft +/- ()
COMPLETION DEPTH: 60.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-55

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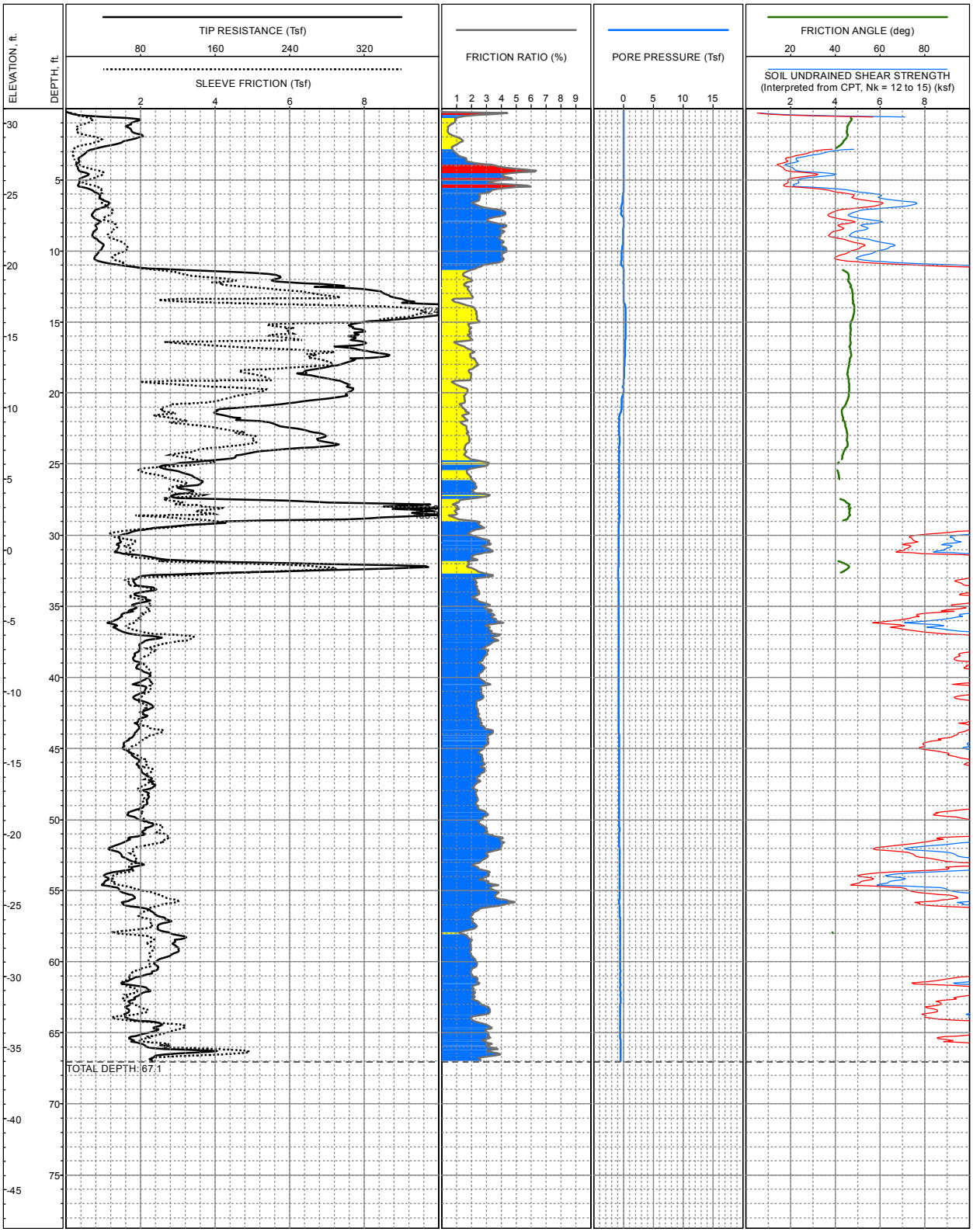

LOCATION: E5,998,705, N 1,979,507, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.0ft +/- ()
COMPLETION DEPTH: 67.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-56

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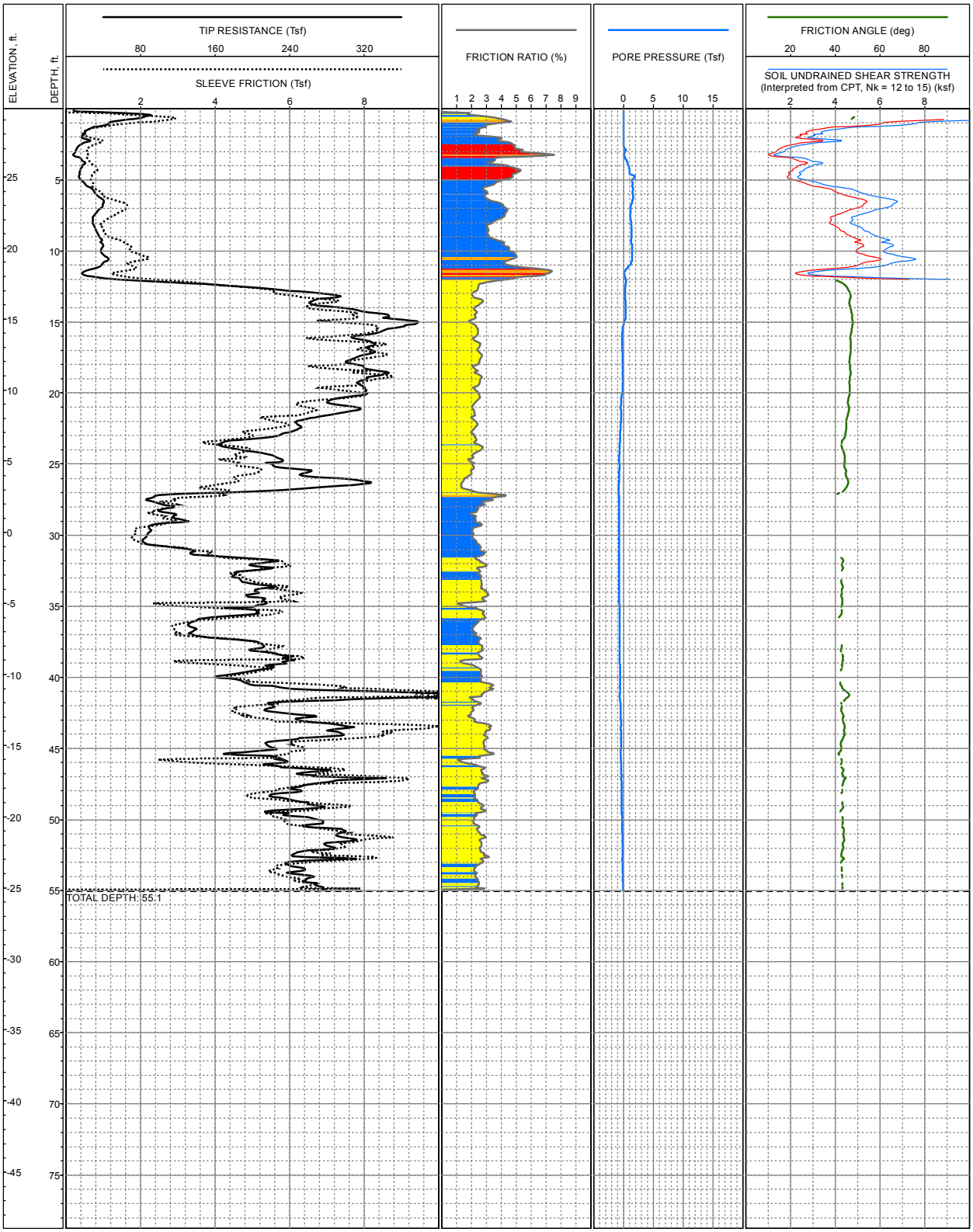

LOCATION: E5,998,724, N 1,979,542, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 29.8ft +/- ()
COMPLETION DEPTH: 55.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-57

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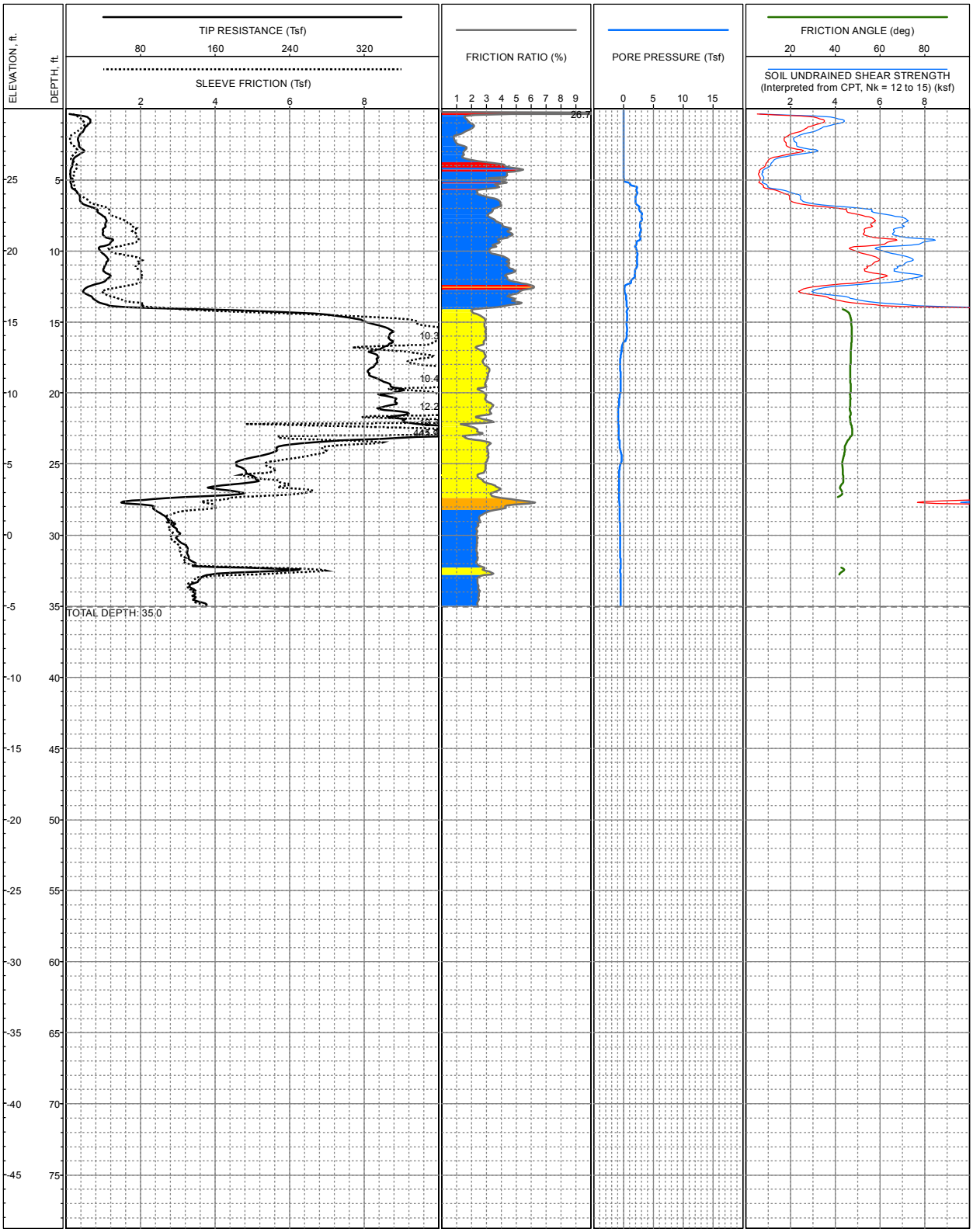

LOCATION: E5,998,731, N 1,979,566, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 30.0ft +/- ()
COMPLETION DEPTH: 35.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-57A

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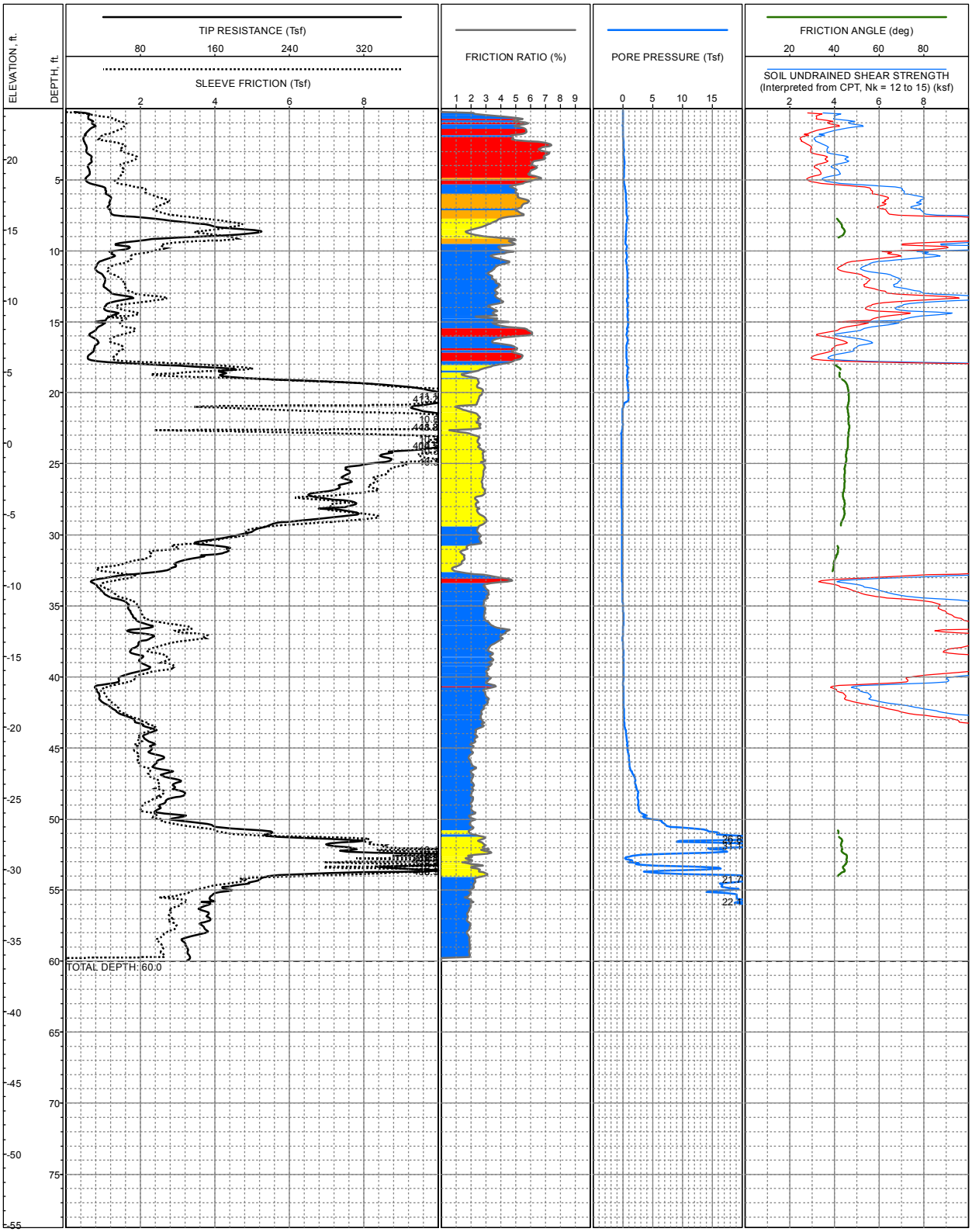

LOCATION: E5,998,279, N 1,979,923, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.6ft +/- ()
COMPLETION DEPTH: 60.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-58

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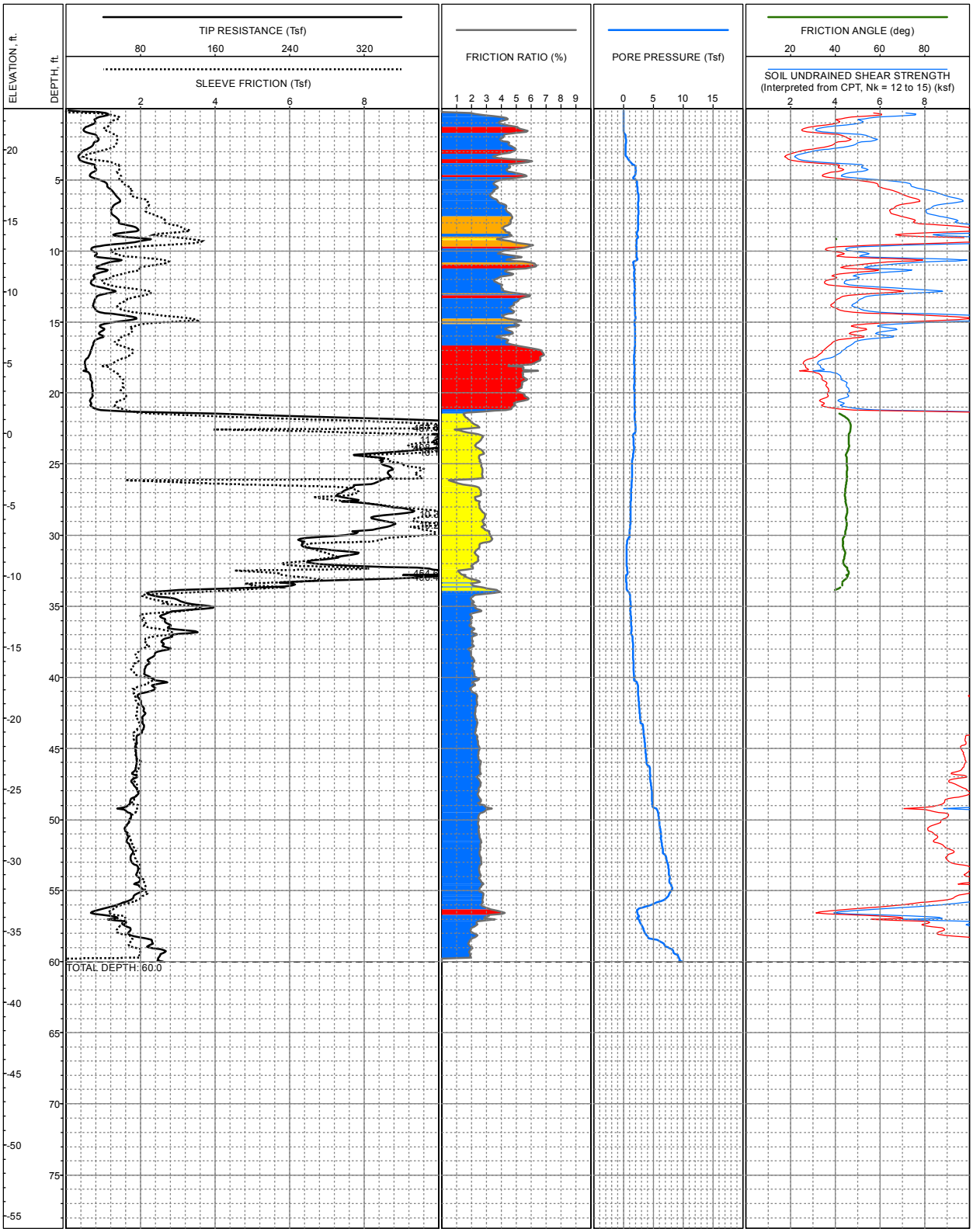

LOCATION: E5,998,280, N 1,979,948, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.9ft +/- ()
COMPLETION DEPTH: 60.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-59

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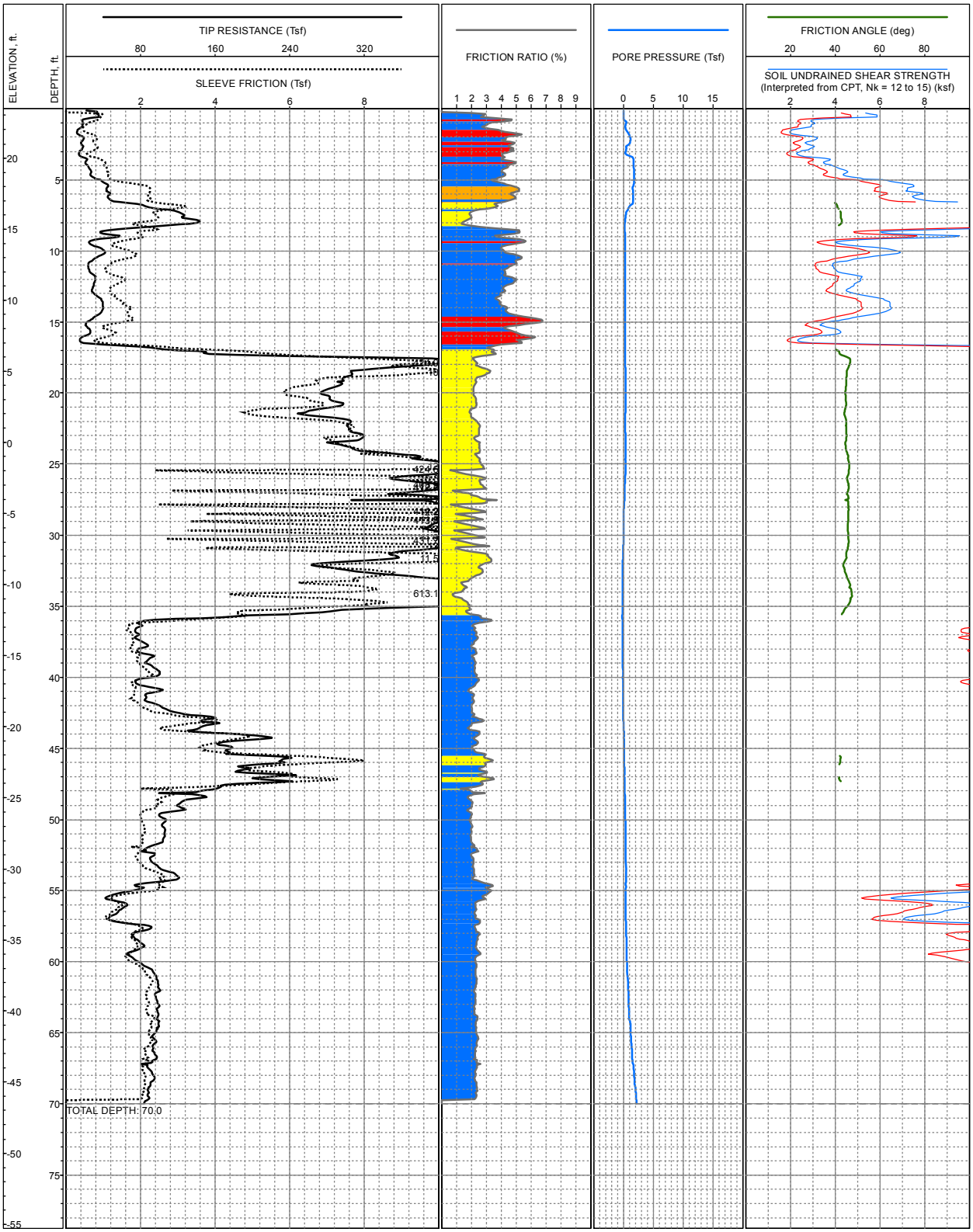

LOCATION: E5,998,279, N 1,979,911, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.5ft +/- ()
COMPLETION DEPTH: 70.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-60

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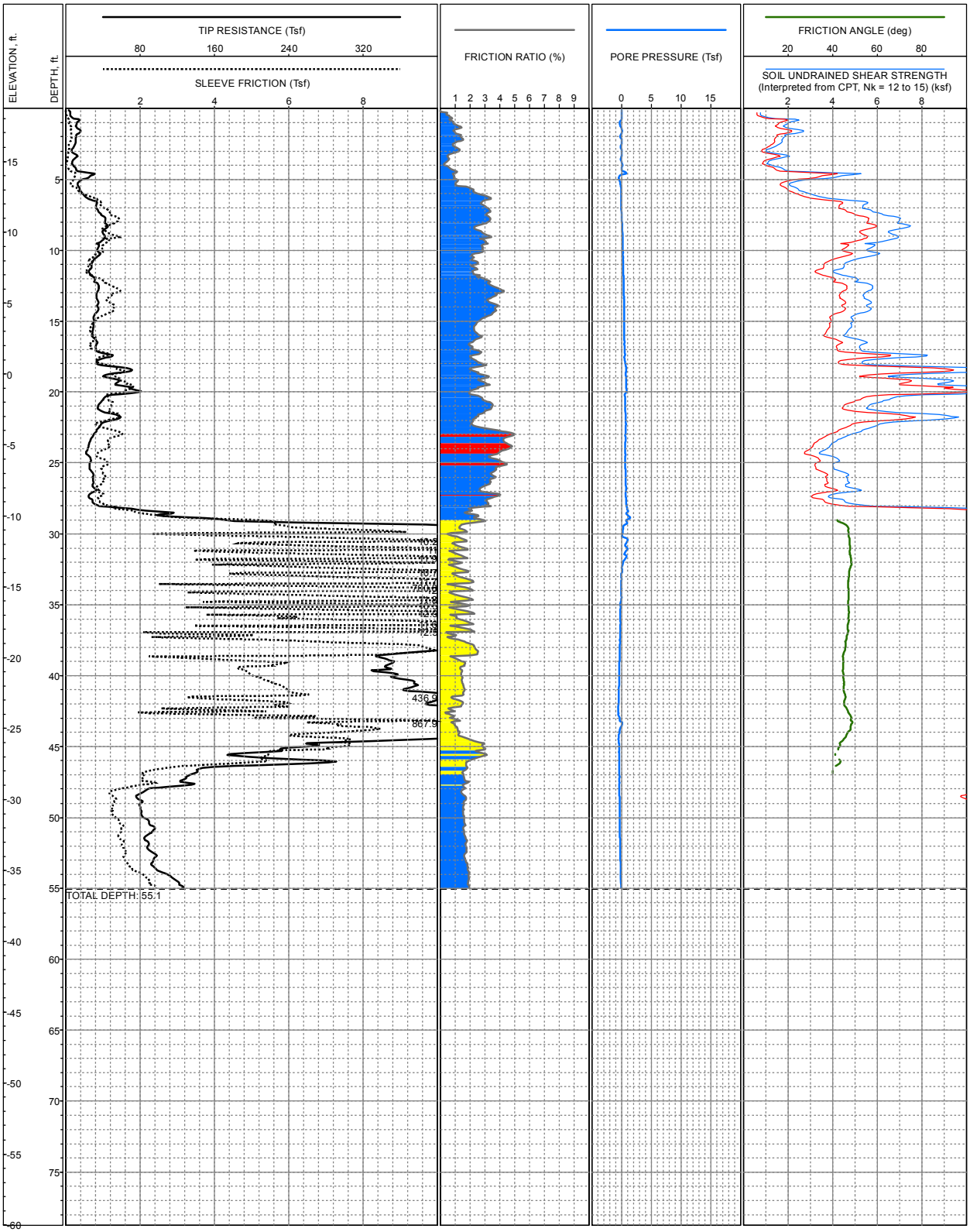

LOCATION: E5,998,716, N 1,979,878, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 18.7ft +/- ()
COMPLETION DEPTH: 55.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-61

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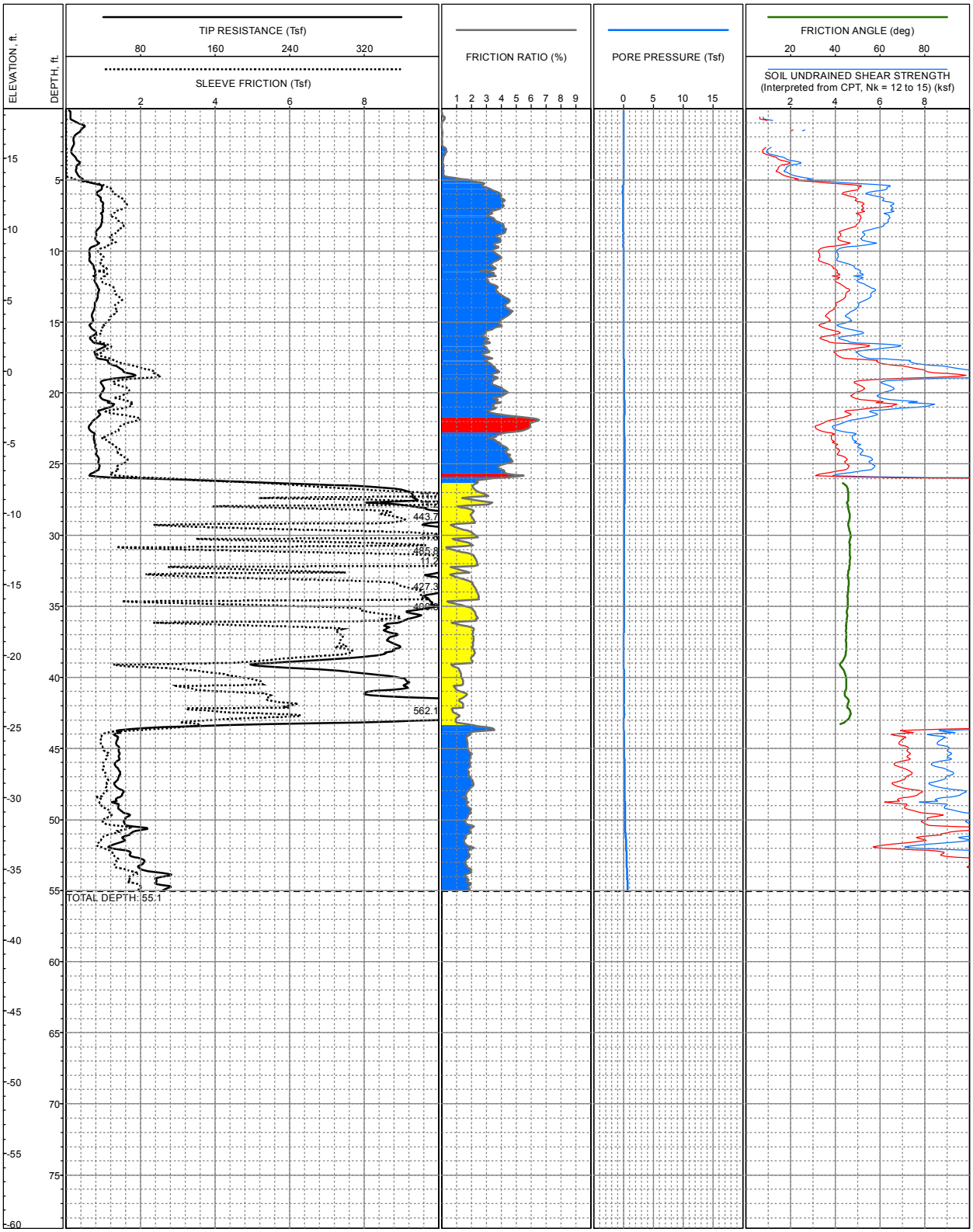

LOCATION: E5,998,715, N 1,979,902, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 18.5ft +/- ()
COMPLETION DEPTH: 55.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-62

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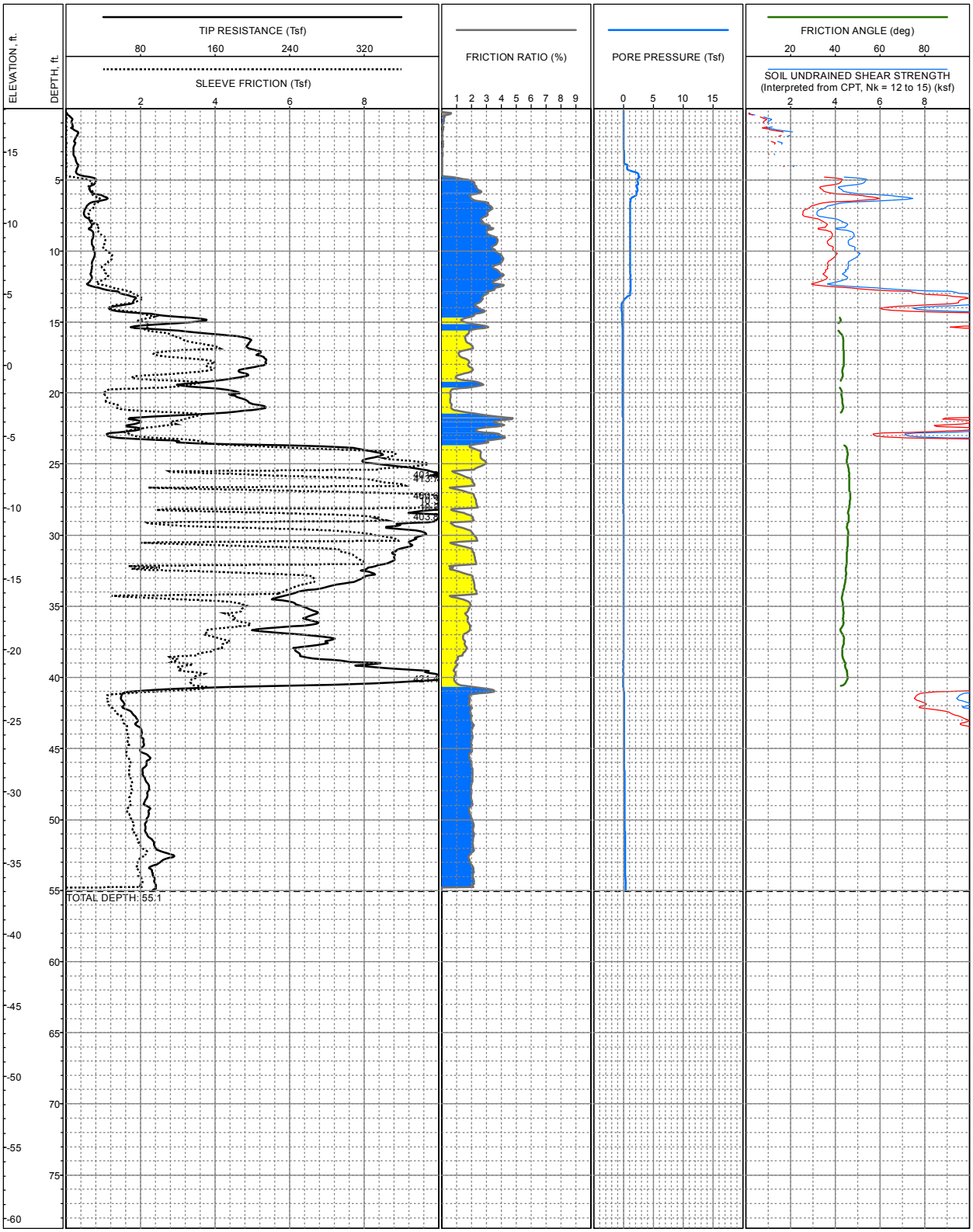

LOCATION: E5,998,716, N 1,979,930, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 18.1ft +/- ()
COMPLETION DEPTH: 55.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-63

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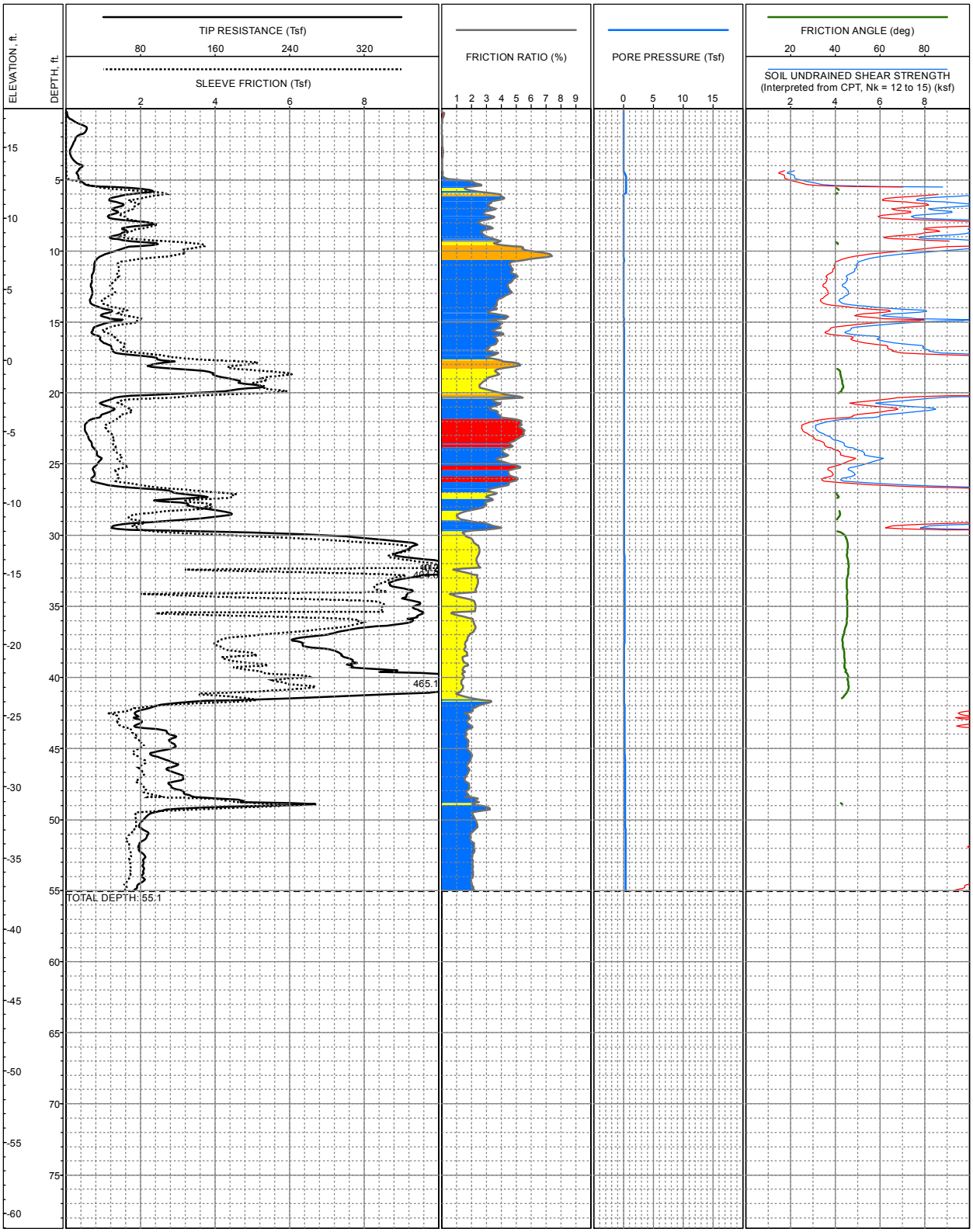

LOCATION: E5,998,716, N 1,979,957, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 17.7ft +/- ()
COMPLETION DEPTH: 55.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-64

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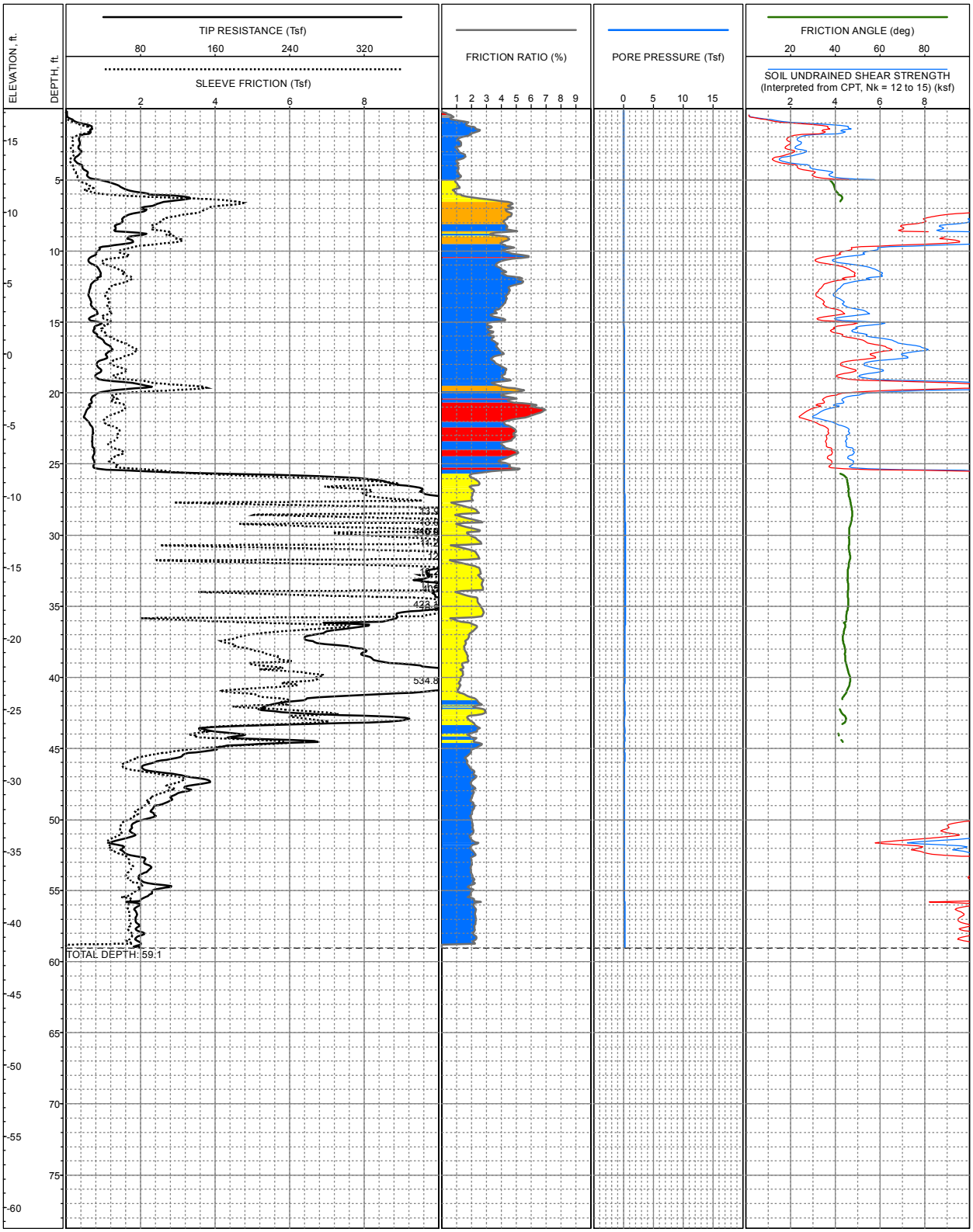

LOCATION: E5,998,716, N 1,979,981, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 17.3ft +/- ()
COMPLETION DEPTH: 59.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-65

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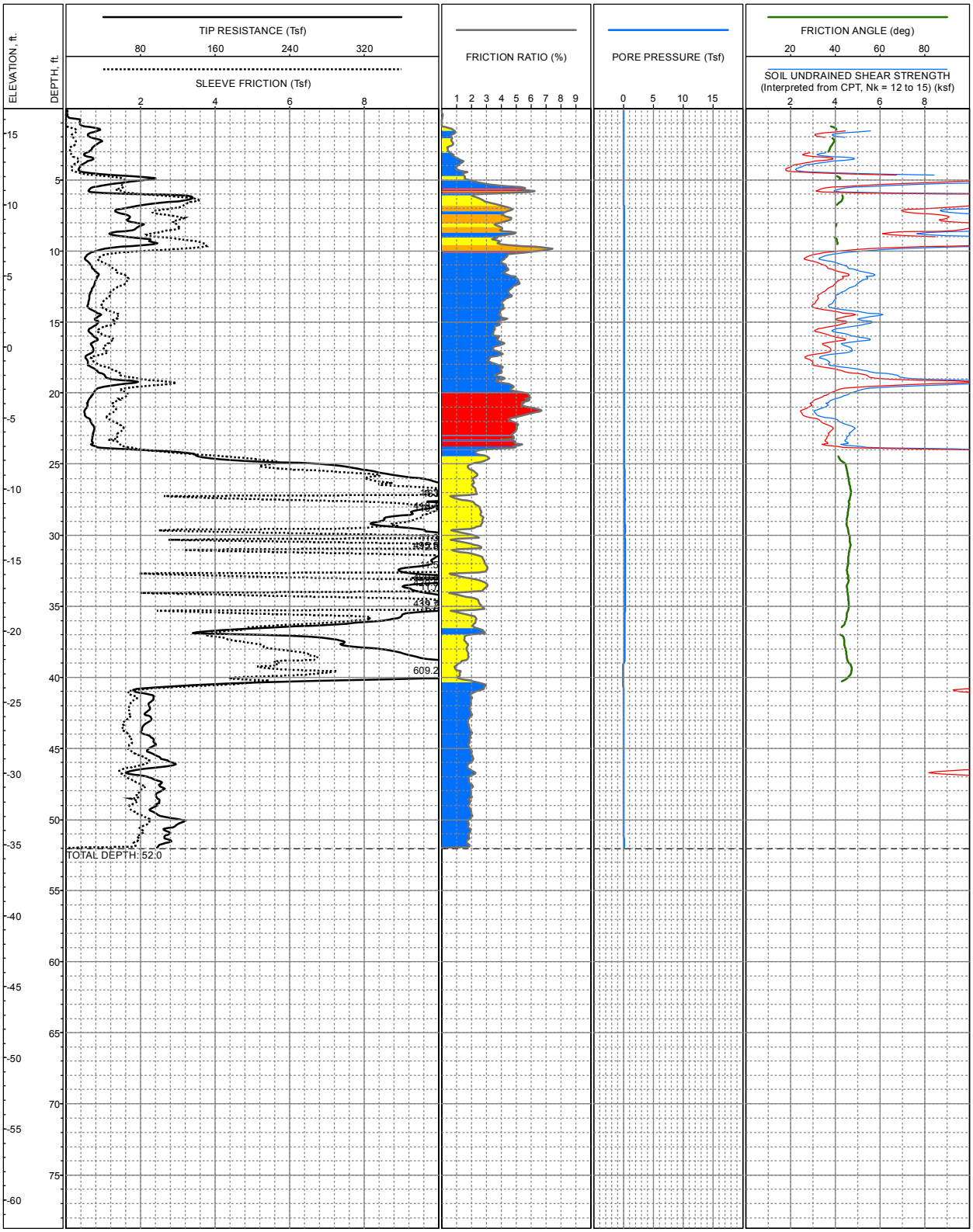

LOCATION: E5,998,715, N 1,980,006, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 16.8ft +/- ()
COMPLETION DEPTH: 52.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-66

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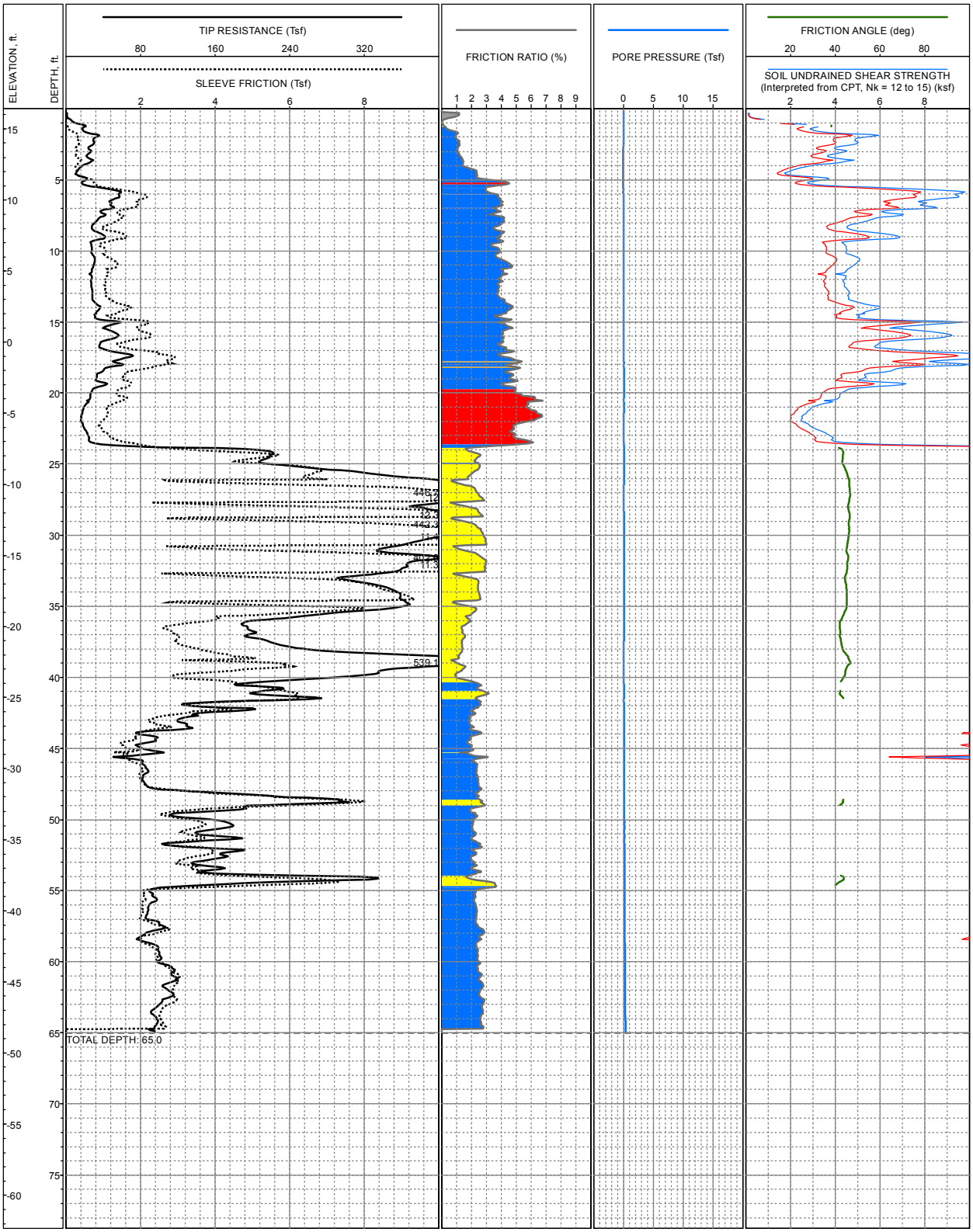

LOCATION: E5,998,715, N 1,980,034, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 16.4ft +/- ()
COMPLETION DEPTH: 65.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-67

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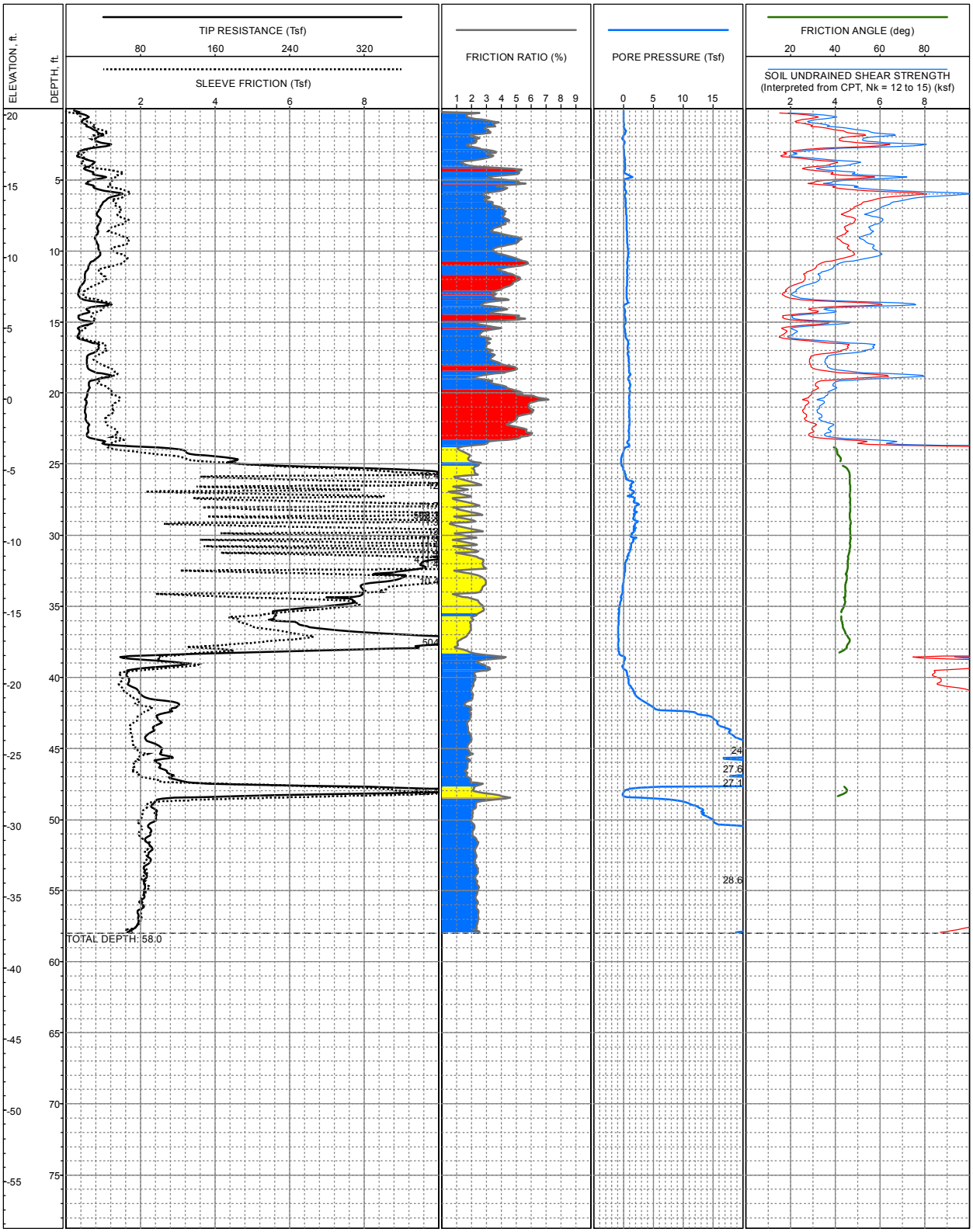

LOCATION: E5,998,557, N 1,980,025, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 20.5ft +/- ()
COMPLETION DEPTH: 58.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-68

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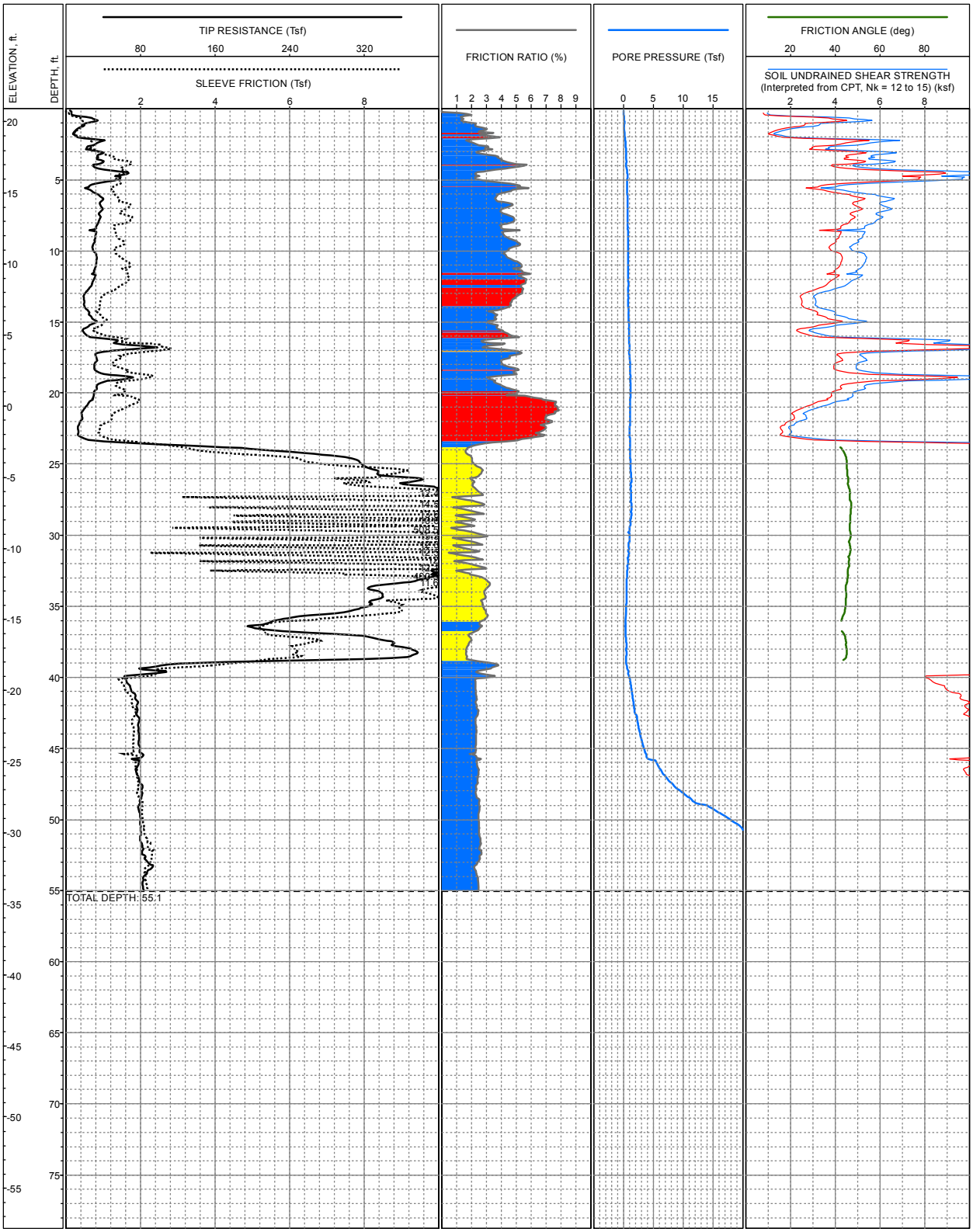

LOCATION: E5,998,556, N 1,979,996, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 20.9ft +/- ()
COMPLETION DEPTH: 55.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-69

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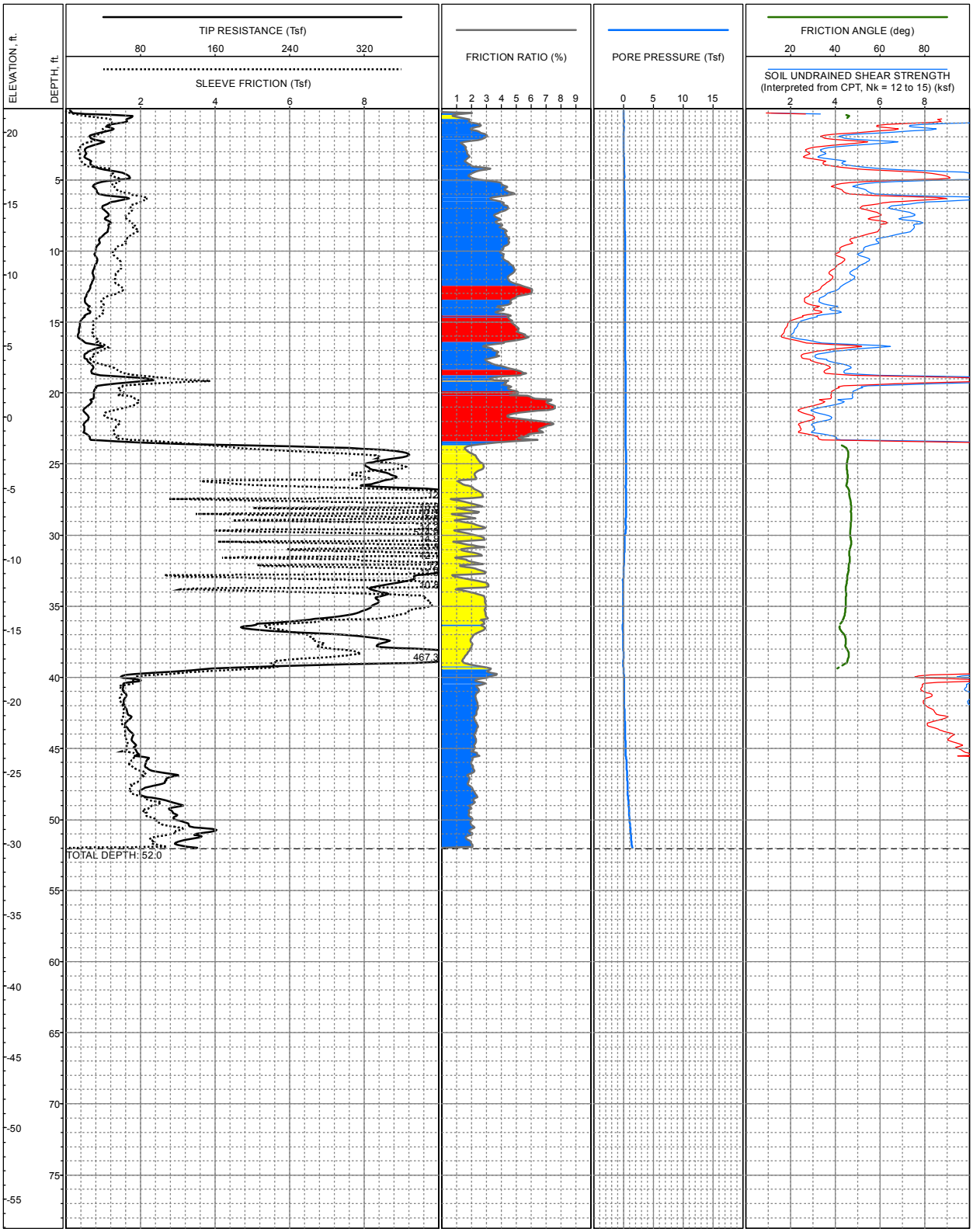

LOCATION: E5,998,555, N 1,979,967, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 21.7ft +/- ()
COMPLETION DEPTH: 52.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-70

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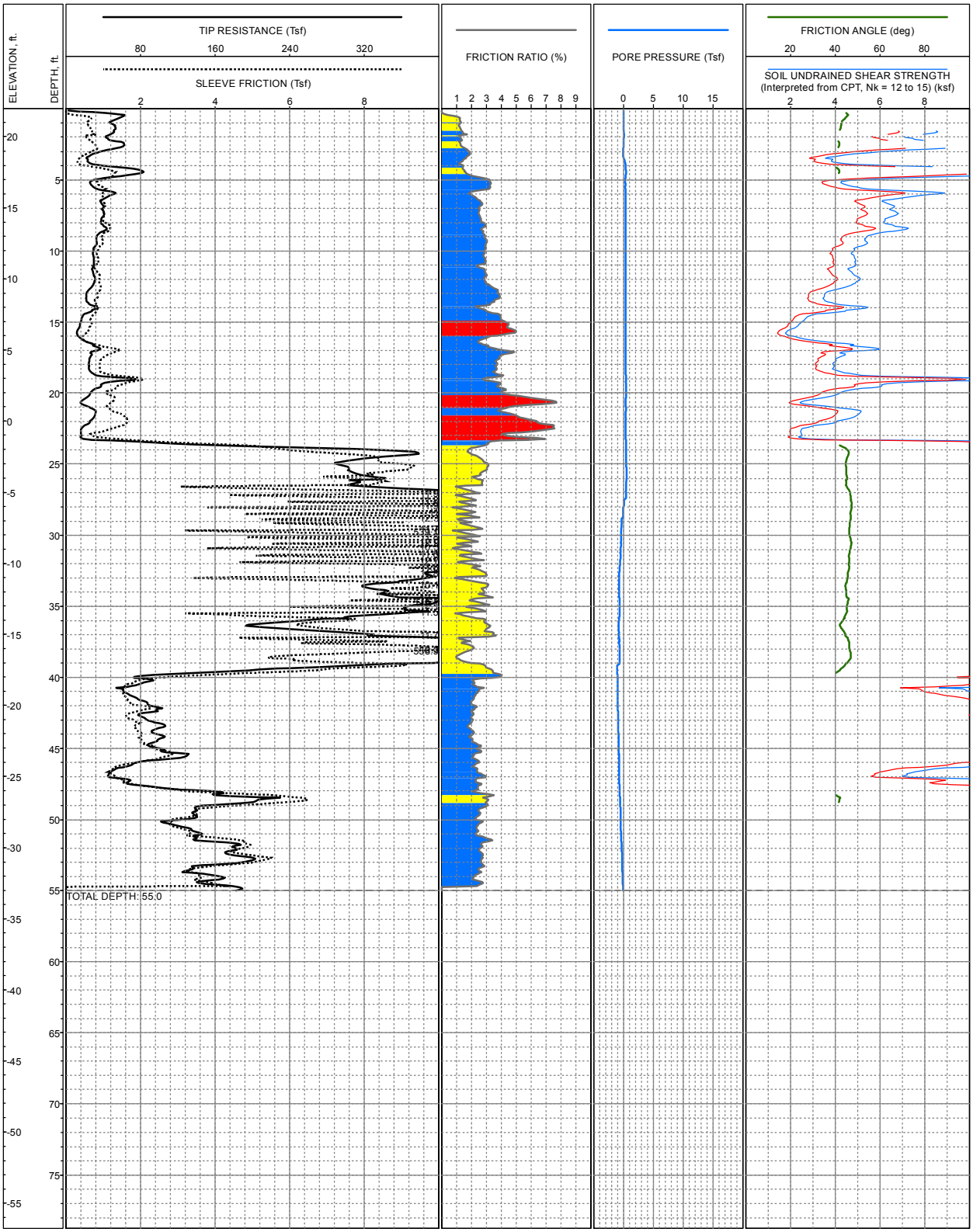

LOCATION: E5,998,553, N 1,979,958, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.0ft +/- ()
COMPLETION DEPTH: 55.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-71

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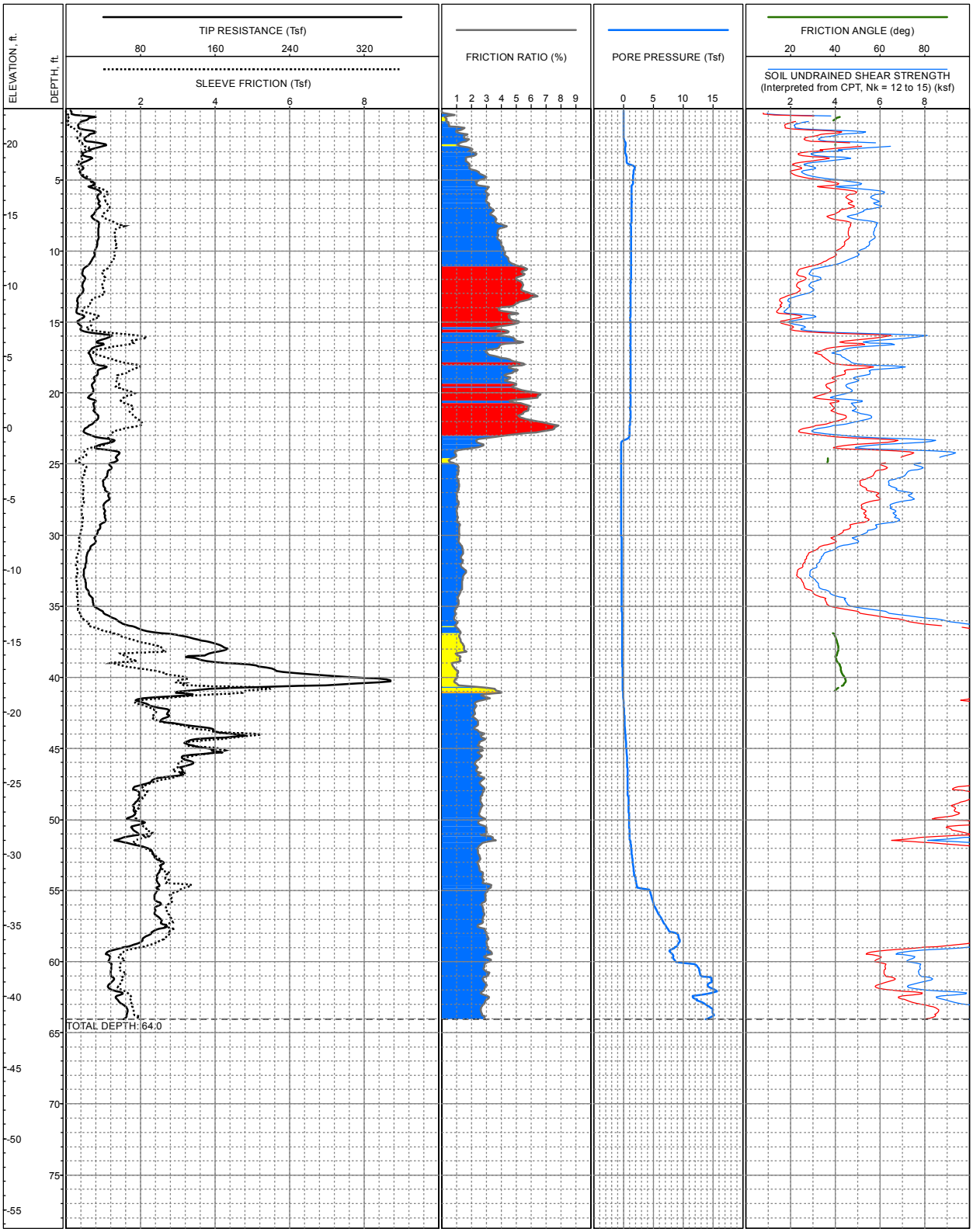

LOCATION: E5,998,557, N 1,979,942, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.4ft +/- ()
COMPLETION DEPTH: 64.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-72

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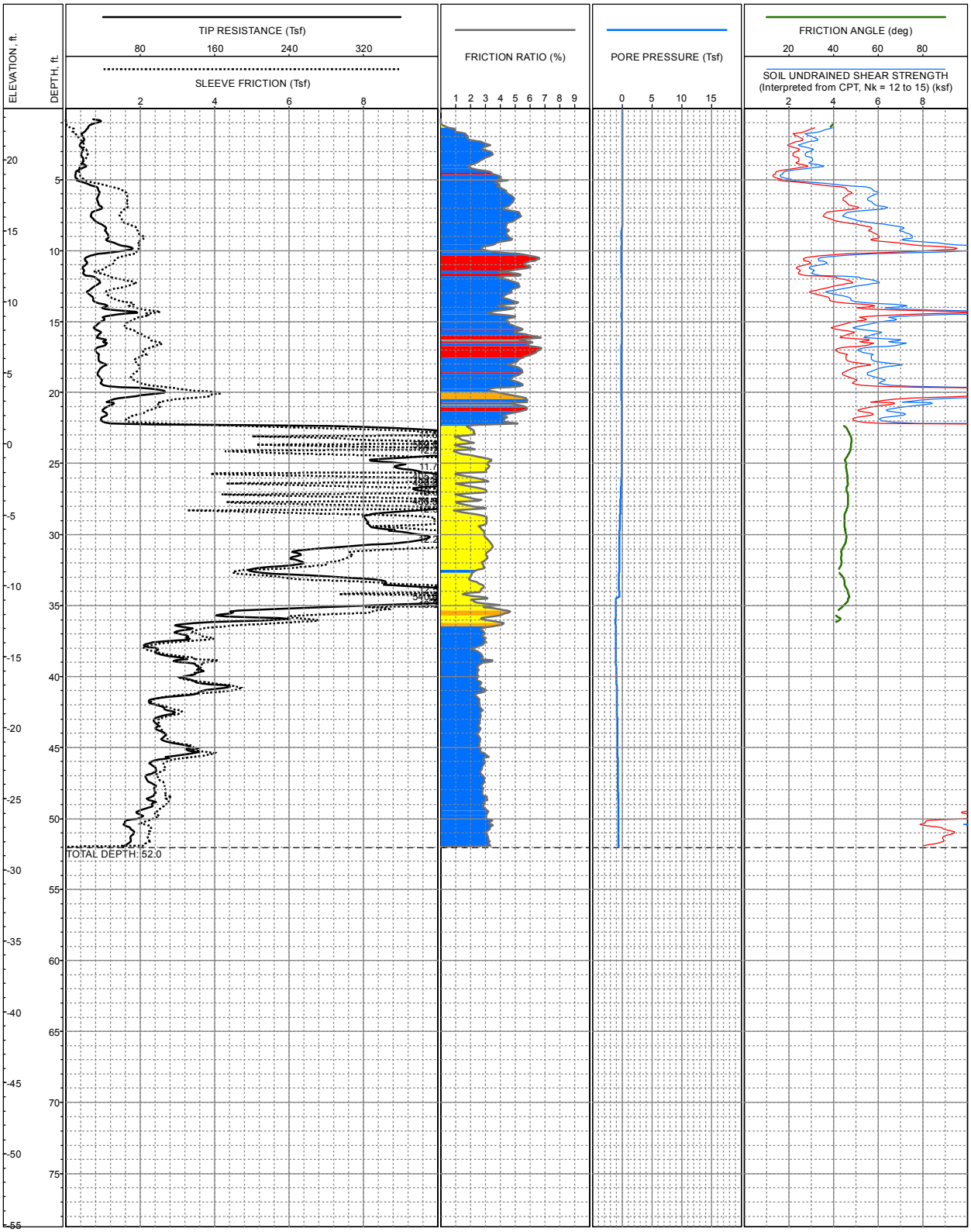

LOCATION: E5,998,563, N 1,979,911, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.6ft +/- ()
COMPLETION DEPTH: 52.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-73

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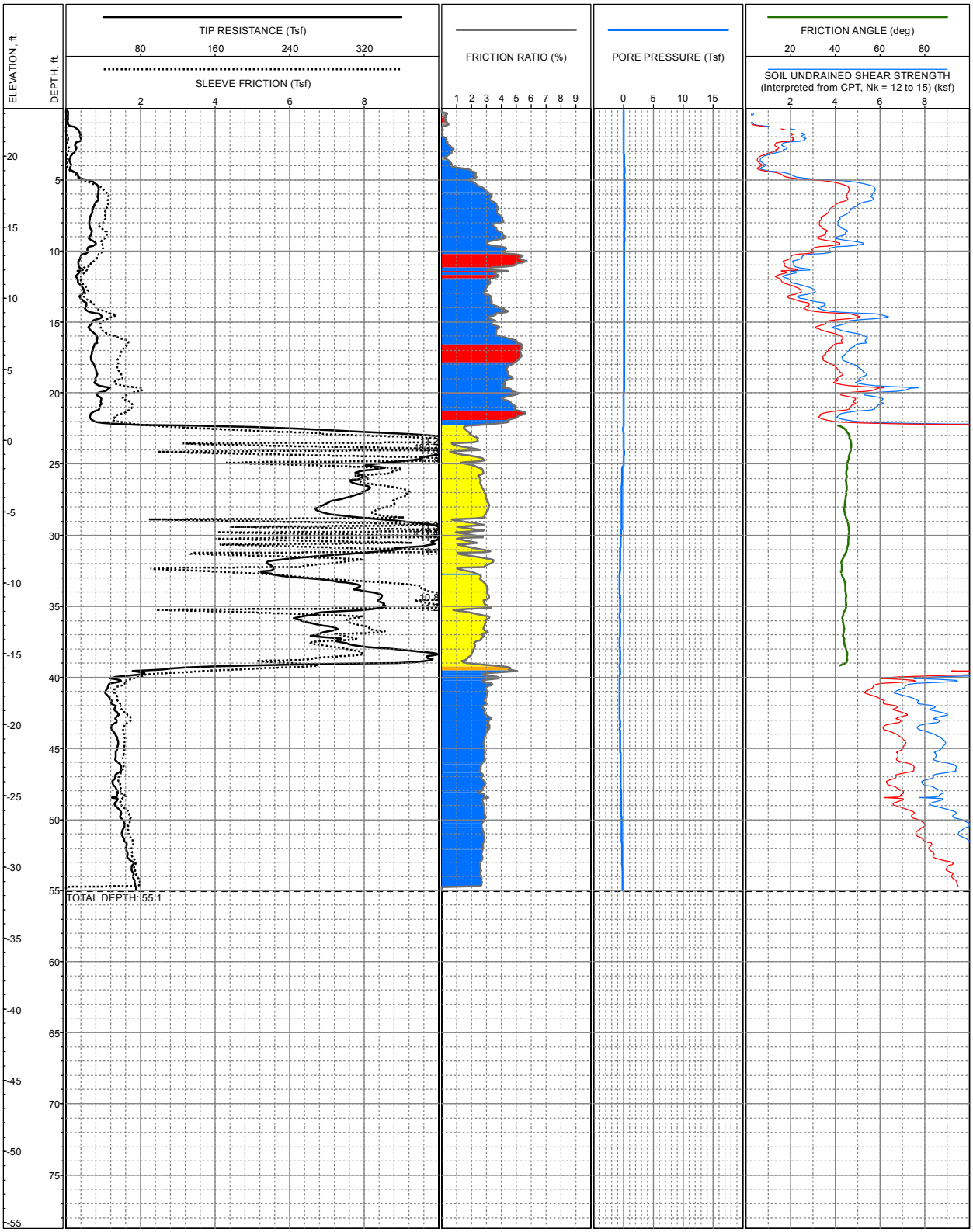

LOCATION: E5,998,560, N 1,979,925, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.3ft +/- ()
COMPLETION DEPTH: 55.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-74

San Joaquin Apartments & Precinct Improvements
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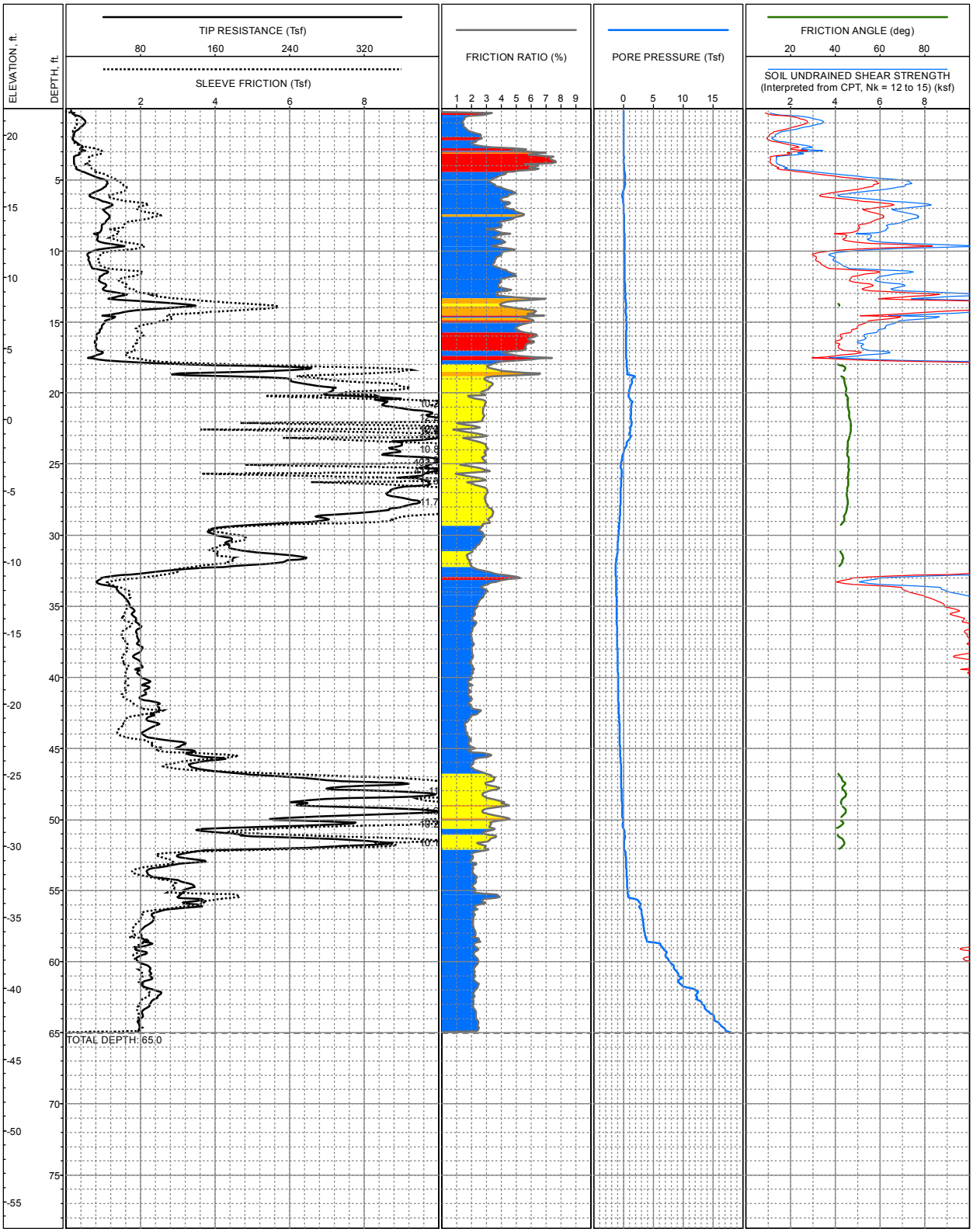

LOCATION: E5,998,281, N 1,980,135, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 21.9ft +/- ()
COMPLETION DEPTH: 65.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-75

San Joaquin Apartments & Precinct Improvements
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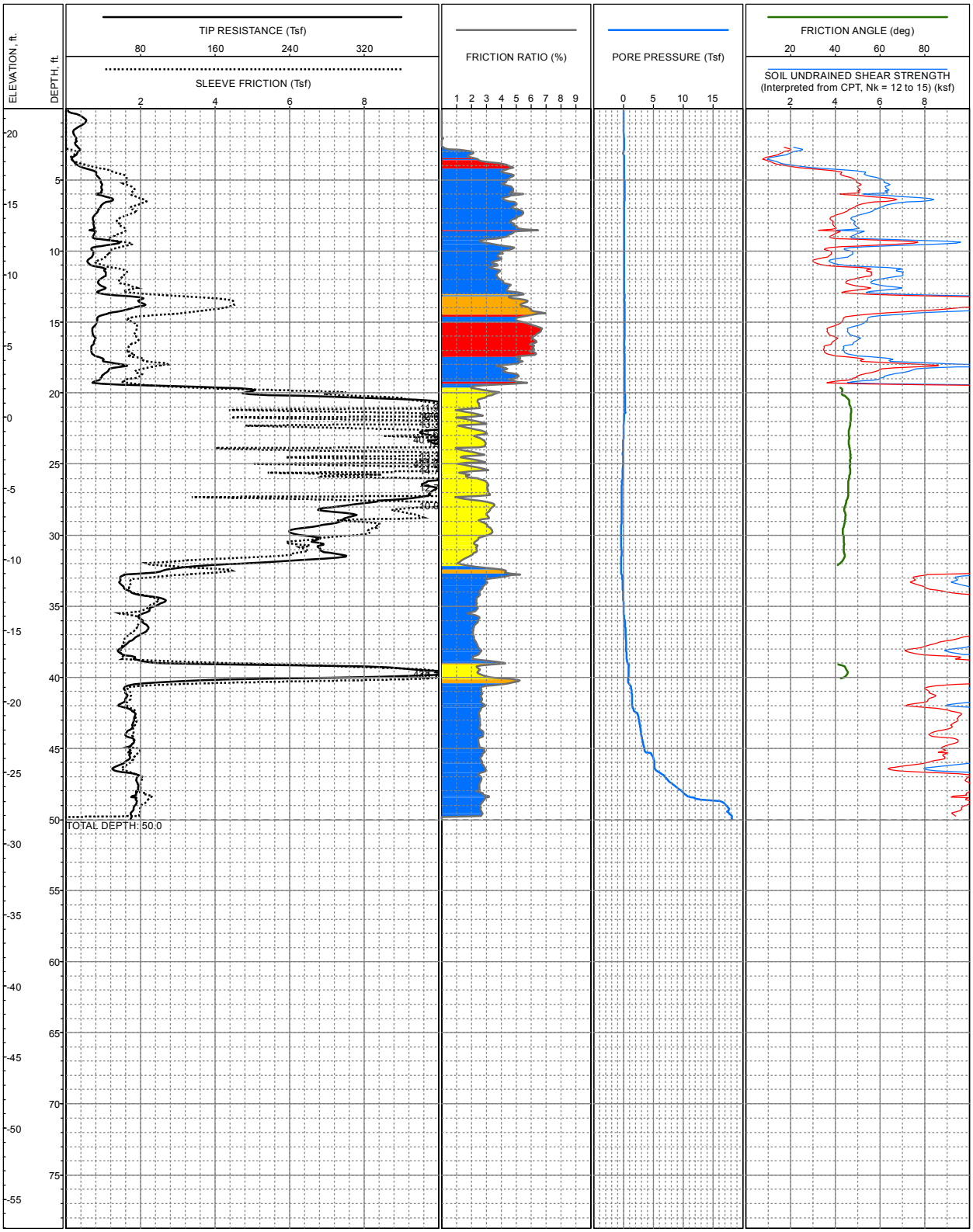

LOCATION: E5,998,280, N 1,980,066, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 21.7ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-76

San Joaquin Apartments & Precinct Improvements
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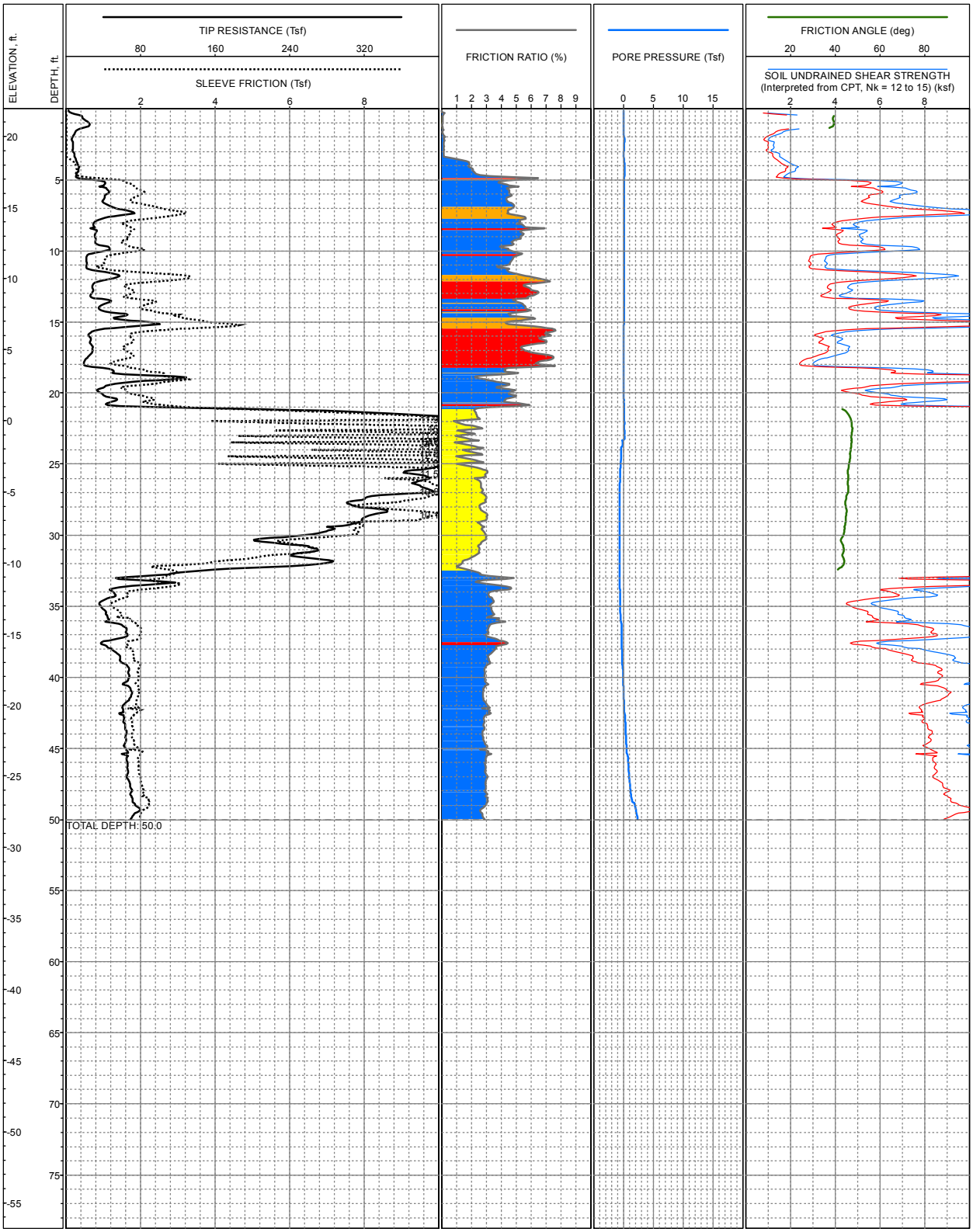

LOCATION: E5,998,280, N 1,980,035, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 21.9ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-77

San Joaquin Apartments & Precinct Improvements
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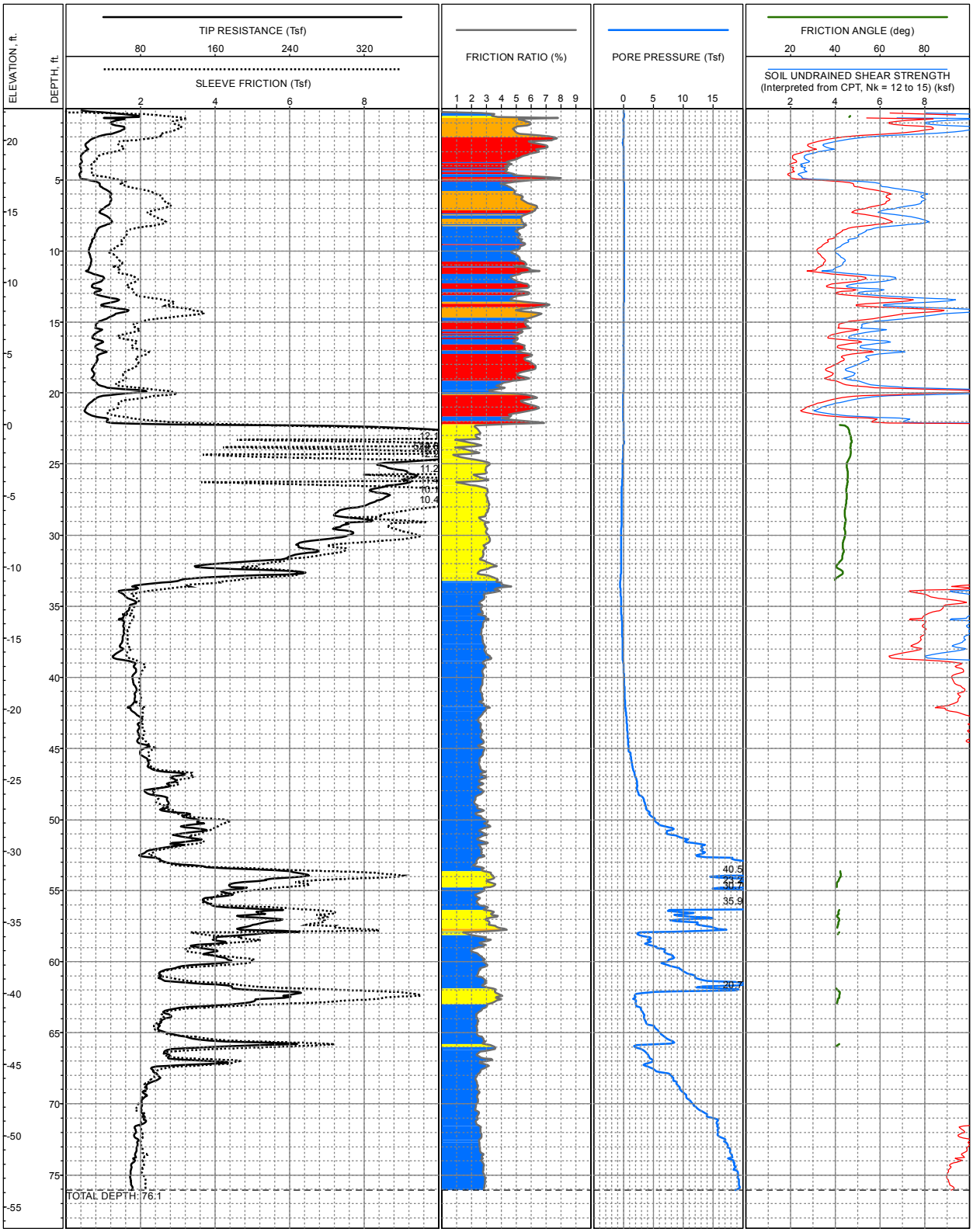

LOCATION: E5,998,281, N 1,980,006, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.2ft +/- ()
COMPLETION DEPTH: 76.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-78

San Joaquin Apartments & Precinct Improvements
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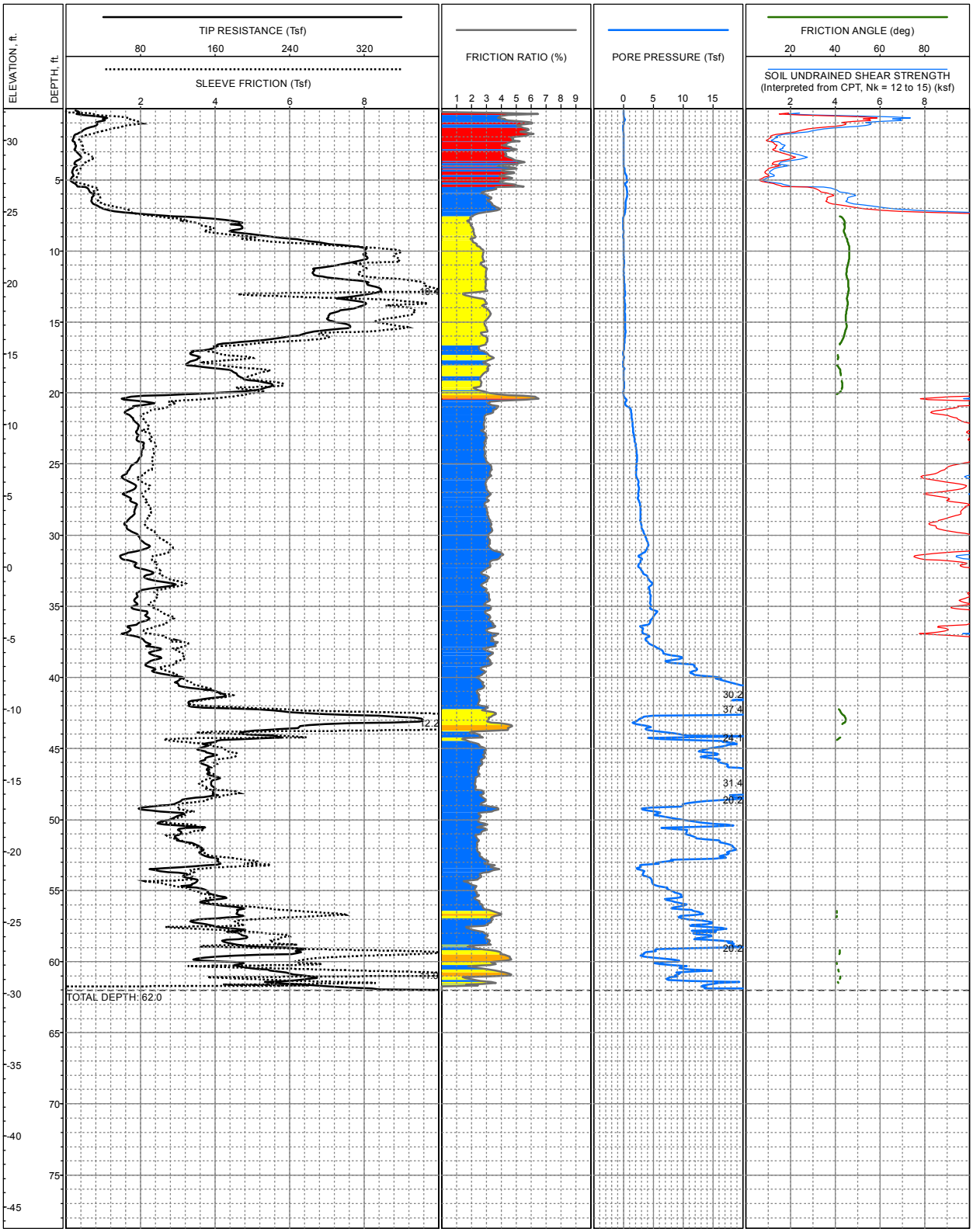

LOCATION: E5,998,520, N 1,979,543, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.2ft +/- ()
COMPLETION DEPTH: 62.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-79

San Joaquin Apartments & Precinct Improvements
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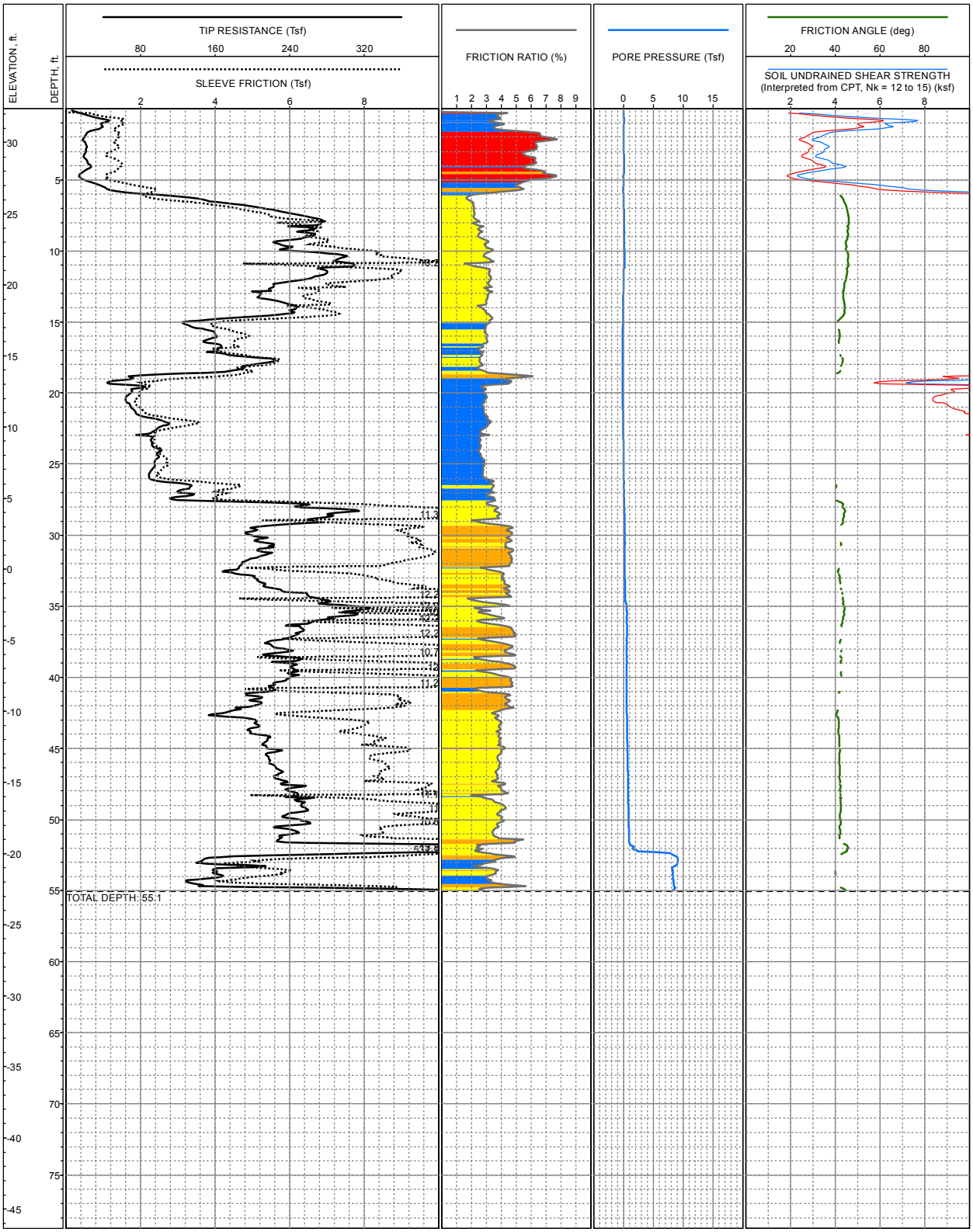

LOCATION: E5,998,519, N 1,979,477, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.4ft +/- ()
COMPLETION DEPTH: 55.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-80

San Joaquin Apartments & Precinct Improvements
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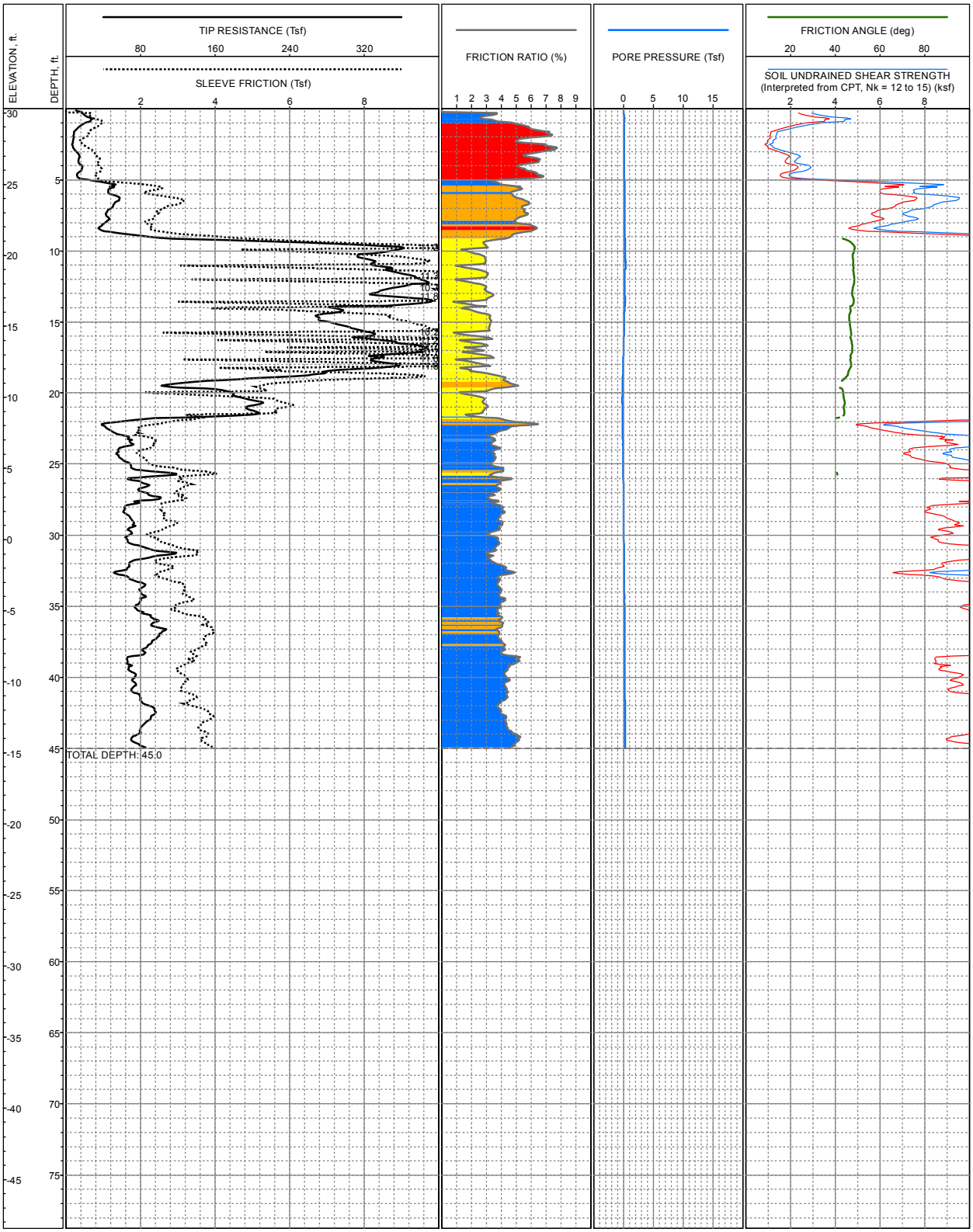

LOCATION: E5,998,703, N 1,979,472, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 30.3ft +/- ()
COMPLETION DEPTH: 45.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-81

San Joaquin Apartments & Precinct Improvements
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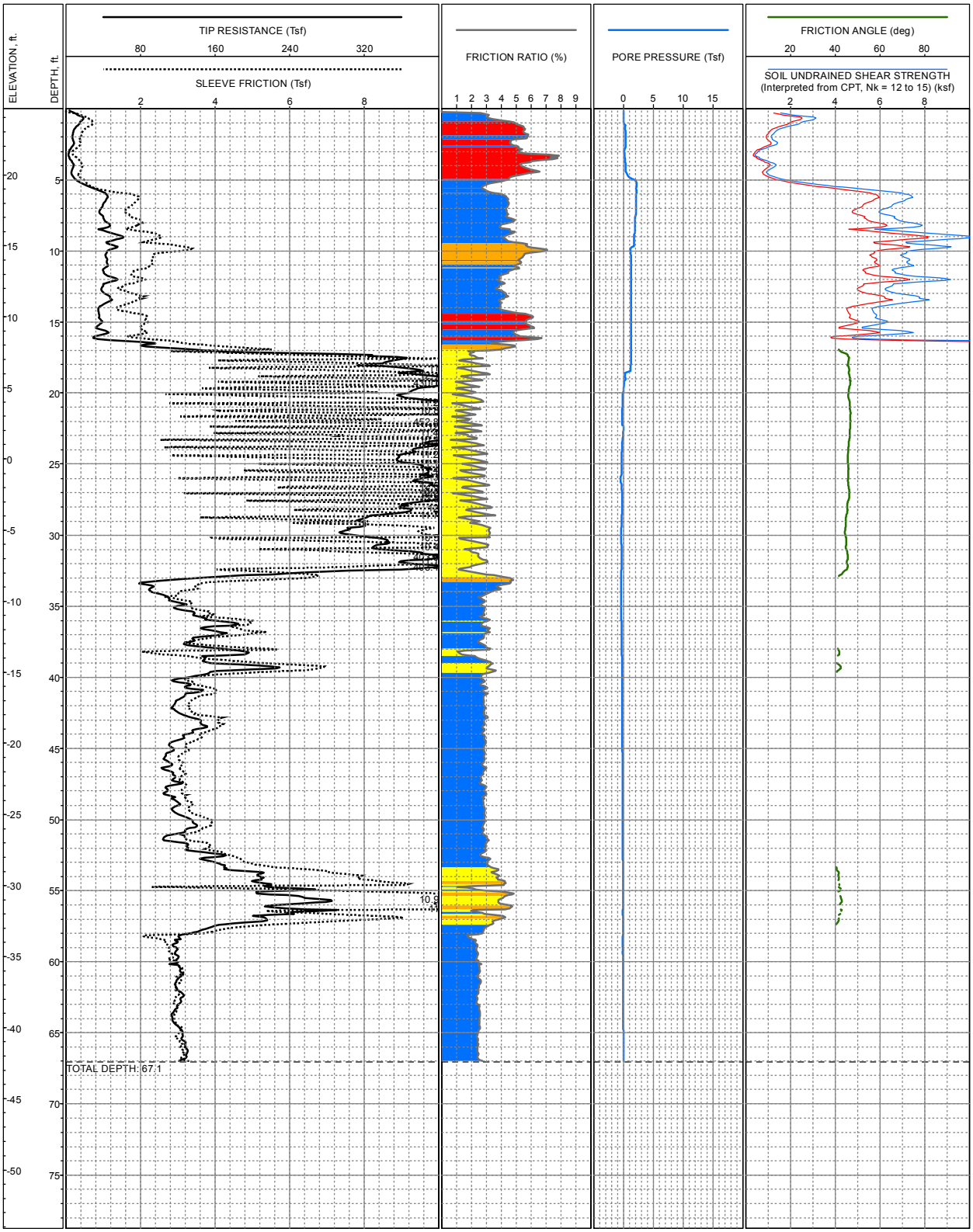

LOCATION: E5,998,070, N 1,980,013, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.6ft +/- ()
COMPLETION DEPTH: 67.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-82

San Joaquin Apartments & Precinct Improvements
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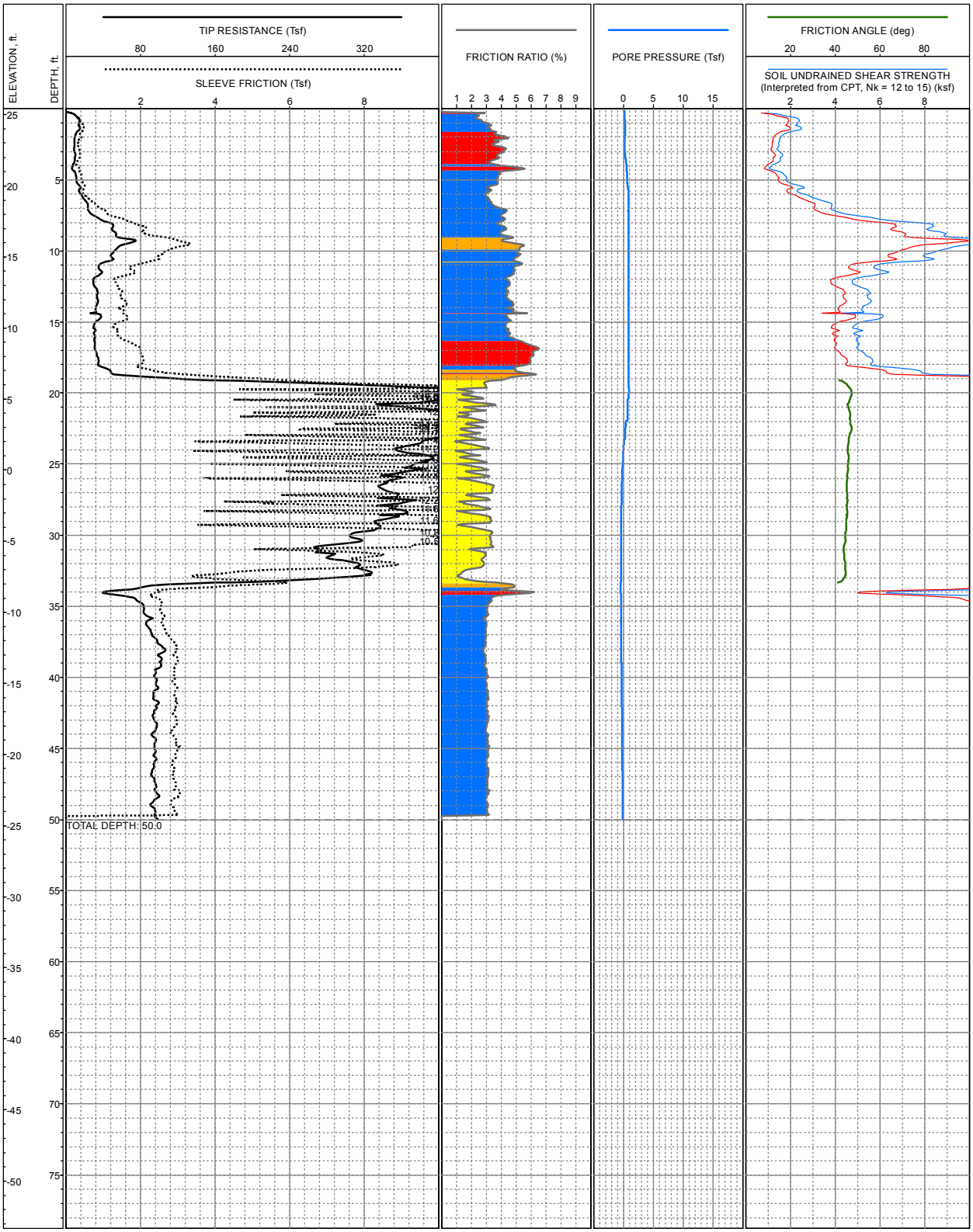

LOCATION: E5,998,069, N 1,979,972, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.4ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-83

San Joaquin Apartments & Precinct Improvements
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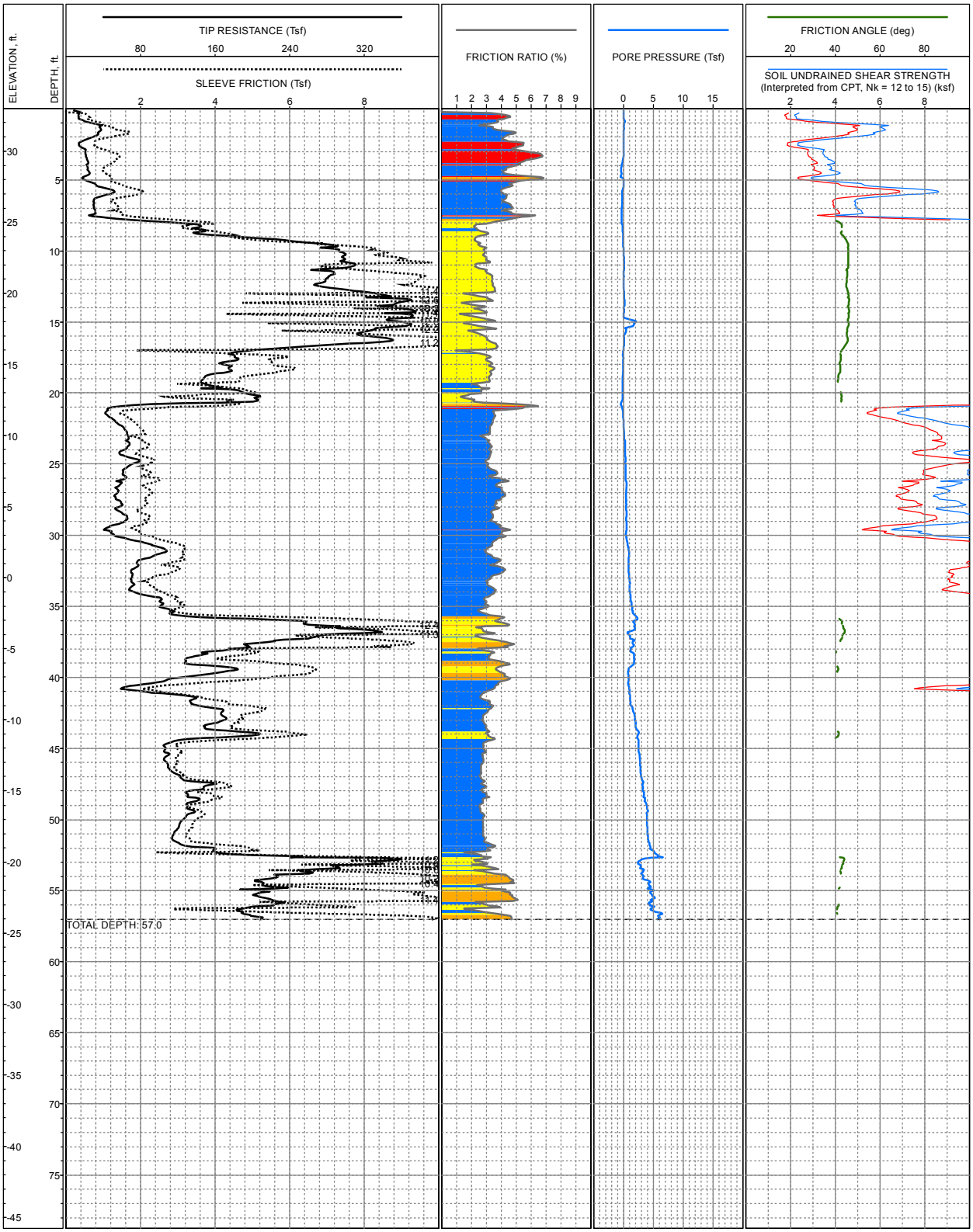

LOCATION: E5,998,520, N 1,979,527, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 33.0ft +/- ()
COMPLETION DEPTH: 57.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-84

San Joaquin Apartments & Precinct Improvements
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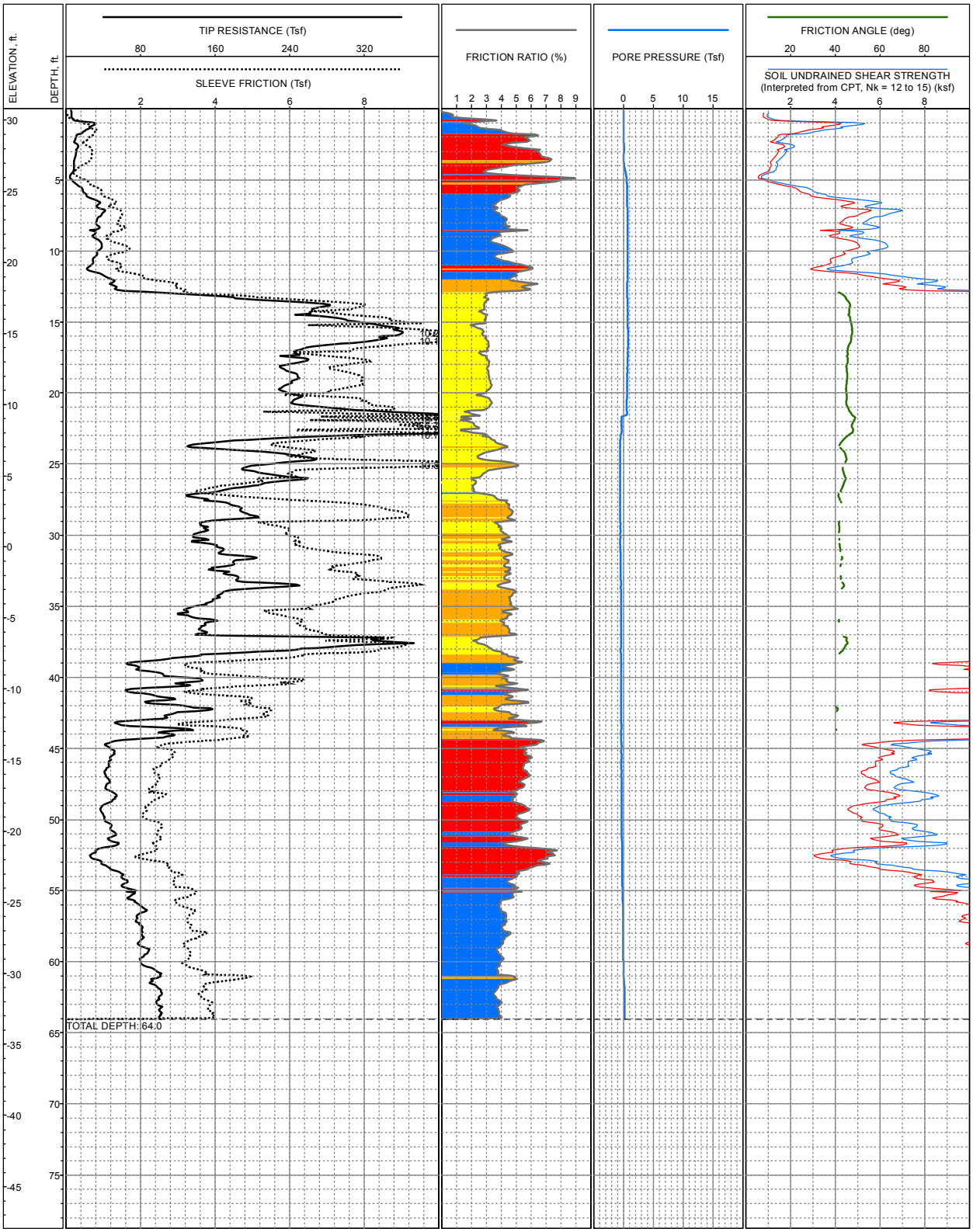

LOCATION: E5,998,720, N 1,979,521, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 30.8ft +/- ()
COMPLETION DEPTH: 64.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-85

San Joaquin Apartments & Precinct Improvements
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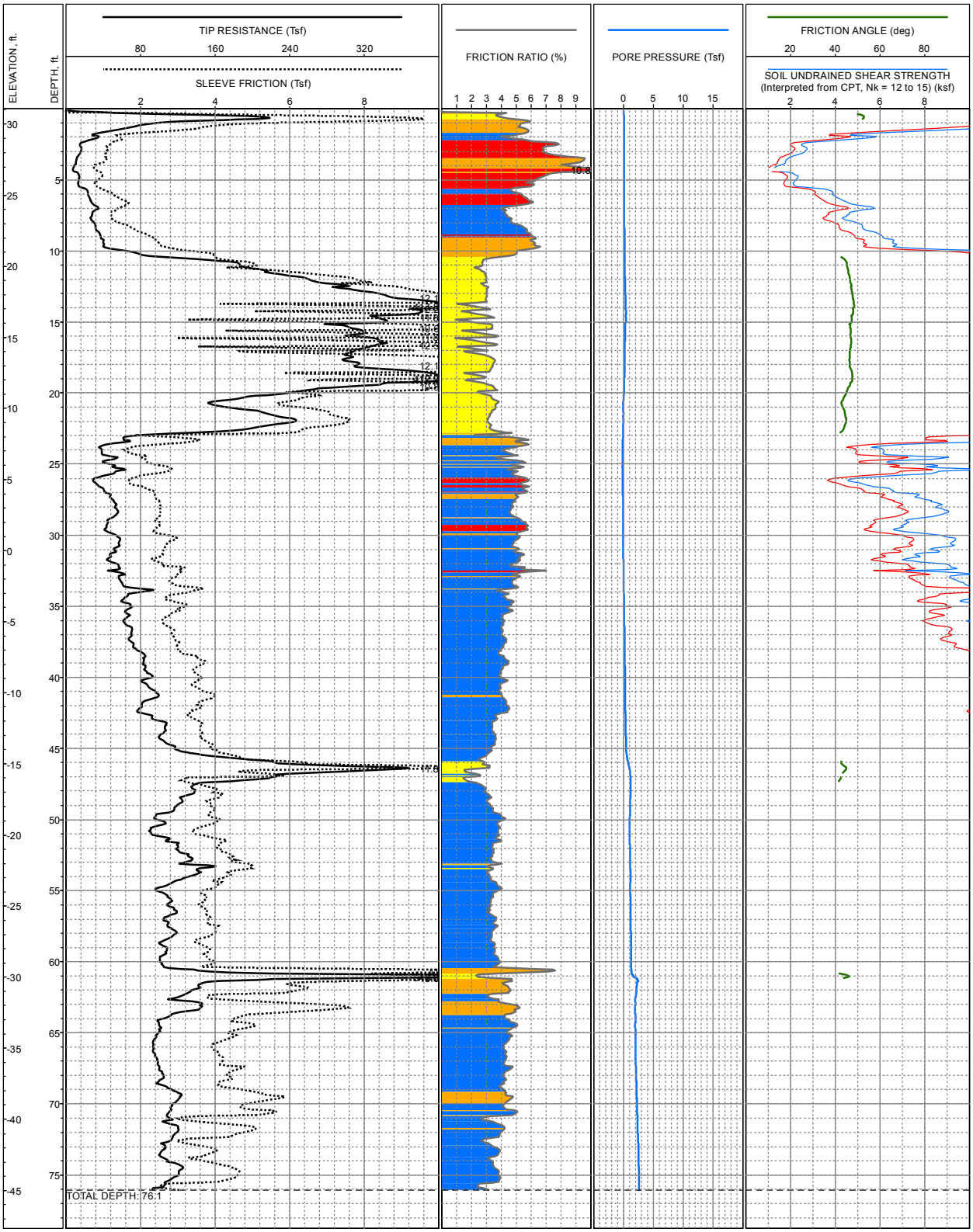

LOCATION: E5,998,704, N 1,979,490, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.1ft +/- ()
COMPLETION DEPTH: 76.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-86

San Joaquin Apartments & Precinct Improvements
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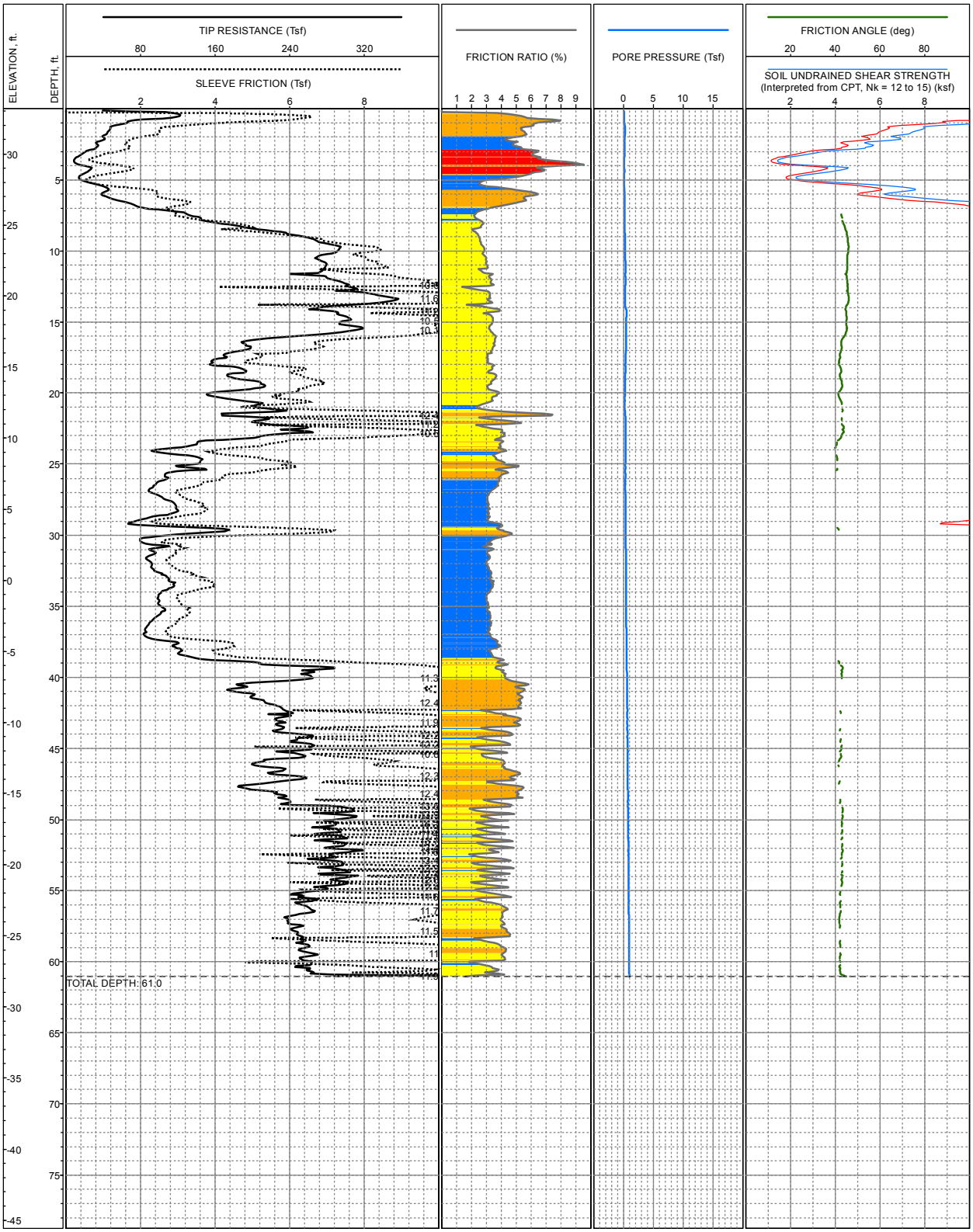

LOCATION: E5,998,519, N 1,979,497, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 33.2ft +/- ()
COMPLETION DEPTH: 61.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-87

San Joaquin Apartments & Precinct Improvements
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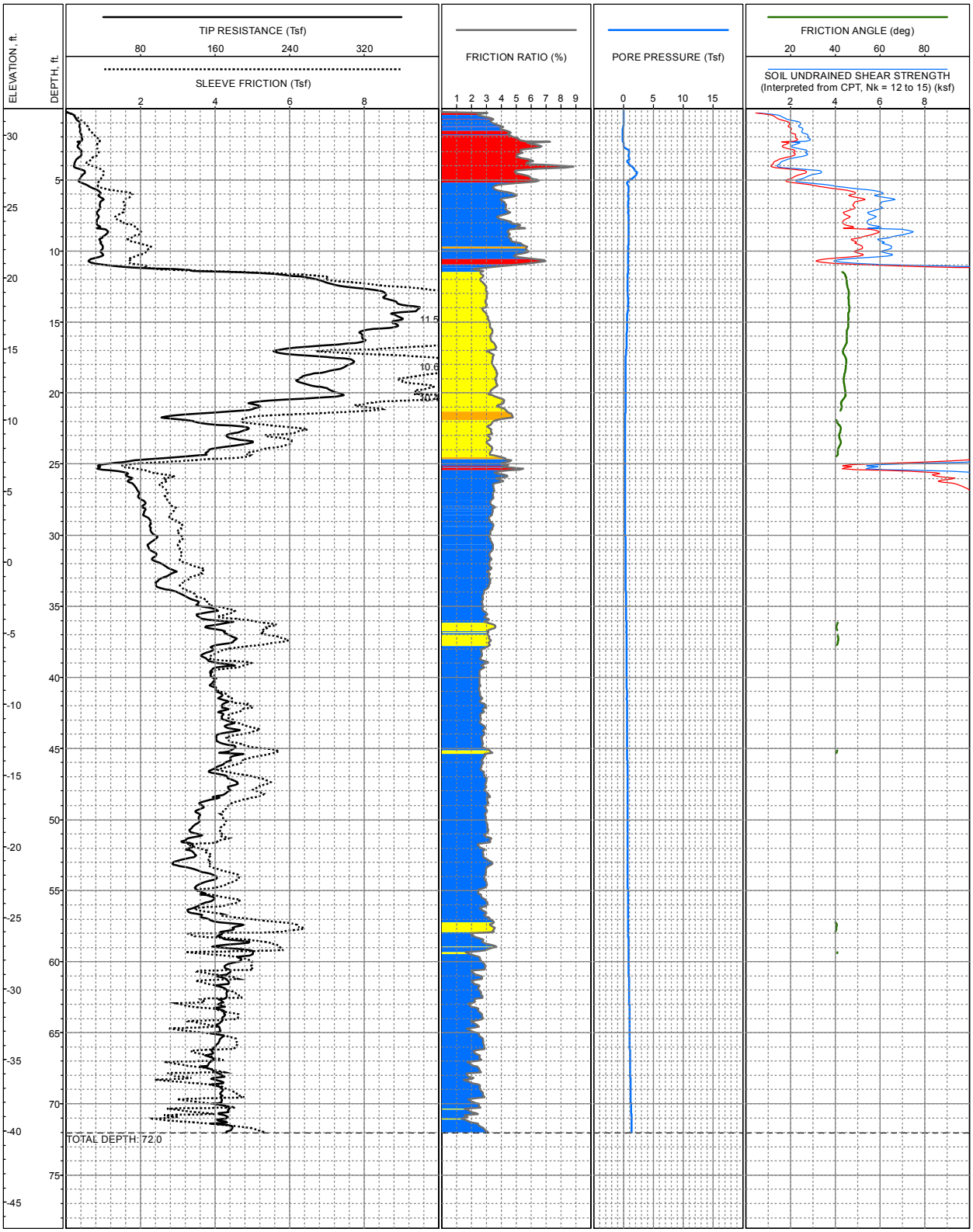

LOCATION: E5,998,521, N 1,979,626, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.9ft +/- ()
COMPLETION DEPTH: 72.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-88

San Joaquin Apartments & Precinct Improvements
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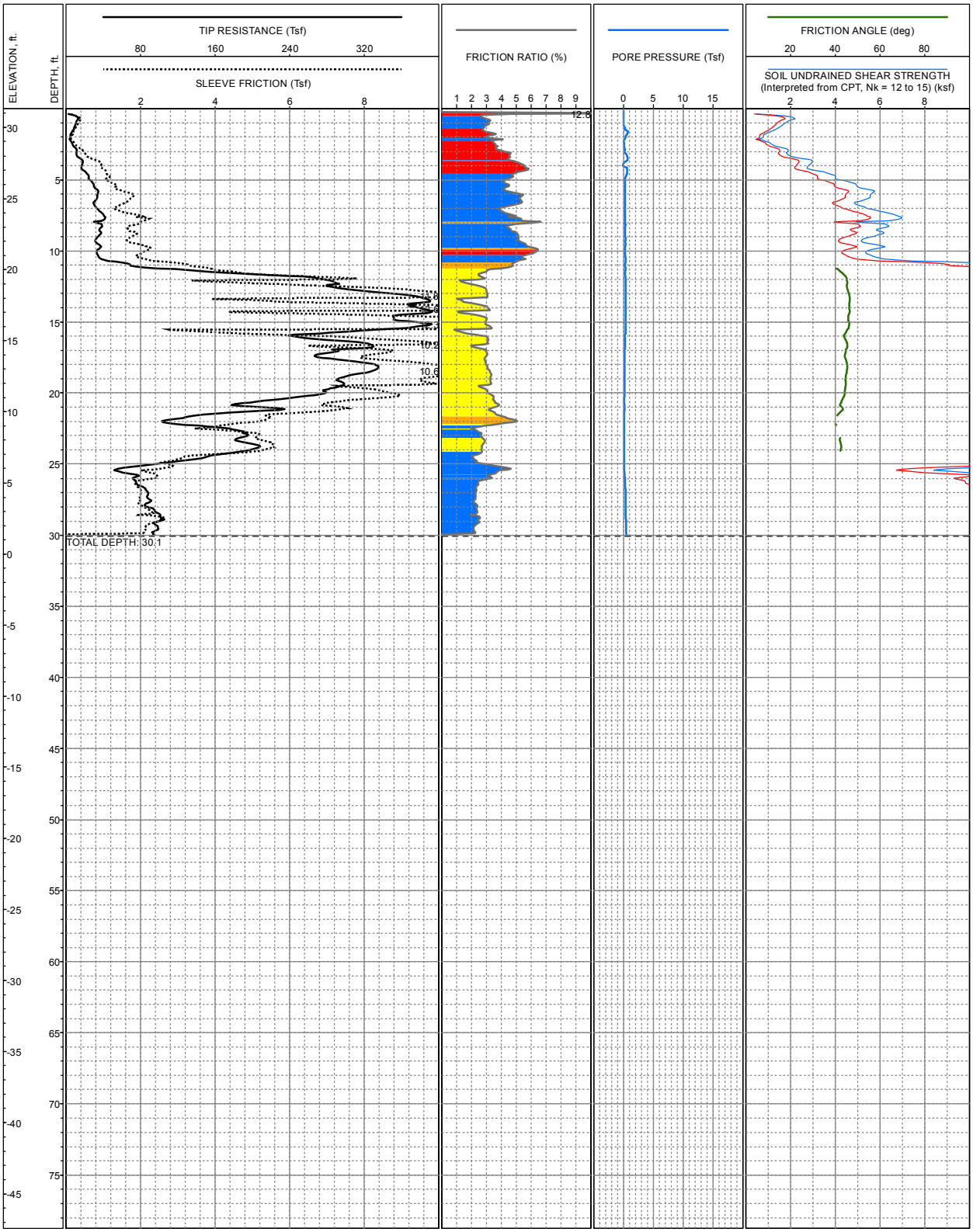

LOCATION: E5,998,520, N 1,979,641, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.3ft +/- ()
COMPLETION DEPTH: 30.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-88A

San Joaquin Apartments & Precinct Improvements
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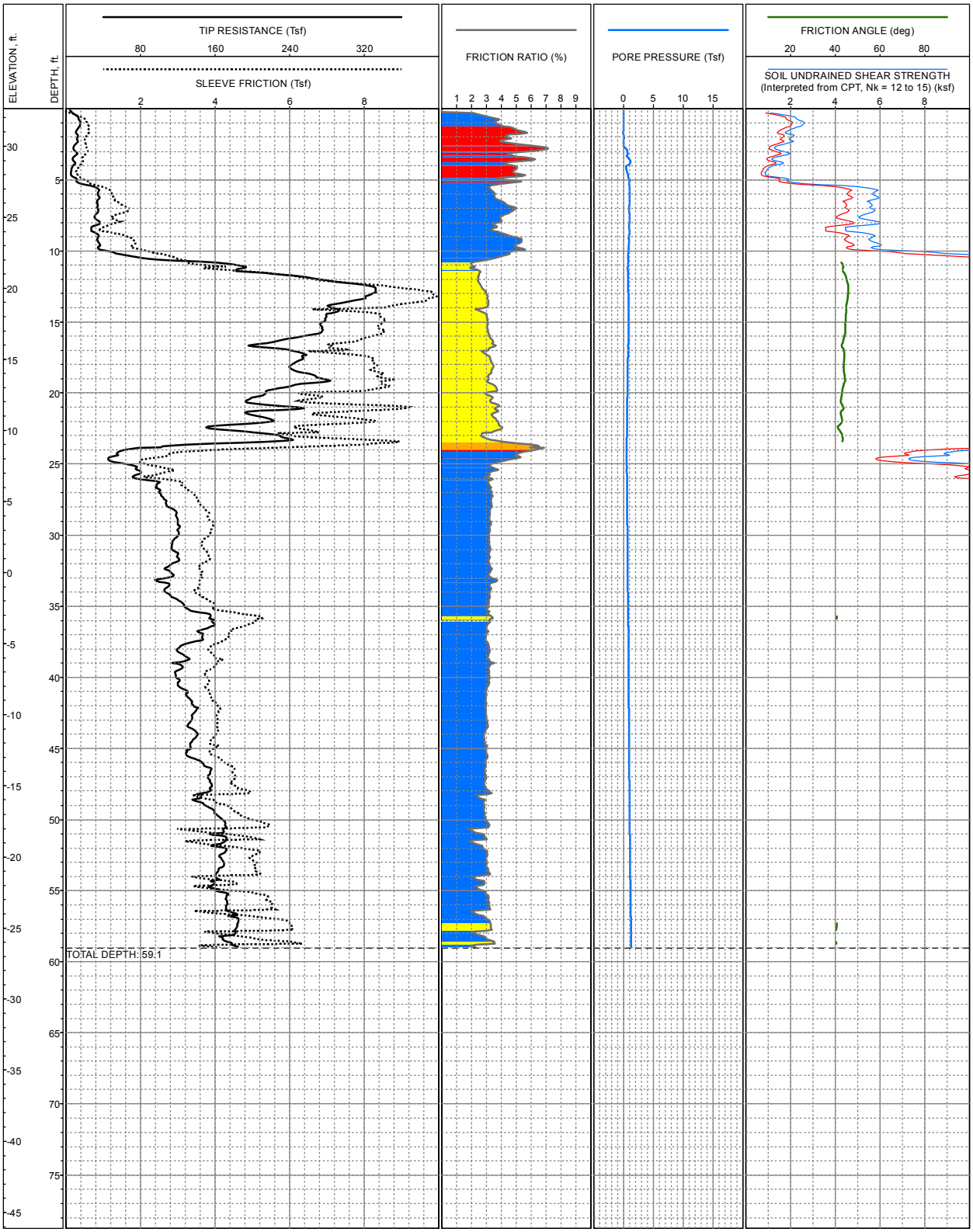

LOCATION: E5,998,521, N 1,979,599, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.6ft +/- ()
COMPLETION DEPTH: 59.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-89

San Joaquin Apartments & Precinct Improvements
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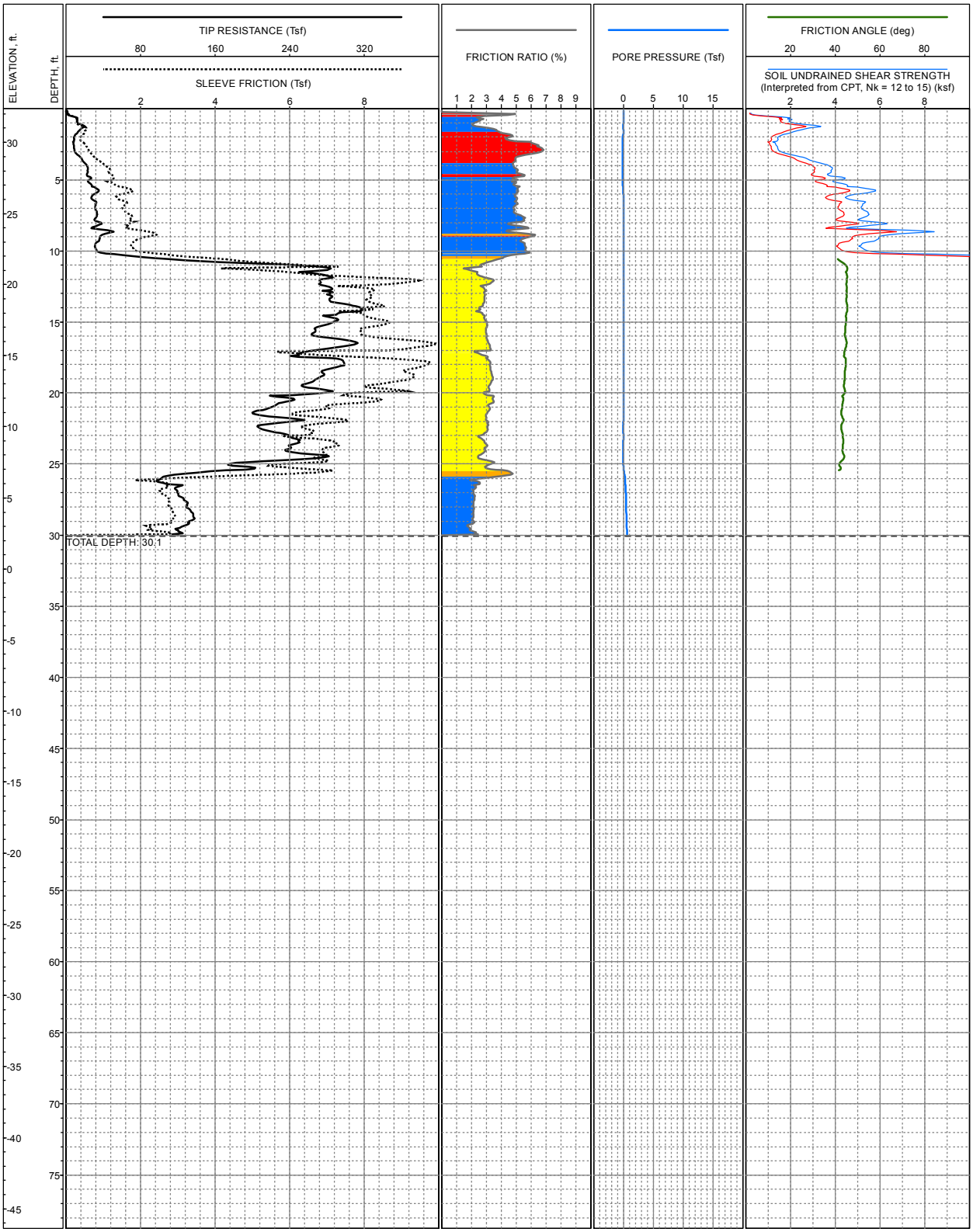

LOCATION: E5,998,520, N 1,979,612, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.4ft +/- ()
COMPLETION DEPTH: 30.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-89A

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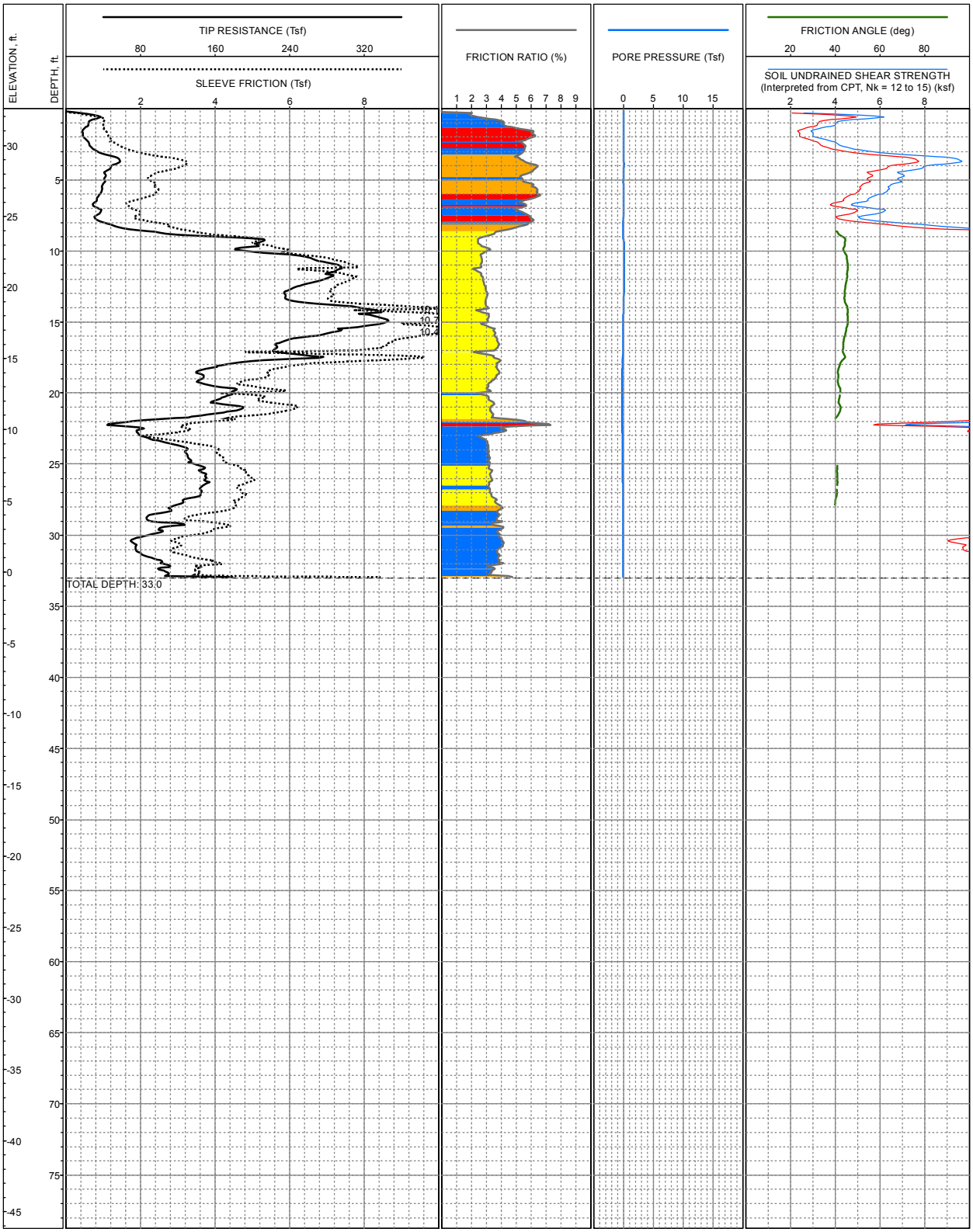

LOCATION: E5,998,521, N 1,979,569, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.6ft +/- ()
COMPLETION DEPTH: 33.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-90

San Joaquin Apartments & Precinct Improvements
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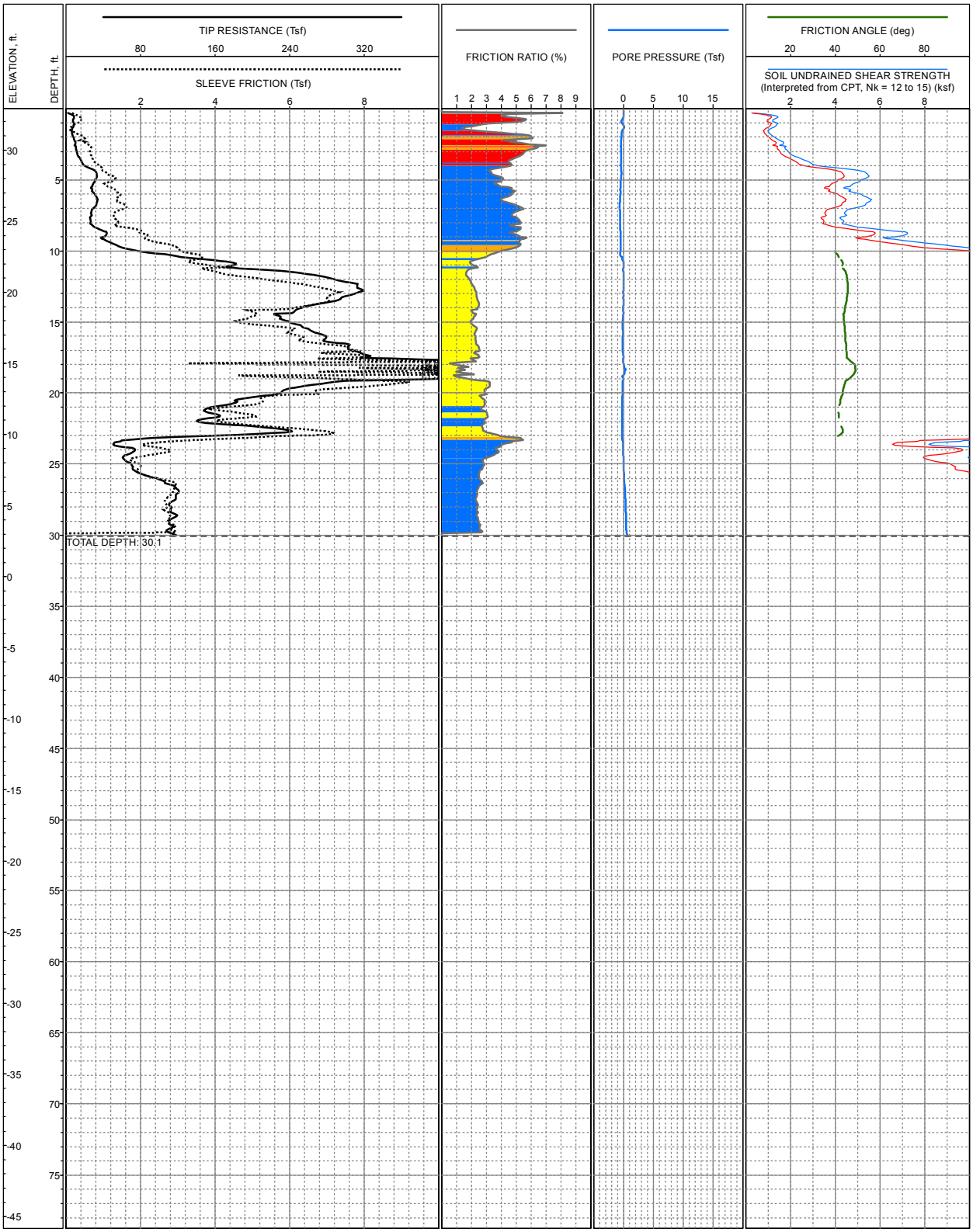

LOCATION: E5,998,522, N 1,979,585, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.9ft +/- ()
COMPLETION DEPTH: 30.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-90A

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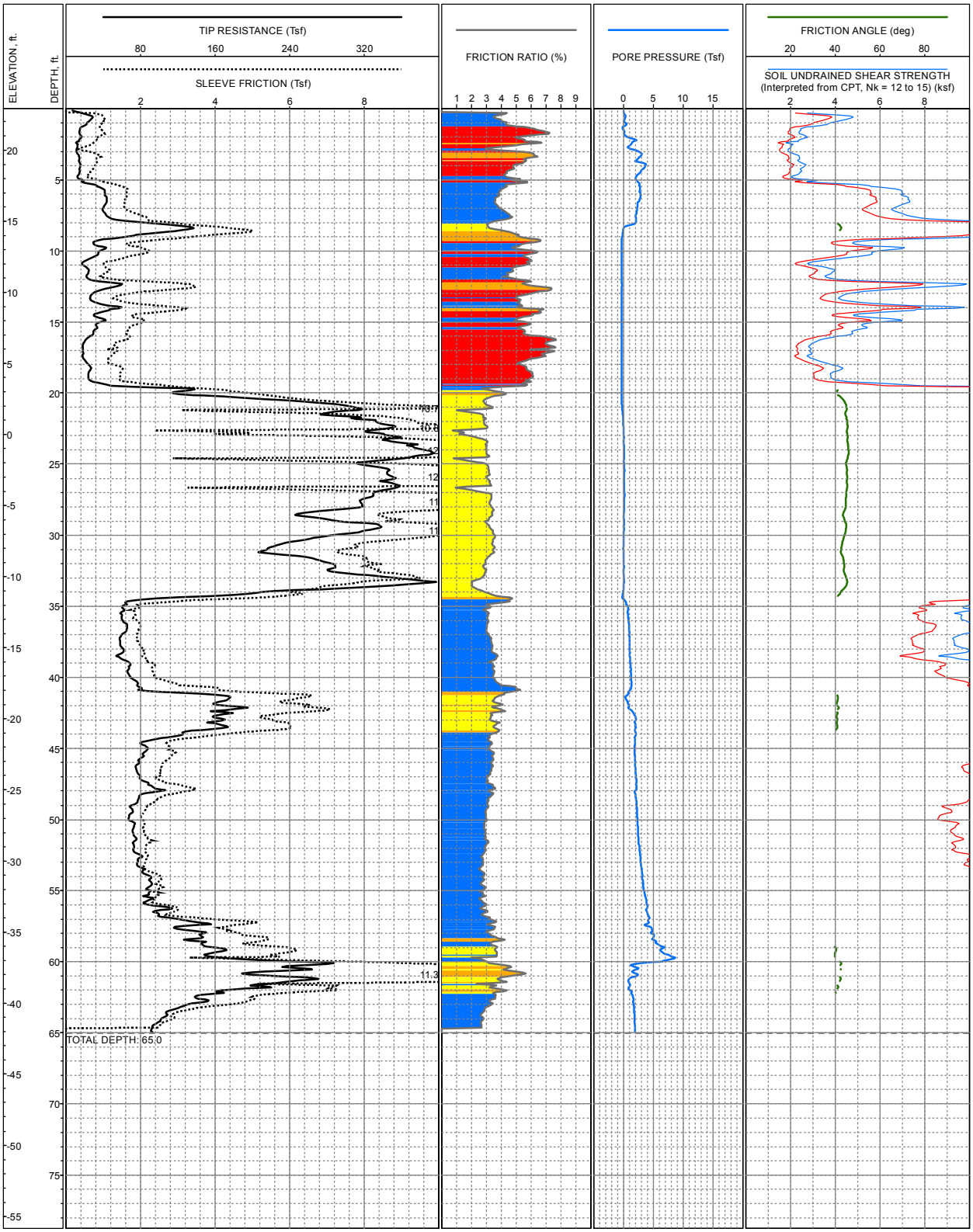

LOCATION: E5,998,279, N 1,979,936, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.9ft +/- ()
COMPLETION DEPTH: 65.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-91

San Joaquin Apartments & Precinct Improvements
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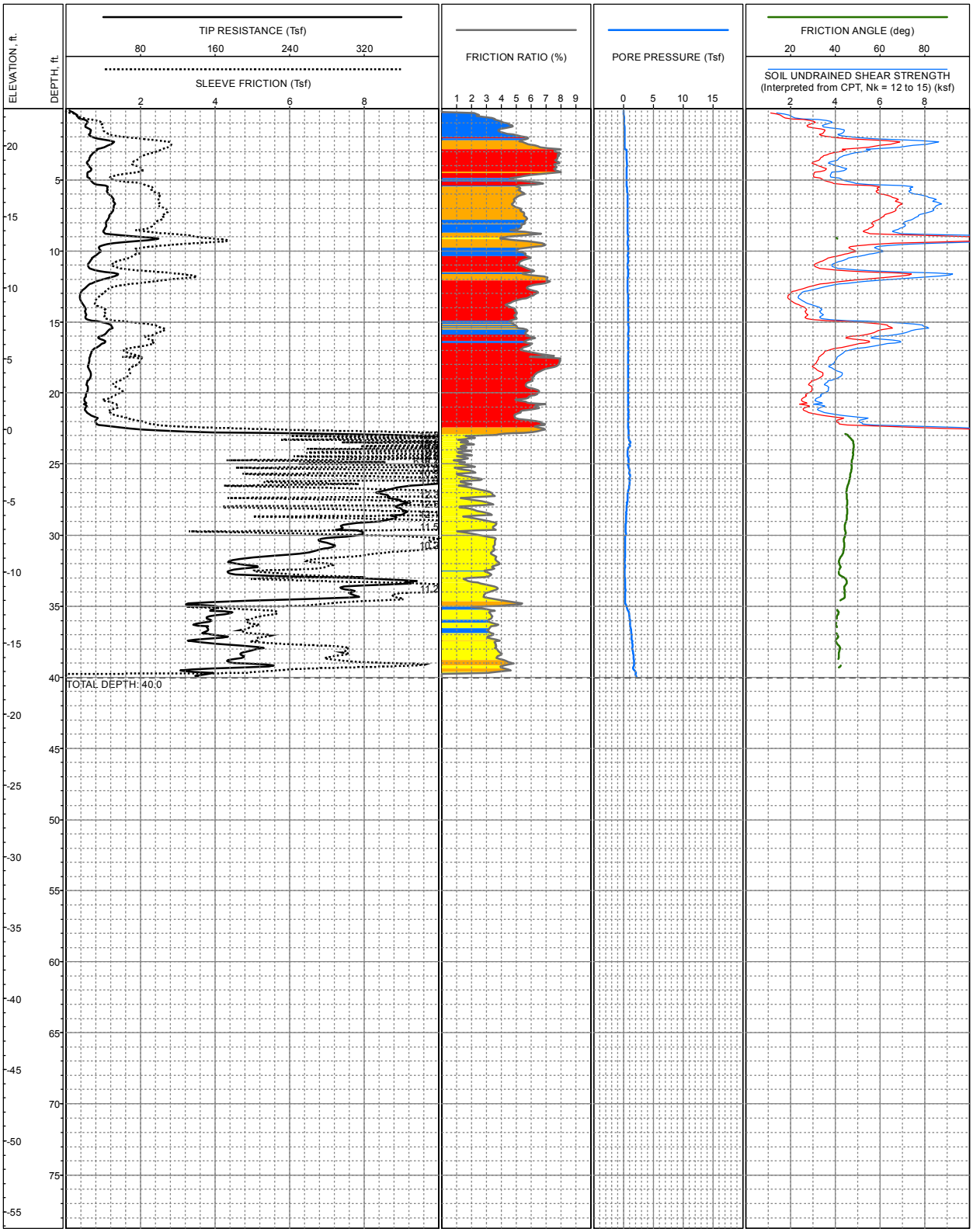
Santa Barbara, California

N:\Projects\04_2011\04_6211_0136_UCSB_SCatalina_Housing\Explorations\CPT\2012\Logs\2012_06_18_Logs_SuF\MXD\CPT_Proc_VK12C.mxd,06/19/2012,CDean



LOCATION: E5,998,280, N 1,979,968, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.6ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-92

San Joaquin Apartments & Precinct Improvements
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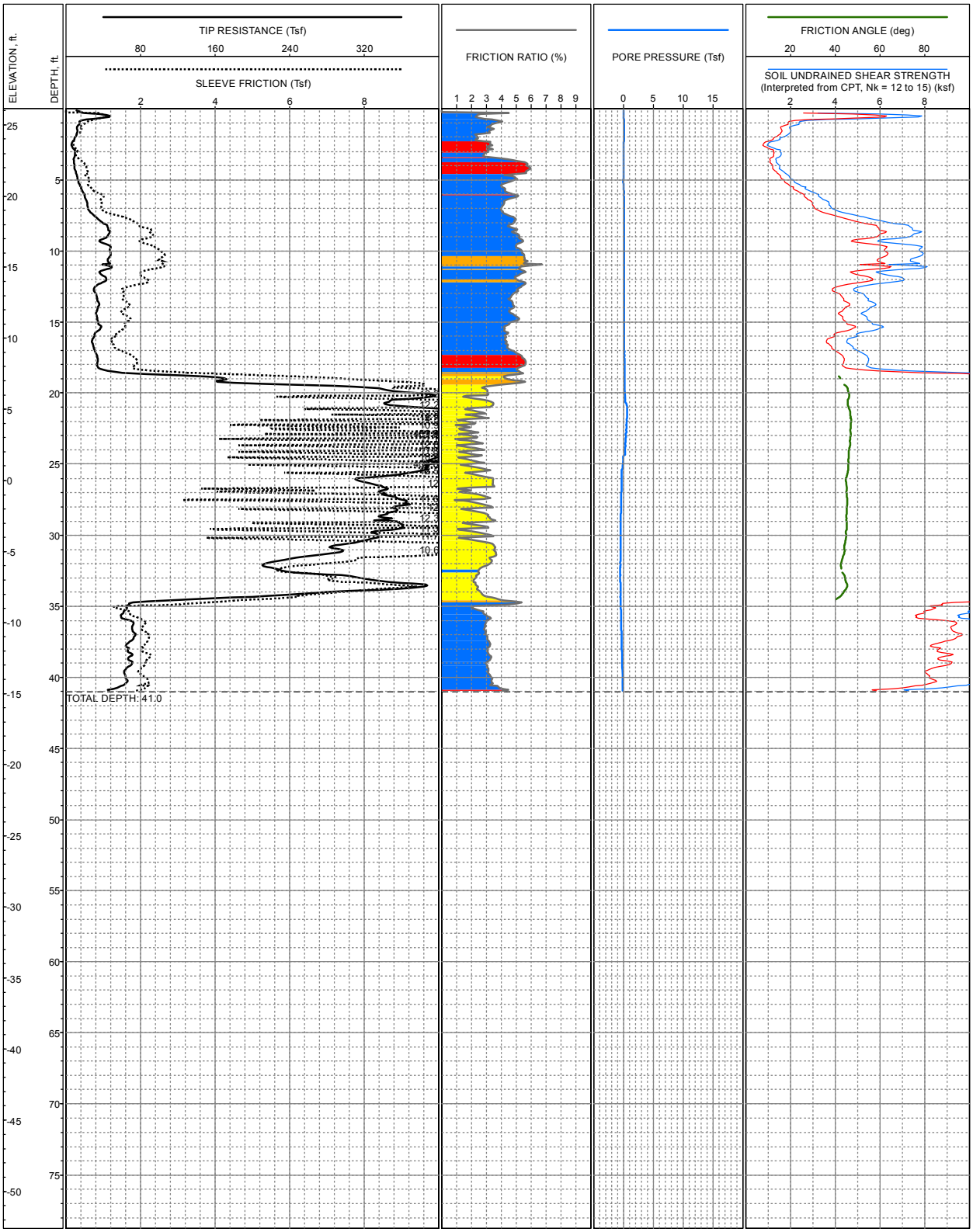

LOCATION: E5,998,070, N 1,979,941, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 26.1ft +/- ()
COMPLETION DEPTH: 41.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-93

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

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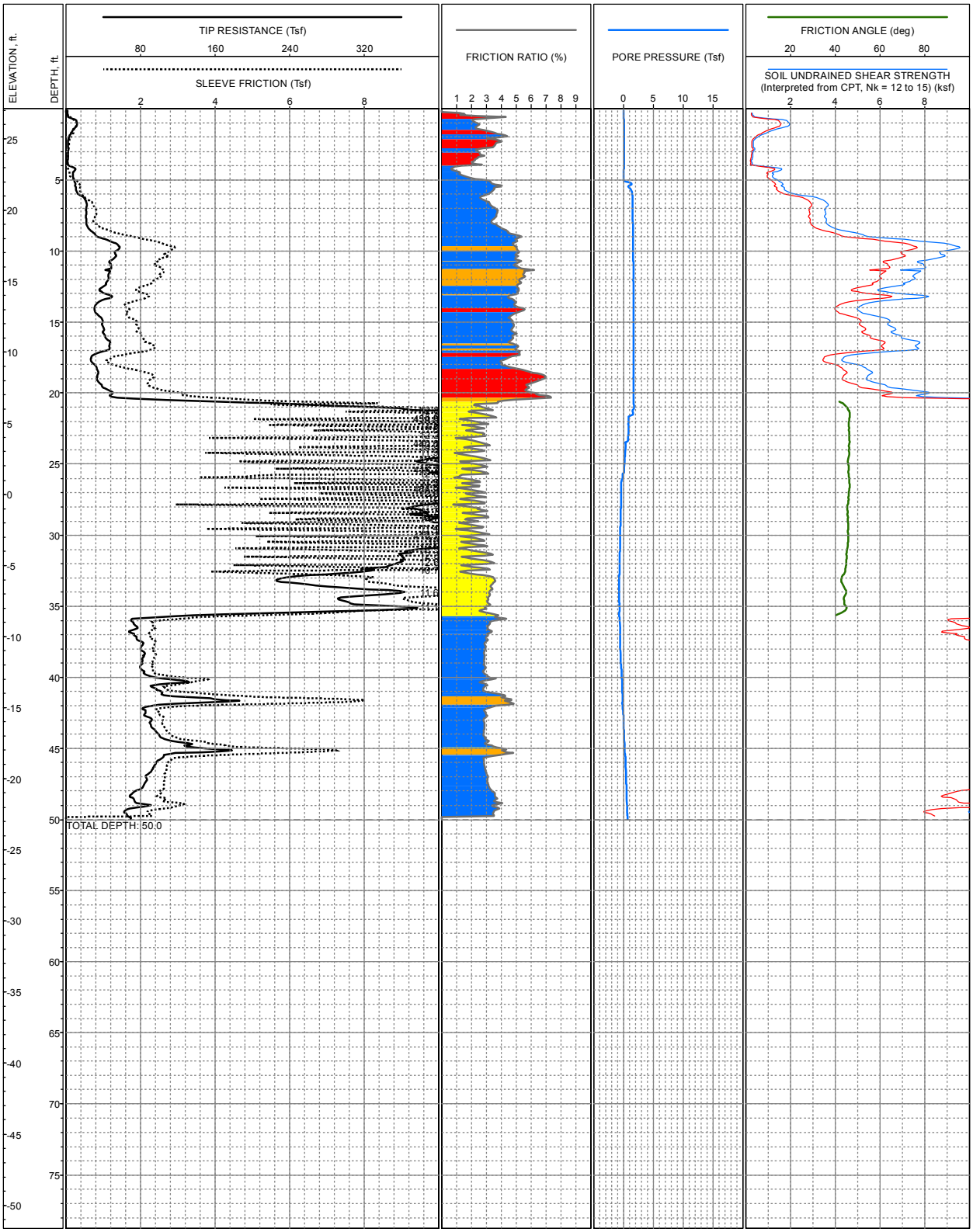

LOCATION: E5,998,068, N 1,979,910, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 27.1ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-94

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

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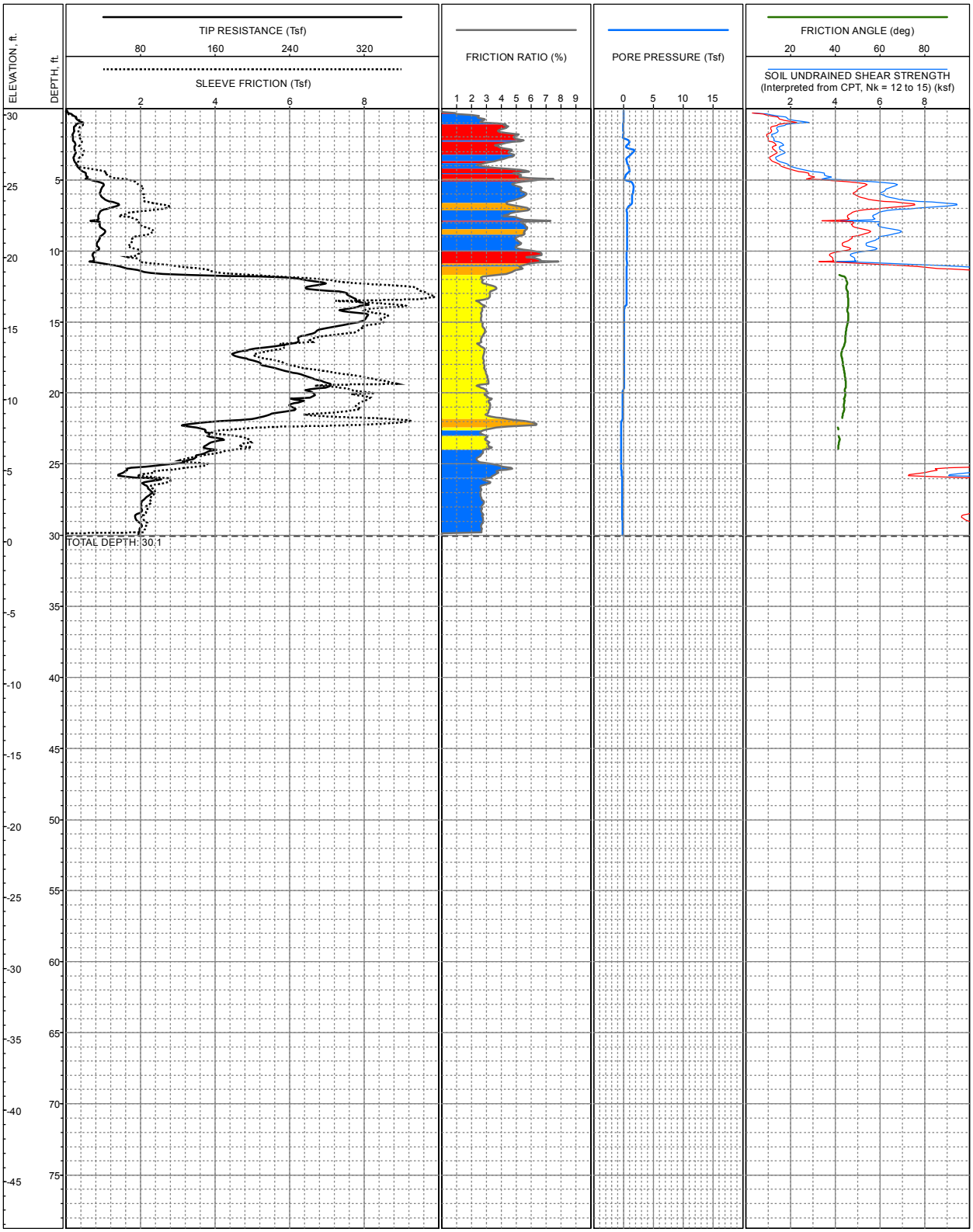

LOCATION: E5,998,519, N 1,979,657, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 30.5ft +/- ()
COMPLETION DEPTH: 30.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-95

San Joaquin Apartments & Precinct Improvements
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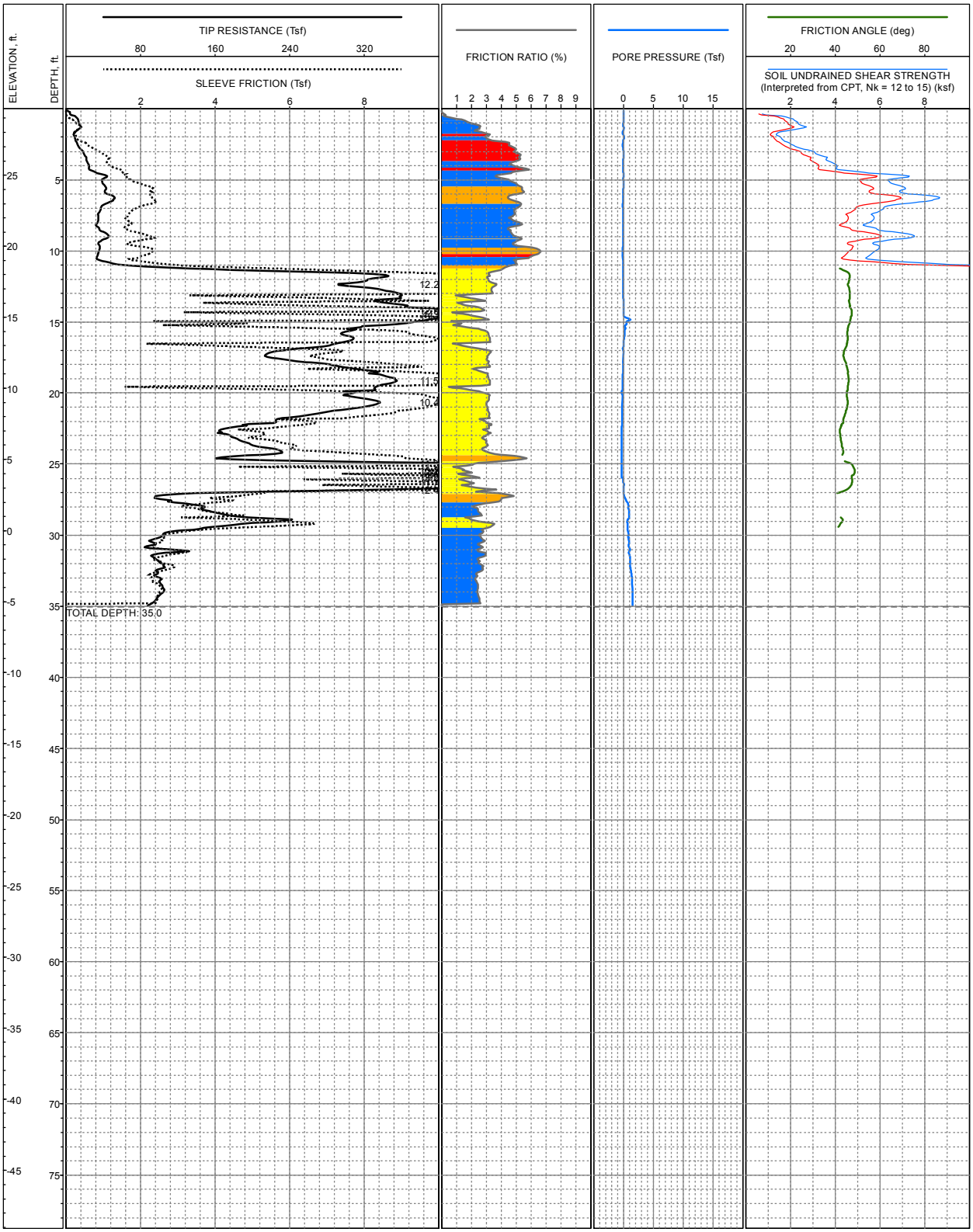

LOCATION: E5,998,519, N 1,979,668, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 29.7ft +/- ()
COMPLETION DEPTH: 35.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-96

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

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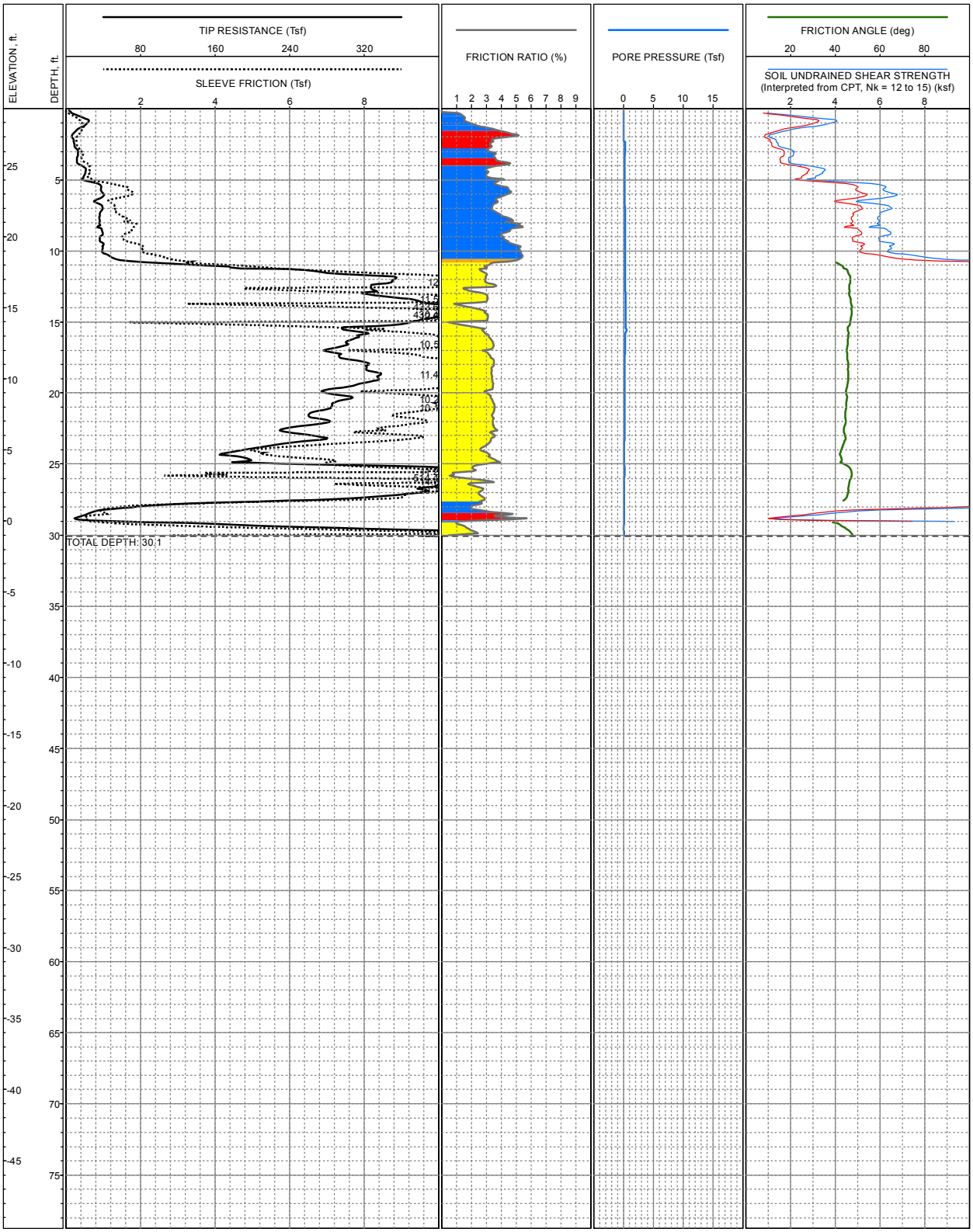

LOCATION: E5,998,518, N 1,979,678, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 29.0ft +/- ()
COMPLETION DEPTH: 30.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-97

San Joaquin Apartments & Precinct Improvements
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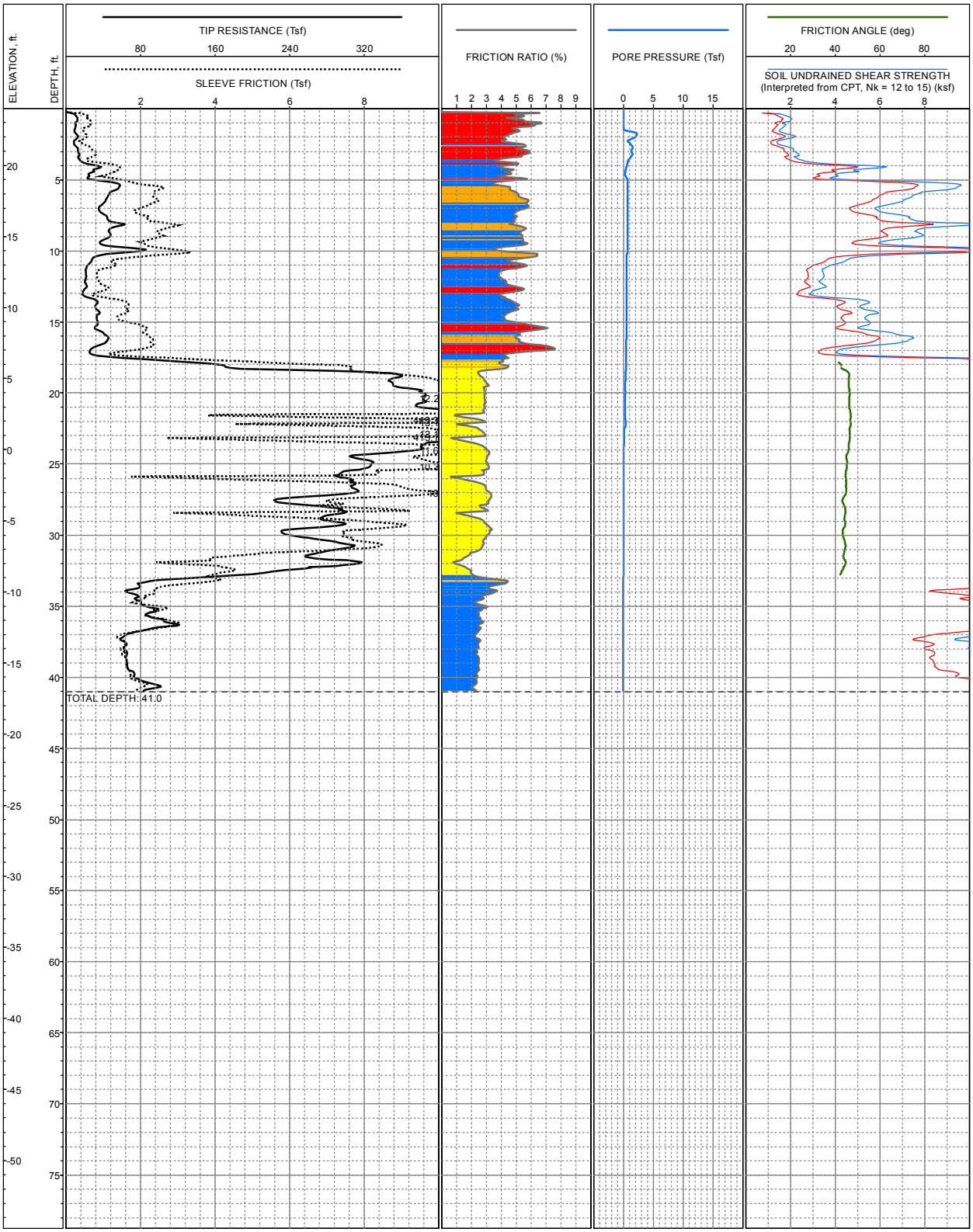

LOCATION: E5,998,165, N 1,979,929, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.0ft +/- ()
COMPLETION DEPTH: 41.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-98

San Joaquin Apartments & Precinct Improvements
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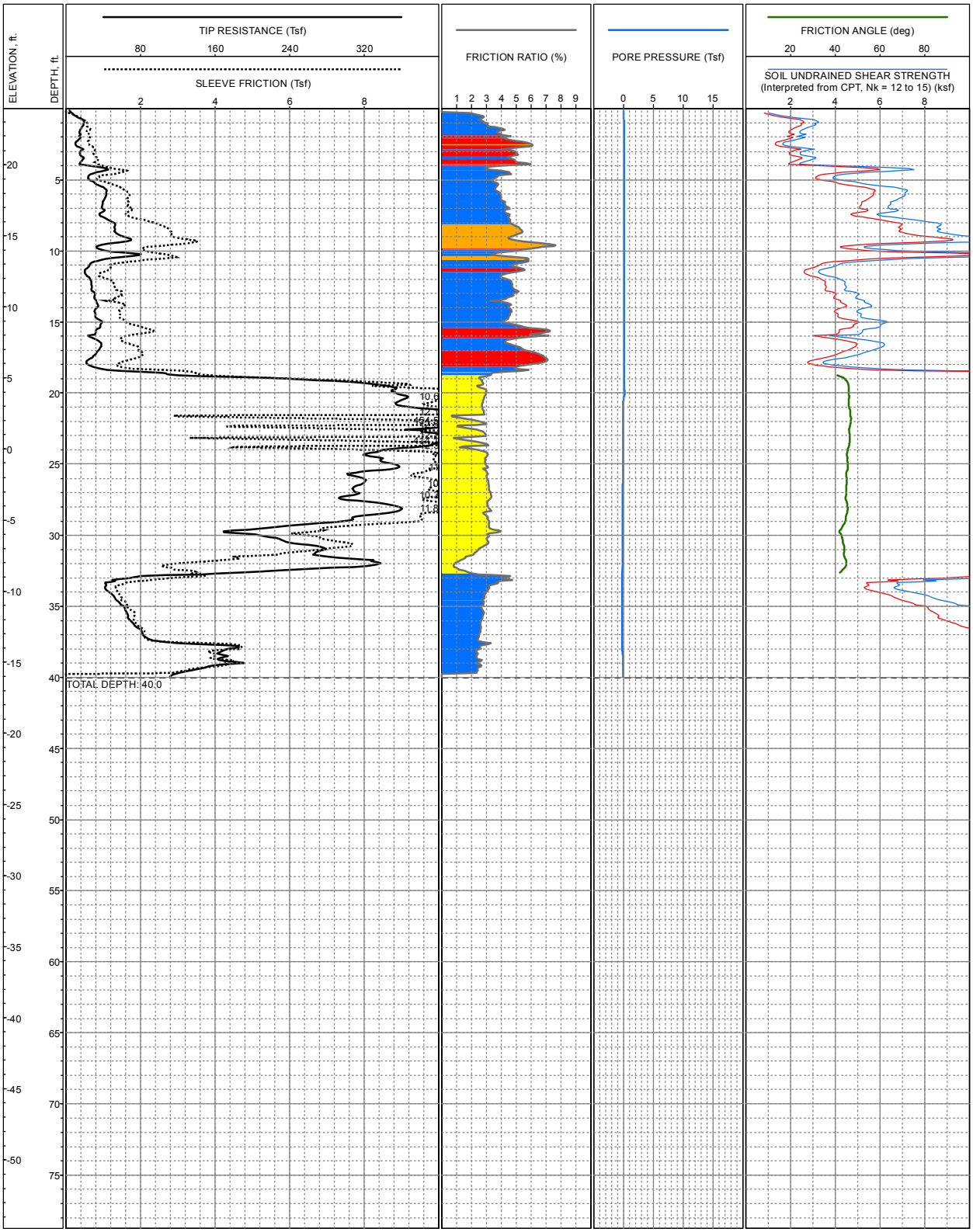

LOCATION: E5,998,165, N 1,979,942, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.9ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-99

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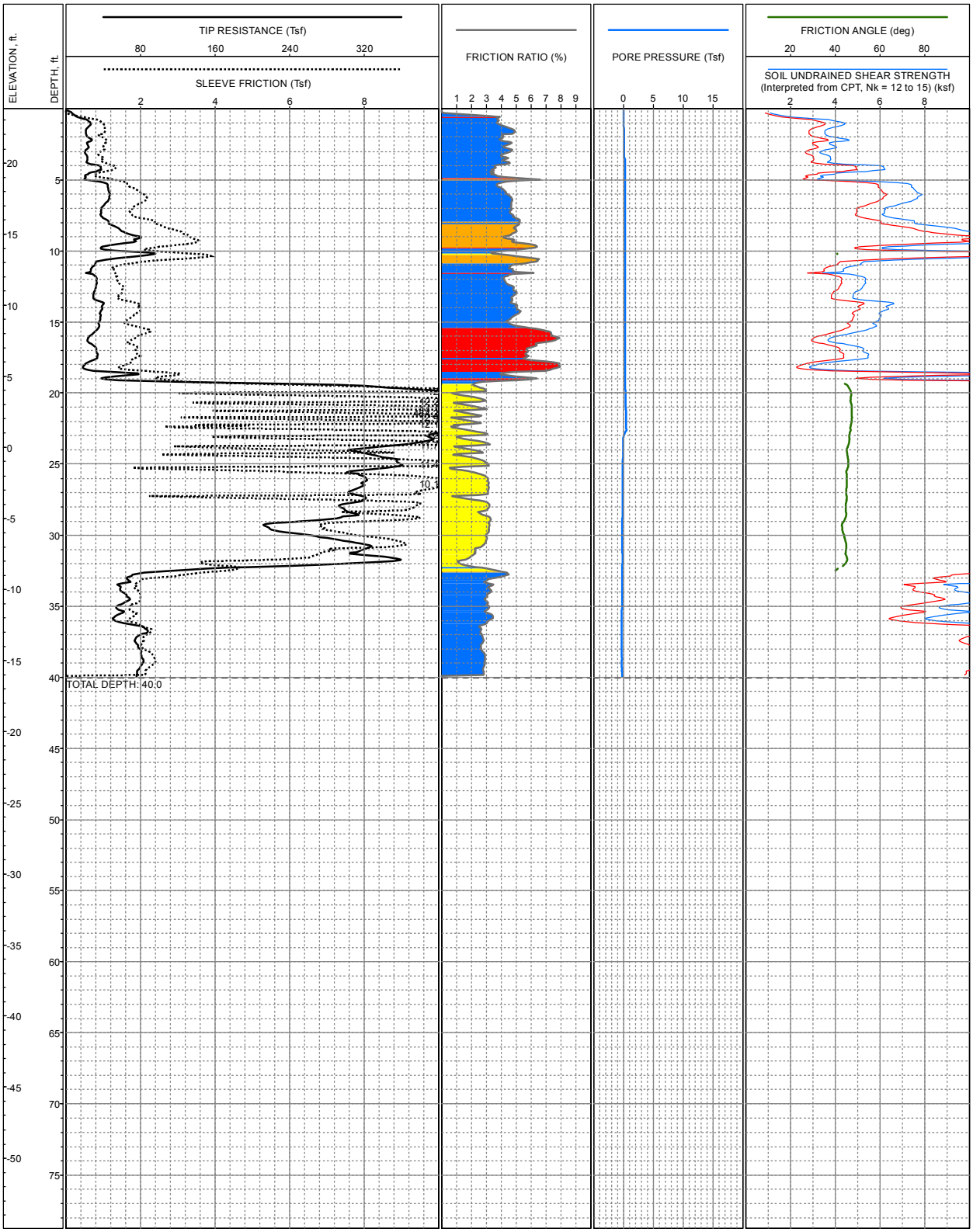

LOCATION: E5,998,166, N 1,979,954, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.8ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-100

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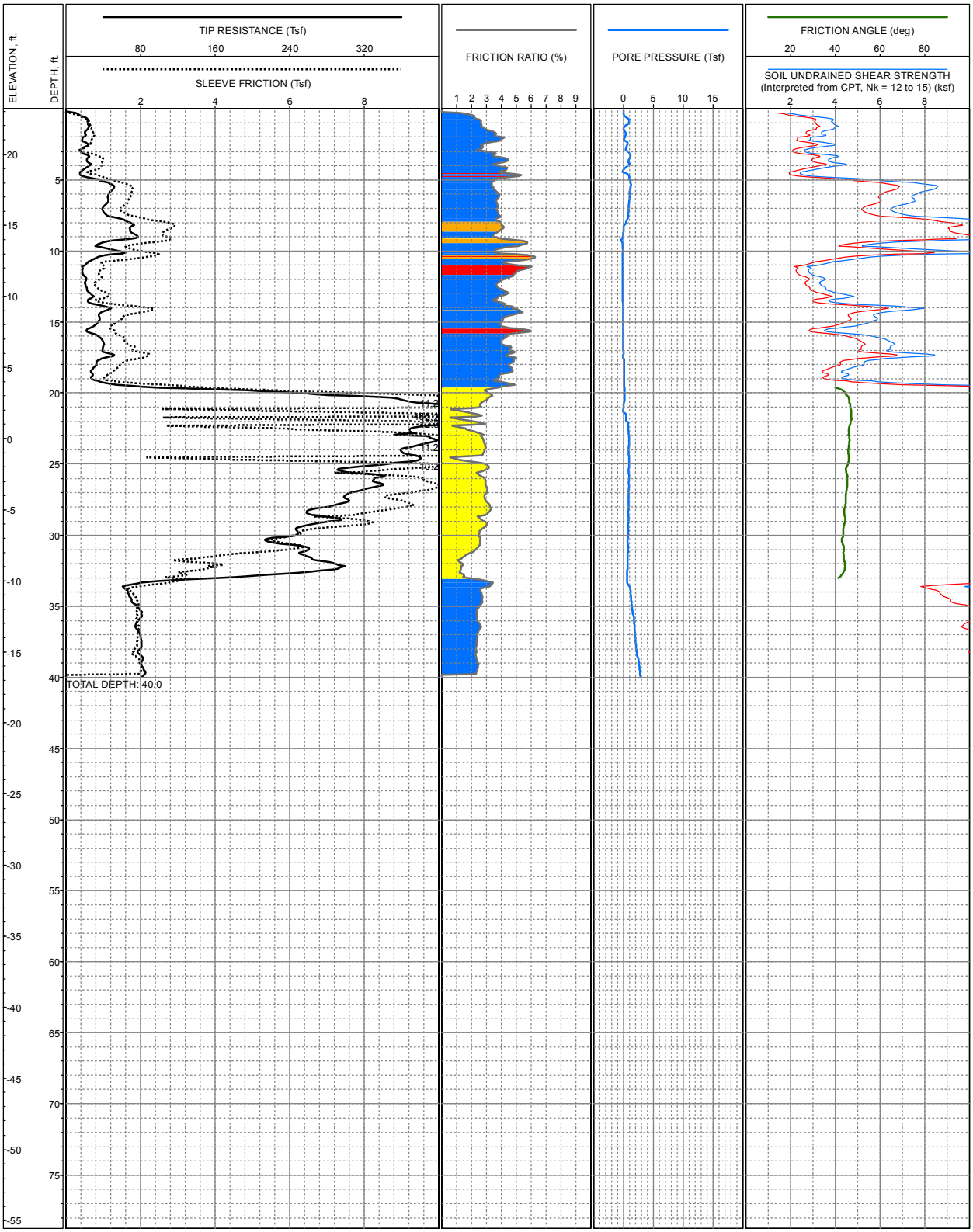

LOCATION: E5,998,202, N 1,979,956, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.2ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-101

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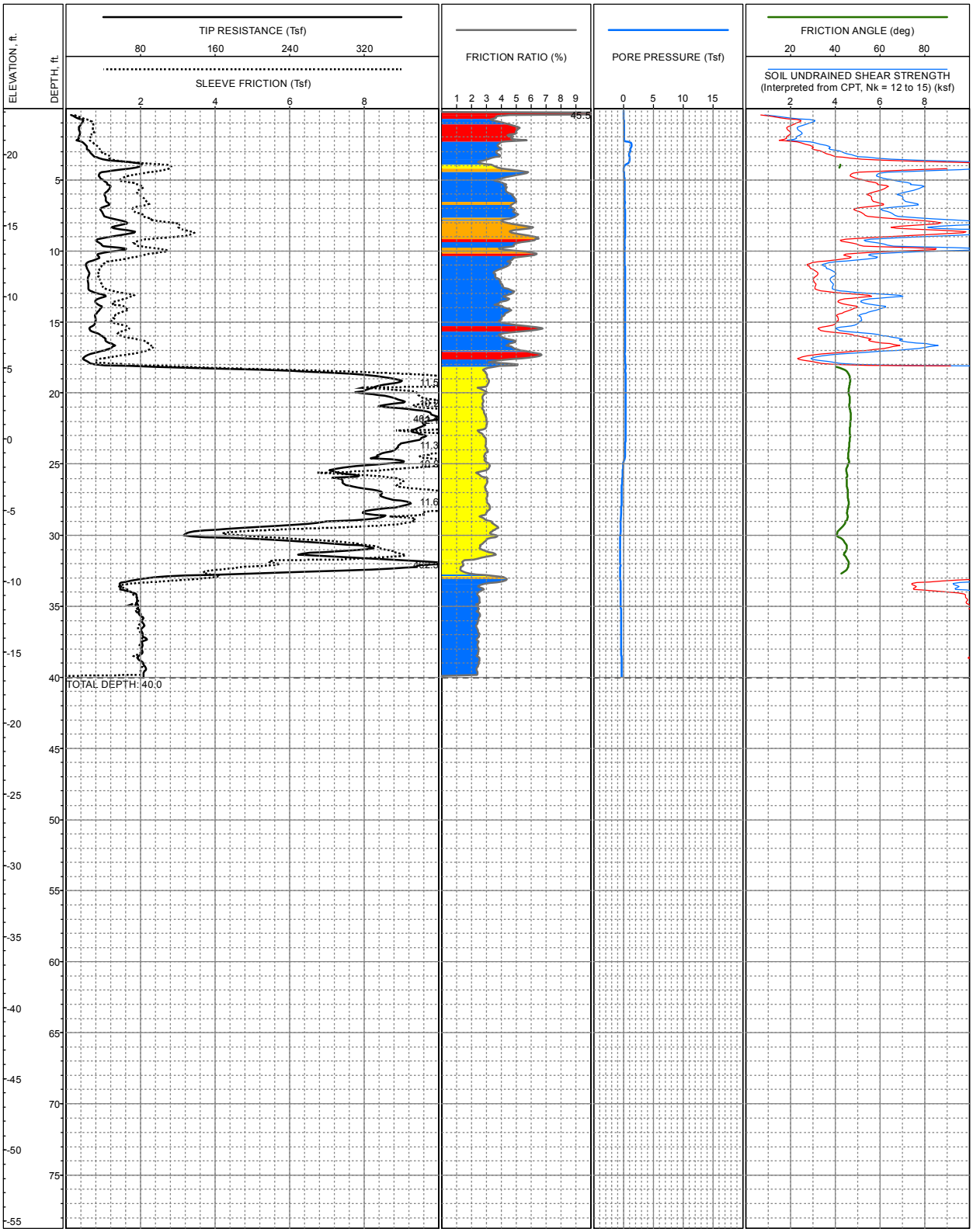

LOCATION: E5,998,202, N 1,979,941, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.2ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-102

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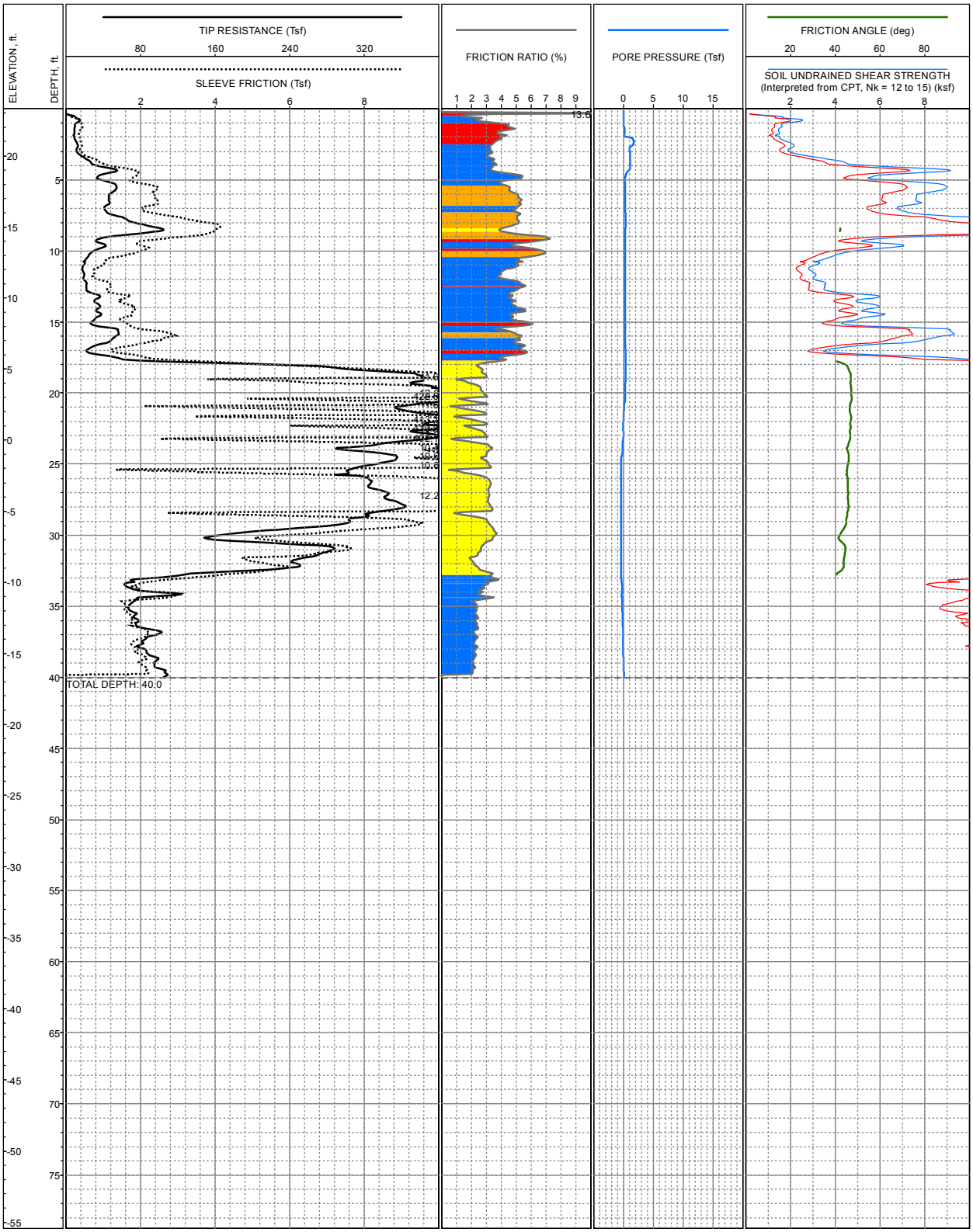

LOCATION: E5,998,201, N 1,979,932, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.3ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-103

San Joaquin Apartments & Precinct Improvements
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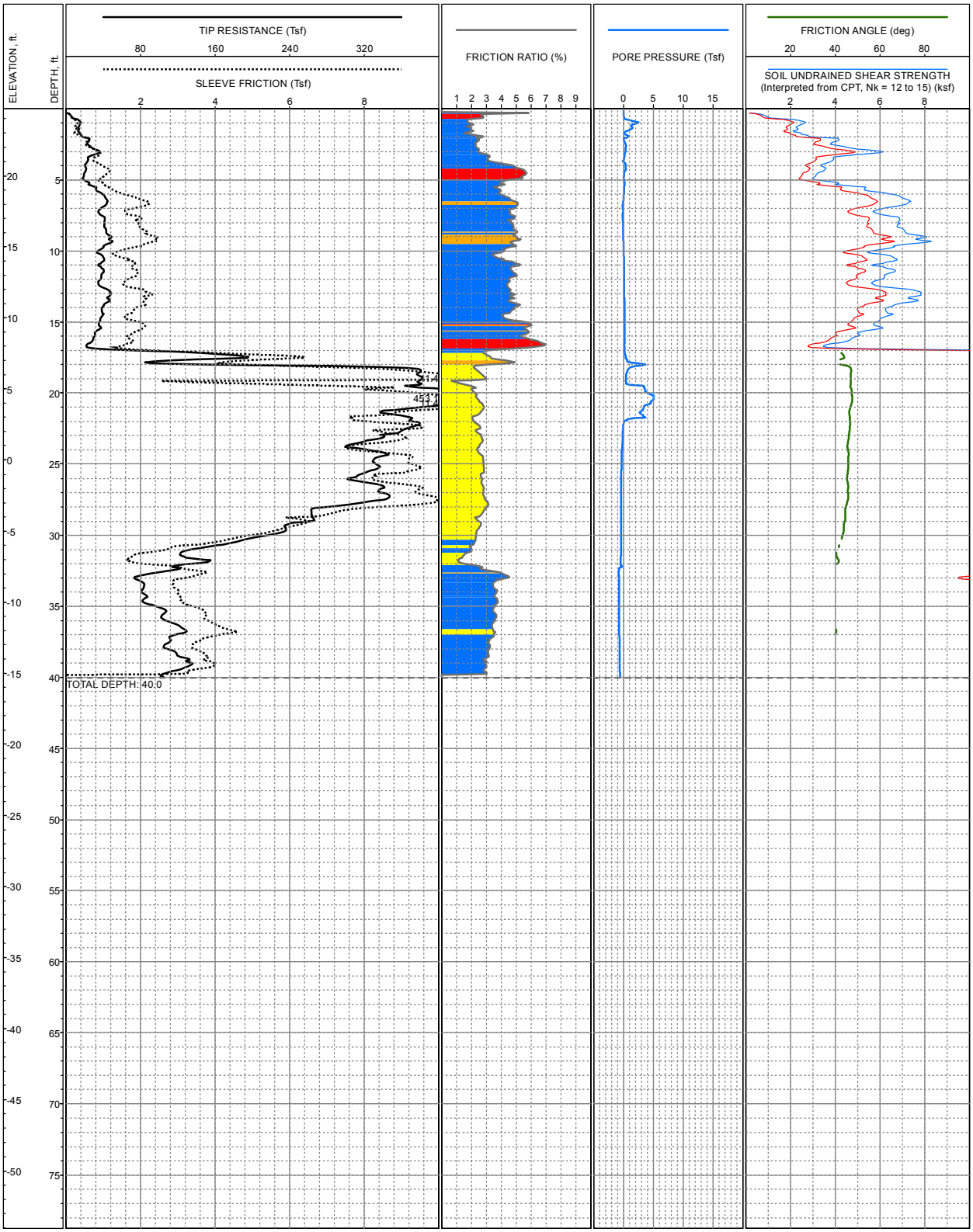

LOCATION: E5,998,123, N 1,979,941, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.7ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-104

San Joaquin Apartments & Precinct Improvements
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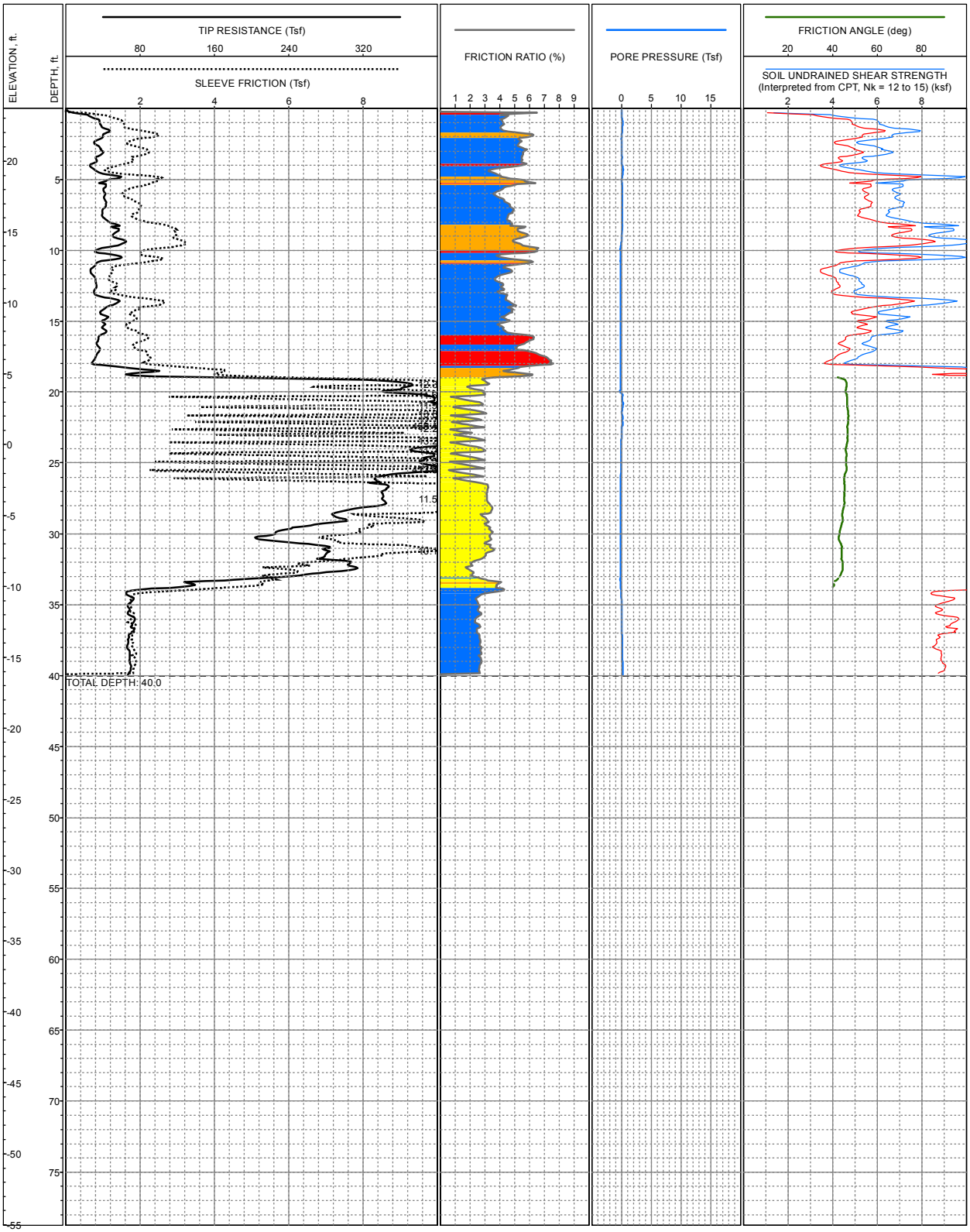

LOCATION: E5,998,166, N 1,979,967, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.7ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-105

San Joaquin Apartments & Precinct Improvements
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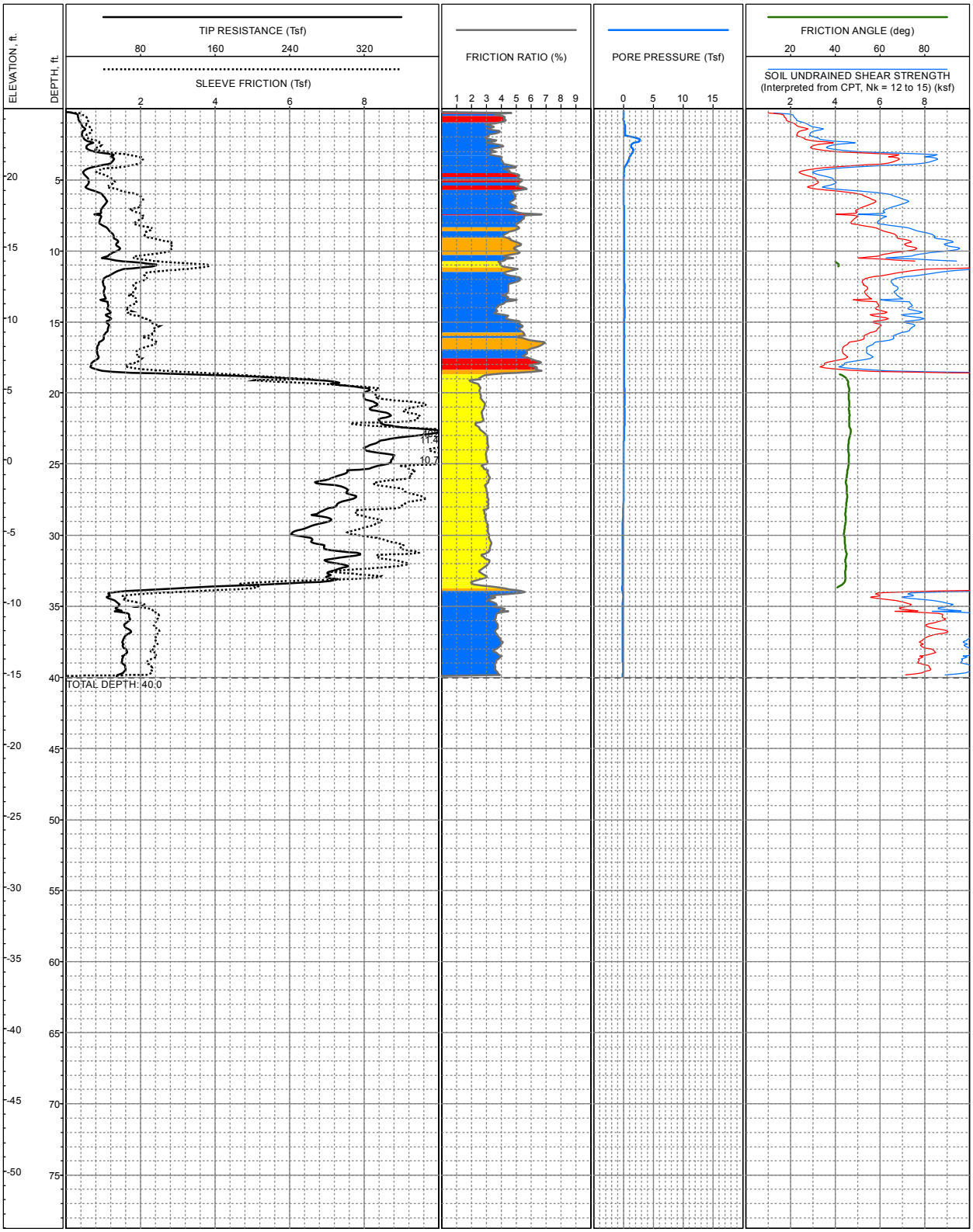

LOCATION: E5,998,122, N 1,979,929, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.7ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-106

San Joaquin Apartments & Precinct Improvements
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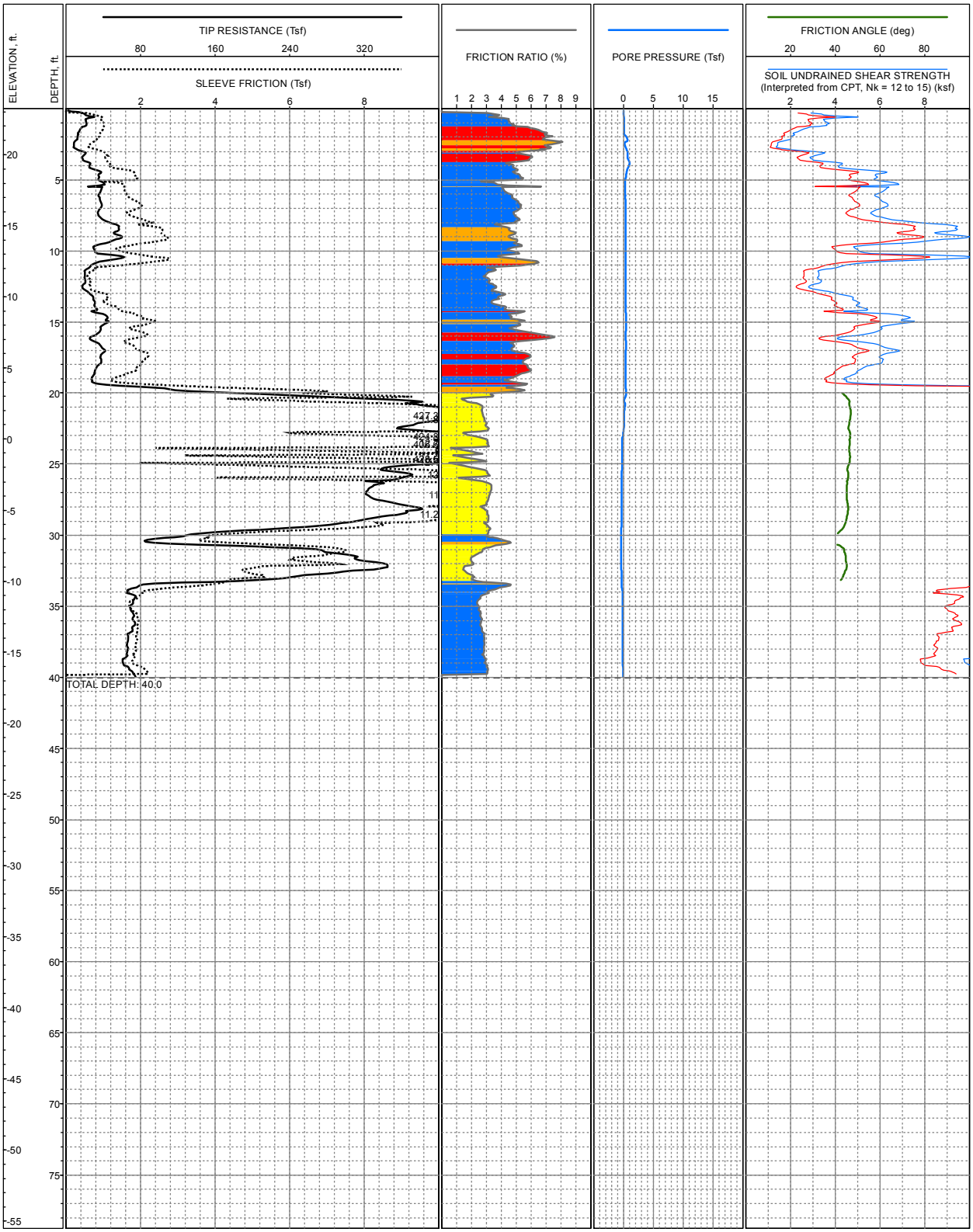

LOCATION: E5,998,202, N 1,979,968, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.2ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-107

San Joaquin Apartments & Precinct Improvements
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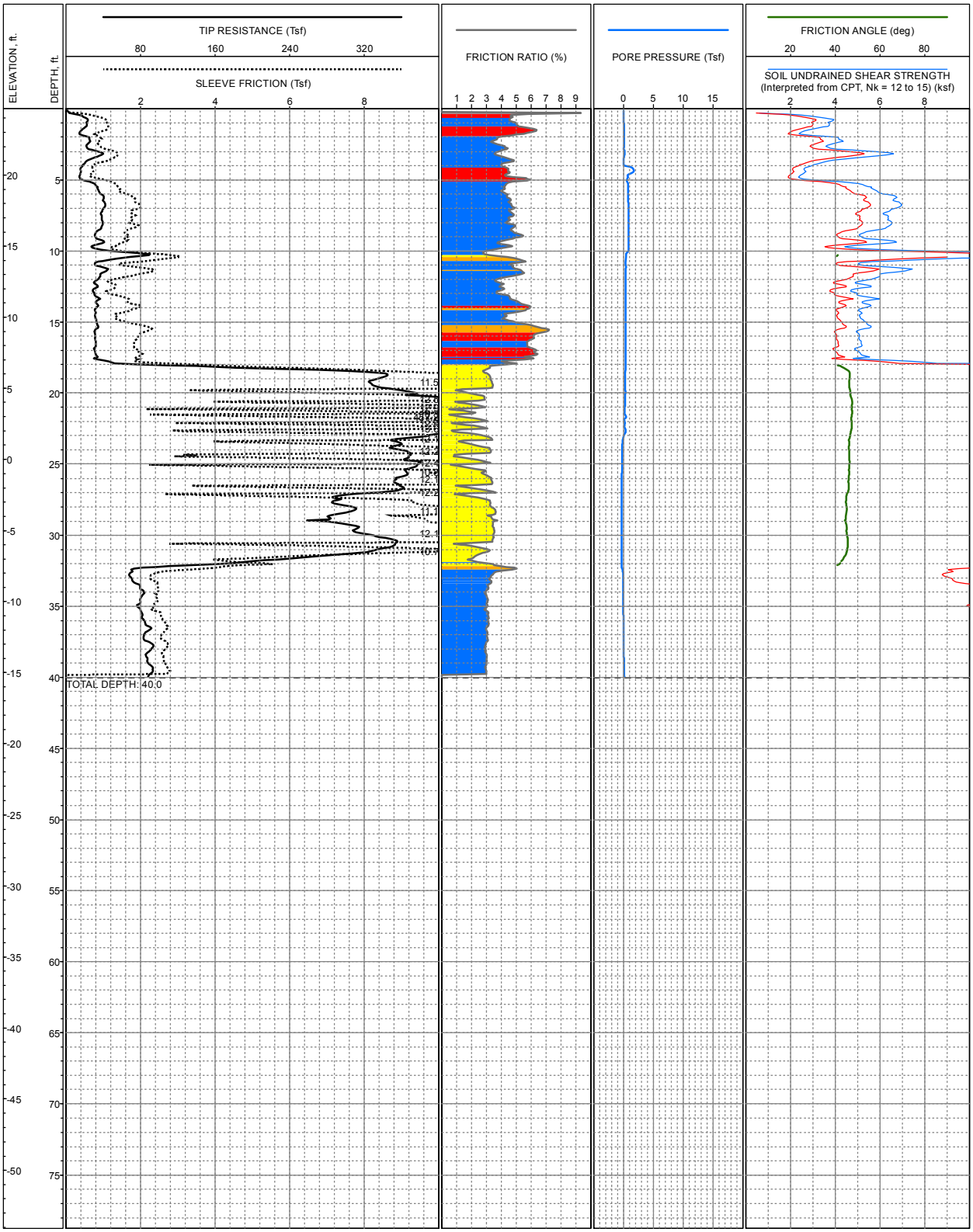

LOCATION: E5,998,123, N 1,979,955, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.7ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-108

San Joaquin Apartments & Precinct Improvements
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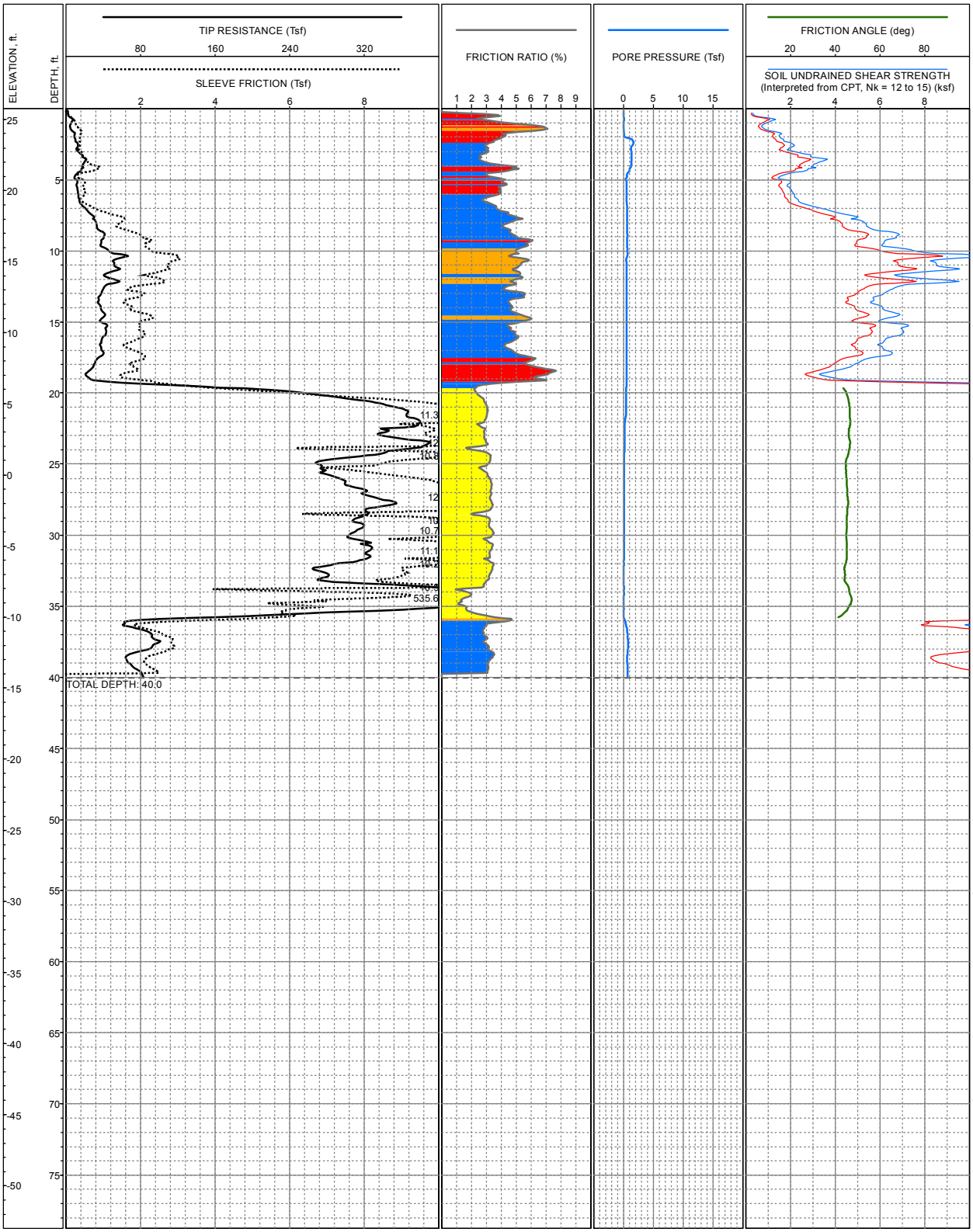

LOCATION: E5,998,122, N 1,979,917, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.8ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-109

San Joaquin Apartments & Precinct Improvements
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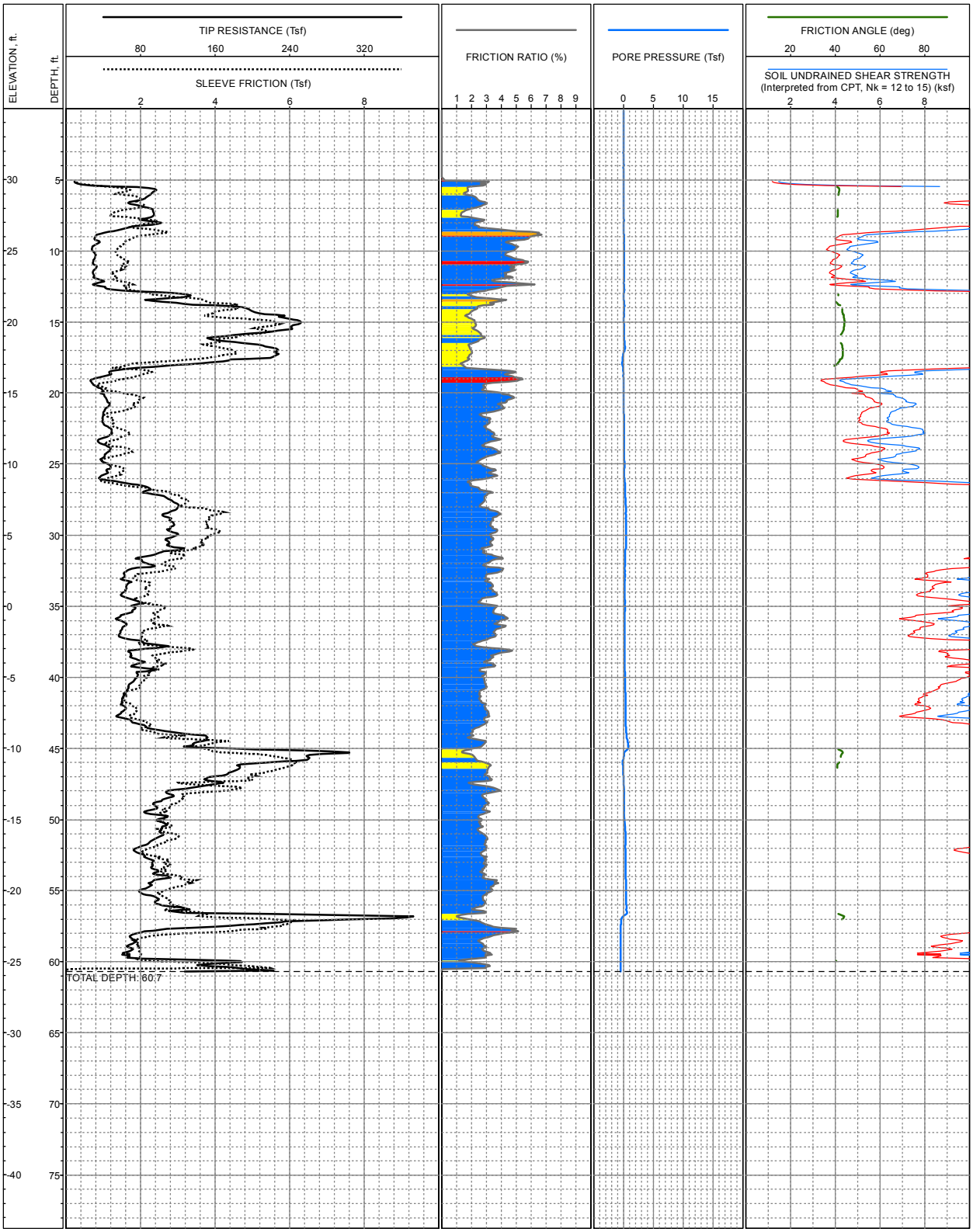

LOCATION: E5,998,213, N 1,979,562, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.0ft +/- ()
COMPLETION DEPTH: 60.7ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-110

San Joaquin Apartments & Precinct Improvements
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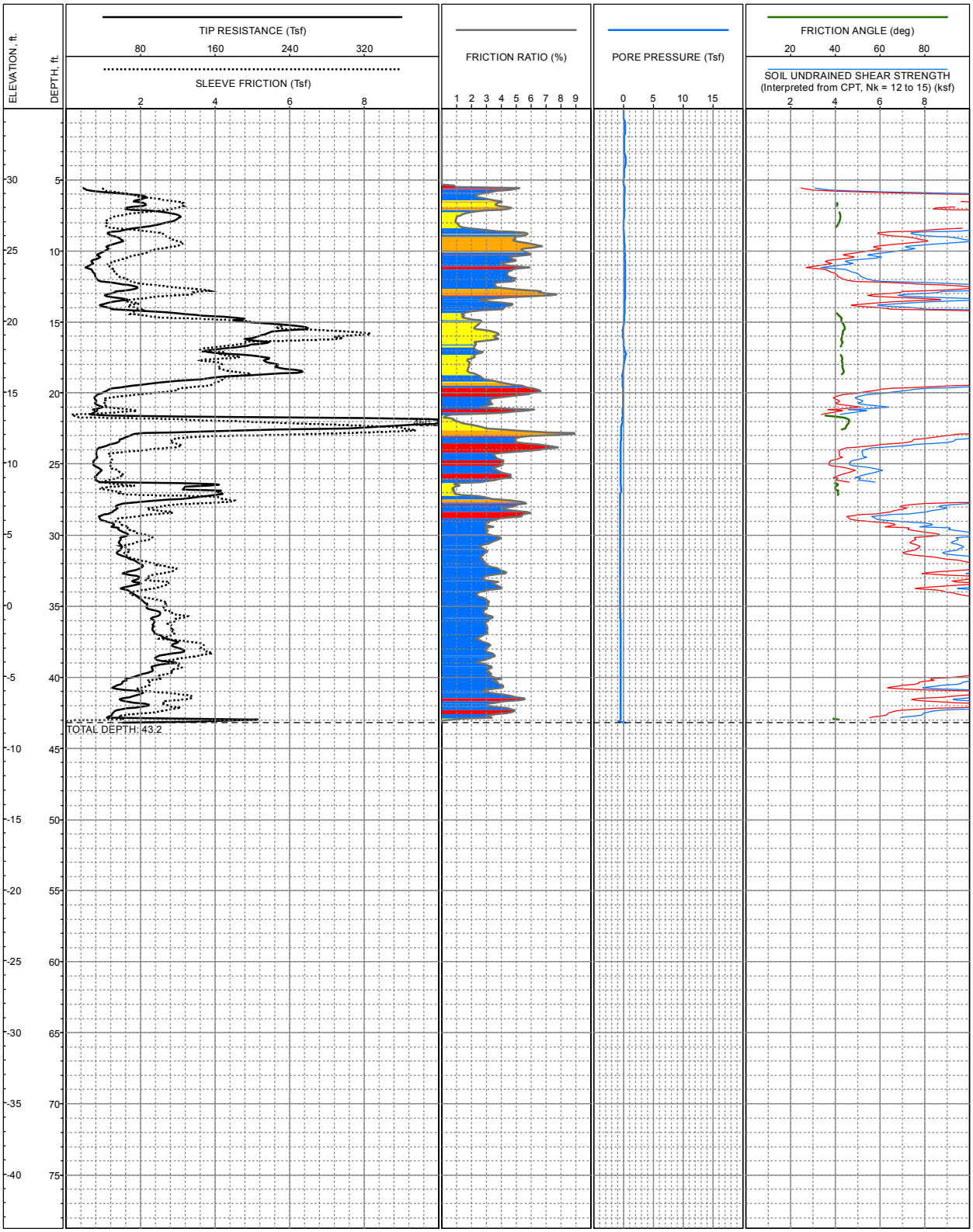

LOCATION: E5,998,214, N 1,979,571, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 34.9ft +/- ()
COMPLETION DEPTH: 43.2ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-111

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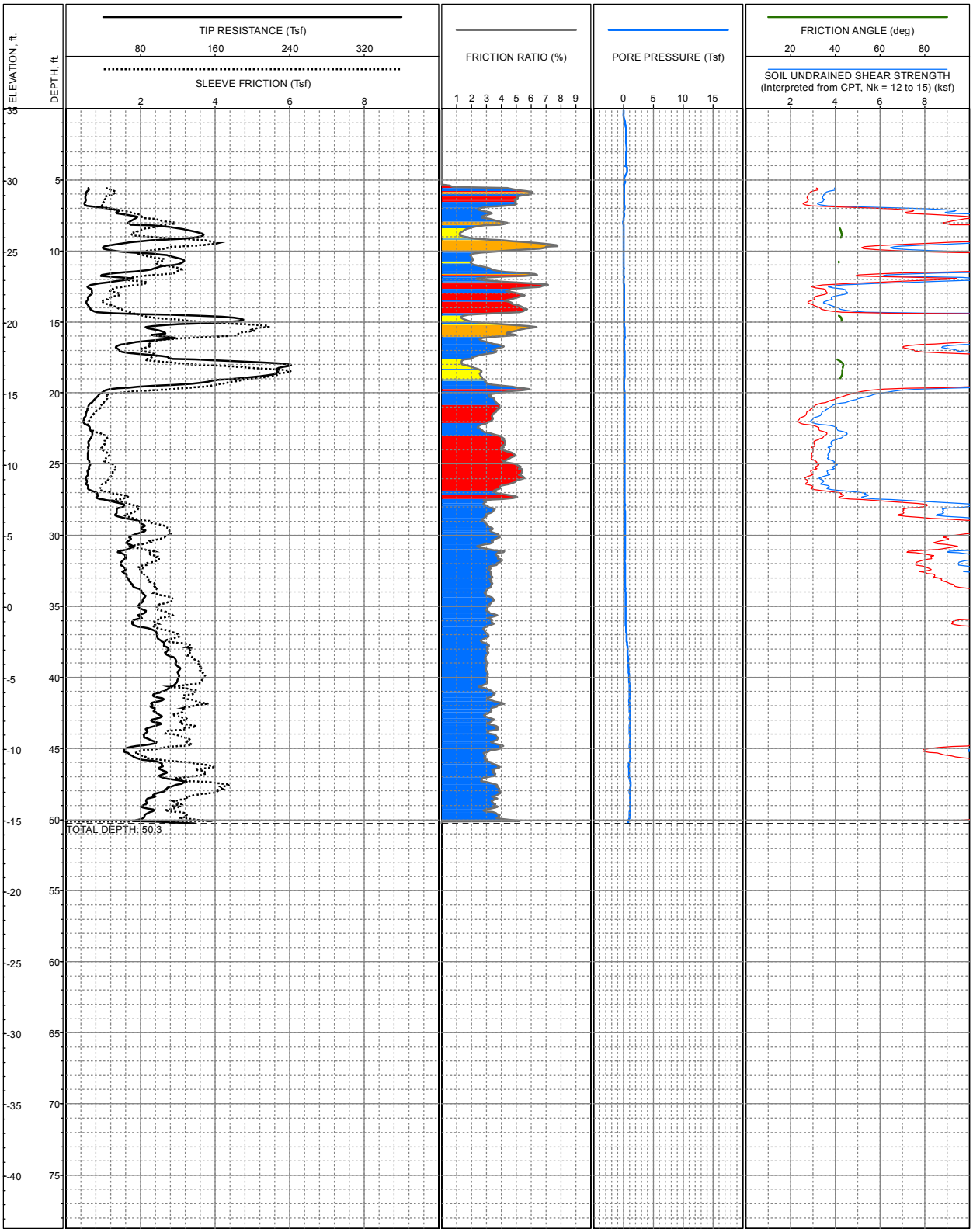

LOCATION: E5,998,214, N 1,979,580, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.1ft +/- ()
COMPLETION DEPTH: 50.3ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-112

San Joaquin Apartments & Precinct Improvements
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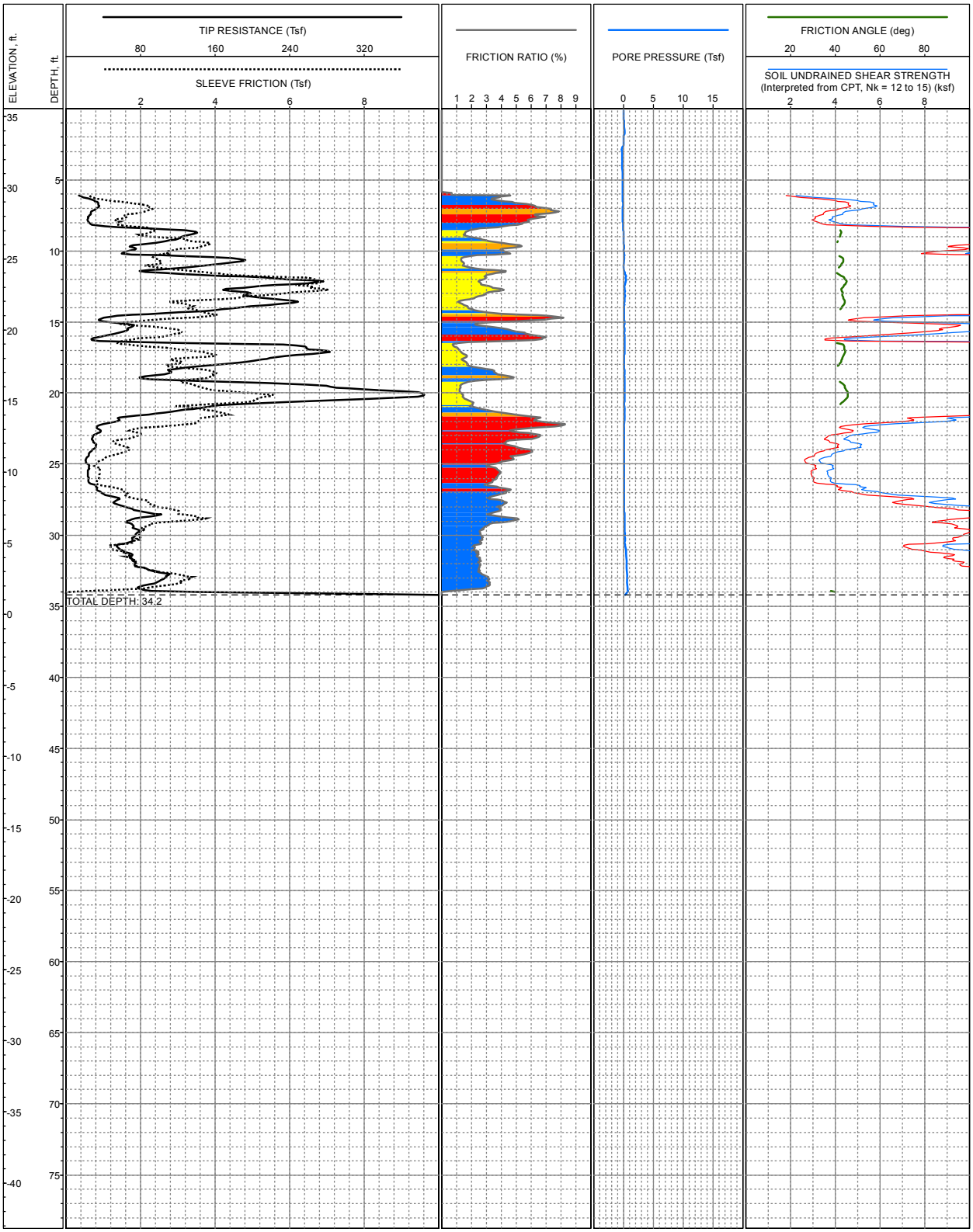

LOCATION: E5,998,215, N 1,979,588, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.6ft +/- ()
COMPLETION DEPTH: 34.2ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-113

San Joaquin Apartments & Precinct Improvements
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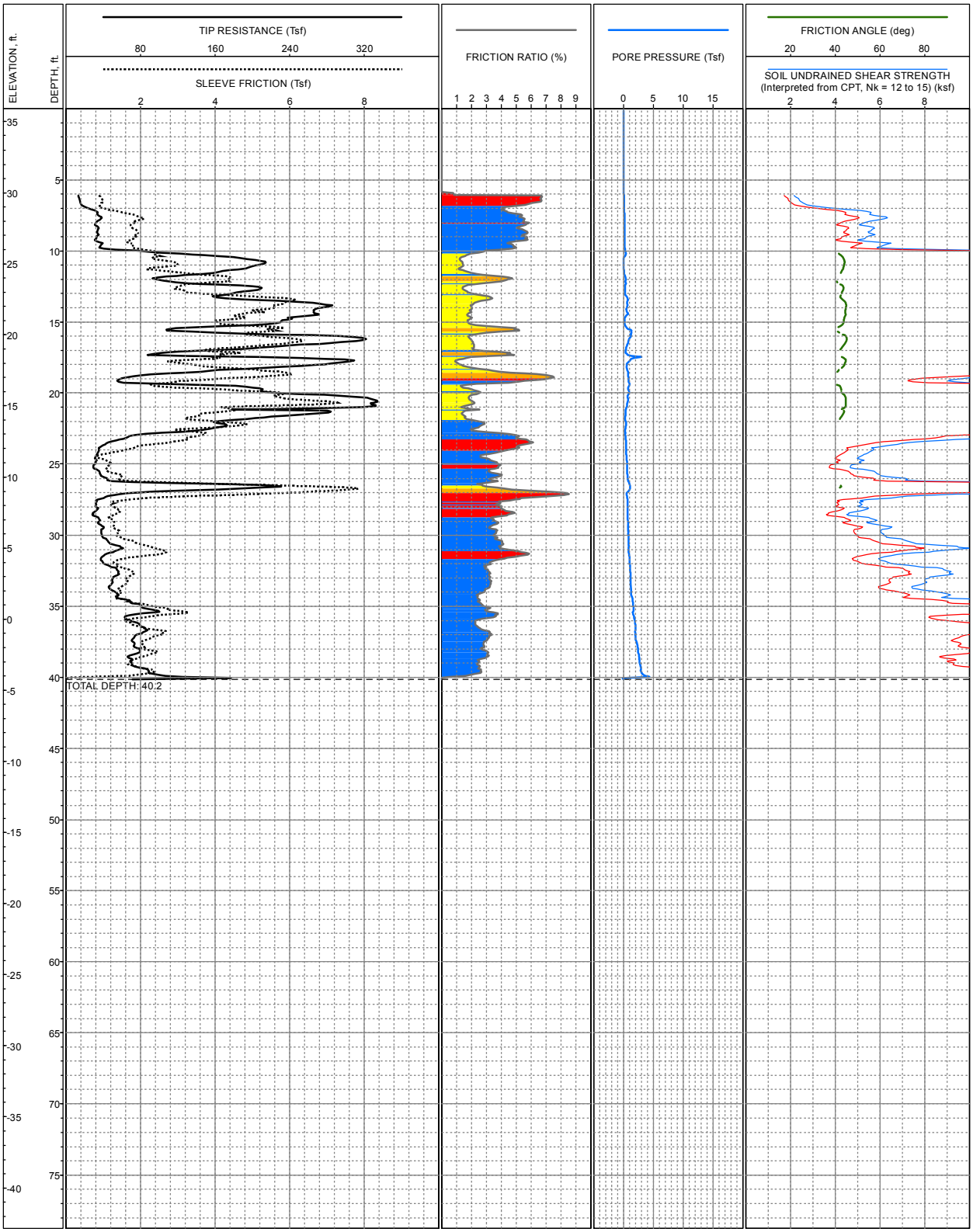

LOCATION: E5,998,216, N 1,979,596, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.9ft +/- ()
COMPLETION DEPTH: 40.2ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-114

San Joaquin Apartments & Precinct Improvements
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Santa Barbara, California

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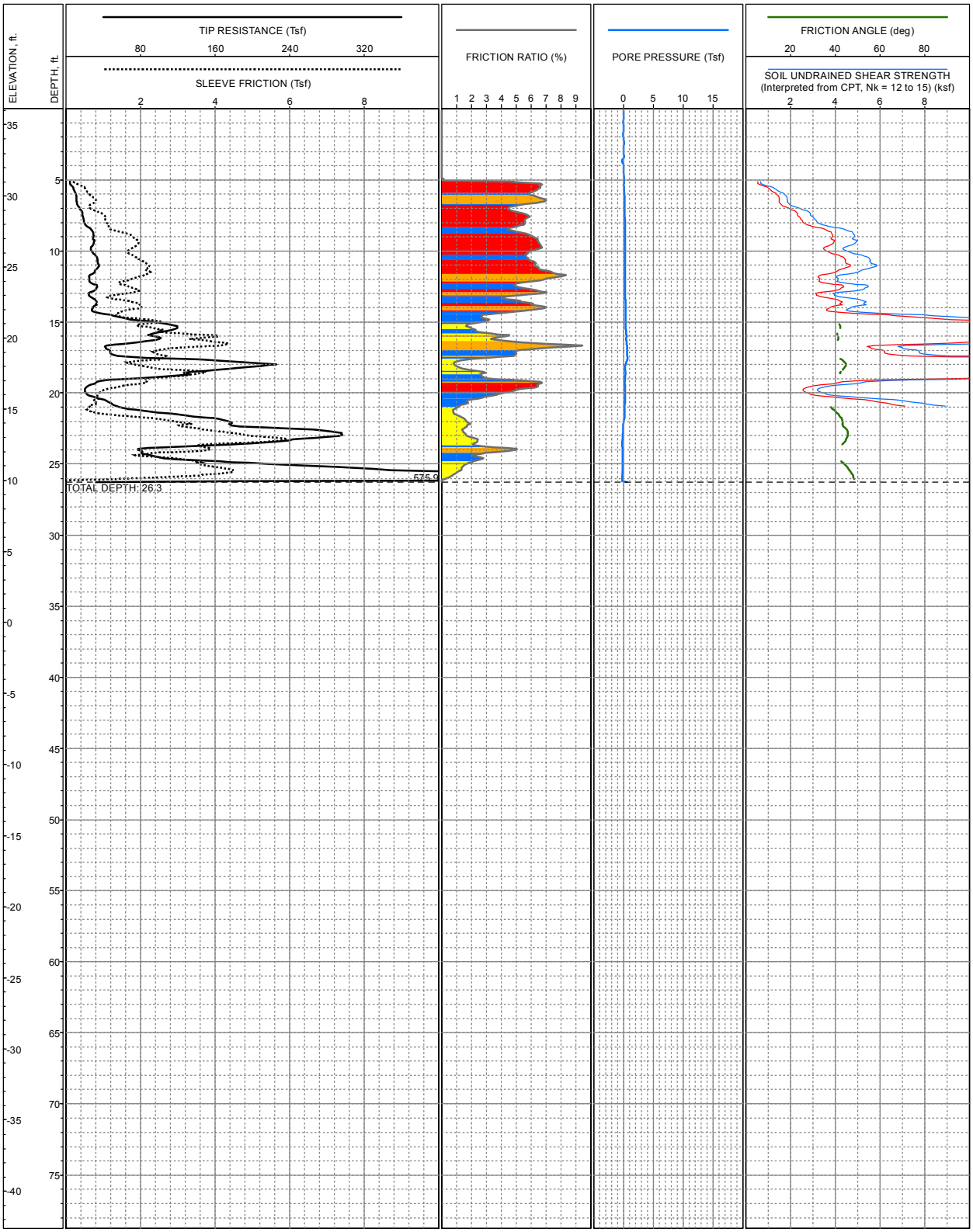

LOCATION: E5,998,216, N 1,979,604, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 36.1ft +/- ()
COMPLETION DEPTH: 26.3ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-115

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Santa Barbara, California

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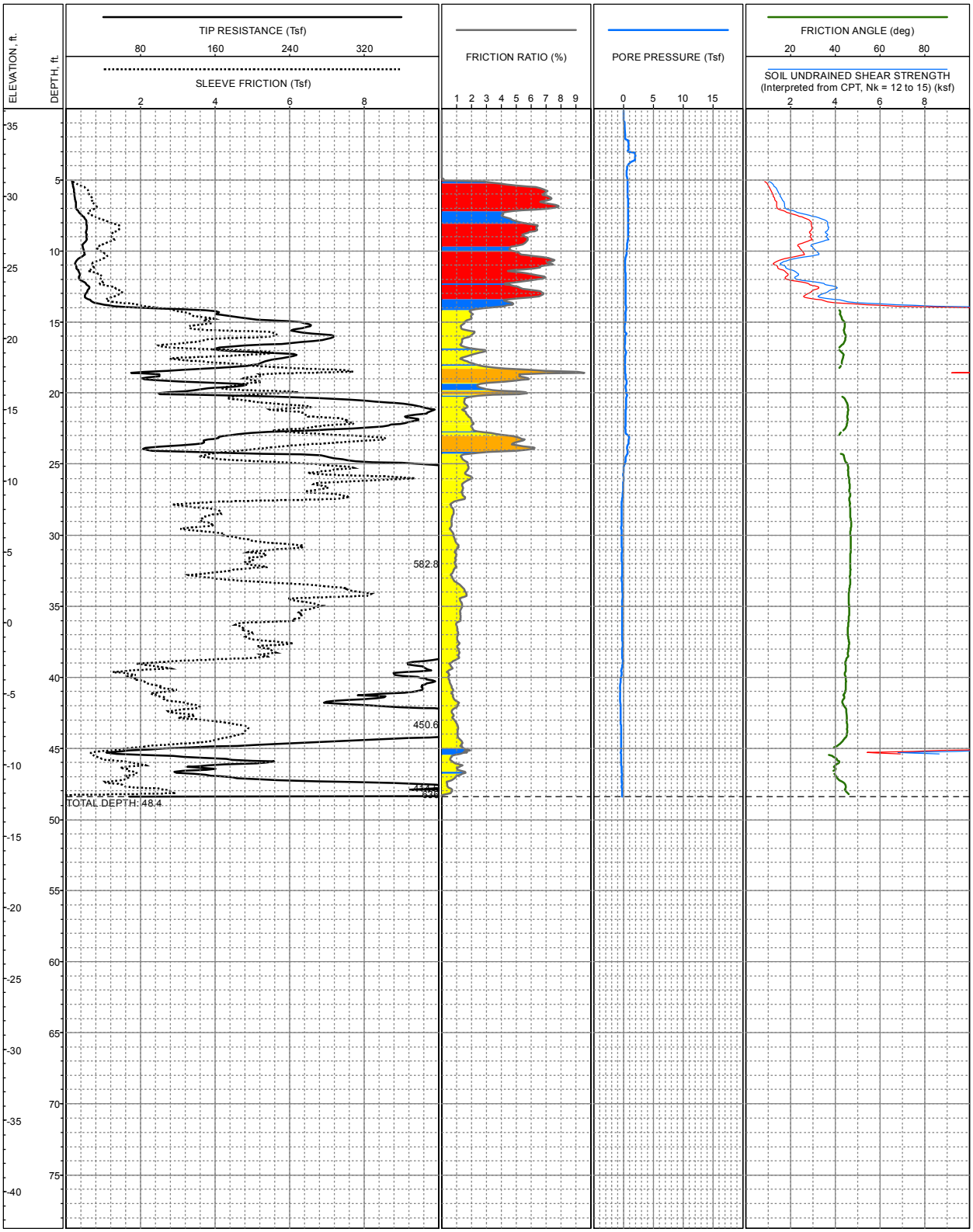

LOCATION: E5,998,218, N 1,979,605, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 36.2ft +/- ()
COMPLETION DEPTH: 48.4ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-115A

San Joaquin Apartments & Precinct Improvements
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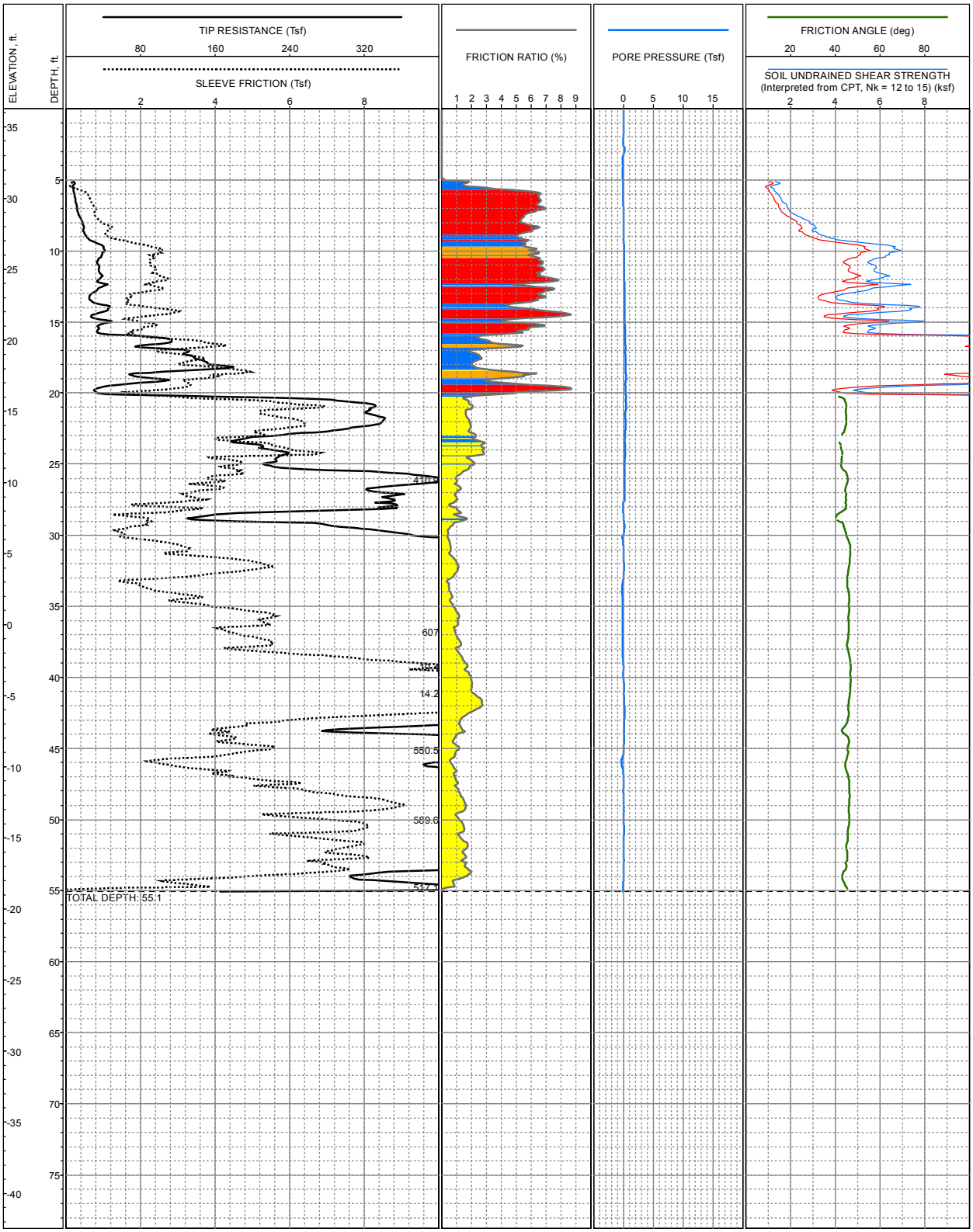

LOCATION: E5,998,216, N 1,979,613, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 36.3ft +/- ()
COMPLETION DEPTH: 55.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-116

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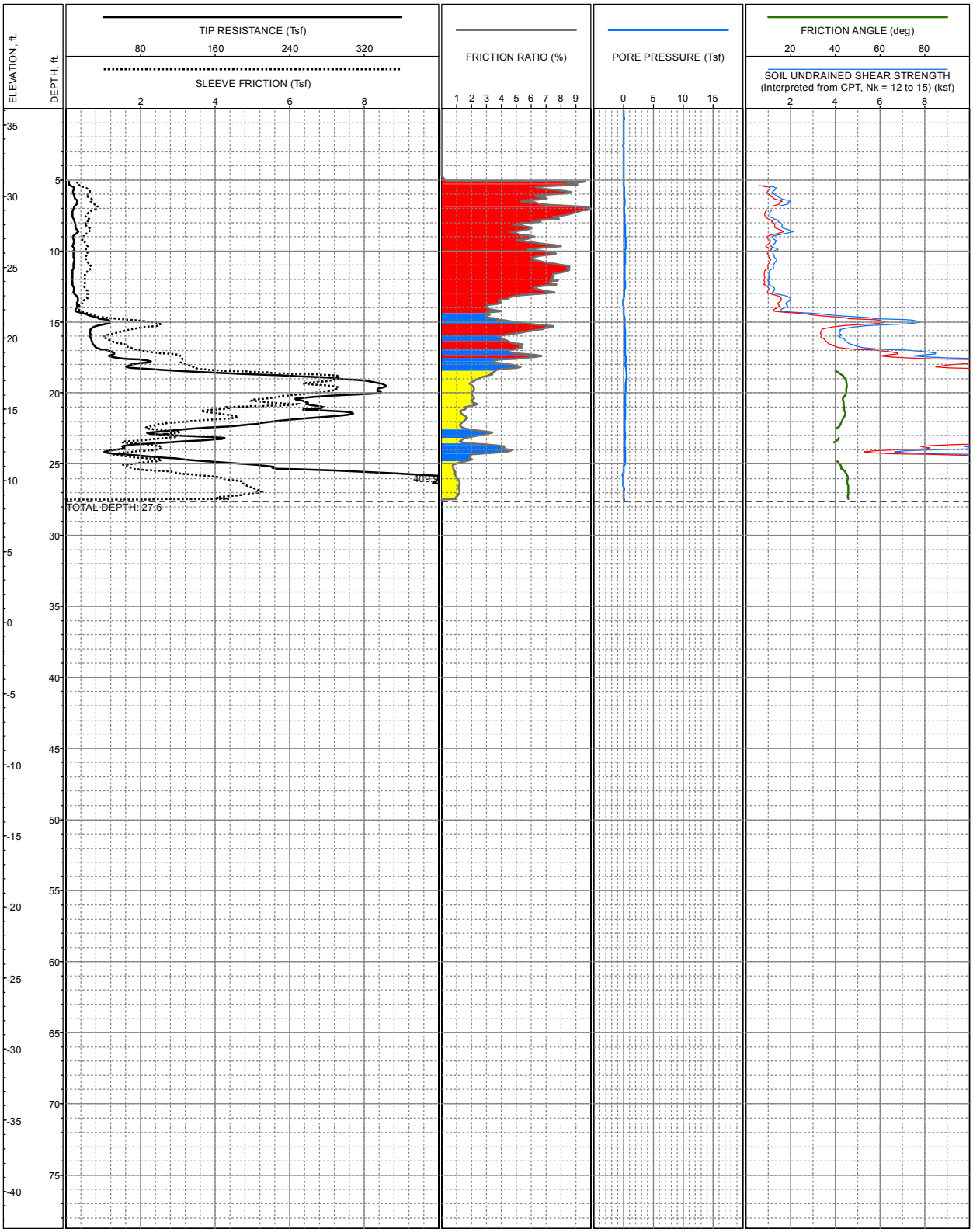

LOCATION: E5,998,215, N 1,979,622, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 36.2ft +/- ()
COMPLETION DEPTH: 27.6ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-117

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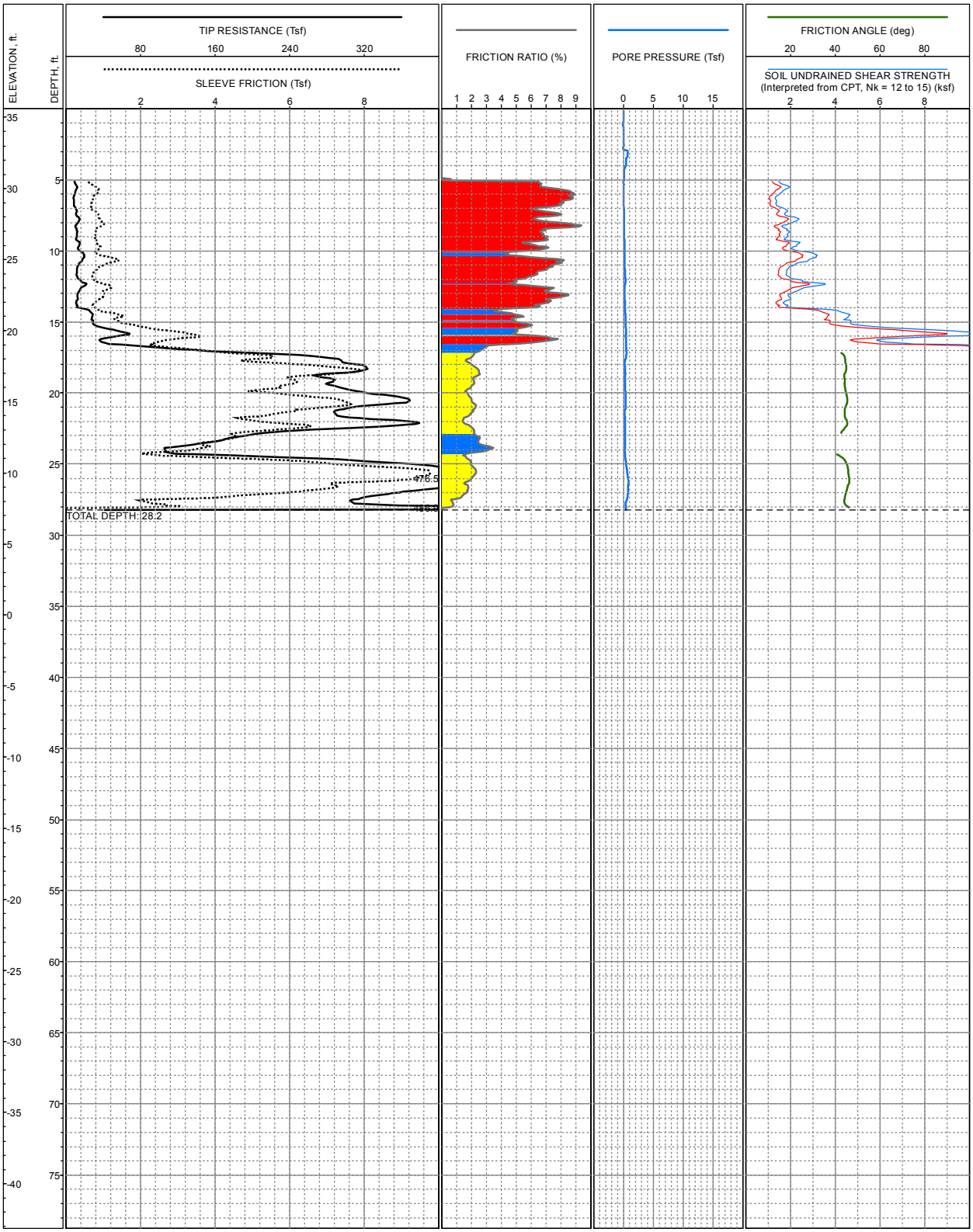

LOCATION: E5,998,213, N 1,979,629, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.6ft +/- ()
COMPLETION DEPTH: 28.2ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Fugro Consultants, Inc.
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.59

LOG OF CPT NO: CPT-118

San Joaquin Apartments & Precinct Improvements
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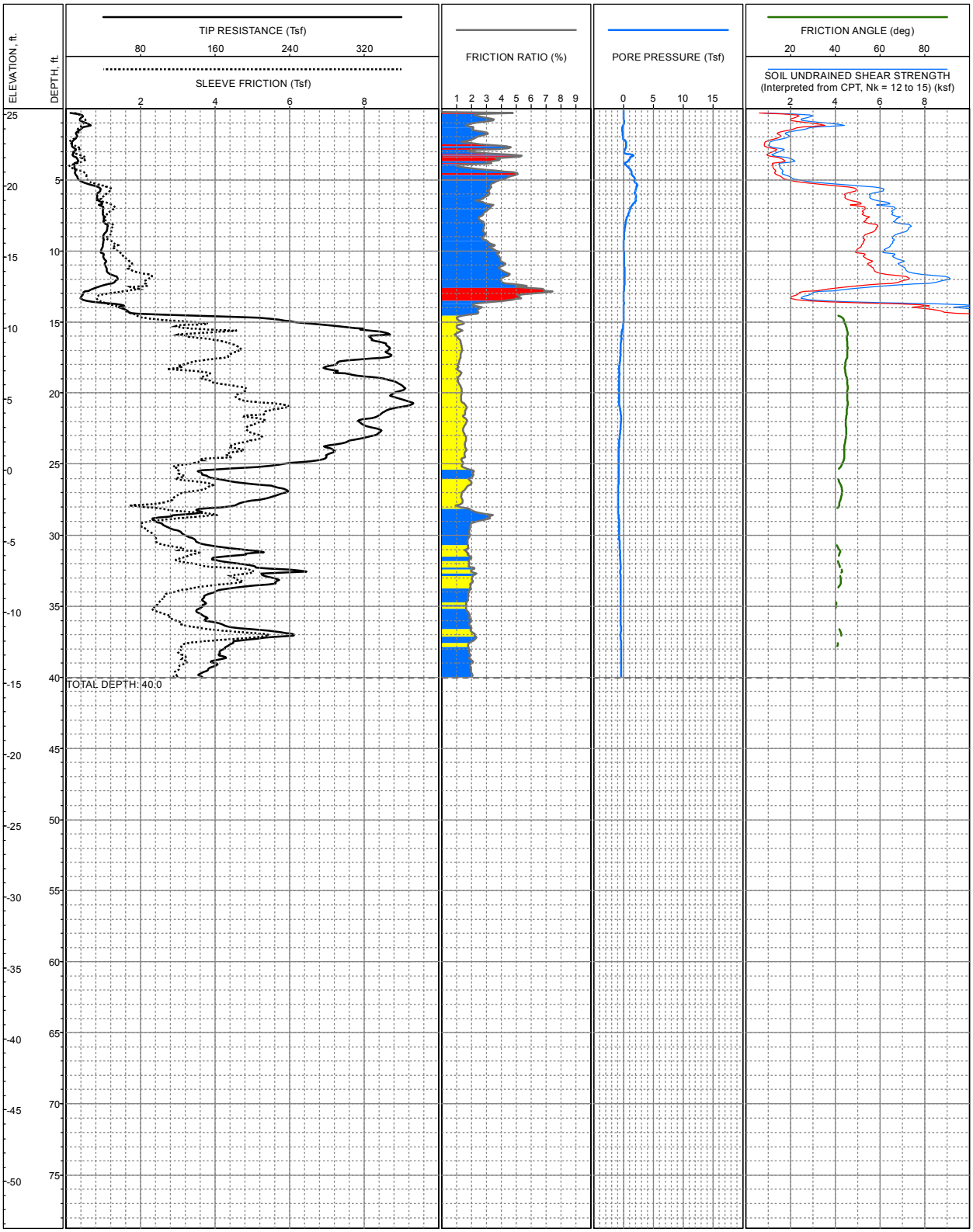

LOCATION: E5,998,719, N 1,979,660, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.4ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-200

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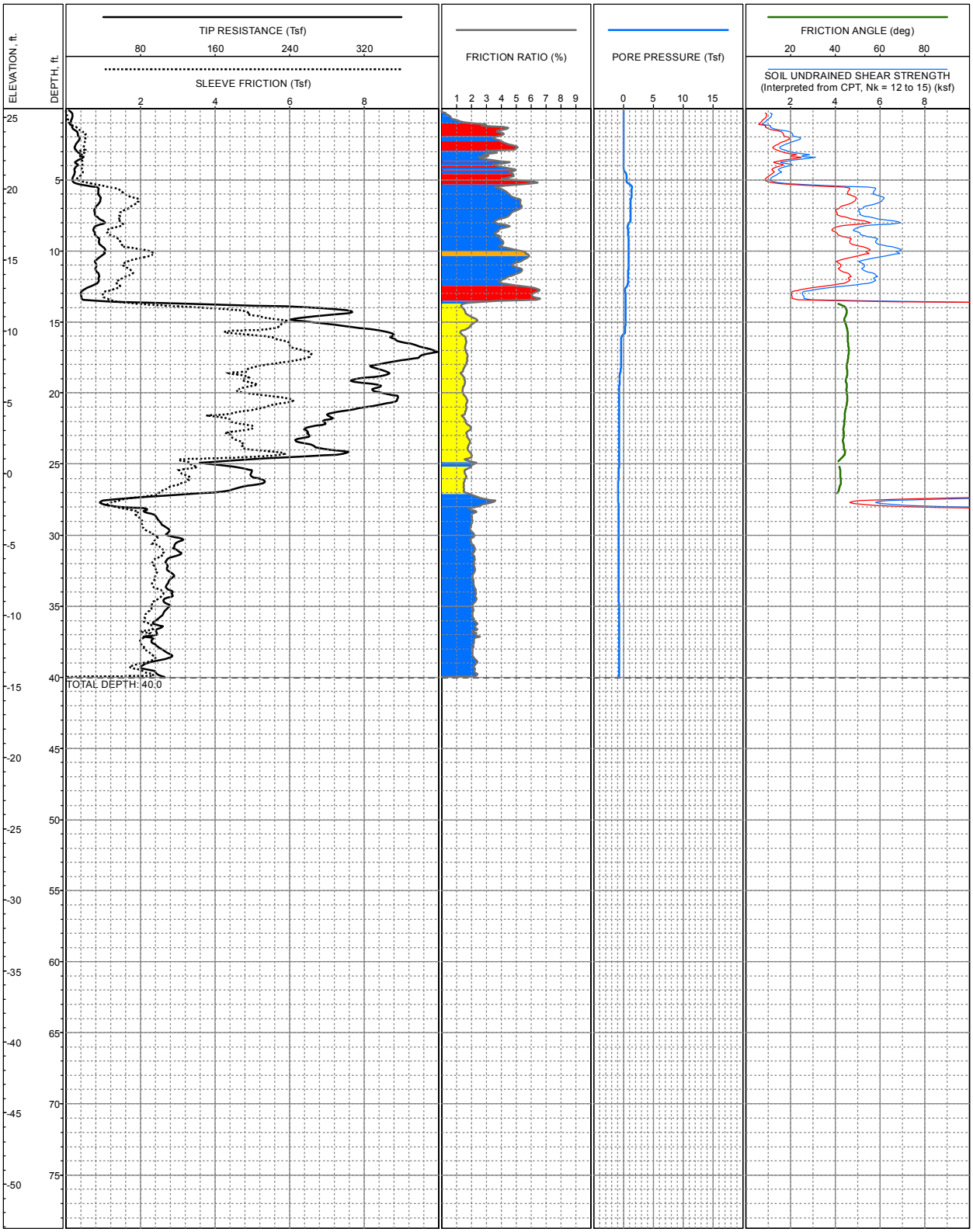

LOCATION: E5,998,722, N 1,979,648, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.6ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-201

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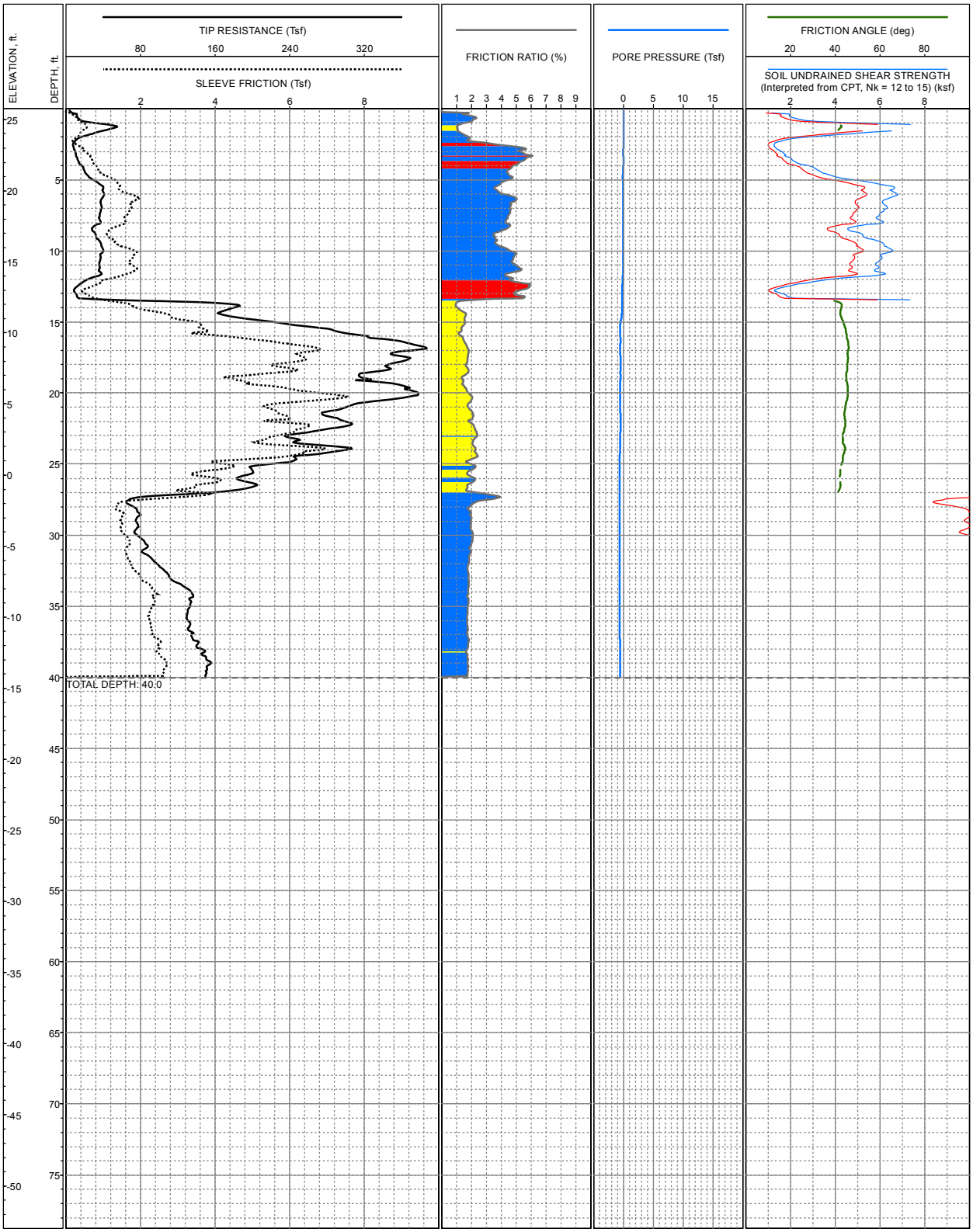

LOCATION: E5,998,727, N 1,979,636, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.8ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-202

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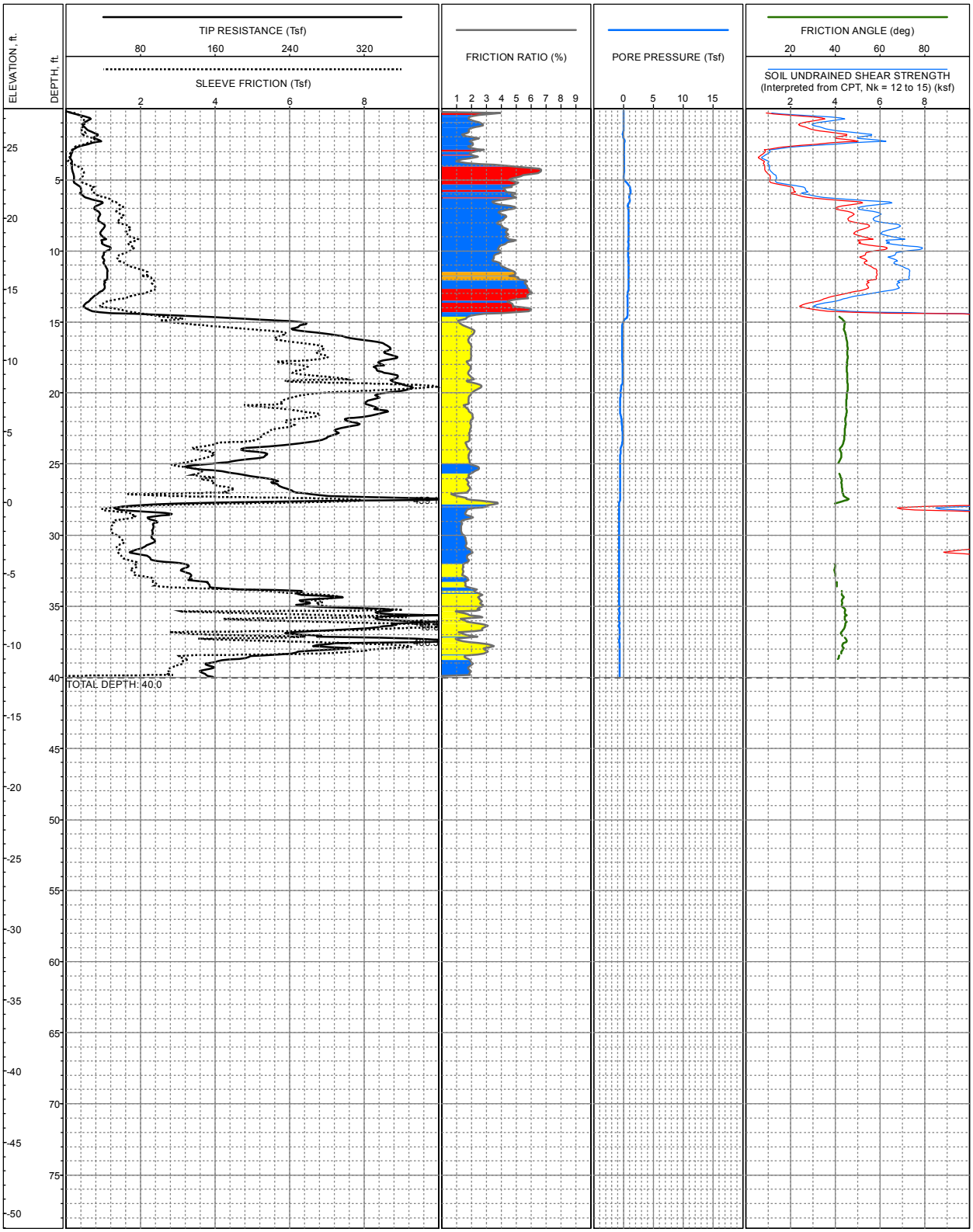

LOCATION: E5,998,740, N 1,979,601, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 27.7ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-203

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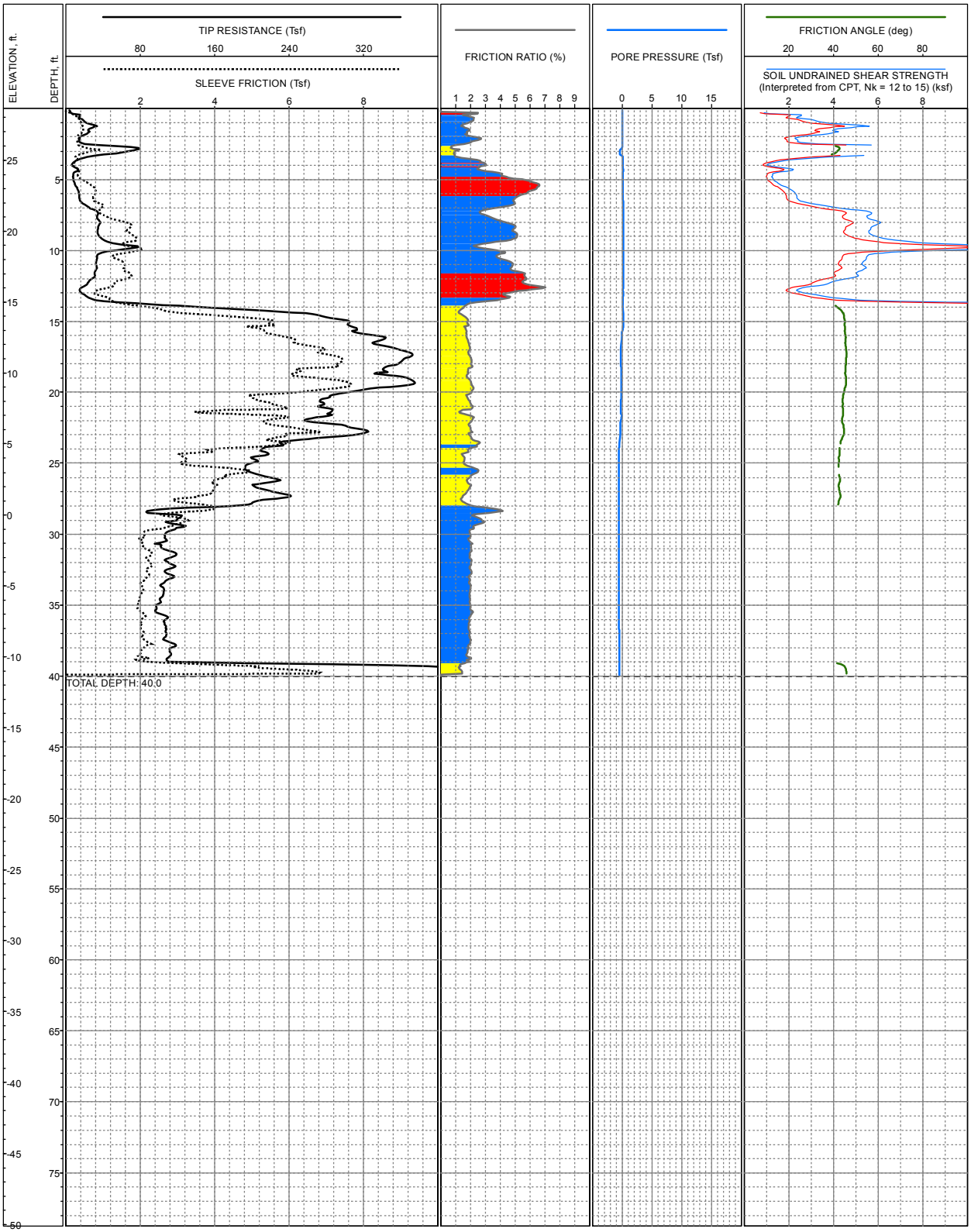

LOCATION: E5,998,742, N 1,979,590, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 28.6ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-204

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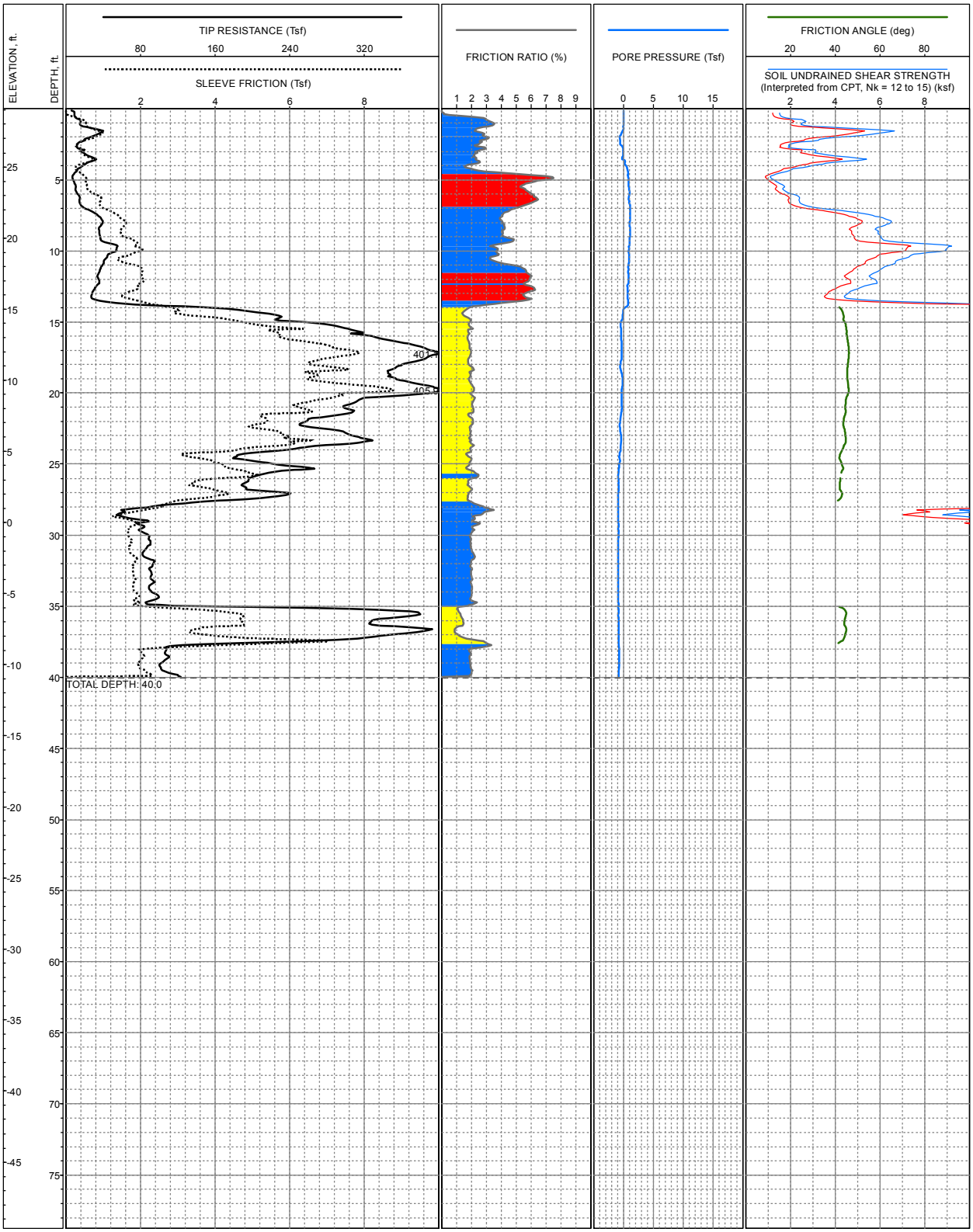

LOCATION: E5,998,743, N 1,979,585, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 29.1ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-205

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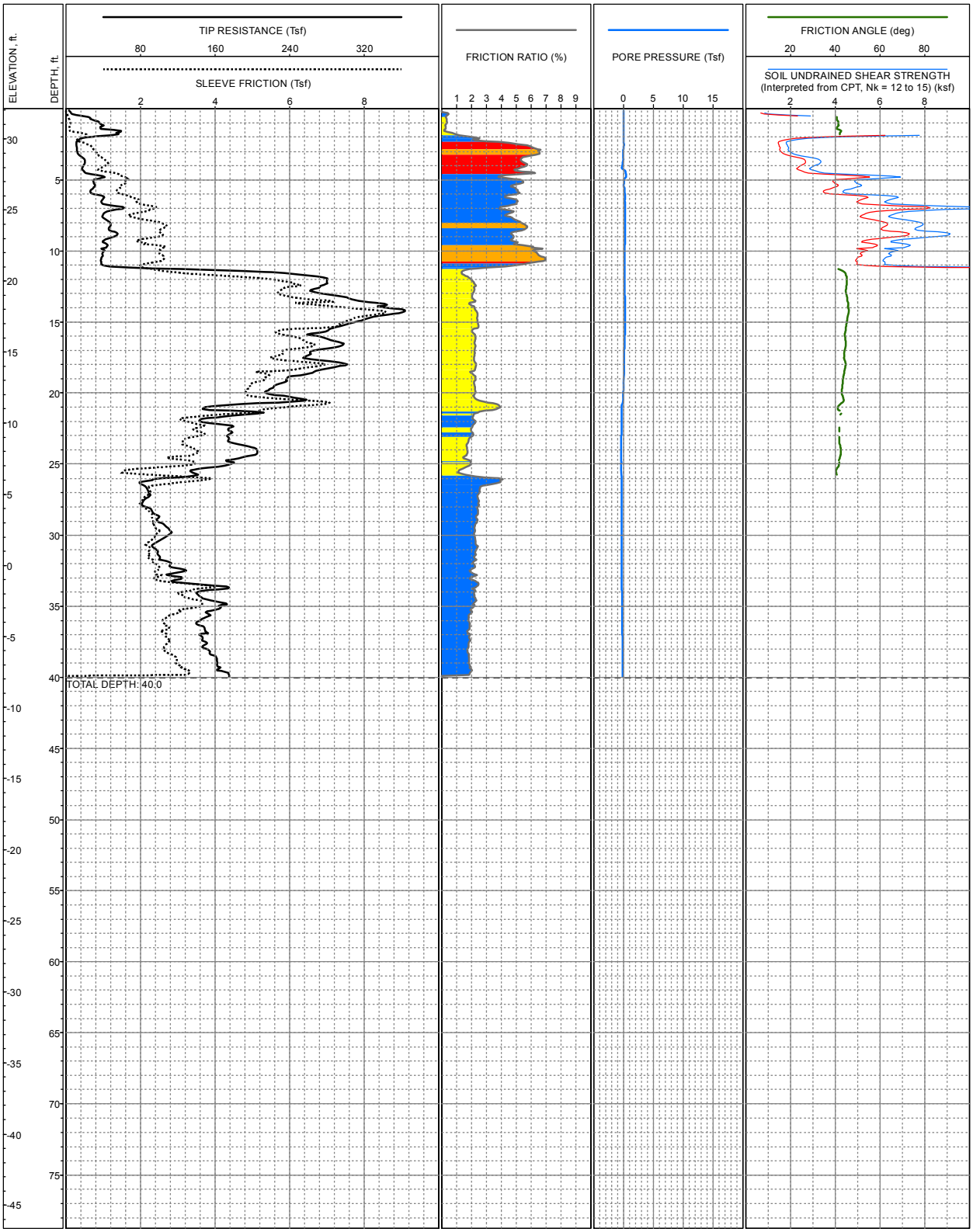

LOCATION: E5,998,521, N 1,979,621, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.1ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-206

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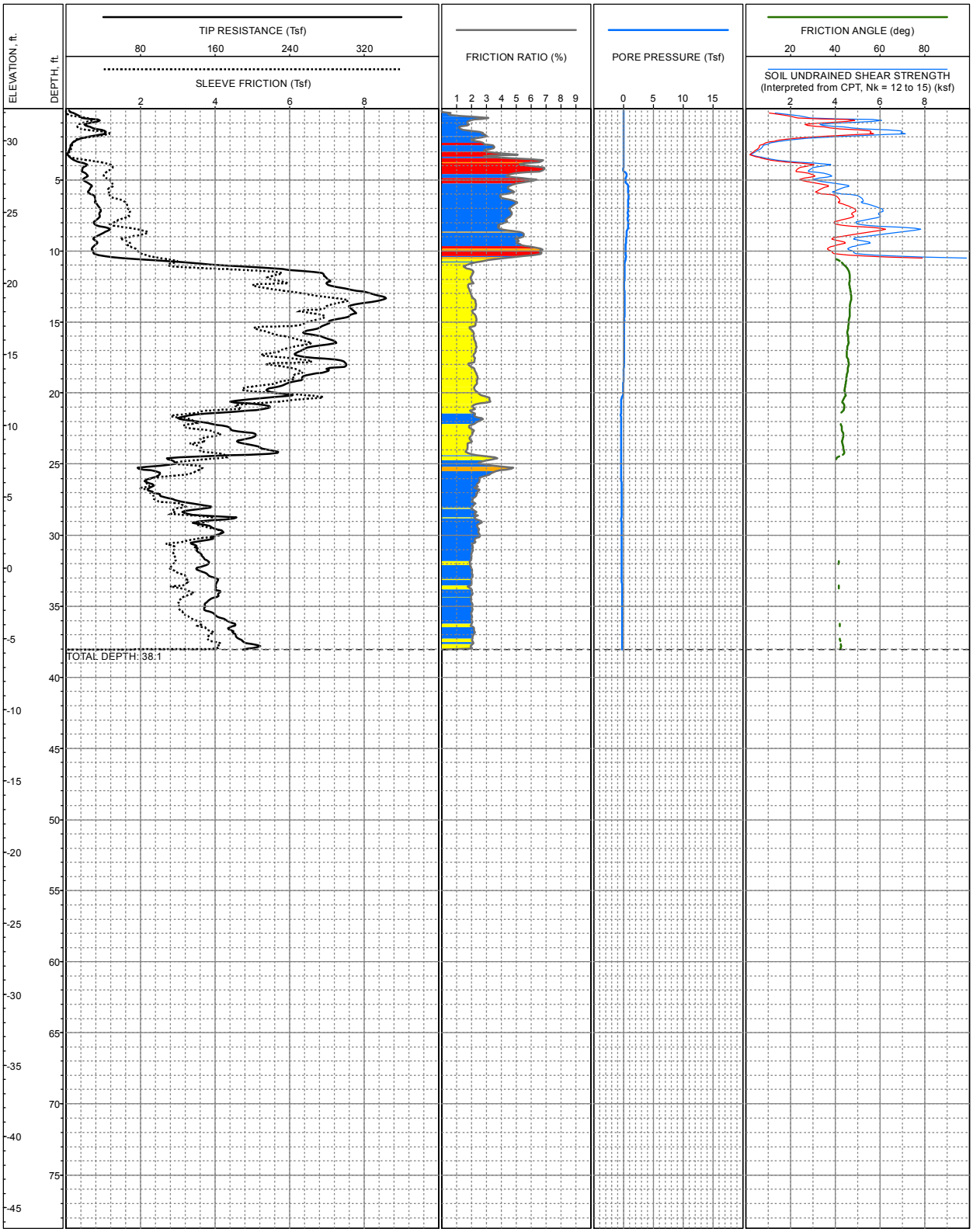

LOCATION: E5,998,521, N 1,979,616, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.3ft +/- ()
COMPLETION DEPTH: 38.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-207

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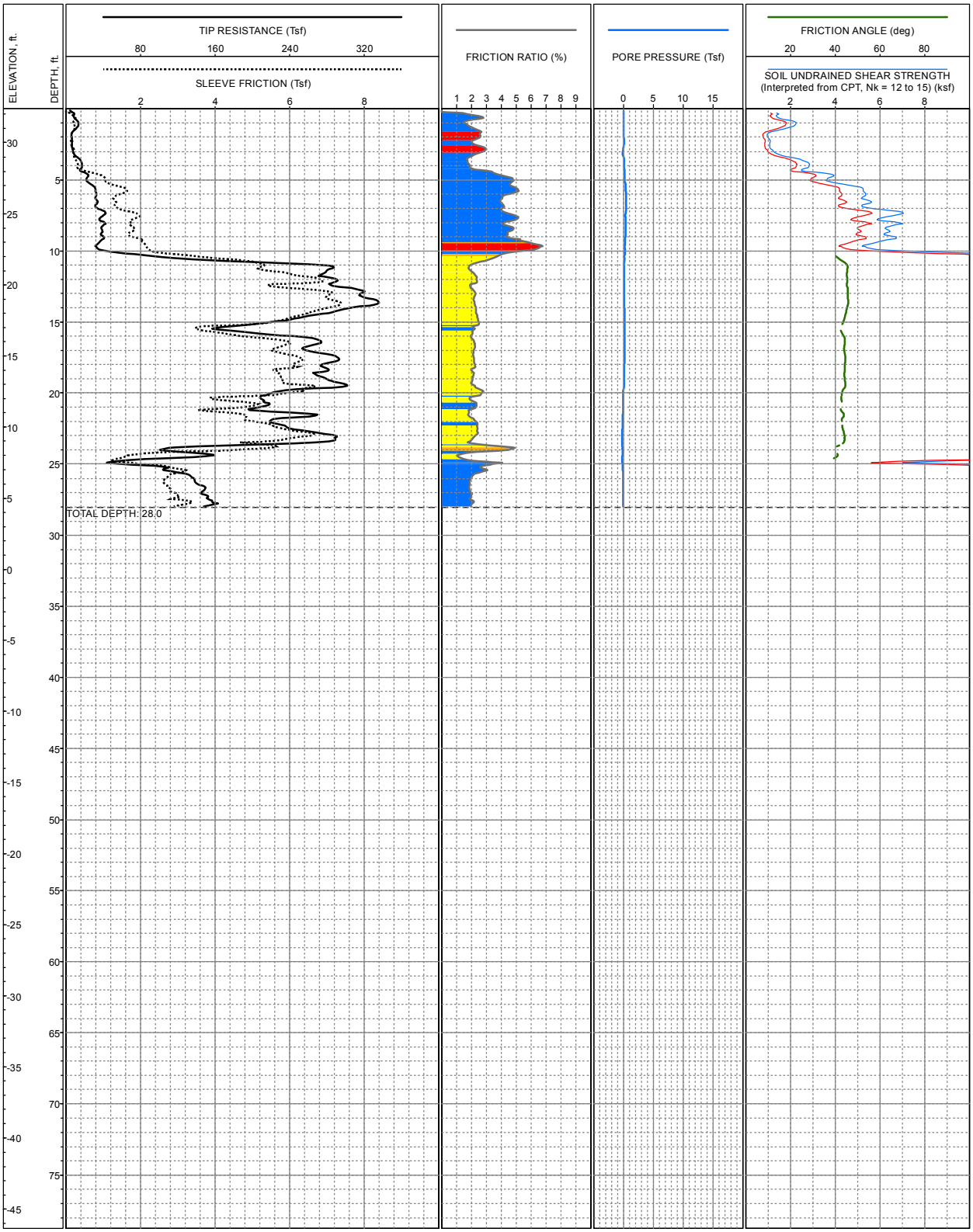

LOCATION: E5,998,521, N 1,979,607, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.4ft +/- ()
COMPLETION DEPTH: 28.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-208

San Joaquin Apartments & Precinct Improvements
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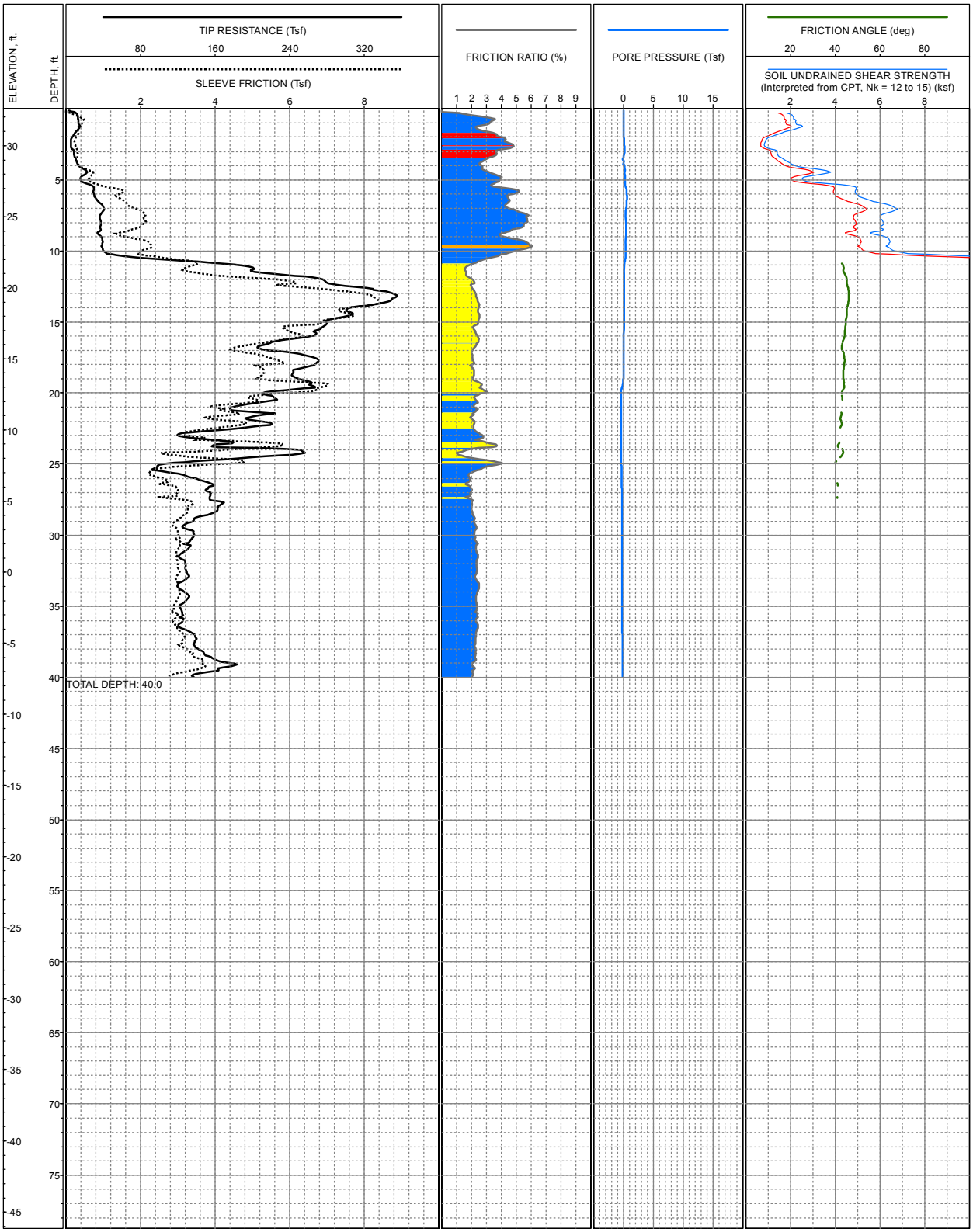

LOCATION: E5,998,521, N 1,979,602, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.6ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-209

San Joaquin Apartments & Precinct Improvements
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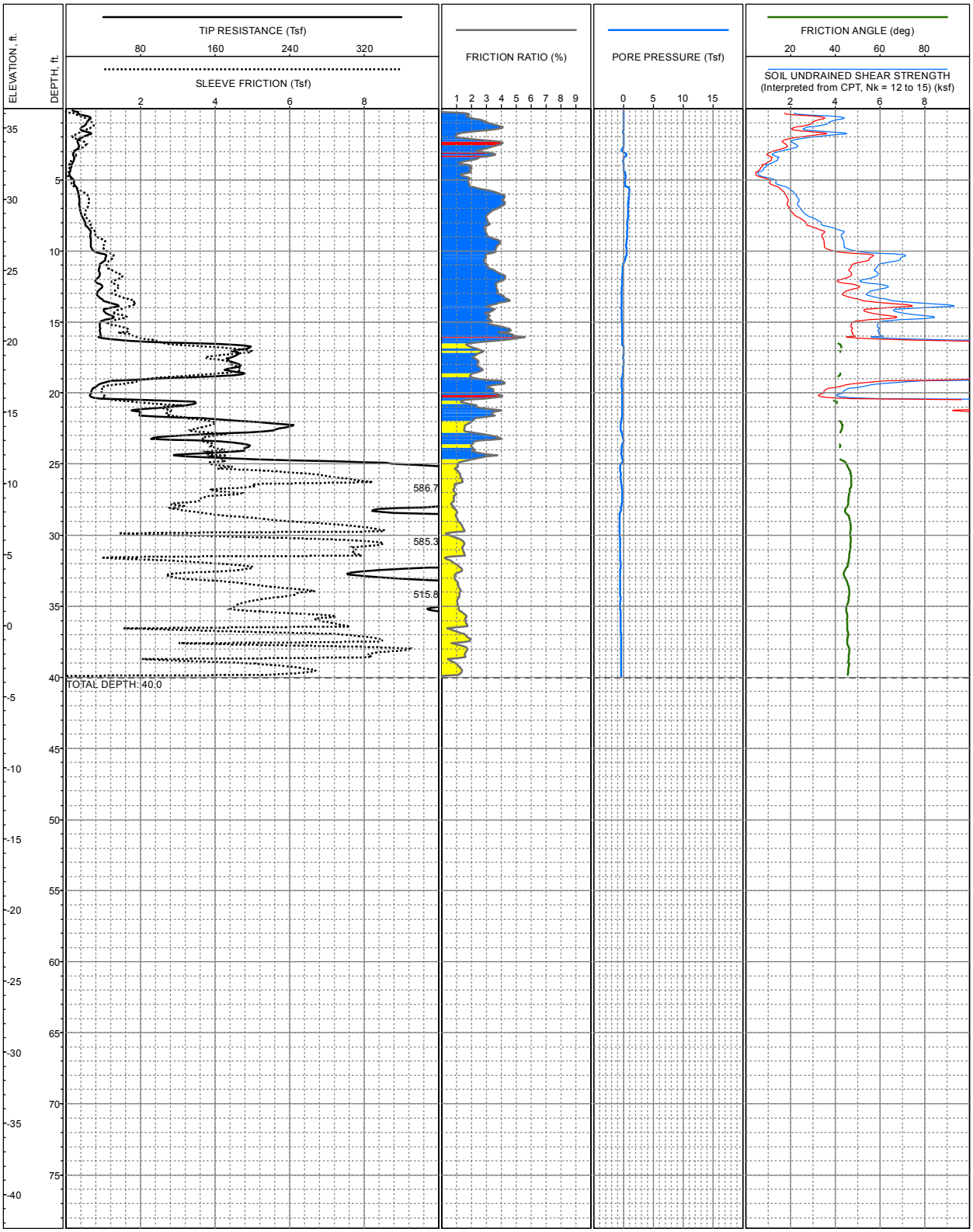

LOCATION: E5,998,216, N 1,979,609, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 36.4ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-210

San Joaquin Apartments & Precinct Improvements
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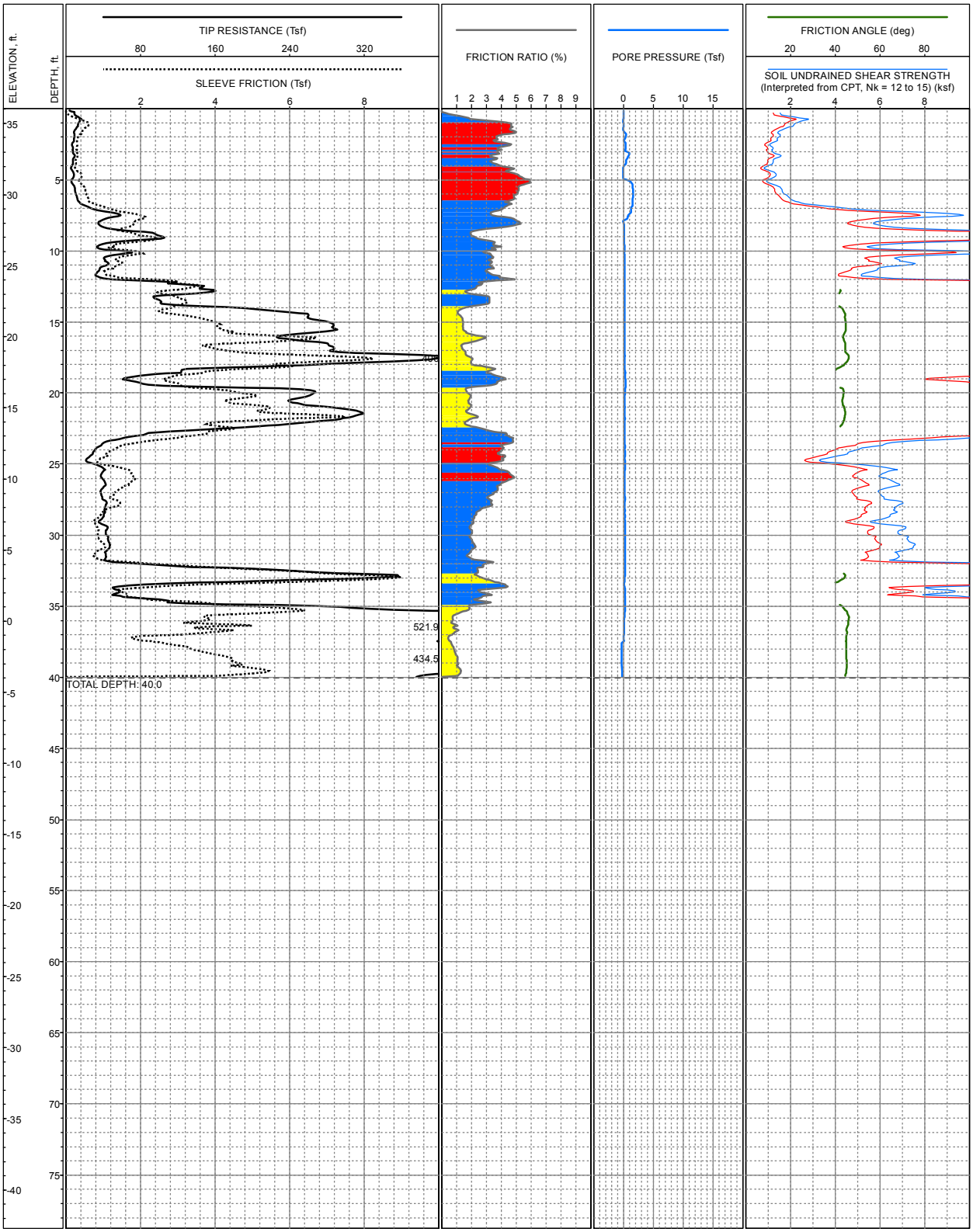

LOCATION: E5,998,216, N 1,979,600, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 36.0ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-211

San Joaquin Apartments & Precinct Improvements
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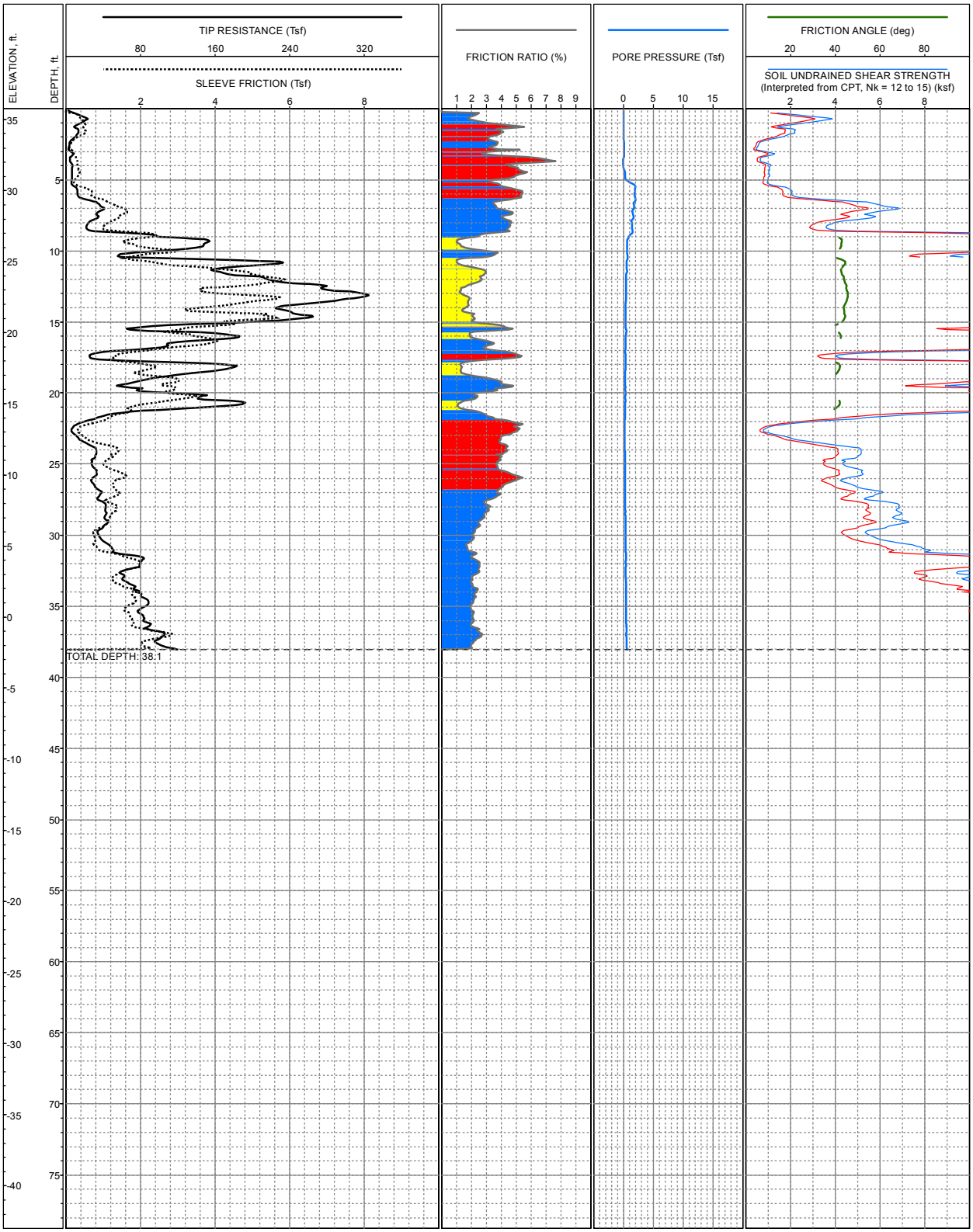

LOCATION: E5,998,215, N 1,979,592, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.8ft +/- ()
COMPLETION DEPTH: 38.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-212

San Joaquin Apartments & Precinct Improvements
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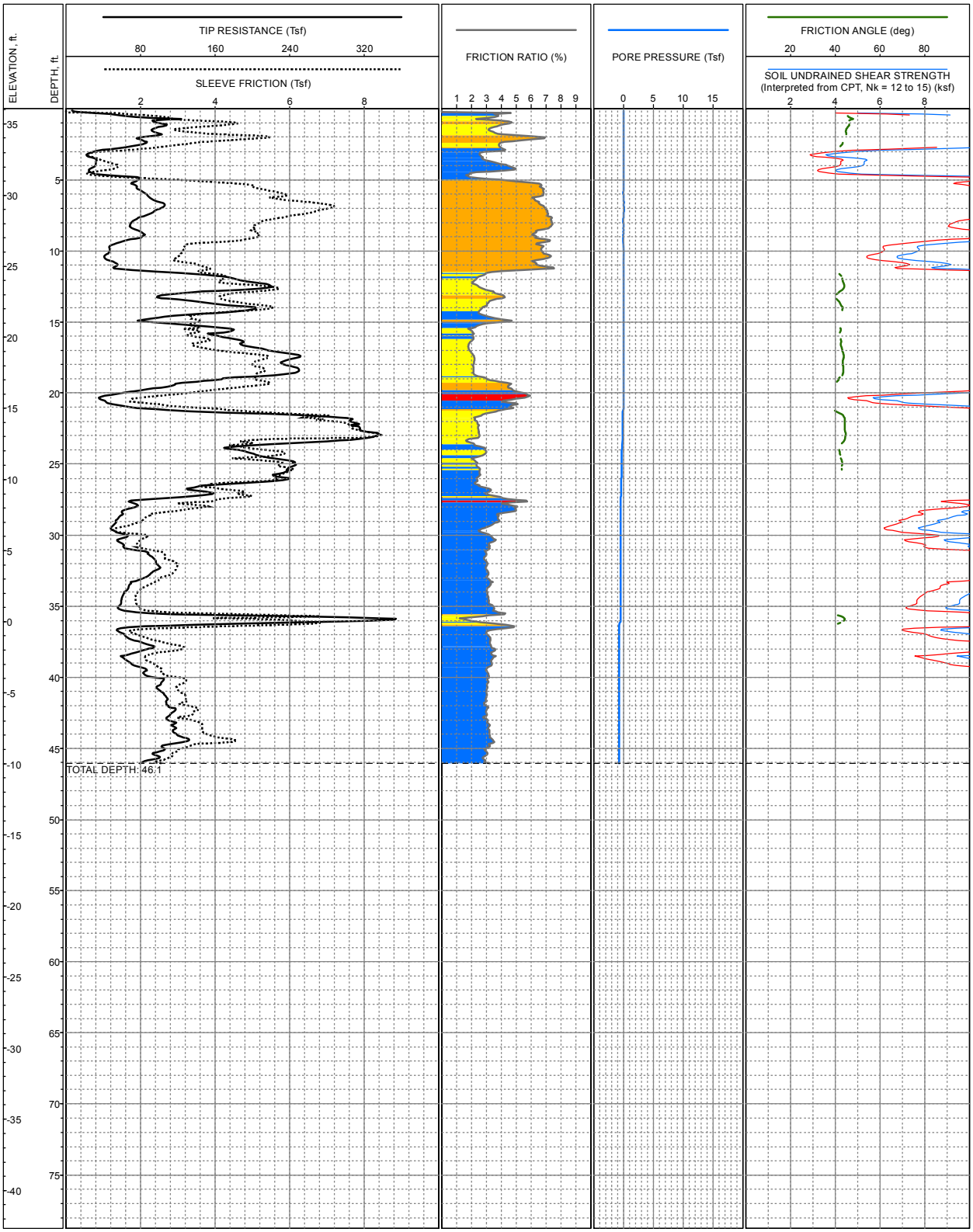

LOCATION: E5,997,904, N 1,979,617, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 36.1ft +/- ()
COMPLETION DEPTH: 46.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-213

San Joaquin Apartments & Precinct Improvements
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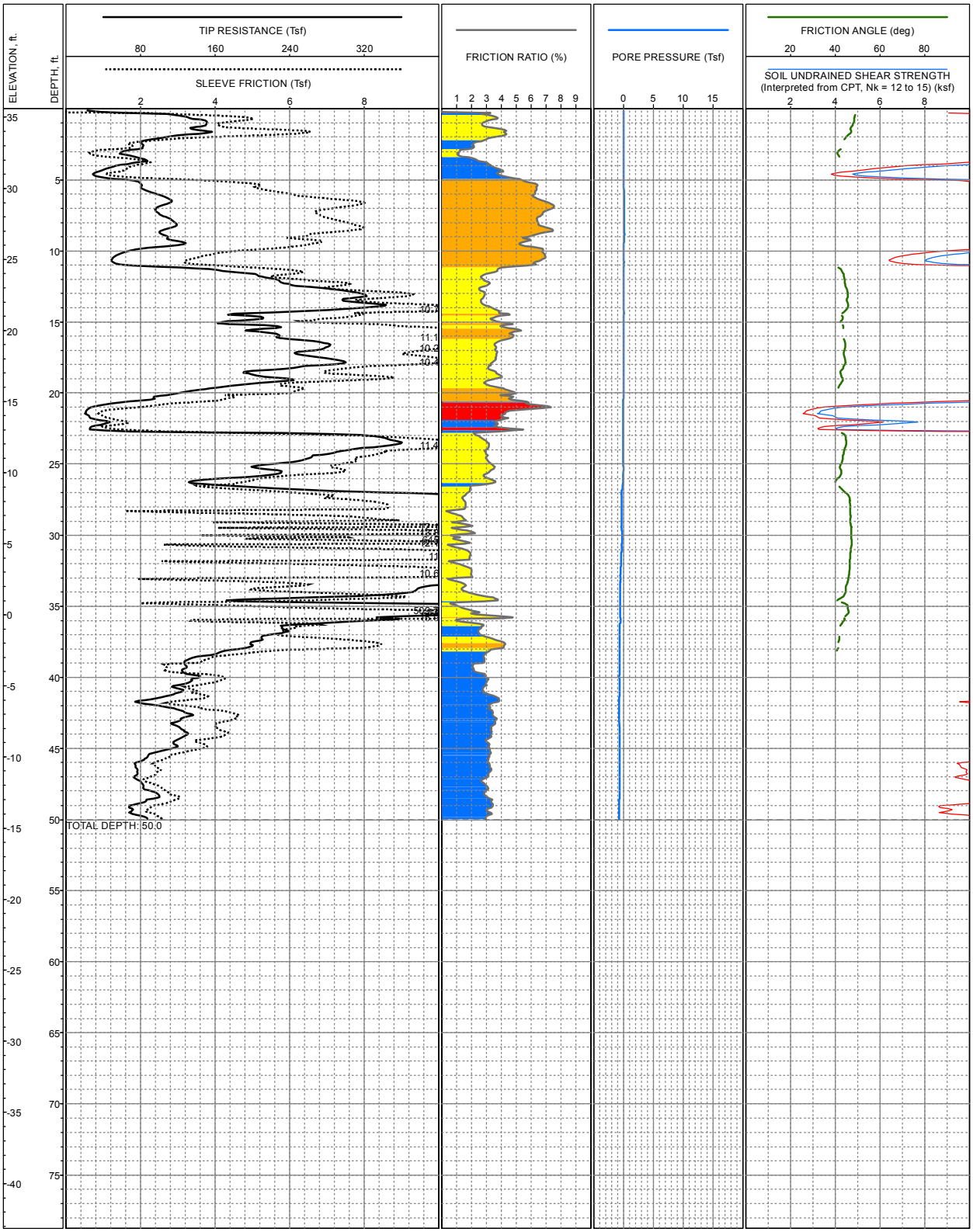

LOCATION: E5,997,904, N 1,979,626, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.6ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-214

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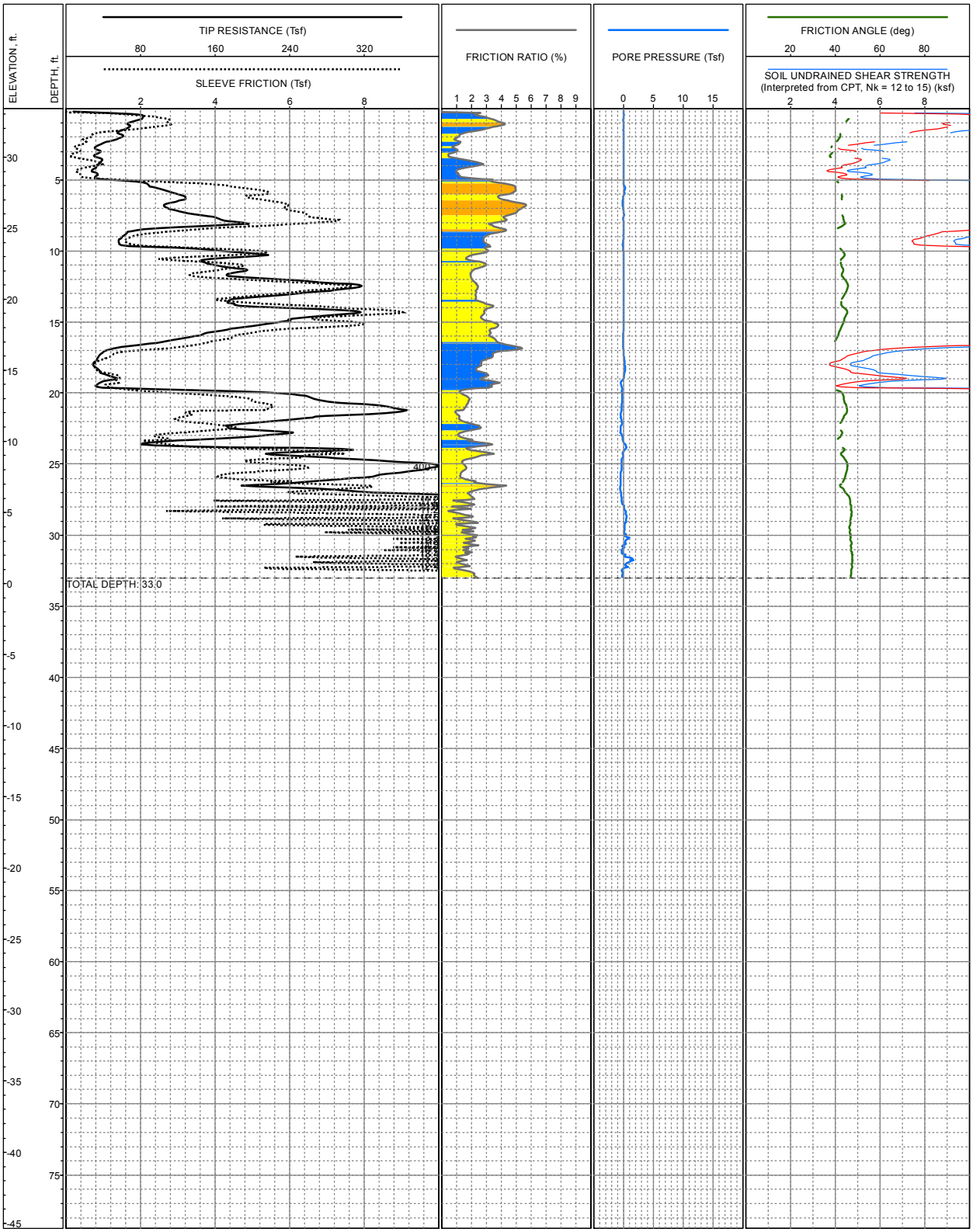

LOCATION: E5,997,905, N 1,979,686, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 33.4ft +/- ()
COMPLETION DEPTH: 33.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-215

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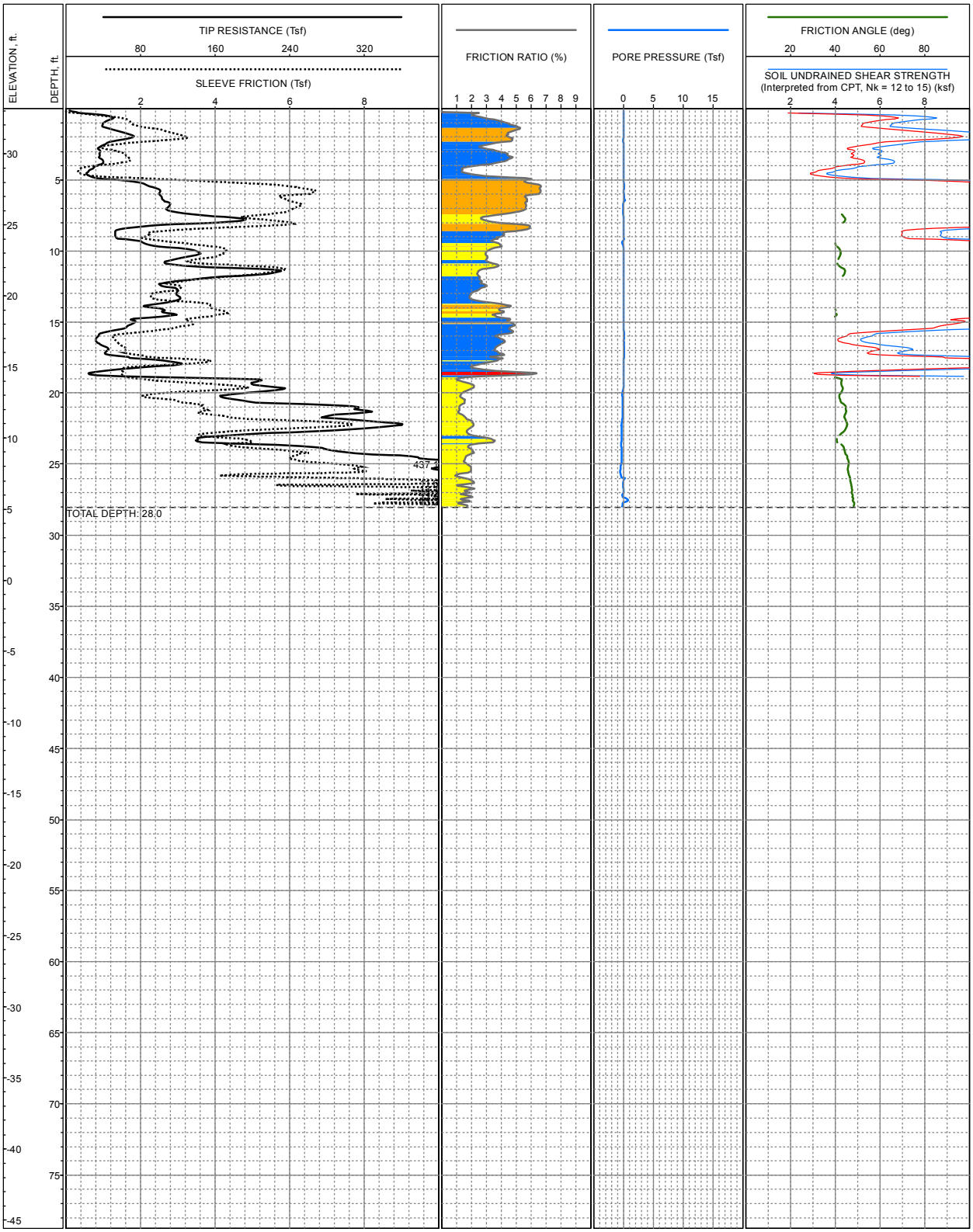

LOCATION: E5,997,905, N 1,979,696, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 33.2ft +/- ()
COMPLETION DEPTH: 28.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-216

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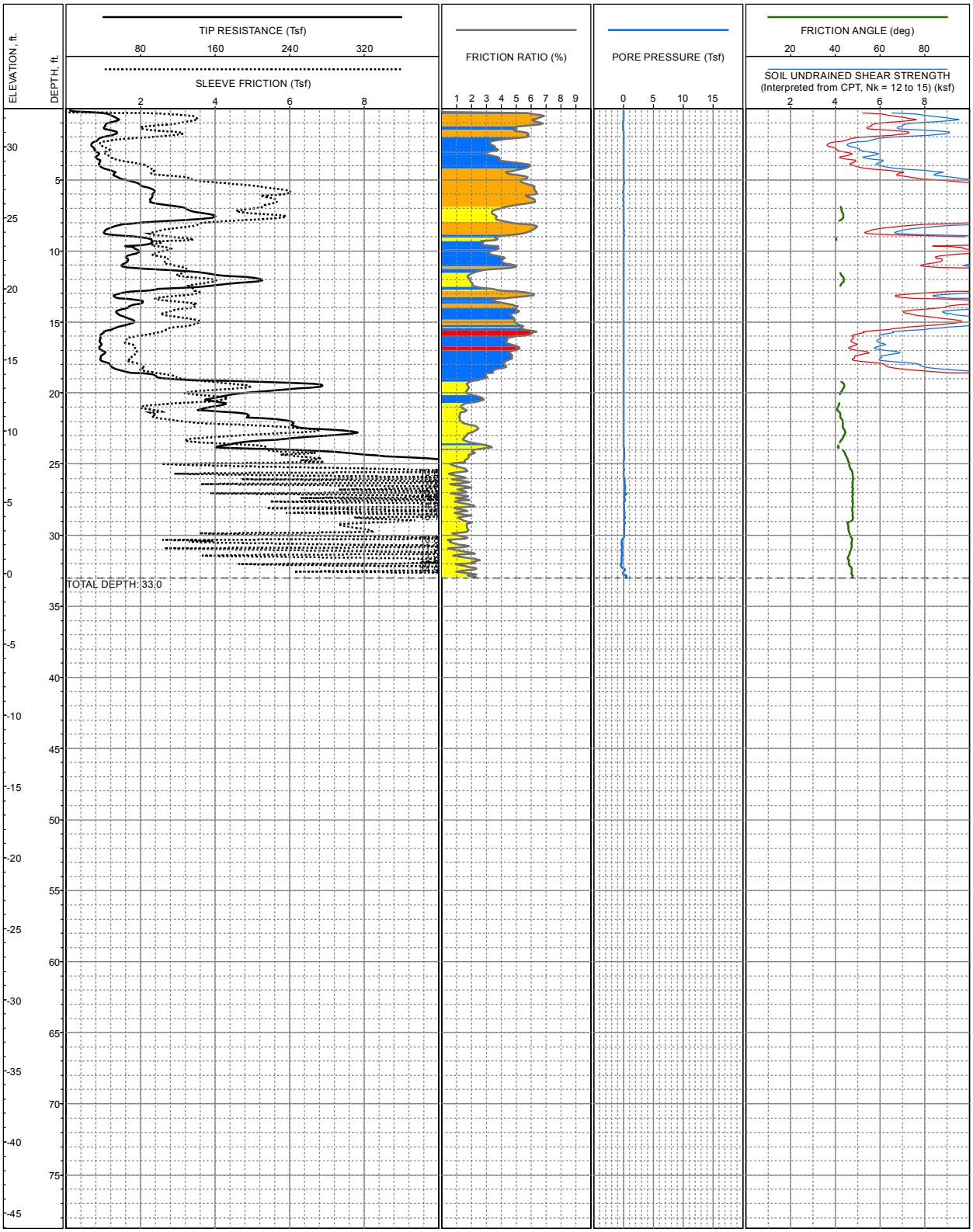

LOCATION: E5,997,906, N 1,979,711, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.7ft +/- ()
COMPLETION DEPTH: 33.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-217

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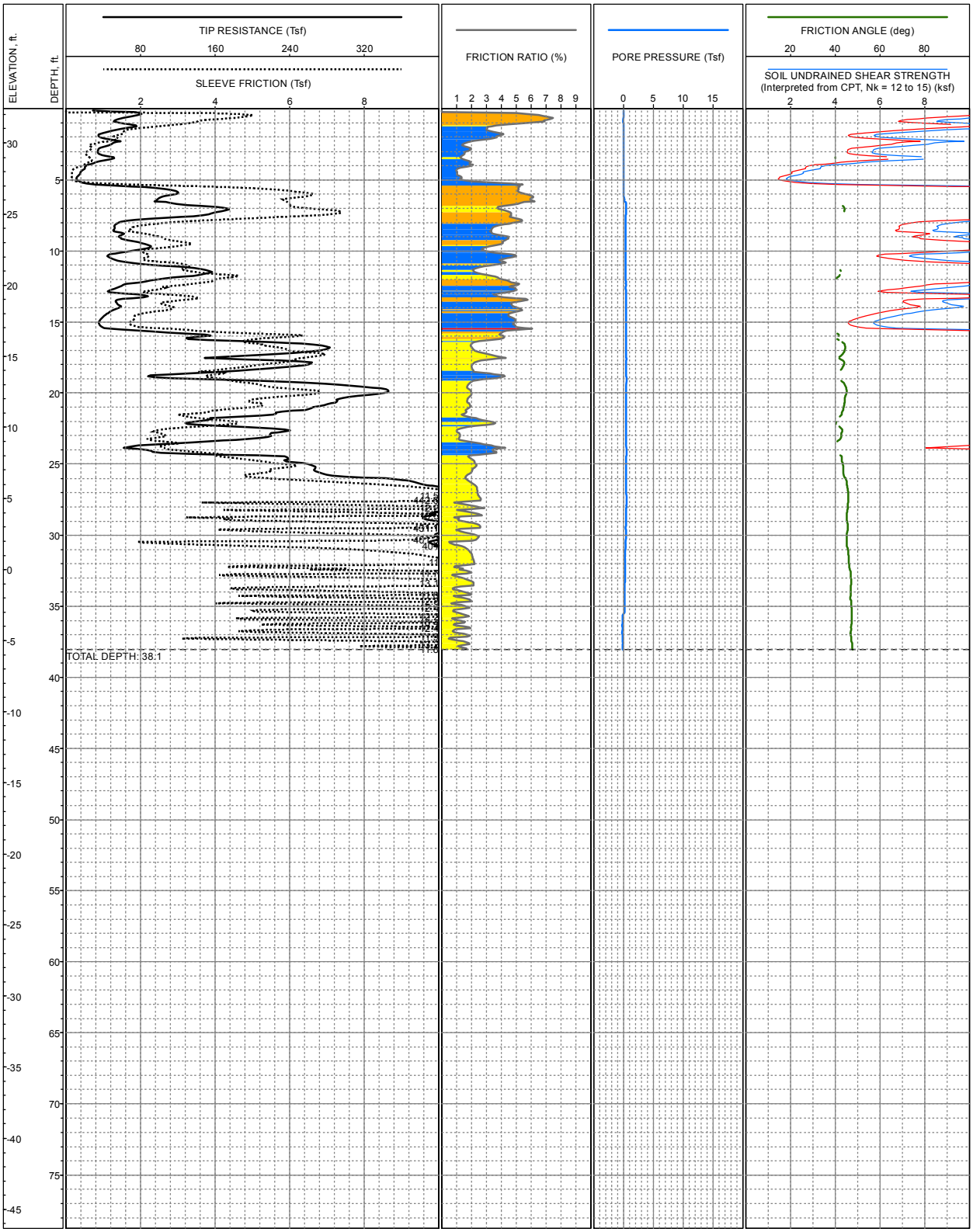

LOCATION: E5,997,906, N 1,979,721, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.4ft +/- ()
COMPLETION DEPTH: 38.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-218

San Joaquin Apartments & Precinct Improvements
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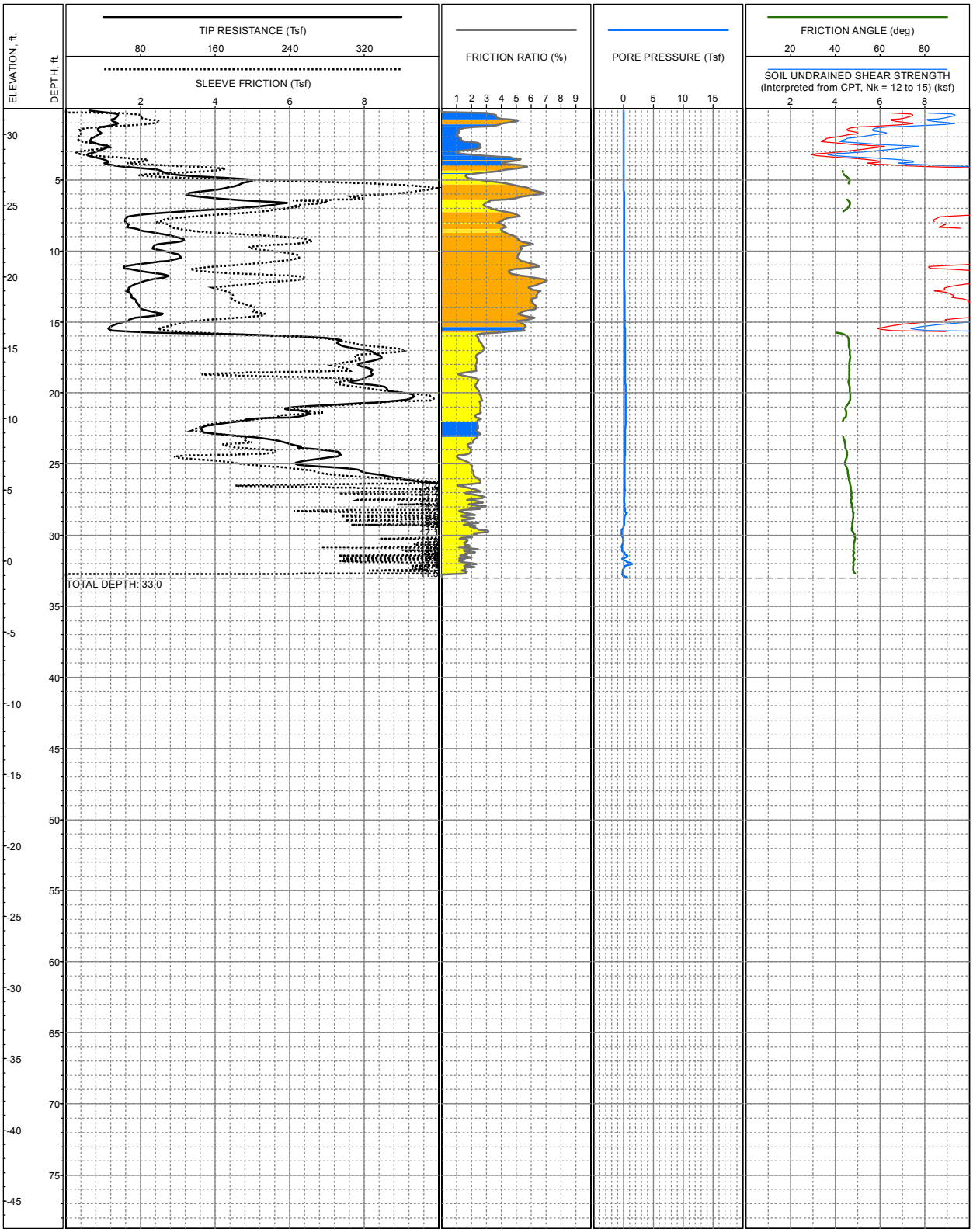

LOCATION: E5,997,907, N 1,979,741, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.8ft +/- ()
COMPLETION DEPTH: 33.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-219

San Joaquin Apartments & Precinct Improvements
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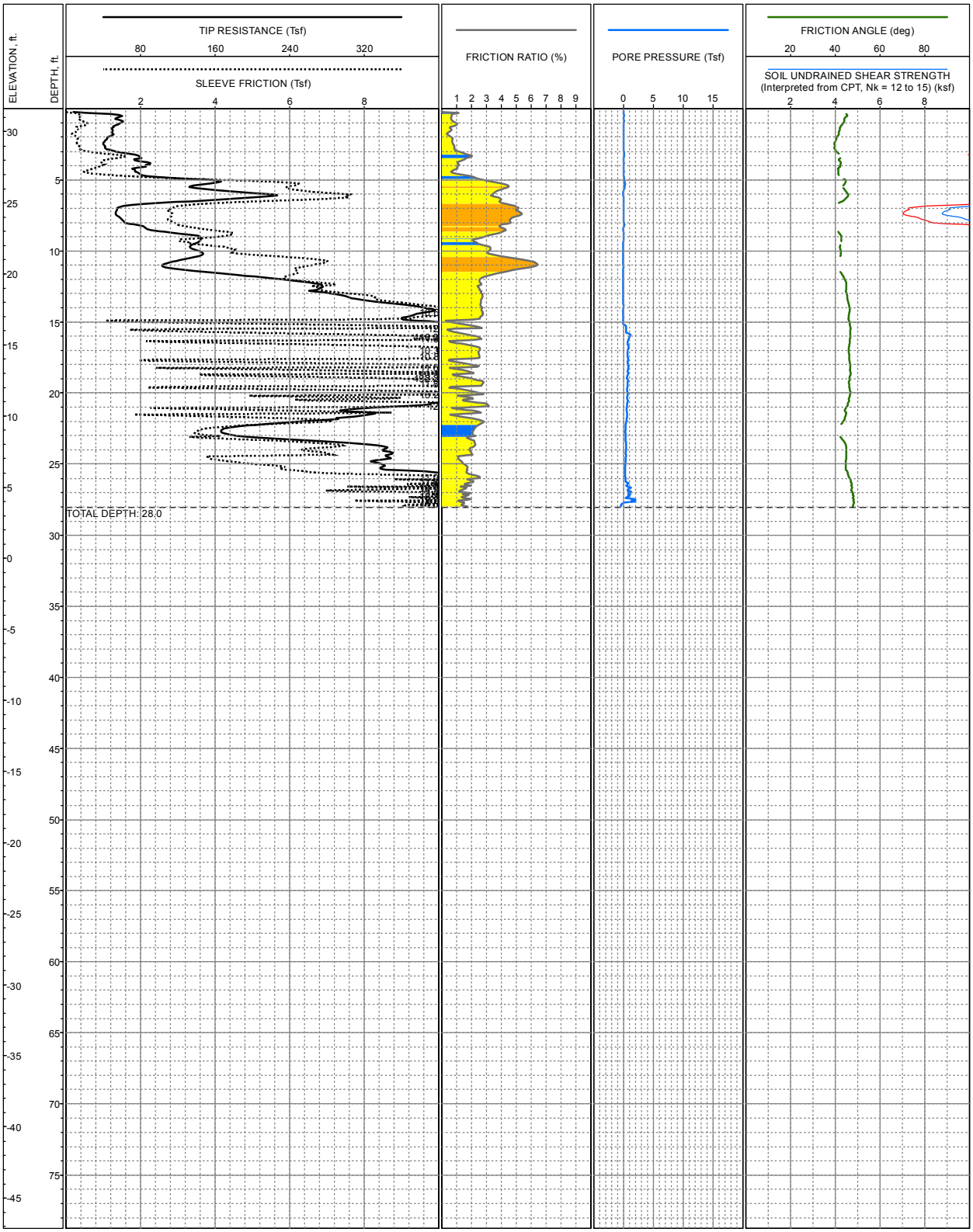

LOCATION: E5,997,908, N 1,979,748, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.6ft +/- ()
COMPLETION DEPTH: 28.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-220

San Joaquin Apartments & Precinct Improvements
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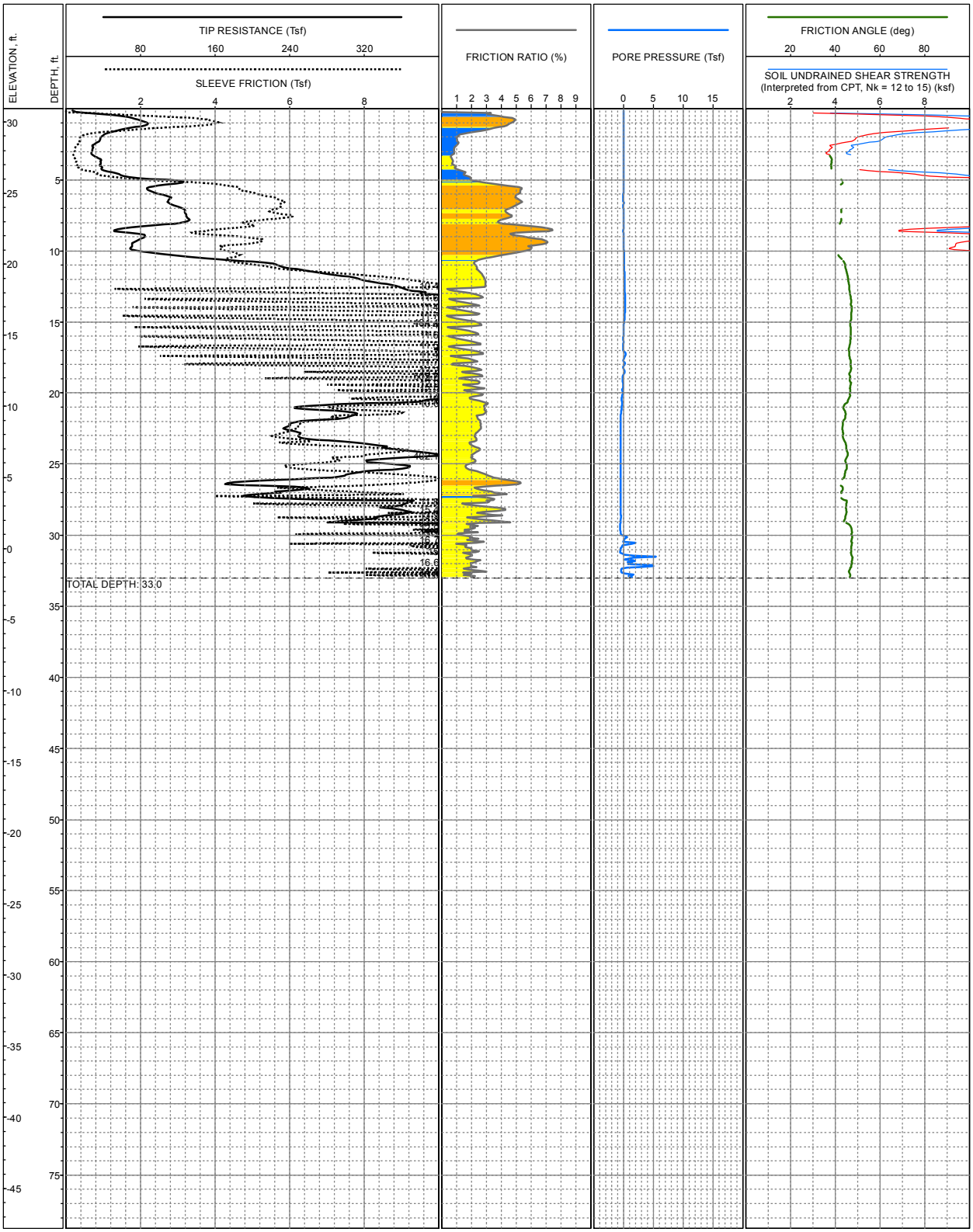

LOCATION: E5,997,908, N 1,979,770, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 30.9ft +/- ()
COMPLETION DEPTH: 33.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-221

San Joaquin Apartments & Precinct Improvements
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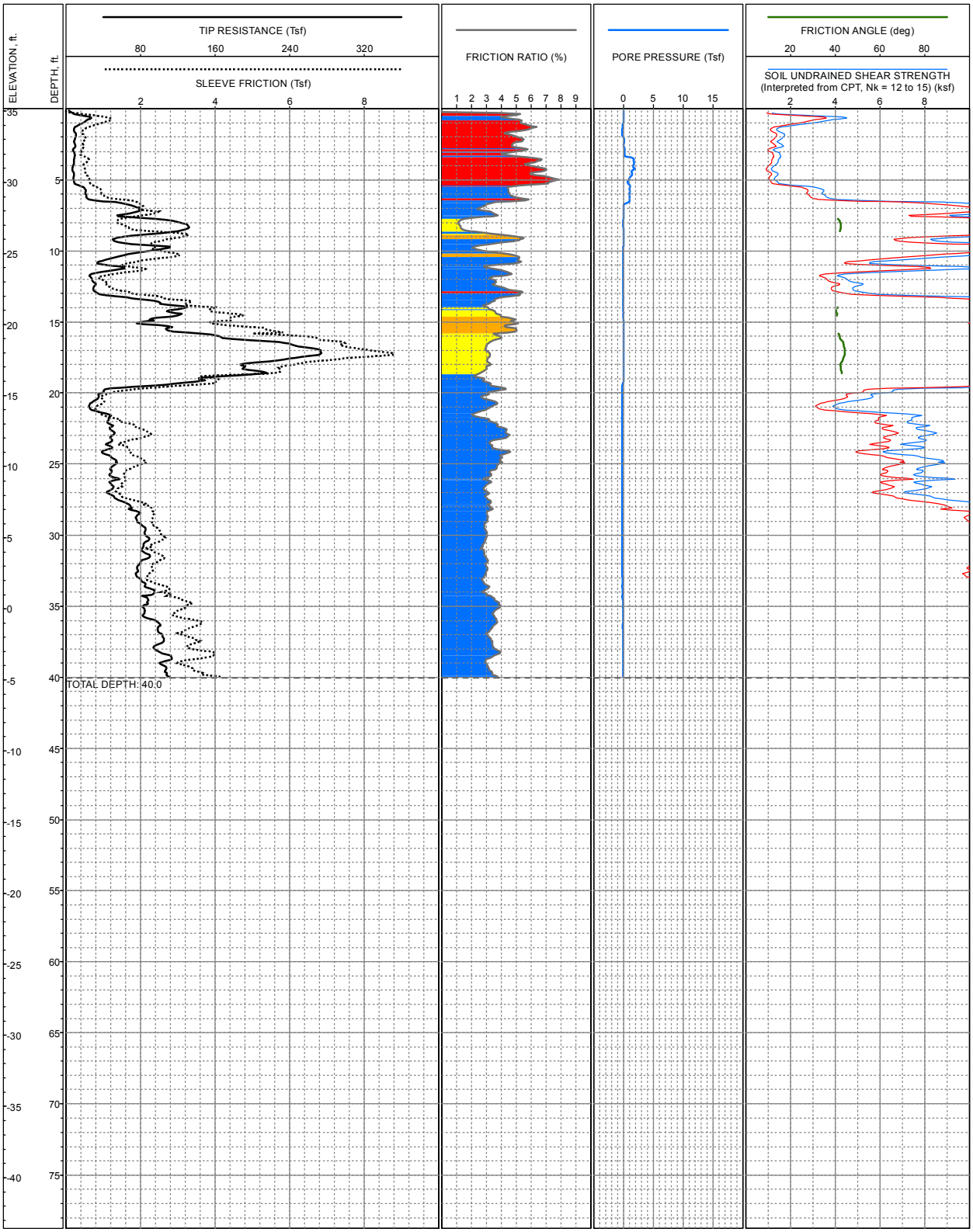

LOCATION: E5,998,214, N 1,979,575, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.2ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-222

San Joaquin Apartments & Precinct Improvements
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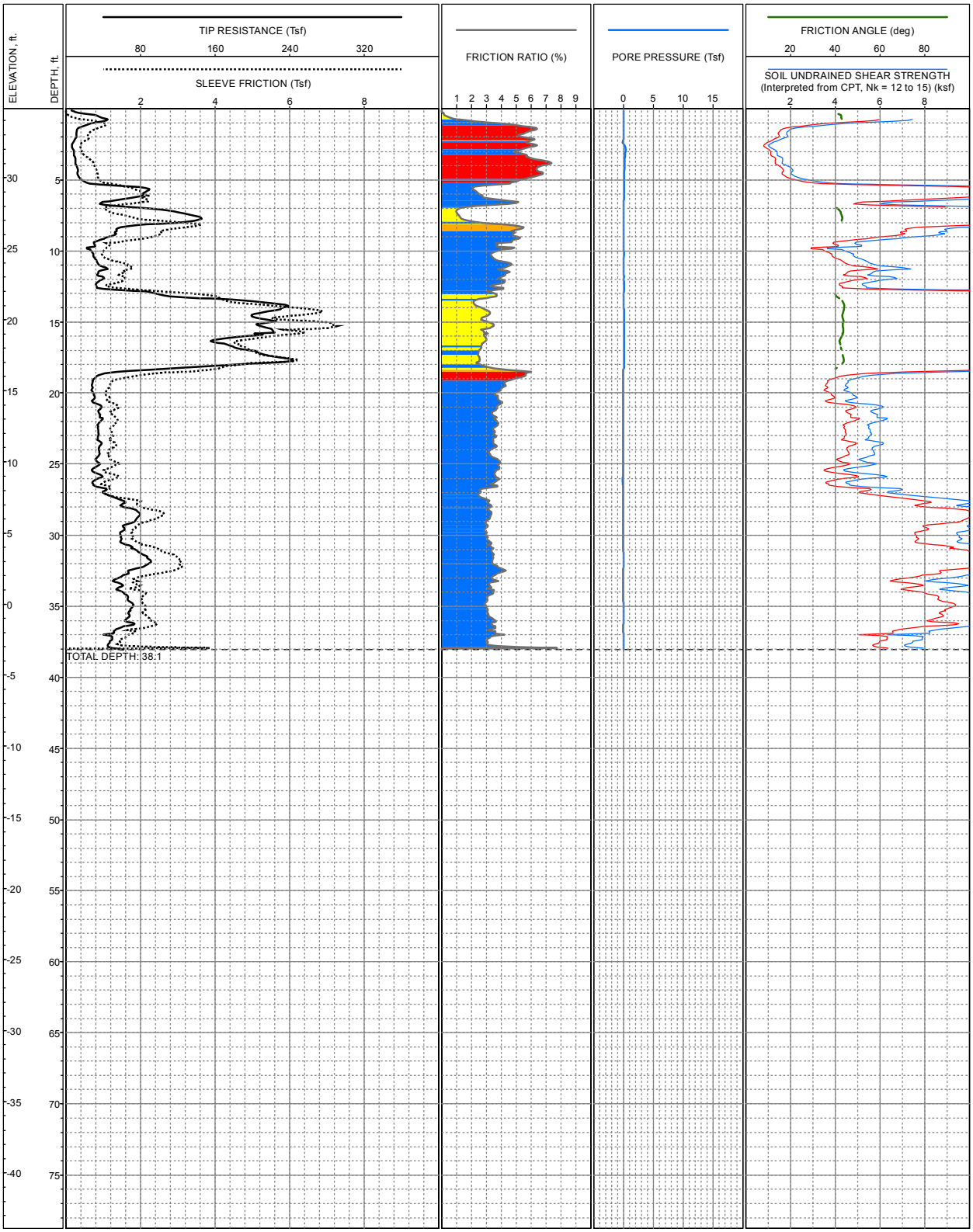

LOCATION: E5,998,214, N 1,979,566, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 34.8ft +/- ()
COMPLETION DEPTH: 38.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-223

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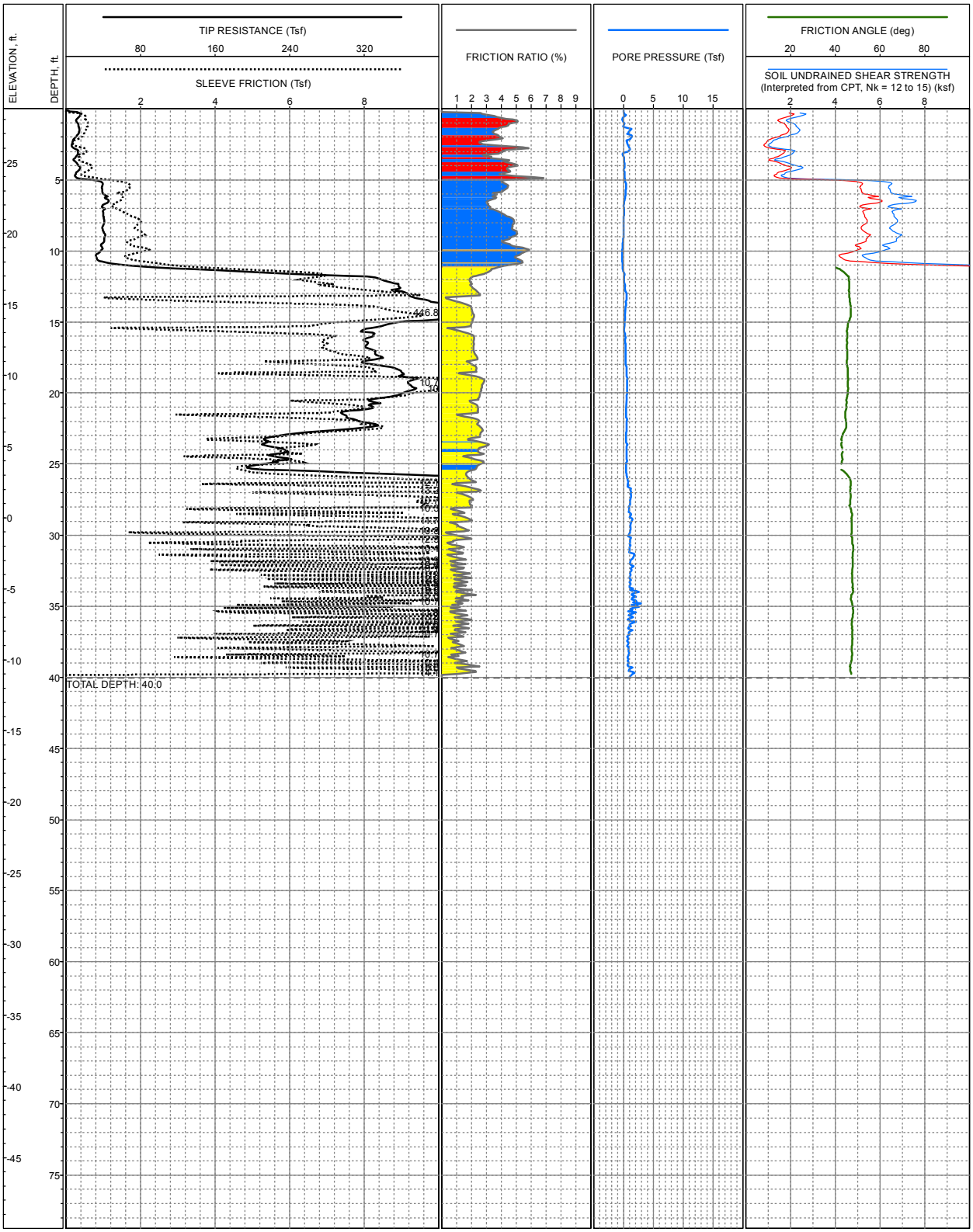

LOCATION: E5,998,518, N 1,979,683, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 28.8ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-224

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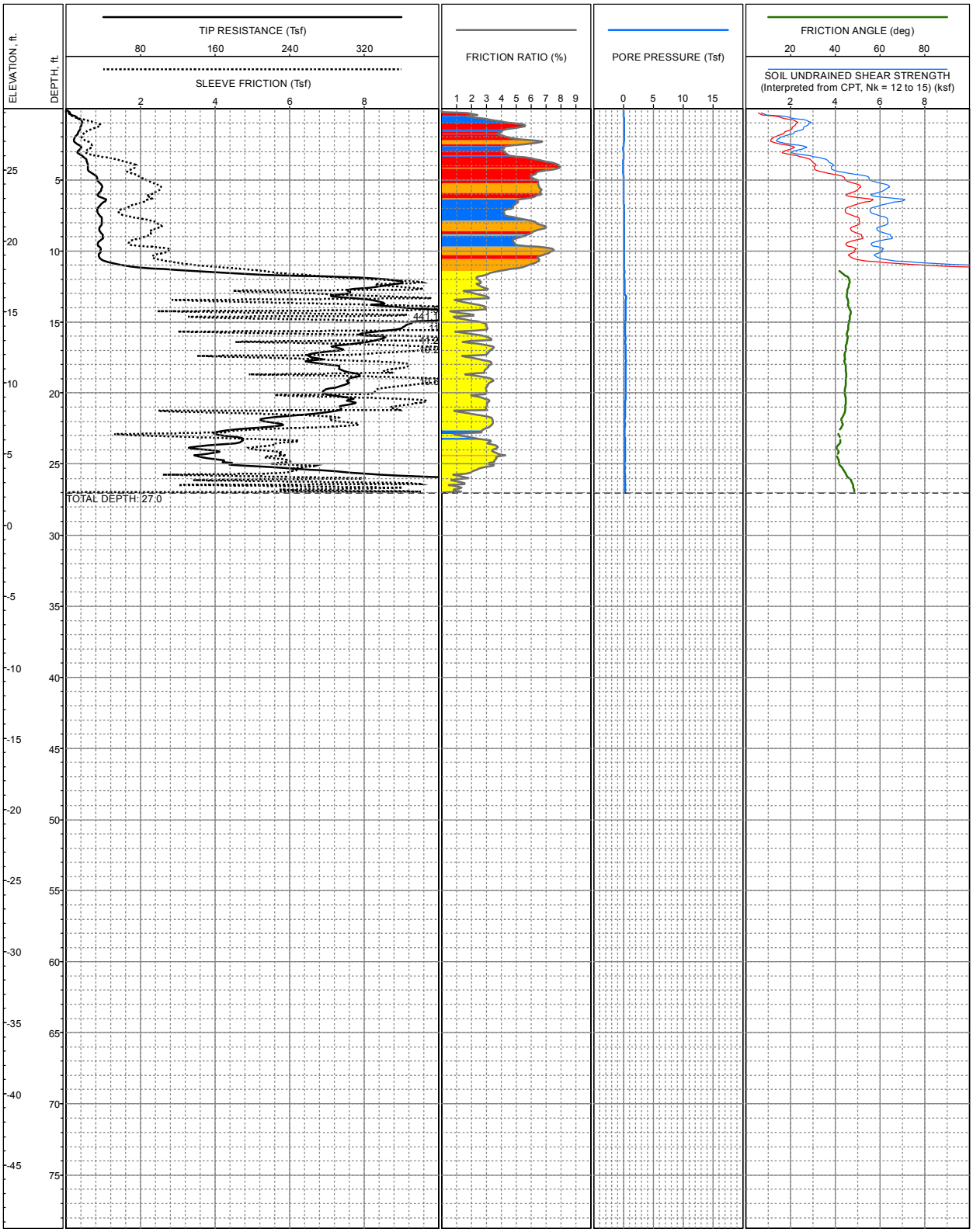

LOCATION: E5,998,518, N 1,979,673, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 29.3ft +/- ()
COMPLETION DEPTH: 27.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-225

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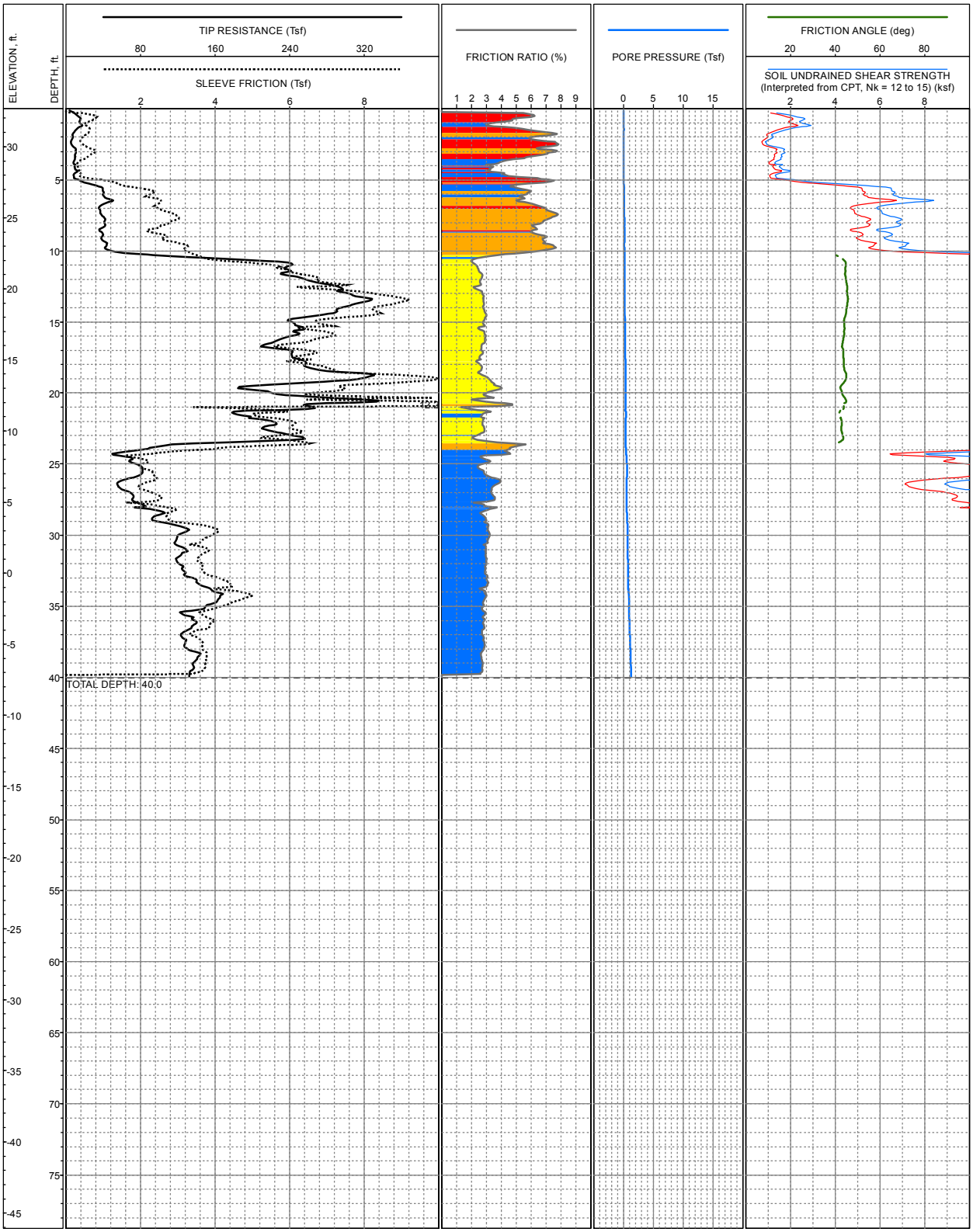

LOCATION: E5,998,521, N 1,979,594, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.7ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-226

San Joaquin Apartments & Precinct Improvements
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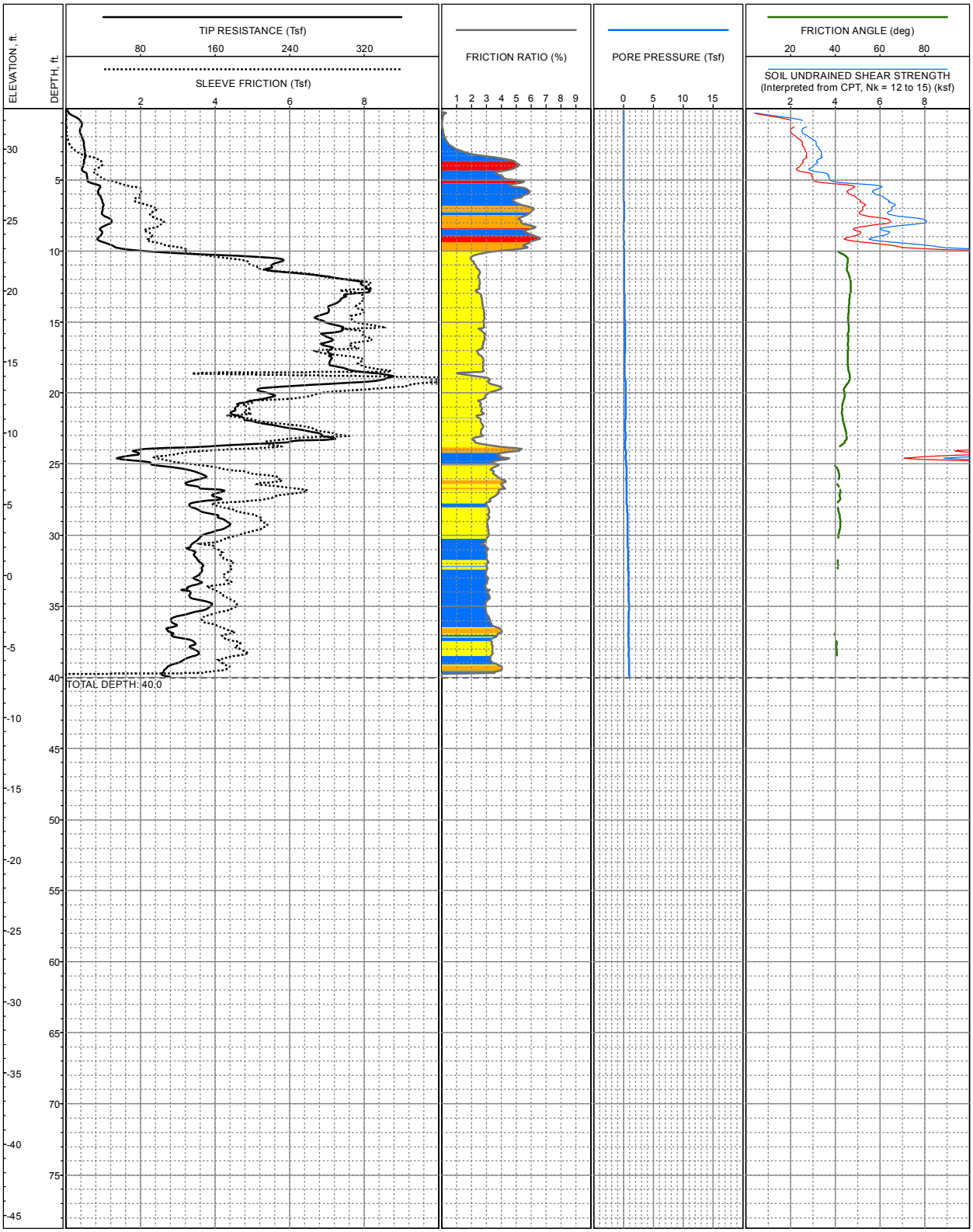

LOCATION: E5,998,521, N 1,979,590, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.8ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-227

San Joaquin Apartments & Precinct Improvements
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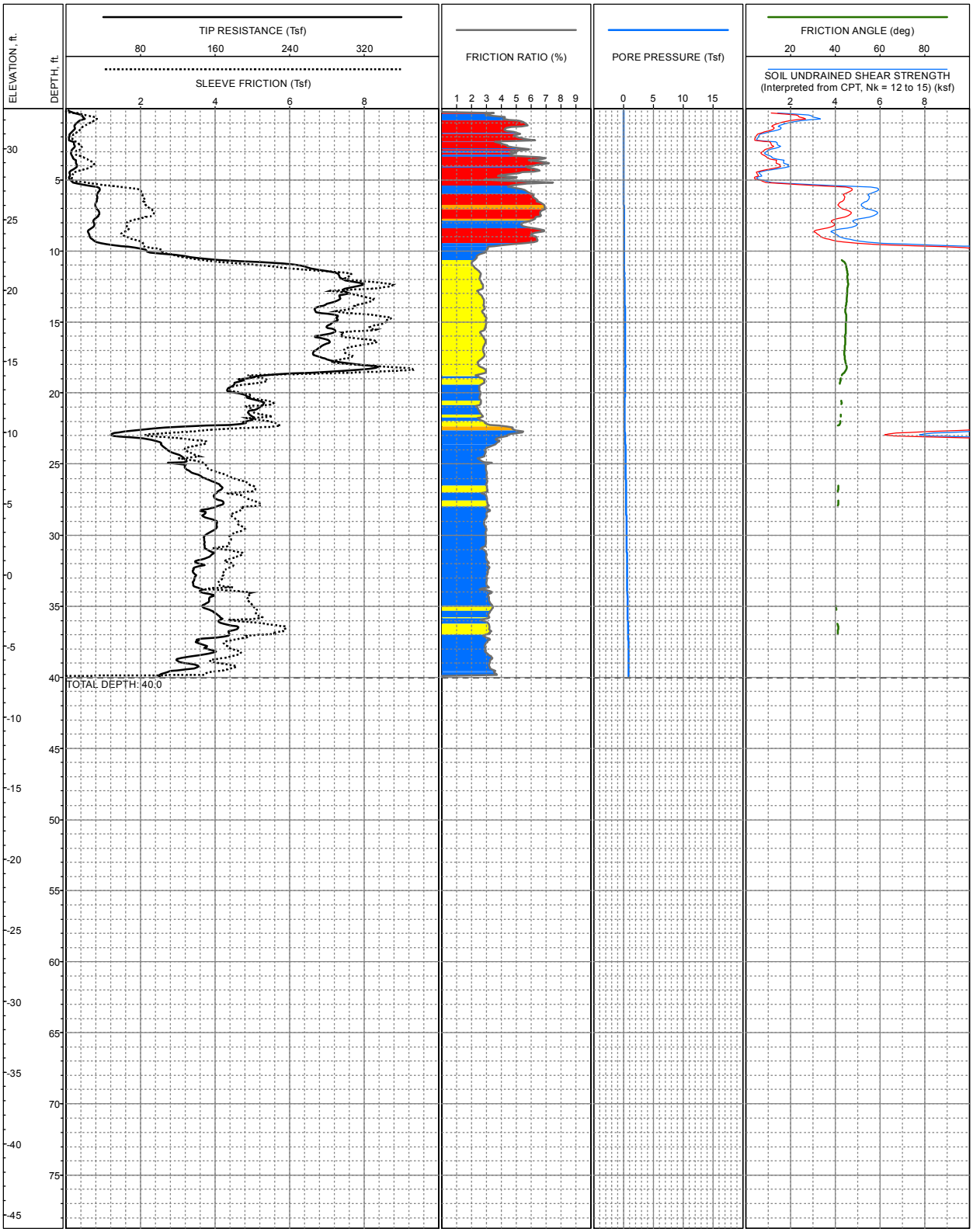

LOCATION: E5,998,521, N 1,979,578, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.8ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-228

San Joaquin Apartments & Precinct Improvements
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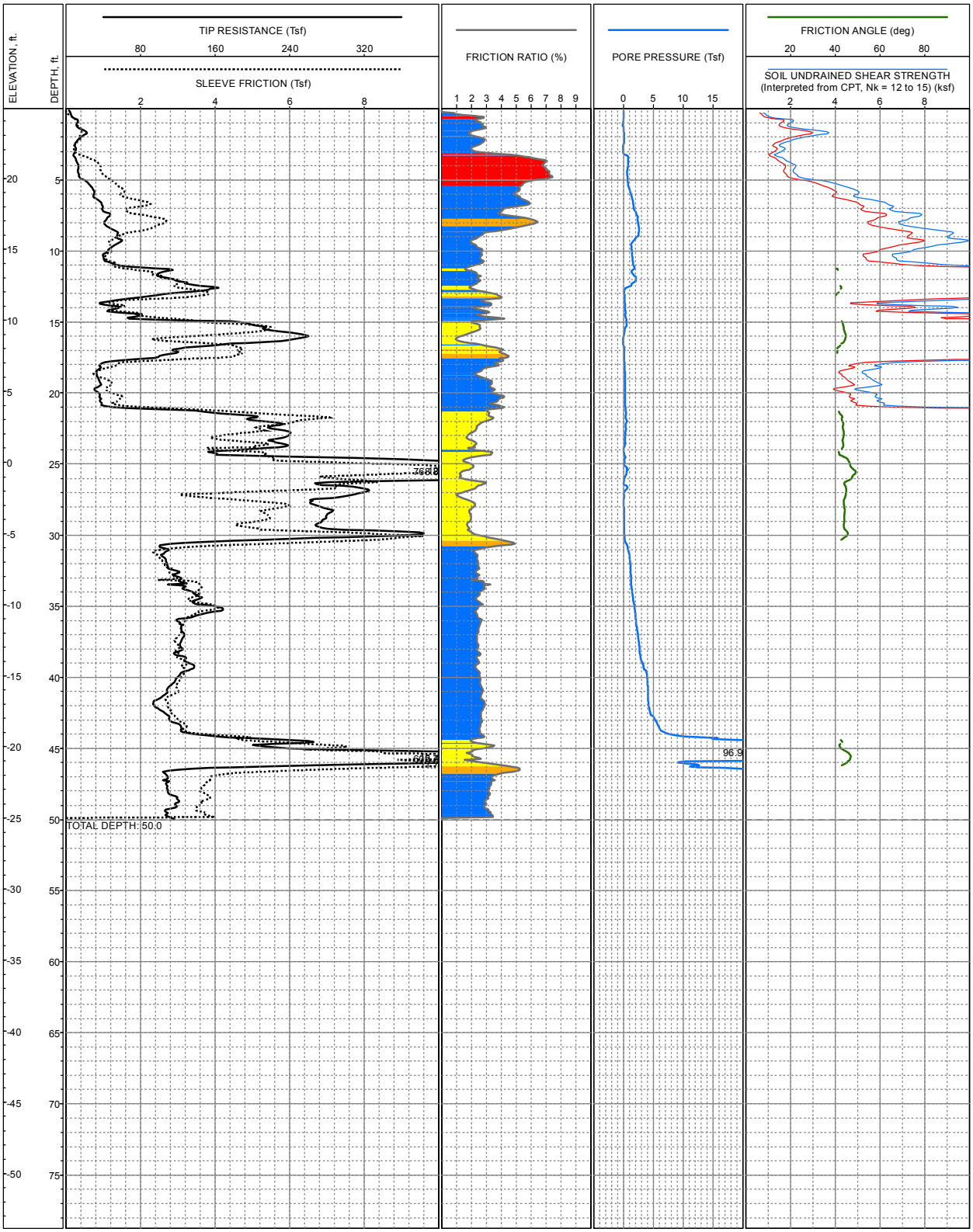

LOCATION: E5,998,707, N 1,979,697, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.9ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-229

San Joaquin Apartments & Precinct Improvements
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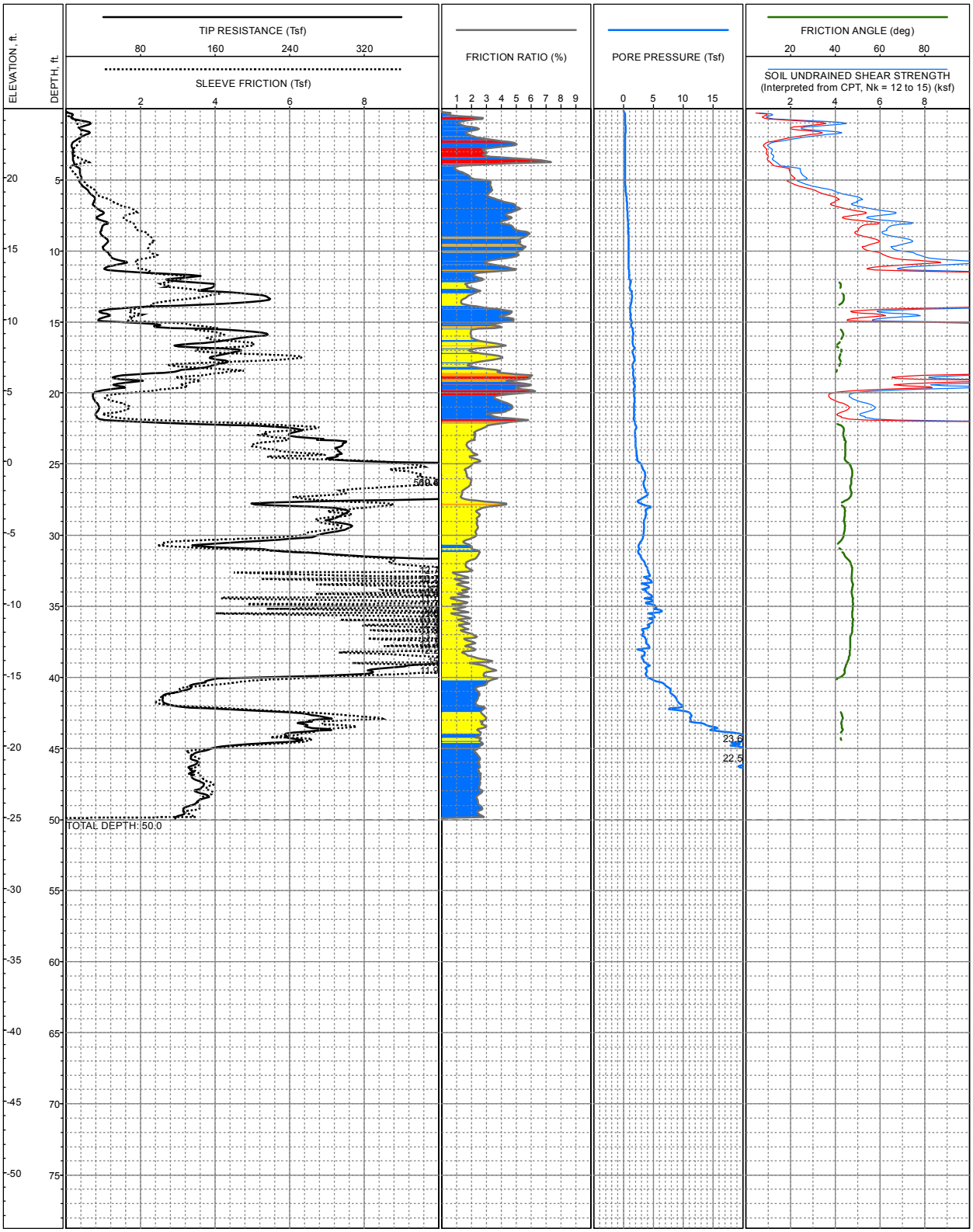

LOCATION: E5,998,705, N 1,979,705, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.8ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-230

San Joaquin Apartments & Precinct Improvements
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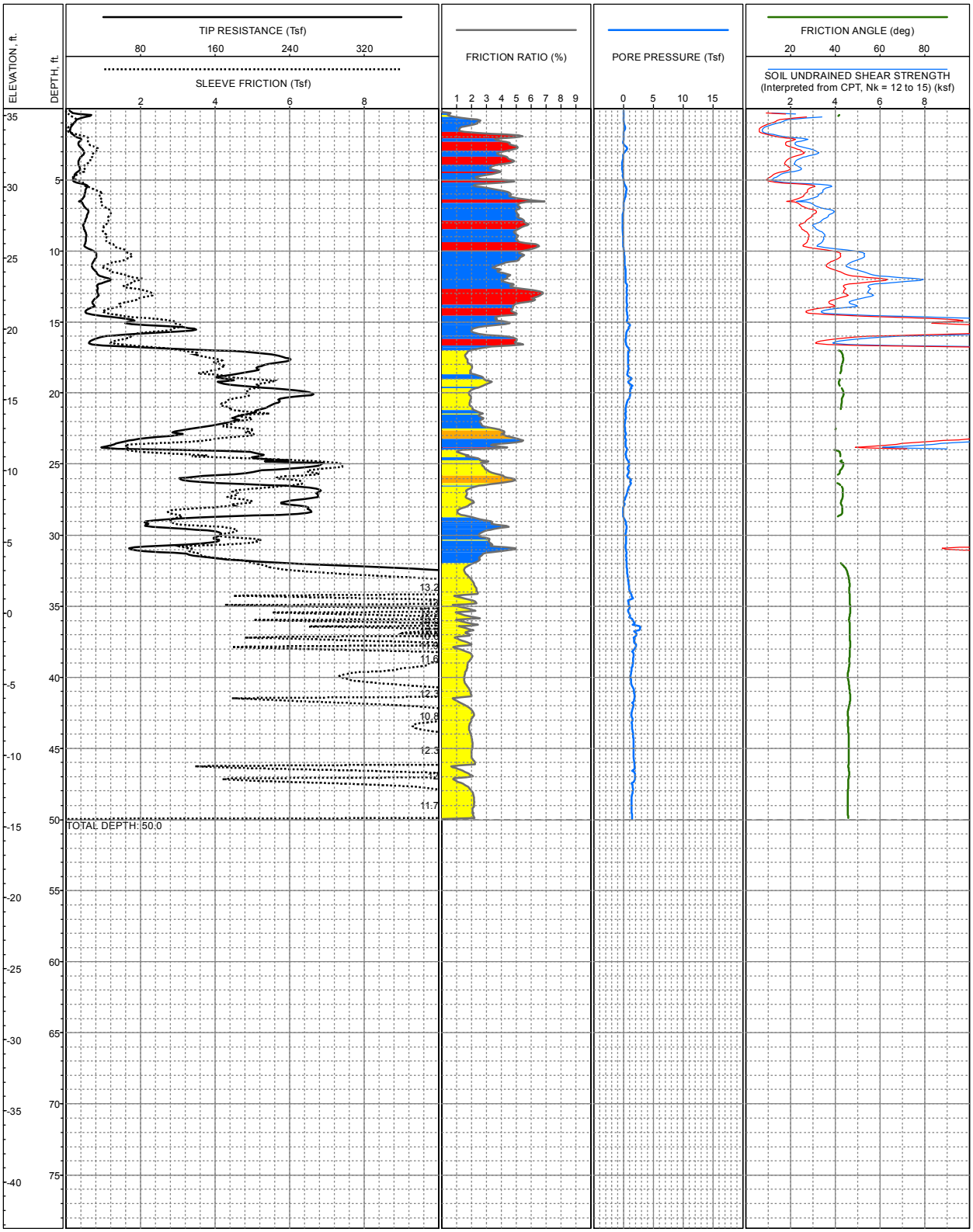

LOCATION: E5,998,054, N 1,979,638, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.5ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-231

San Joaquin Apartments & Precinct Improvements
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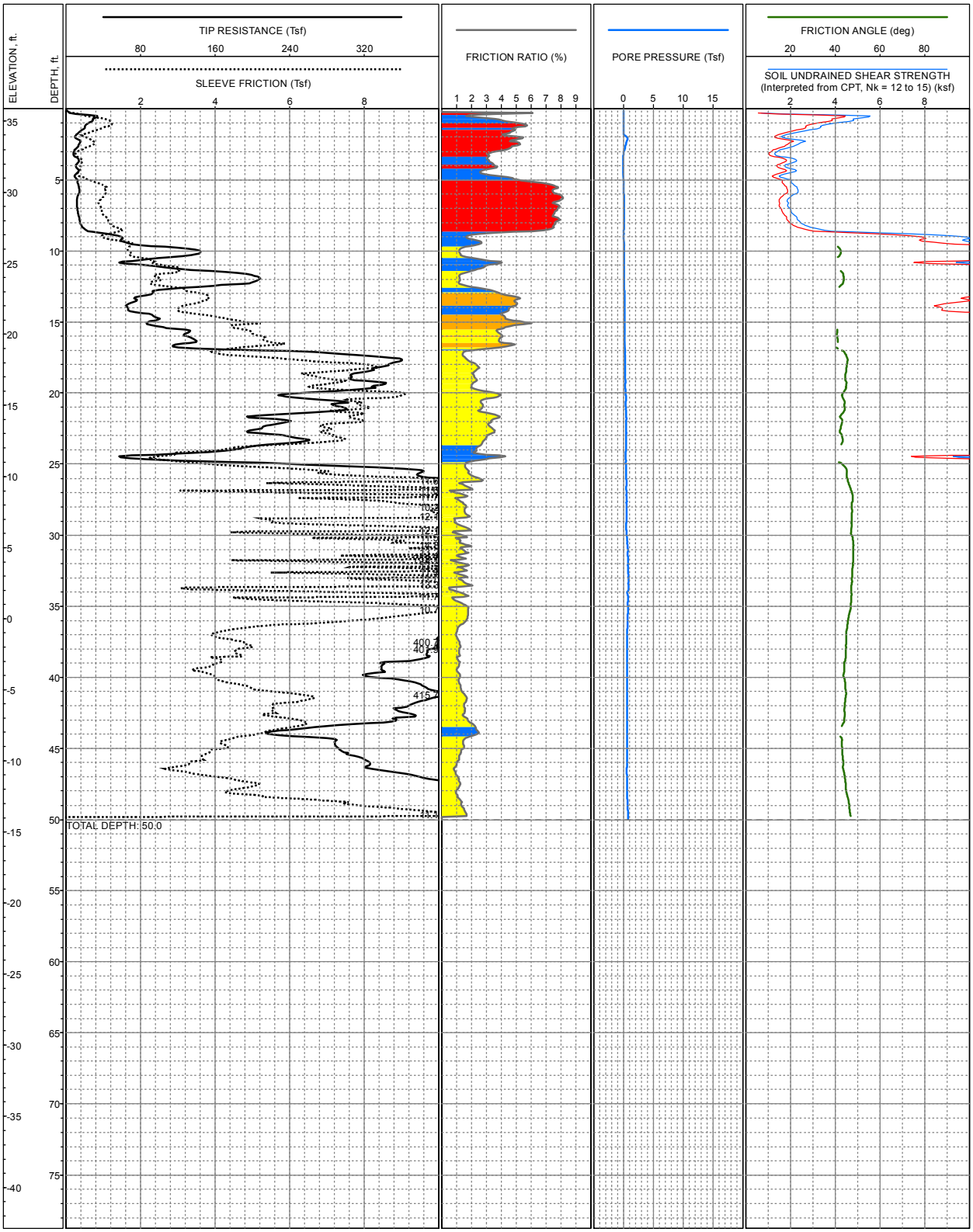

LOCATION: E5,998,055, N 1,979,623, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.9ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-232

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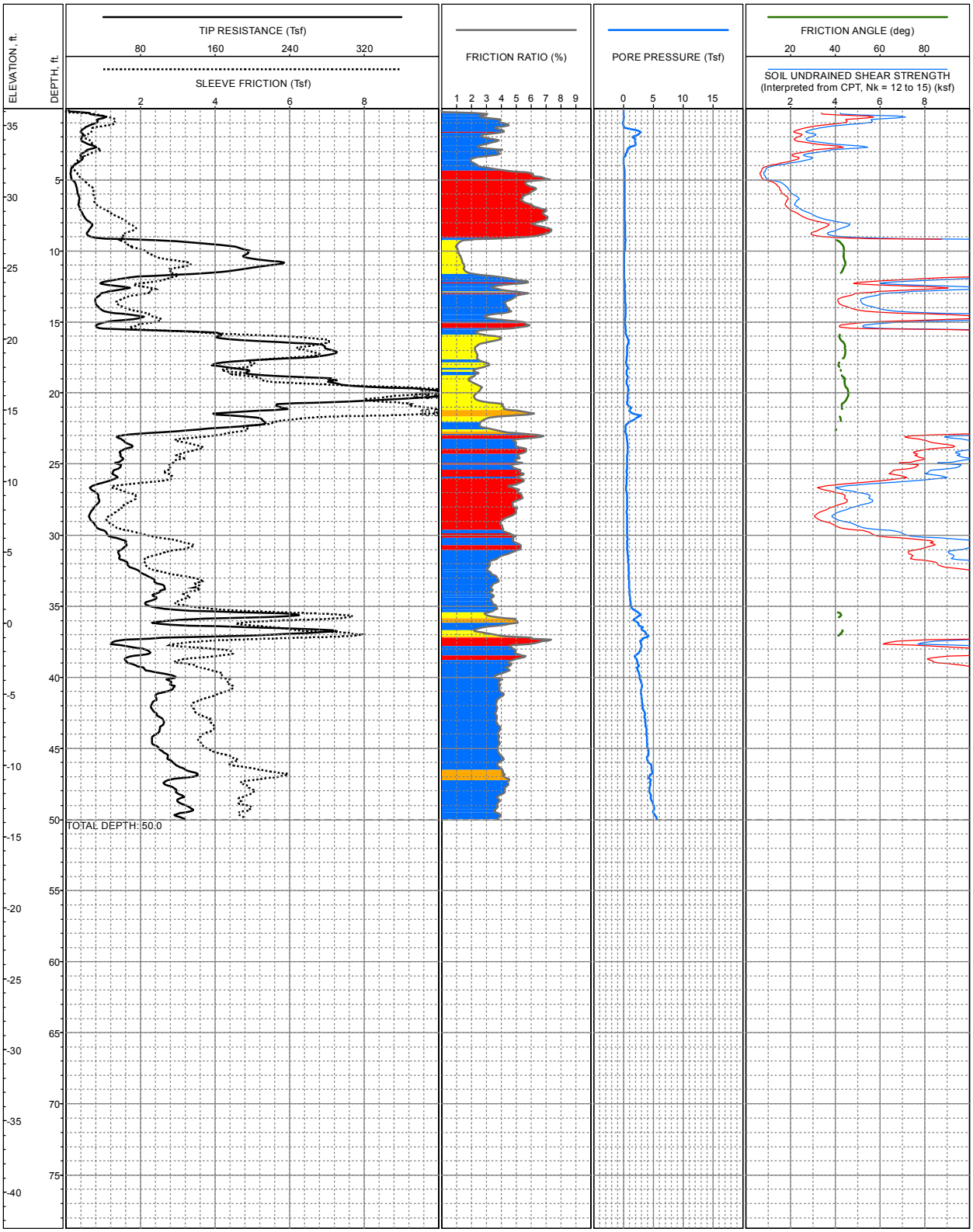

LOCATION: E5,998,055, N 1,979,608, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 36.2ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-233

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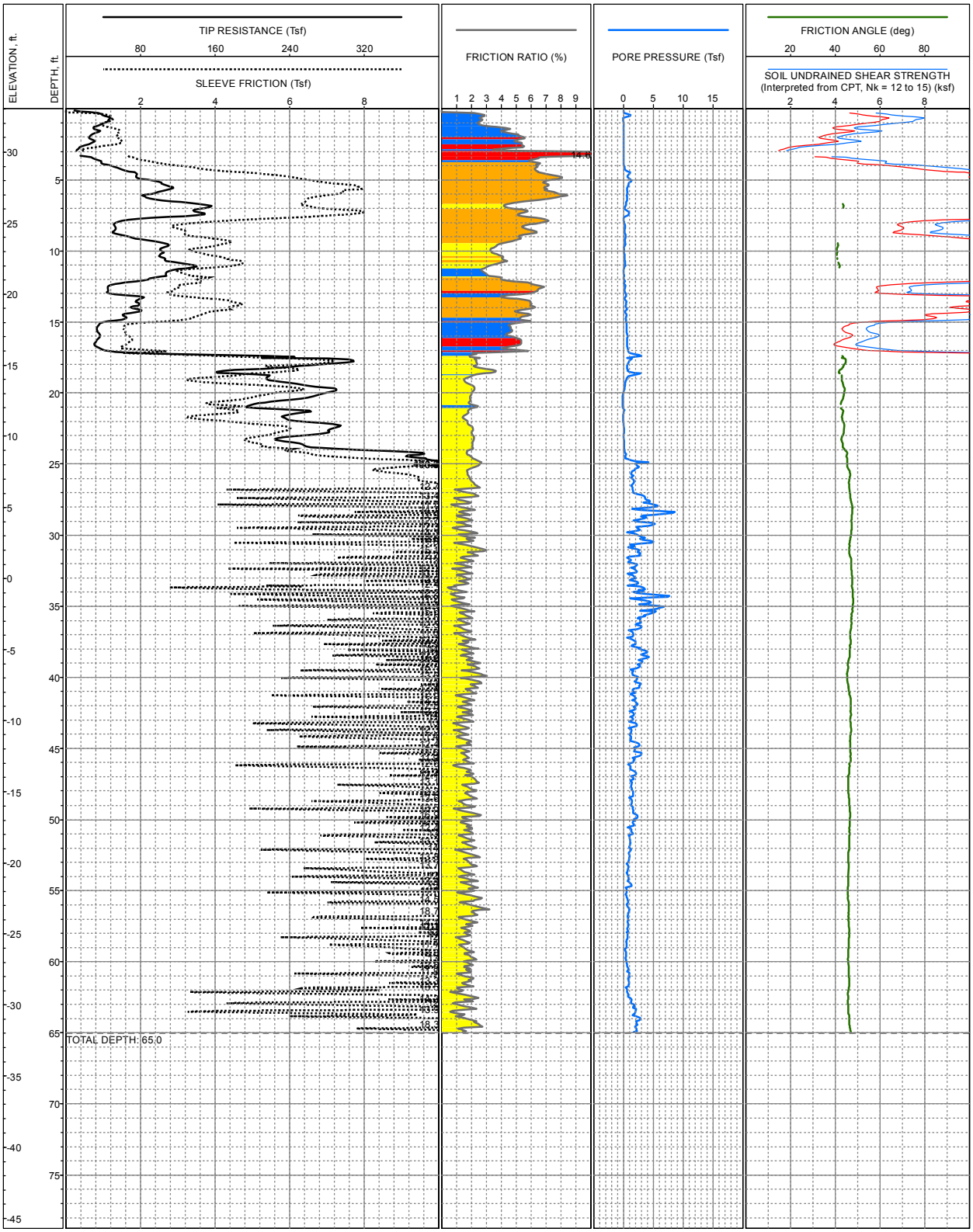

LOCATION: E5,997,906, N 1,979,701, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 33.0ft +/- ()
COMPLETION DEPTH: 65.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-234

San Joaquin Apartments & Precinct Improvements
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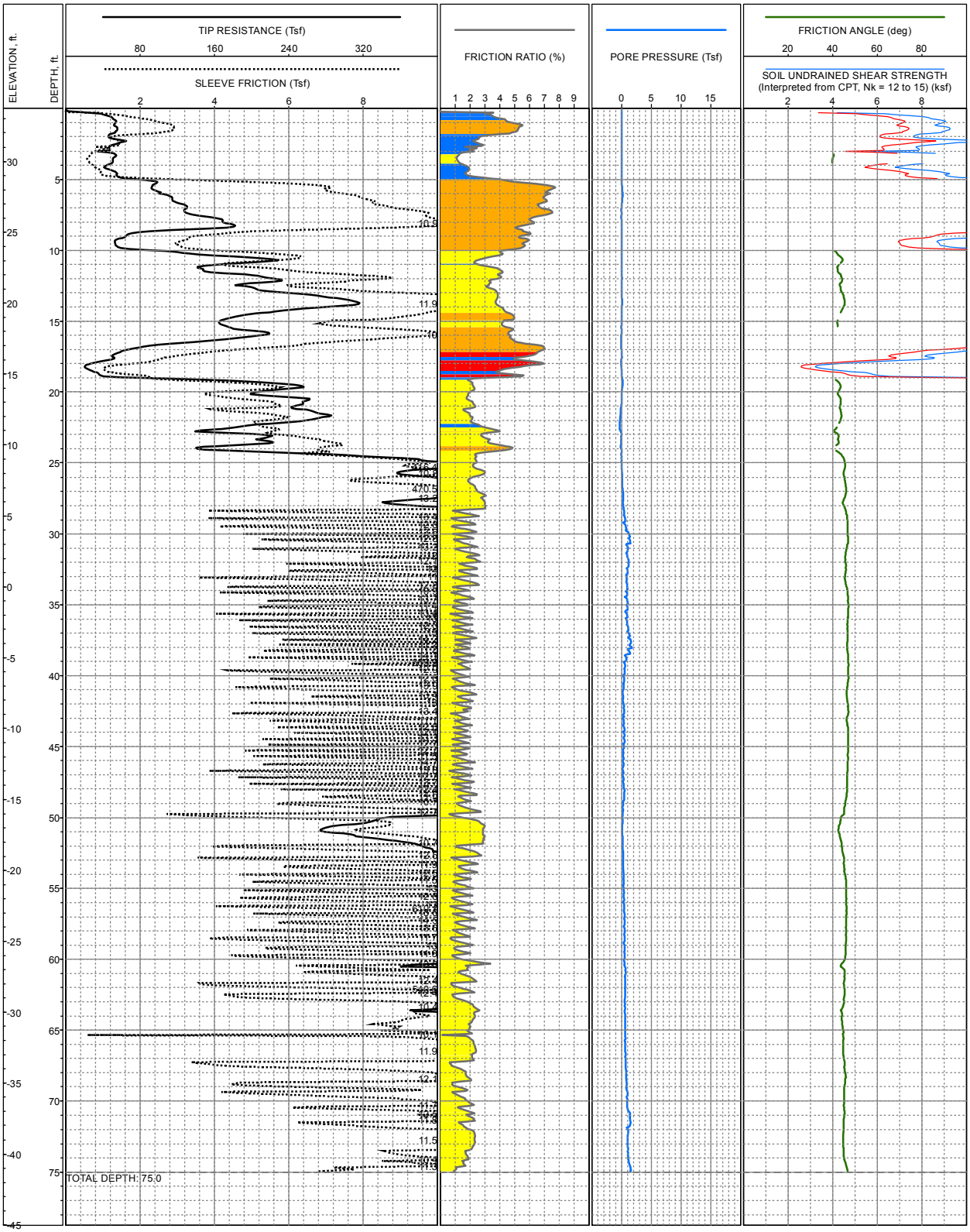

LOCATION: E5,997,905, N 1,979,675, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 33.7ft +/- ()
COMPLETION DEPTH: 75.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-235

San Joaquin Apartments & Precinct Improvements
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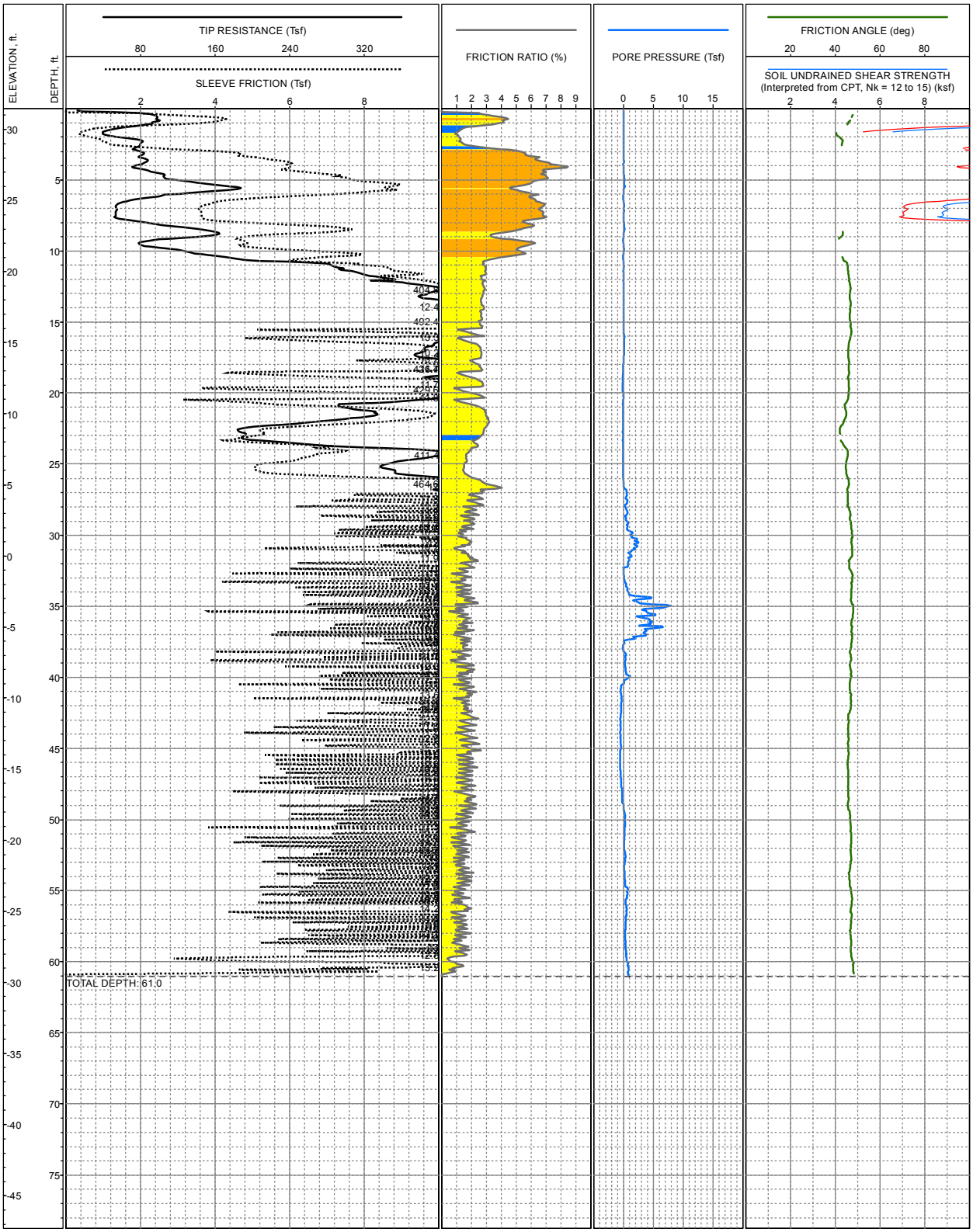

LOCATION: E5,997,908, N 1,979,753, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.5ft +/- ()
COMPLETION DEPTH: 61.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-236

San Joaquin Apartments & Precinct Improvements
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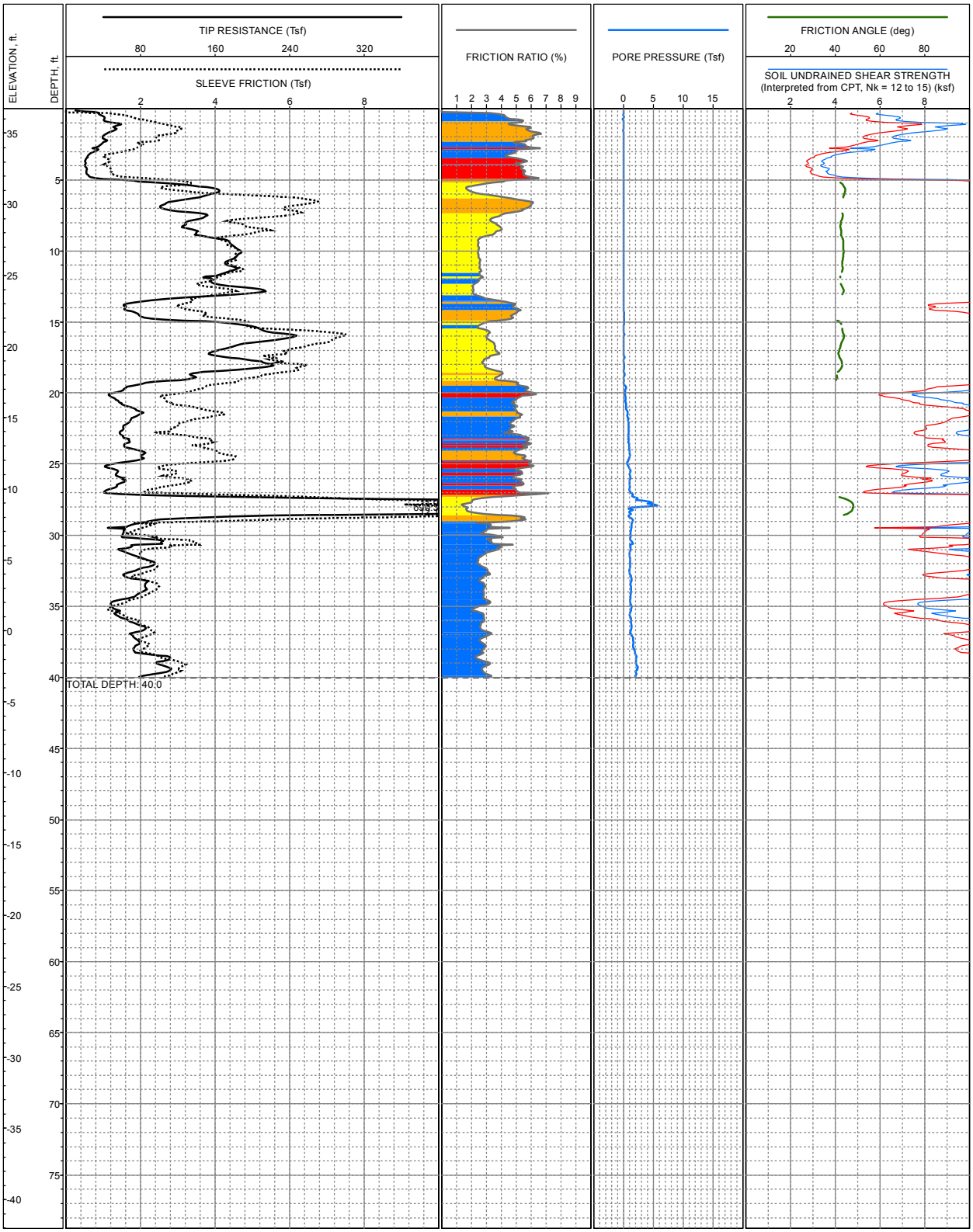

LOCATION: E5,997,904, N 1,979,605, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 36.7ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-237

San Joaquin Apartments & Precinct Improvements
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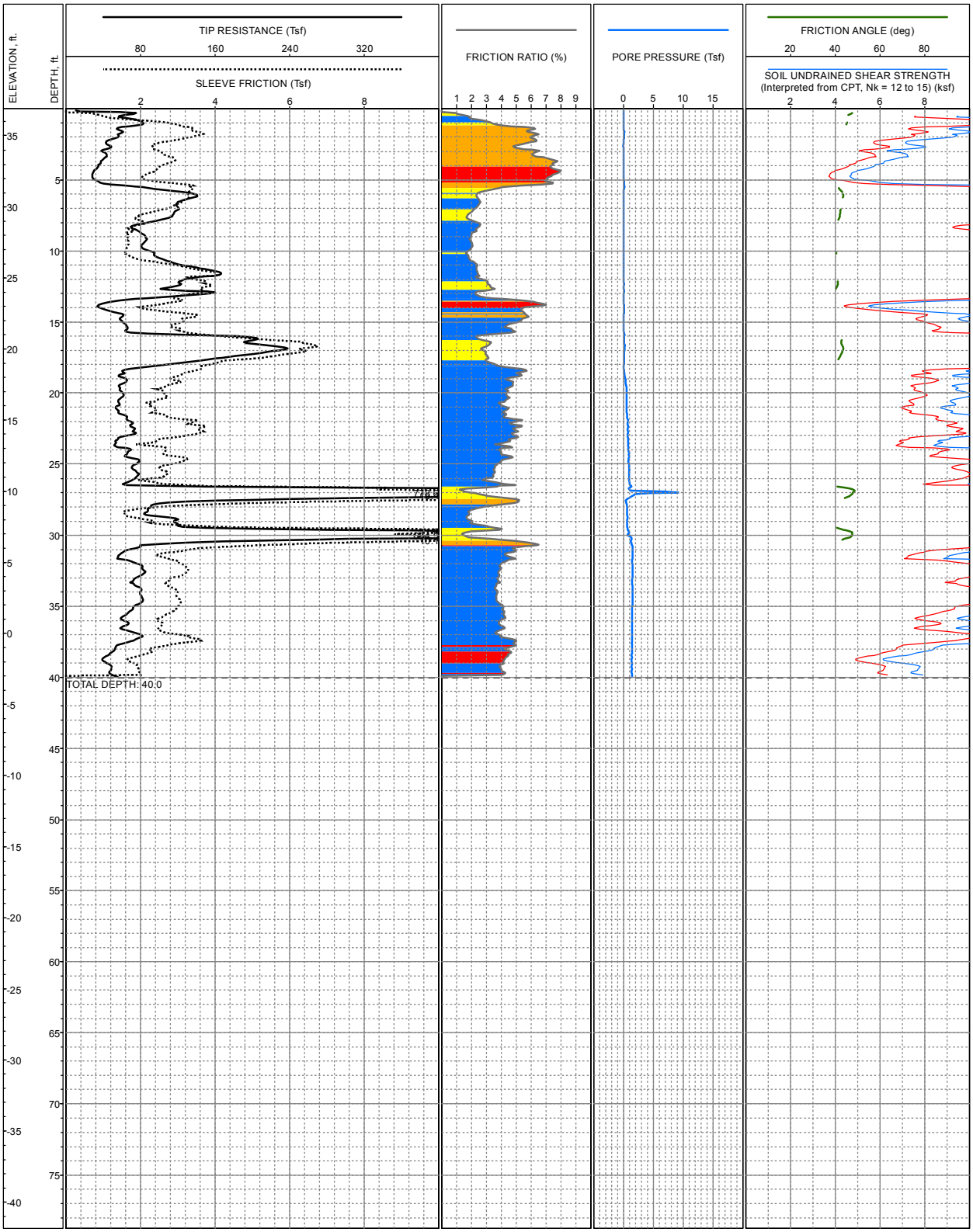

LOCATION: E5,997,904, N 1,979,600, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 36.9ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-238

San Joaquin Apartments & Precinct Improvements
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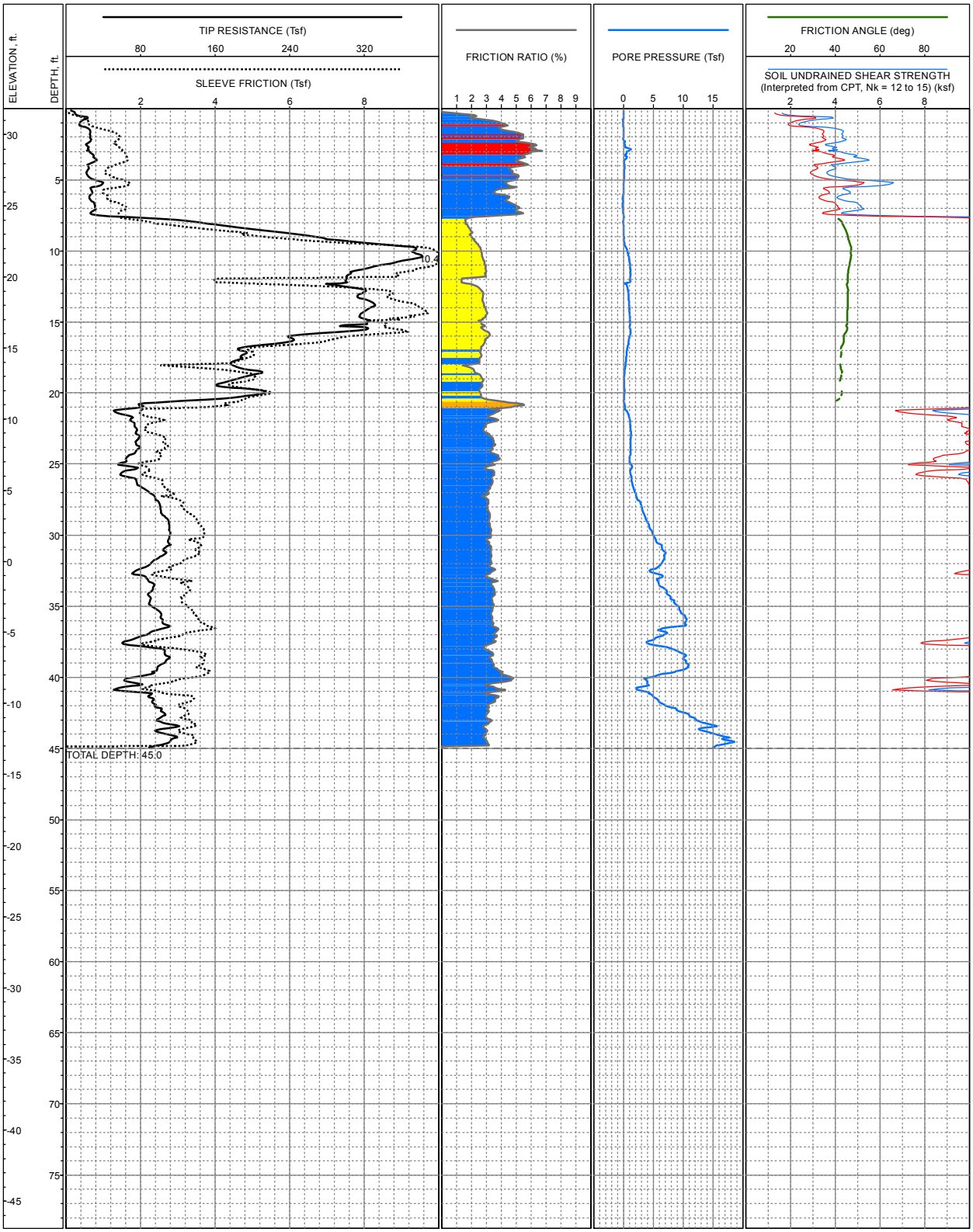

LOCATION: E5,998,521, N 1,979,548, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.8ft +/- ()
COMPLETION DEPTH: 45.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-239

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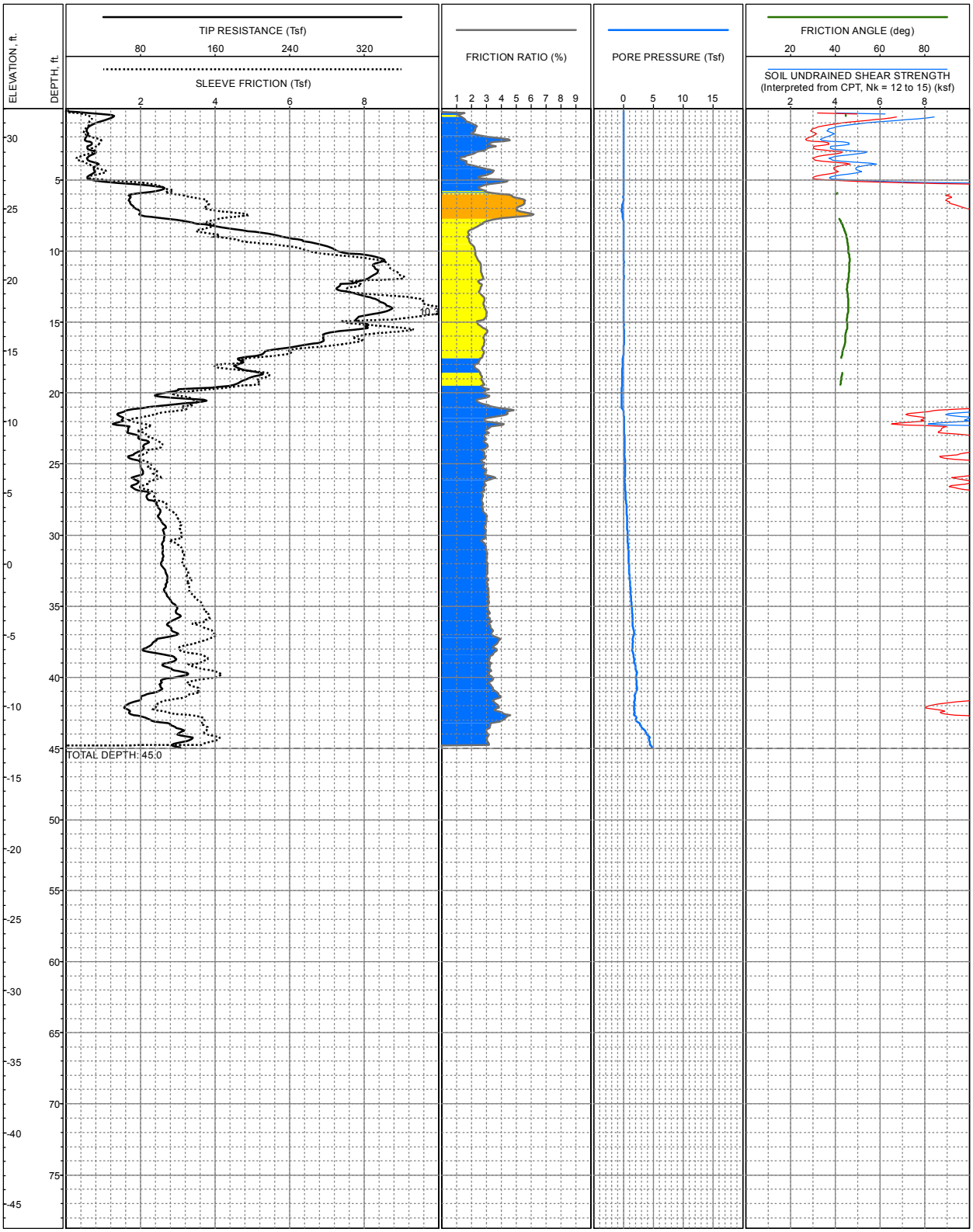

LOCATION: E5,998,521, N 1,979,553, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.0ft +/- ()
COMPLETION DEPTH: 45.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-240

San Joaquin Apartments & Precinct Improvements
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Santa Barbara, California

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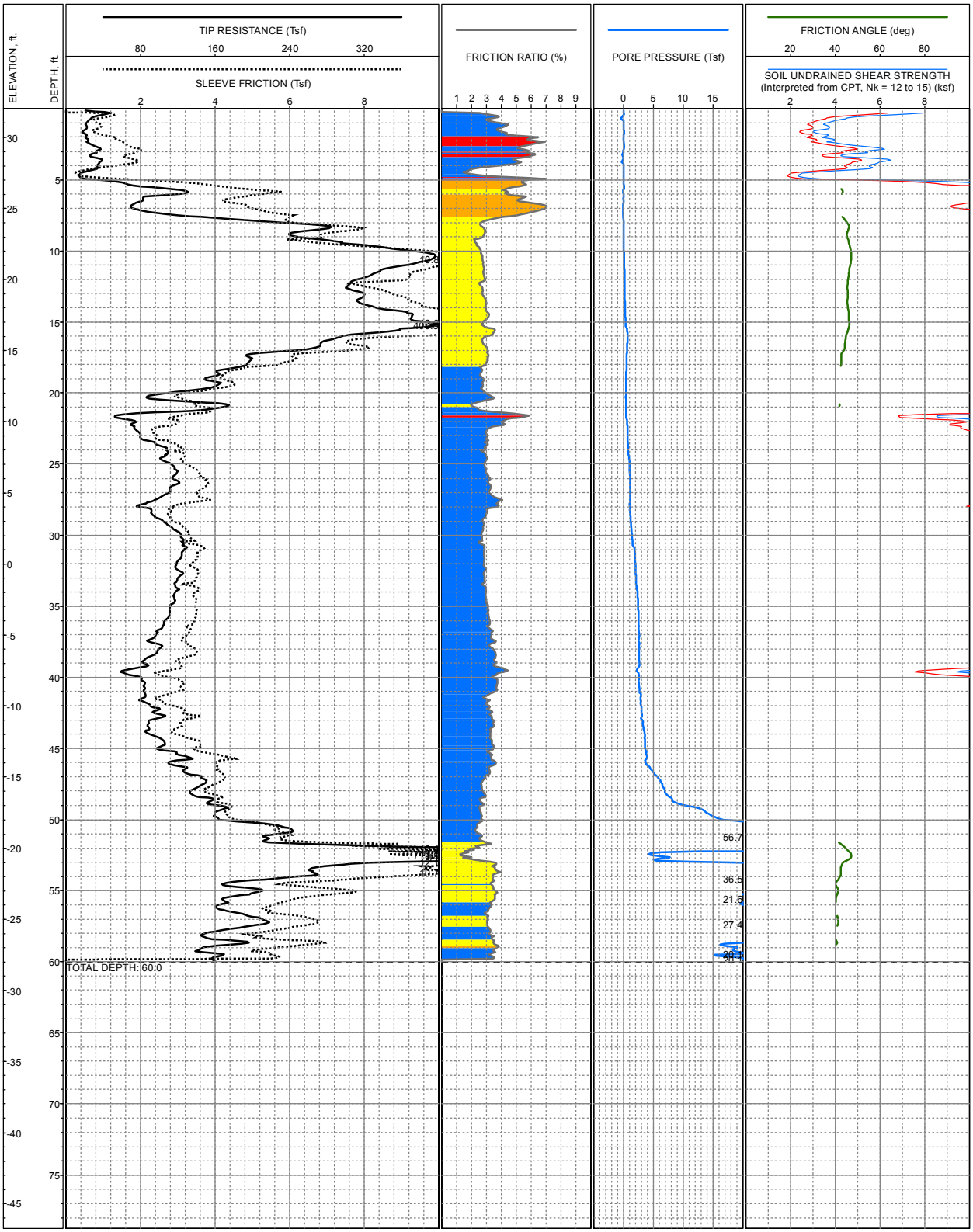

LOCATION: E5,998,521, N 1,979,558, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.0ft +/- ()
COMPLETION DEPTH: 60.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-241

San Joaquin Apartments & Precinct Improvements
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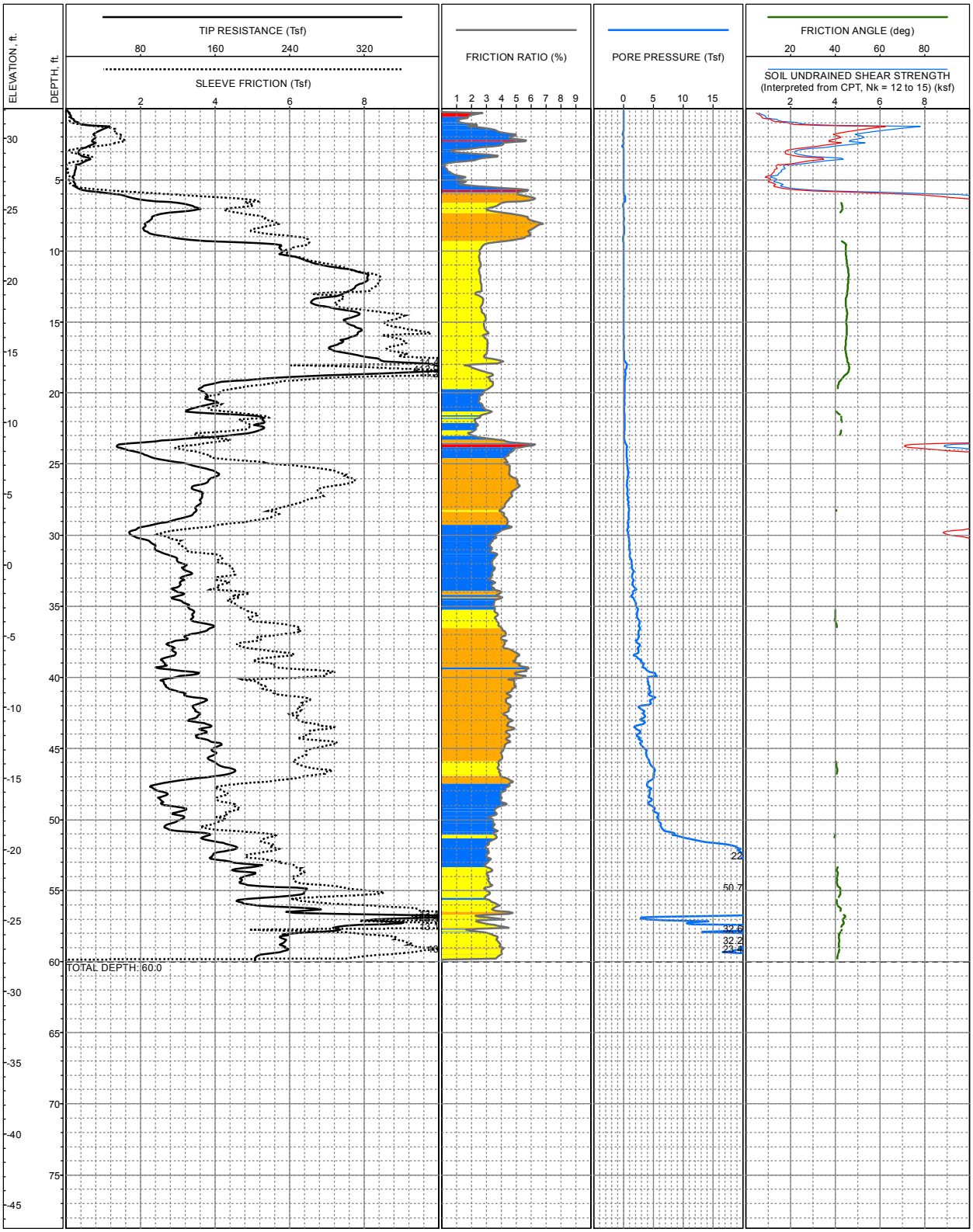

LOCATION: E5,998,521, N 1,979,563, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.1ft +/- ()
COMPLETION DEPTH: 60.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-242

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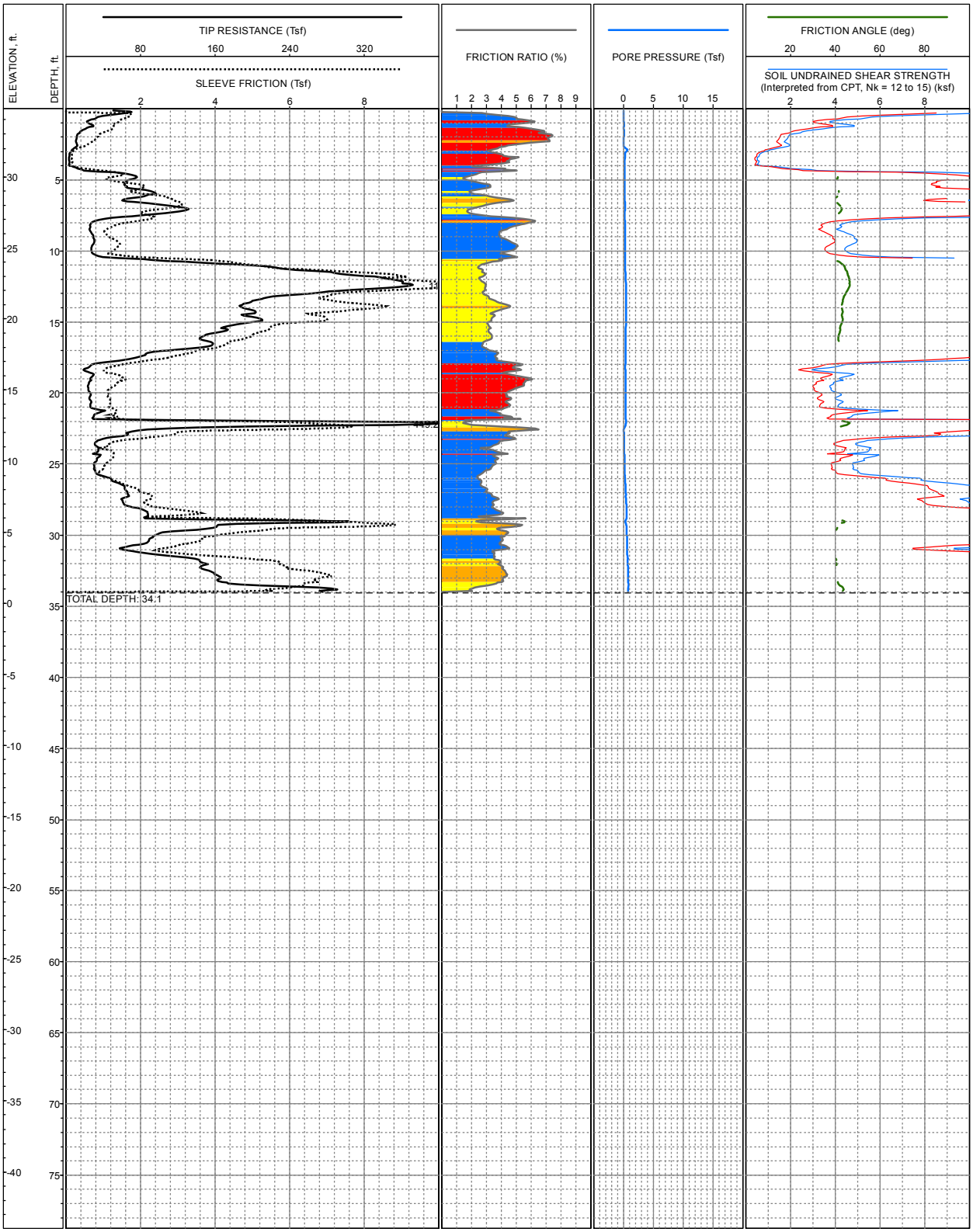

LOCATION: E5,998,213, N 1,979,554, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 34.8ft +/- ()
COMPLETION DEPTH: 34.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-243

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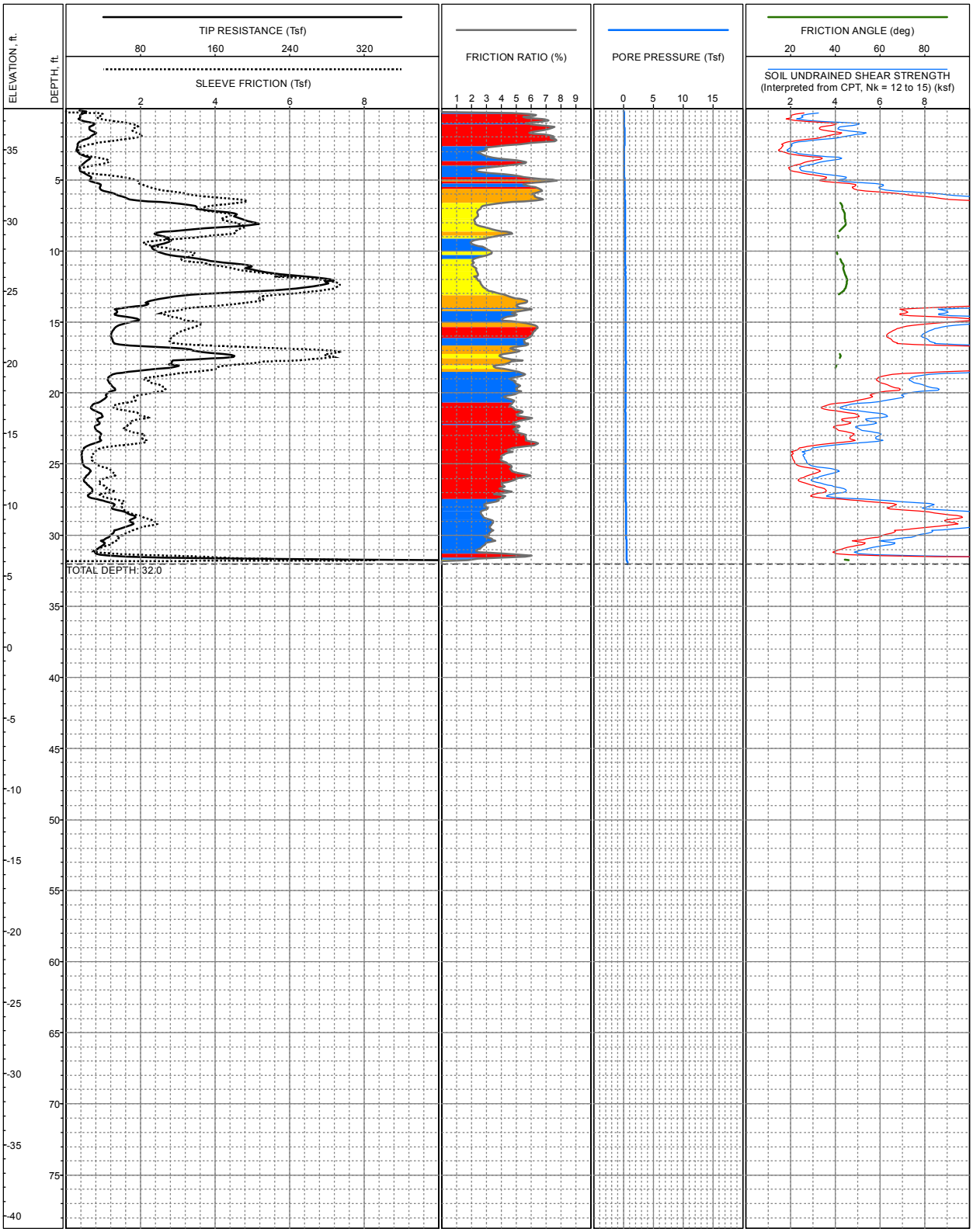

LOCATION: E5,997,904, N 1,979,595, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 37.9ft +/- ()
COMPLETION DEPTH: 32.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-244

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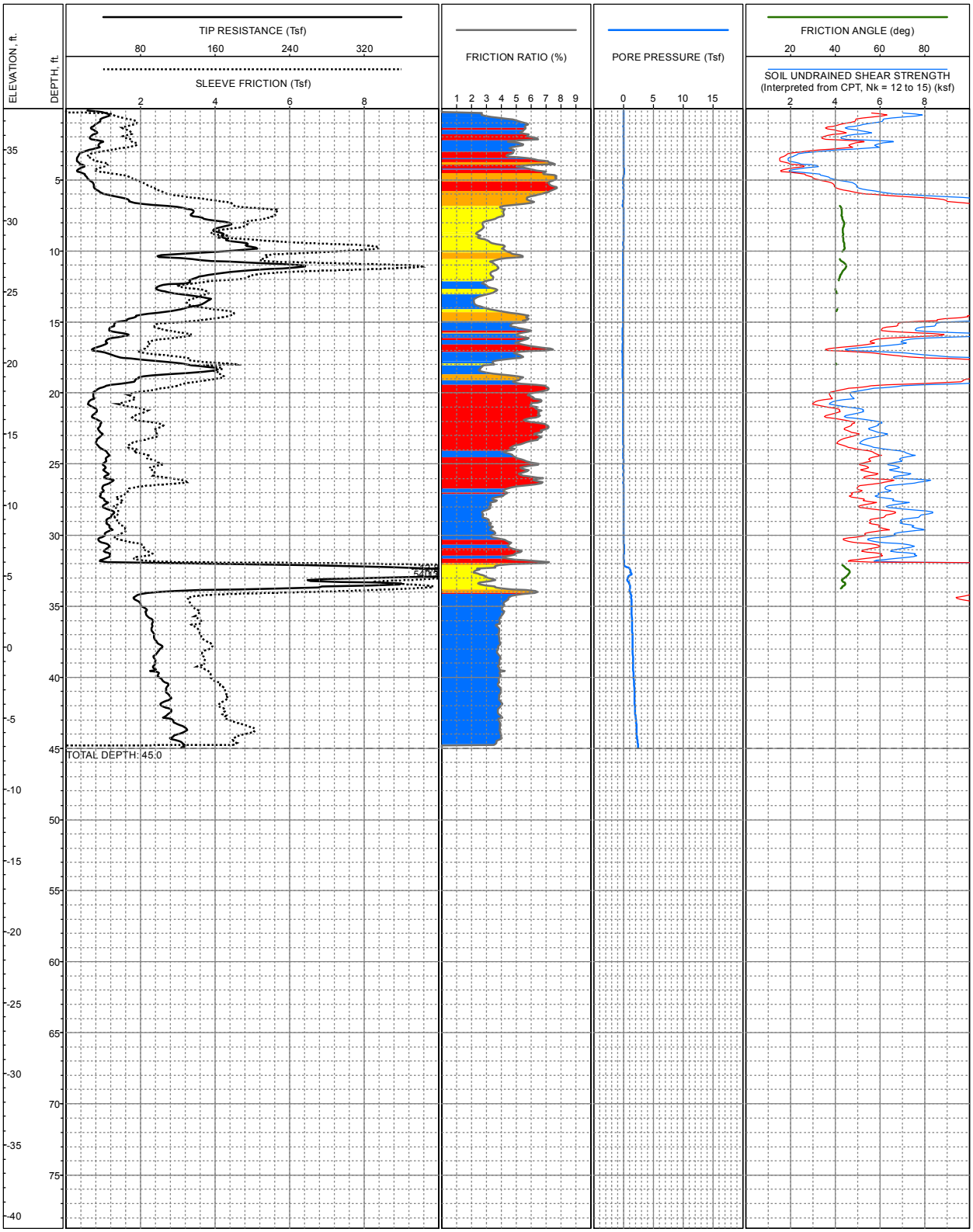

LOCATION: E5,997,904, N 1,979,590, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 37.9ft +/- ()
COMPLETION DEPTH: 45.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-245

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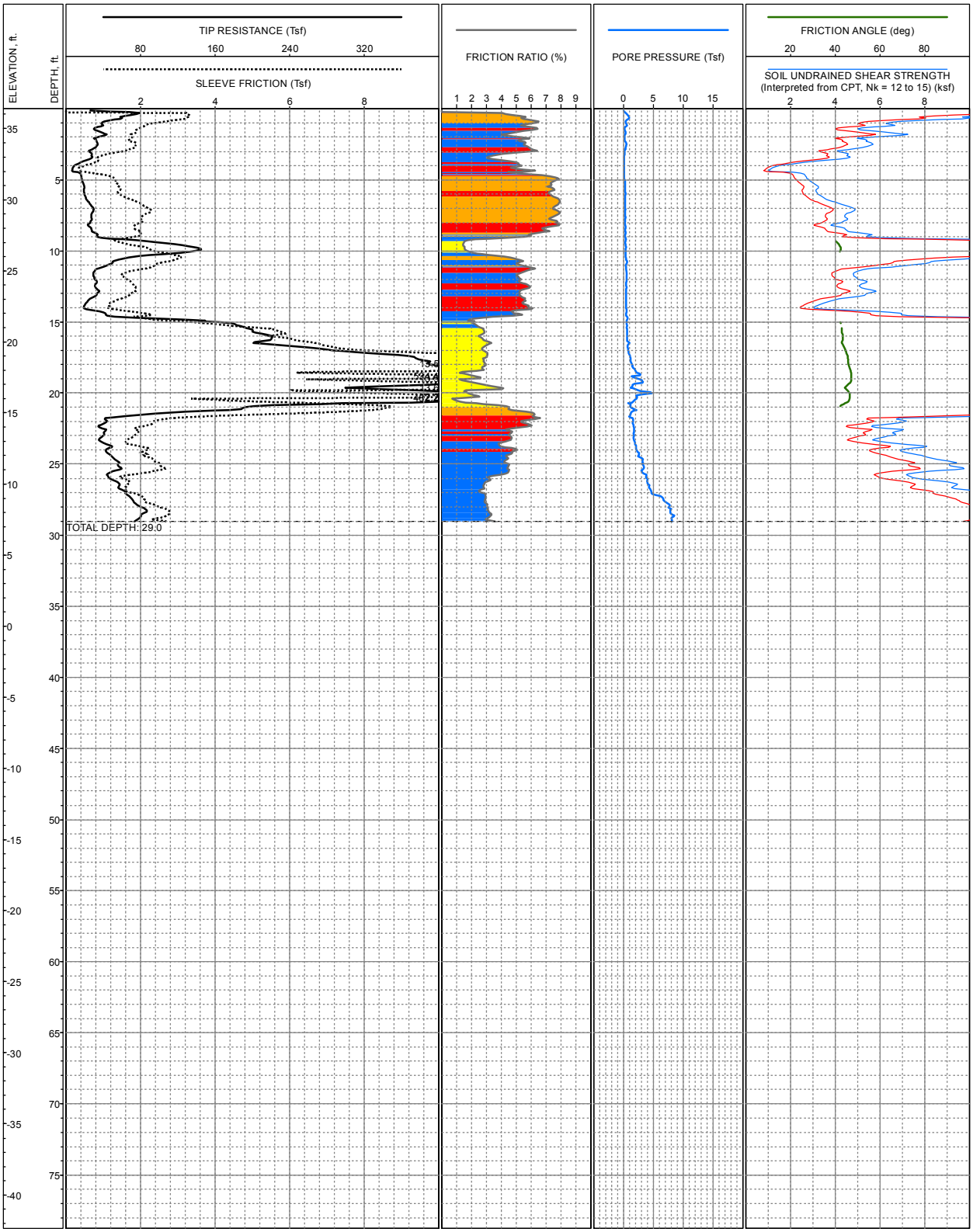

LOCATION: E5,998,055, N 1,979,593, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 36.4ft +/- ()
COMPLETION DEPTH: 29.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-246

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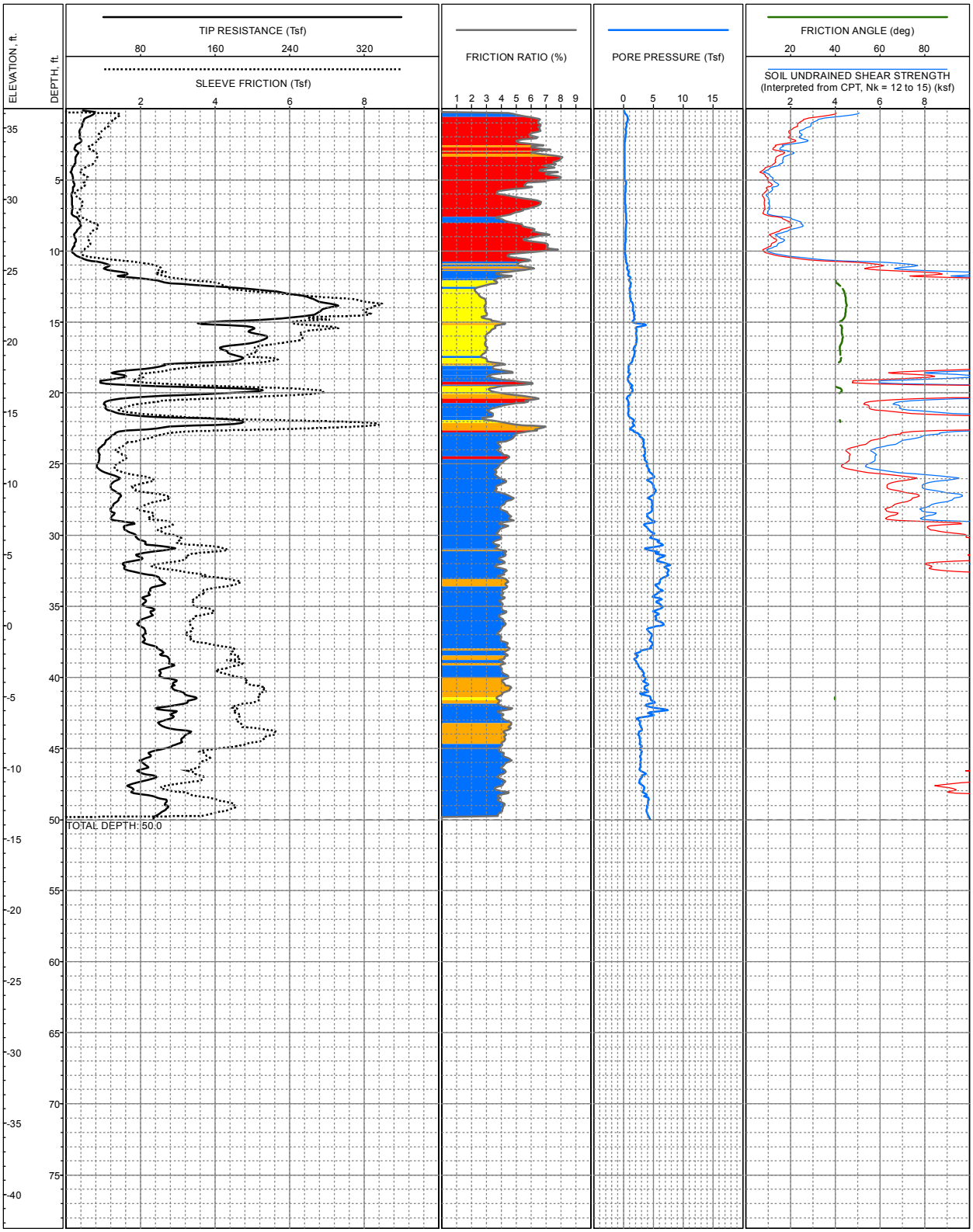

LOCATION: E5,998,055, N 1,979,578, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 36.4ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-247

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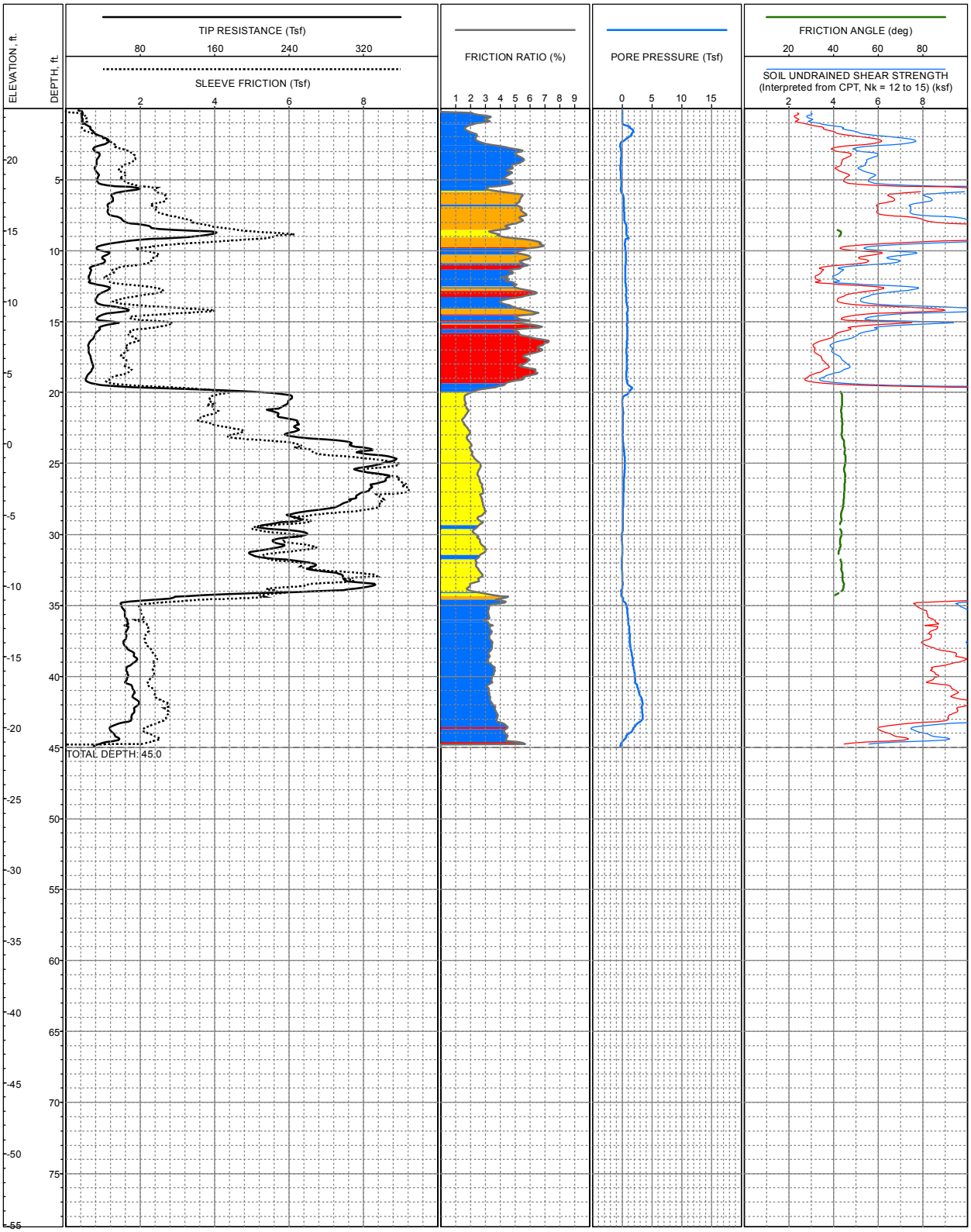

LOCATION: E5,998,279, N 1,979,932, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.6ft +/- ()
COMPLETION DEPTH: 45.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-248

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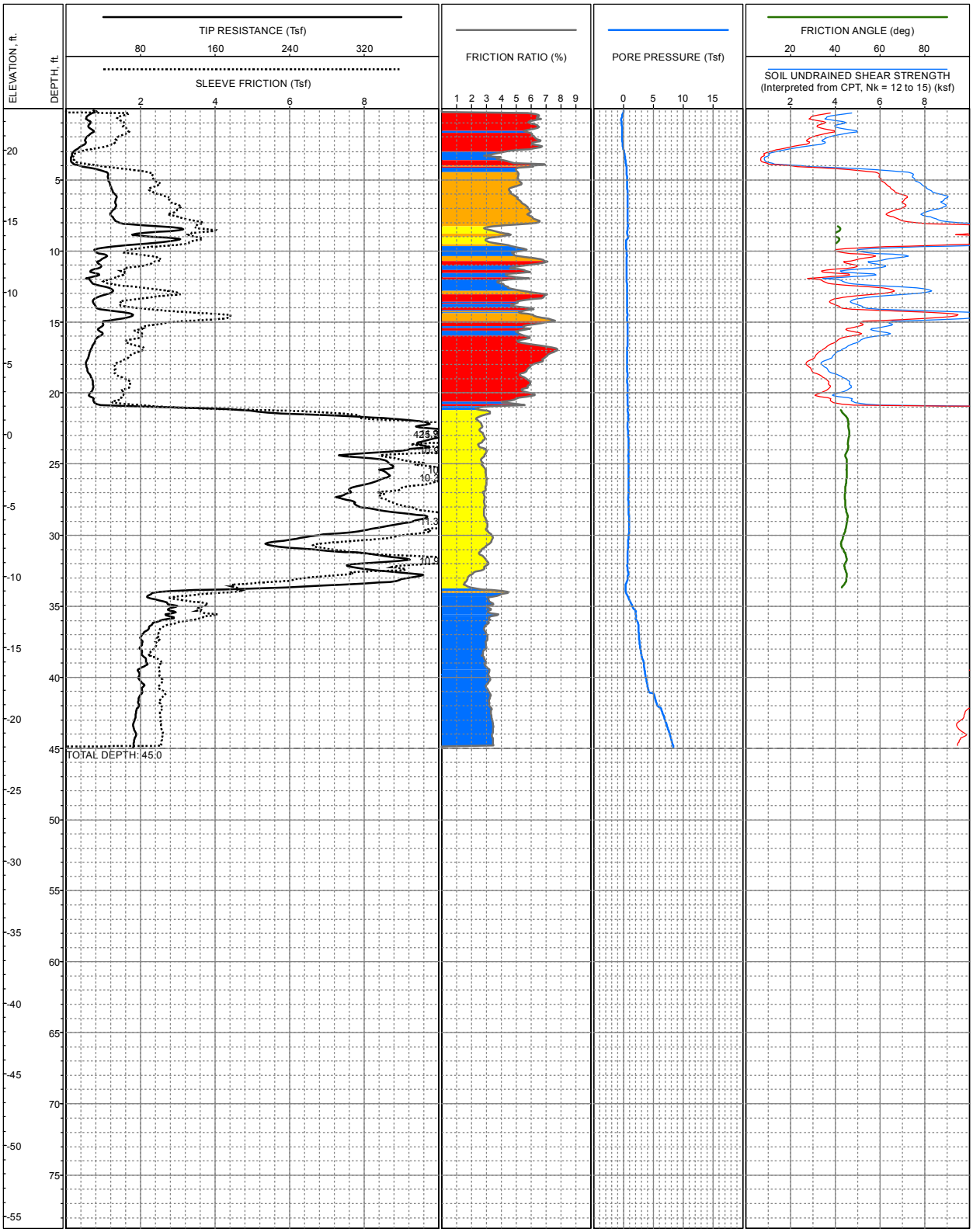

LOCATION: E5,998,280, N 1,979,946, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.9ft +/- ()
COMPLETION DEPTH: 45.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-249

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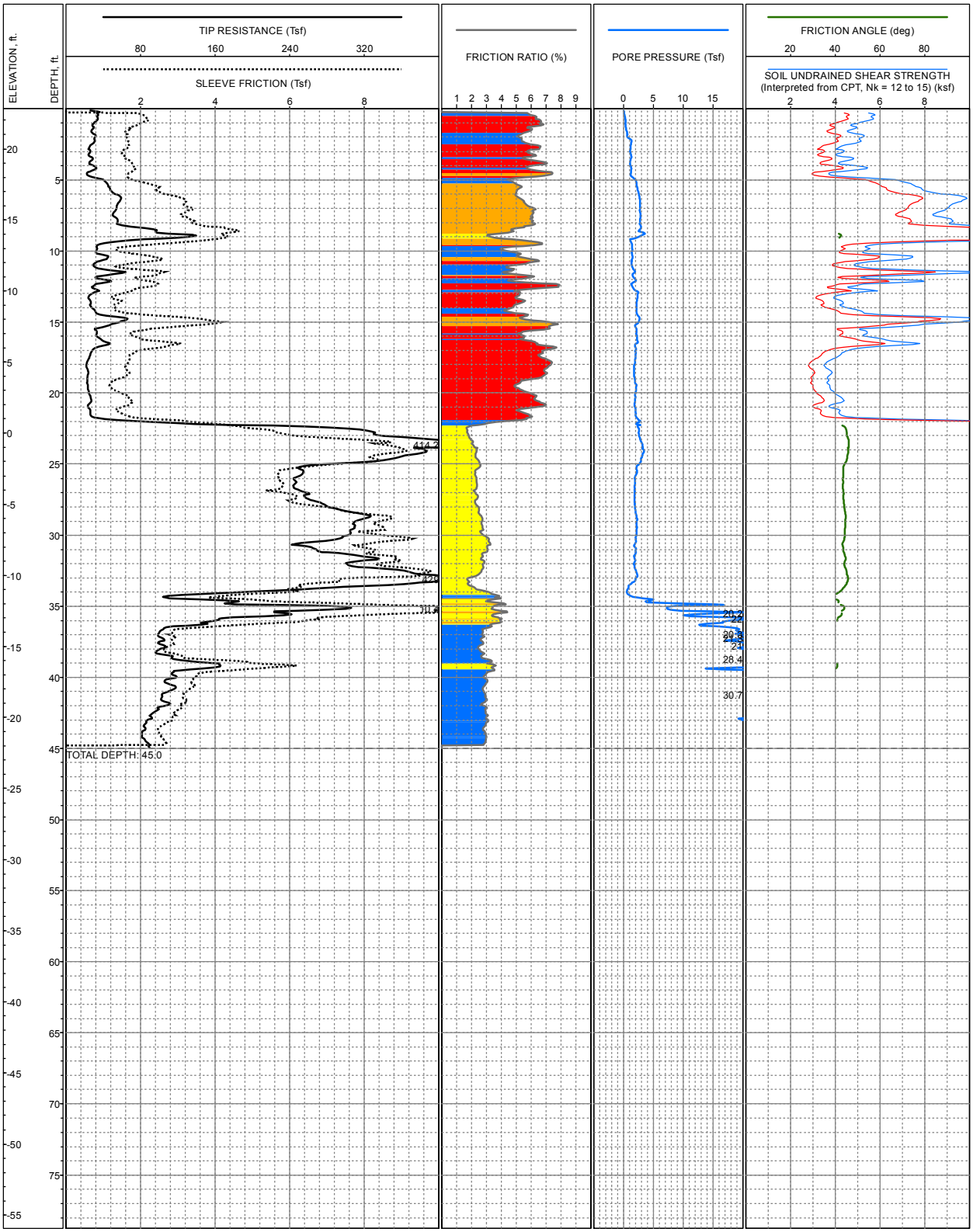

LOCATION: E5,998,280, N 1,979,953, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.8ft +/- ()
COMPLETION DEPTH: 45.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-250

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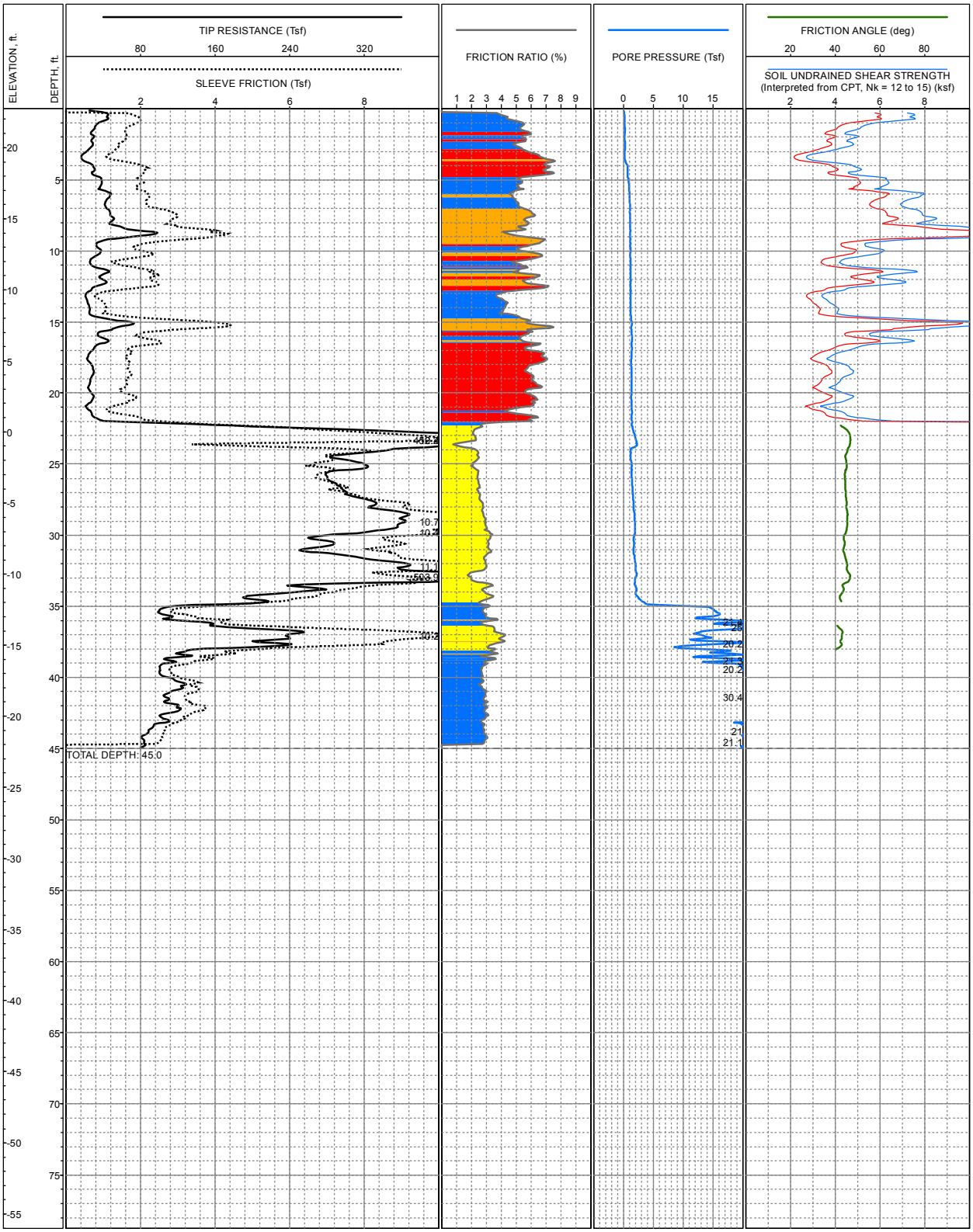

LOCATION: E5,998,280, N 1,979,958, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.7ft +/- ()
COMPLETION DEPTH: 45.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-251

San Joaquin Apartments & Precinct Improvements
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Santa Barbara, California

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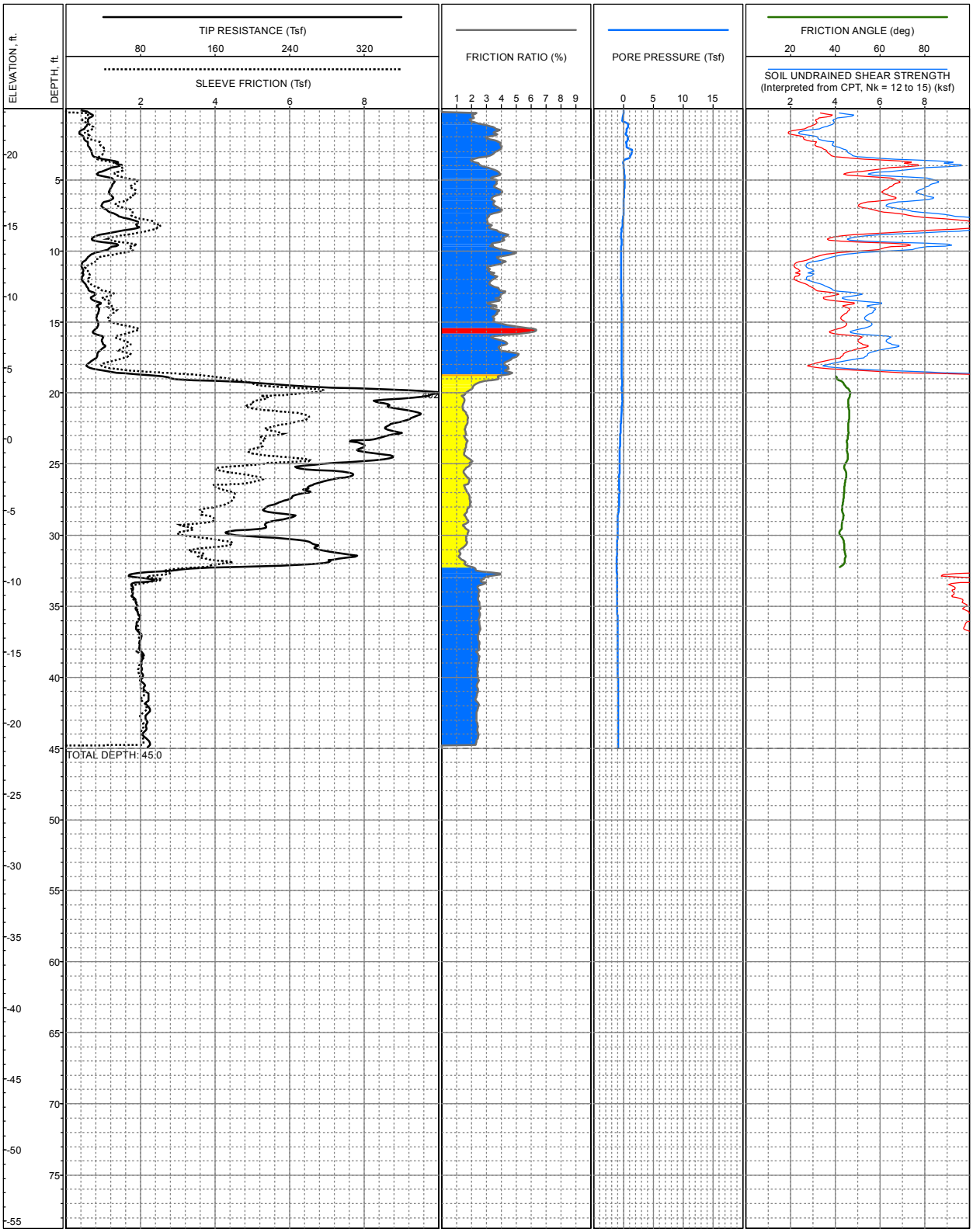

LOCATION: E5,998,202, N 1,979,951, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.2ft +/- ()
COMPLETION DEPTH: 45.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-252

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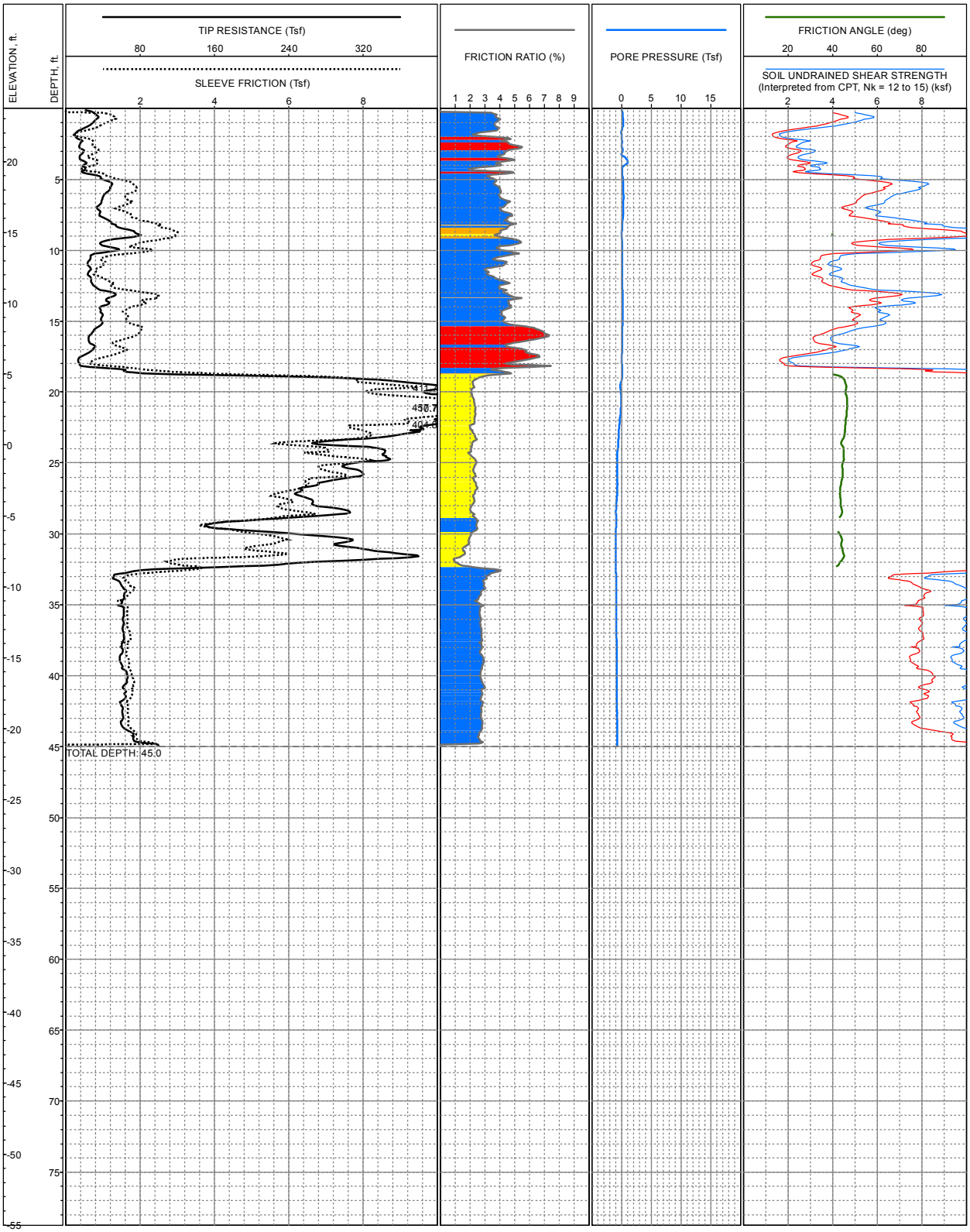

LOCATION: E5,998,166, N 1,979,962, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.7ft +/- ()
COMPLETION DEPTH: 45.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-253

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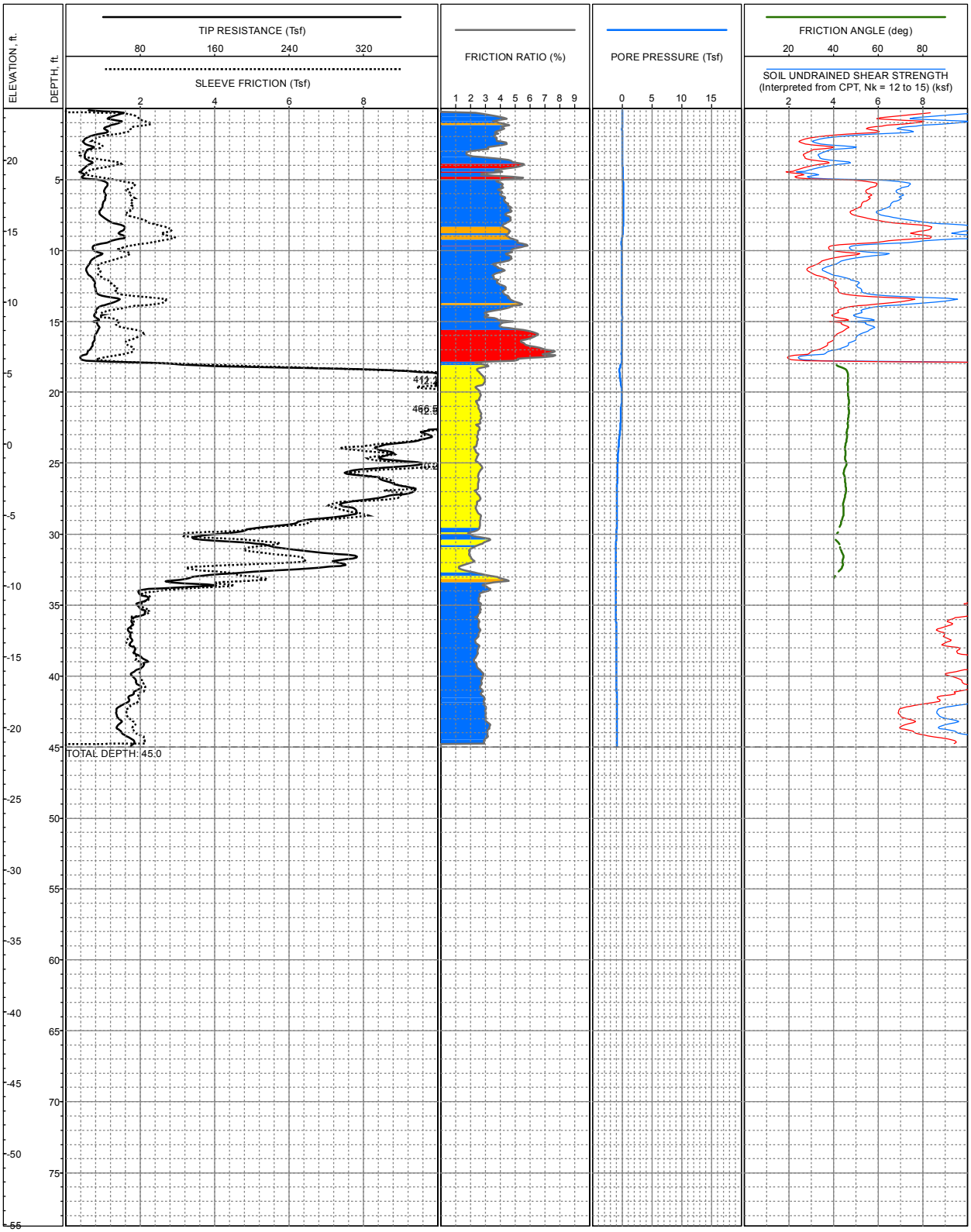

LOCATION: E5,998,166, N 1,979,971, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.6ft +/- ()
COMPLETION DEPTH: 45.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-254

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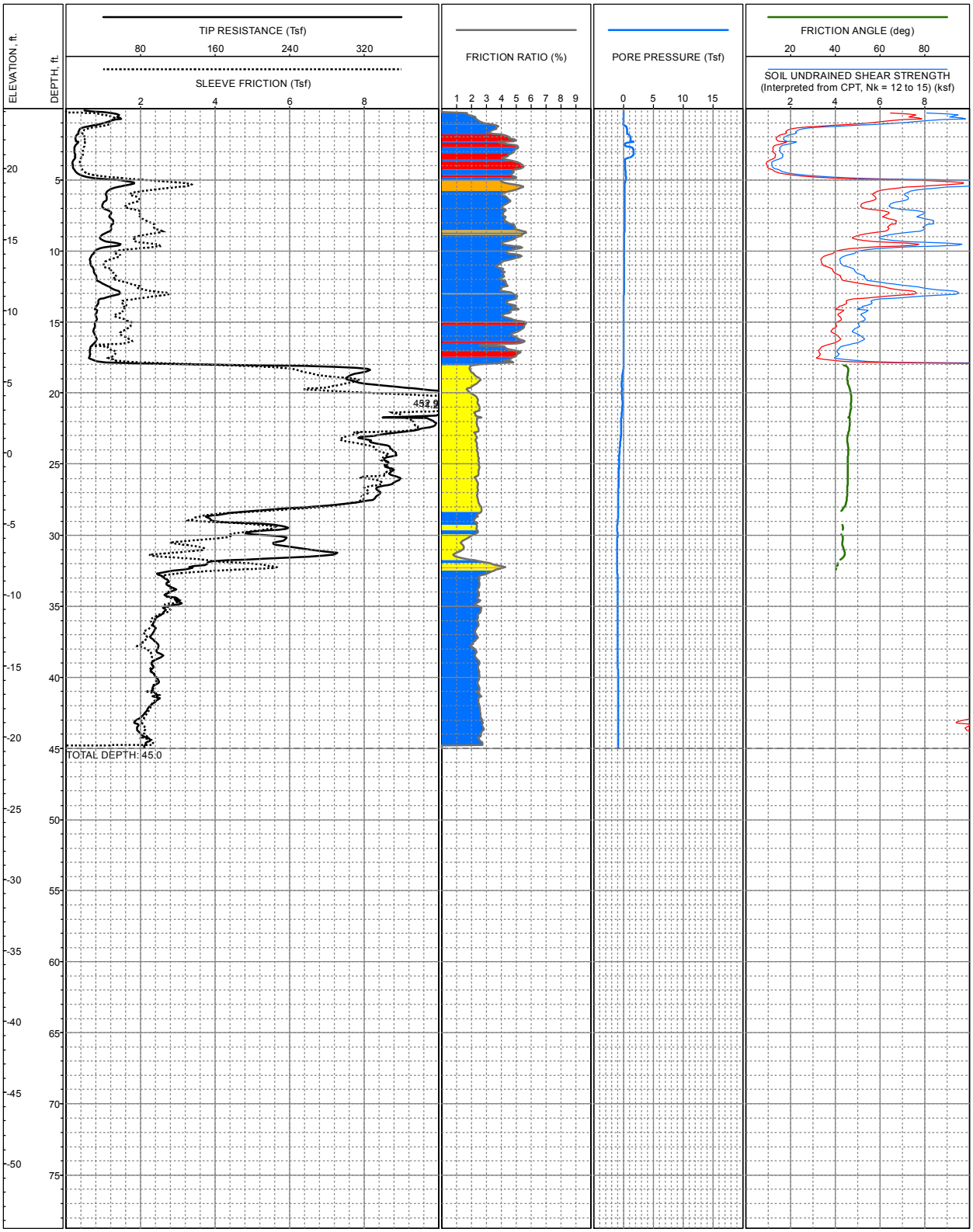

LOCATION: E5,998,123, N 1,979,975, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.2ft +/- ()
COMPLETION DEPTH: 45.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-255

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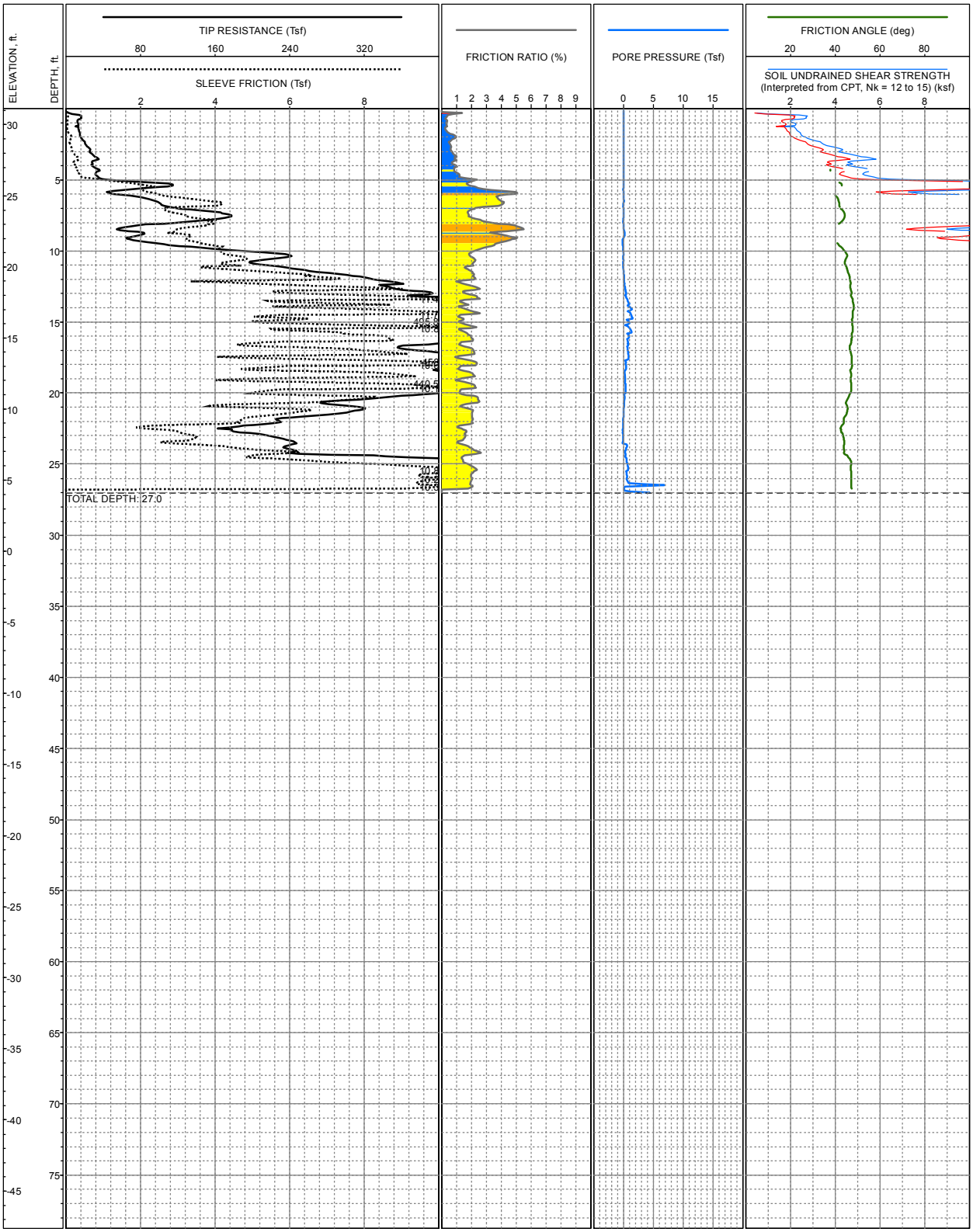

LOCATION: E5,997,908, N 1,979,763, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.1ft +/- ()
COMPLETION DEPTH: 27.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-256

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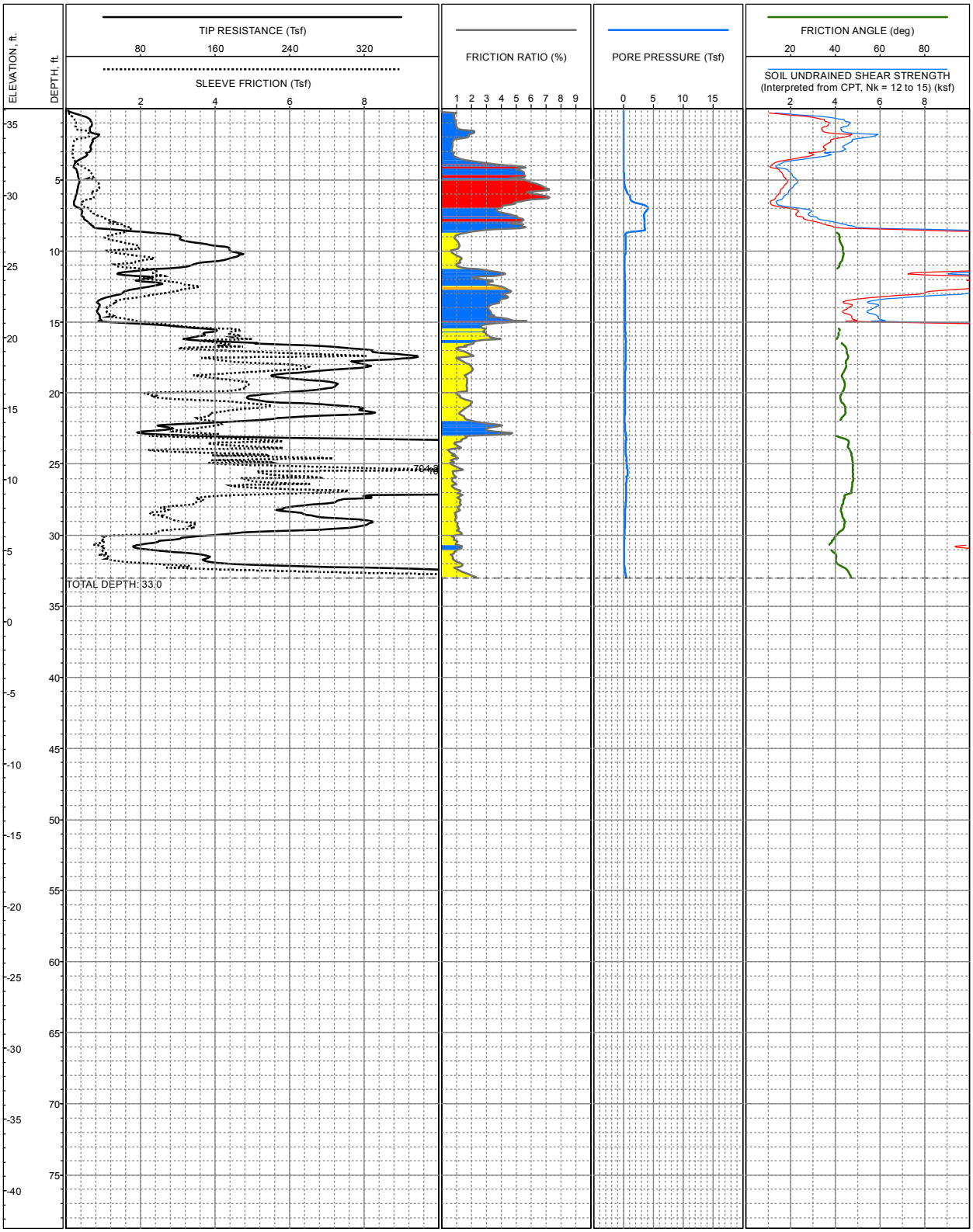

LOCATION: E5,998,055, N 1,979,615, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 36.1ft +/- ()
COMPLETION DEPTH: 33.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-257

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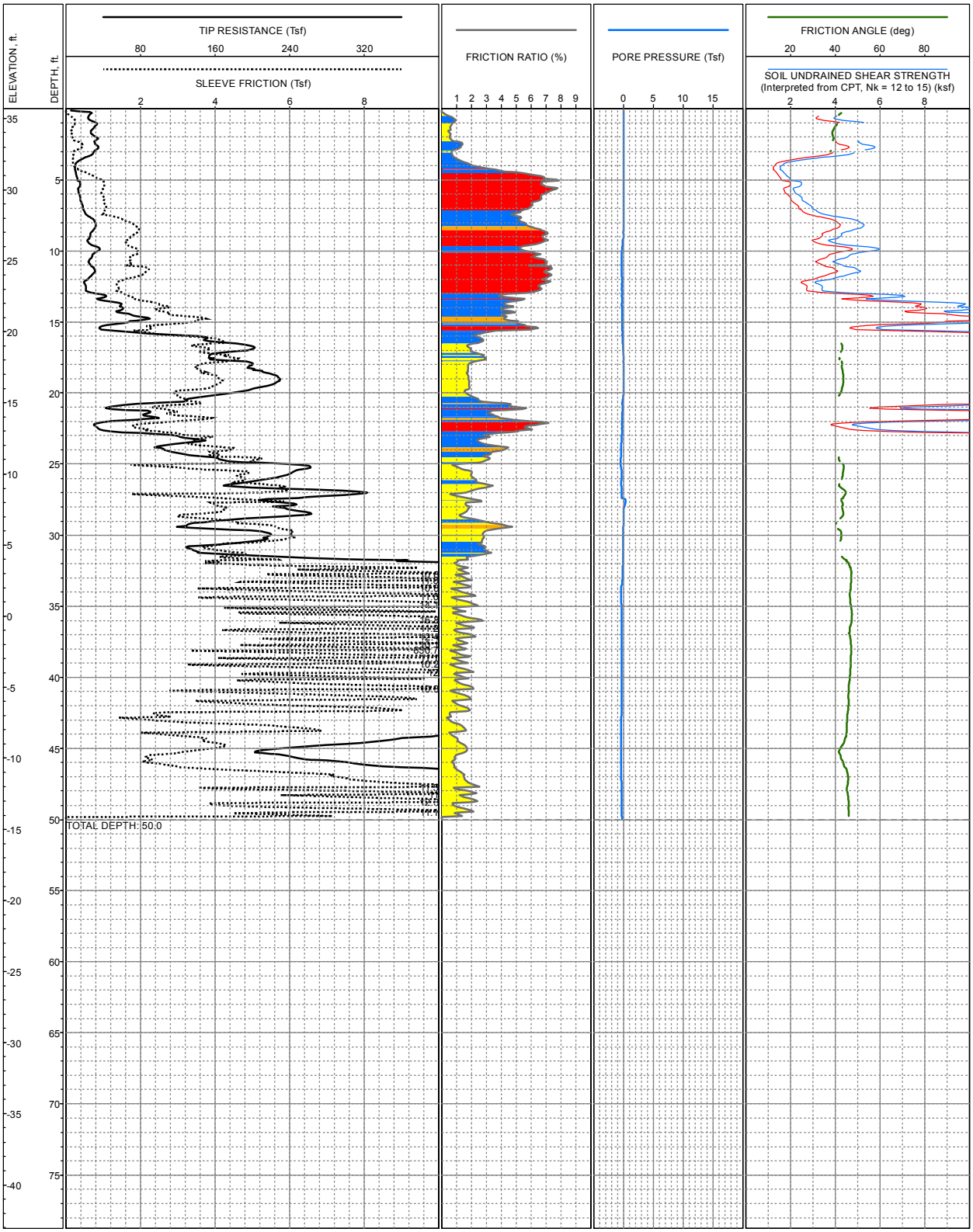

LOCATION: E5,998,055, N 1,979,630, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.7ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-258

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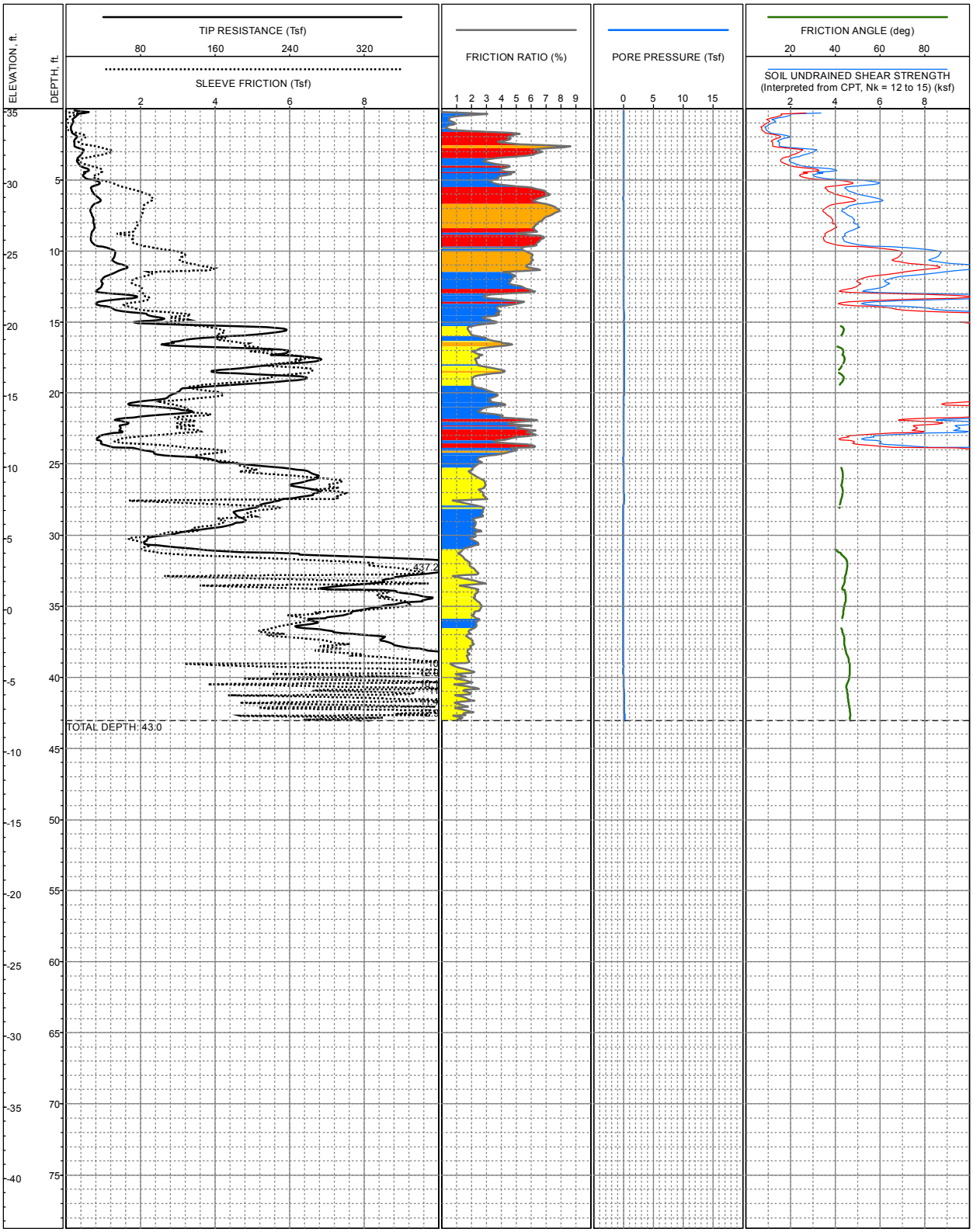

LOCATION: E5,998,056, N 1,979,648, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.2ft +/- ()
COMPLETION DEPTH: 43.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-259

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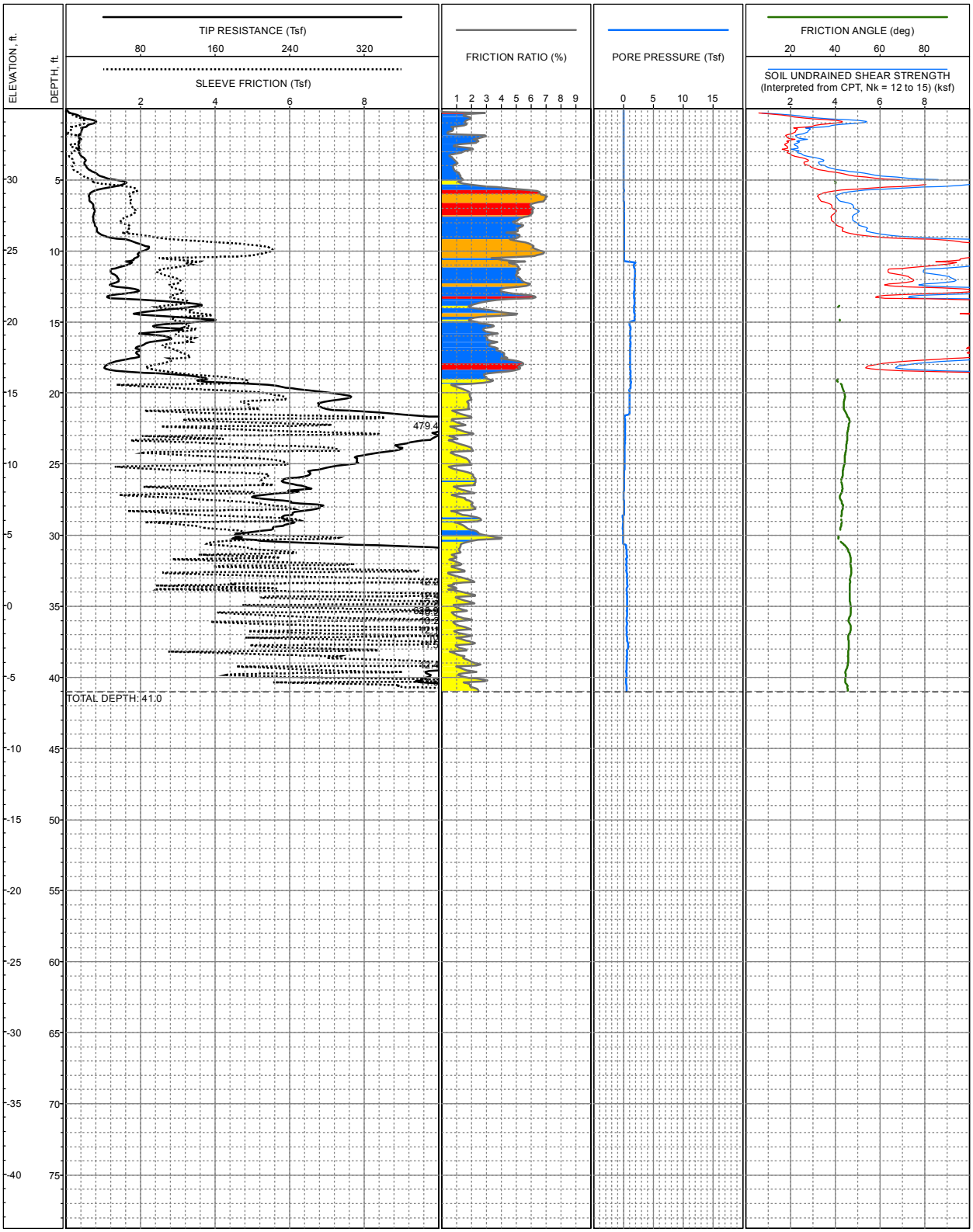

LOCATION: E5,998,056, N 1,979,658, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 34.9ft +/- ()
COMPLETION DEPTH: 41.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-260

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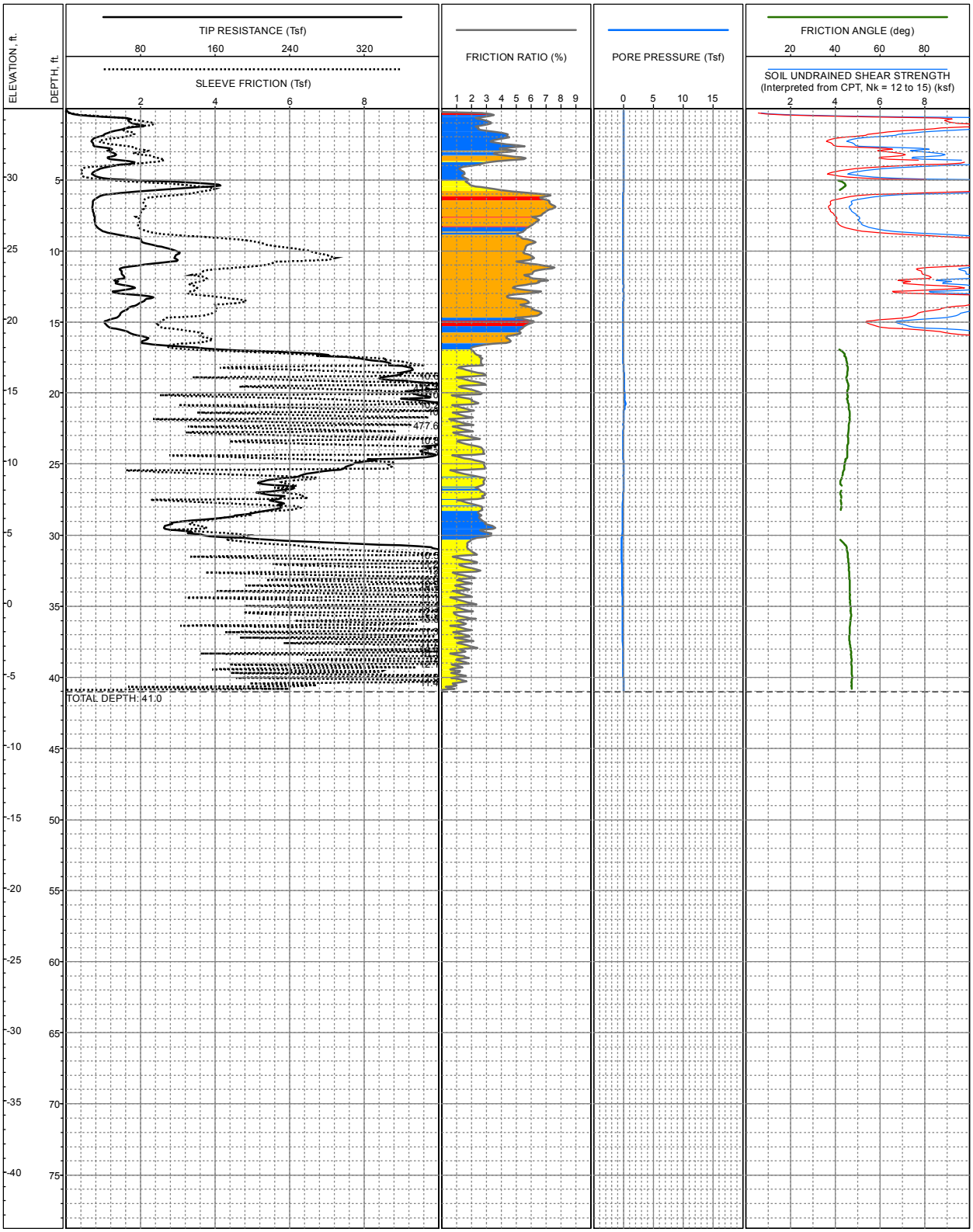

LOCATION: E5,998,057, N 1,979,668, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 34.8ft +/- ()
COMPLETION DEPTH: 41.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-261

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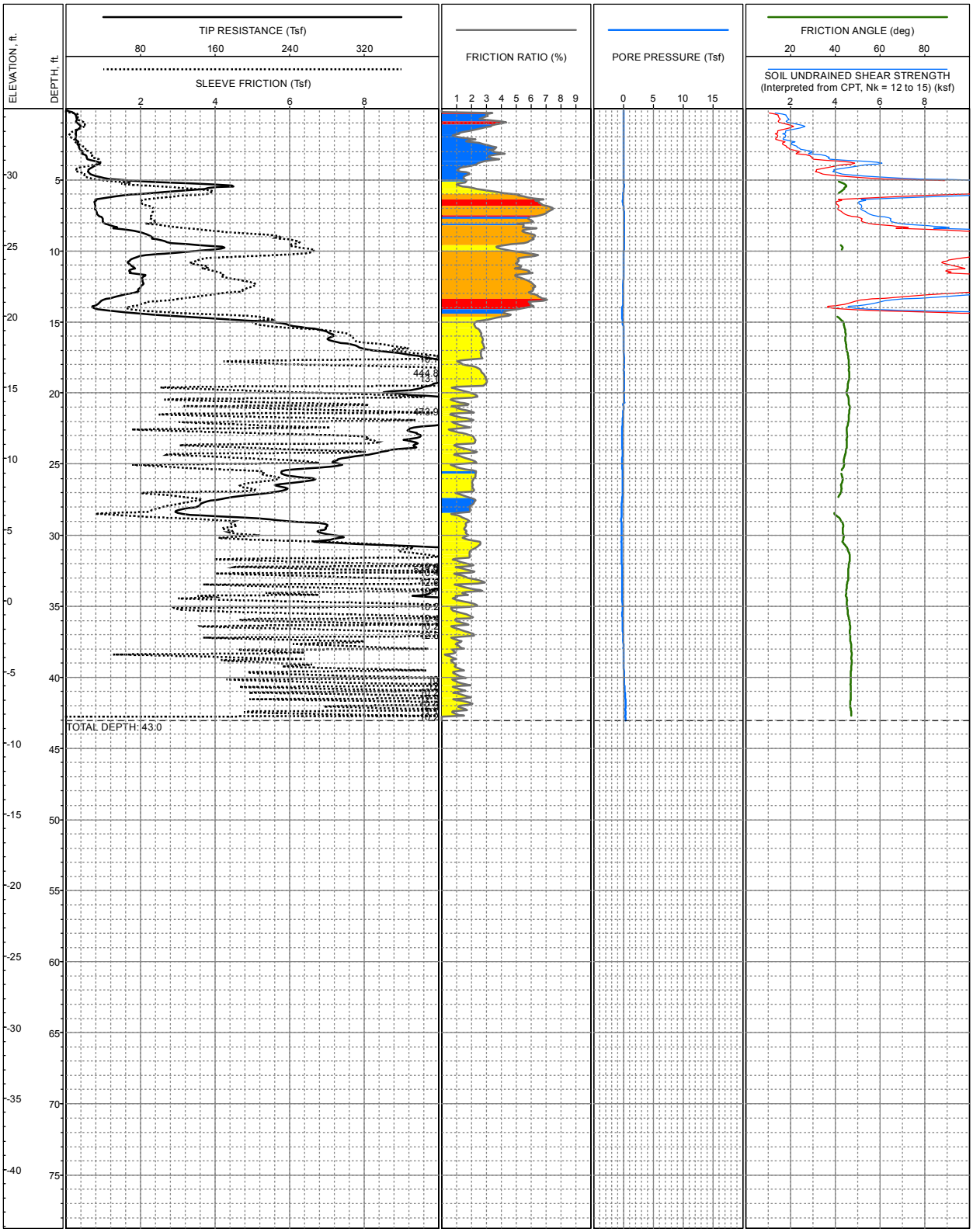

LOCATION: E5,998,057, N 1,979,678, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 34.6ft +/- ()
COMPLETION DEPTH: 43.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-262

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Santa Barbara, California

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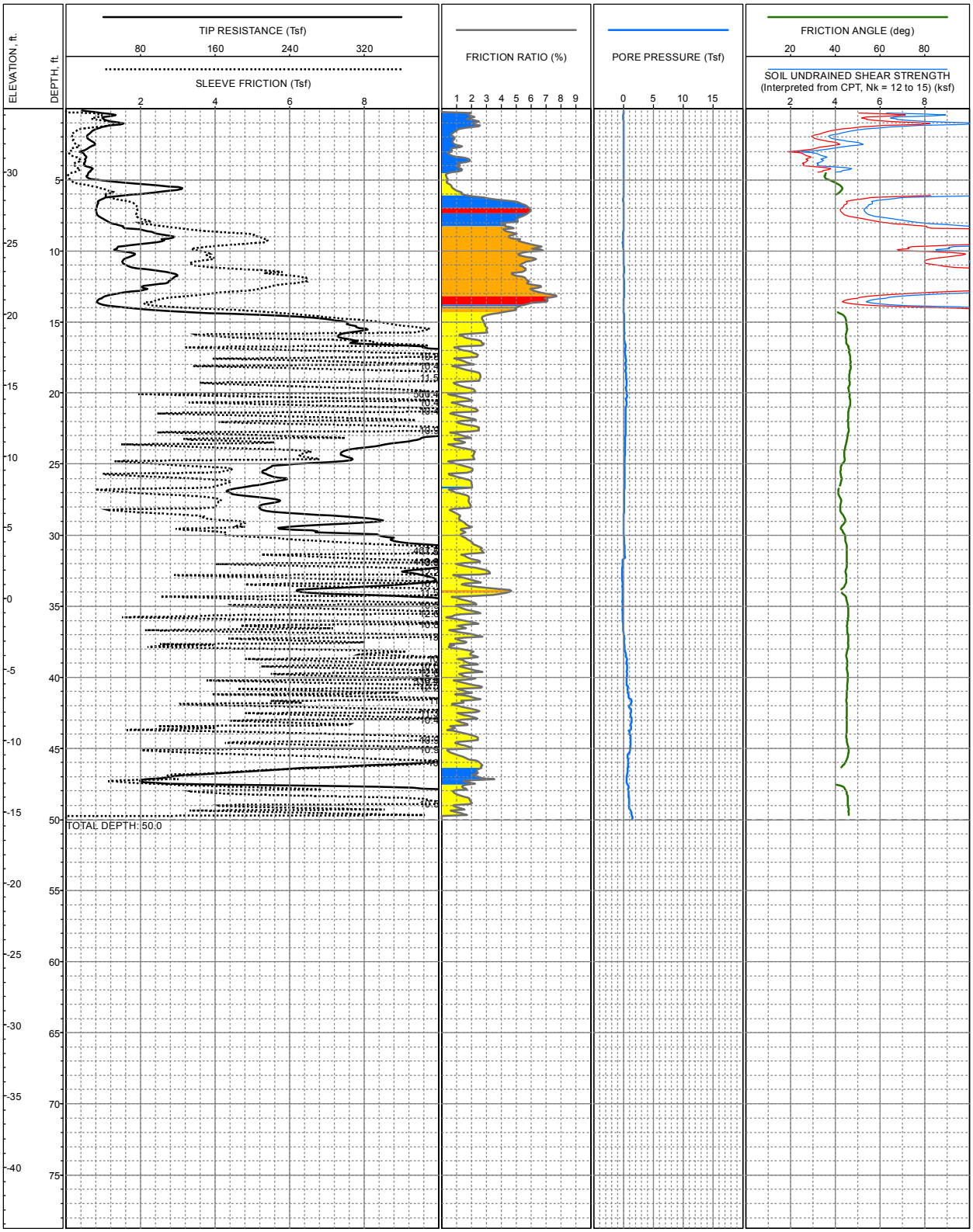

LOCATION: E5,998,058, N 1,979,688, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 34.4ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-263

San Joaquin Apartments & Precinct Improvements
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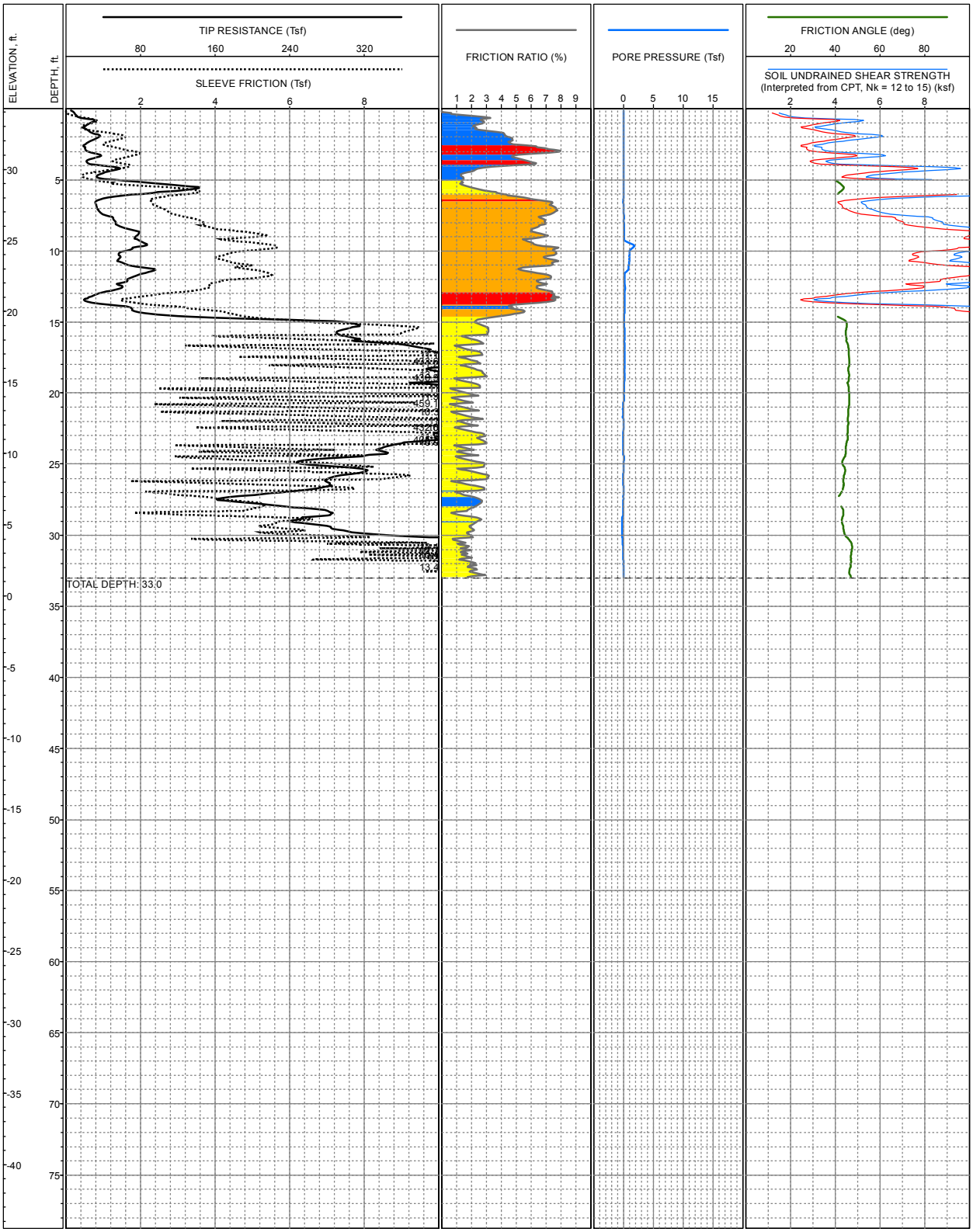

LOCATION: E5,998,058, N 1,979,698, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 34.3ft +/- ()
COMPLETION DEPTH: 33.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-264

San Joaquin Apartments & Precinct Improvements
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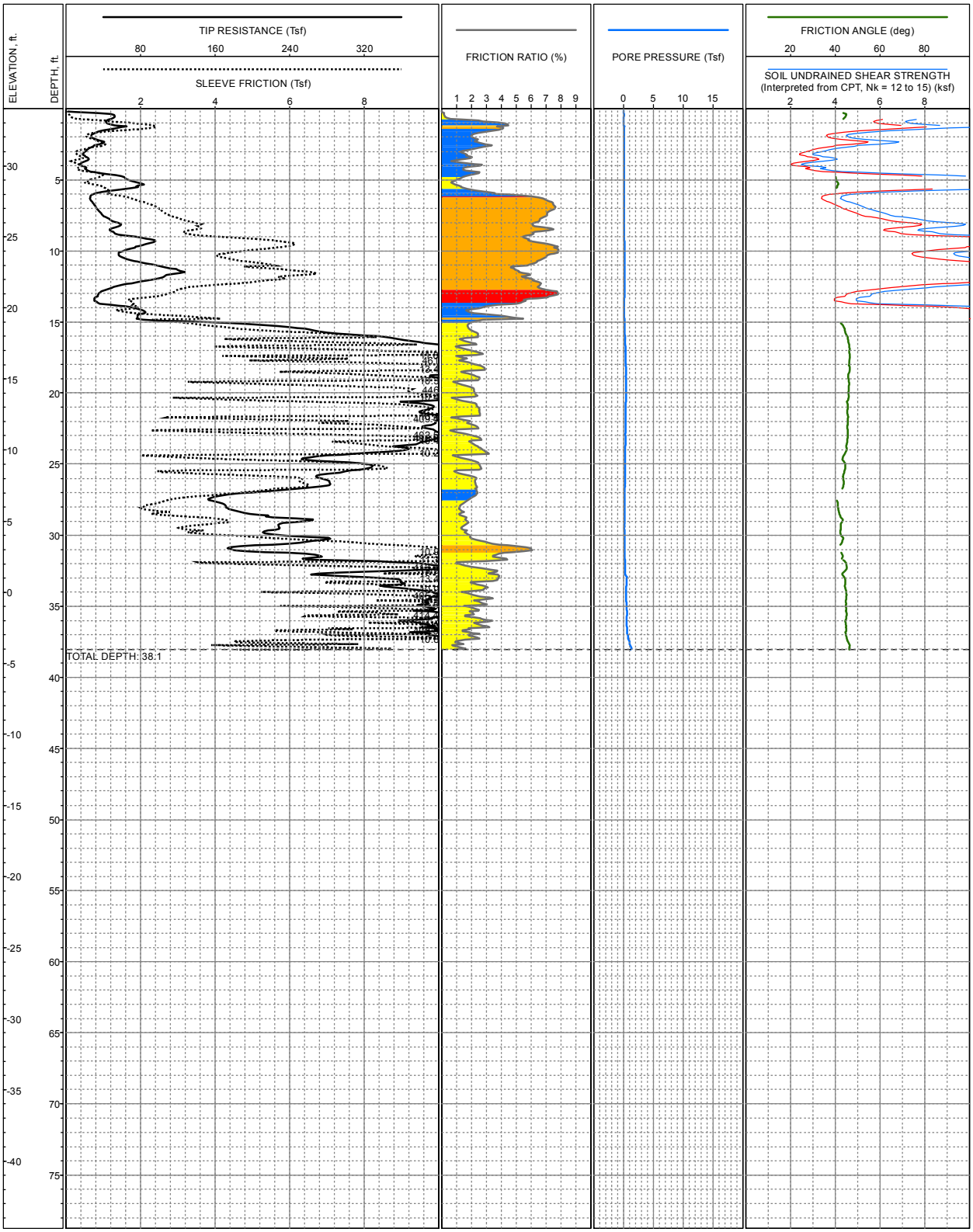

LOCATION: E5,998,059, N 1,979,708, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 34.0ft +/- ()
COMPLETION DEPTH: 38.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-265

San Joaquin Apartments & Precinct Improvements
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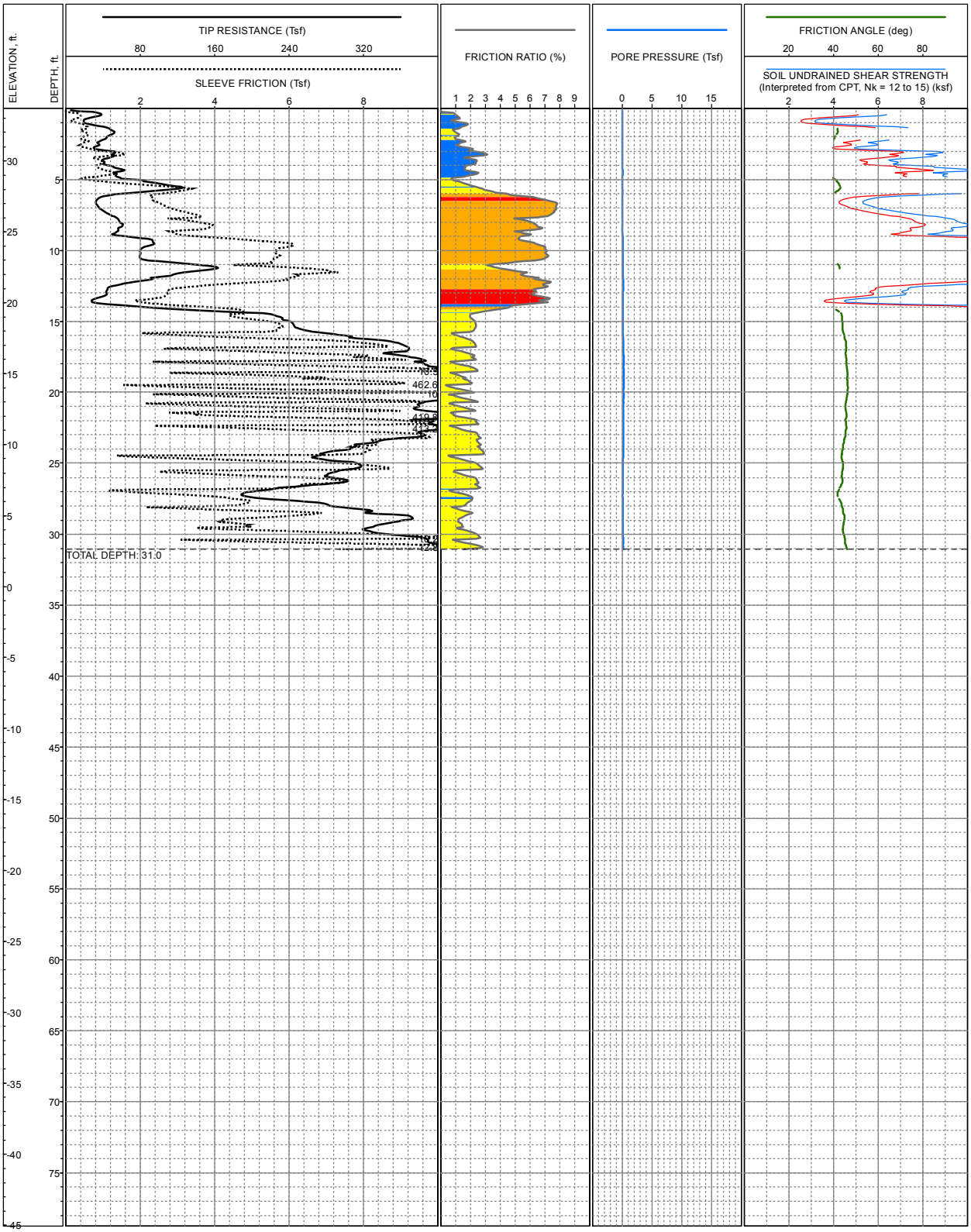

LOCATION: E5,998,059, N 1,979,718, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 33.7ft +/- ()
COMPLETION DEPTH: 31.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-266

San Joaquin Apartments & Precinct Improvements
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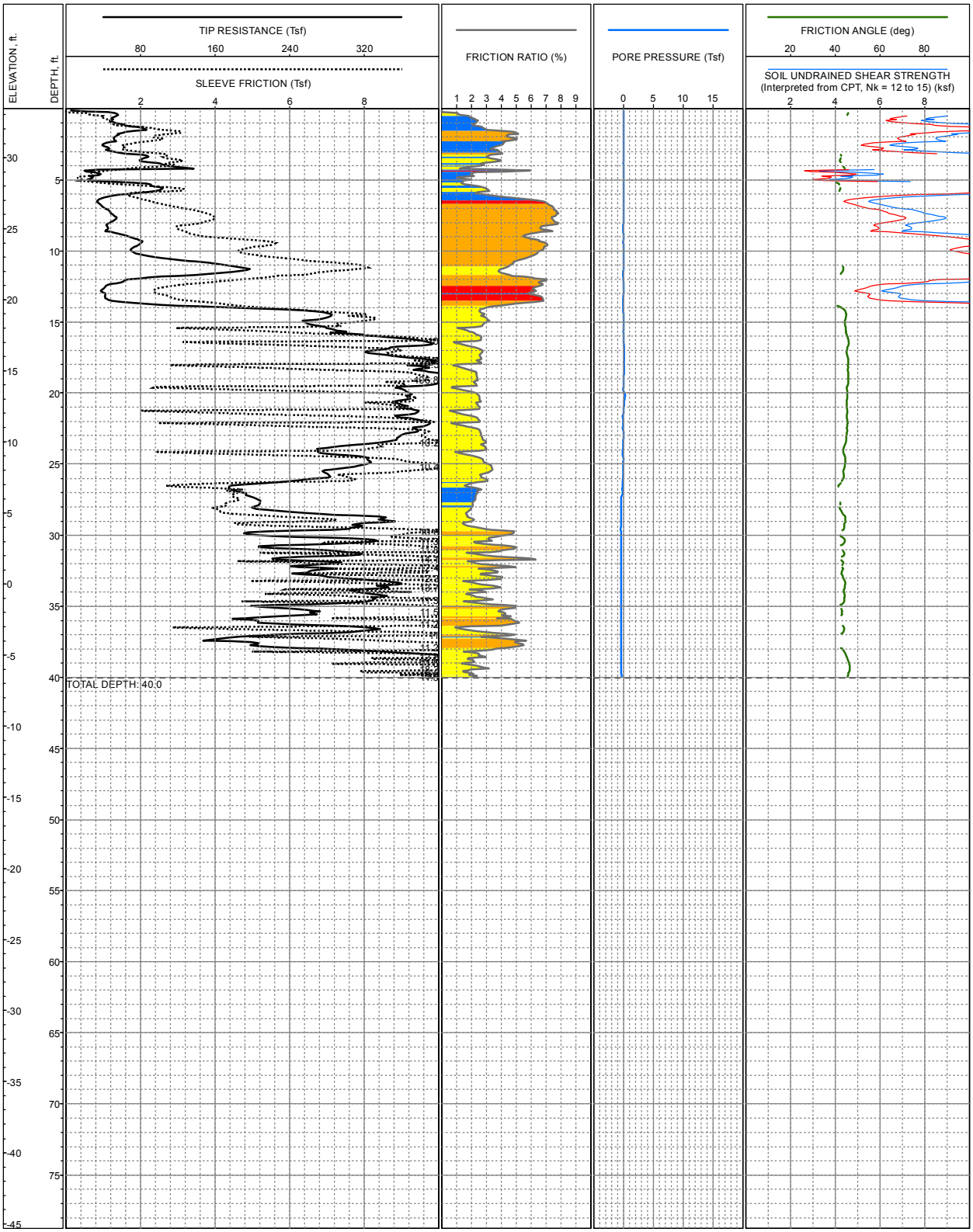

LOCATION: E5,998,060, N 1,979,727, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 33.4ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-267

San Joaquin Apartments & Precinct Improvements
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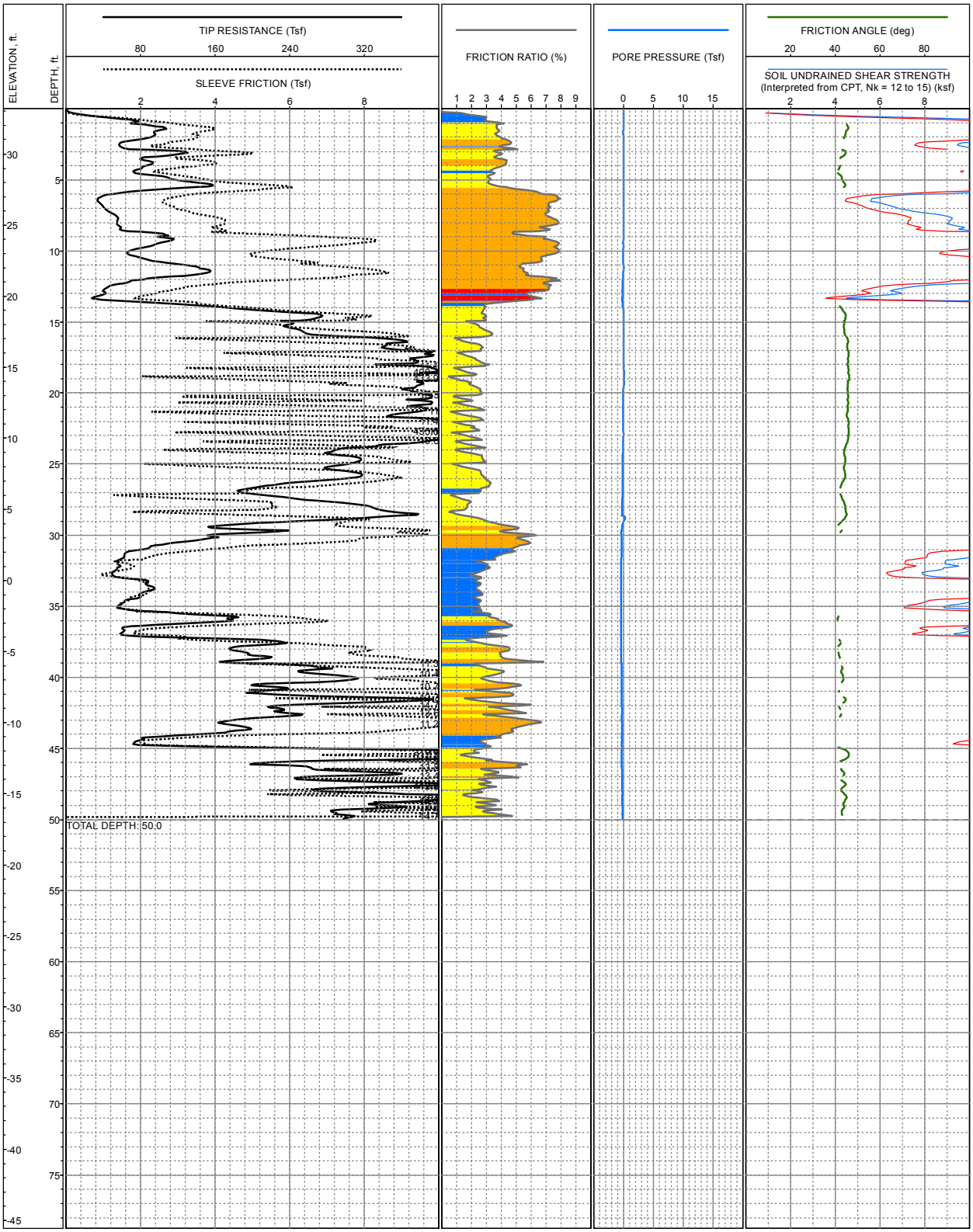

LOCATION: E5,998,060, N 1,979,737, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 33.2ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-268

San Joaquin Apartments & Precinct Improvements
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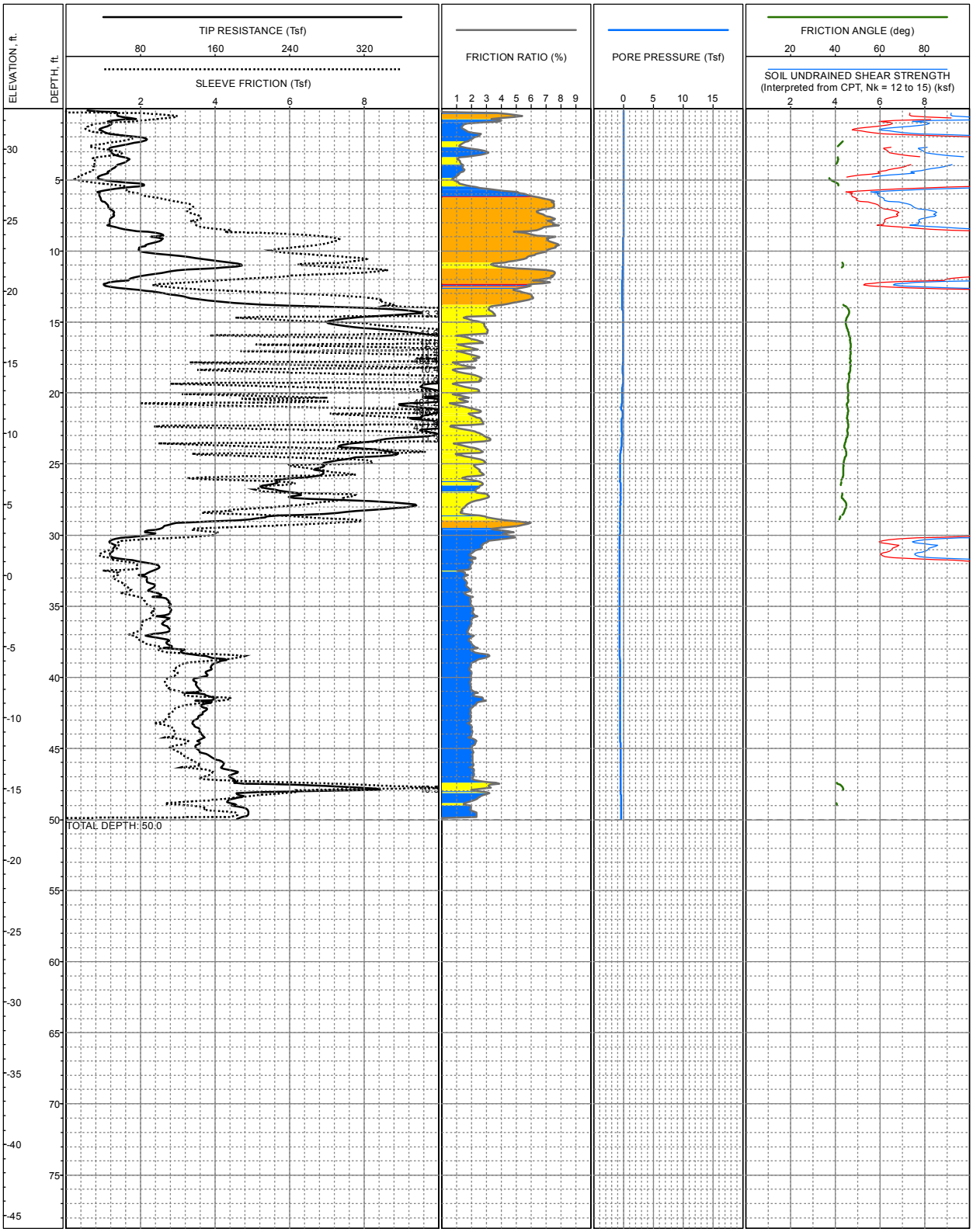

LOCATION: E5,998,061, N 1,979,747, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.8ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-269

San Joaquin Apartments & Precinct Improvements
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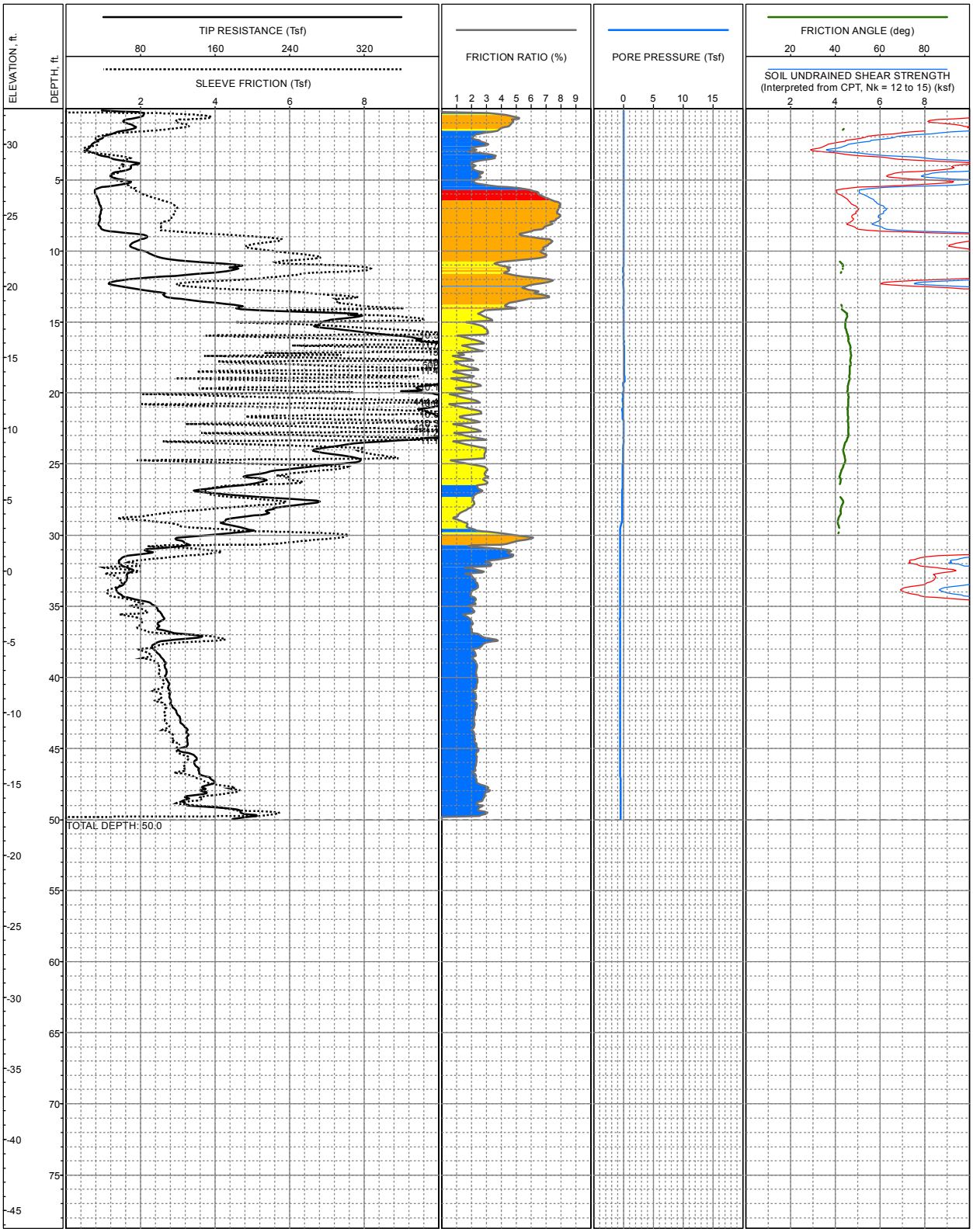

LOCATION: E5,998,061, N 1,979,757, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.5ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-270

San Joaquin Apartments & Precinct Improvements
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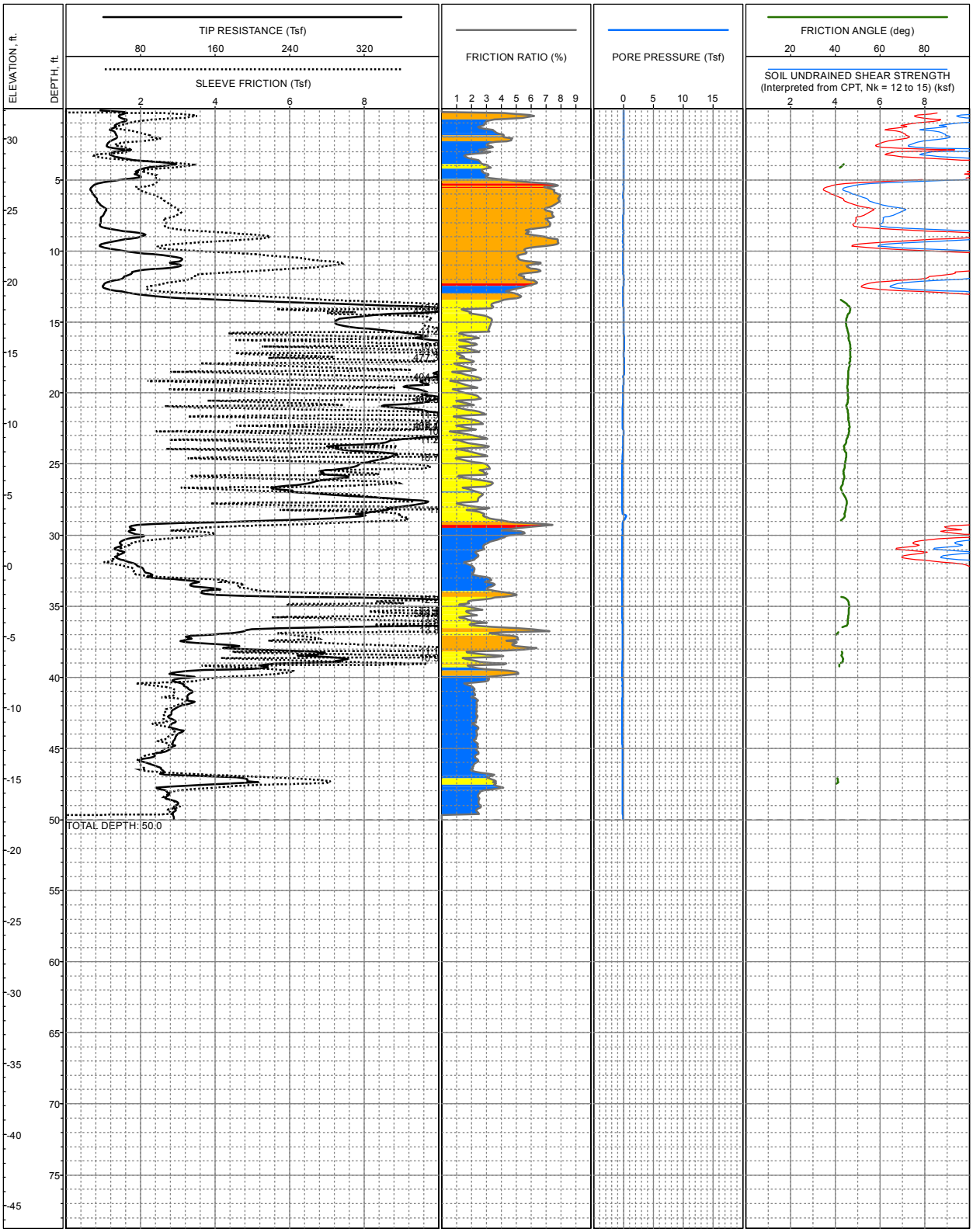

LOCATION: E5,998,062, N 1,979,767, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 32.1ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-271

San Joaquin Apartments & Precinct Improvements
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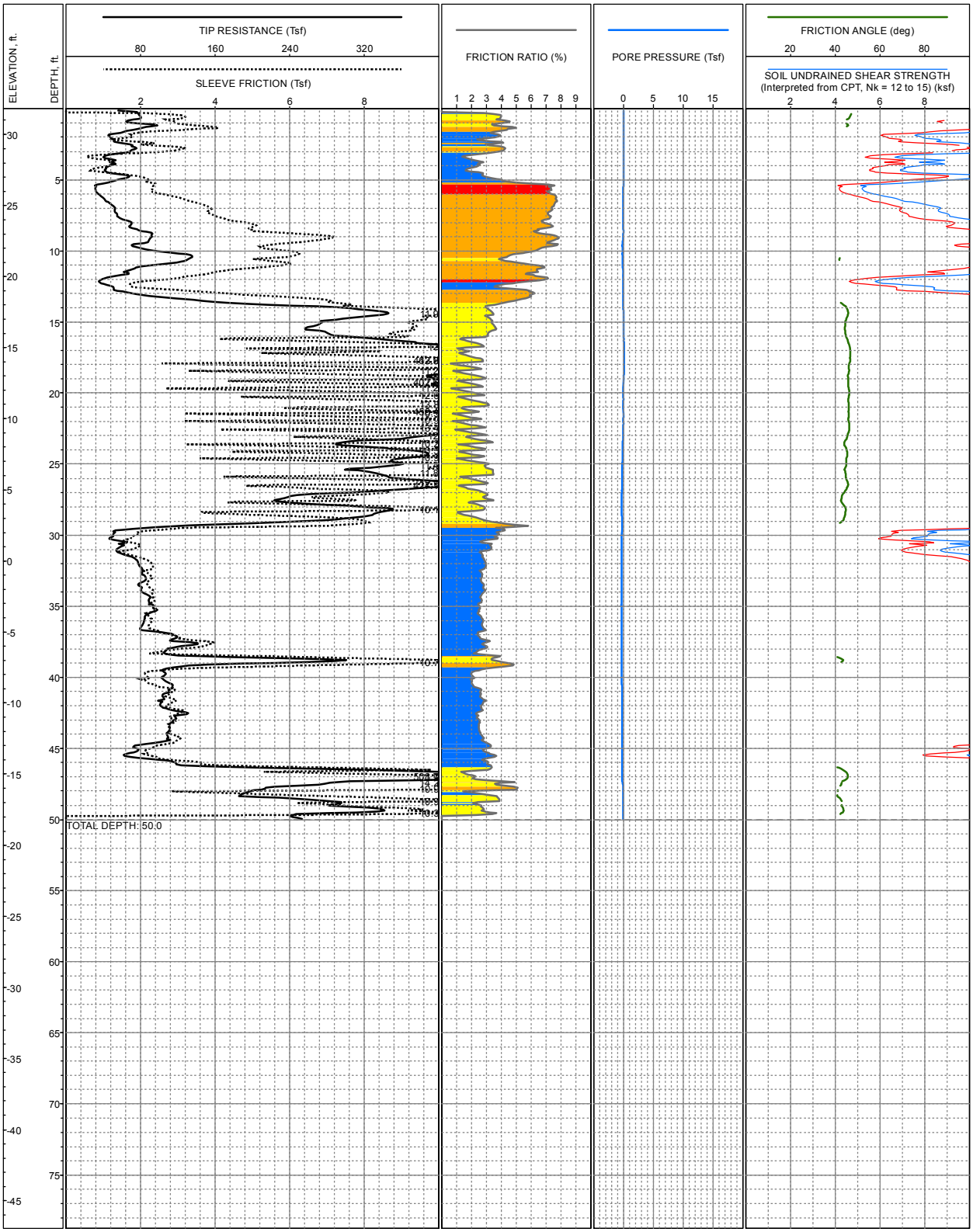

LOCATION: E5,998,062, N 1,979,777, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.8ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-272

San Joaquin Apartments & Precinct Improvements
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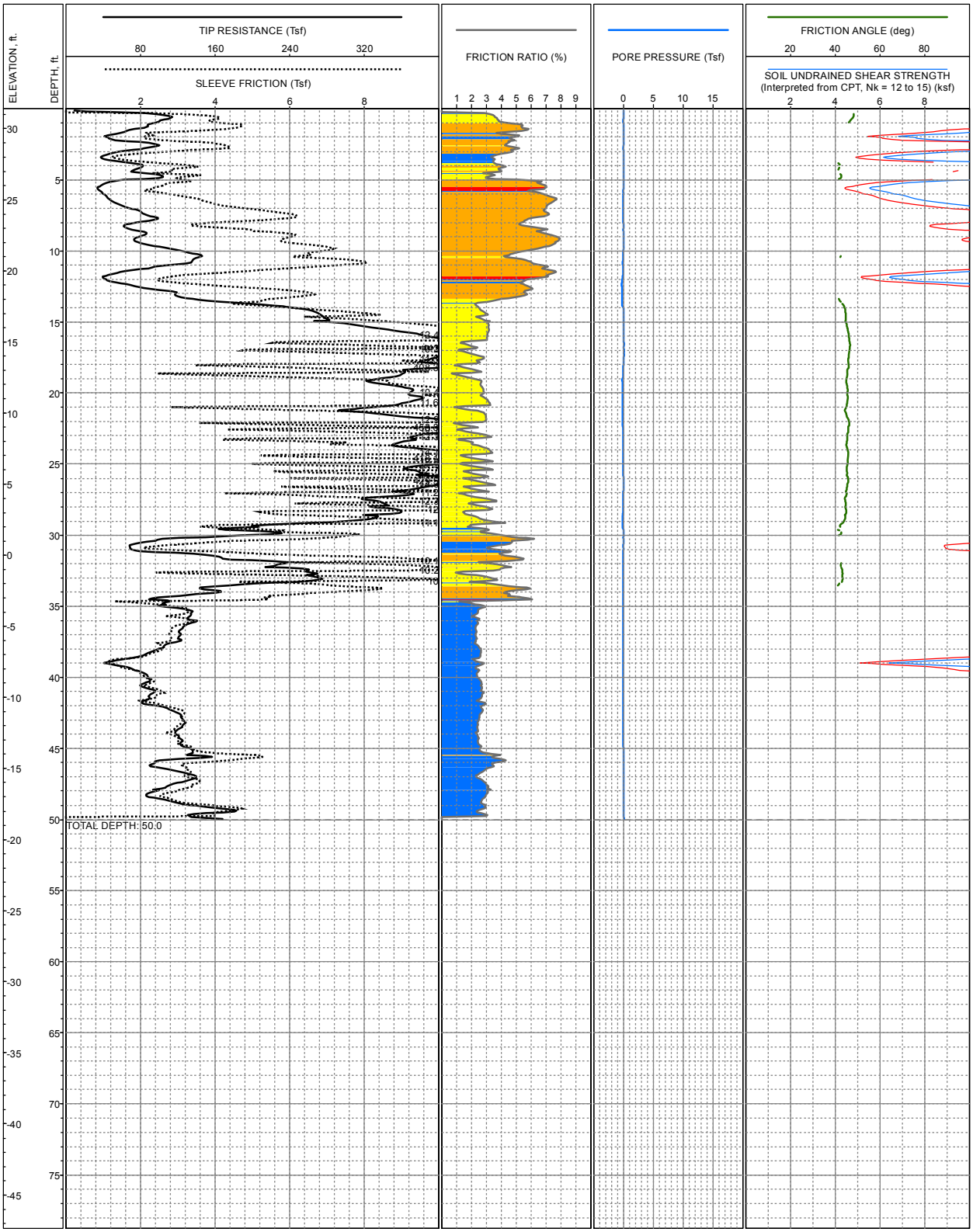

LOCATION: E5,998,063, N 1,979,789, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.4ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-273

San Joaquin Apartments & Precinct Improvements
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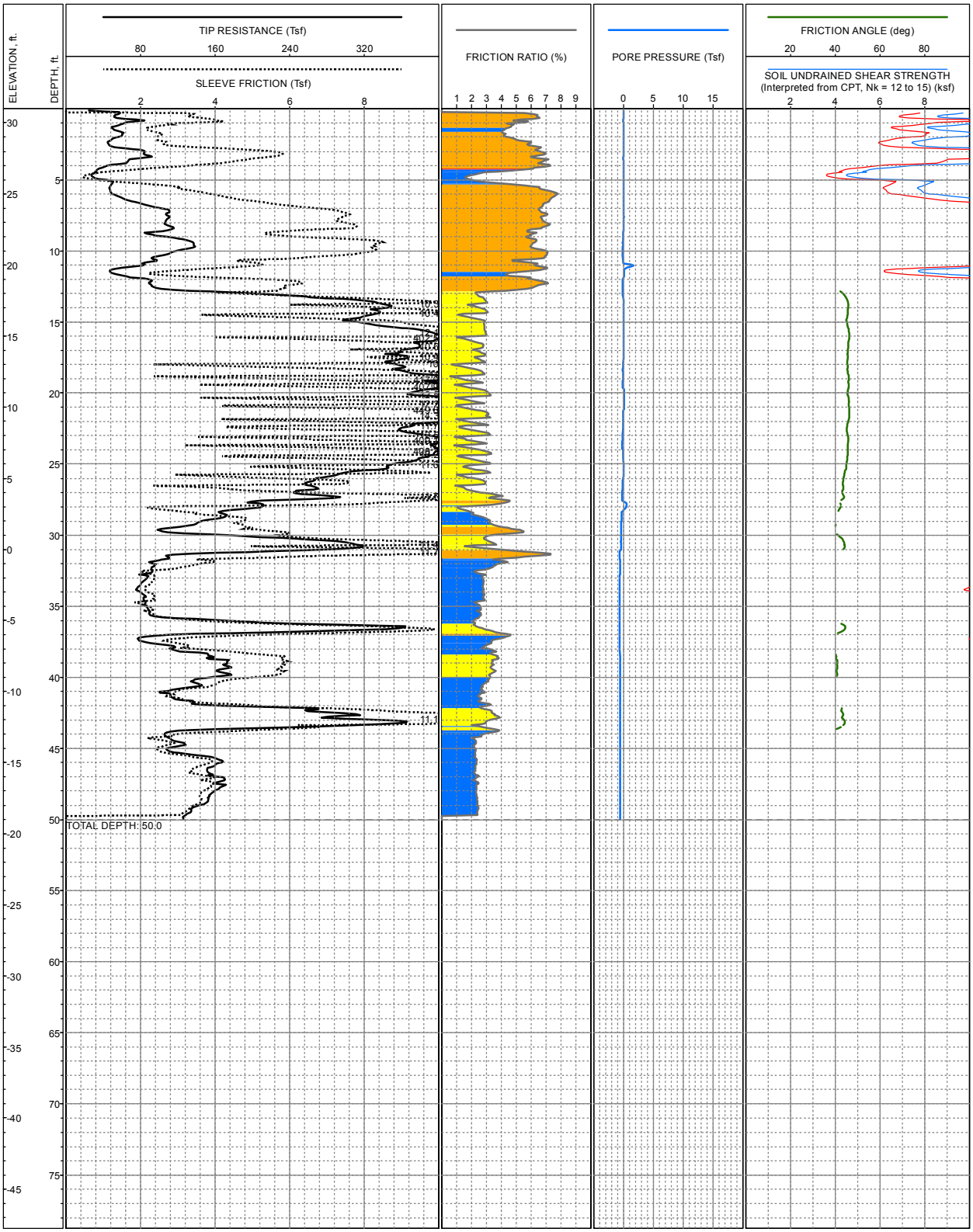

LOCATION: E5,998,063, N 1,979,799, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.0ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-274

San Joaquin Apartments & Precinct Improvements
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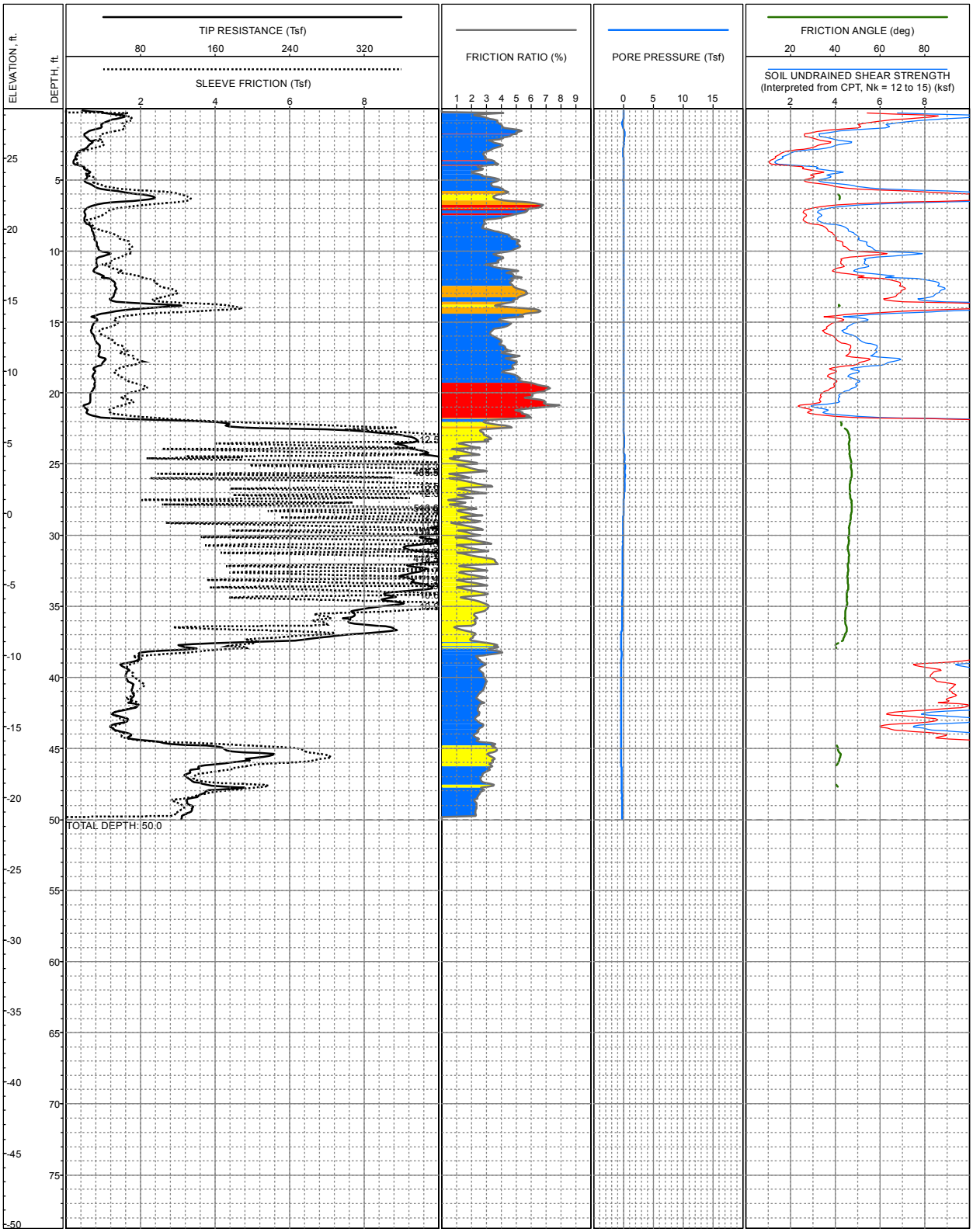

LOCATION: E5,998,066, N 1,979,877, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 28.5ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-275

San Joaquin Apartments & Precinct Improvements
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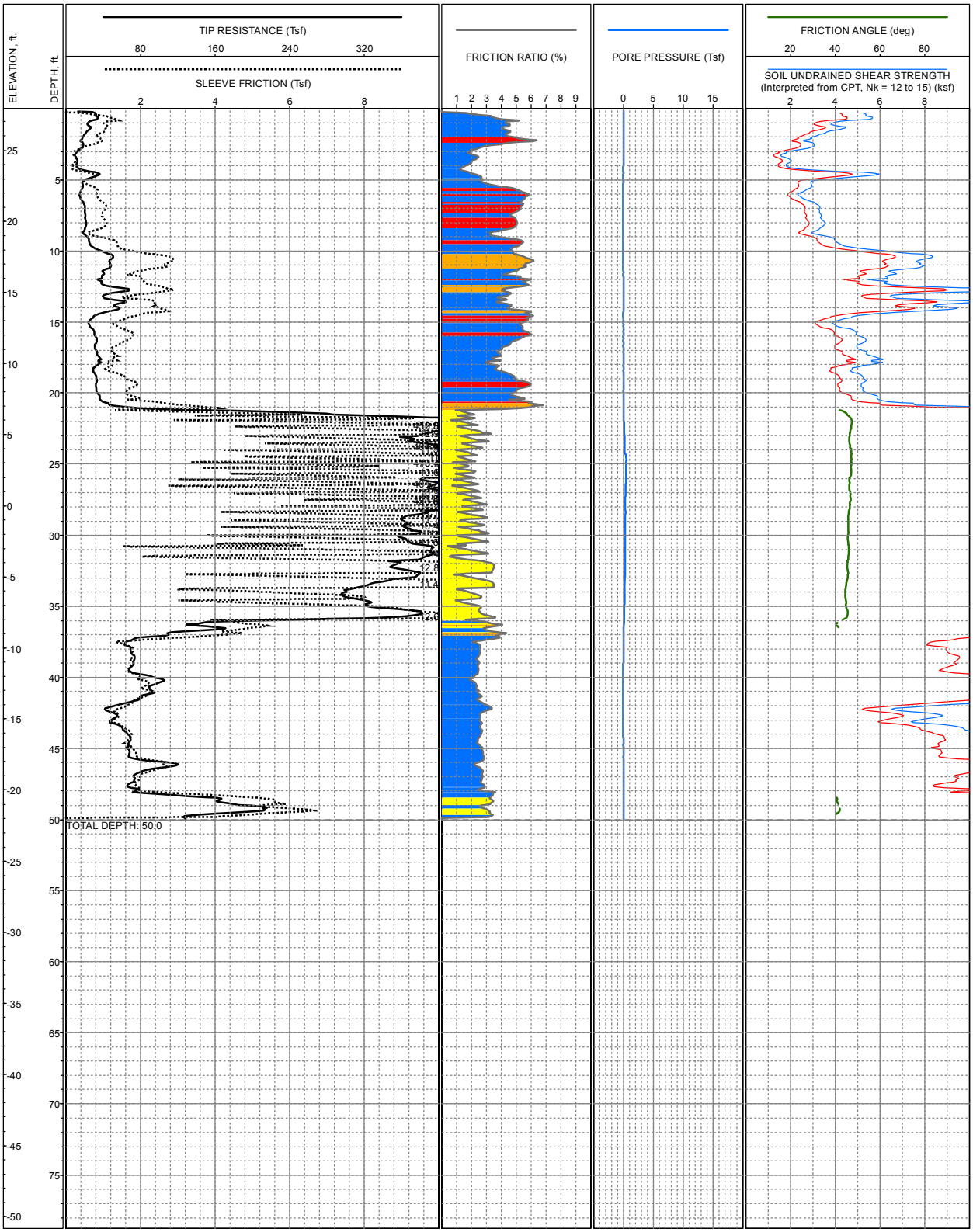

LOCATION: E5,998,066, N 1,979,893, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 27.9ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-276

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
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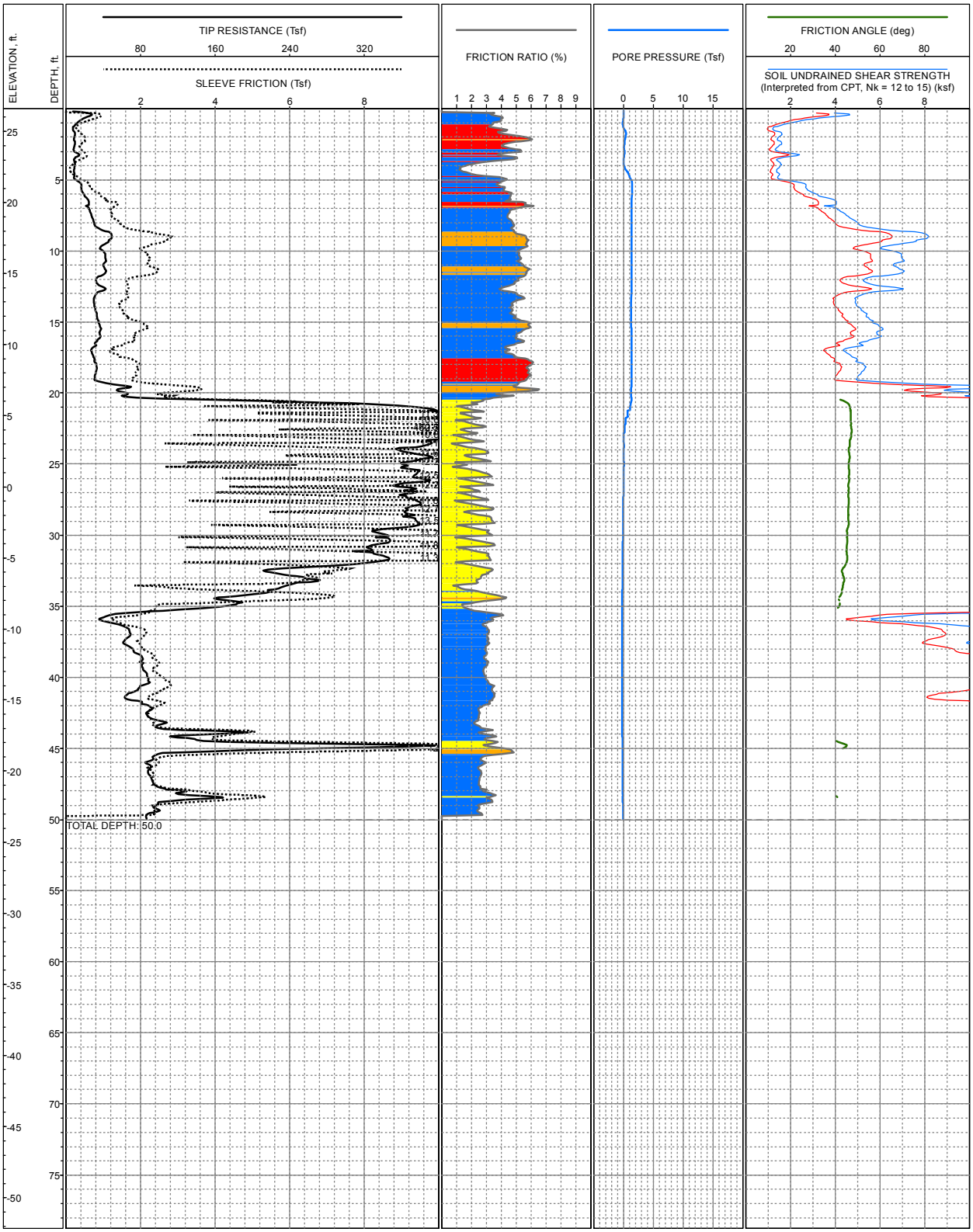

LOCATION: E5,998,068, N 1,979,928, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 26.6ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-277

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
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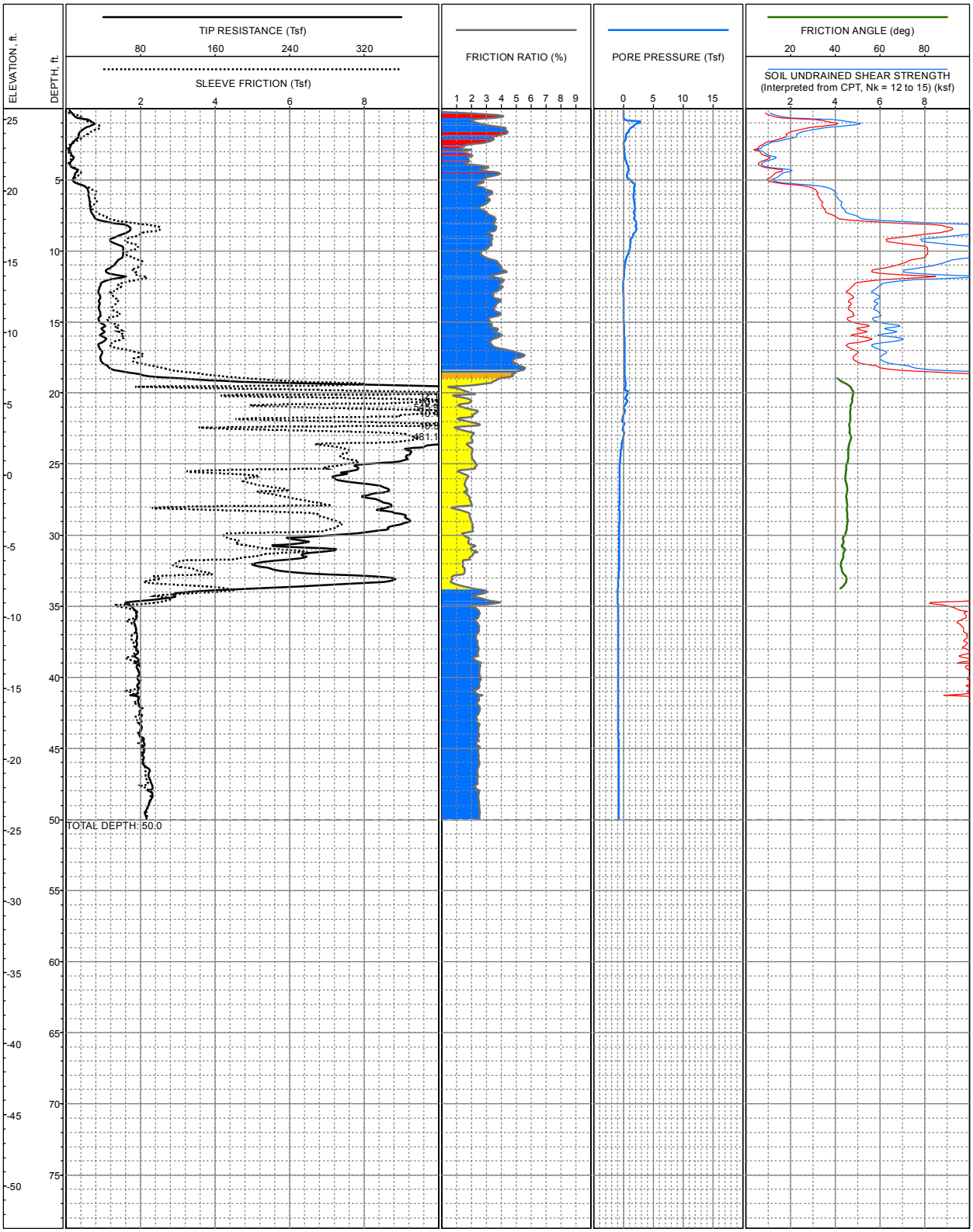

LOCATION: E5,998,069, N 1,979,958, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 25.8ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-278

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

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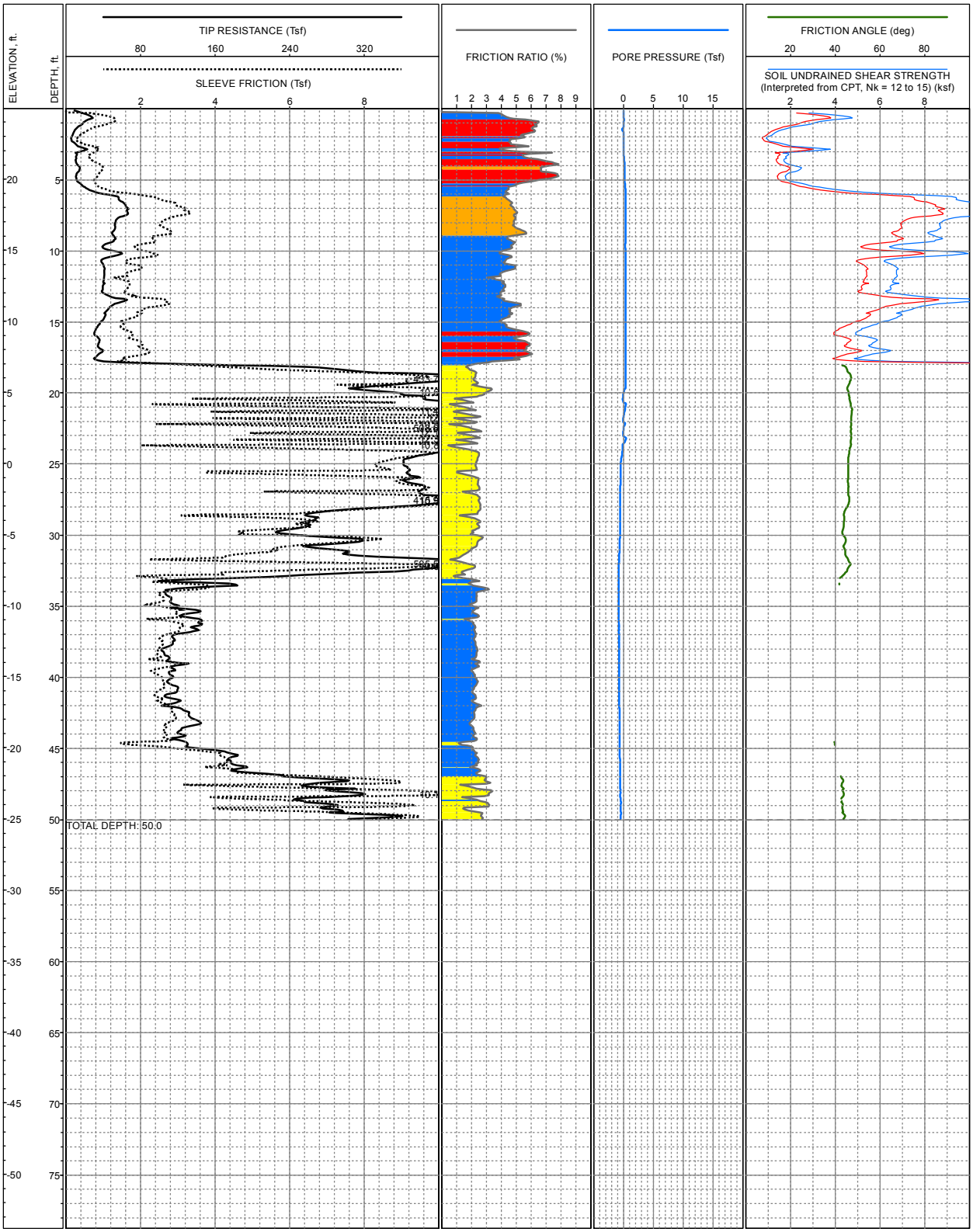

LOCATION: E5,998,070, N 1,980,001, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.9ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-279

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

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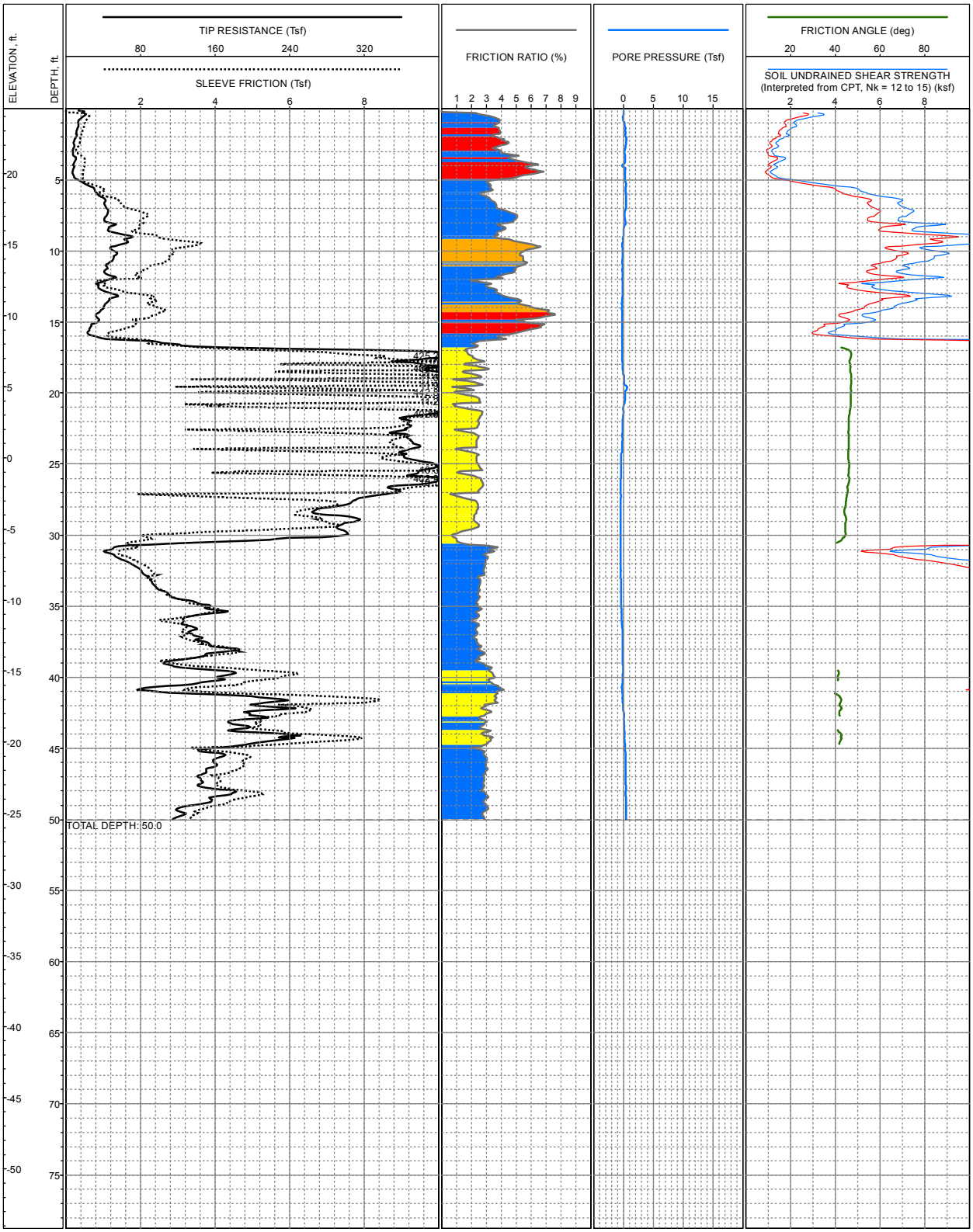

LOCATION: E5,998,071, N 1,980,022, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.6ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-280

San Joaquin Apartments & Precinct Improvements
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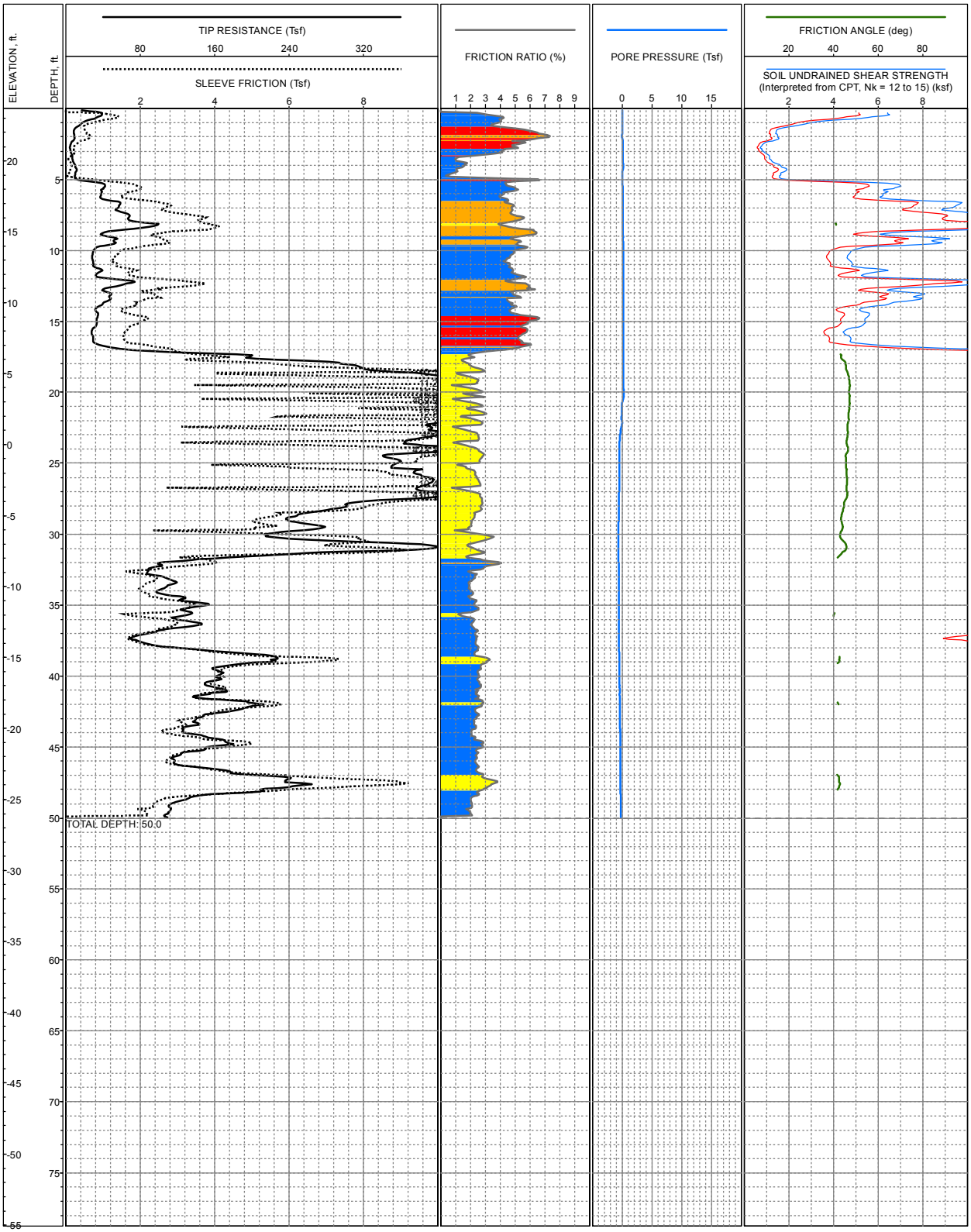

LOCATION: E5,998,124, N 1,980,008, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.7ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-281

San Joaquin Apartments & Precinct Improvements
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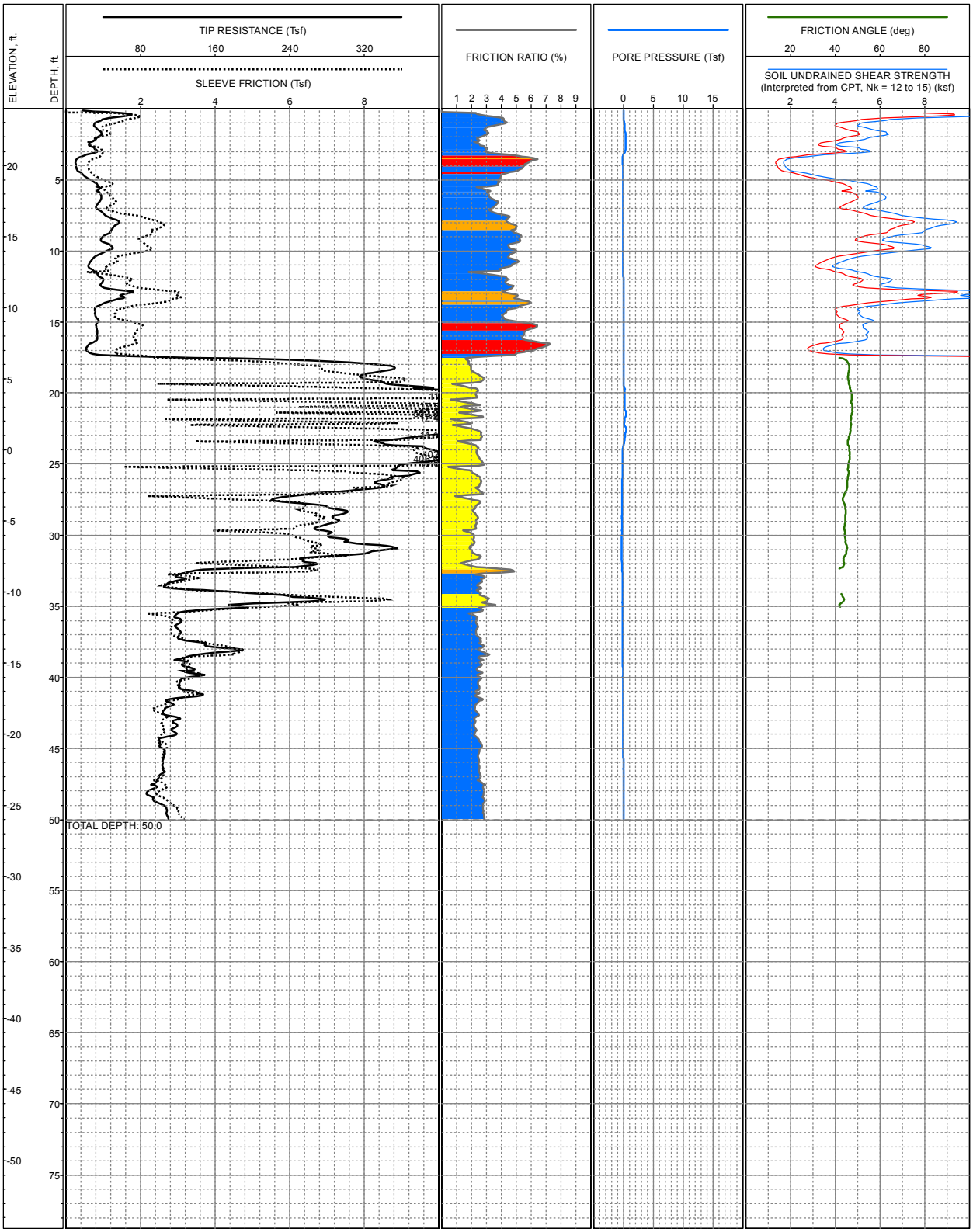

LOCATION: E5,998,124, N 1,979,986, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.0ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-282

San Joaquin Apartments & Precinct Improvements
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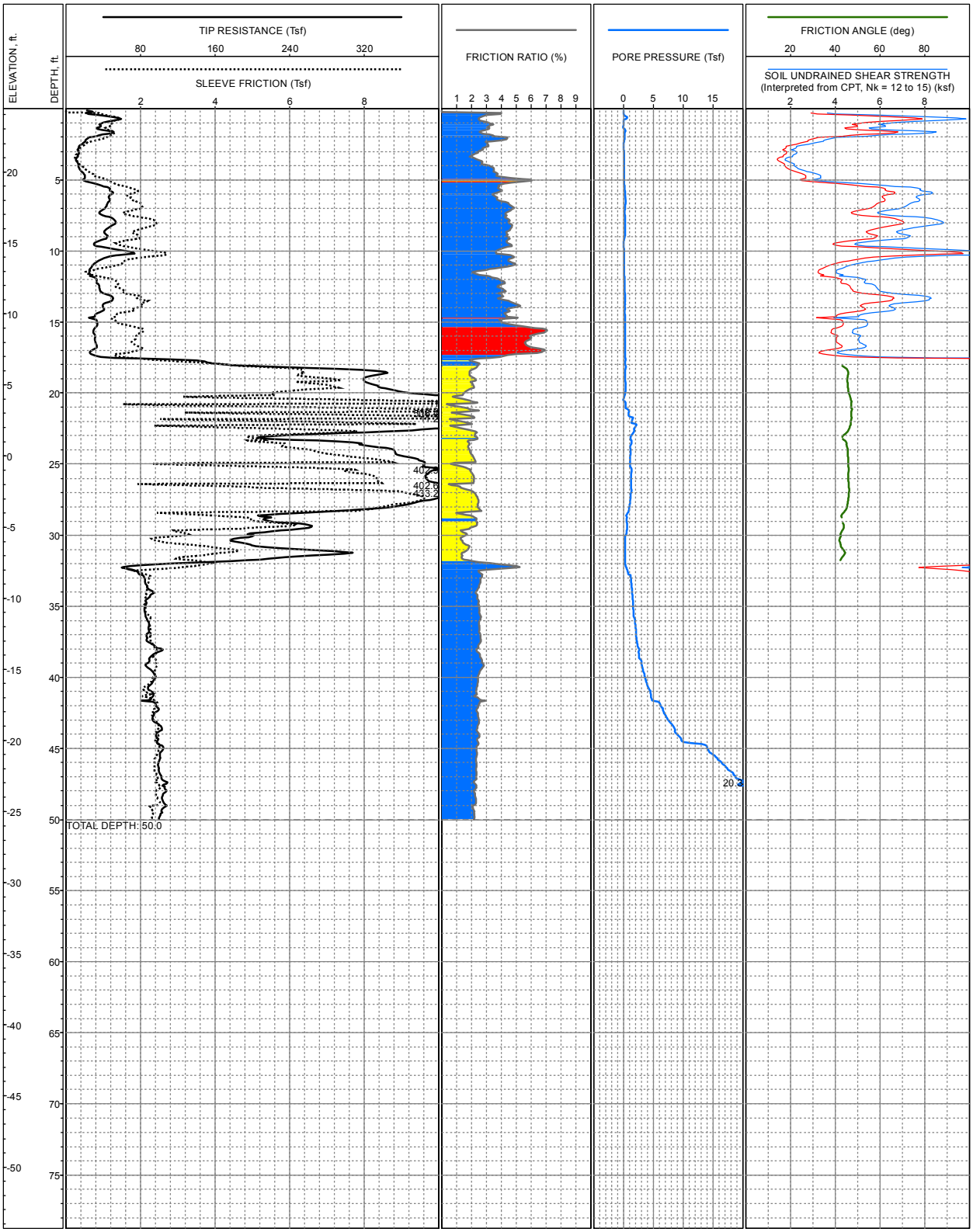
N:\Projects\04_2011\04_6211_0136_UCSB_SCatalina_Housing\Explorations\CPT\2012\Logs\2012_06_18_Logs_SuF\MXD\CPT_Proc_VK12C.mxd,06/19/2012,CDean



LOCATION: E5,998,123, N 1,979,965, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.4ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-283

San Joaquin Apartments & Precinct Improvements
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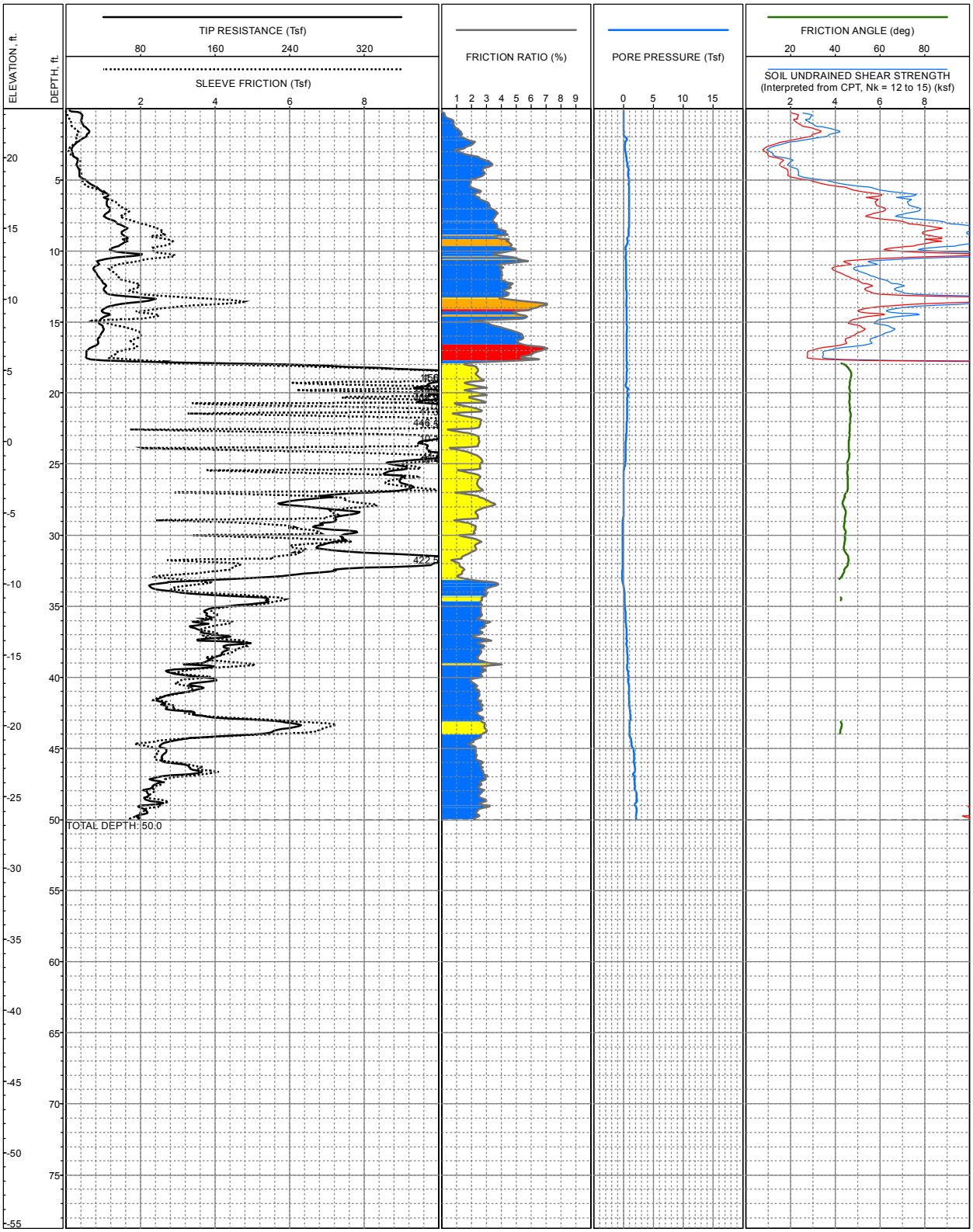
Santa Barbara, California

N:\Projects\04_2011\04_6211_0136_UCSB_SCatalina_Housing\Explorations\CPT\2012\Logs\2012_06_18_Logs_SuF\MXD\CPT_Proc_VK12C.mxd,06/19/2012,CDean



LOCATION: E5,998,167, N 1,979,997, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.4ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-284

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
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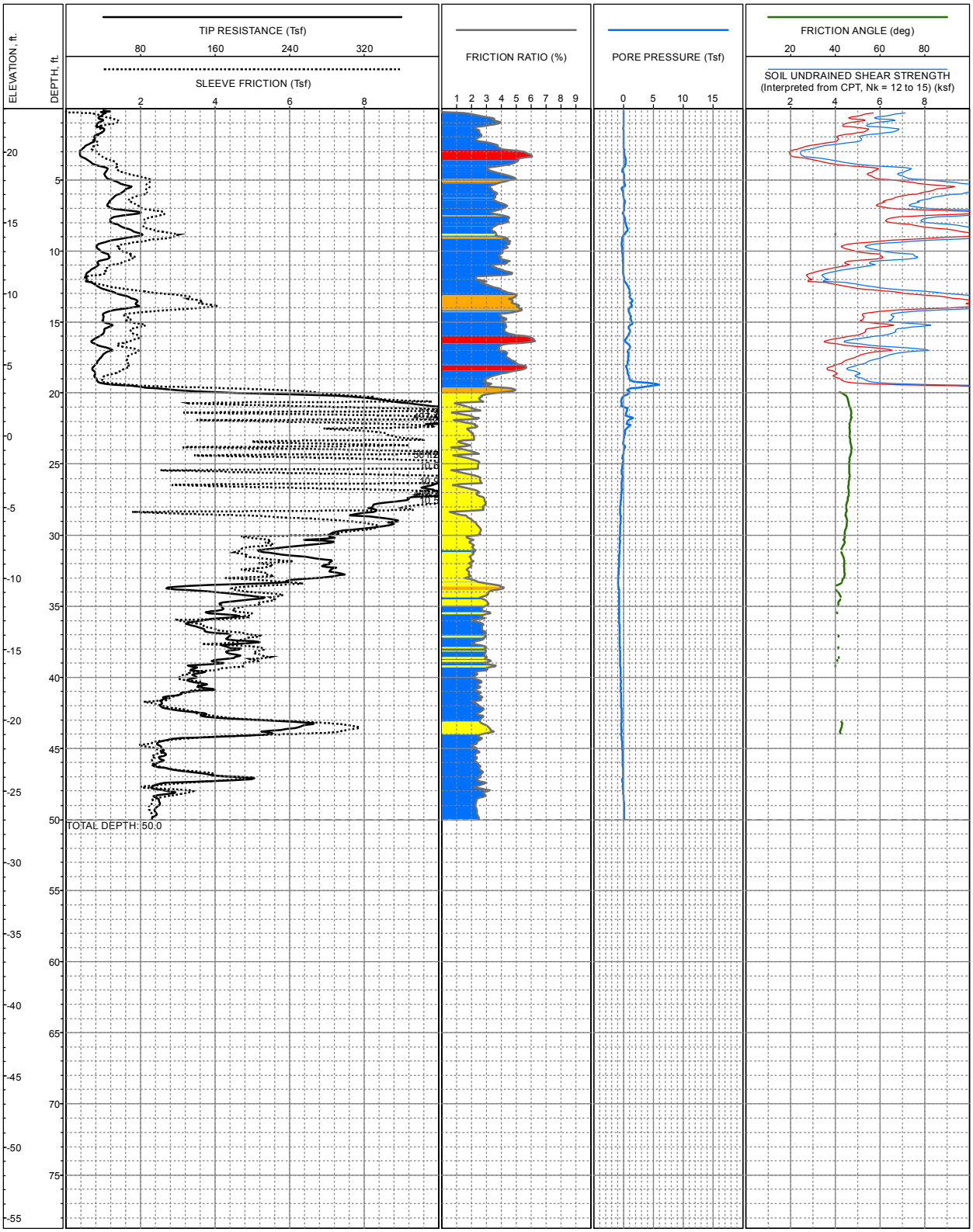
N:\Projects\04_2011\04_6211_0136_UCSB_SCatalina_Housing\Explorations\CPT\2012\Logs\2012_06_18_Logs_SuFr\MXD\CPT_Proc_VK12C.mxd,06/19/2012,CDean



LOCATION: E5,998,203, N 1,979,996, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.0ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-285

San Joaquin Apartments & Precinct Improvements
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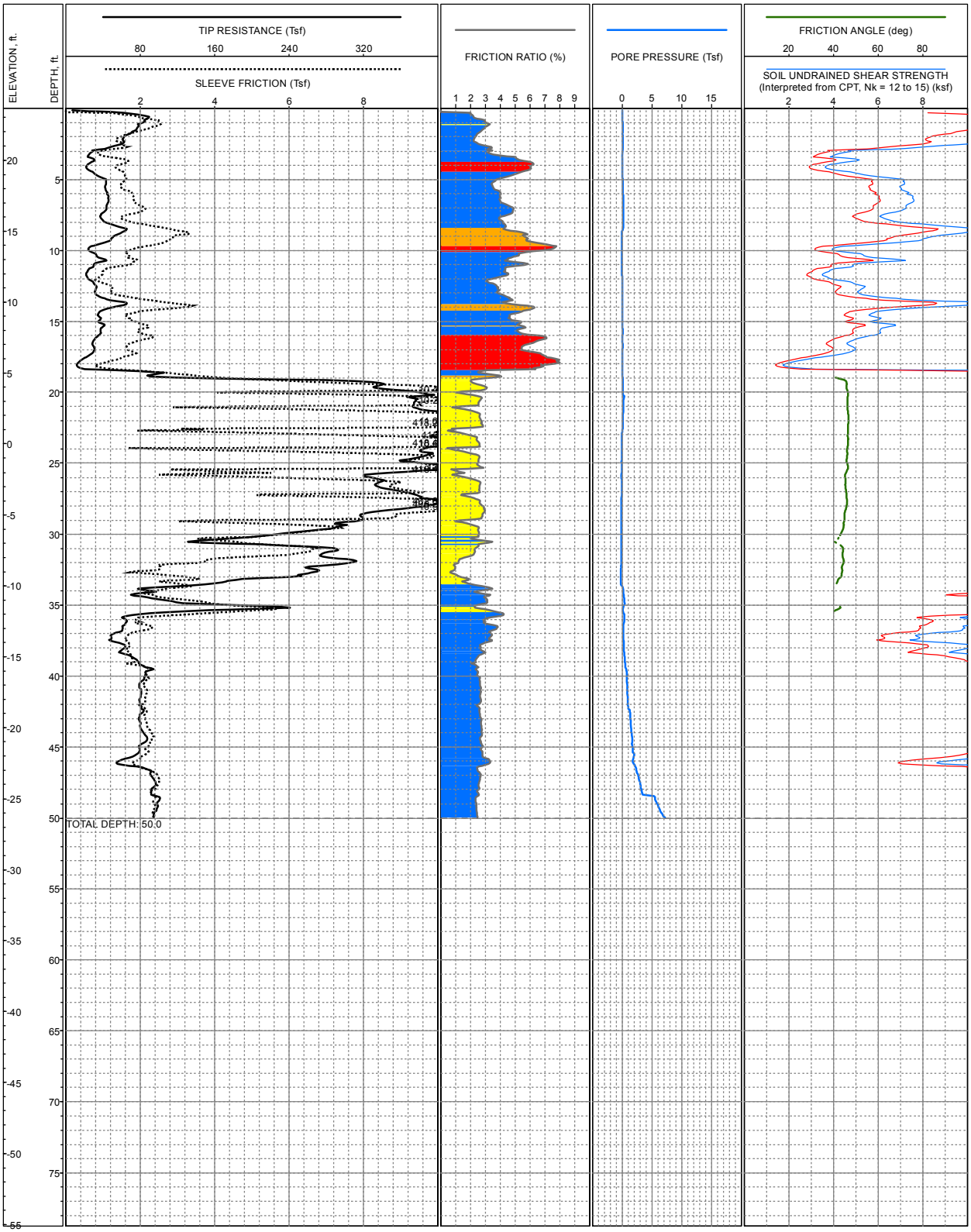

LOCATION: E5,998,166, N 1,979,976, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.6ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-286

San Joaquin Apartments & Precinct Improvements
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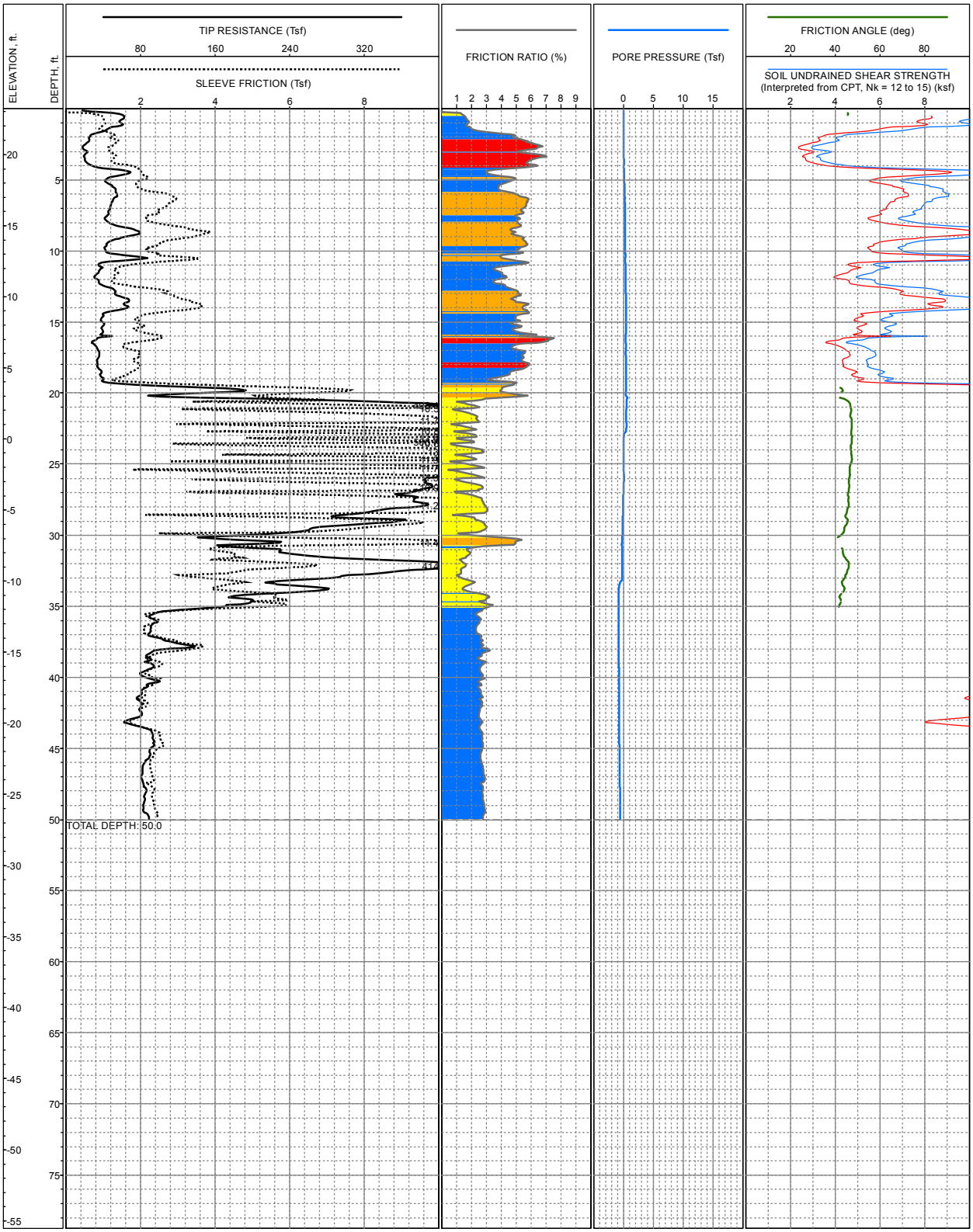

LOCATION: E5,998,203, N 1,979,980, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.2ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-287

San Joaquin Apartments & Precinct Improvements
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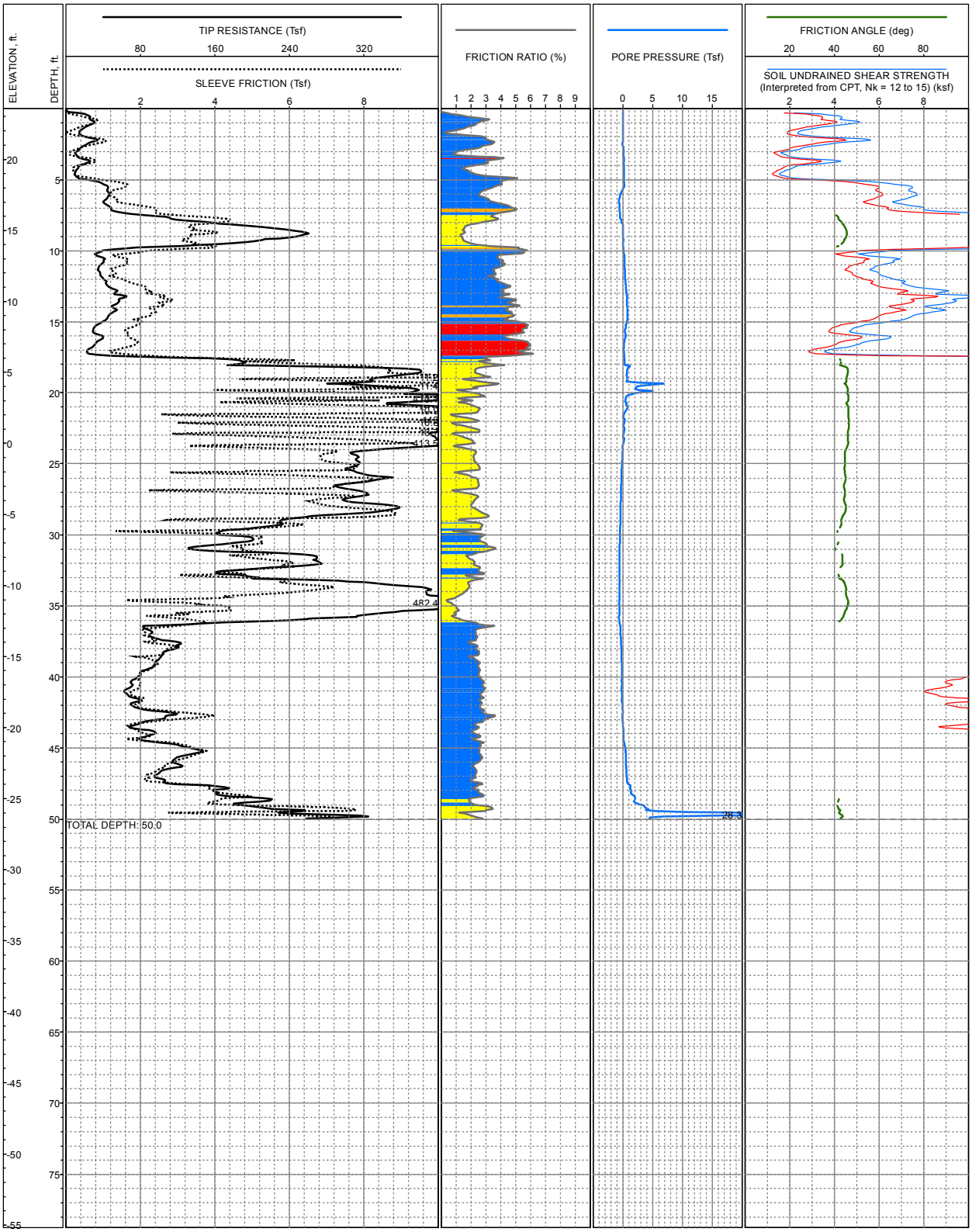

LOCATION: E5,998,279, N 1,979,919, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.6ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-288

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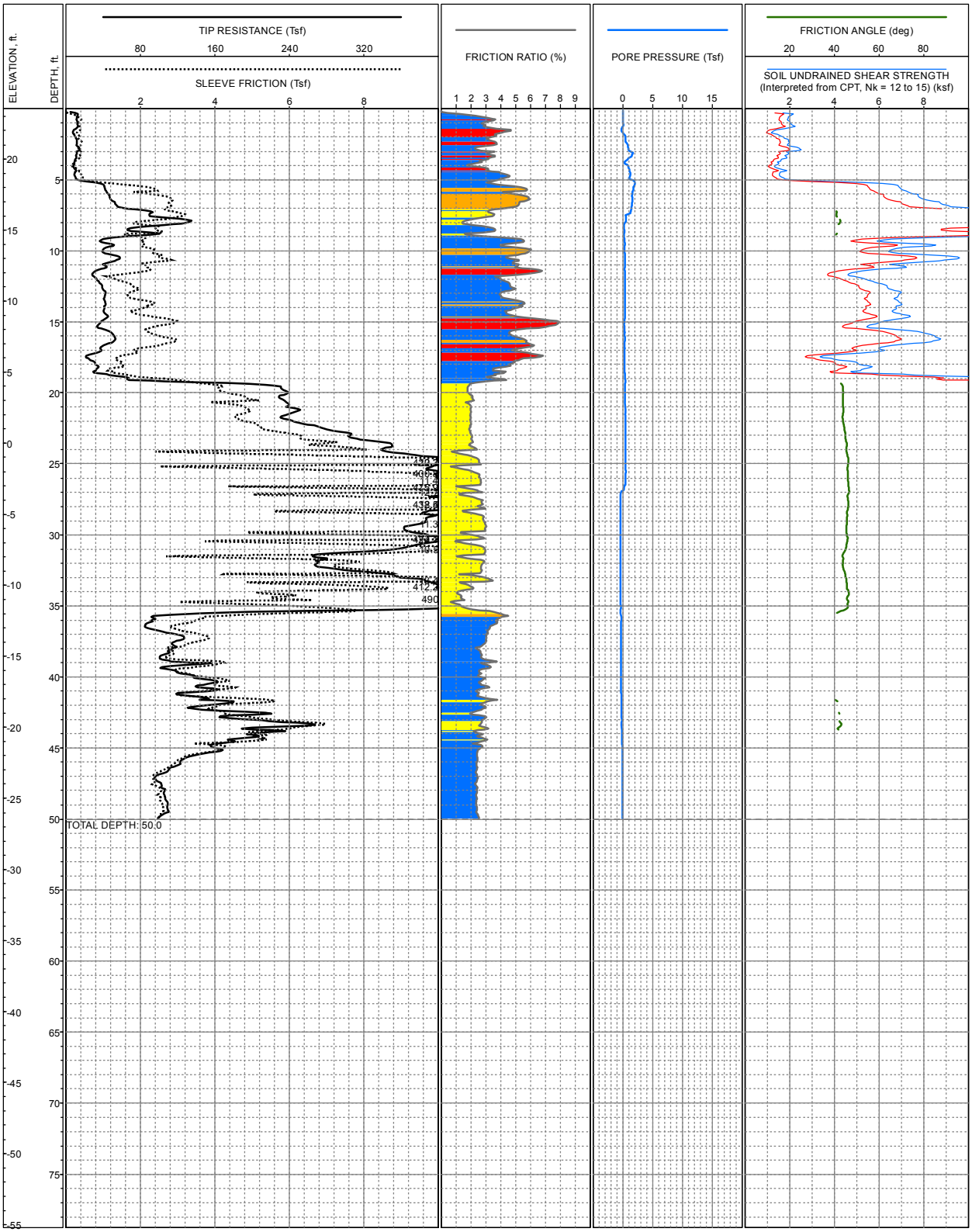

LOCATION: E5,998,279, N 1,979,907, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.5ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-289

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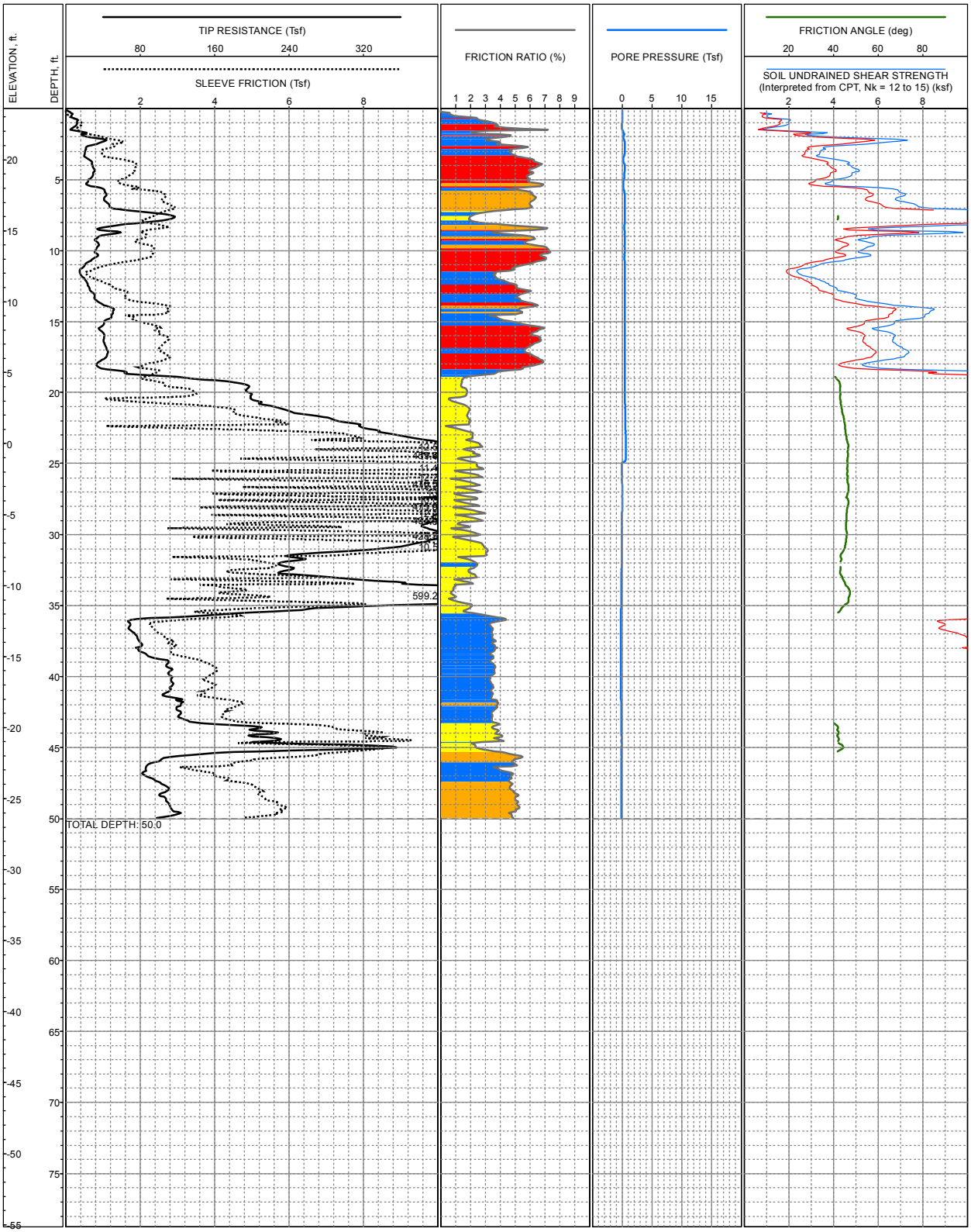

LOCATION: E5,998,279, N 1,979,904, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.6ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-290

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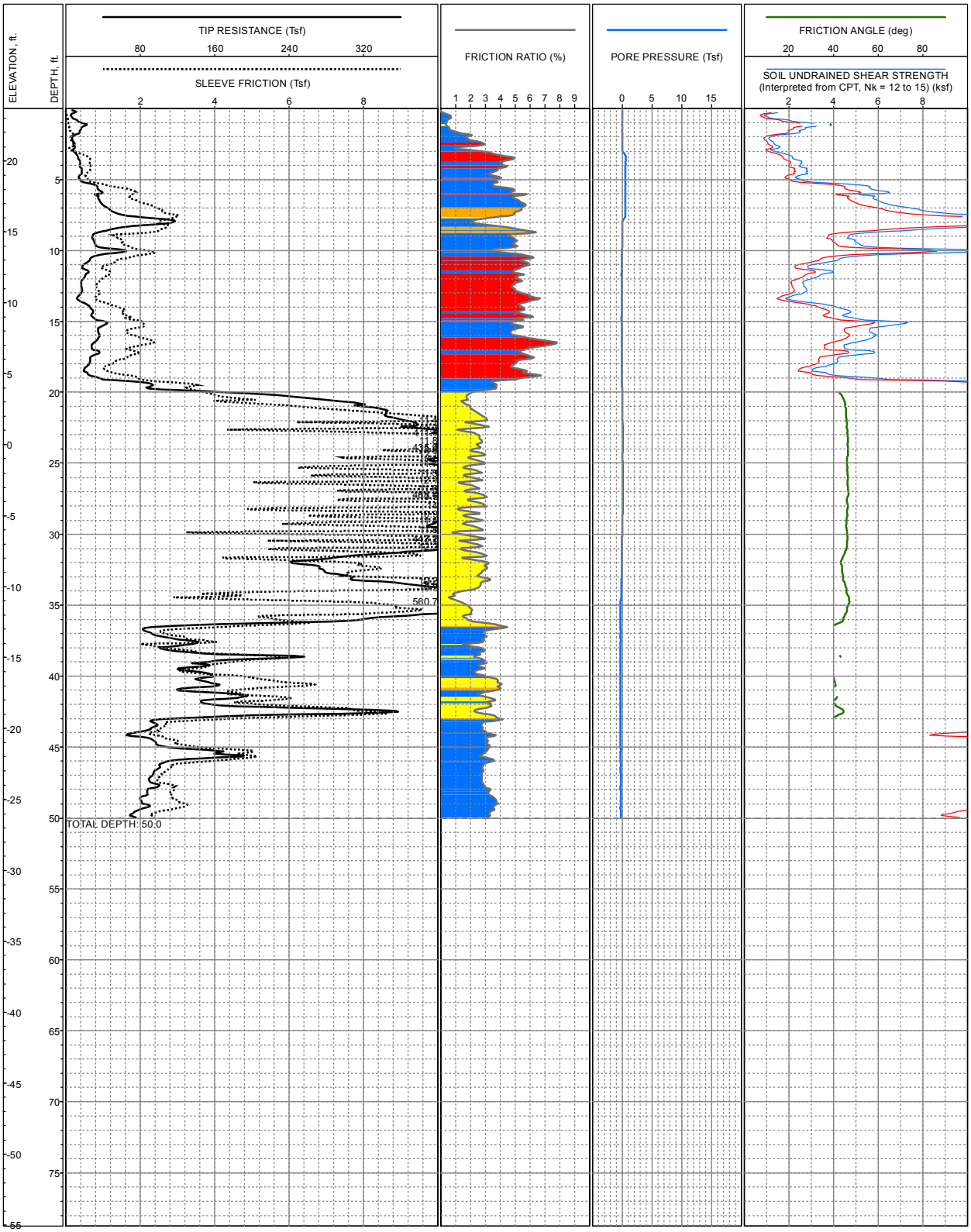

LOCATION: E5,998,279, N 1,979,899, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.7ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-291

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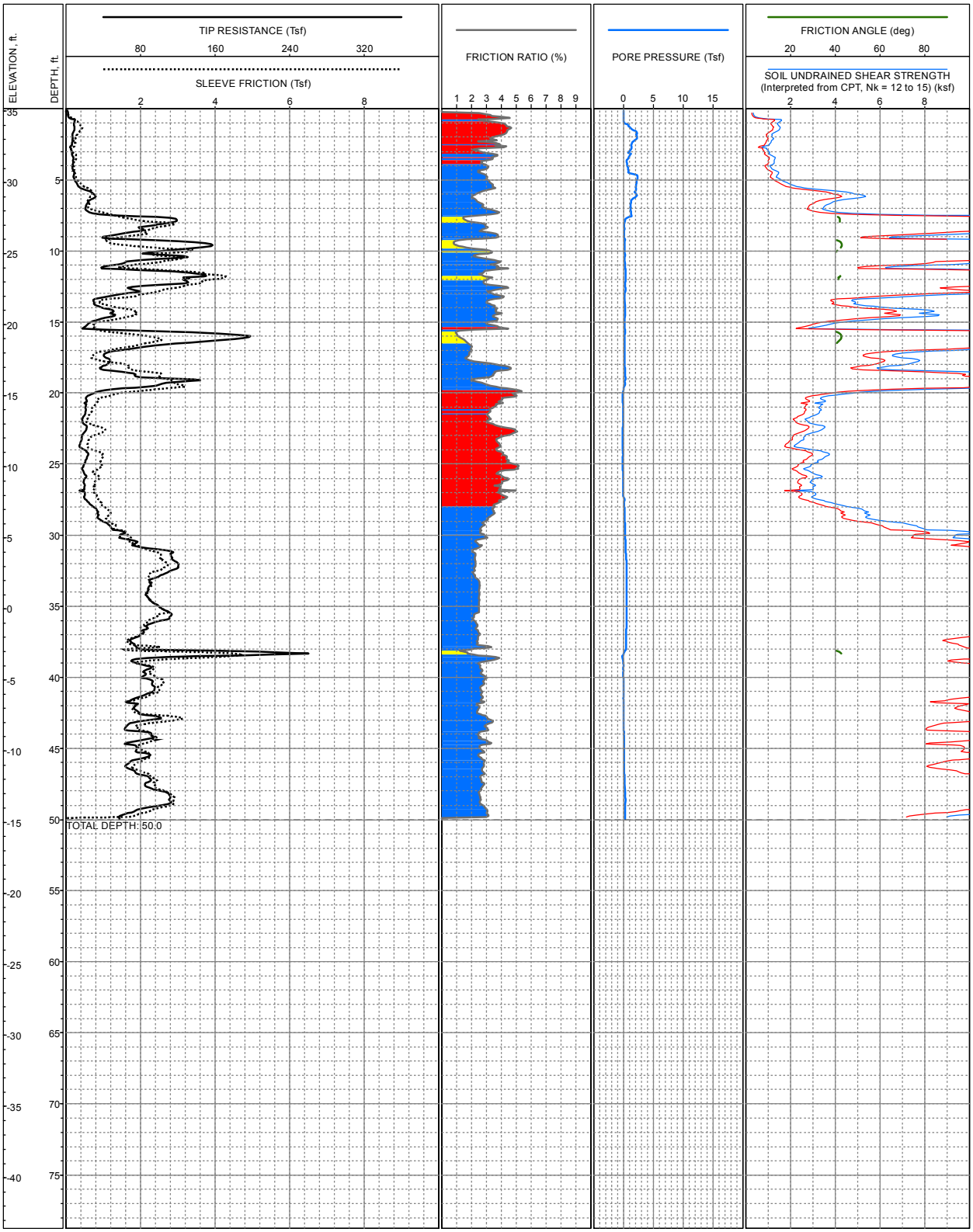

LOCATION: E5,998,215, N 1,979,584, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.2ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-292

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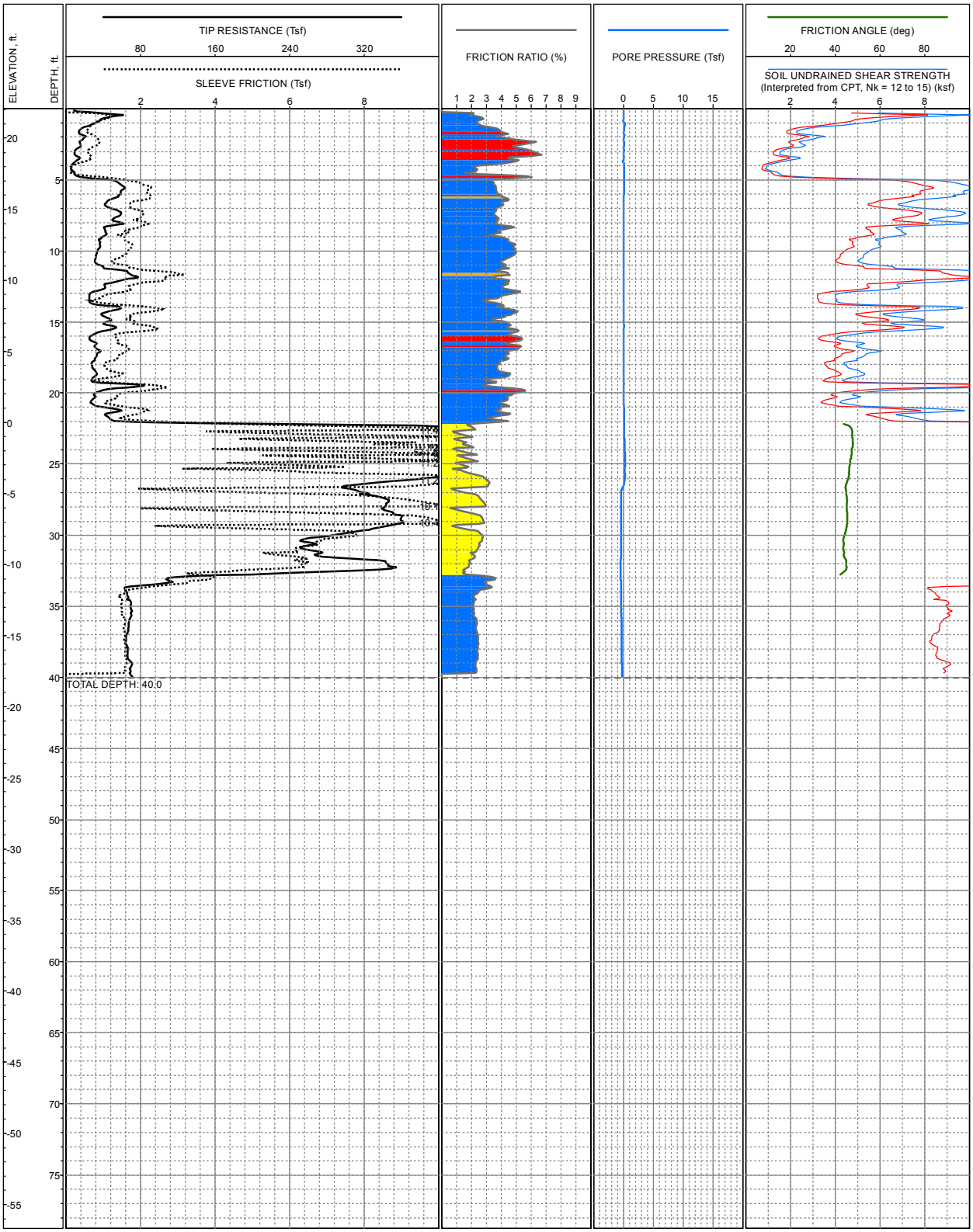

LOCATION: E5,998,280, N 1,980,018, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.1ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-293

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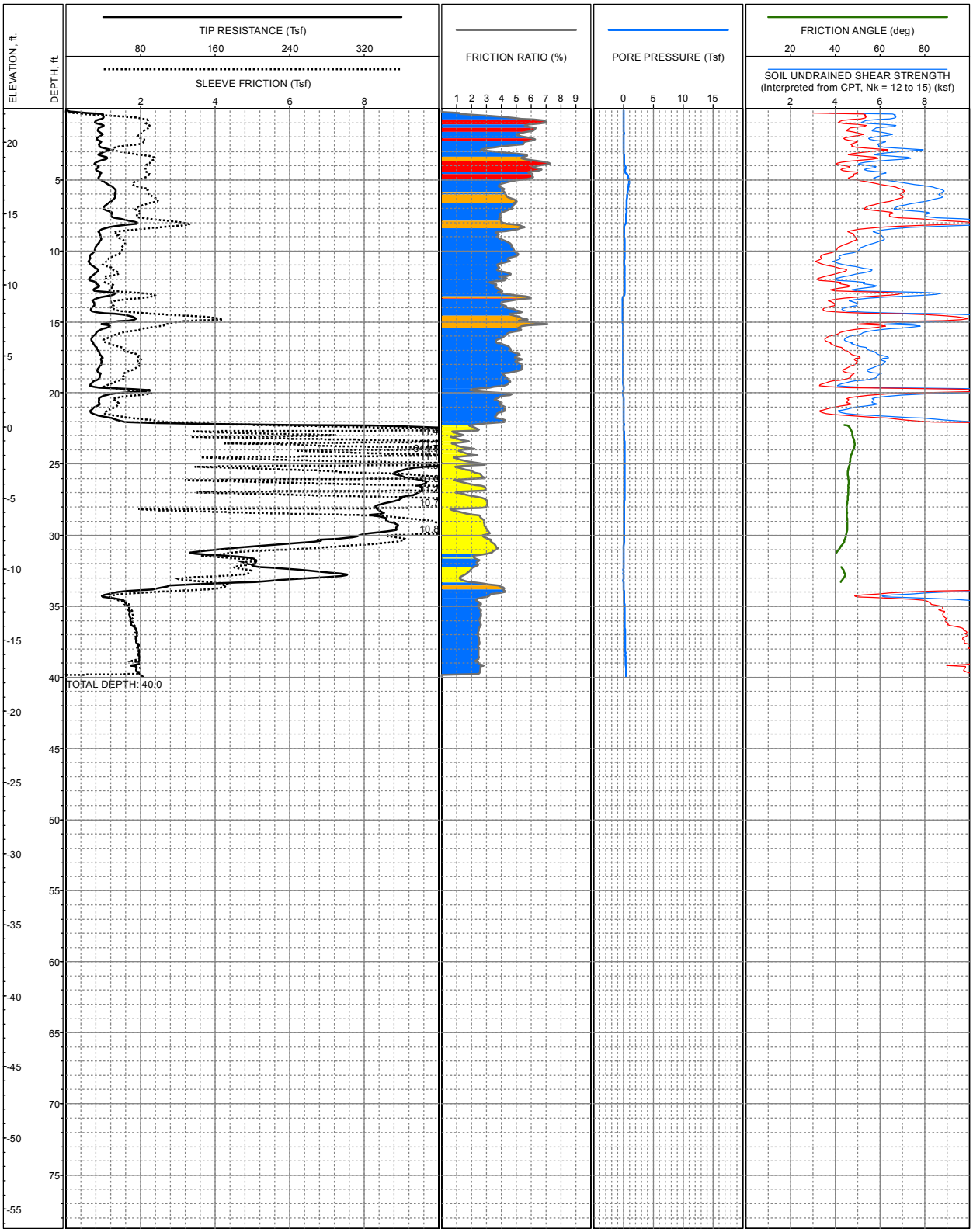

LOCATION: E5,998,280, N 1,979,998, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.4ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-294

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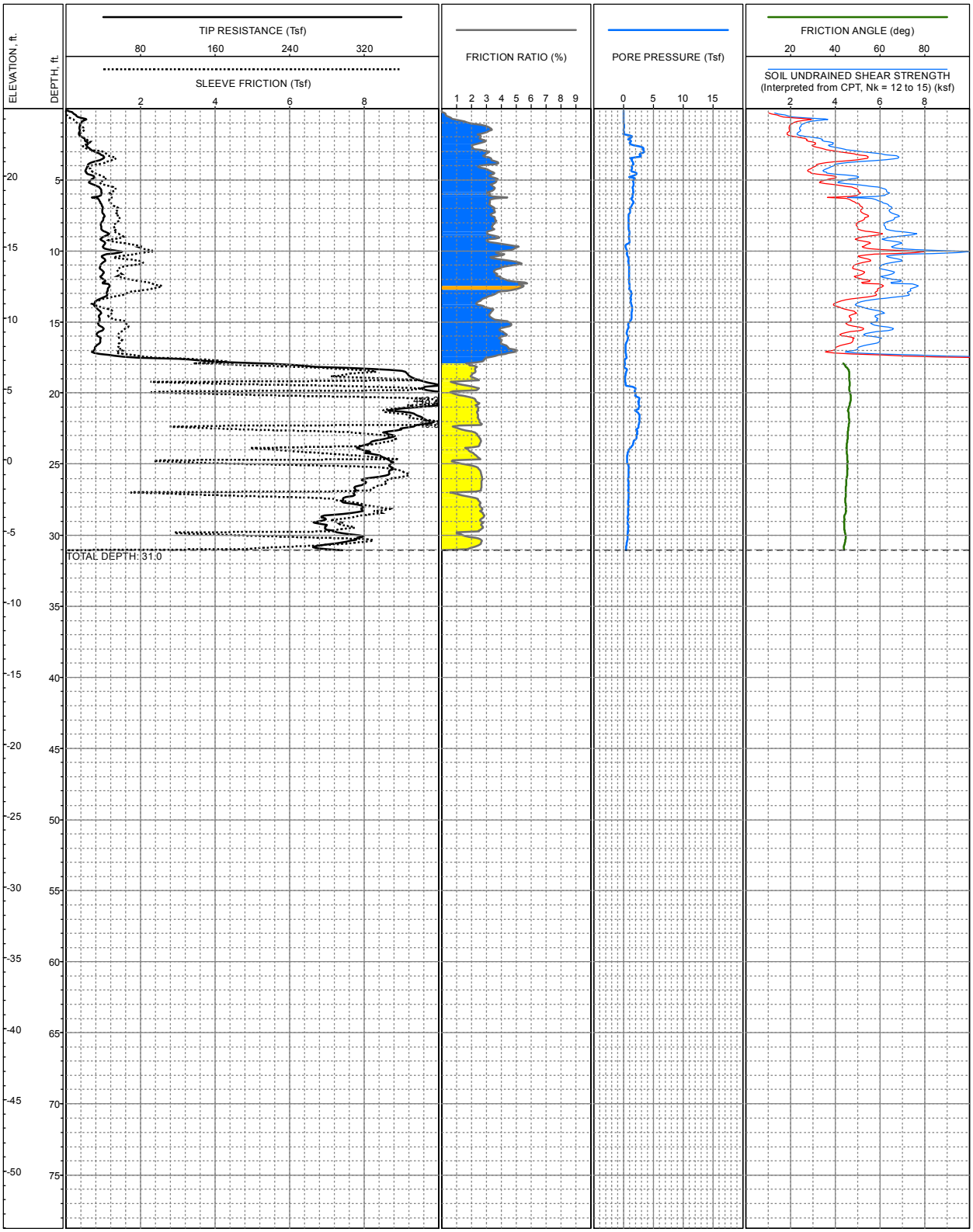

LOCATION: E5,998,123, N 1,979,945, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.7ft +/- ()
COMPLETION DEPTH: 31.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-295

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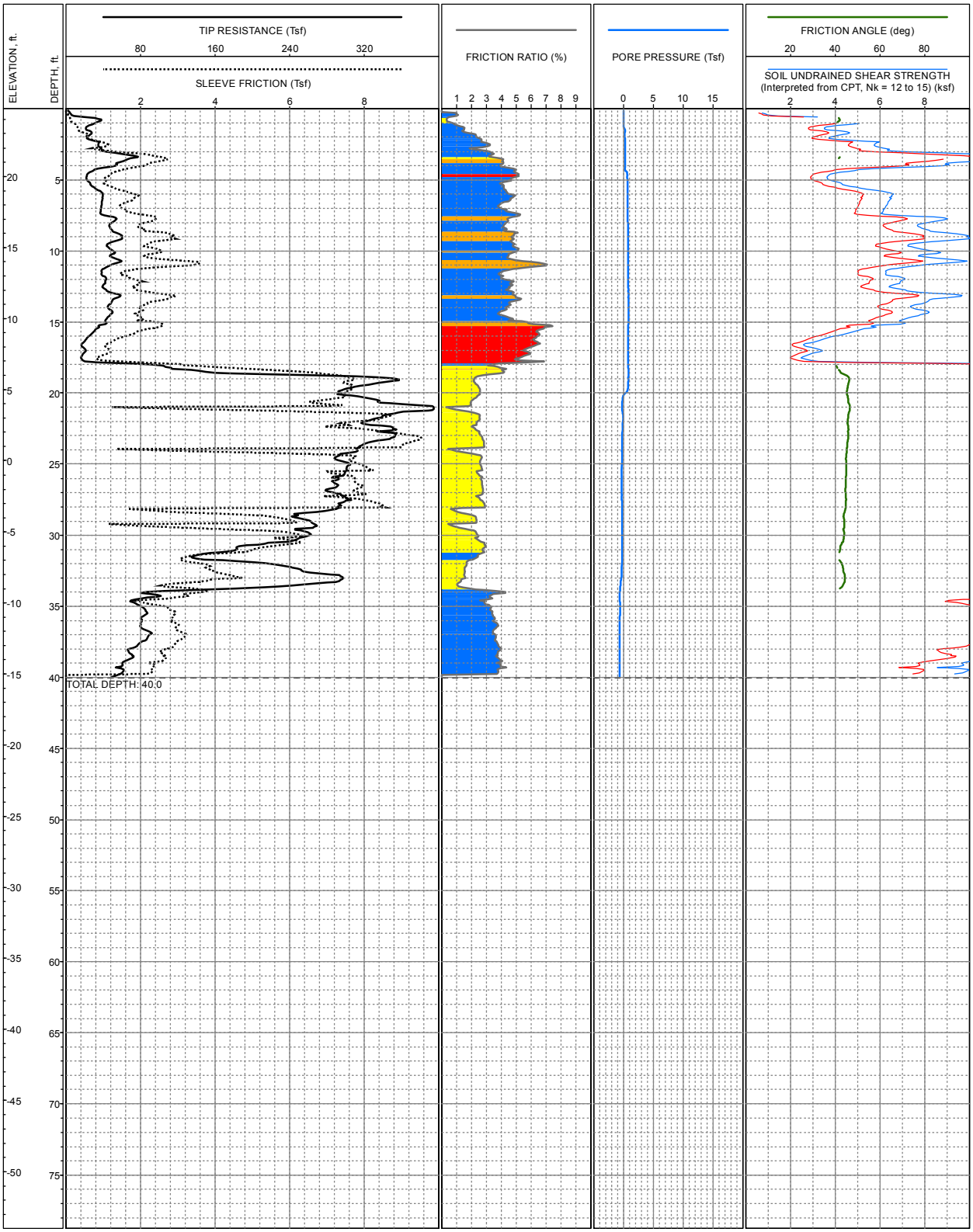

LOCATION: E5,998,123, N 1,979,935, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.8ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-296

San Joaquin Apartments & Precinct Improvements
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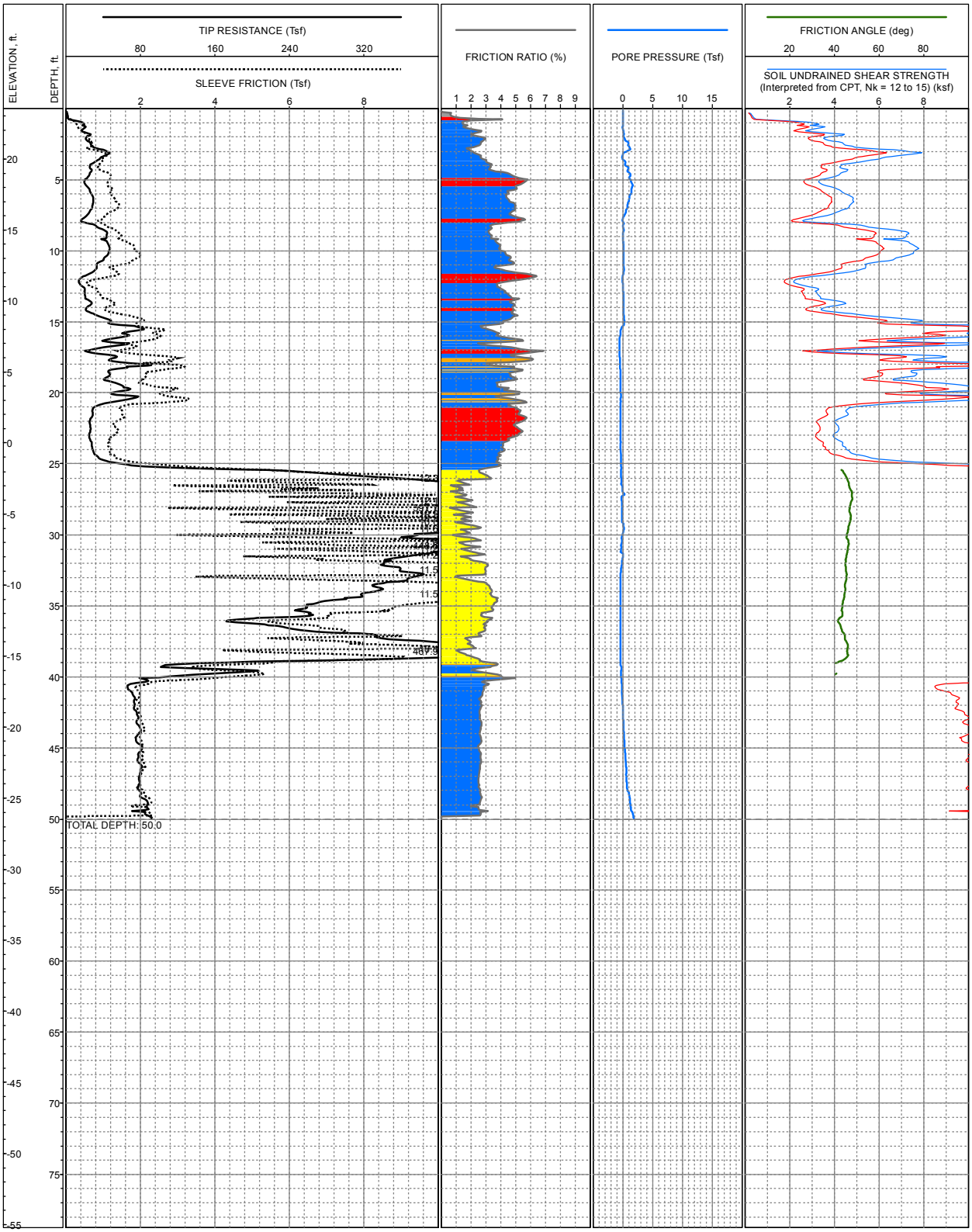

LOCATION: E5,998,441, N 1,979,923, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.5ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-297

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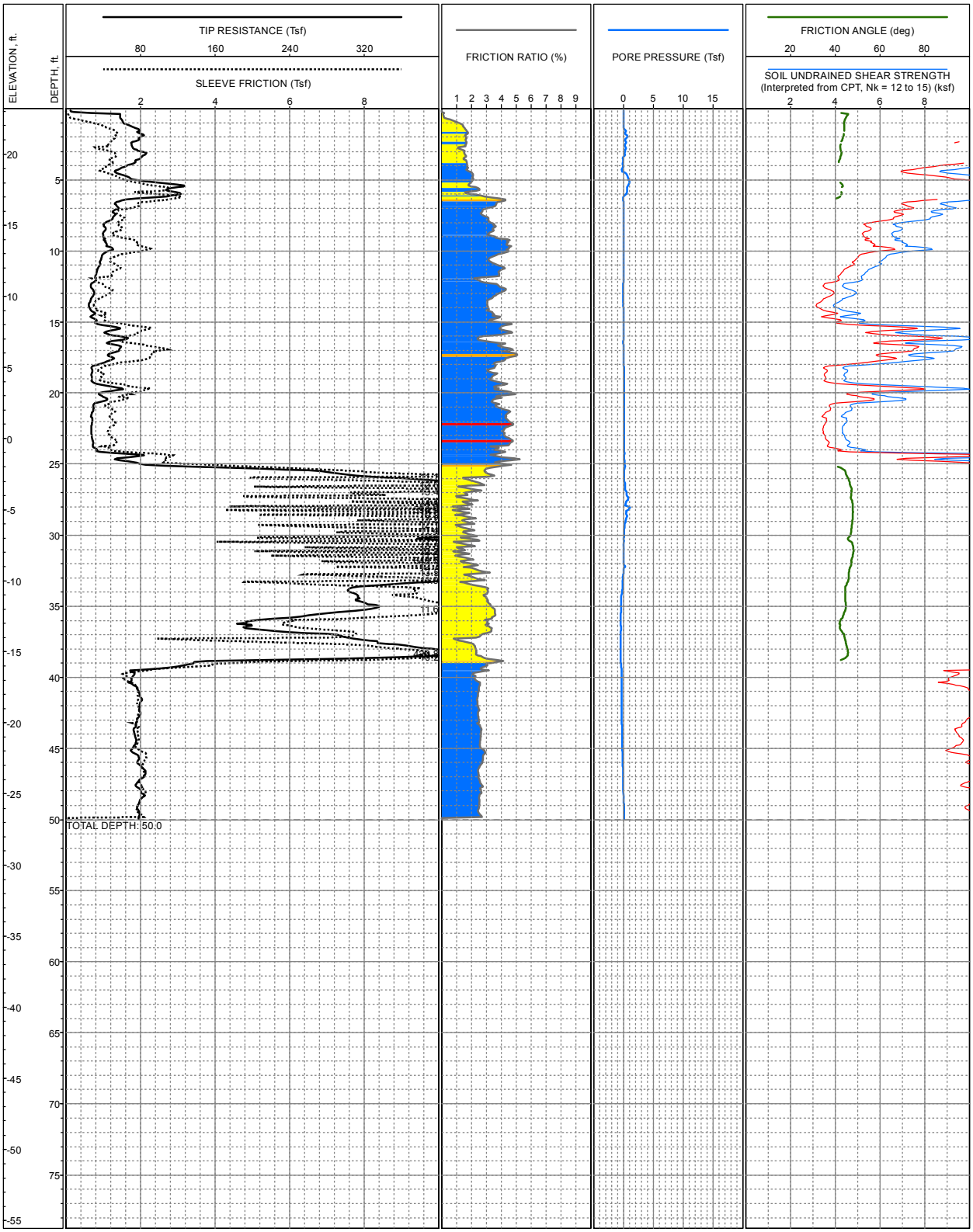

LOCATION: E5,998,441, N 1,979,937, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.2ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-298

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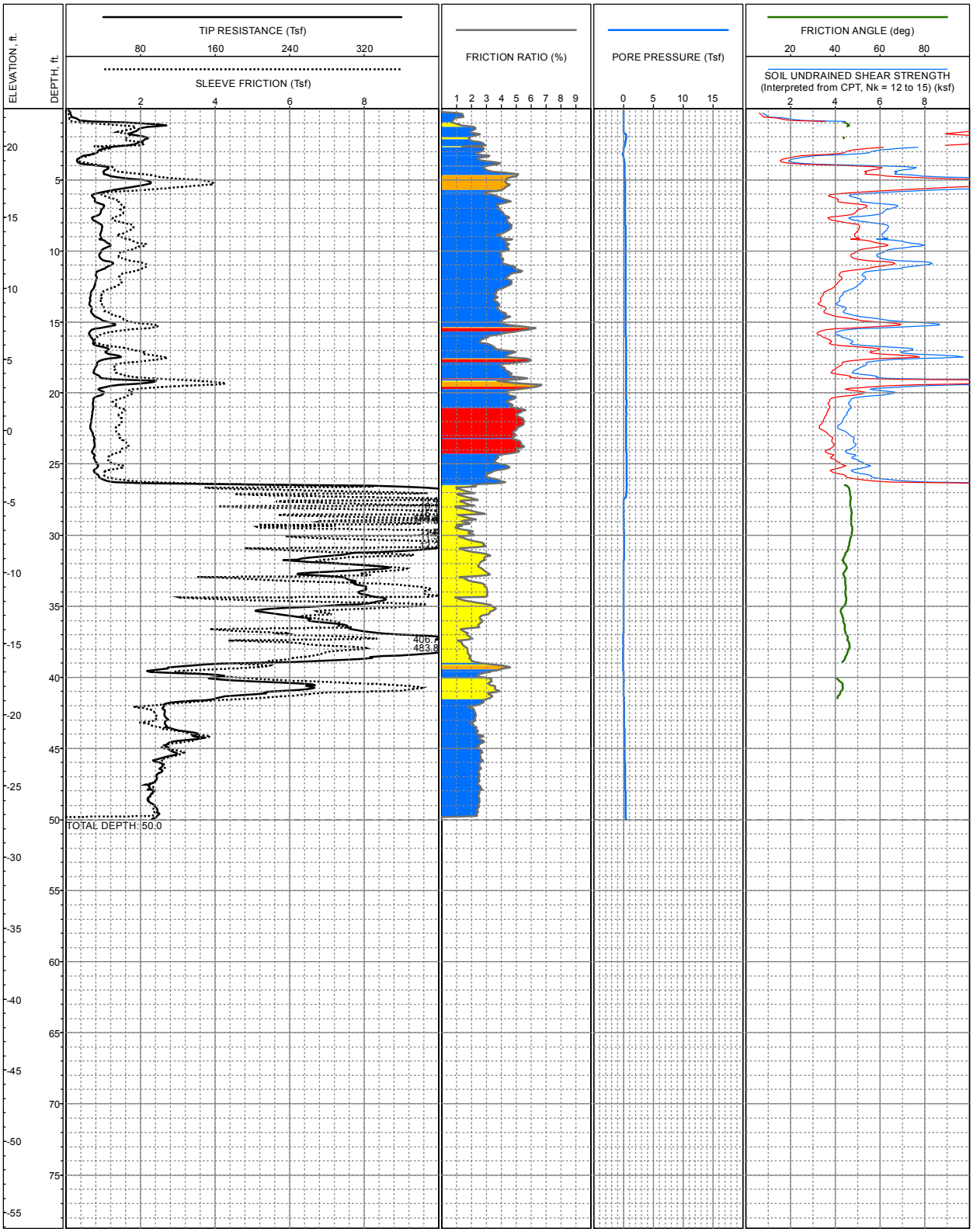

LOCATION: E5,998,442, N 1,979,956, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.6ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-299

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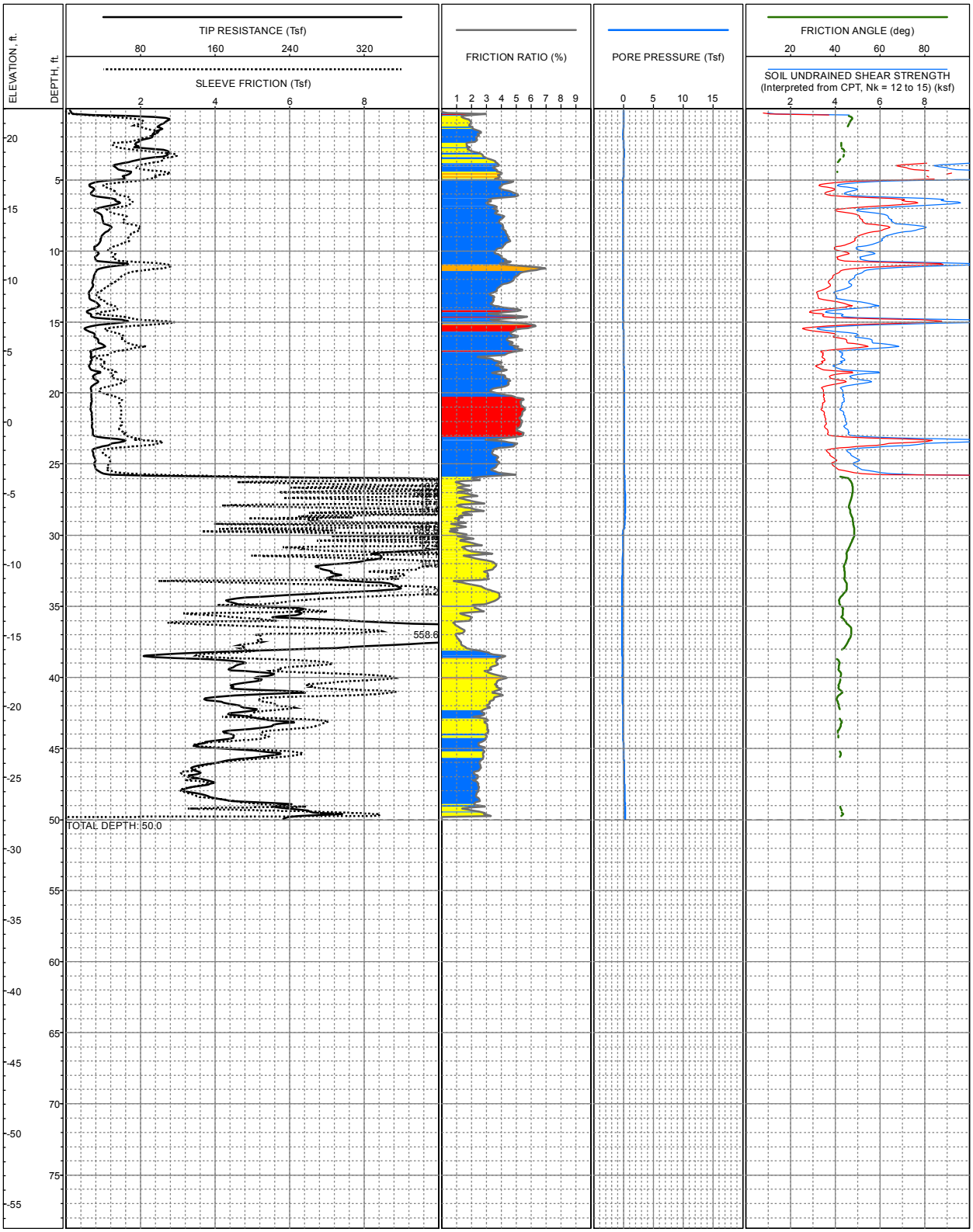

LOCATION: E5,998,442, N 1,979,972, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.1ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-300

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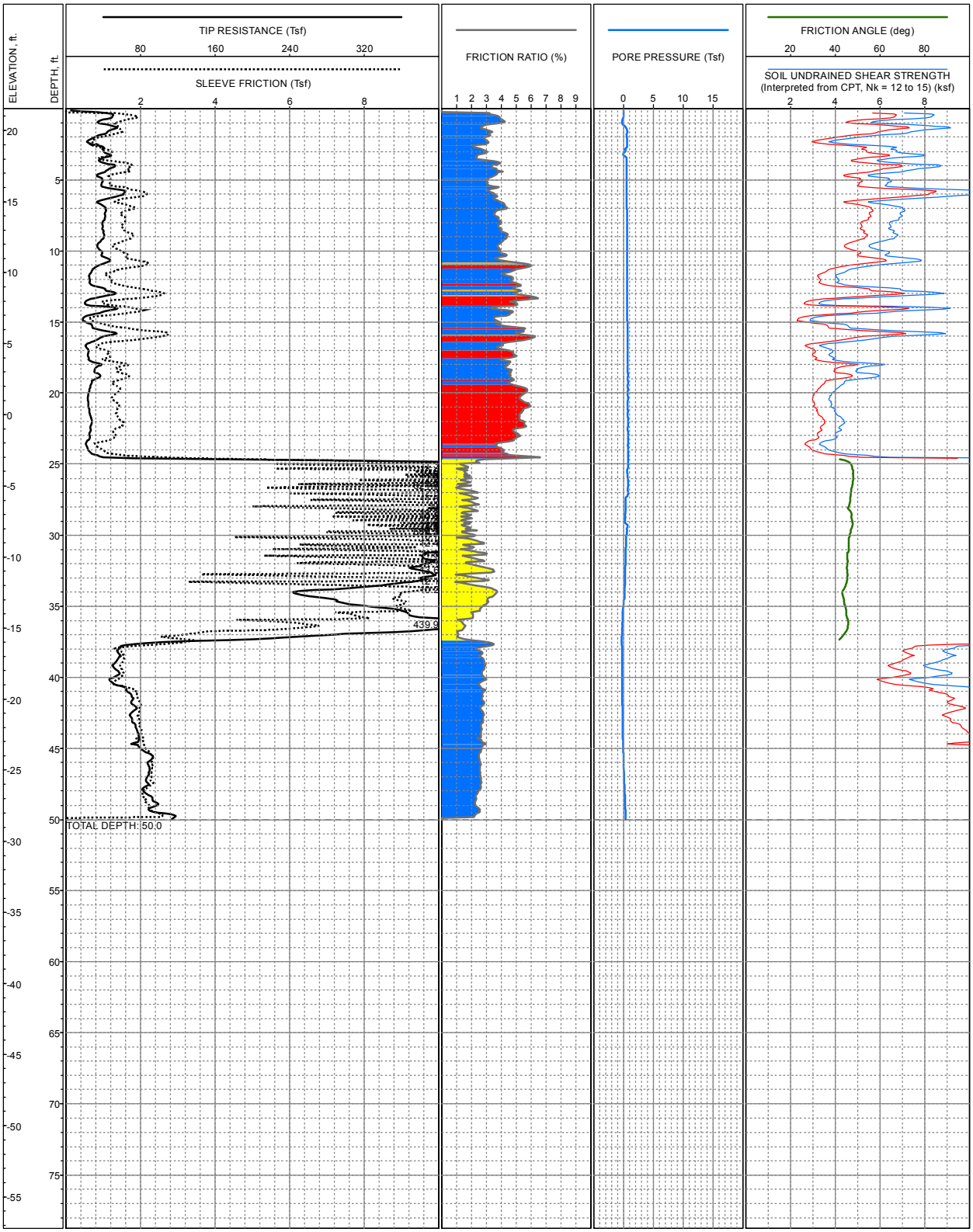

LOCATION: E5,998,443, N 1,979,992, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 21.5ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-301

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University of California Santa Barbara
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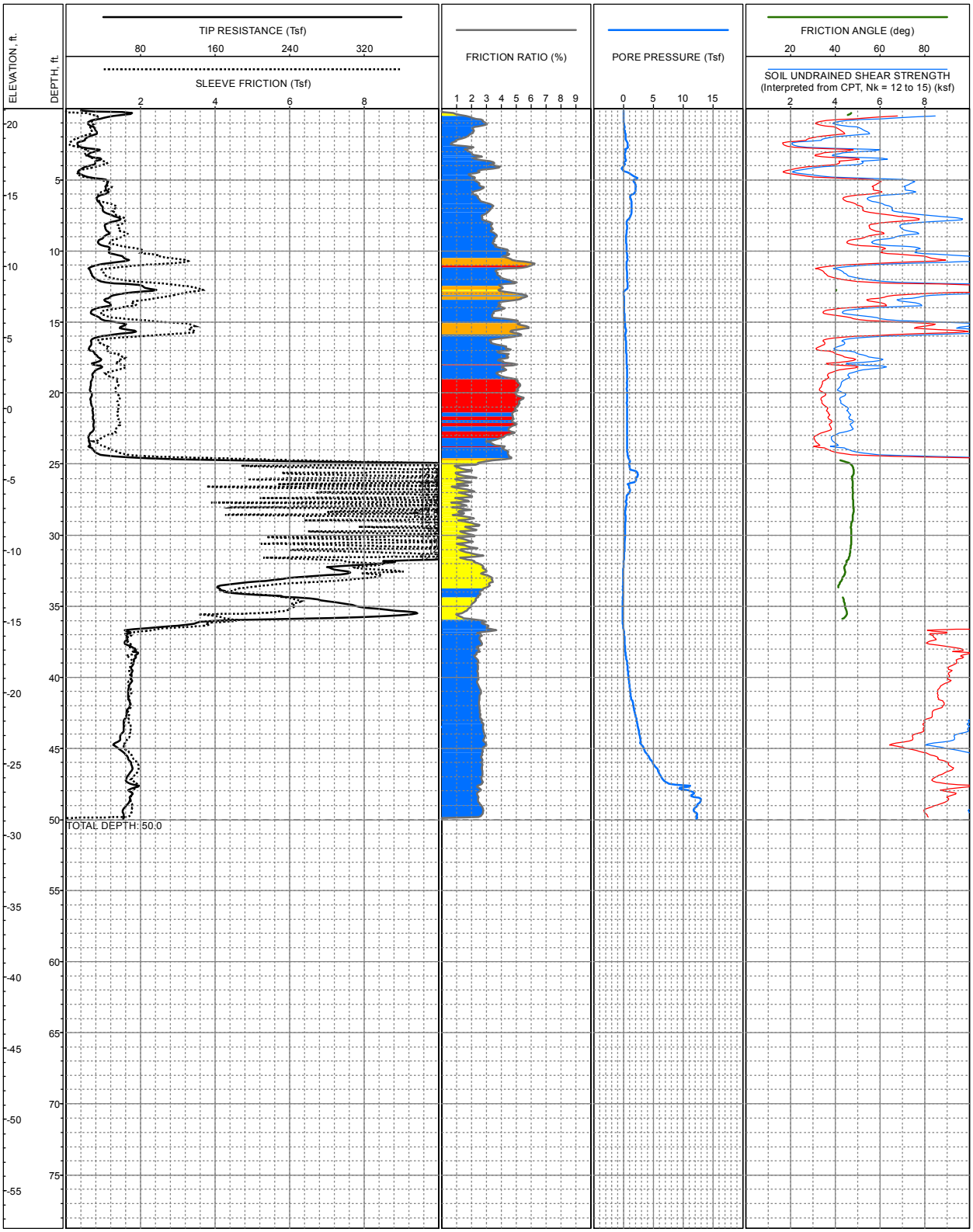

LOCATION: E5,998,444, N 1,980,012, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 21.1ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-302

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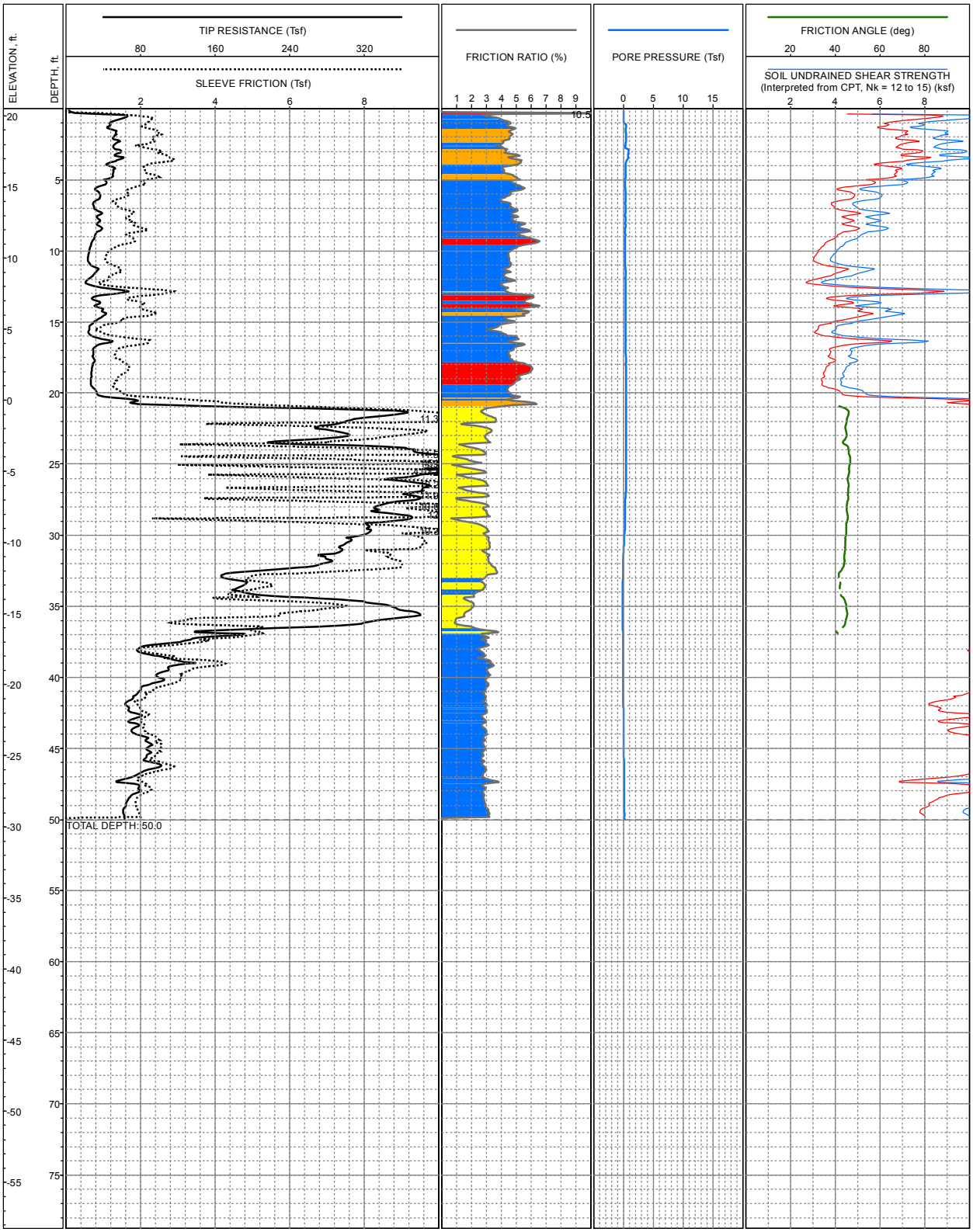

LOCATION: E5,998,445, N 1,980,073, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 20.5ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-303

San Joaquin Apartments & Precinct Improvements
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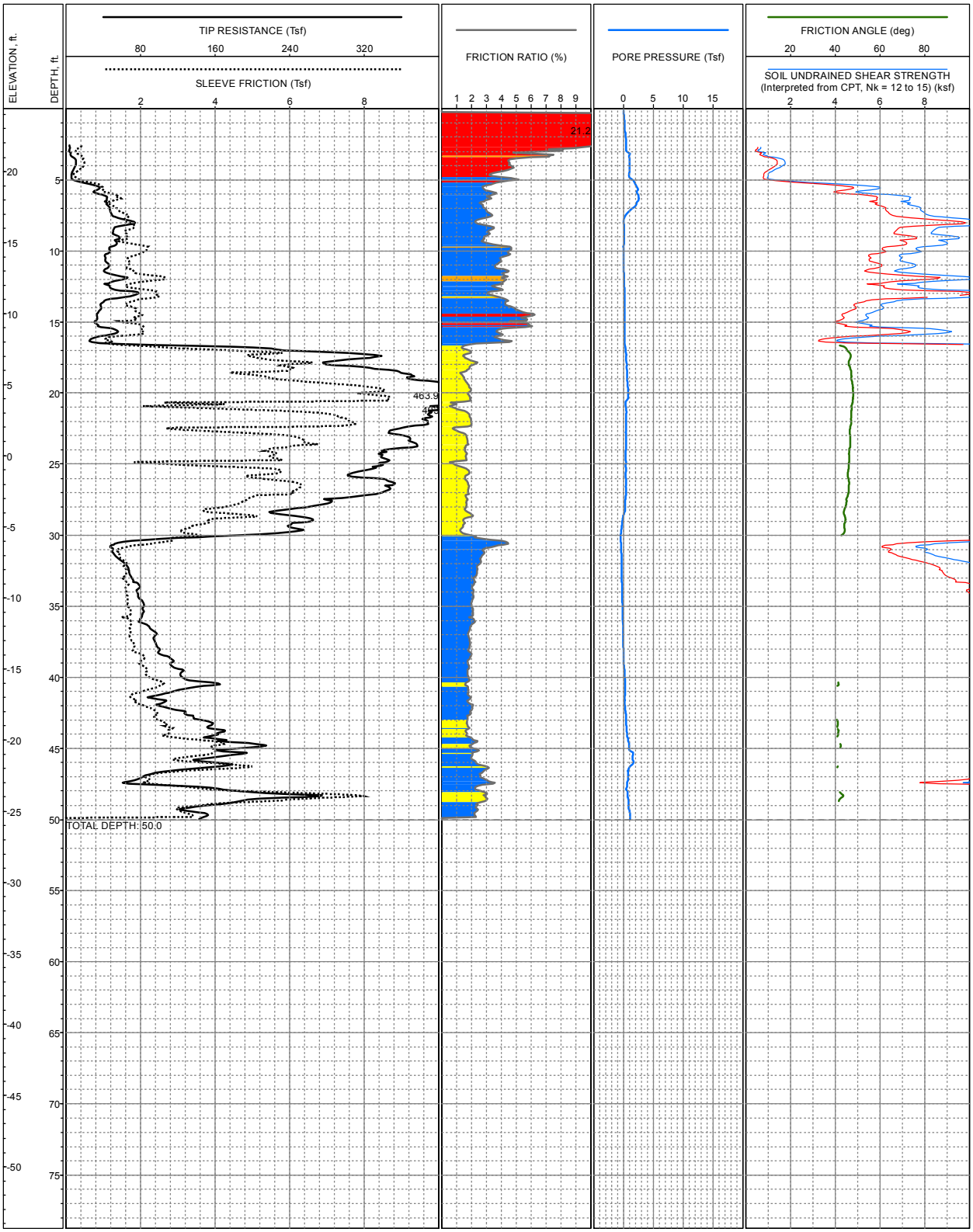

LOCATION: E5,998,071, N 1,980,032, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.4ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-304

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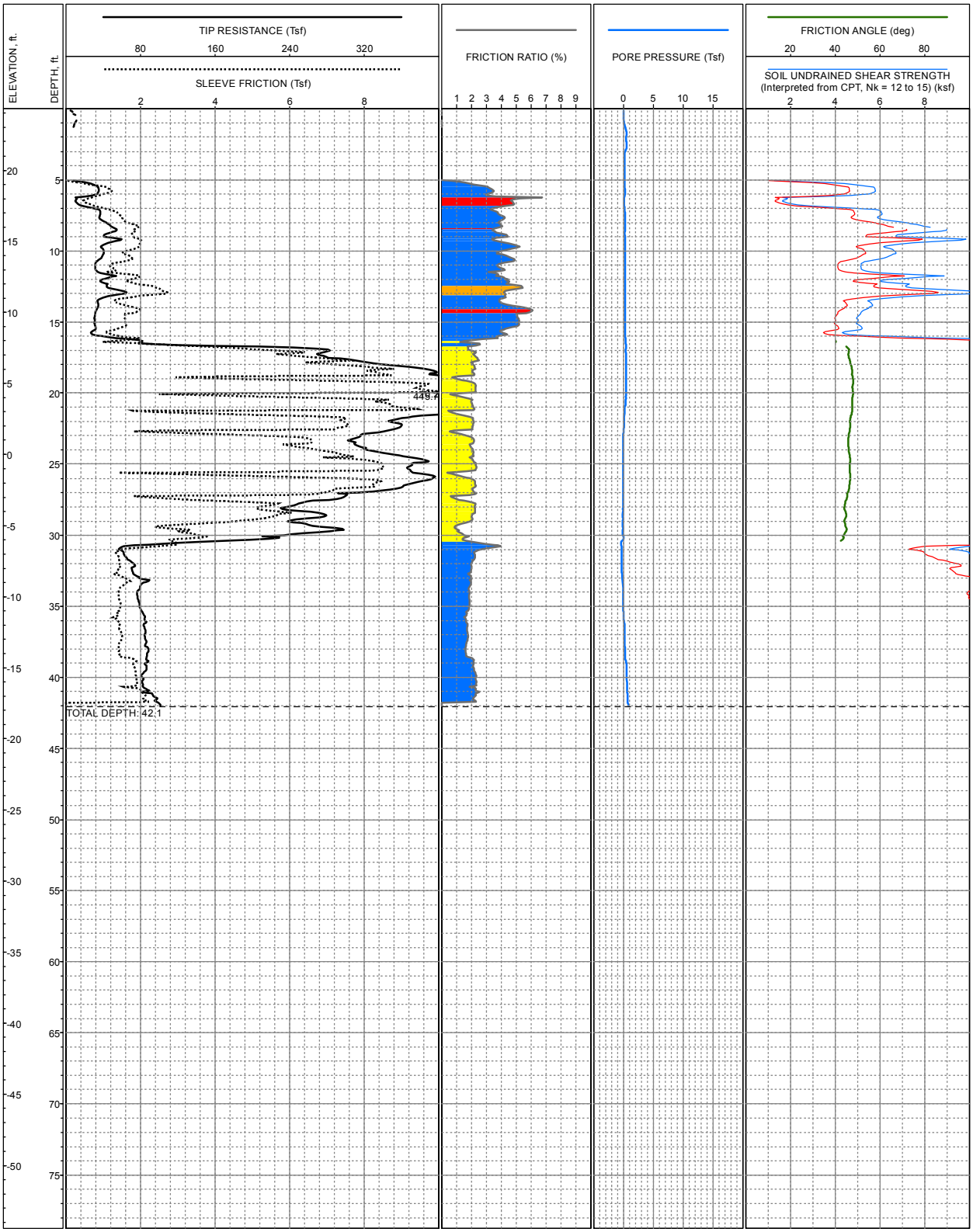

LOCATION: E5,998,071, N 1,980,042, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.3ft +/- ()
COMPLETION DEPTH: 42.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-305

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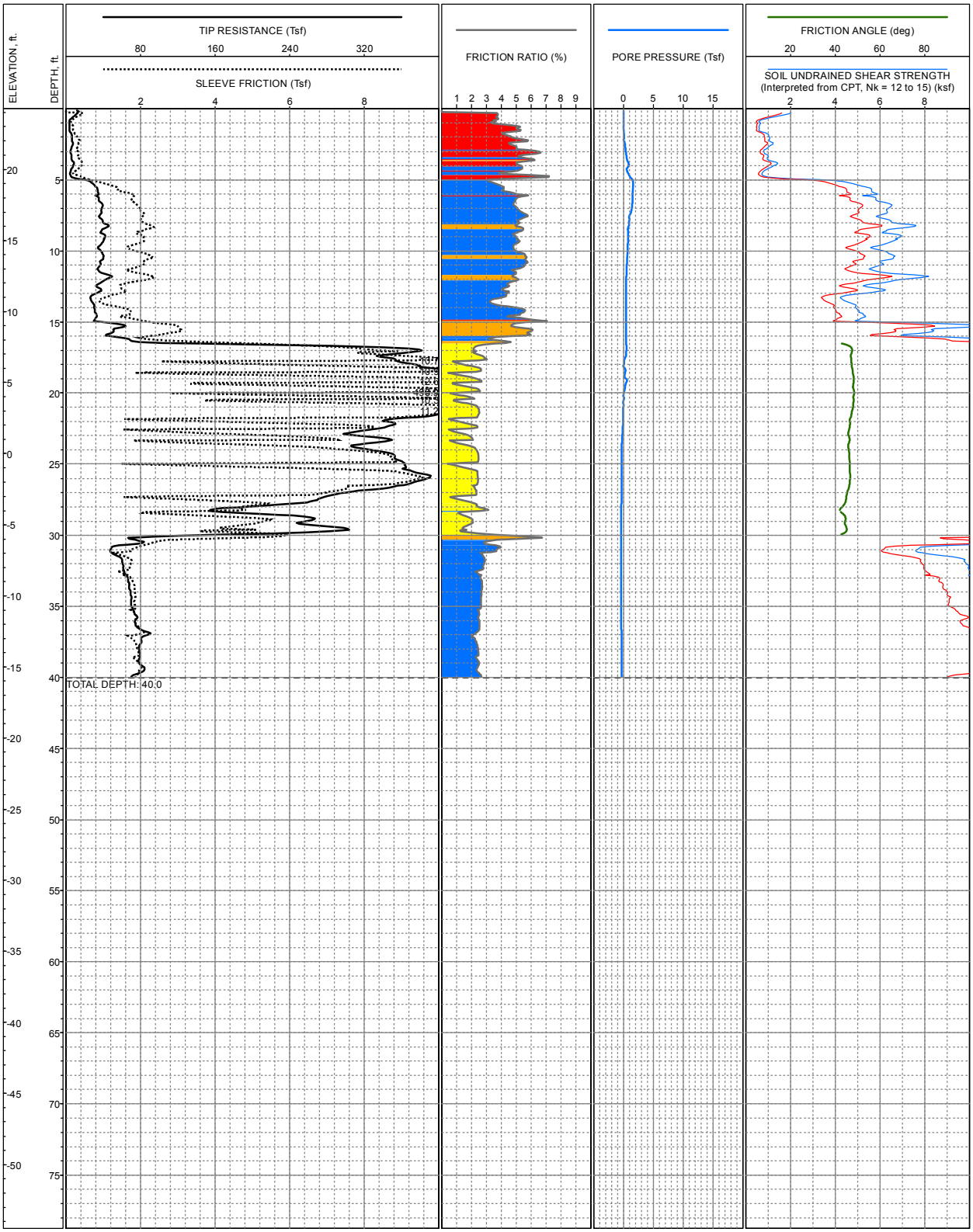

LOCATION: E5,998,071, N 1,980,048, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.3ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-306

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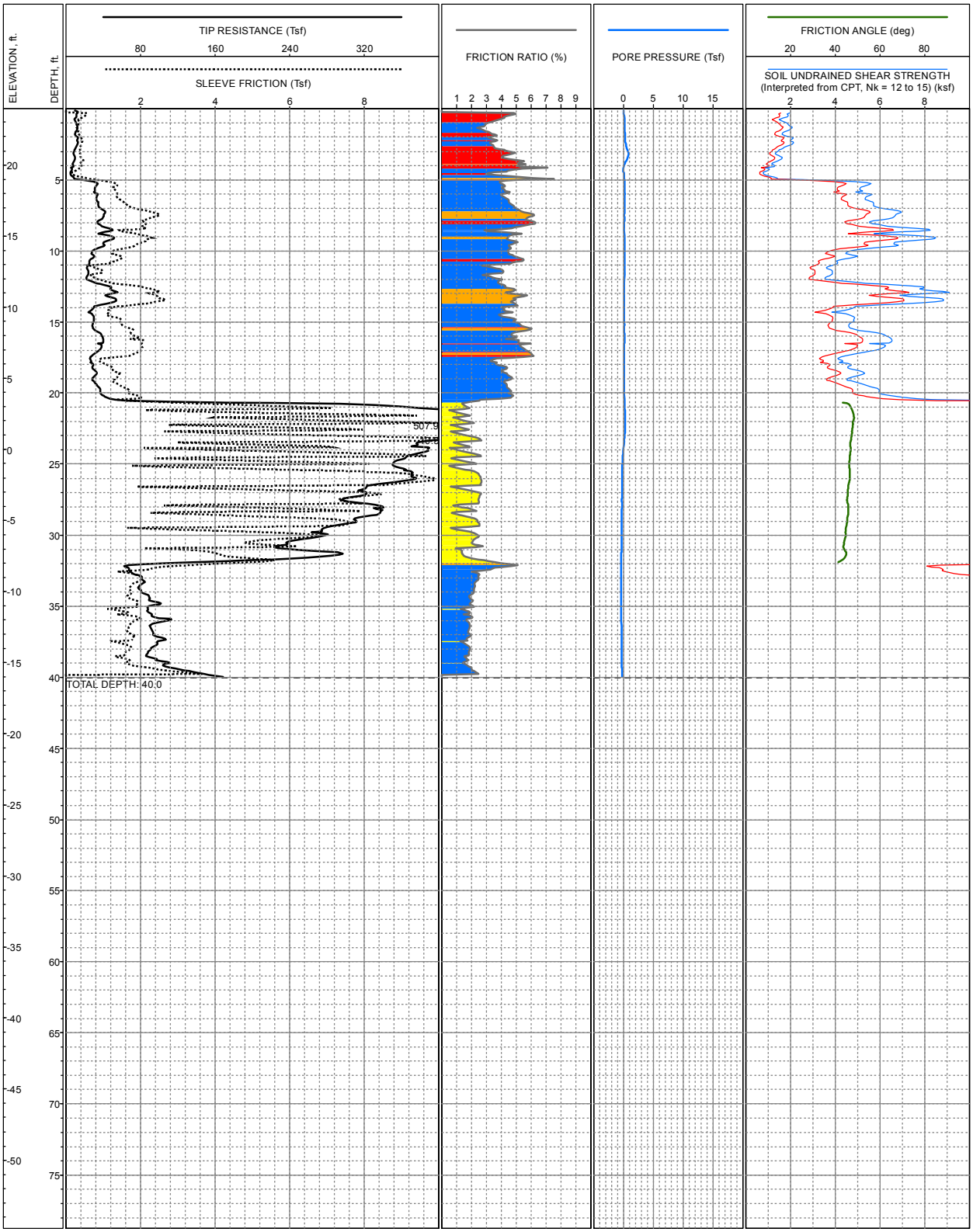

LOCATION: E5,998,076, N 1,980,154, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.0ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-307

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Santa Barbara, California

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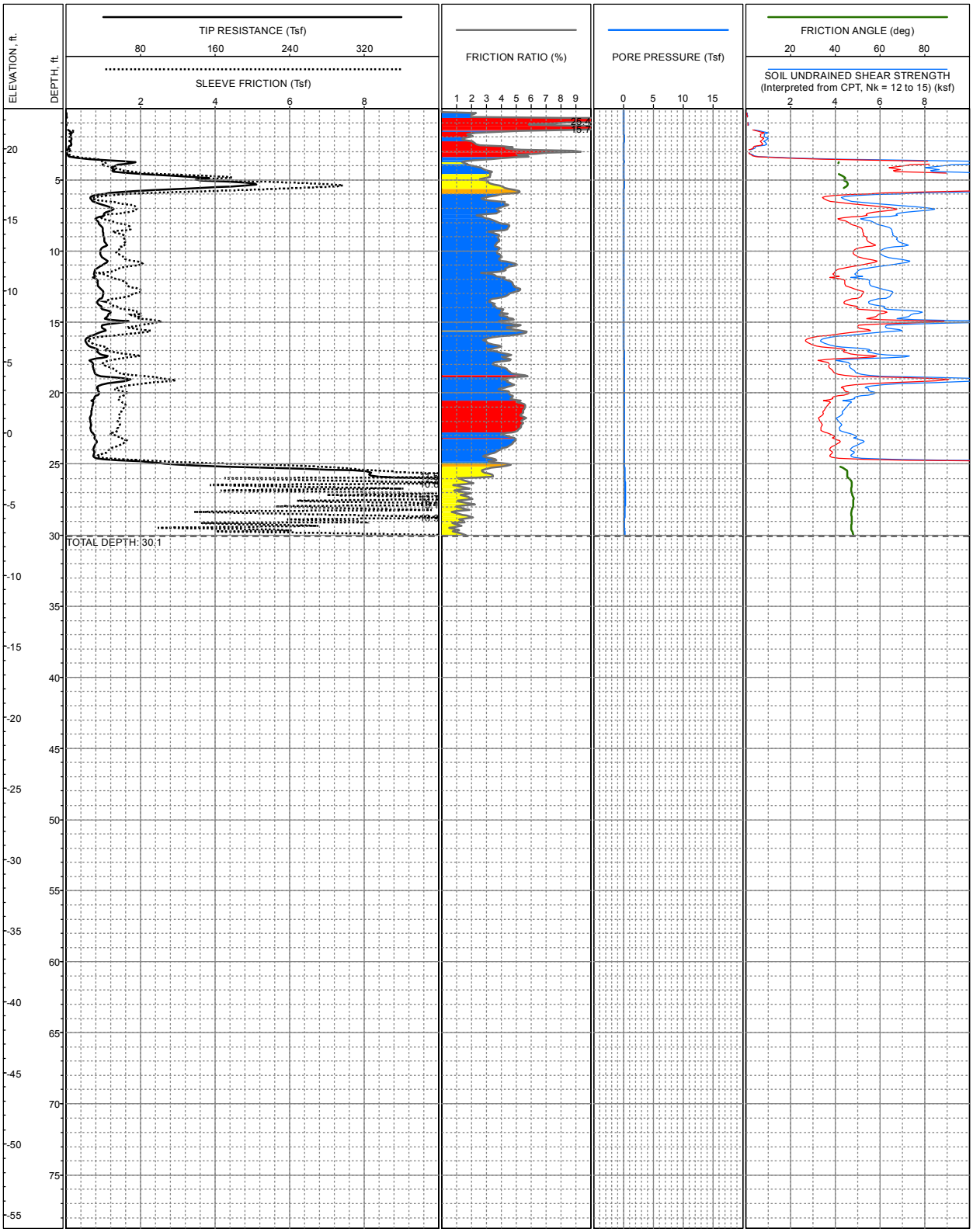

LOCATION: E5,998,441, N 1,979,946, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.8ft +/- ()
COMPLETION DEPTH: 30.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-308

San Joaquin Apartments & Precinct Improvements
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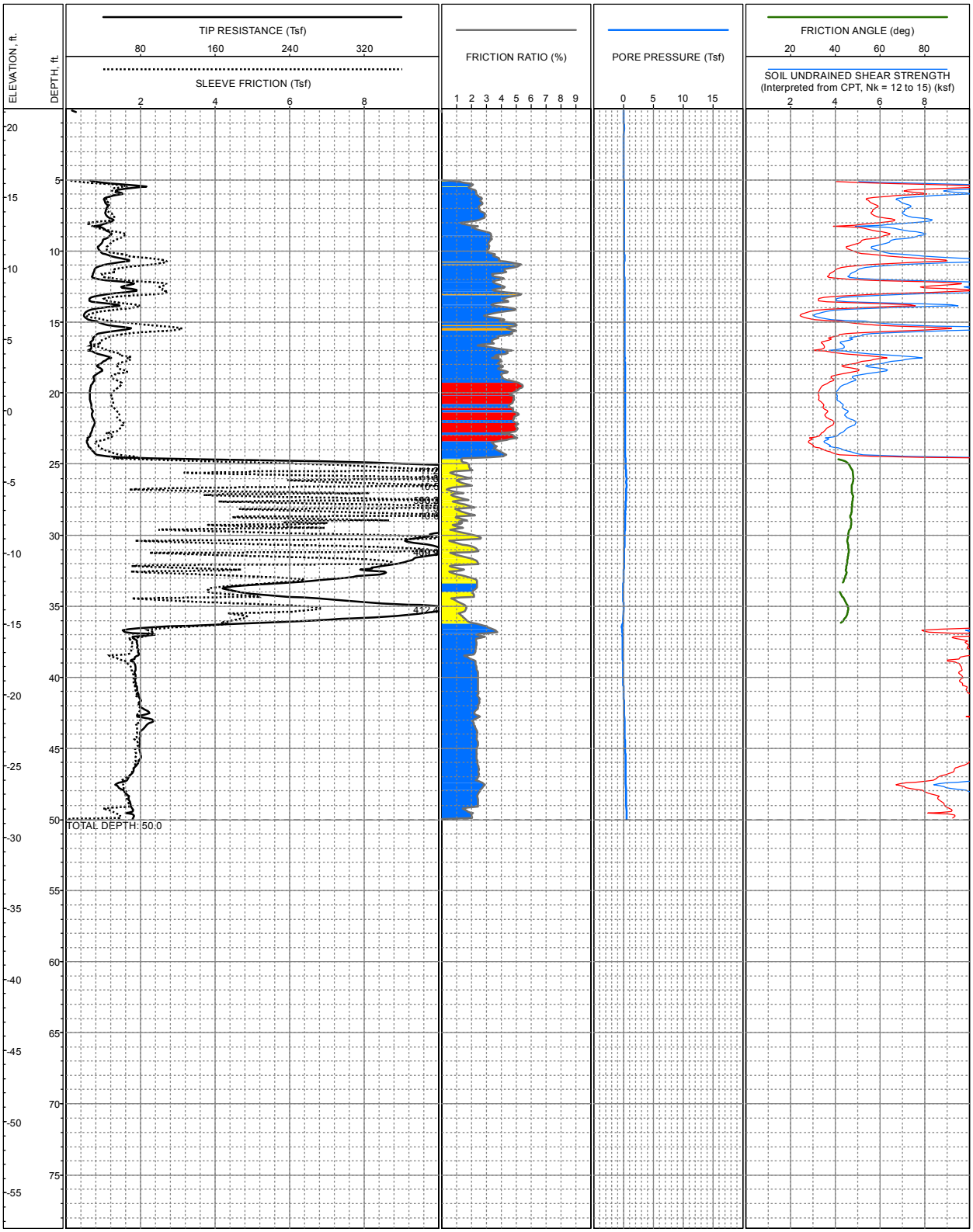

LOCATION: E5,998,443, N 1,980,003, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 21.2ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-309

San Joaquin Apartments & Precinct Improvements
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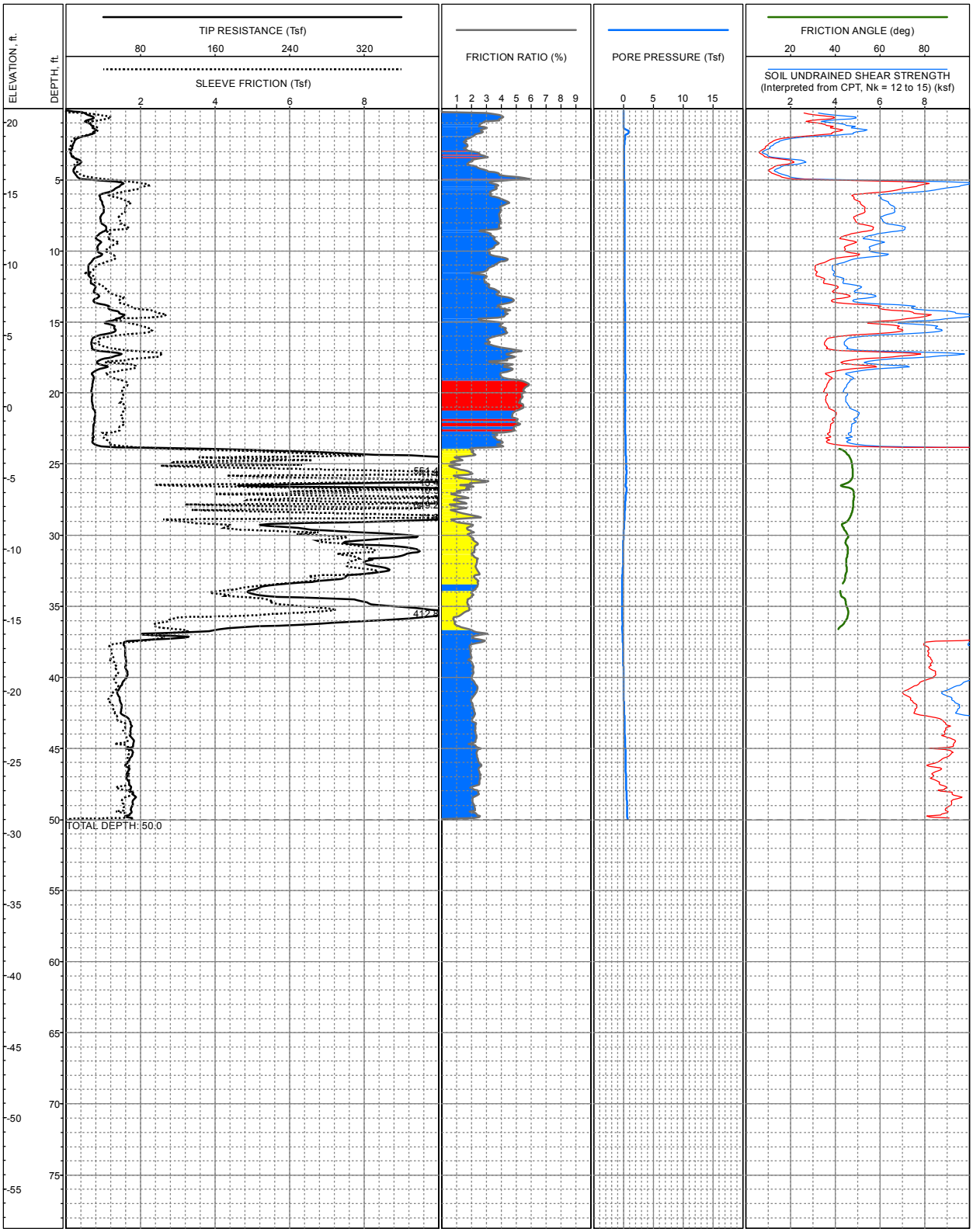

LOCATION: E5,998,444, N 1,980,021, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 21.0ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-310

San Joaquin Apartments & Precinct Improvements
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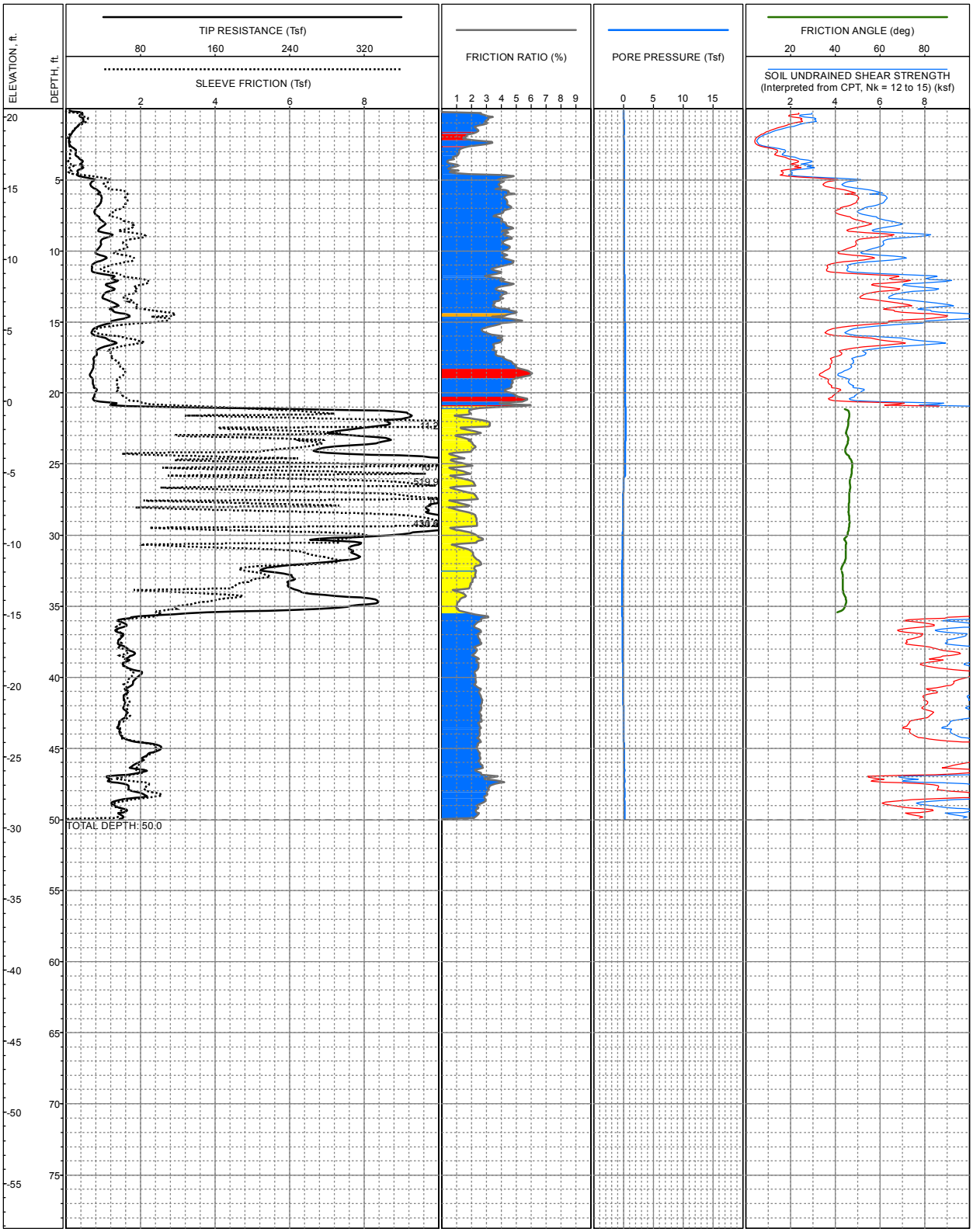

LOCATION: E5,998,445, N 1,980,060, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 20.6ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-311

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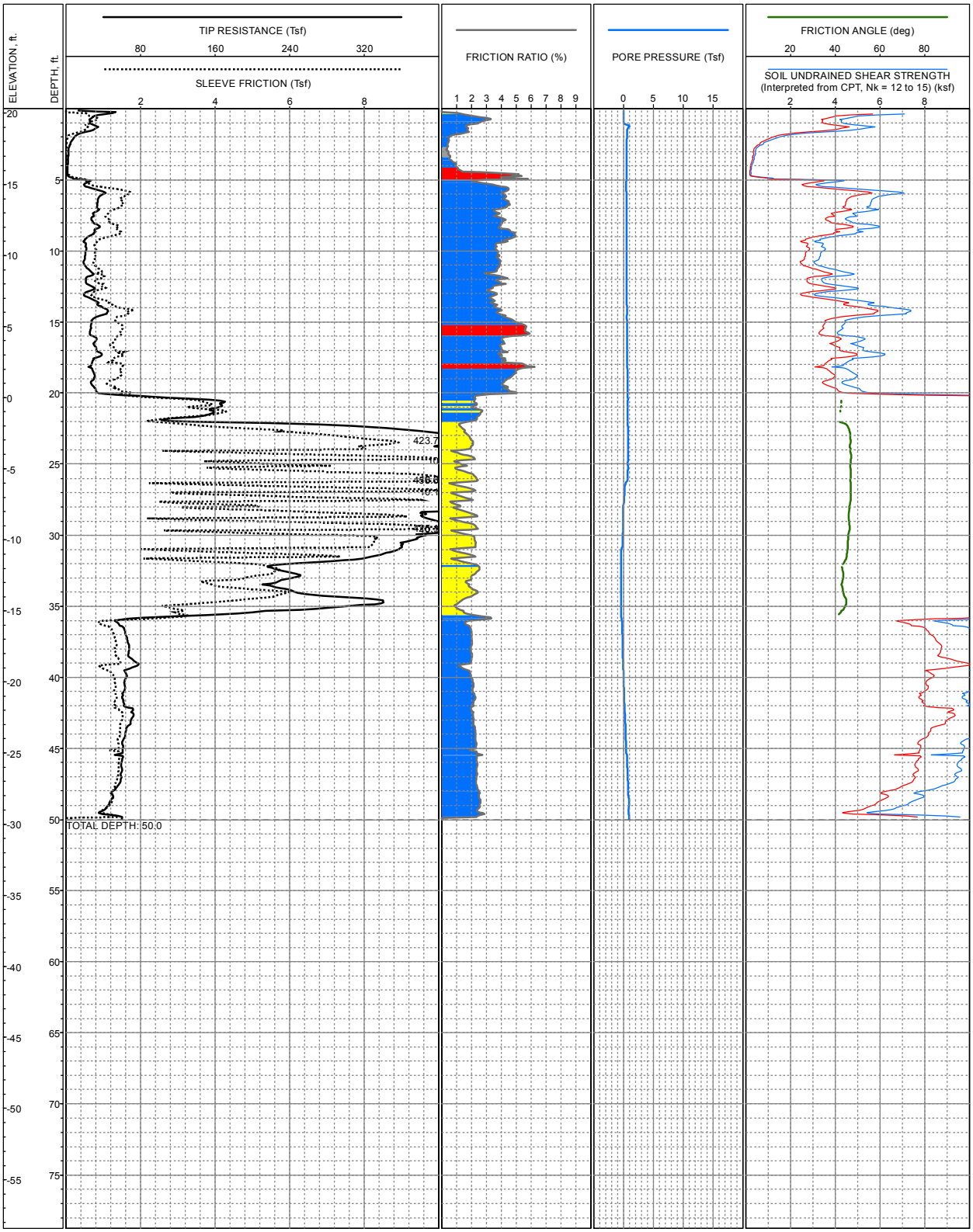
University of California Santa Barbara
Project No. 04.62110136



LOCATION: E5,998,447, N 1,980,128, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 20.3ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-312

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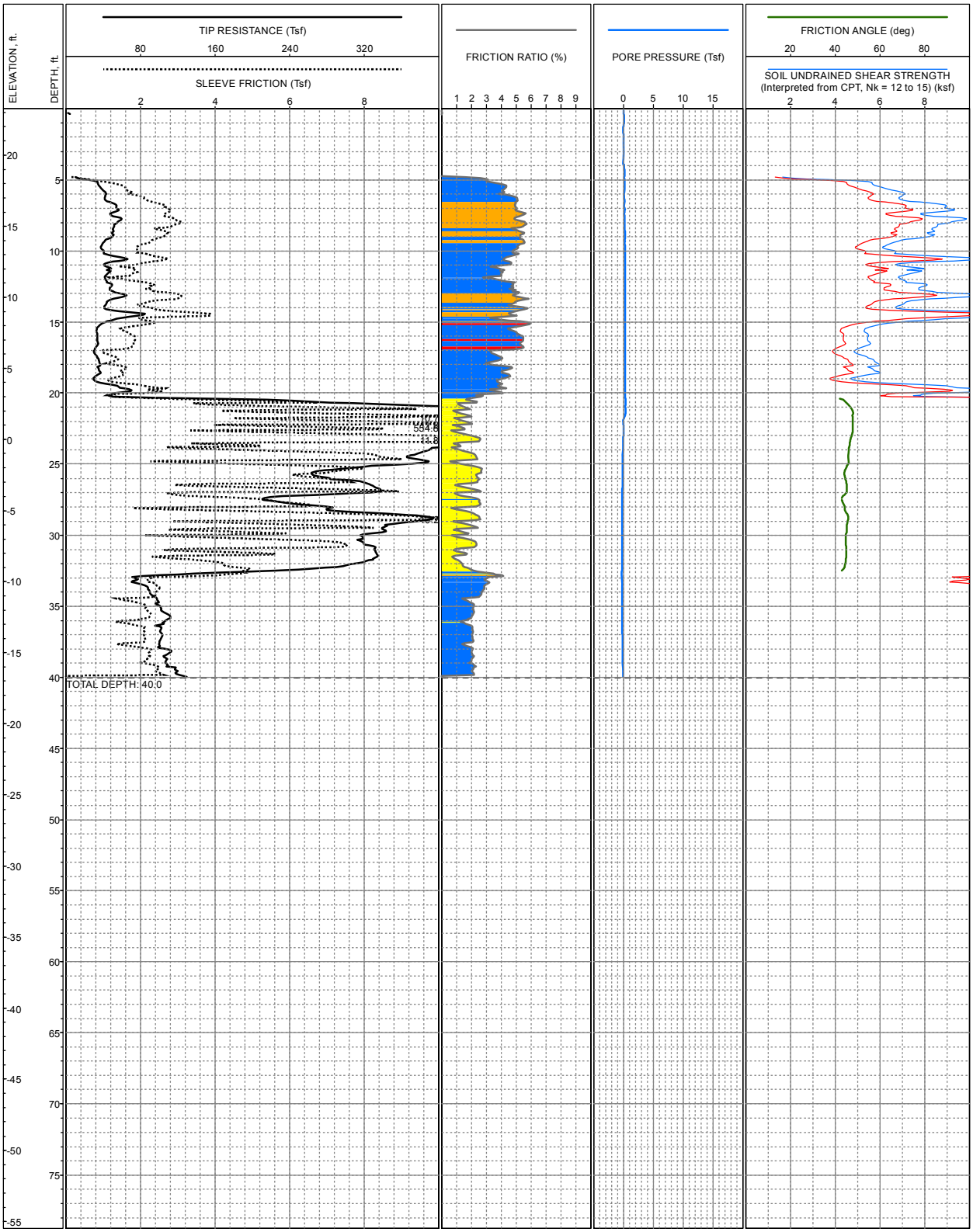

LOCATION: E5,998,171, N 1,980,153, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.3ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-313

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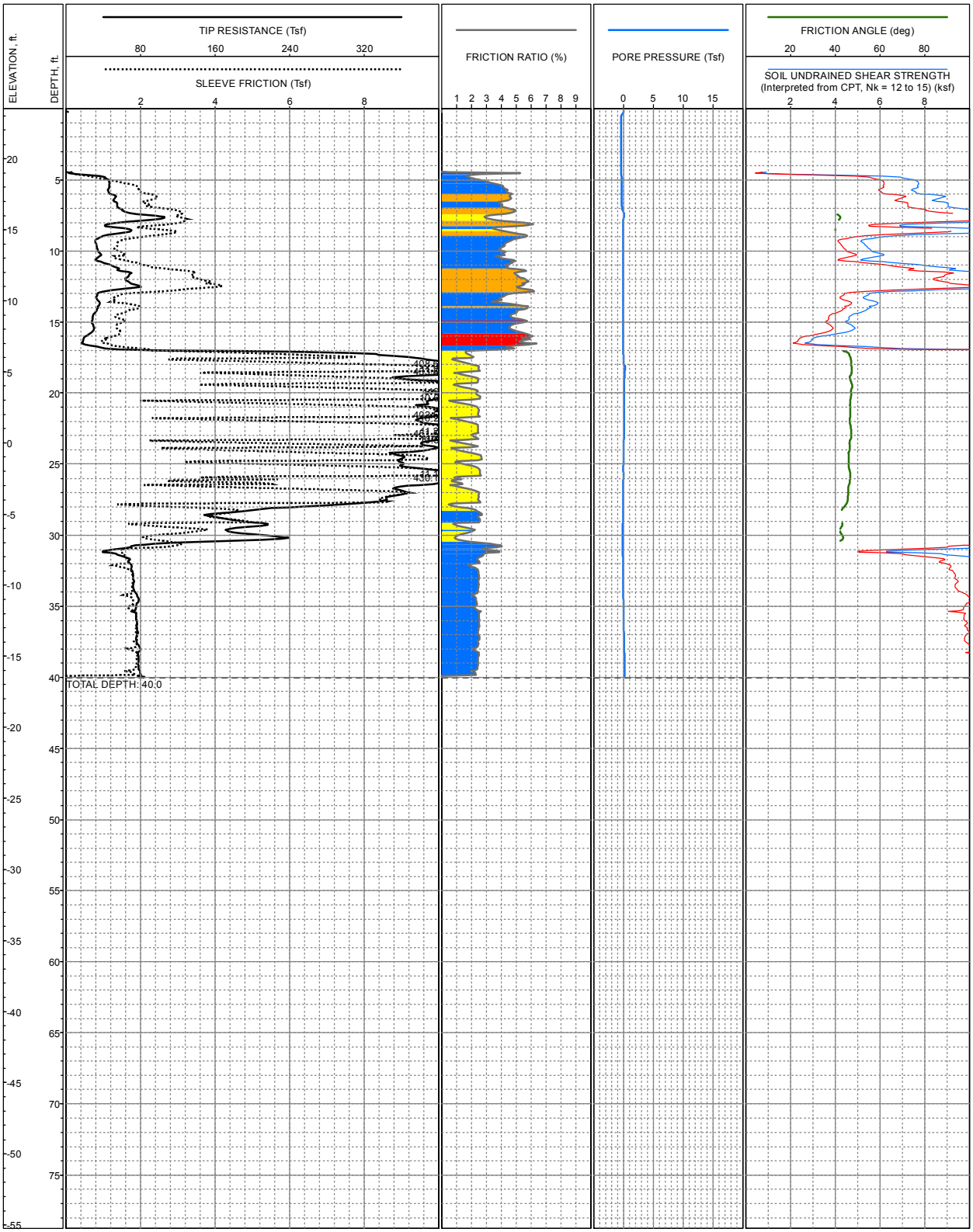

LOCATION: E5,998,124, N 1,980,030, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.5ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-314

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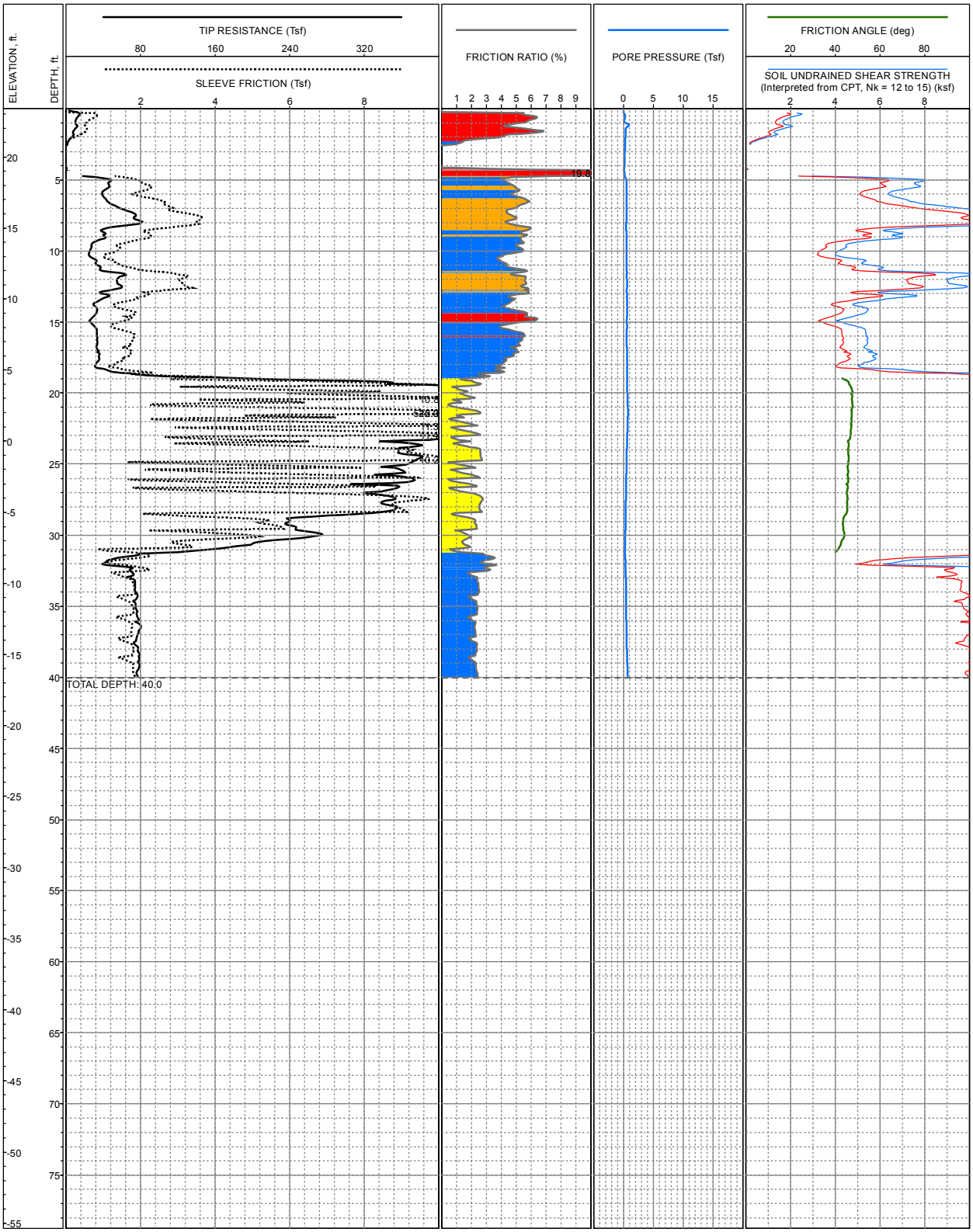

LOCATION: E5,998,126, N 1,980,051, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.4ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-315

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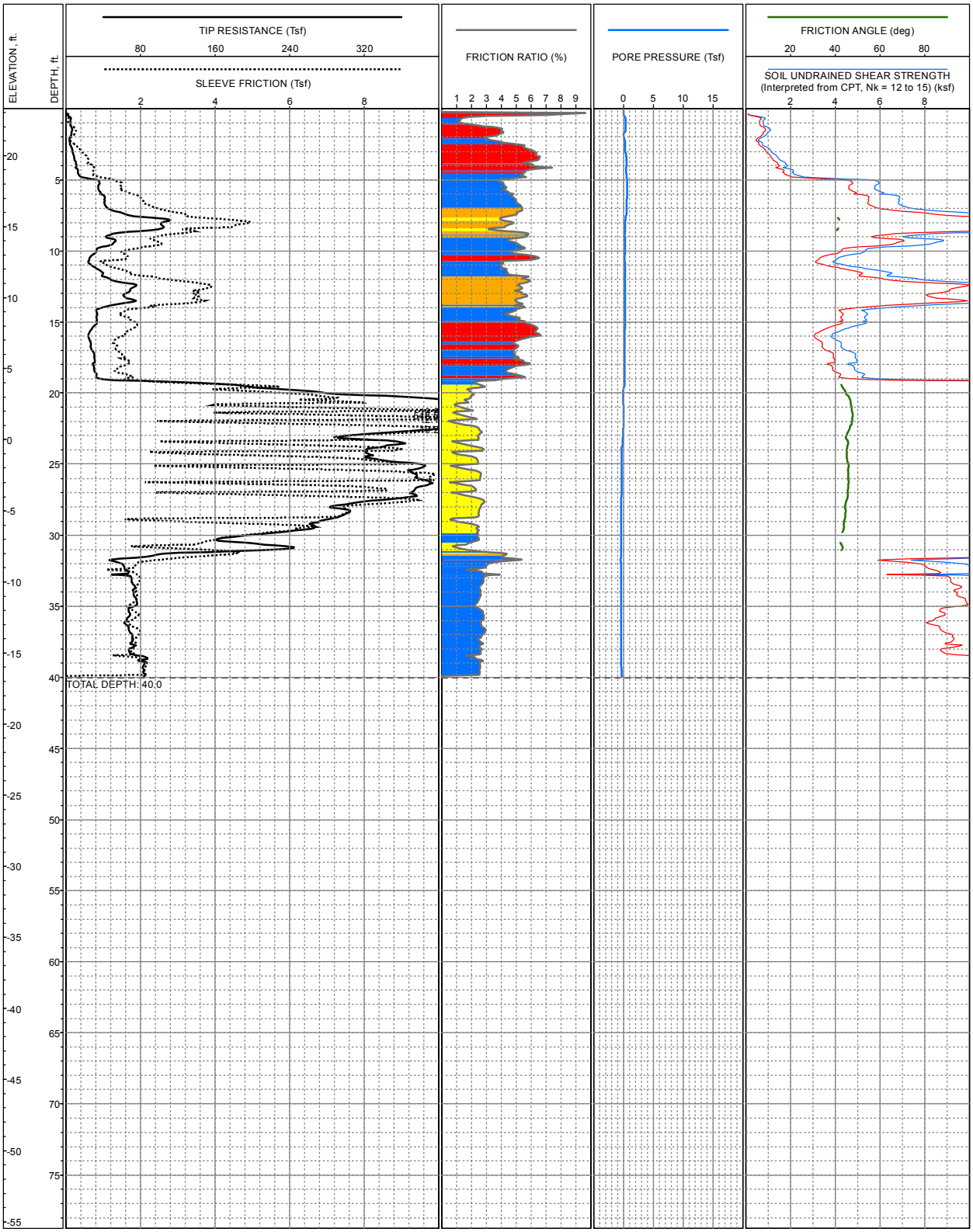

LOCATION: E5,998,125, N 1,980,069, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.3ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-316

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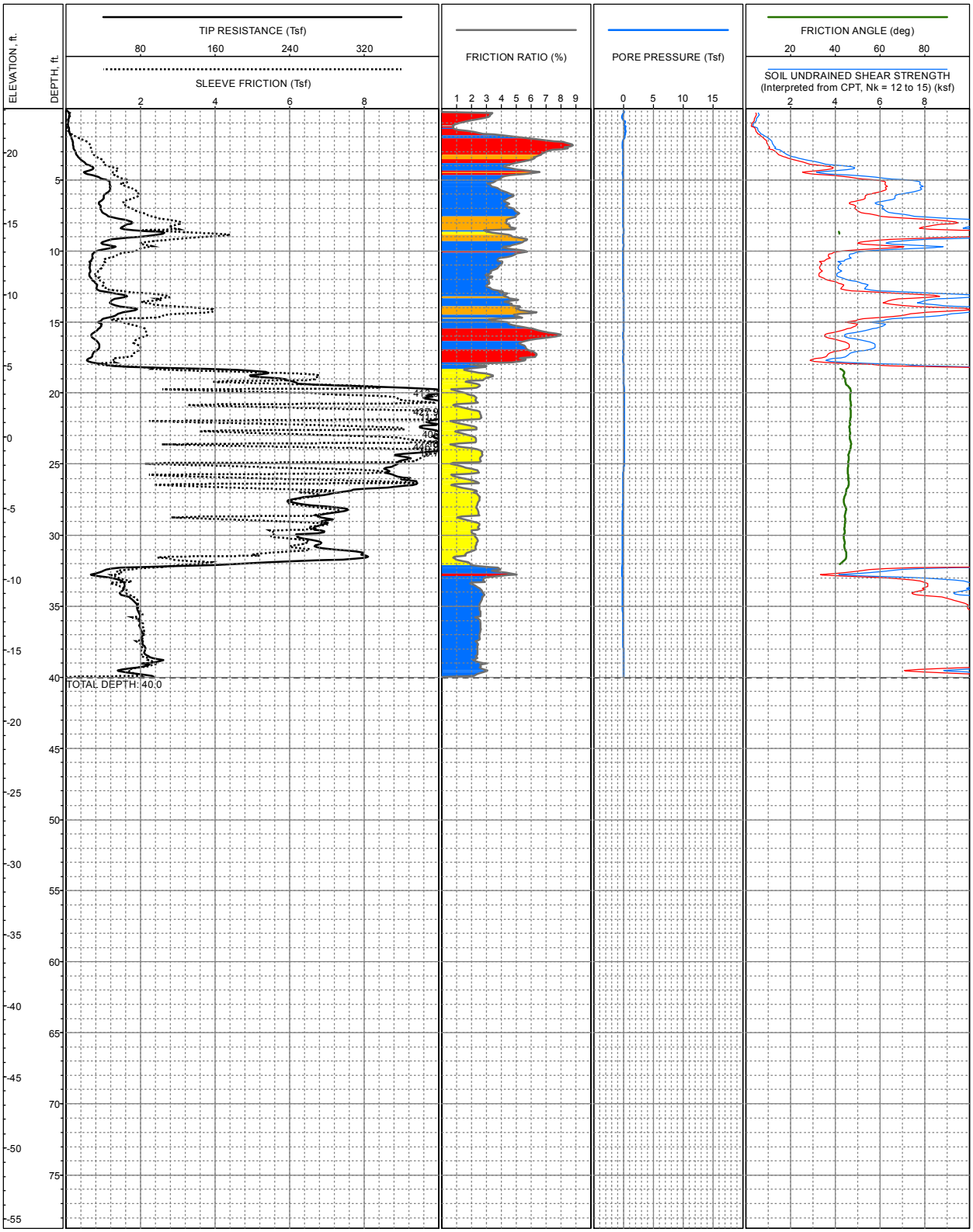

LOCATION: E5,998,168, N 1,980,016, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.1ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-317

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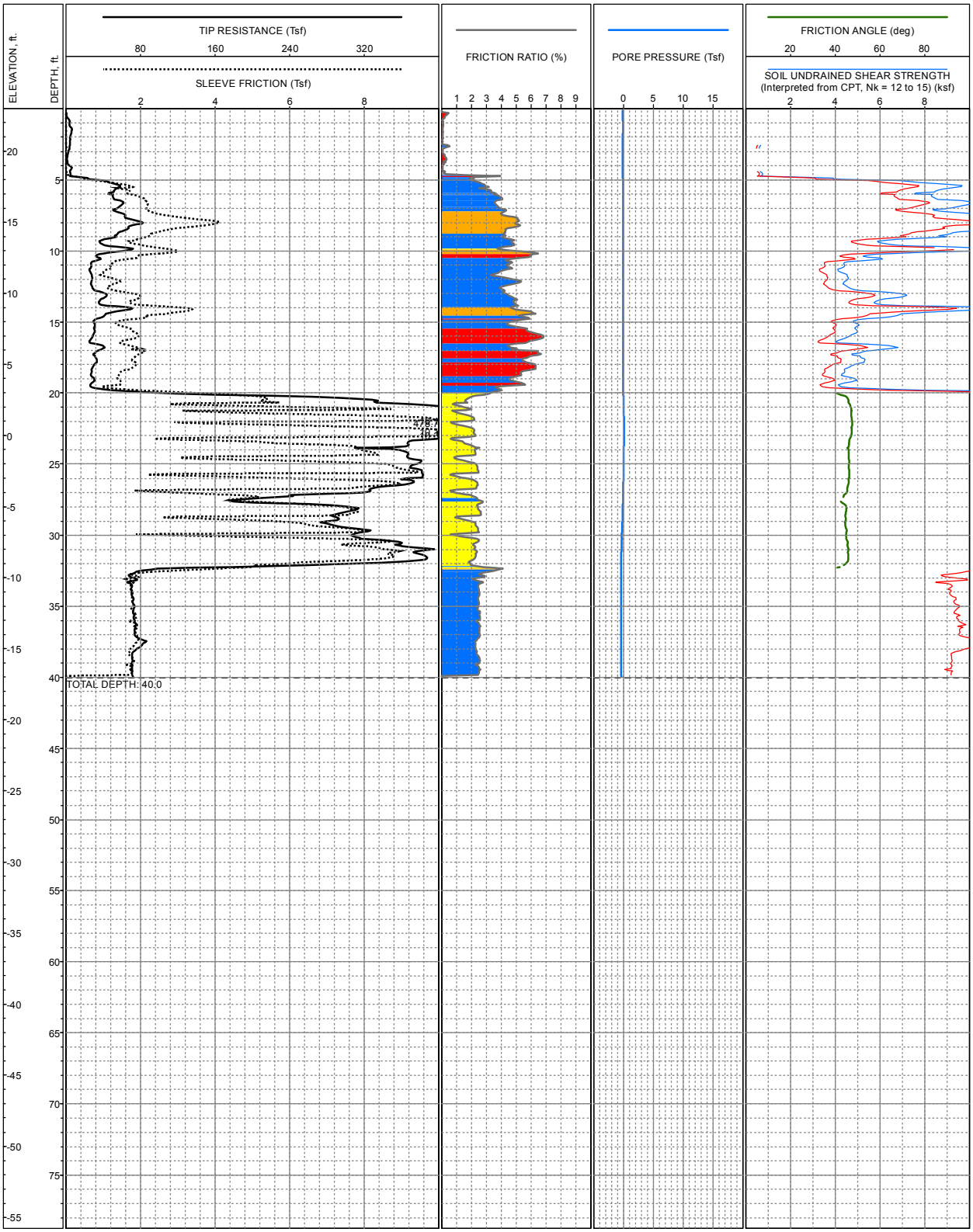

LOCATION: E5,998,168, N 1,980,036, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 23.0ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-318

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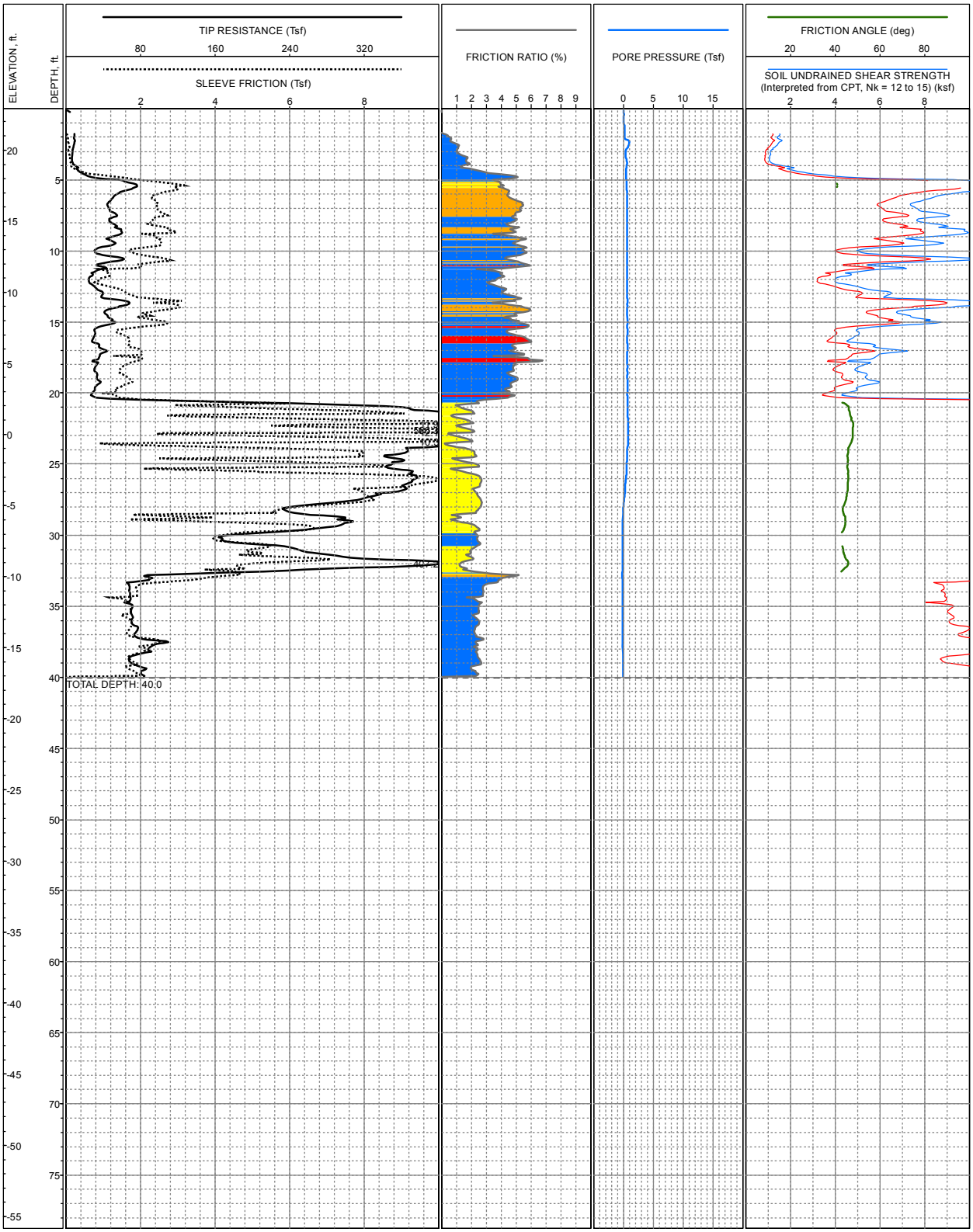

LOCATION: E5,998,204, N 1,980,014, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.9ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-319

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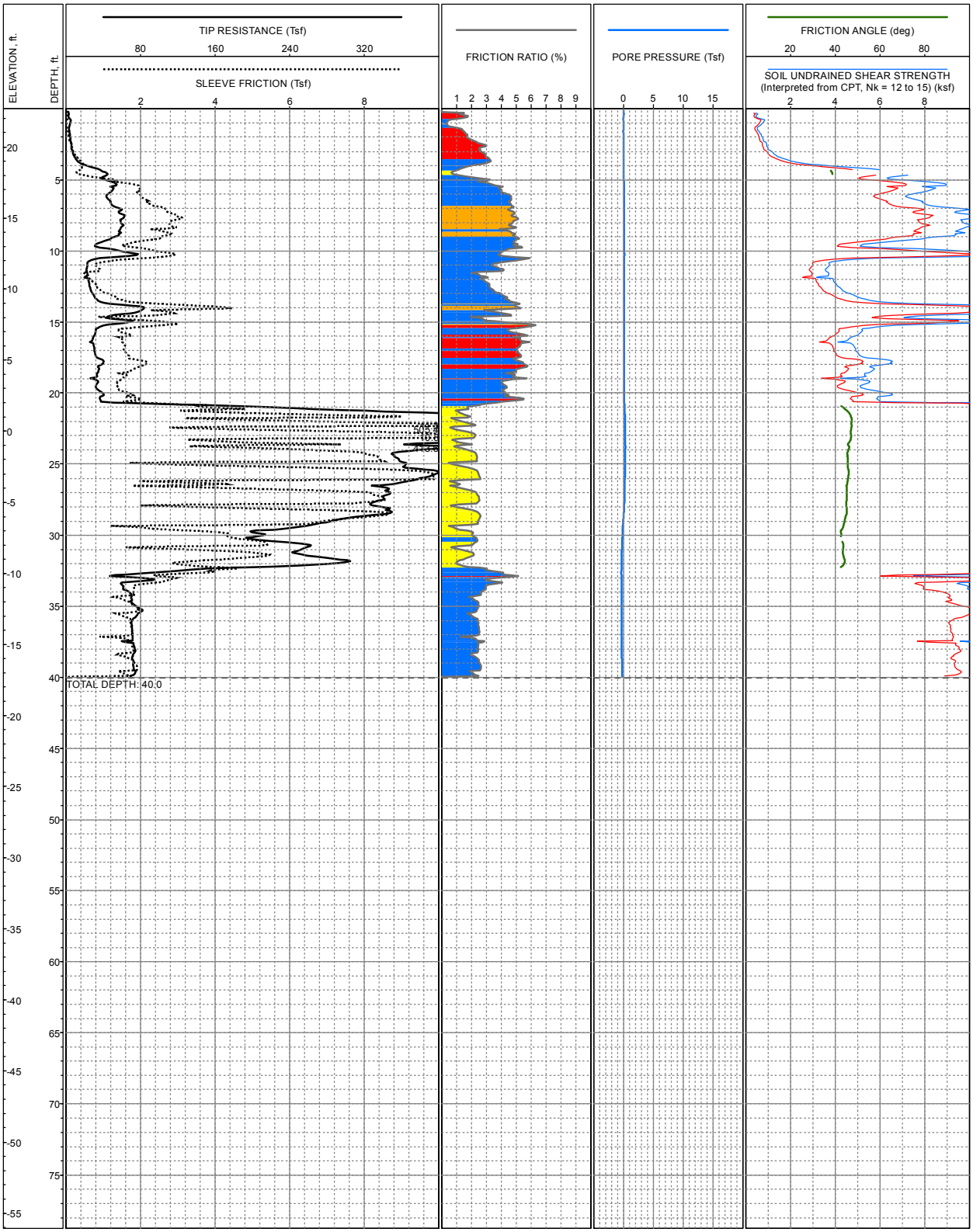

LOCATION: E5,998,204, N 1,980,034, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.7ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-320

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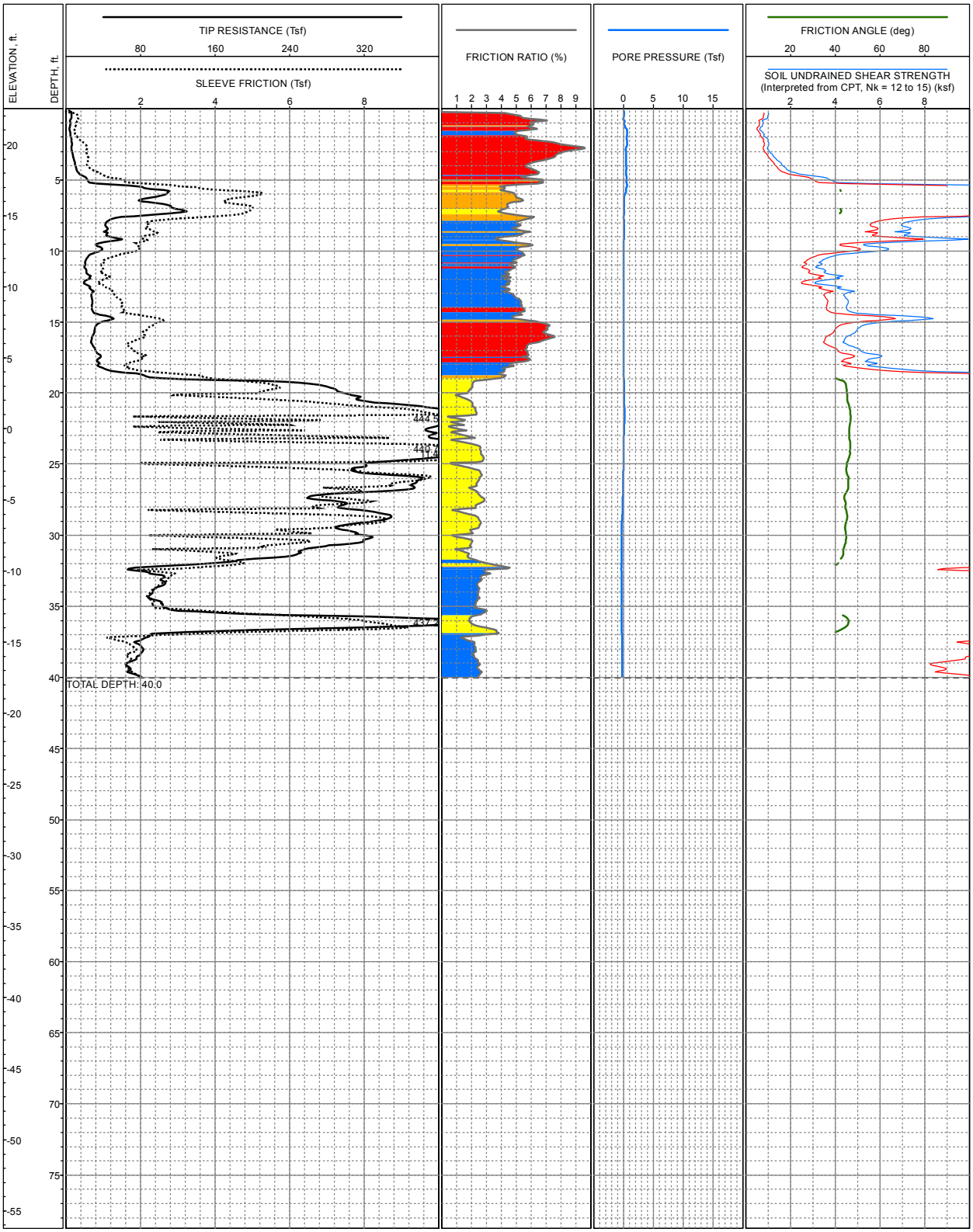

LOCATION: E5,998,205, N 1,980,078, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.5ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-321

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
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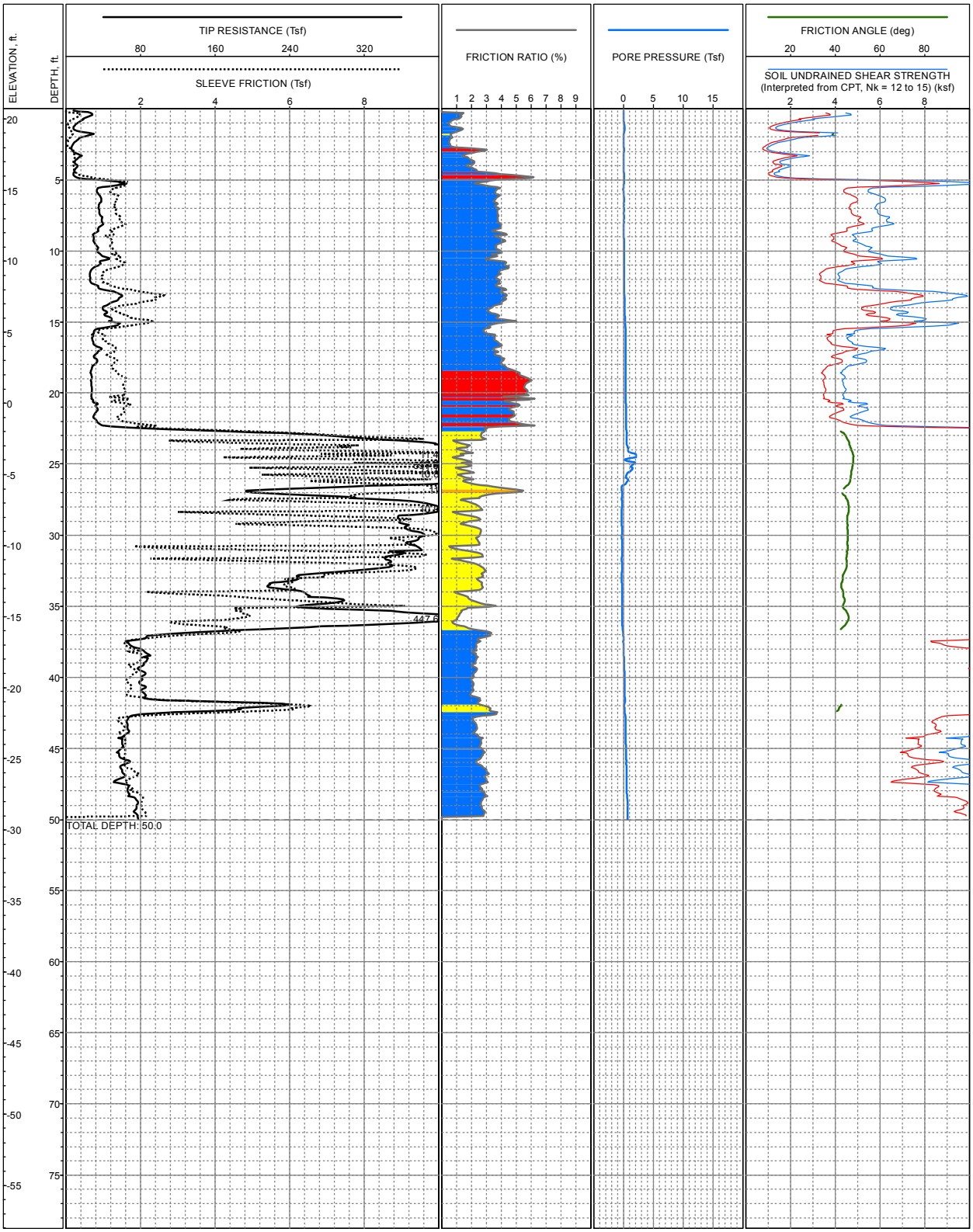

LOCATION: E5,998,445, N 1,980,042, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 20.7ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-322

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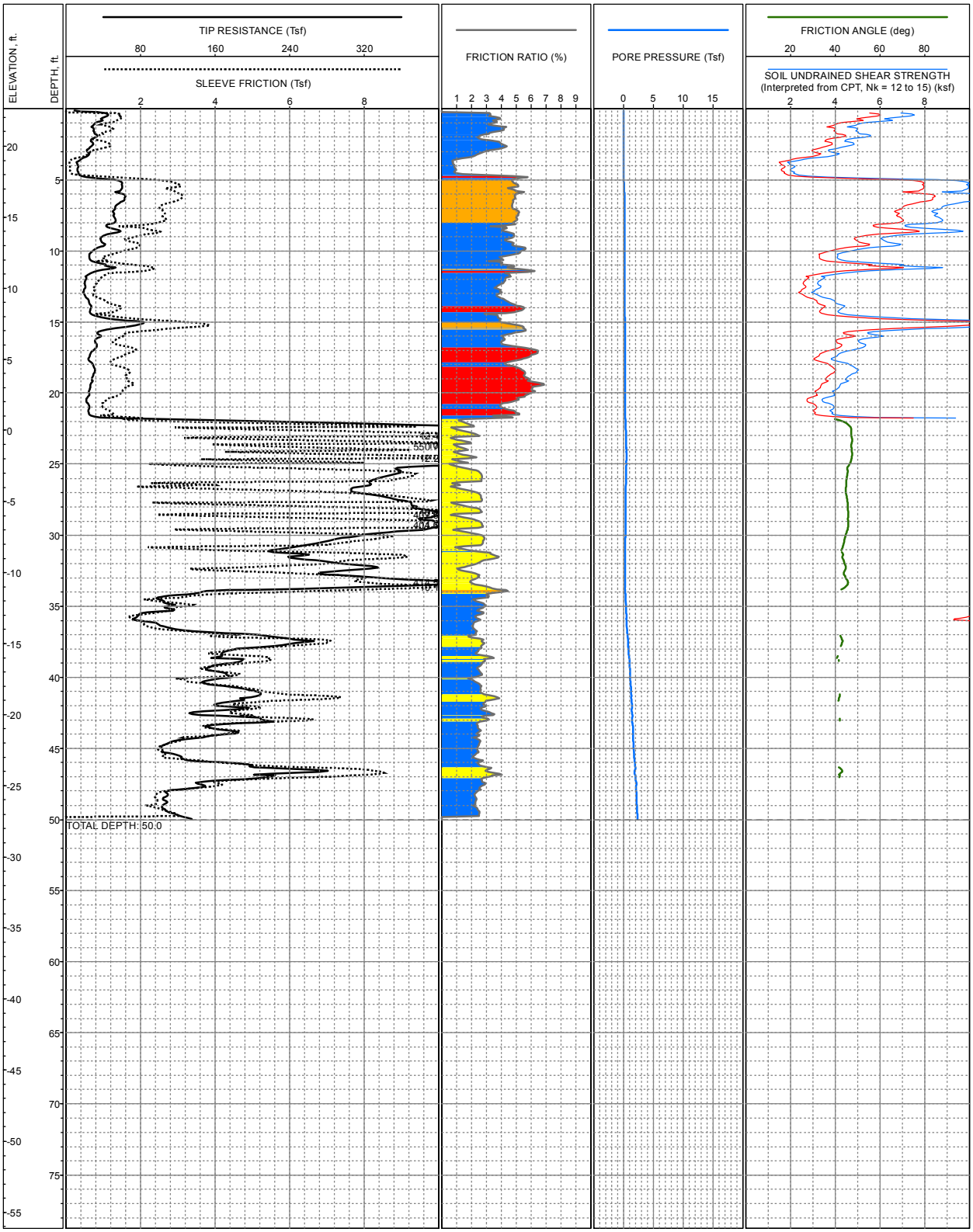

LOCATION: E5,998,280, N 1,979,973, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 22.6ft +/- ()
COMPLETION DEPTH: 50.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-323

San Joaquin Apartments & Precinct Improvements
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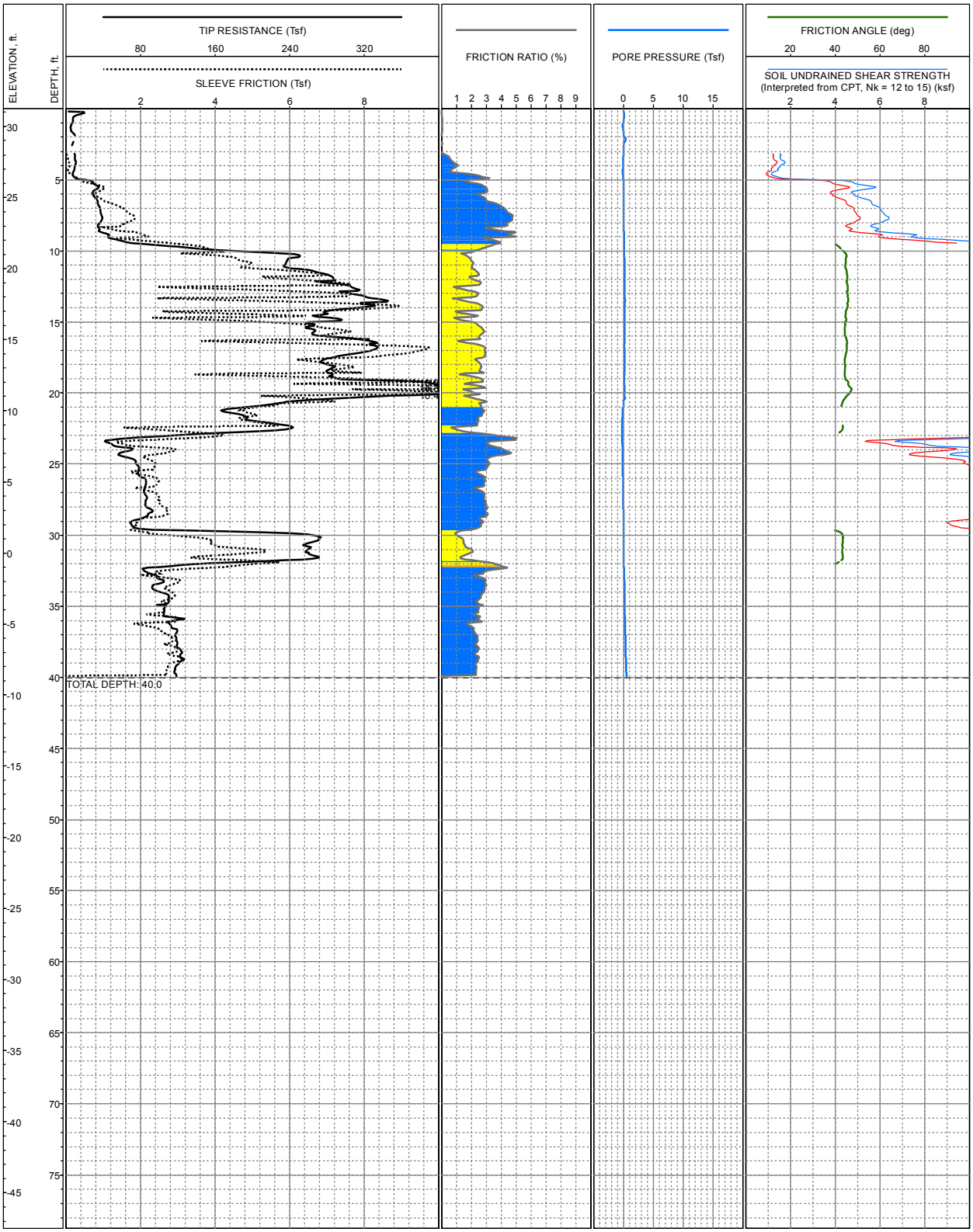

LOCATION: E5,998,602, N 1,979,570, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.2ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-324

San Joaquin Apartments & Precinct Improvements
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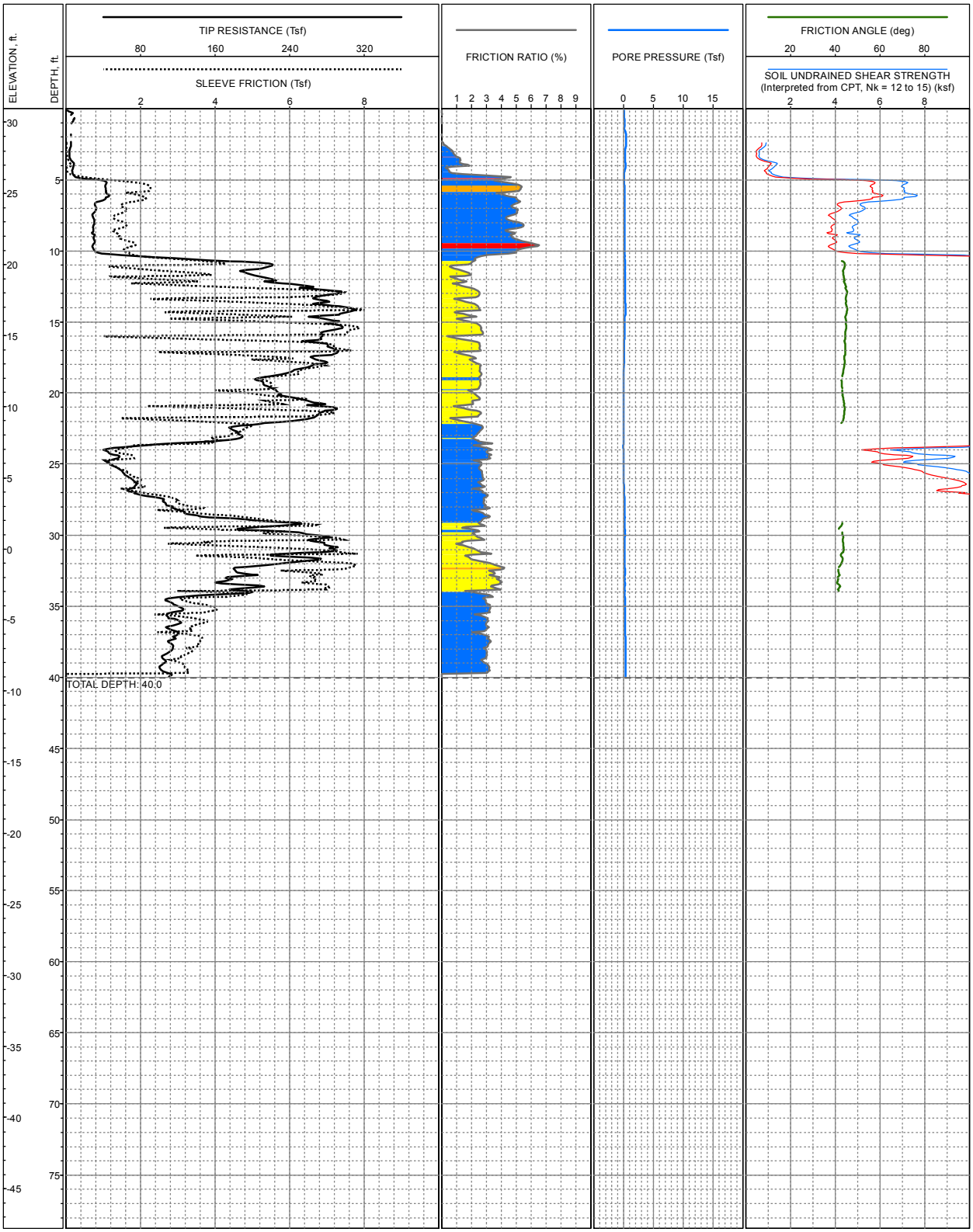

LOCATION: E5,998,603, N 1,979,590, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.0ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-325

San Joaquin Apartments & Precinct Improvements
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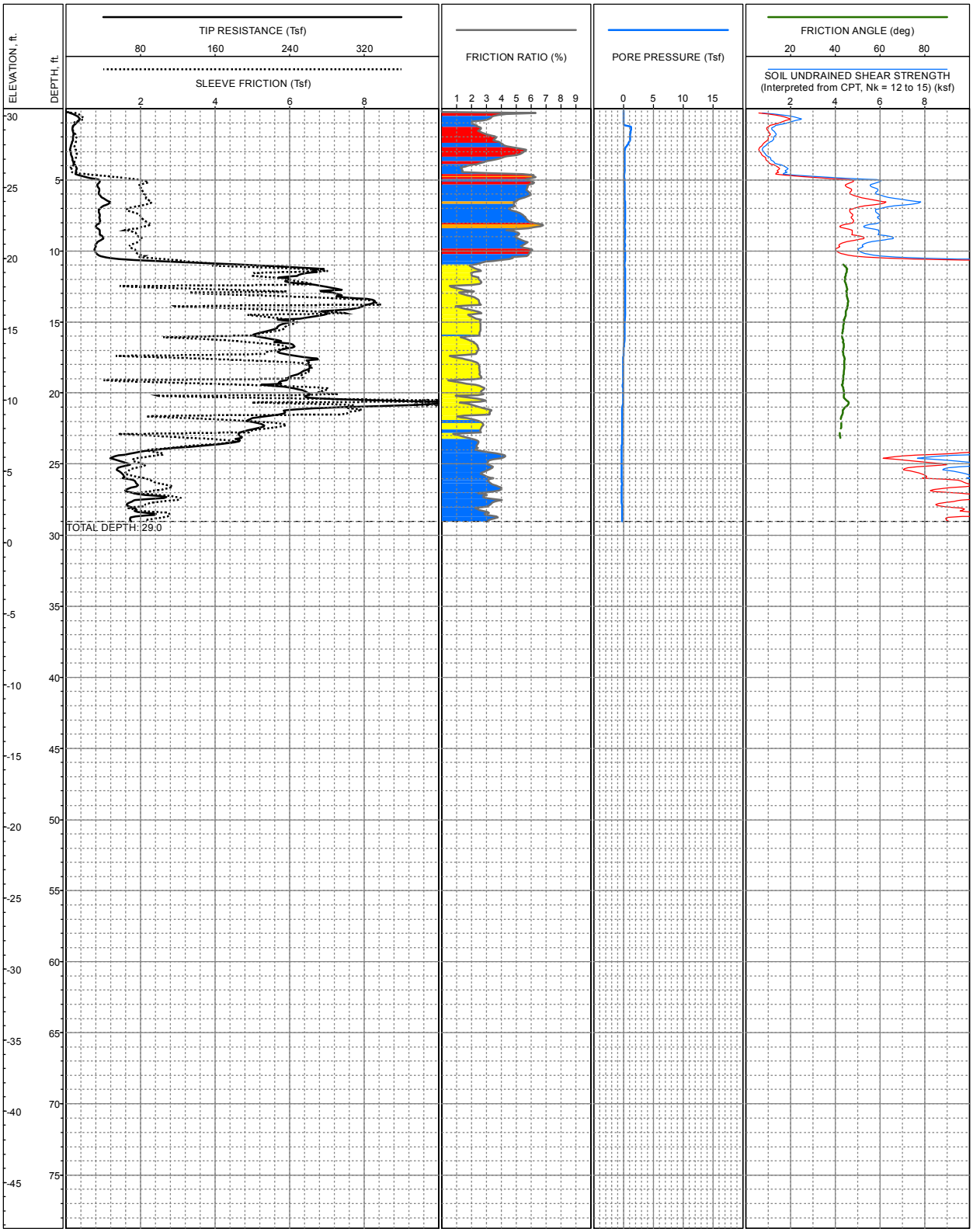

LOCATION: E5,998,603, N 1,979,605, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 30.5ft +/- ()
COMPLETION DEPTH: 29.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-326

San Joaquin Apartments & Precinct Improvements
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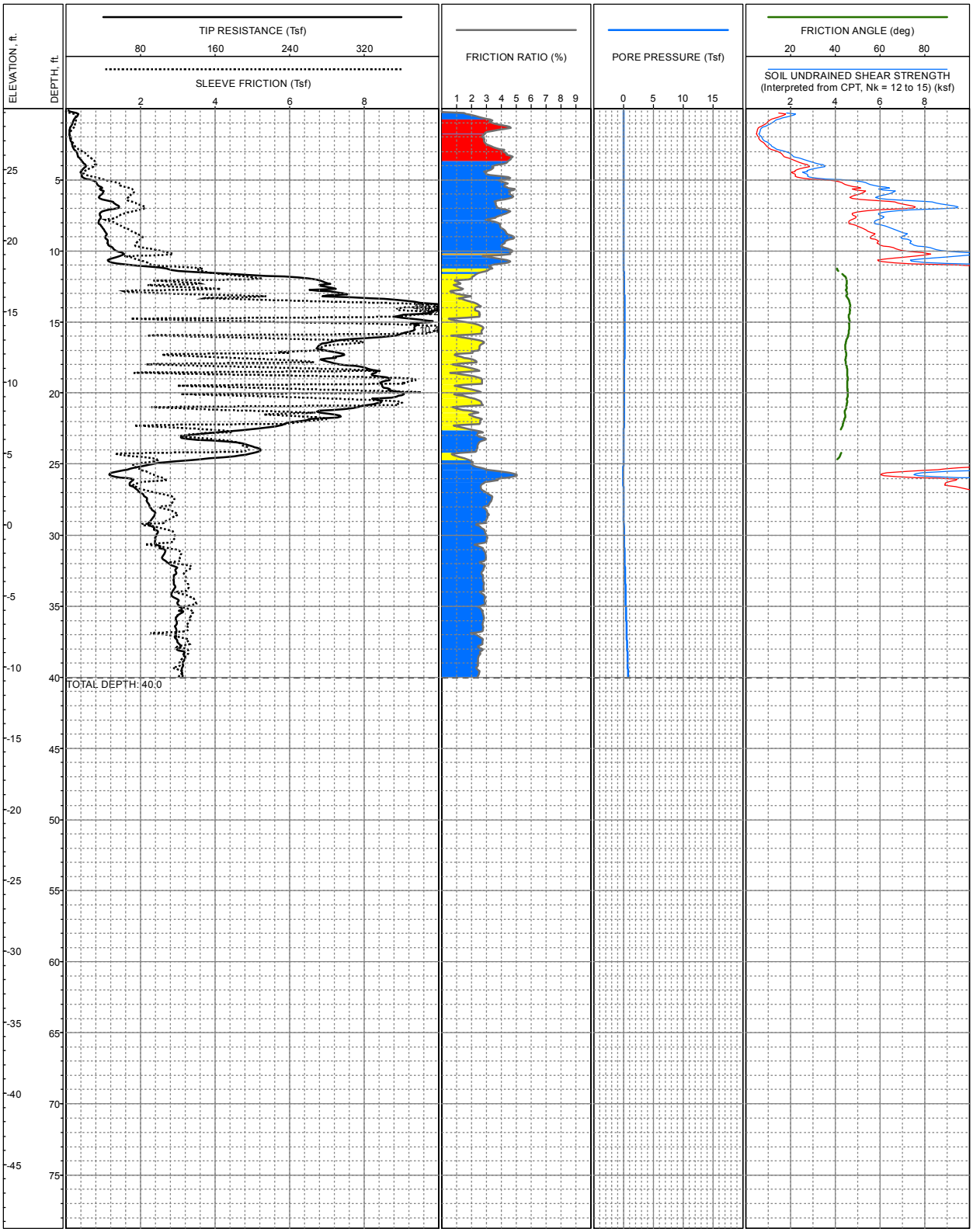

LOCATION: E5,998,604, N 1,979,637, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 29.3ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-327

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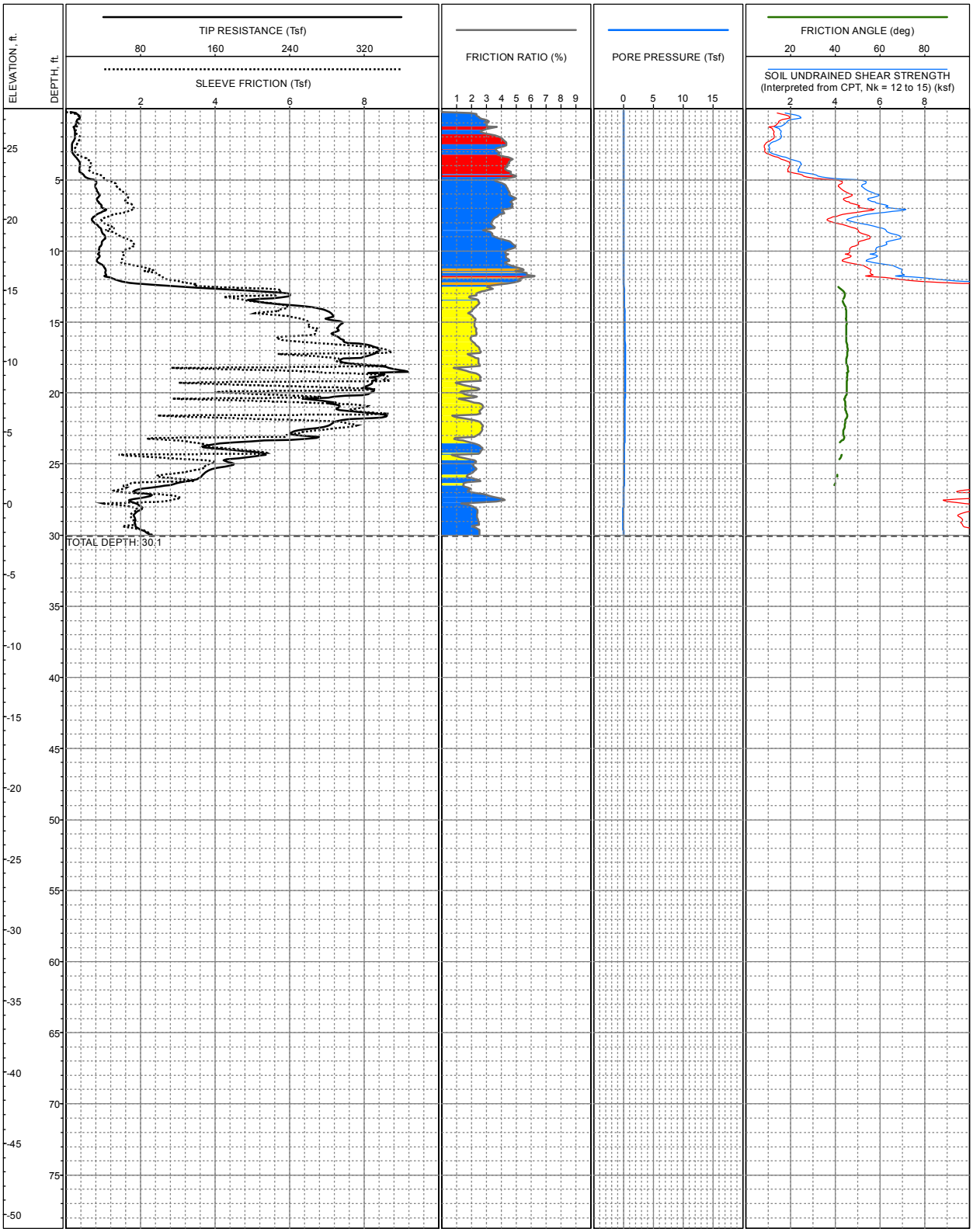

LOCATION: E5,998,605, N 1,979,672, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 27.8ft +/- ()
COMPLETION DEPTH: 30.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-328

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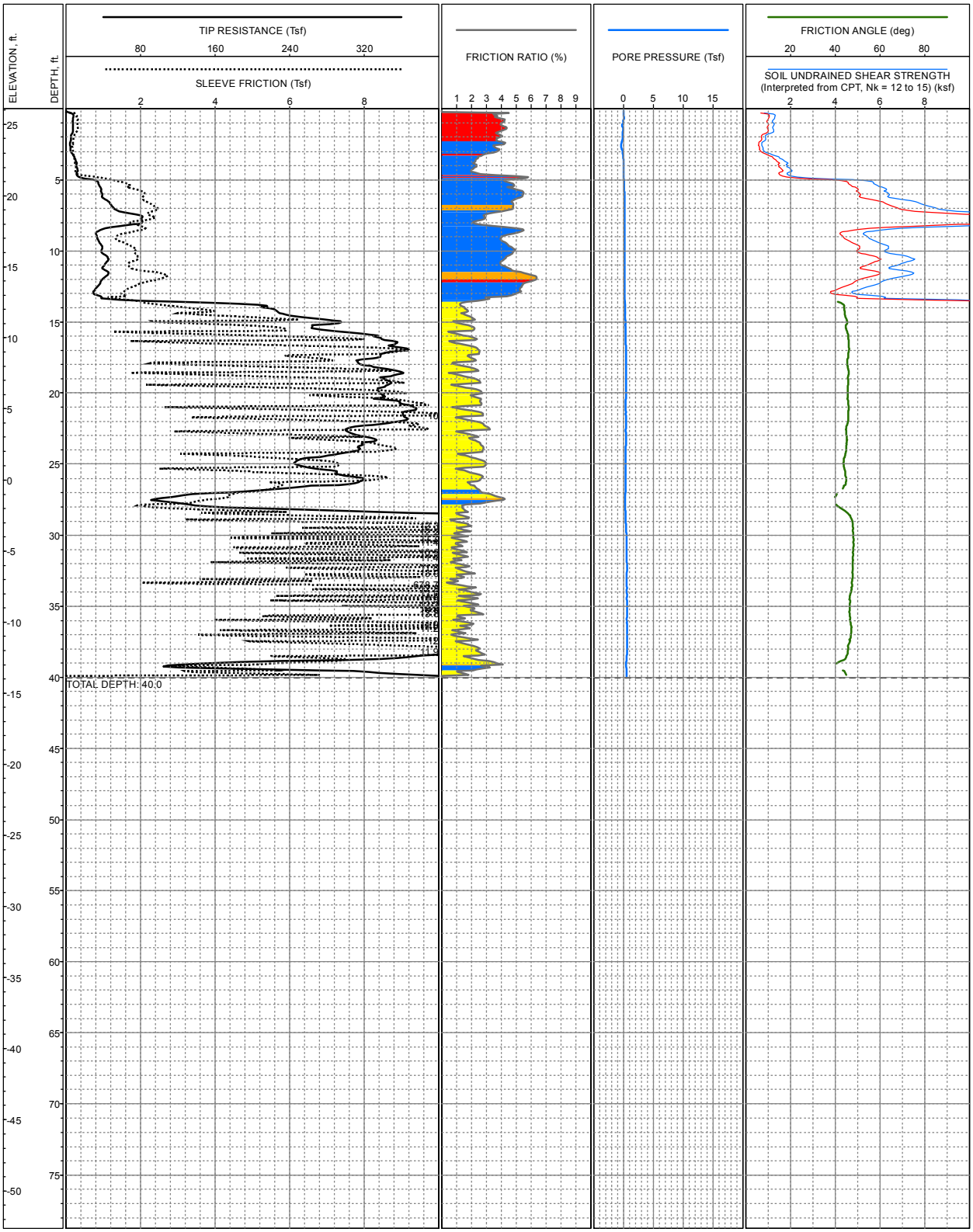

LOCATION: E5,998,606, N 1,979,709, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 26.1ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-329

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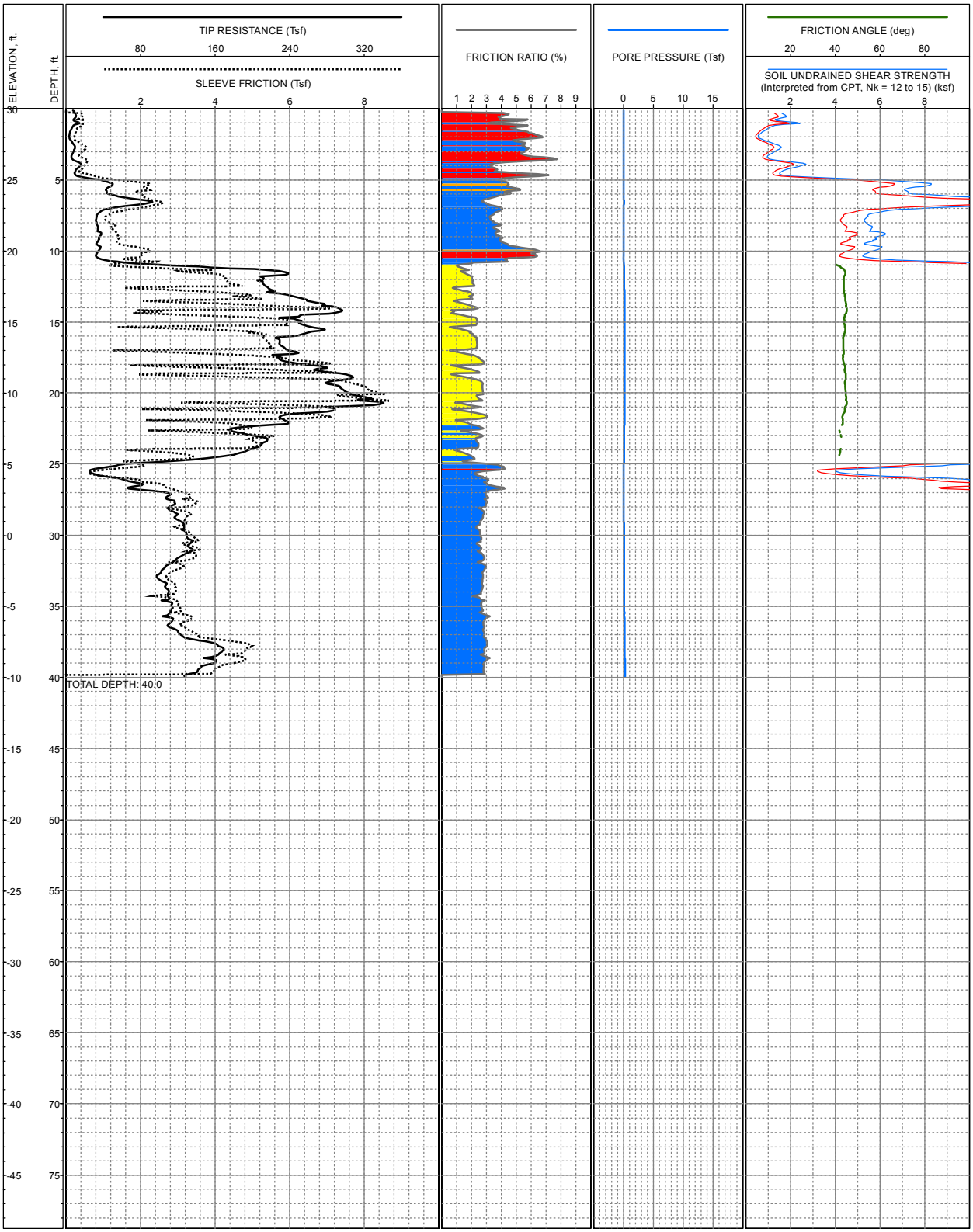


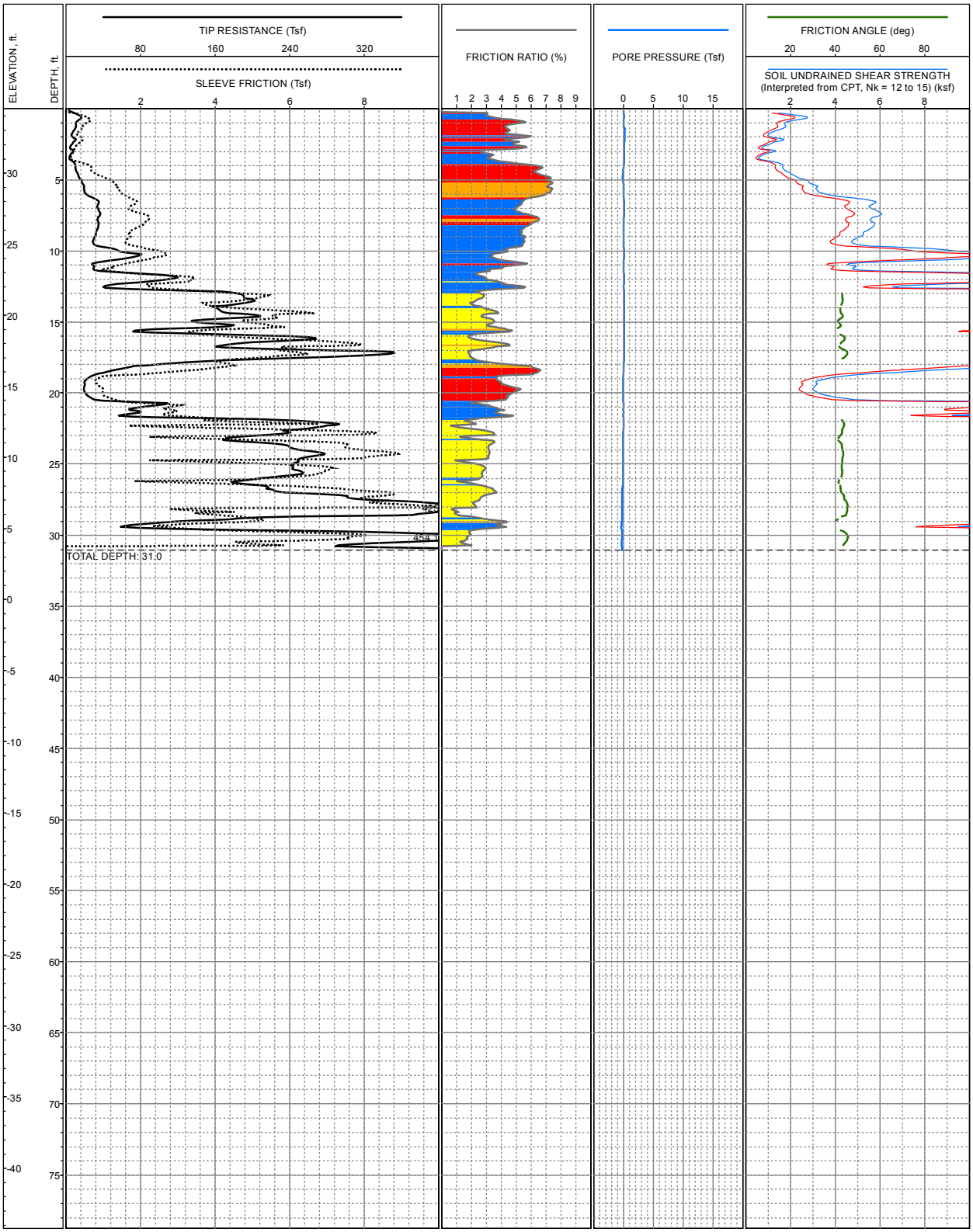
LOCATION: E5,998,603, N 1,979,620, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 30.0ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-330

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

N:\Projects\04_2011\04_6211_0136_UCSB_SCatalina_Housing\Explorations\CPT\2012\Logs\2012_06_18_Logs_SuF\MXD\CPT_Proc_VK12C.mxd,06/19/2012,CDean



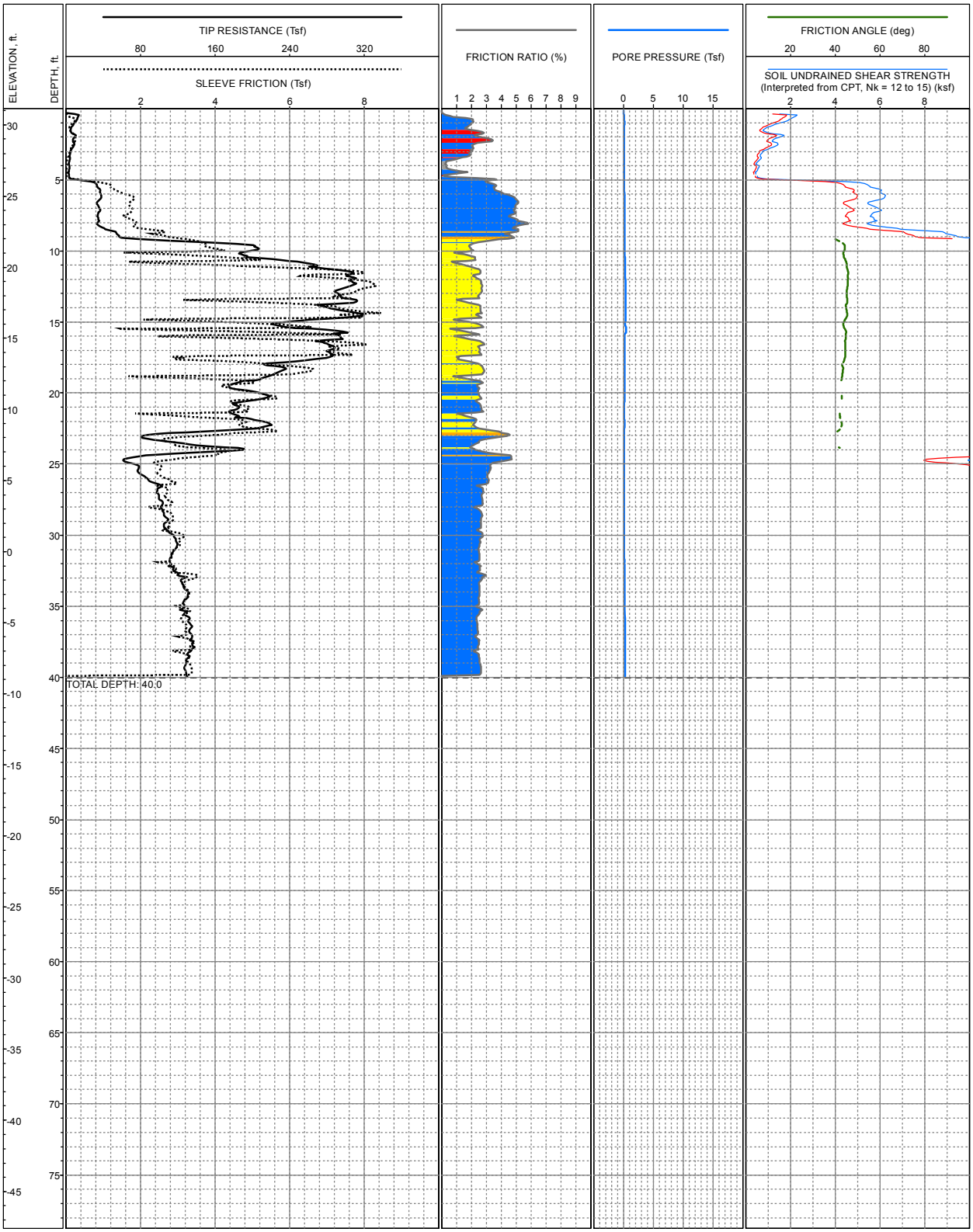
LOCATION: E5,998,443, N 1,979,655, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 34.5ft +/- ()
COMPLETION DEPTH: 31.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-331

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

N:\Projects\04_2011\04_6211_0136_UCSB_SCatalina_Housing\Explorations\CPT\2012\Logs\2012_06_18_Logs_SuF\MXD\CPT_Proc_VK12C.mxd,06/19/2012,CDean



LOCATION: E5,998,602, N 1,979,558, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.1ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-332

San Joaquin Apartments & Precinct Improvements
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Santa Barbara, California

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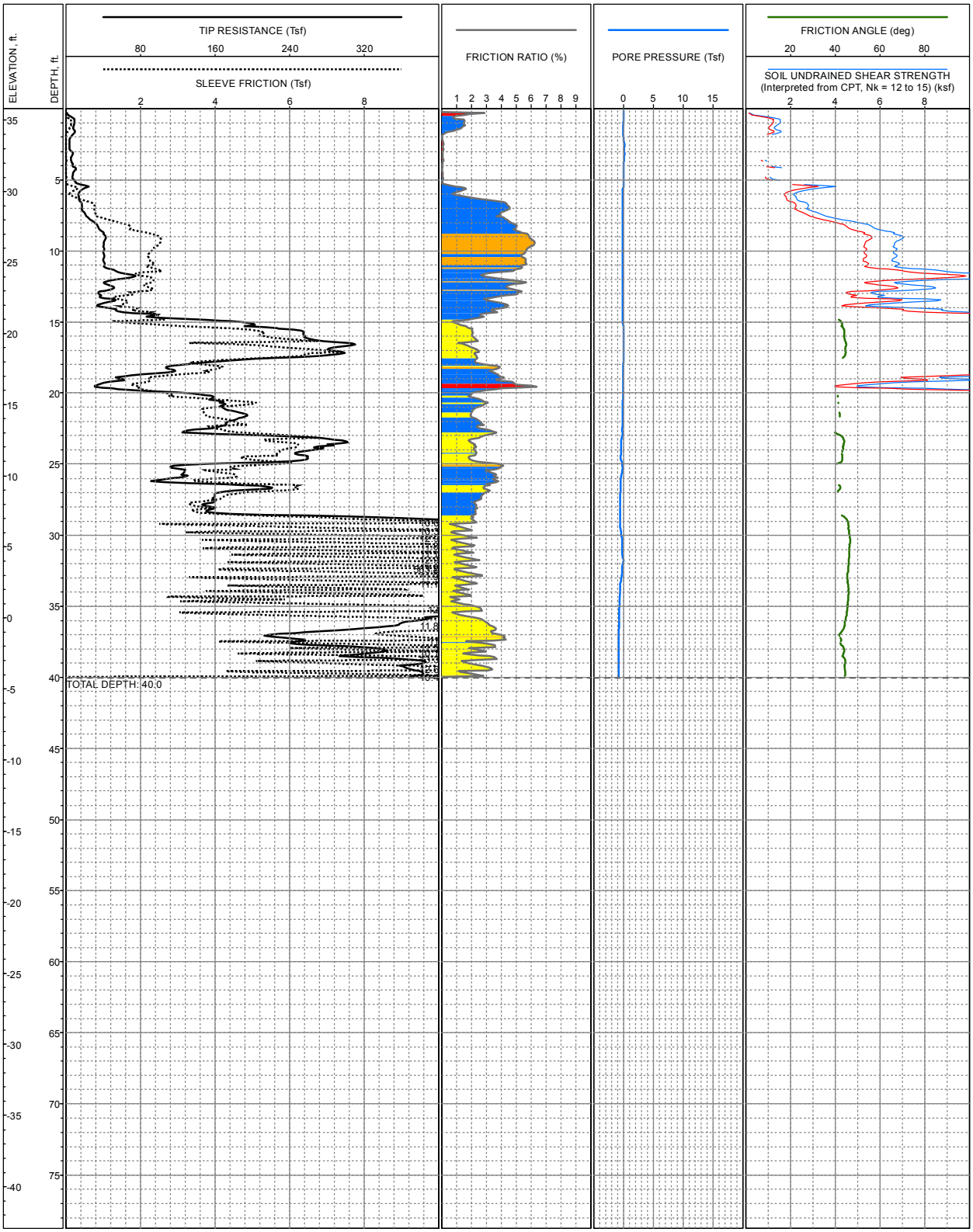

LOCATION: E5,998,430, N 1,979,683, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.8ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-333

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

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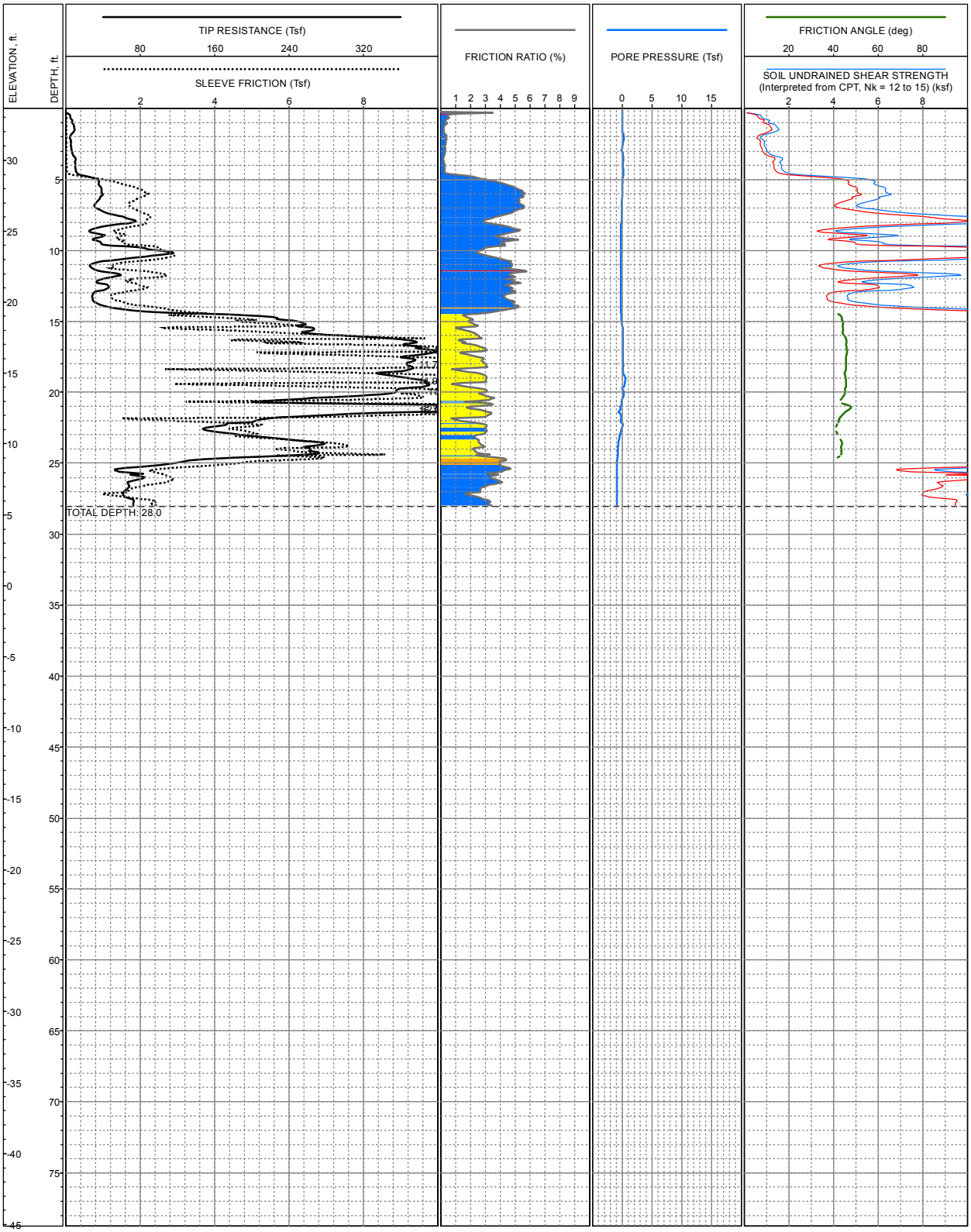

LOCATION: E5,998,457, N 1,979,623, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 33.6ft +/- ()
COMPLETION DEPTH: 28.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-334

San Joaquin Apartments & Precinct Improvements
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Santa Barbara, California

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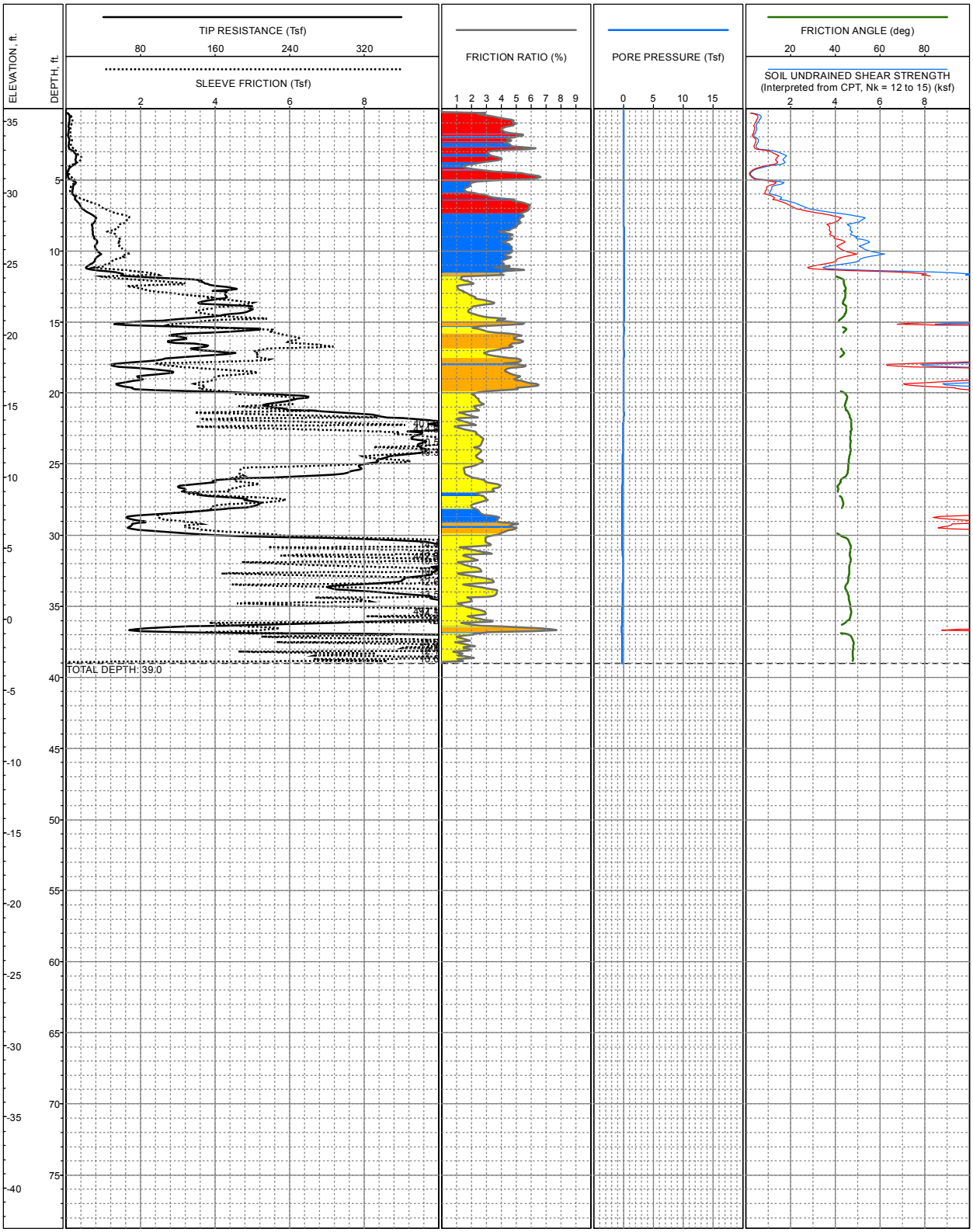

LOCATION: E5,998,327, N 1,979,615, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.9ft +/- ()
COMPLETION DEPTH: 39.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-335

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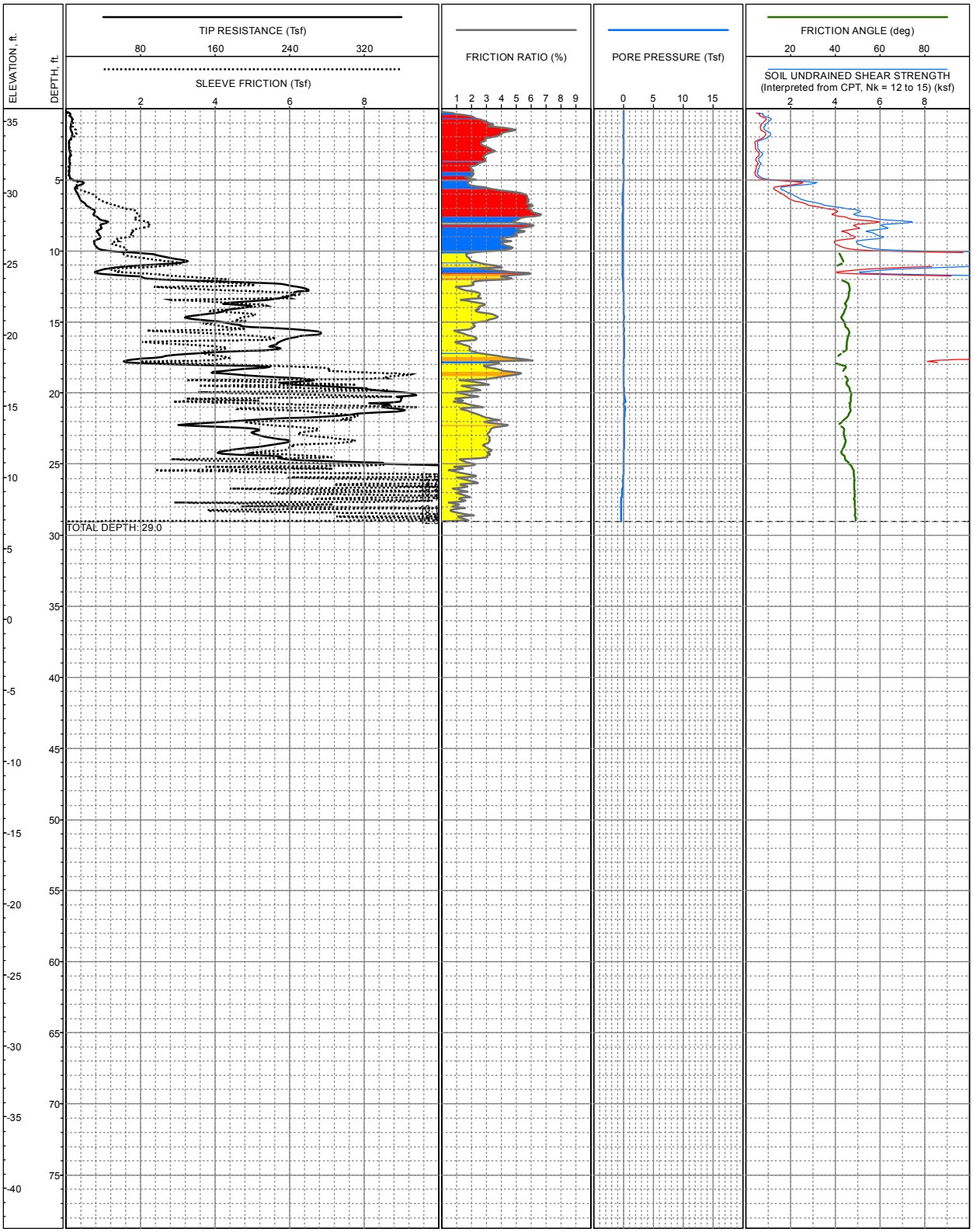

LOCATION: E5,998,270, N 1,979,616, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 35.9ft +/- ()
COMPLETION DEPTH: 29.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-336

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

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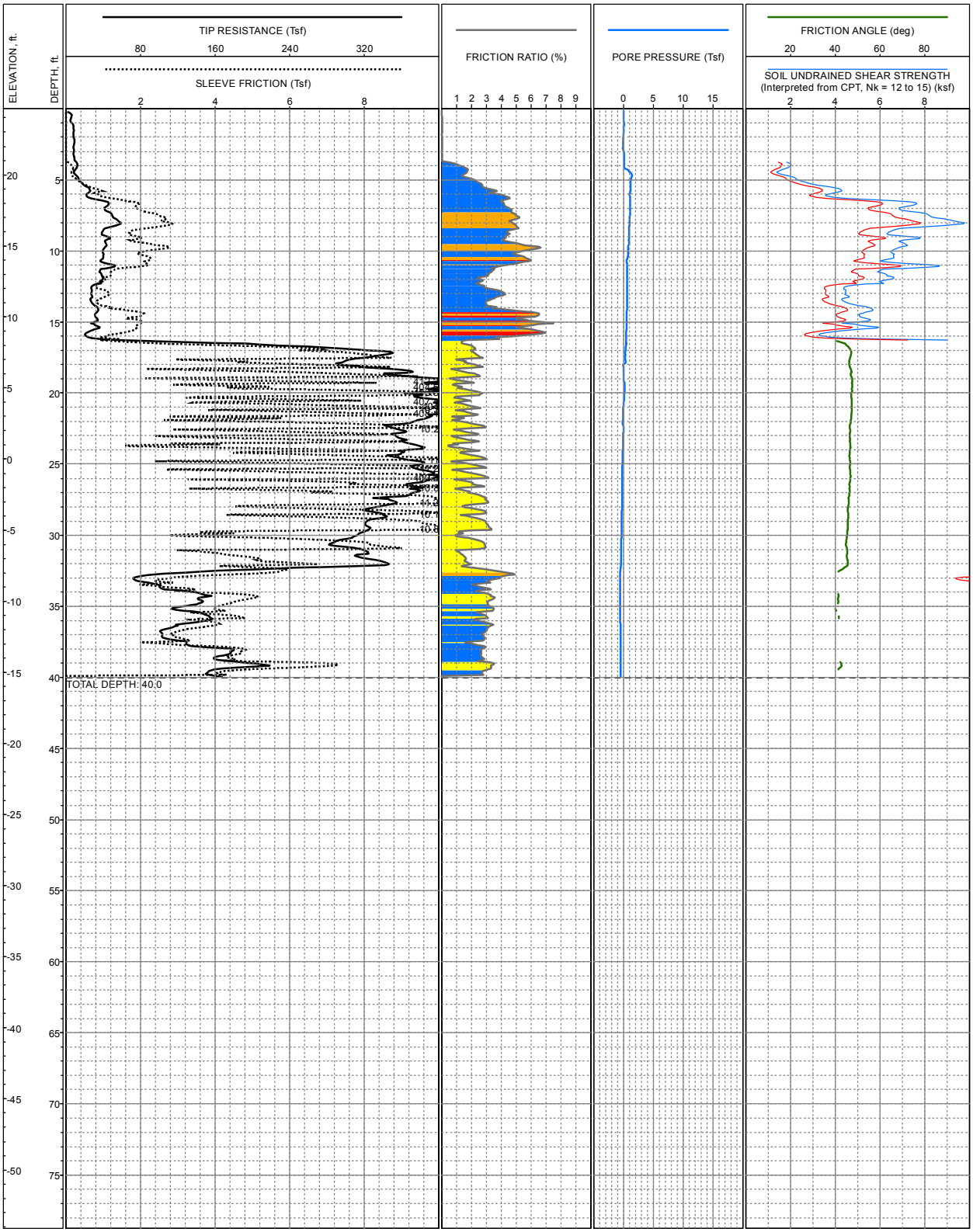

LOCATION: E5,998,070, N 1,980,018, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 24.6ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-337

San Joaquin Apartments & Precinct Improvements
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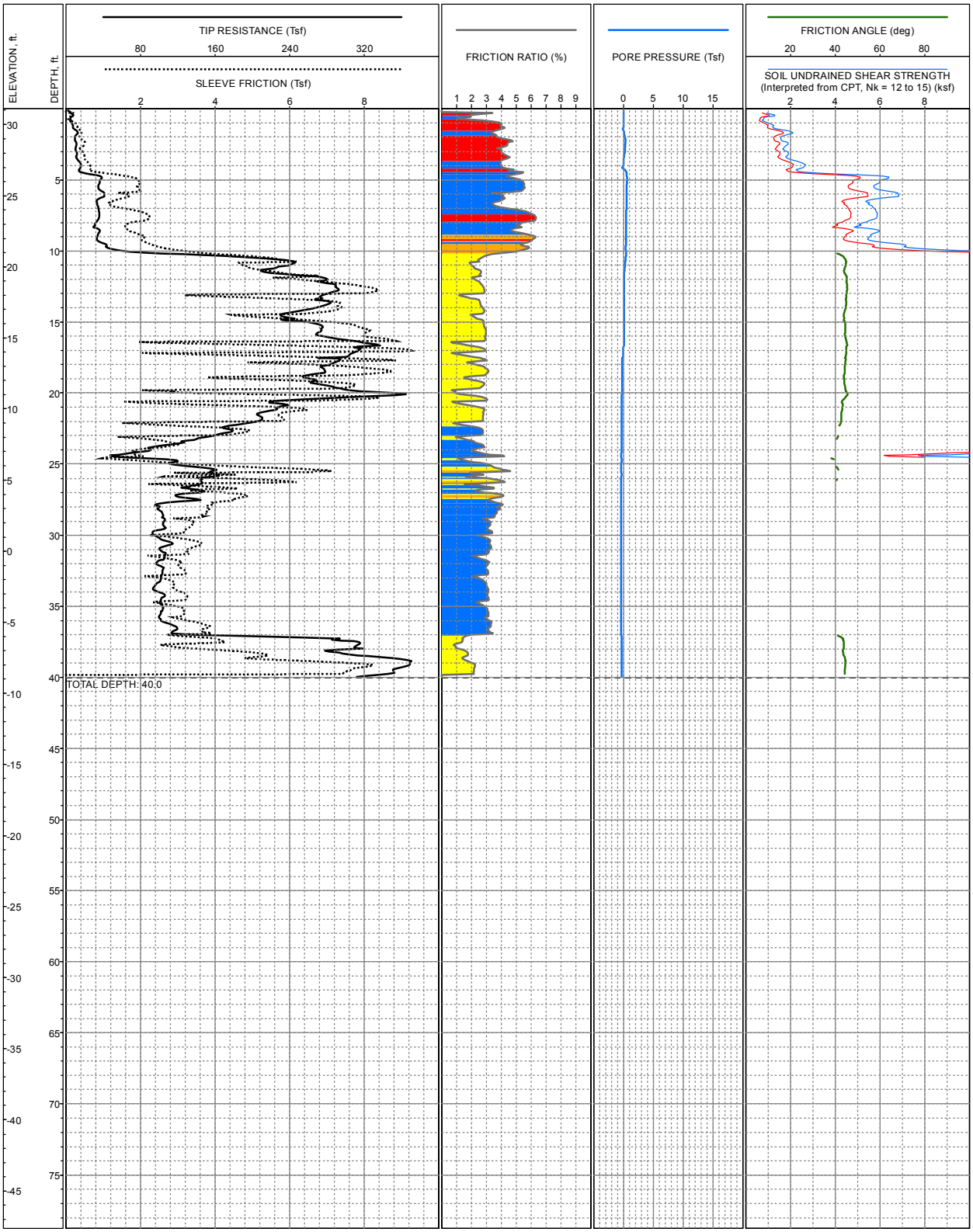
Santa Barbara, California

N:\Projects\04_2011\04_6211_0136_UCSB_SCatalina_Housing\Explorations\CPT\2012\Logs\2012_06_18_Logs_SuF\MXD\CPT_Proc_VK12C.mxd,06/19/2012,CDean



LOCATION: E5,998,603, N 1,979,580, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 31.1ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-338

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

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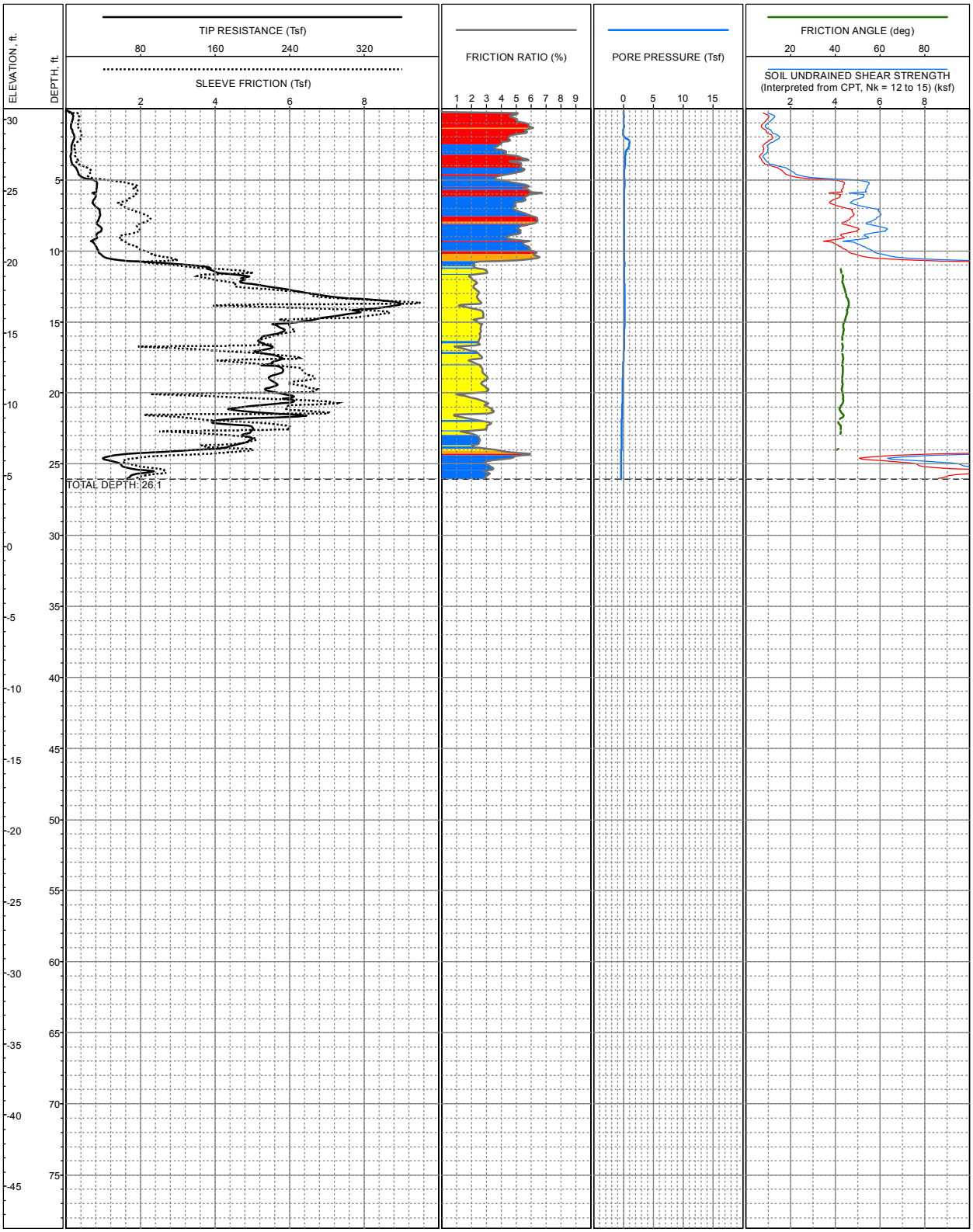

LOCATION: E5,998,603, N 1,979,598, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 30.8ft +/- ()
COMPLETION DEPTH: 26.1ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-339

San Joaquin Apartments & Precinct Improvements
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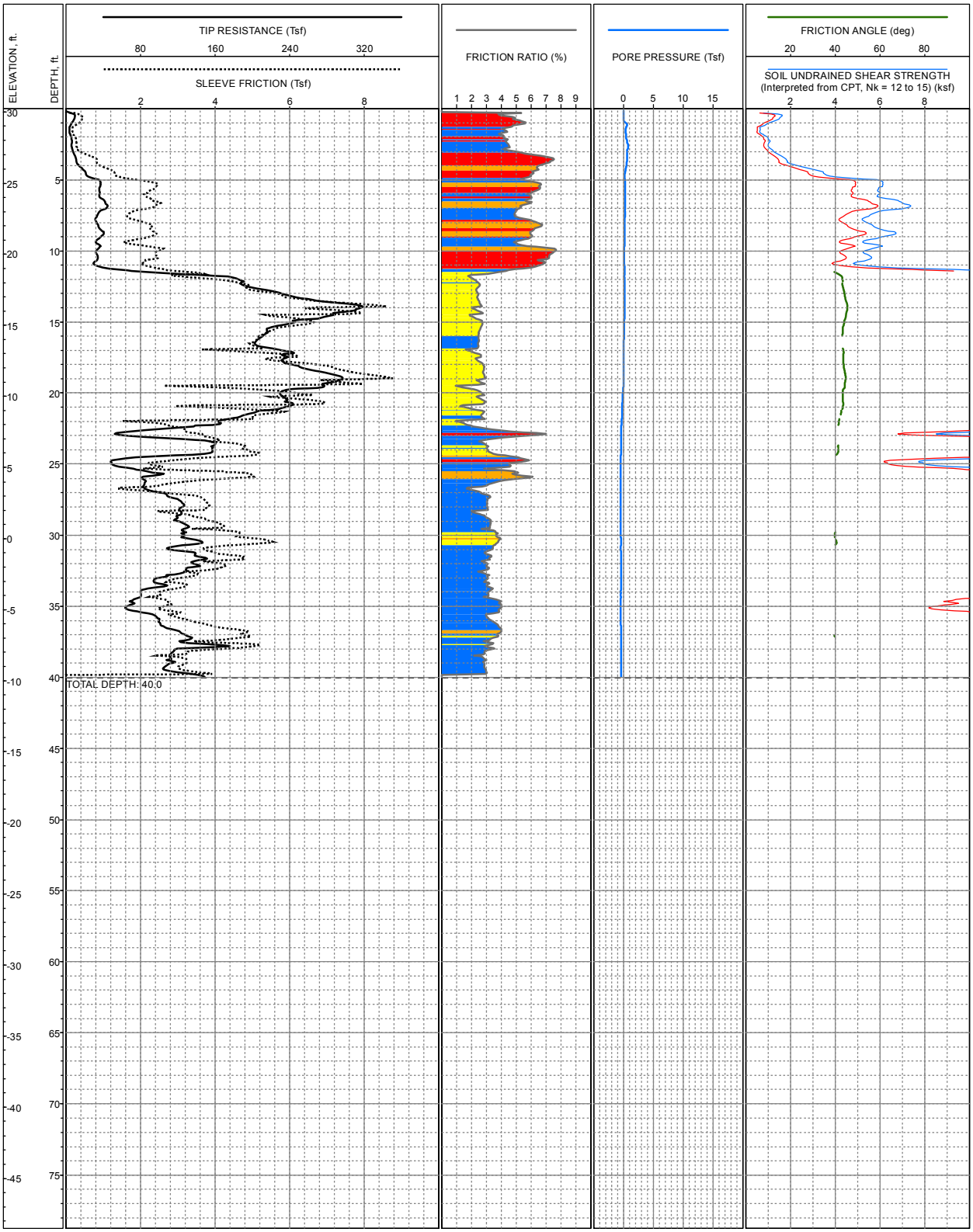

LOCATION: E5,998,603, N 1,979,614, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 30.2ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-340

San Joaquin Apartments & Precinct Improvements
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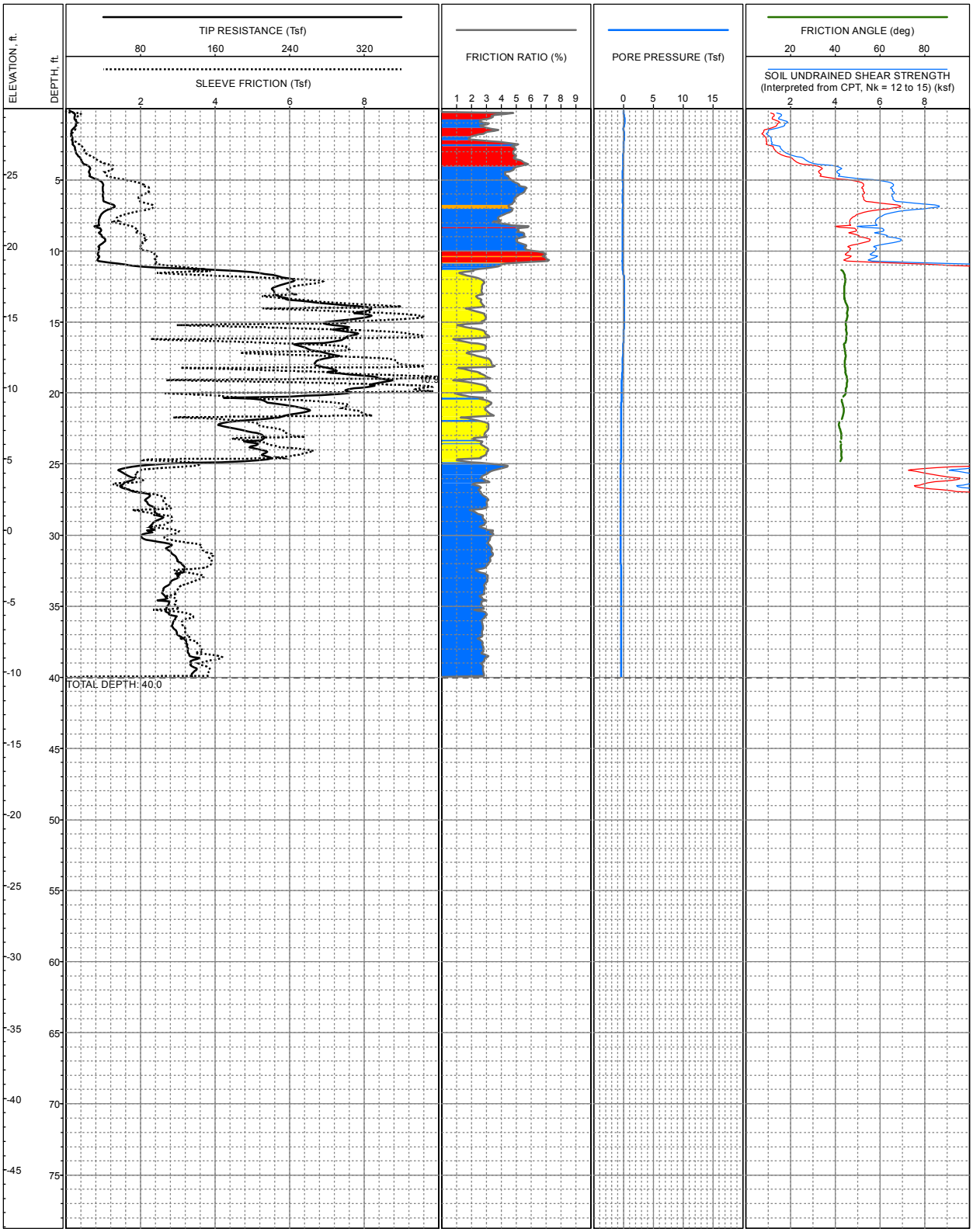

LOCATION: E5,998,604, N 1,979,629, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 29.6ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-341

San Joaquin Apartments & Precinct Improvements
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Santa Barbara, California

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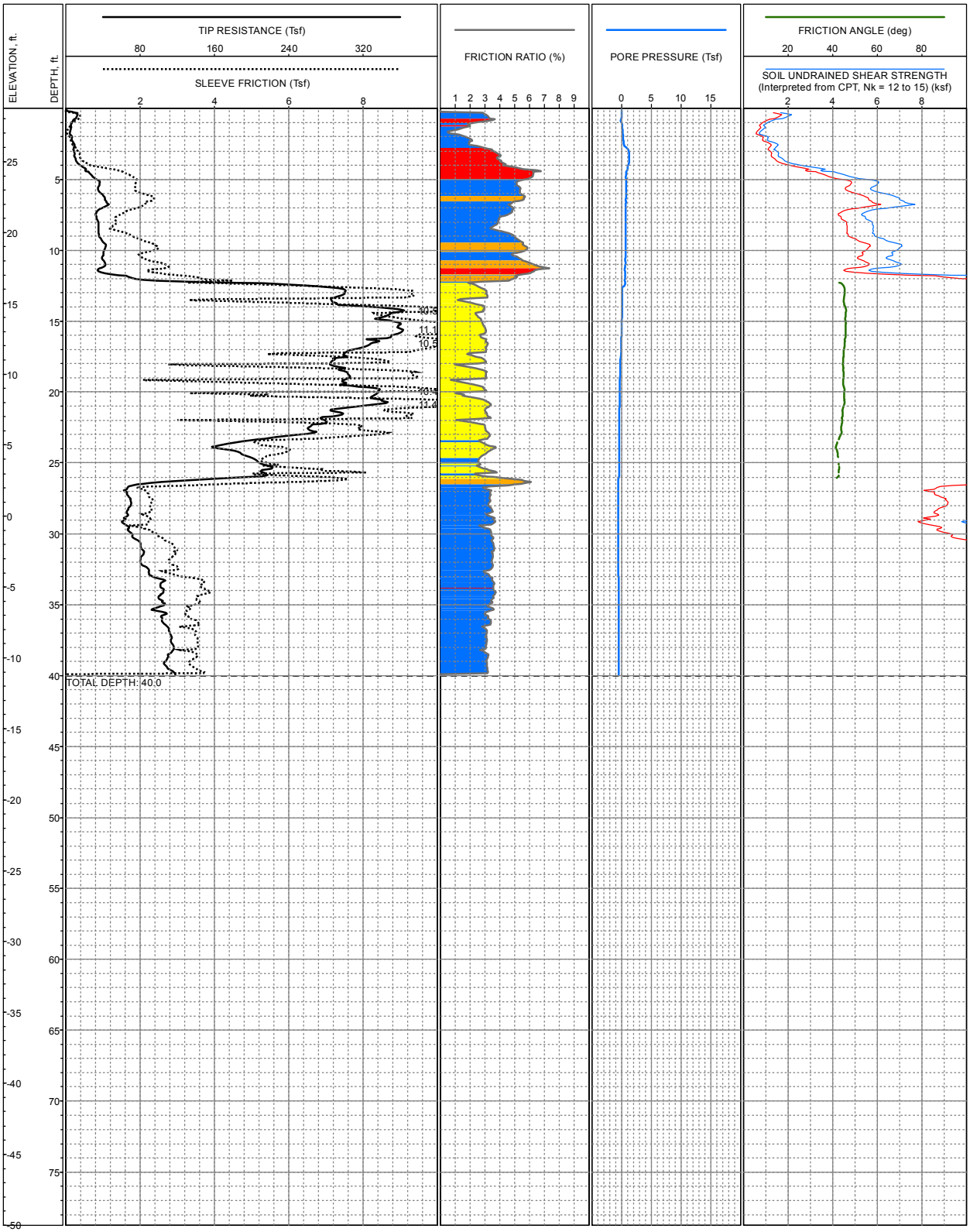

LOCATION: E5,998,604, N 1,979,649, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 28.7ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-342

San Joaquin Apartments & Precinct Improvements
University of California Santa Barbara
Santa Barbara, California

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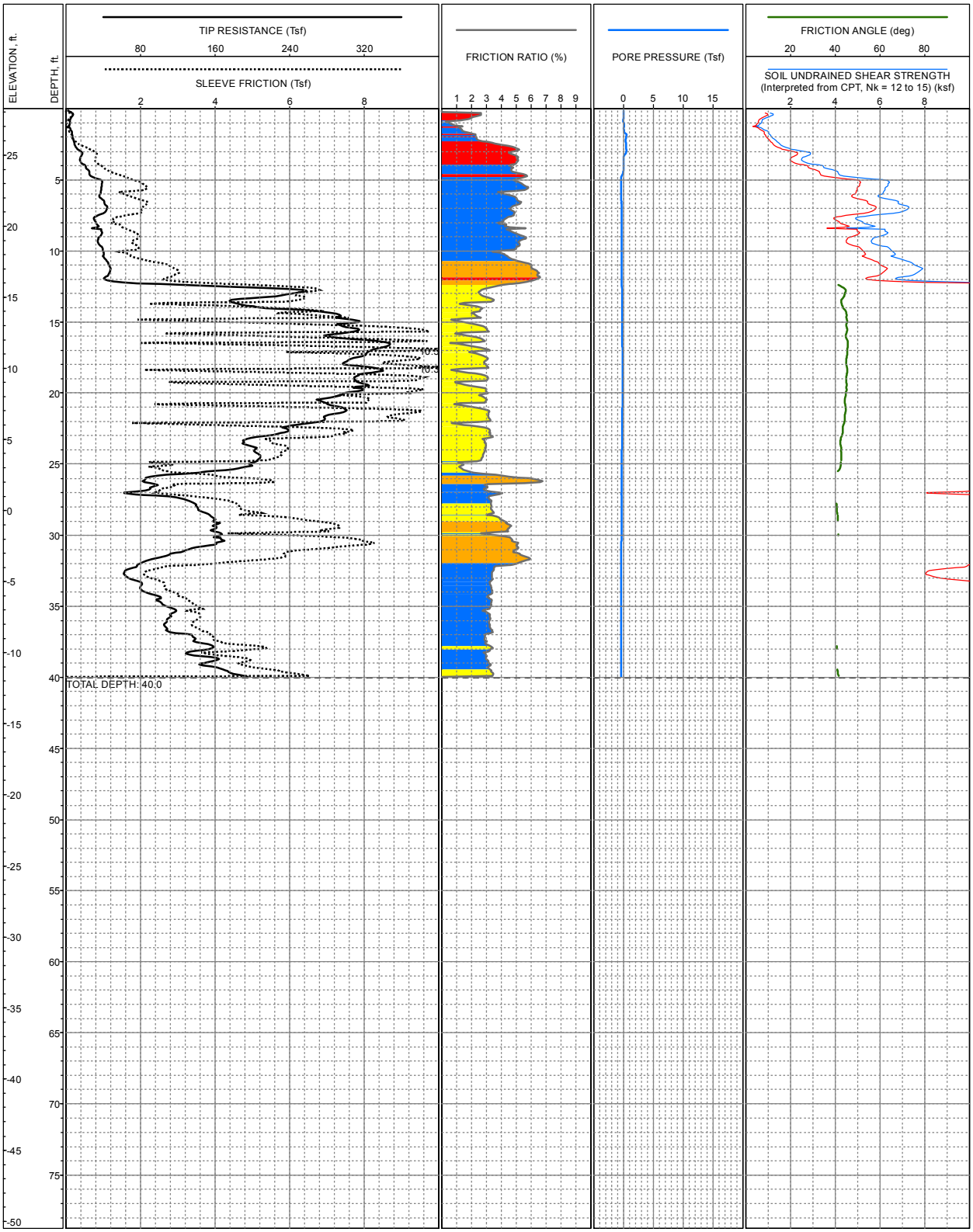

LOCATION: E5,998,605, N 1,979,661, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 28.3ft +/- ()
COMPLETION DEPTH: 40.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-343

San Joaquin Apartments & Precinct Improvements
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Santa Barbara, California

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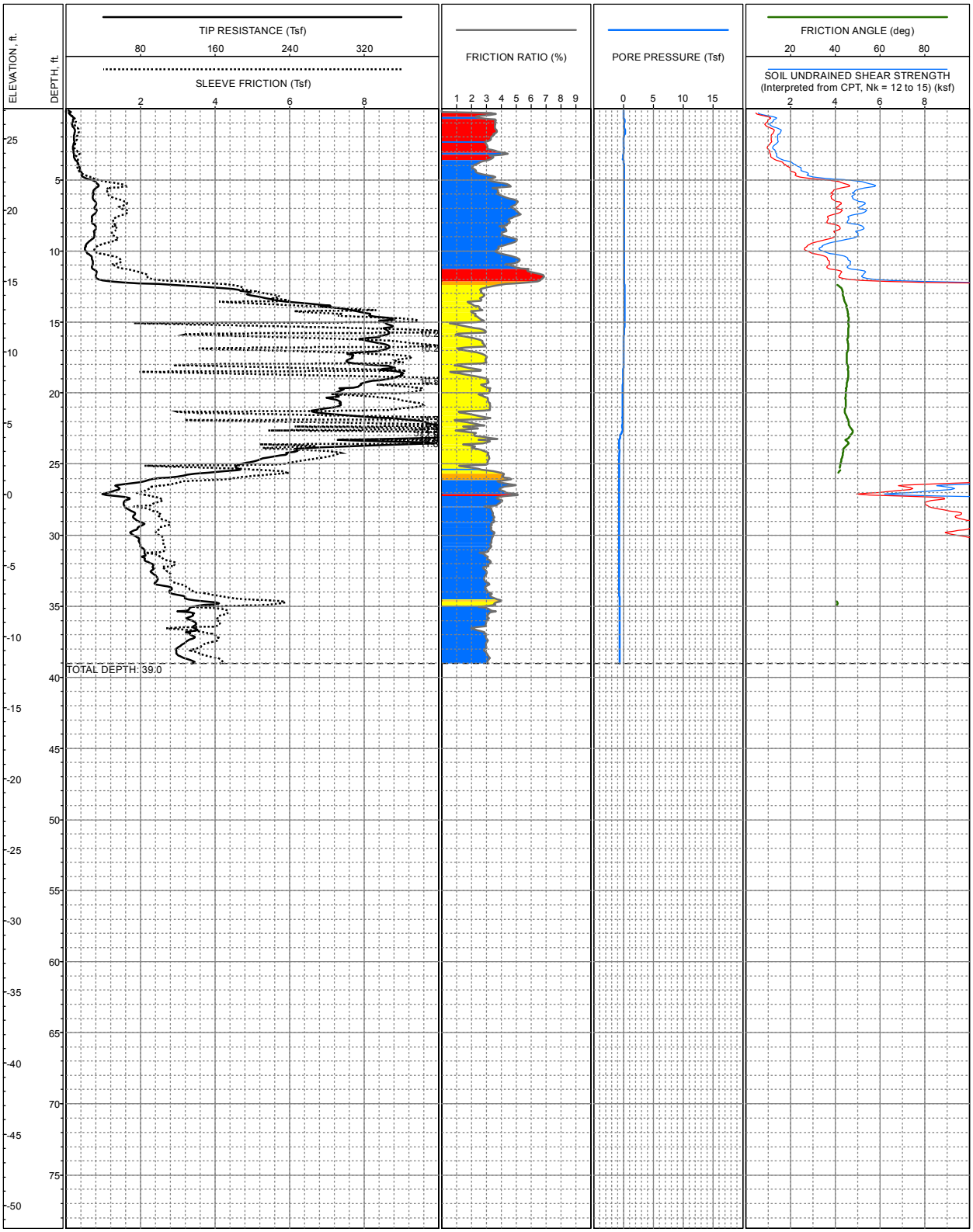

LOCATION: E5,998,605, N 1,979,685, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 27.1ft +/- ()
COMPLETION DEPTH: 39.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-344

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Santa Barbara, California

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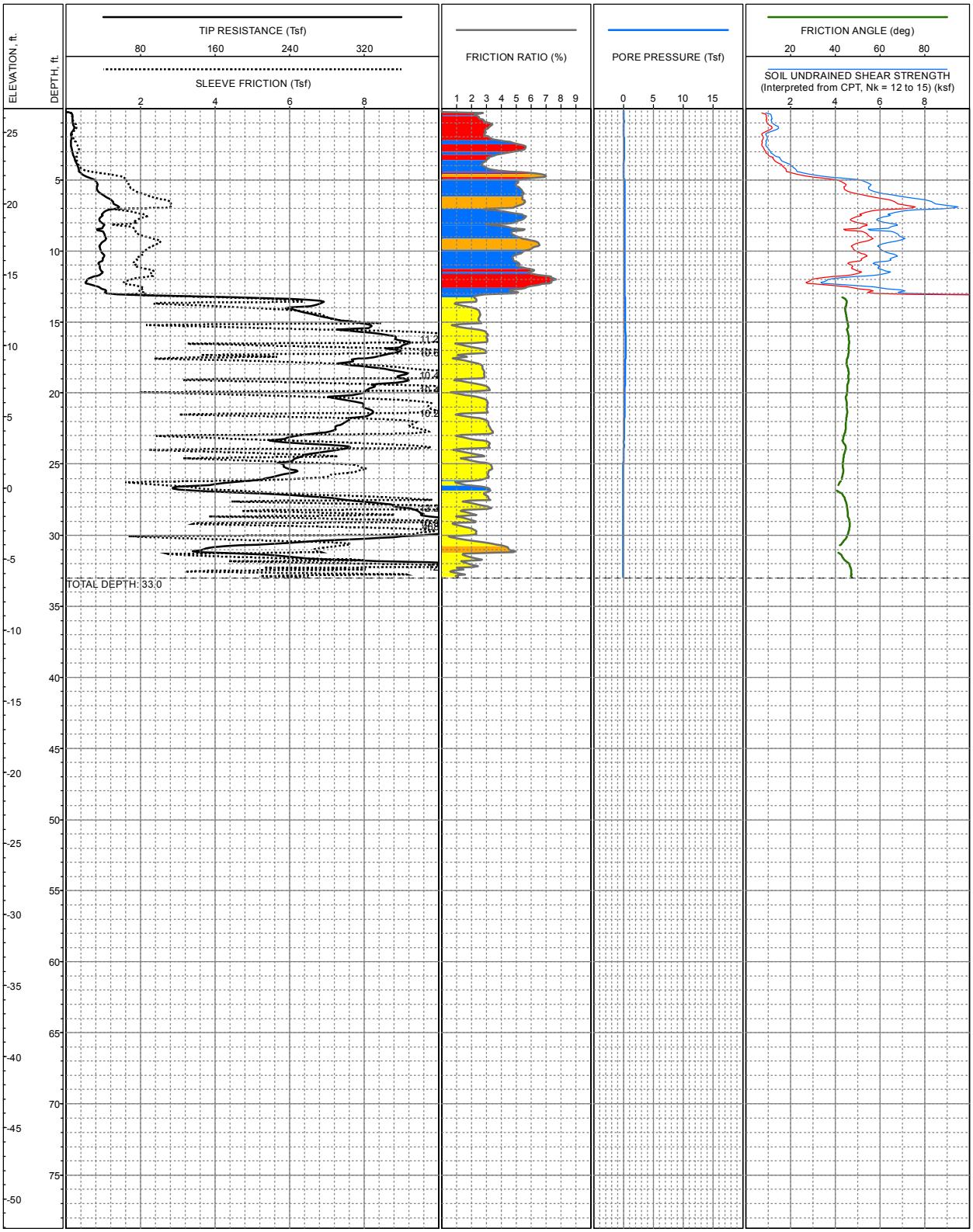

LOCATION: E5,998,605, N 1,979,697, CA State Plane, Zone 5, NAD83, Feet
SURFACE EL: 26.7ft +/- ()
COMPLETION DEPTH: 33.0ft
TESTDATE: 2011-2012

EXPLORATION METHOD: CPT
PERFORMED BY: Kehoe Testing
REVIEWED BY: G. Denlinger
CONE AREA RATIO: 0.85

LOG OF CPT NO: CPT-345

San Joaquin Apartments & Precinct Improvements
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Santa Barbara, California

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Beta Analytic Inc.
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www.radiocarbon.com

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June 12, 2012

Mr. Thomas Blake
Fugro Consultants
4820 McGrath Street
Suite 100
Ventura, CA 93003-7778
USA

RE: Radiocarbon Dating Result For Sample BH-17-C-57@8.35ft

Dear Mr. Blake:

Enclosed is the radiocarbon dating result for one sample recently sent to us. It provided plenty of carbon for an accurate measurement and the analysis proceeded normally. As usual, the method of analysis is listed on the report sheet and calibration data is provided where applicable.

As always, no students or intern researchers who would necessarily be distracted with other obligations and priorities were used in the analysis. It was analyzed with the combined attention of our entire professional staff.

If you have specific questions about the analyses, please contact us. We are always available to answer your questions.

The cost of the analysis was charged to the MASTERCARD card provided. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,

Digital signature on file

BETA ANALYTIC INC.
DR. M.A. TAMERS and MR. D.G. HOOD
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX:305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Thomas Blake

Report Date: 6/12/2012

Fugro Consultants

Material Received: 6/8/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 323469	4770 +/- 30 BP	-26.0 o/oo	4750 +/- 30 BP

SAMPLE : BH-17-C-57@8.35ft
ANALYSIS : AMS-TIMEGUIDE delivery
MATERIAL/PRETREATMENT : (organic sediment): acid washes
2 SIGMA CALIBRATION : Cal BC 3640 to 3510 (Cal BP 5590 to 5460) AND Cal BC 3500 to 3500 (Cal BP 5450 to 5450)
Cal BC 3430 to 3380 (Cal BP 5380 to 5330)

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-26:lab. mult=1)

Laboratory number: **Beta-323469**

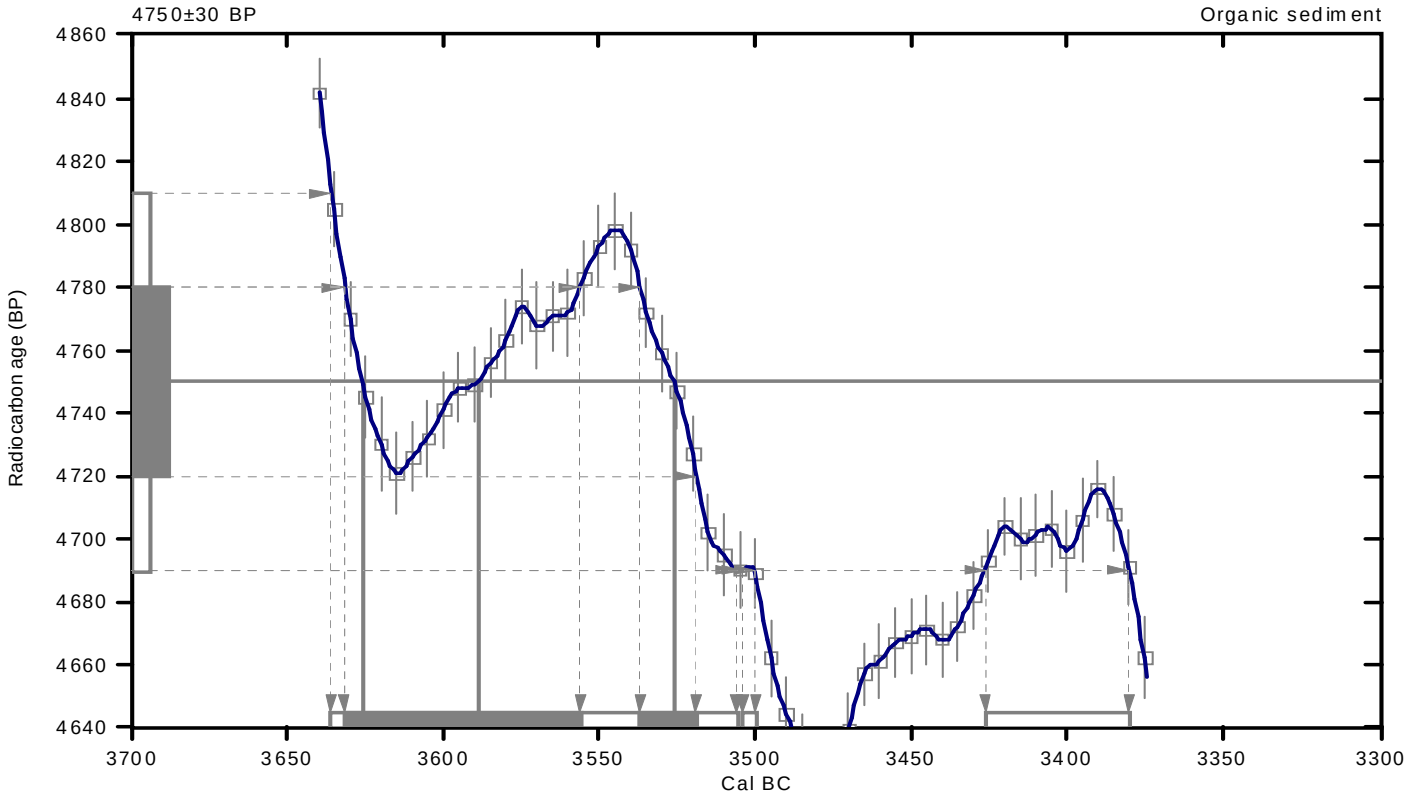
Conventional radiocarbon age: **4750±30 BP**

2 Sigma calibrated results: **Cal BC 3640 to 3510 (Cal BP 5590 to 5460) and**
(95% probability) **Cal BC 3500 to 3500 (Cal BP 5450 to 5450) and**
Cal BC 3430 to 3380 (Cal BP 5380 to 5330)

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal BC 3630 (Cal BP 5580) and
Cal BC 3590 (Cal BP 5540) and
Cal BC 3530 (Cal BP 5480)

1 Sigma calibrated results: Cal BC 3630 to 3560 (Cal BP 5580 to 5510) and
(68% probability) Cal BC 3540 to 3520 (Cal BP 5490 to 5470)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

Beta Analytic Radiocarbon Dating Laboratory

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April 2, 2012

Mr. Thomas Blake
Fugro Consultants
4820 McGrath Street
Suite 100
Ventura, CA 93003-7778

RE: Radiocarbon Dating Results For Samples BH-1@24.6ft, BH-1@34.2ft, BH-2@27.8ft, BH-5@29.5ft, BH-9@14.13ft, BH-11@7.5ft

Dear Mr. Blake:

Enclosed are the radiocarbon dating results for six samples recently sent to us. They each provided plenty of carbon for accurate measurements and all the analyses proceeded normally. The report sheet contains the dating result, method used, material type, applied pretreatment and two-sigma calendar calibration result (where applicable) for each sample.

This report has been both mailed and sent electronically, along with a separate publication quality calendar calibration page. This is useful for incorporating directly into your reports. It is also digitally available in Windows metafile (.wmf) format upon request. Calibrations are calculated using the newest (2004) calibration database. References are quoted on the bottom of each calibration page. Multiple probability ranges may appear in some cases, due to short-term variations in the atmospheric 14C contents at certain time periods. Examining the calibration graphs will help you understand this phenomenon. Calibrations may not be included with all analyses. The upper limit is about 20,000 years, the lower limit is about 250 years and some material types are not suitable for calibration (e.g. water).

We analyzed these samples on a sole priority basis. No students or intern researchers who would necessarily be distracted with other obligations and priorities were used in the analyses. We analyzed them with the combined attention of our entire professional staff.

Information pages are enclosed with the mailed copy of this report. They should answer most of questions you may have. If they do not, or if you have specific questions about the analyses, please do not hesitate to contact us. Someone is always available to answer your questions.

Thank you for prepaying the analyses. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,

Digital signature on file

BETA ANALYTIC INC.
DR. M.A. TAMERS and MR. D.G. HOOD
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX:305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Thomas Blake — Report Date: 4/2/2012

Fugro Consultants — Material Received: 3/23/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 318990	33570 +/- 200 BP	-22.2 o/oo	33620 +/- 200 BP
SAMPLE : BH-1@24.6ft			
ANALYSIS : AMS-PRIORITY delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			
2 SIGMA CALIBRATION : Cal BC 36890 to 36030 (Cal BP 38840 to 37980)			
Beta - 318991	21370 +/- 120 BP	-22.4 o/oo	21410 +/- 120 BP
SAMPLE : BH-1@34.2ft			
ANALYSIS : AMS-PRIORITY delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			
2 SIGMA CALIBRATION : Cal BC 24010 to 23200 (Cal BP 25960 to 25150)			
Beta - 318992	42220 +/- 450 BP	-22.2 o/oo	42270 +/- 450 BP
SAMPLE : BH-2@27.8ft			
ANALYSIS : AMS-PRIORITY delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			
COMMENT: The result is outside of calibration range.			
Beta - 318993	NA	-22.8 o/oo	> 43500 BP
SAMPLE : BH-5@29.5ft			
ANALYSIS : AMS-PRIORITY delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			

COMMENTS:

(1) The 14C activity was extremely low and almost identical to the background signal. In such cases, indeterminant errors associated with the background add non-measurable uncertainty to the result. Always, the result should be considered along with other lines of evidence. The most conservative interpretation of age is infinite (i.e. greater than).

(2) A Measured Radiocarbon Age is not reported for infinite dates since corrections may imply a greater level of confidence than is appropriate.

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

BETA ANALYTIC INC.
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MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX:305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Thomas Blake

Report Date: 4/2/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 318994	14490 +/- 60 BP	-23.5 o/oo	14510 +/- 60 BP
SAMPLE : BH-9@14.13ft			
ANALYSIS : AMS-PRIORITY delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			
2 SIGMA CALIBRATION : Cal BC 15900 to 15600 (Cal BP 17850 to 17550)			
Beta - 318995	17780 +/- 70 BP	-23.2 o/oo	17810 +/- 70 BP
SAMPLE : BH-11@7.5ft			
ANALYSIS : AMS-PRIORITY delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			
2 SIGMA CALIBRATION : Cal BC 19490 to 19270 (Cal BP 21440 to 21220)			

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-22.2:lab. mult=1)

Laboratory number: **Beta-318990**

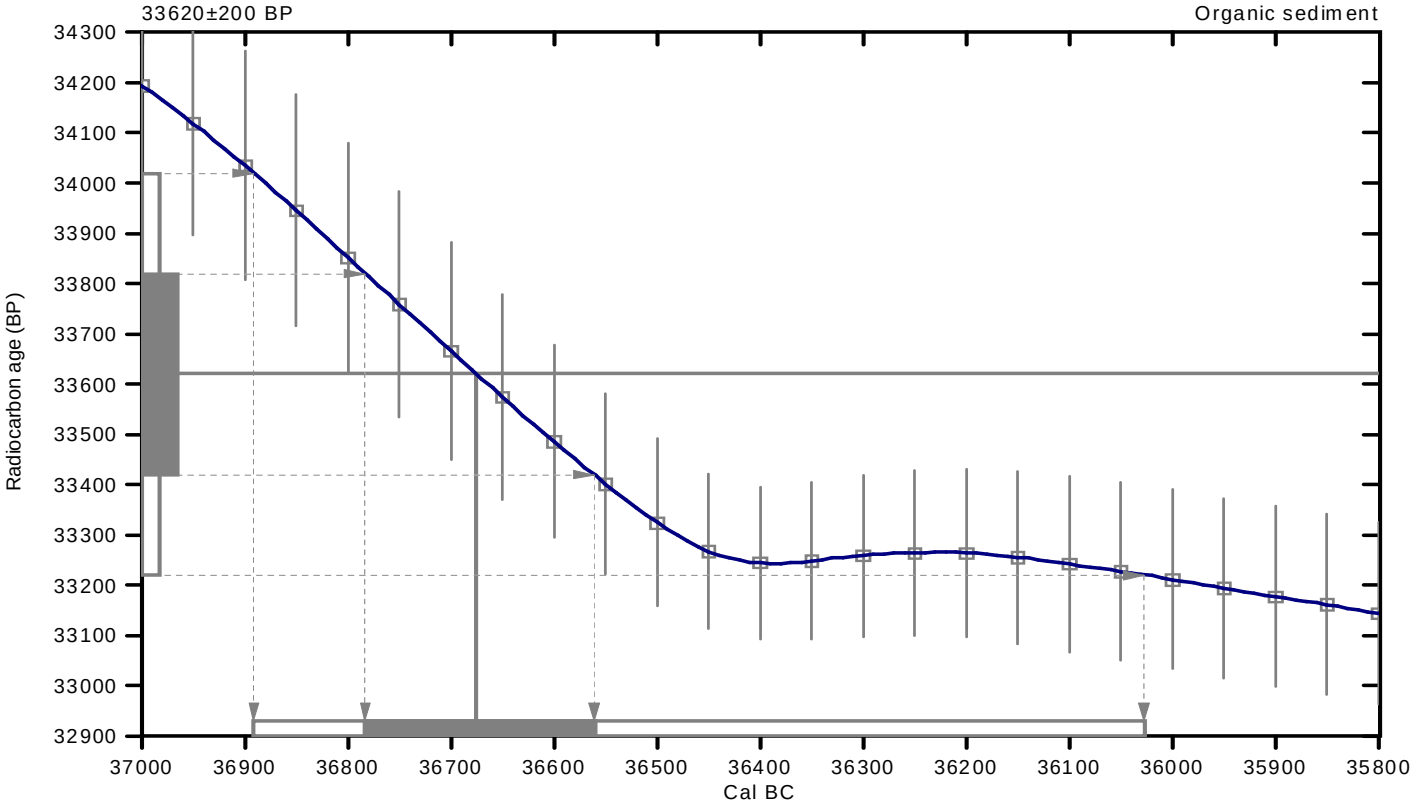
Conventional radiocarbon age: **33620±200 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 36890 to 36030 (Cal BP 38840 to 37980)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 36680 (Cal BP 38620)

1 Sigma calibrated result: (68% probability) Cal BC 36780 to 36560 (Cal BP 38730 to 38510)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-22.4:lab. mult=1)

Laboratory number: **Beta-318991**

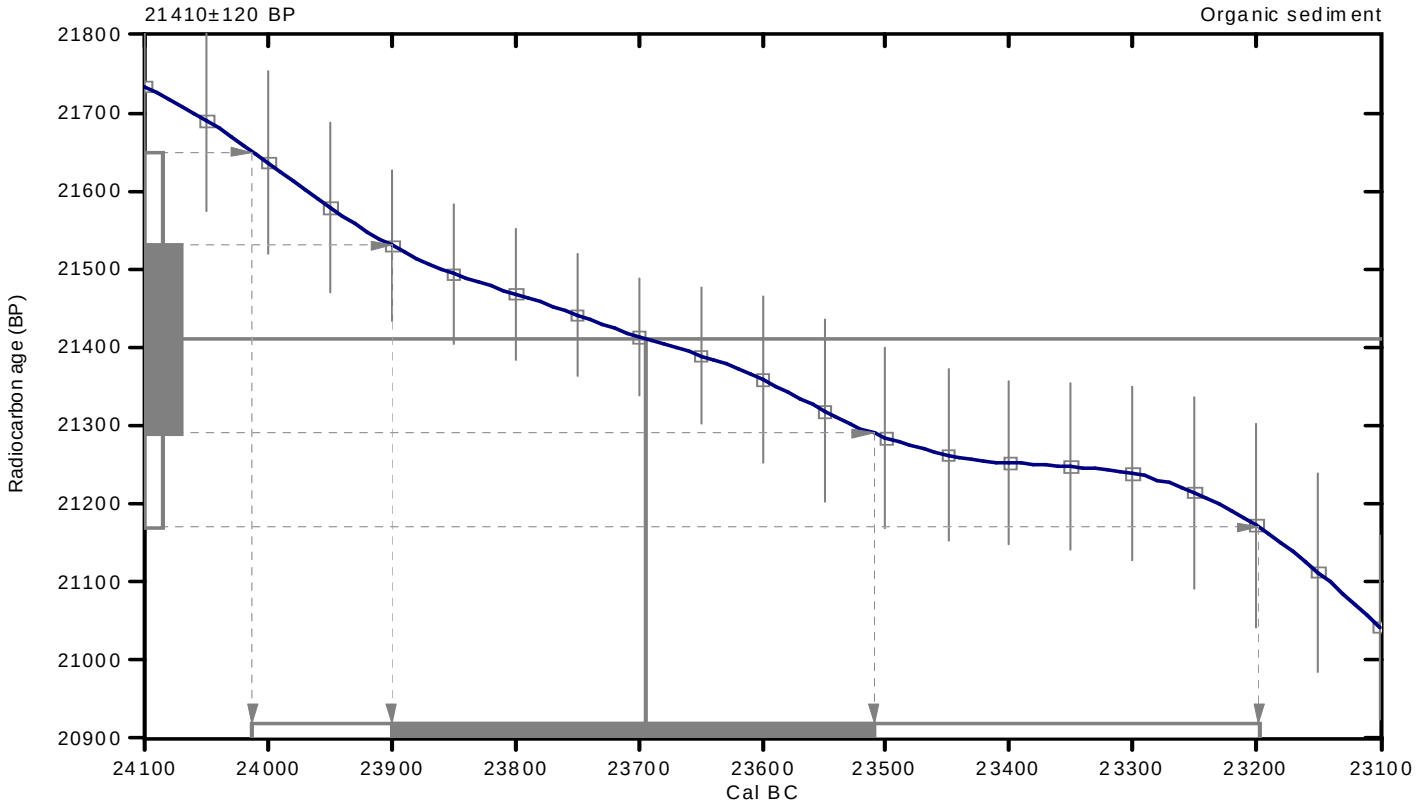
Conventional radiocarbon age: **21410±120 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 24010 to 23200 (Cal BP 25960 to 25150)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 23690 (Cal BP 25640)

1 Sigma calibrated result: (68% probability) Cal BC 23900 to 23510 (Cal BP 25850 to 25460)



References:

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Mathematics used for calibration scenario

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.5:lab. mult=1)

Laboratory number: **Beta-318994**

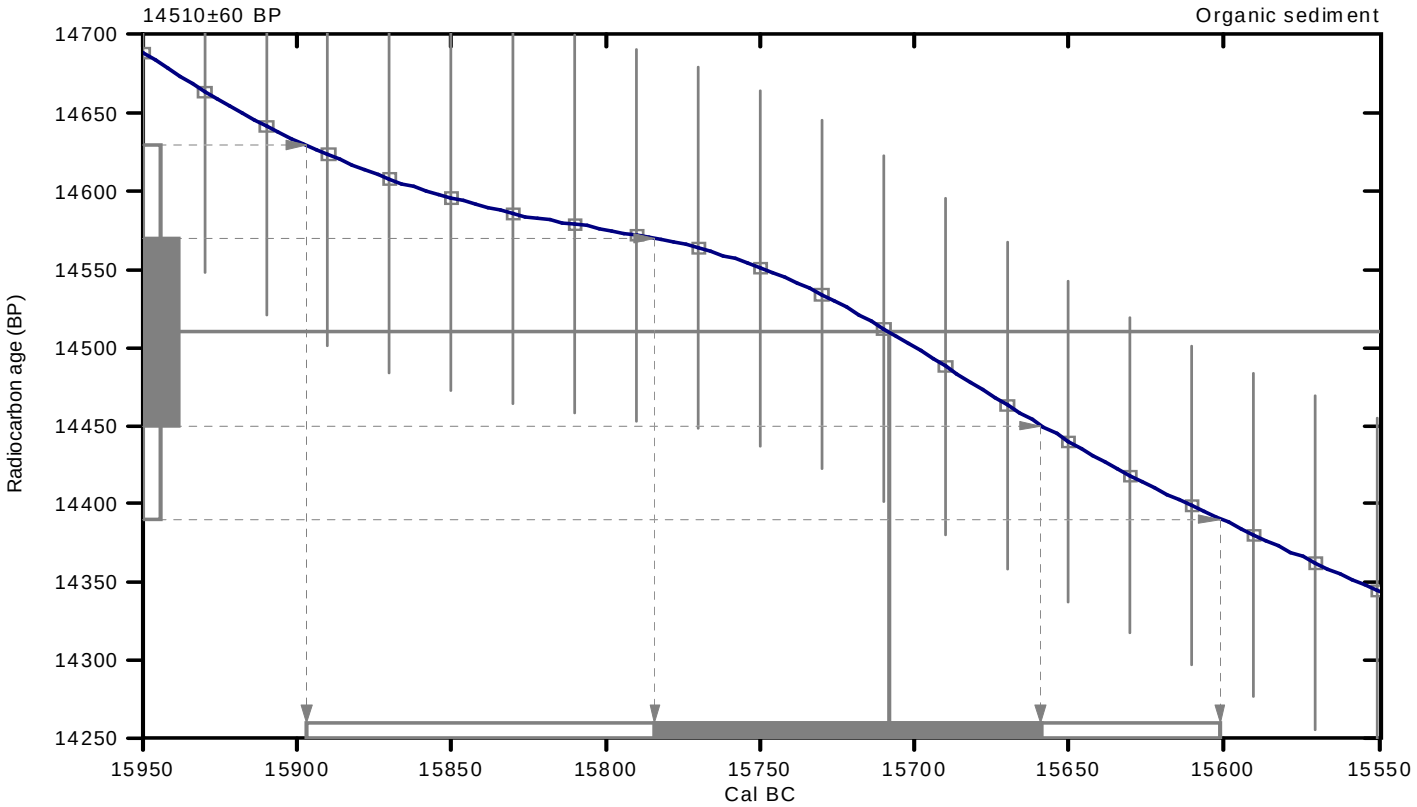
Conventional radiocarbon age: **14510±60 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 15900 to 15600 (Cal BP 17850 to 17550)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 15710 (Cal BP 17660)

1 Sigma calibrated result: (68% probability) Cal BC 15780 to 15660 (Cal BP 17730 to 17610)



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Mathematics used for calibration scenario

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.2:lab. mult=1)

Laboratory number: **Beta-318995**

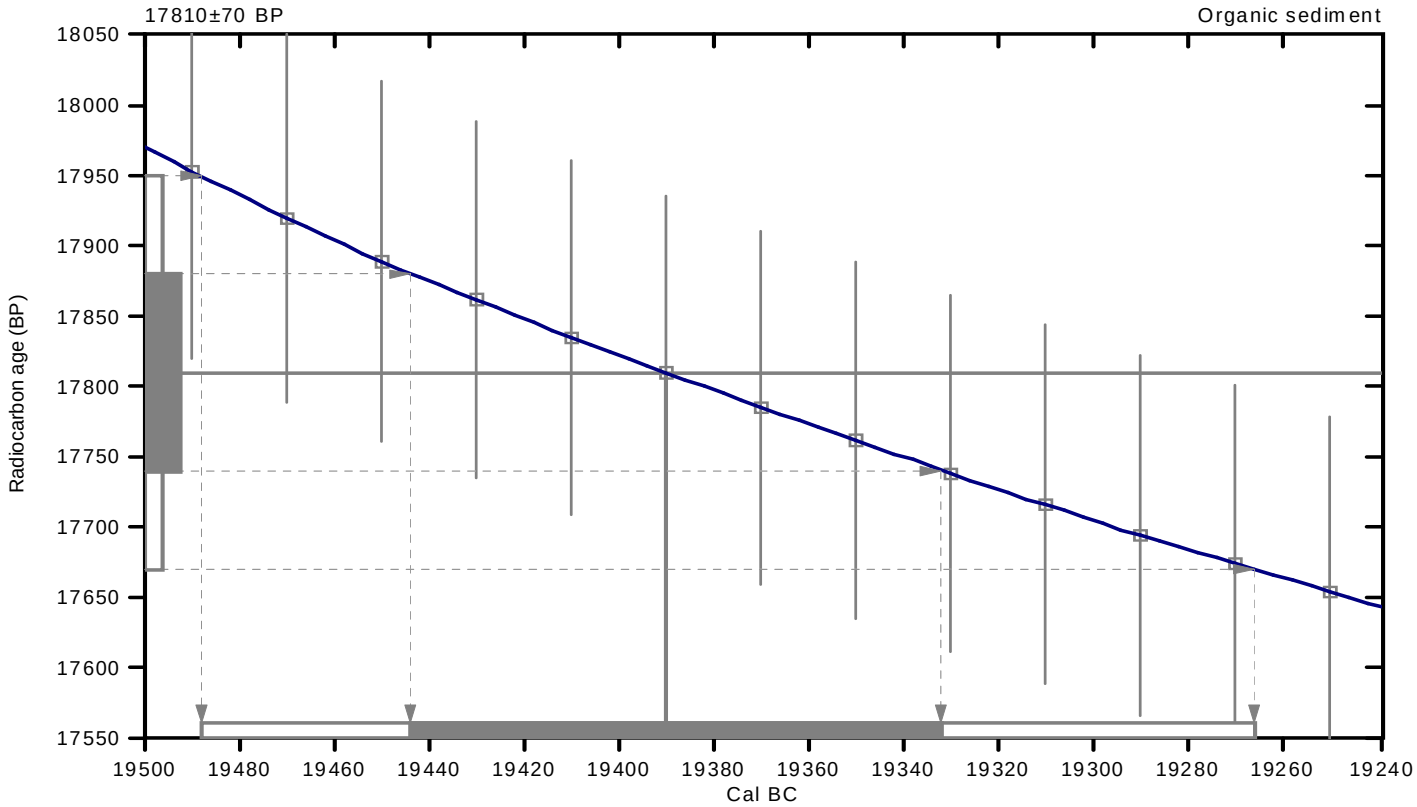
Conventional radiocarbon age: **17810±70 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 19490 to 19270 (Cal BP 21440 to 21220)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 19390 (Cal BP 21340)

1 Sigma calibrated result: (68% probability) Cal BC 19440 to 19330 (Cal BP 21390 to 21280)



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Mathematics used for calibration scenario

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April 30, 2012

Mr. Thomas Blake
Fugro Consultants
4820 McGrath Street
Suite 100
Ventura, CA 93003-7778
USA

RE: Radiocarbon Dating Results For Samples BH-8at6.77ft, BH-8at8.13ft, BH-8at9.71ft, BH-8at11.75ft, BH-8at17.75ft

Dear Mr. Blake:

Enclosed are the radiocarbon dating results for five samples recently sent to us. They each provided plenty of carbon for accurate measurements and all the analyses proceeded normally. As usual, the method of analysis is listed on the report with the results and calibration data is provided where applicable.

As always, no students or intern researchers who would necessarily be distracted with other obligations and priorities were used in the analyses. We analyzed them with the combined attention of our entire professional staff.

If you have specific questions about the analyses, please contact us. We are always available to answer your questions.

Thank you for prepaying the analyses. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,

Digital signature on file

BETA ANALYTIC INC.
DR. M.A. TAMERS and MR. D.G. HOOD
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MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX:305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Thomas Blake

Report Date: 4/30/2012

Fugro Consultants

Material Received: 4/25/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 320869	14140 +/- 60 BP	-22.5 o/oo	14180 +/- 60 BP
SAMPLE : BH-8at6.77ft			
ANALYSIS : AMS-TIMEGUIDE delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			
2 SIGMA CALIBRATION : Cal BC 15490 to 15120 (Cal BP 17440 to 17070)			
Beta - 320870	8490 +/- 40 BP	-22.4 o/oo	8530 +/- 40 BP
SAMPLE : BH-8at8.13ft			
ANALYSIS : AMS-TIMEGUIDE delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			
2 SIGMA CALIBRATION : Cal BC 7600 to 7530 (Cal BP 9540 to 9480)			
Beta - 320871	7550 +/- 40 BP	-22.0 o/oo	7600 +/- 40 BP
SAMPLE : BH-8at9.71ft			
ANALYSIS : AMS-TIMEGUIDE delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			
2 SIGMA CALIBRATION : Cal BC 6490 to 6490 (Cal BP 8440 to 8440) AND Cal BC 6480 to 6410 (Cal BP 8430 to 8360)			
Beta - 320872	15160 +/- 60 BP	-22.3 o/oo	15200 +/- 60 BP
SAMPLE : BH-8at11.75ft			
ANALYSIS : AMS-TIMEGUIDE delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			
2 SIGMA CALIBRATION : Cal BC 16640 to 16560 (Cal BP 18590 to 18500)			

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

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REPORT OF RADIOCARBON DATING ANALYSES

Mr. Thomas Blake

Report Date: 4/30/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 320873	20690 +/- 90 BP	-22.8 o/oo	20730 +/- 90 BP

SAMPLE : BH-8at17.75ft
ANALYSIS : AMS-TIMEGUIDE delivery
MATERIAL/PRETREATMENT : (organic sediment): acid washes
2 SIGMA CALIBRATION : Cal BC 23020 to 22530 (Cal BP 24970 to 24480)

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-22.5:lab. mult=1)

Laboratory number: **Beta-320869**

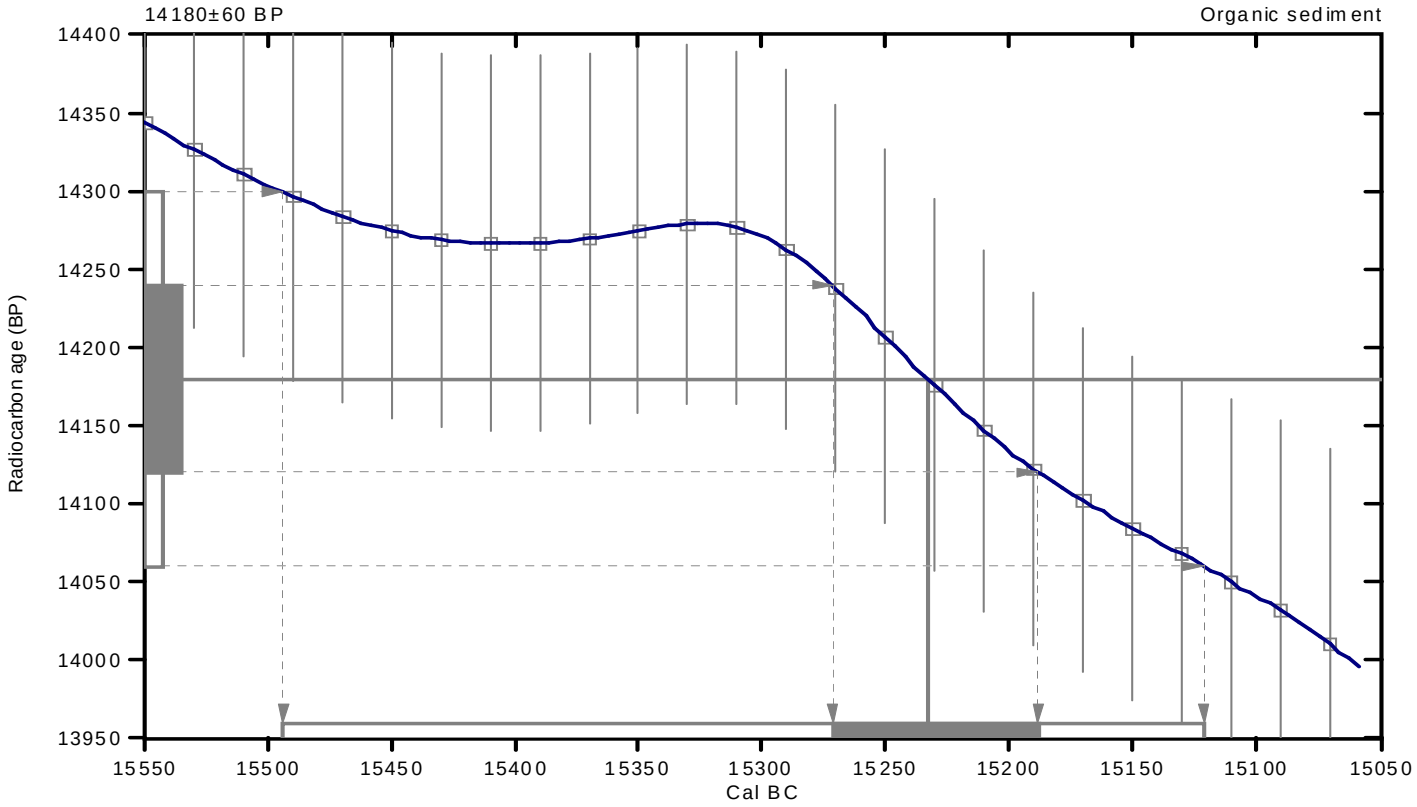
Conventional radiocarbon age: **14180±60 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 15490 to 15120 (Cal BP 17440 to 17070)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 15230 (Cal BP 17180)

1 Sigma calibrated result: (68% probability) Cal BC 15270 to 15190 (Cal BP 17220 to 17140)



References:

Database used

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Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-22.4:lab. mult=1)

Laboratory number: **Beta-320870**

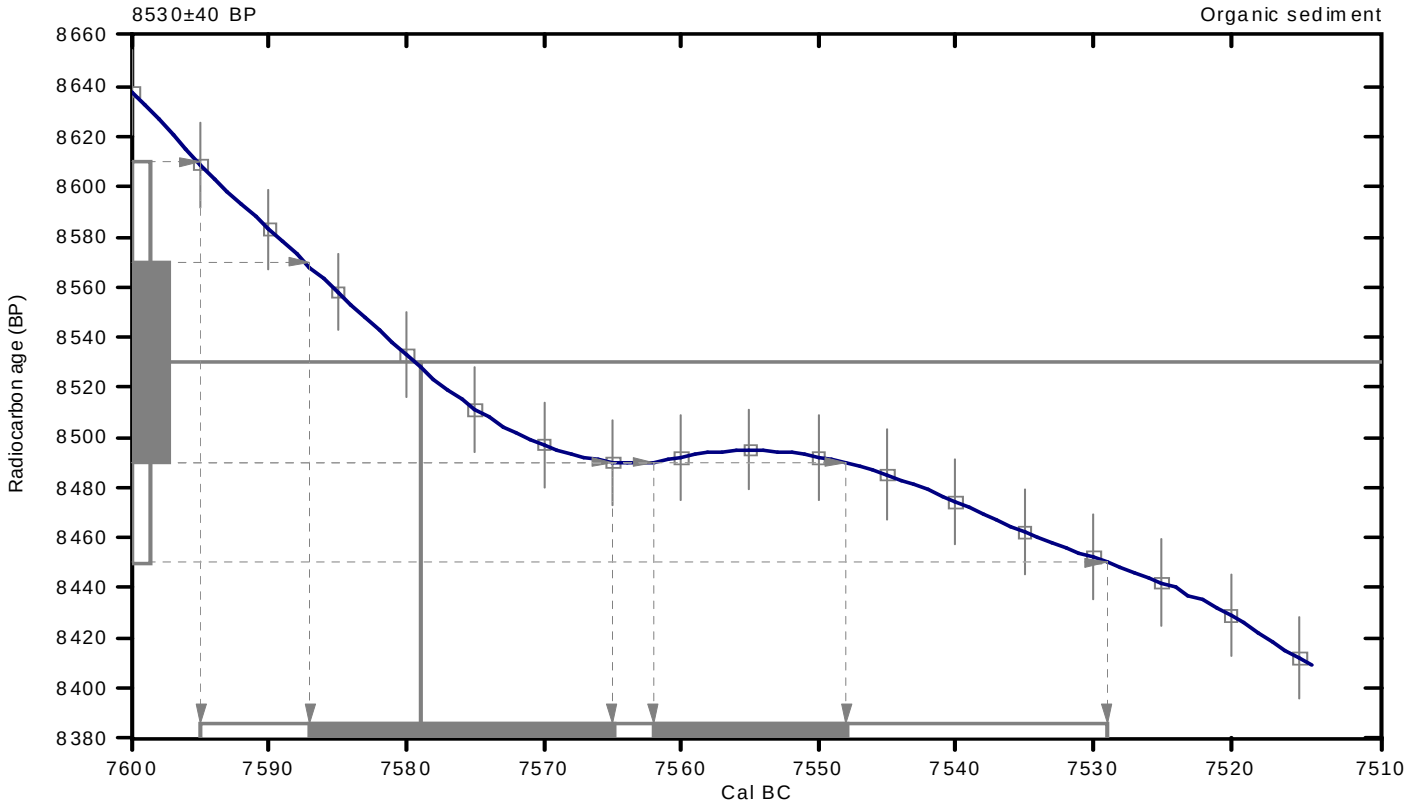
Conventional radiocarbon age: **8530±40 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 7600 to 7530 (Cal BP 9540 to 9480)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 7580 (Cal BP 9530)

1 Sigma calibrated results: (68% probability) Cal BC 7590 to 7560 (Cal BP 9540 to 9520) and Cal BC 7560 to 7550 (Cal BP 9510 to 9500)



References:

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-22:lab. mult=1)

Laboratory number: **Beta-320871**

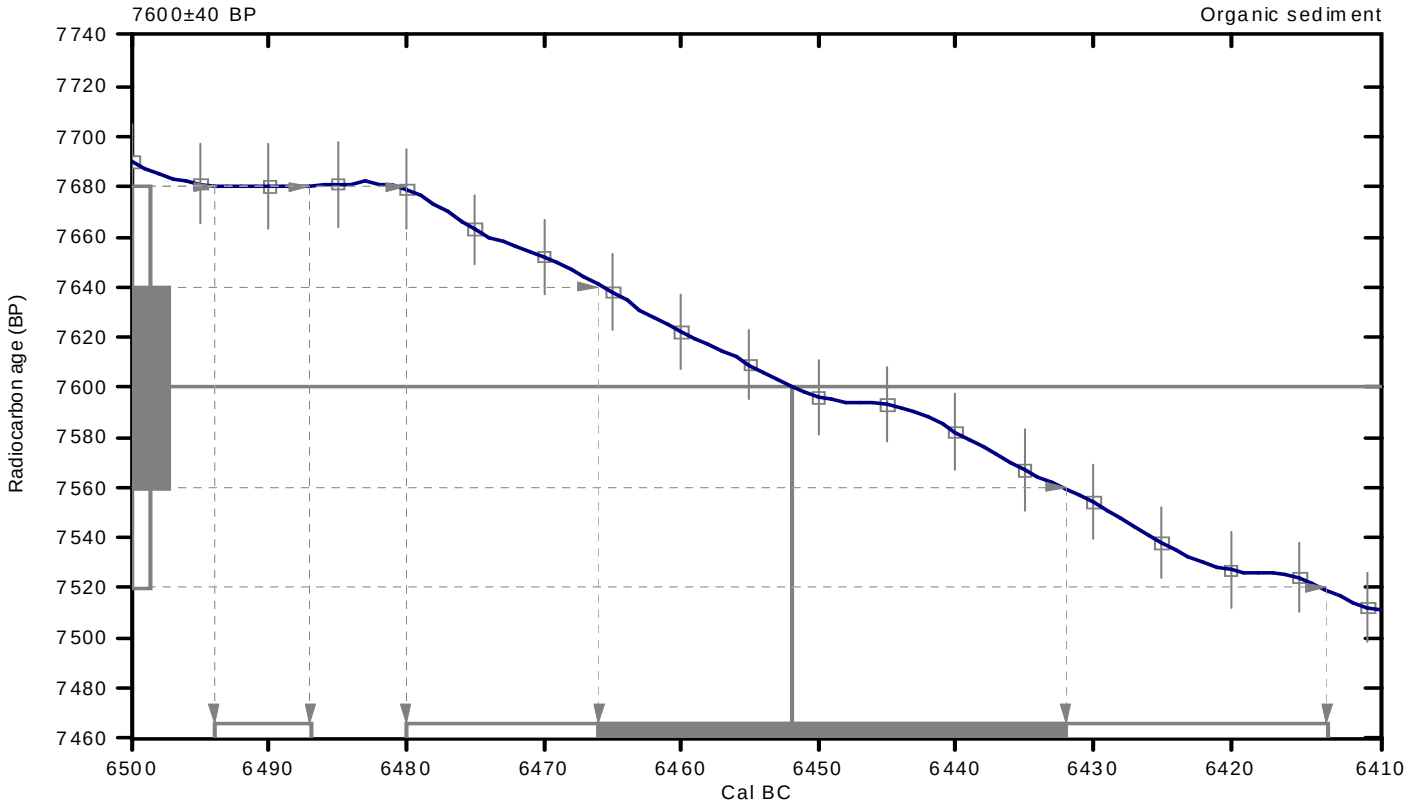
Conventional radiocarbon age: **7600±40 BP**

2 Sigma calibrated results: (95% probability) **Cal BC 6490 to 6490 (Cal BP 8440 to 8440) and Cal BC 6480 to 6410 (Cal BP 8430 to 8360)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 6450 (Cal BP 8400)

1 Sigma calibrated result: (68% probability) Cal BC 6470 to 6430 (Cal BP 8420 to 8380)



References:

Database used

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Mathematics used for calibration scenario

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-22.3:lab. mult=1)

Laboratory number: **Beta-320872**

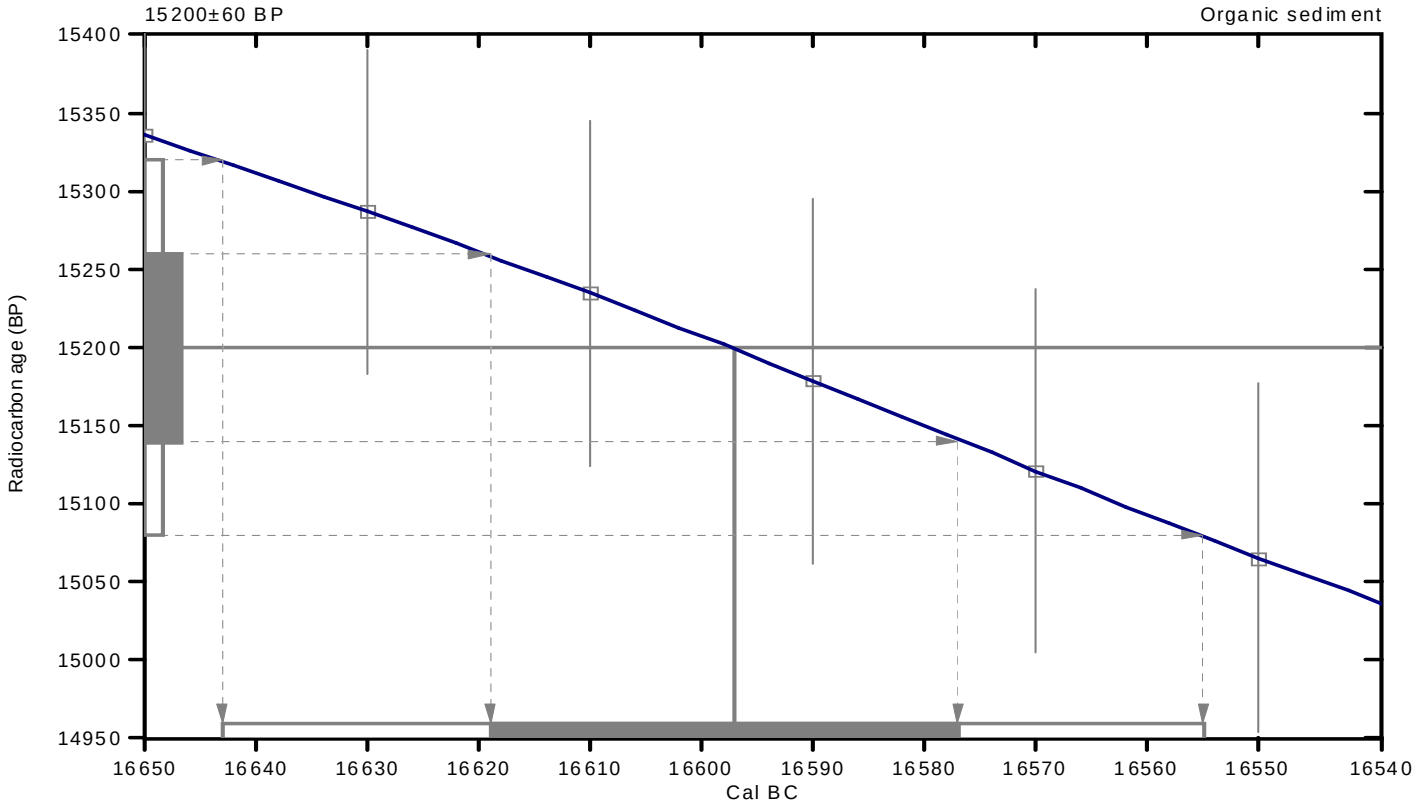
Conventional radiocarbon age: **15200±60 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 16640 to 16560 (Cal BP 18590 to 18500)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 16600 (Cal BP 18550)

1 Sigma calibrated result: (68% probability) Cal BC 16620 to 16580 (Cal BP 18570 to 18530)



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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-22.8:lab. mult=1)

Laboratory number: **Beta-320873**

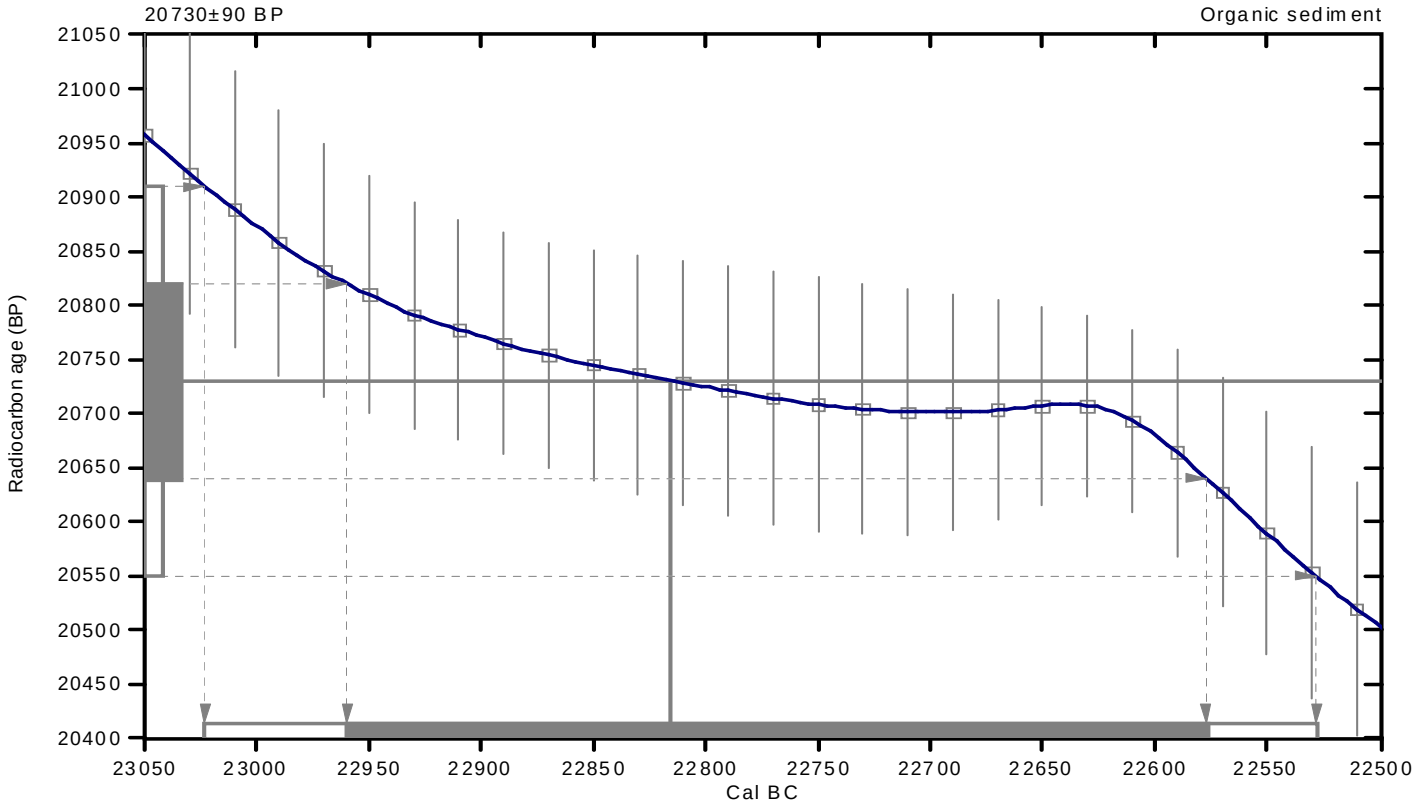
Conventional radiocarbon age: **20730±90 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 23020 to 22530 (Cal BP 24970 to 24480)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 22820 (Cal BP 24770)

1 Sigma calibrated result: (68% probability) Cal BC 22960 to 22580 (Cal BP 24910 to 24530)



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June 5, 2012

Mr. Thomas Blake
Fugro Consultants
4820 McGrath Street
Suite 100
Ventura, CA 93003-7778
USA

RE: Radiocarbon Dating Results For Samples T3C42@9.05ft, T3C43@9.25ft, T1C53@4.05ft, T1C55@6.35ft, T2C50@3.55ft

Dear Mr. Blake:

Enclosed are the radiocarbon dating results for five samples recently sent to us. They each provided plenty of carbon for accurate measurements and all the analyses proceeded normally. As usual, the method of analysis is listed on the report with the results and calibration data is provided where applicable.

As always, no students or intern researchers who would necessarily be distracted with other obligations and priorities were used in the analyses. We analyzed them with the combined attention of our entire professional staff.

If you have specific questions about the analyses, please contact us. We are always available to answer your questions.

The cost of analysis was previously invoiced. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,

Digital signature on file

BETA ANALYTIC INC.
DR. M.A. TAMERS and MR. D.G. HOOD
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX:305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Thomas Blake

Report Date: 6/5/2012

Fugro Consultants

Material Received: 5/25/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 322714	13970 +/- 70 BP	-23.2 o/oo	14000 +/- 70 BP
SAMPLE : T3C42@9.05ft			
ANALYSIS : AMS-PRIORITY delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			
2 SIGMA CALIBRATION : Cal BC 15200 to 14960 (Cal BP 17160 to 16910)			
Beta - 323107	7150 +/- 40 BP	-22.0 o/oo	7200 +/- 40 BP
SAMPLE : T3C43@9.25ft			
ANALYSIS : AMS-TIMEGUIDE delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			
2 SIGMA CALIBRATION : Cal BC 6200 to 6190 (Cal BP 8150 to 8140) AND Cal BC 6180 to 6180 (Cal BP 8130 to 8120) Cal BC 6150 to 6150 (Cal BP 8100 to 8100) AND Cal BC 6100 to 6000 (Cal BP 8050 to 7950)			
Beta - 323109	5010 +/- 40 BP	-23.8 o/oo	5030 +/- 40 BP
SAMPLE : T1C53@4.05ft			
ANALYSIS : AMS-TIMEGUIDE delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			
2 SIGMA CALIBRATION : Cal BC 3950 to 3710 (Cal BP 5900 to 5660)			
Beta - 323111	9920 +/- 50 BP	-23.5 o/oo	9940 +/- 50 BP
SAMPLE : T1C55@6.35ft			
ANALYSIS : AMS-TIMEGUIDE delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			
2 SIGMA CALIBRATION : Cal BC 9660 to 9570 (Cal BP 11610 to 11520) AND Cal BC 9550 to 9290 (Cal BP 11500 to 11240)			

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

BETA ANALYTIC INC.
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MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX:305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Thomas Blake

Report Date: 6/5/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 323112	11400 +/- 50 BP	-22.4 o/oo	11440 +/- 50 BP

SAMPLE : T2C50@3.55ft
ANALYSIS : AMS-TIMEGUIDE delivery
MATERIAL/PRETREATMENT : (organic sediment): acid washes
2 SIGMA CALIBRATION : Cal BC 11430 to 11290 (Cal BP 13380 to 13240)

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.2:lab. mult=1)

Laboratory number: **Beta-322714**

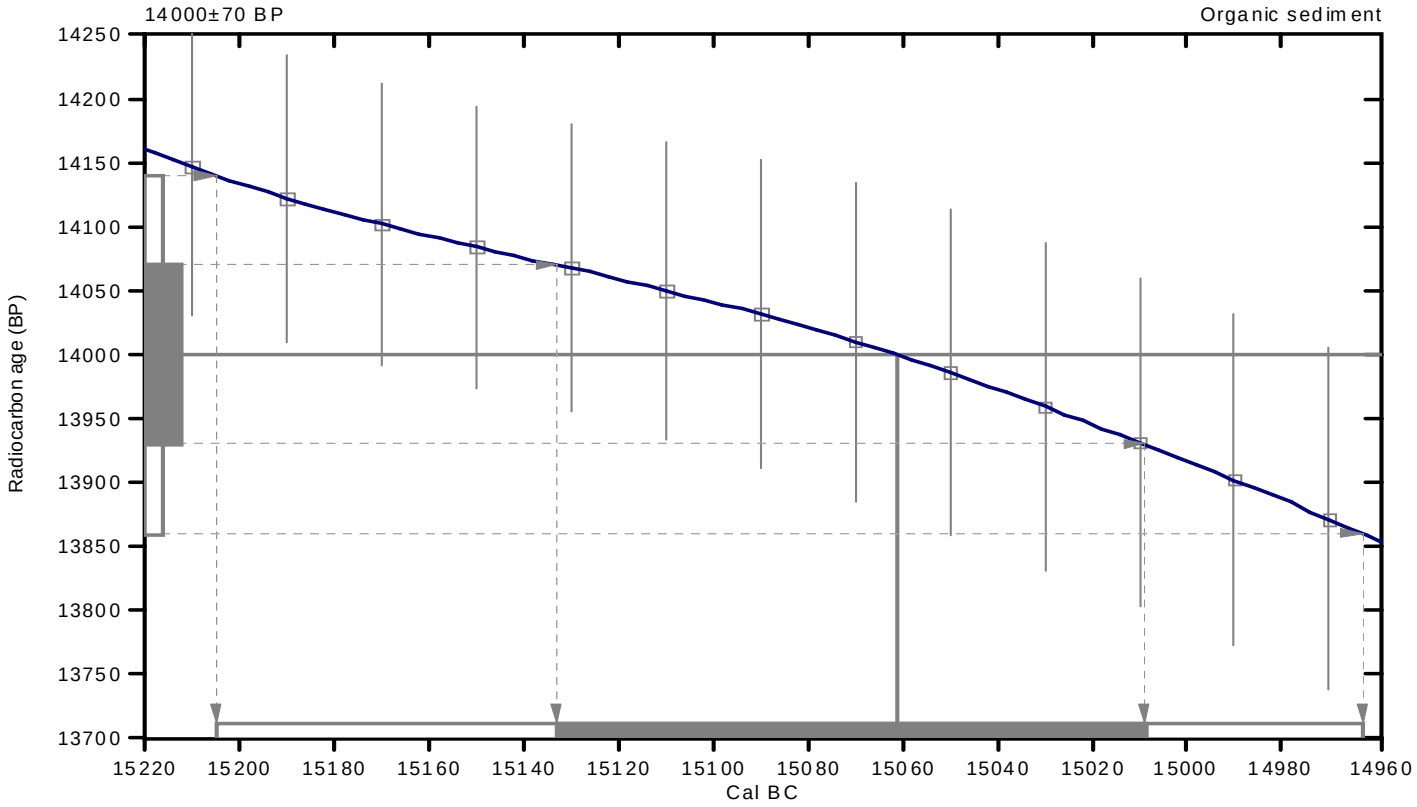
Conventional radiocarbon age: **14000±70 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 15200 to 14960 (Cal BP 17160 to 16910)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 15060 (Cal BP 17010)

1 Sigma calibrated result: (68% probability) Cal BC 15130 to 15010 (Cal BP 17080 to 16960)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-22:lab. mult=1)

Laboratory number: **Beta-323107**

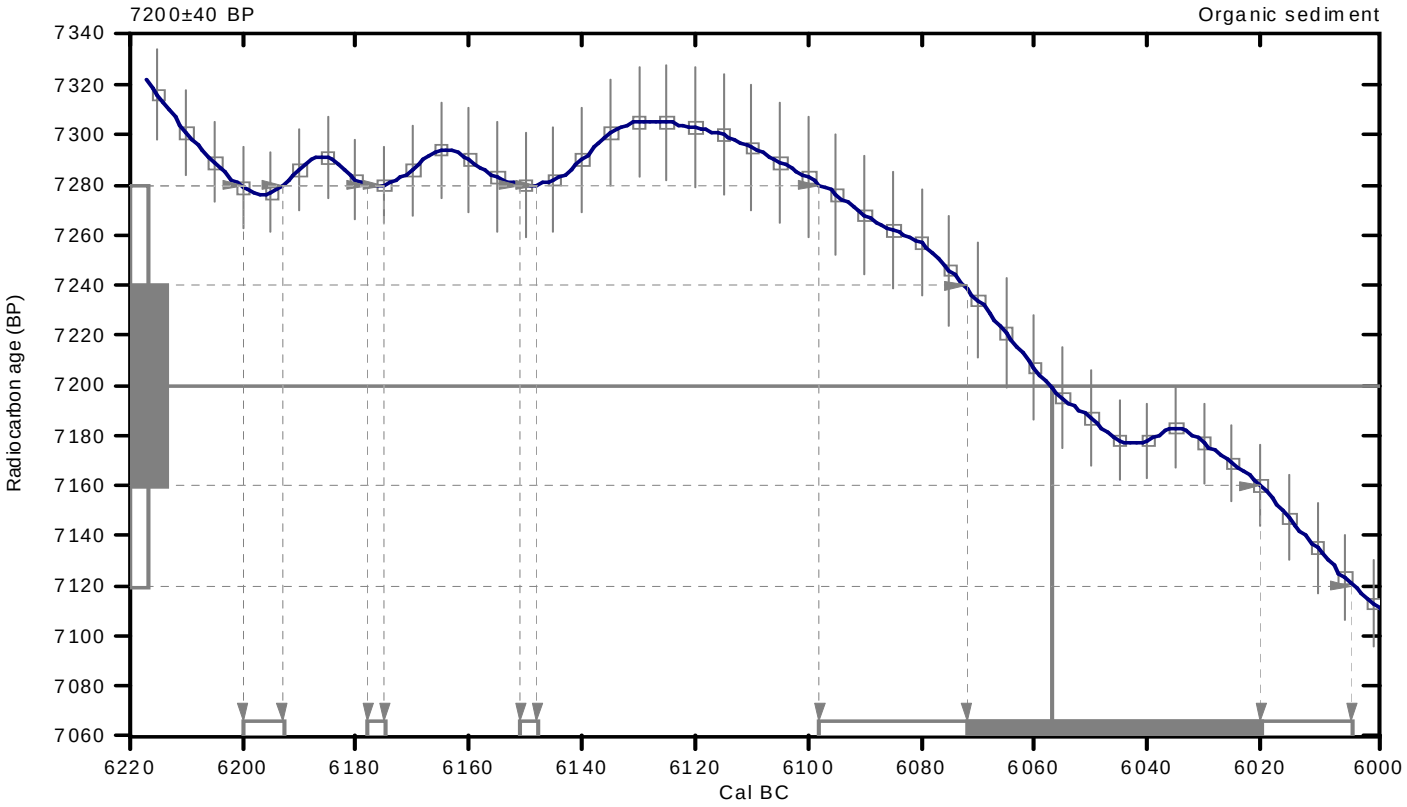
Conventional radiocarbon age: **7200±40 BP**

2 Sigma calibrated results: (95% probability)
Cal BC 6200 to 6190 (Cal BP 8150 to 8140) and
Cal BC 6180 to 6180 (Cal BP 8130 to 8120) and
Cal BC 6150 to 6150 (Cal BP 8100 to 8100) and
Cal BC 6100 to 6000 (Cal BP 8050 to 7950)

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 6060 (Cal BP 8010)

1 Sigma calibrated result: (68% probability) Cal BC 6070 to 6020 (Cal BP 8020 to 7970)



References:

Database used

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References to INTCAL09 database

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Mathematics used for calibration scenario

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.8:lab. mult=1)

Laboratory number: **Beta-323109**

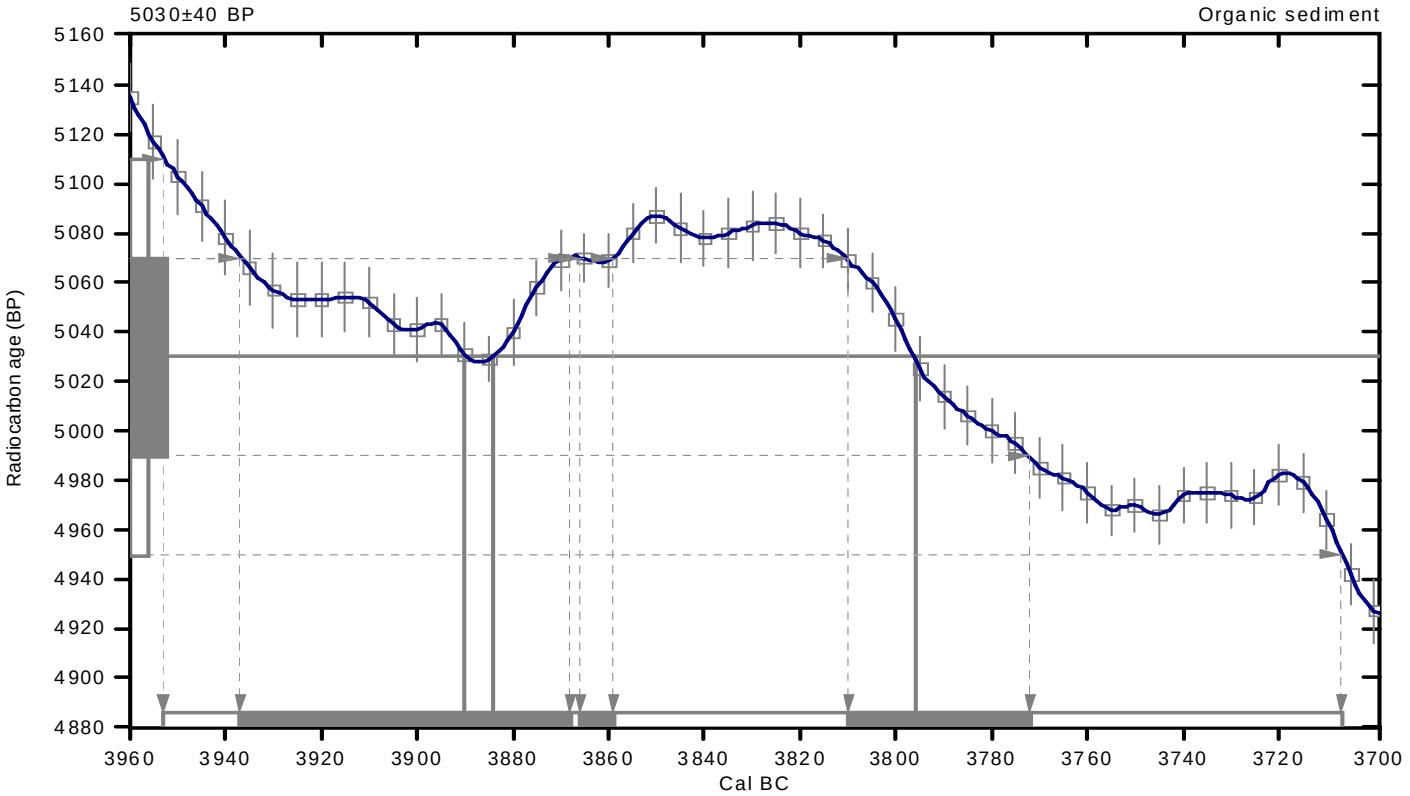
Conventional radiocarbon age: **5030±40 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 3950 to 3710 (Cal BP 5900 to 5660)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal BC 3890 (Cal BP 5840) and
Cal BC 3880 (Cal BP 5830) and
Cal BC 3800 (Cal BP 5750)

1 Sigma calibrated results: (68% probability) Cal BC 3940 to 3870 (Cal BP 5890 to 5820) and
Cal BC 3870 to 3860 (Cal BP 5820 to 5810) and
Cal BC 3810 to 3770 (Cal BP 5760 to 5720)



References:

Database used

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Mathematics used for calibration scenario

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.5:lab. mult=1)

Laboratory number: **Beta-323111**

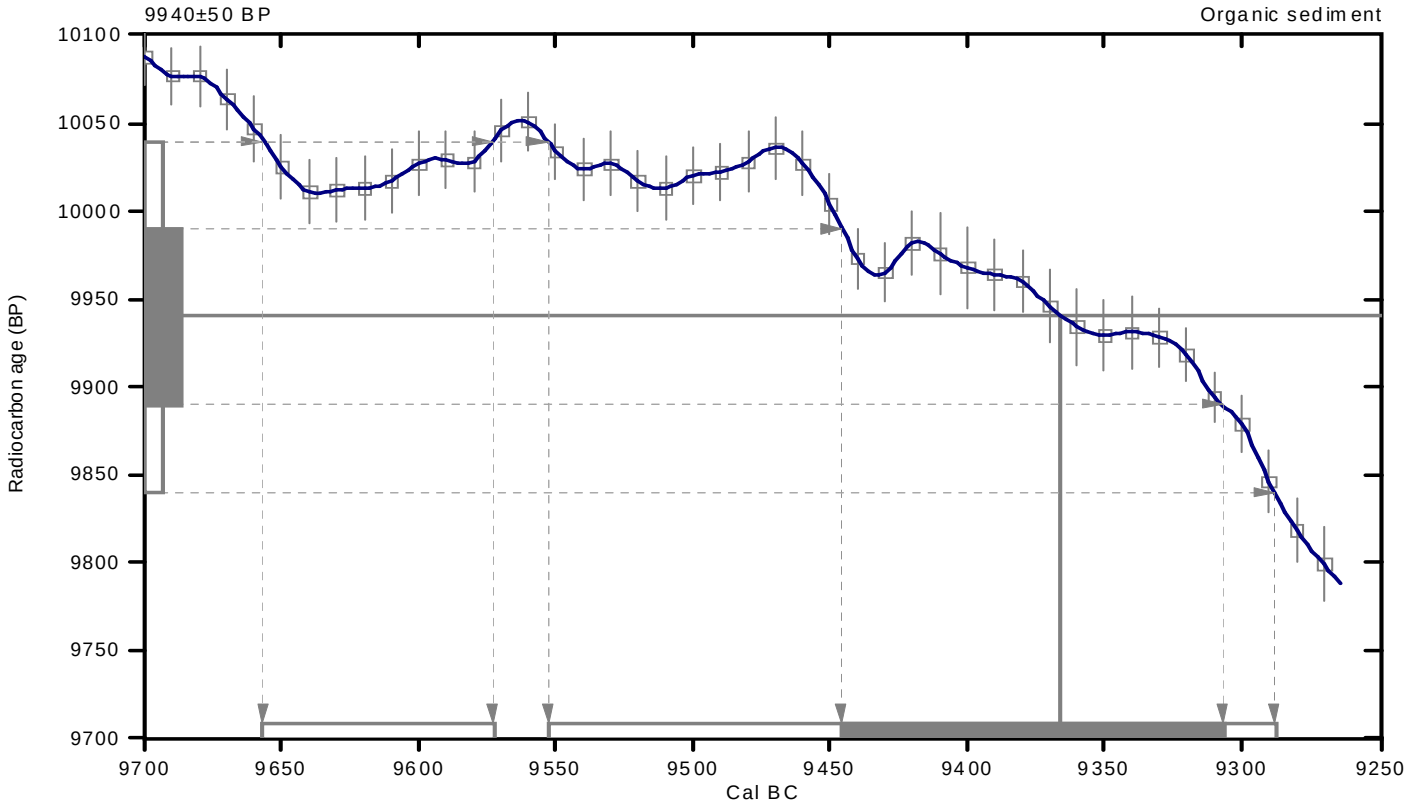
Conventional radiocarbon age: **9940±50 BP**

2 Sigma calibrated results: (95% probability) **Cal BC 9660 to 9570 (Cal BP 11610 to 11520) and Cal BC 9550 to 9290 (Cal BP 11500 to 11240)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 9370 (Cal BP 11320)

1 Sigma calibrated result: (68% probability) Cal BC 9450 to 9310 (Cal BP 11400 to 11260)



References:

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Mathematics used for calibration scenario

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Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-22.4:lab. mult=1)

Laboratory number: **Beta-323112**

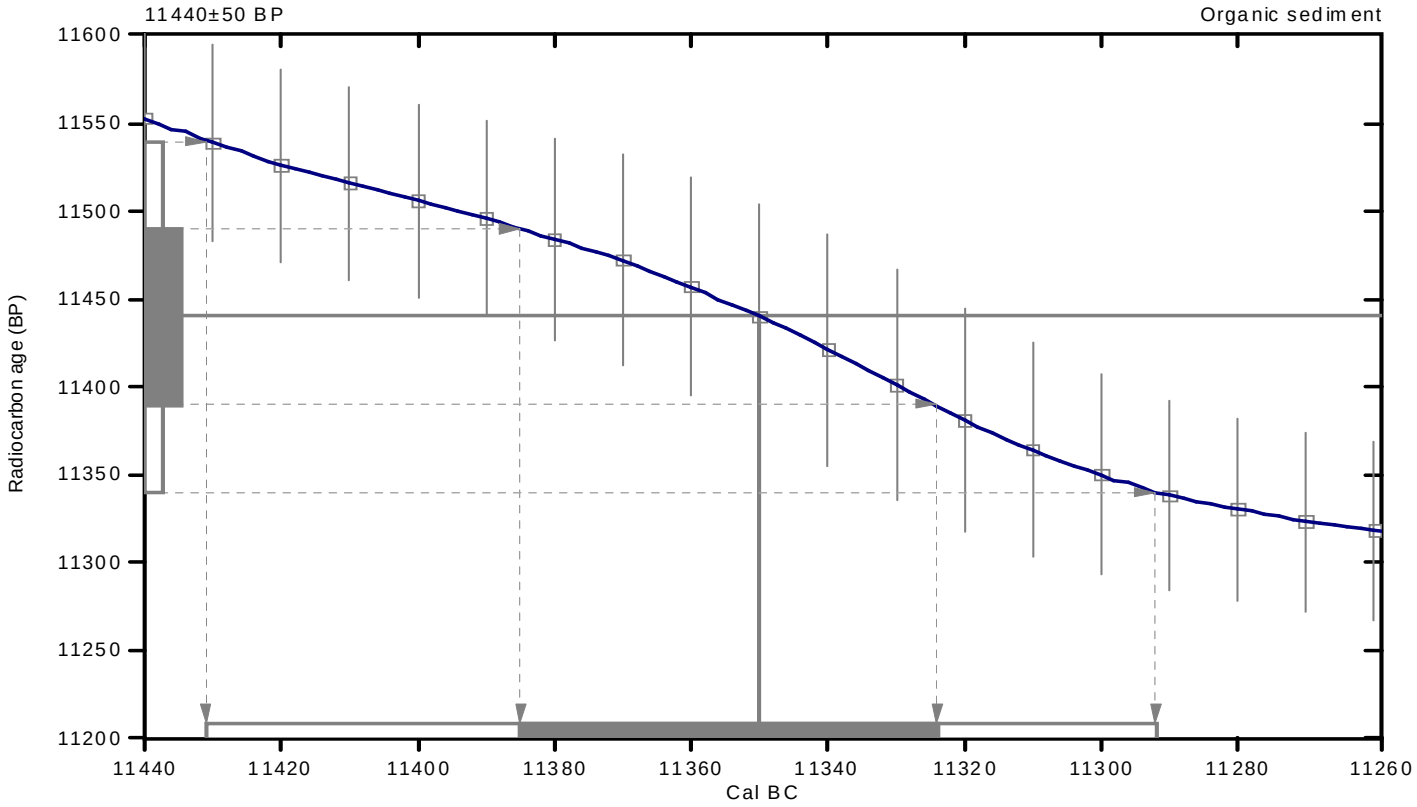
Conventional radiocarbon age: **11440±50 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 11430 to 11290 (Cal BP 13380 to 13240)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 11350 (Cal BP 13300)

1 Sigma calibrated result: (68% probability) Cal BC 11380 to 11320 (Cal BP 13340 to 13270)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

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Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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June 6, 2012

Mr. Thomas Blake
Fugro Consultants
4820 McGrath Street
Suite 100
Ventura, CA 93003-7778
USA

RE: Radiocarbon Dating Results For Samples T3C41@12.95ft, T3C45@8.0ft

Dear Mr. Blake:

Enclosed are the radiocarbon dating results for two samples recently sent to us. They each provided plenty of carbon for accurate measurements and all the analyses proceeded normally. As usual, the method of analysis is listed on the report with the results and calibration data is provided where applicable.

Note that one of the samples (T3C45@8.0ft, Beta-323147) does not have a Measured Radiocarbon Age and 13C/12C Ratio reported. This is because the sample was too small to do a separate 13C/12C ratio and AMS analysis. The only available 13C/12C ratio available to calculate a Conventional Radiocarbon Age was that determined on a small aliquot of graphite. Although this ratio corrects to the appropriate Conventional Radiocarbon Age, it is not reported since it includes laboratory chemical and detector induced fractionation.

If you have specific questions about the analyses, please contact us. We are always available to answer your questions.

Thank you for prepaying the analyses. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,

Darden Hood

Digital signature on file

BETA ANALYTIC INC.
DR. M.A. TAMERS and MR. D.G. HOOD
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX:305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Thomas Blake

Report Date: 6/6/2012

Fugro Consultants

Material Received: 6/1/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 323106	30870 +/- 360 BP	-21.8 o/oo	30920 +/- 360 BP
SAMPLE : T3C41@12.95ft			
ANALYSIS : AMS-TIMEGUIDE delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			
2 SIGMA CALIBRATION : Cal BC 34430 to 32820 (Cal BP 36380 to 34770)			
Beta - 323147	NA	NA	22170 +/- 110 BP
SAMPLE : T3C45@8.0ft			
ANALYSIS : AMS-TIMEGUIDE delivery			
MATERIAL/PRETREATMENT : (organic sediment): acid washes			
2 SIGMA CALIBRATION : Cal BC 24940 to 24280 (Cal BP 26890 to 26230)			

COMMENT: The original sample was too small to provide a 13C/12C ratio on the original material. However, a ratio including both natural and laboratory effects was measured during the 14C detection to calculate the true Conventional Radiocarbon Age.

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-21.8:lab. mult=1)

Laboratory number: **Beta-323106**

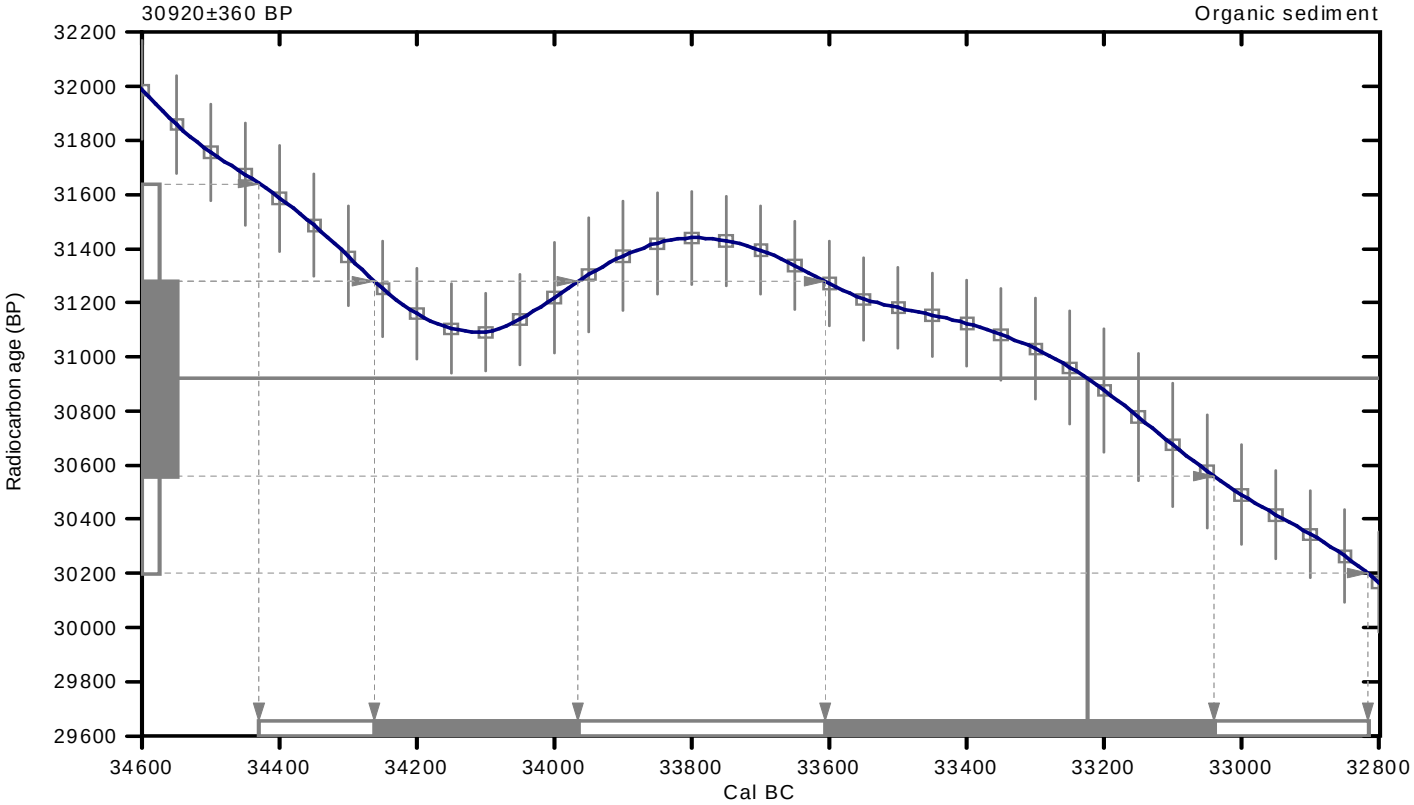
Conventional radiocarbon age: **30920±360 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 34430 to 32820 (Cal BP 36380 to 34770)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 33220 (Cal BP 35170)

1 Sigma calibrated results: (68% probability) Cal BC 34260 to 33960 (Cal BP 36210 to 35920) and Cal BC 33610 to 33040 (Cal BP 35560 to 34990)



References:

Database used

INTCAL09

References to INTCAL09 database

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Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=N/A:lab. mult=1)

Laboratory number: **Beta-323147**

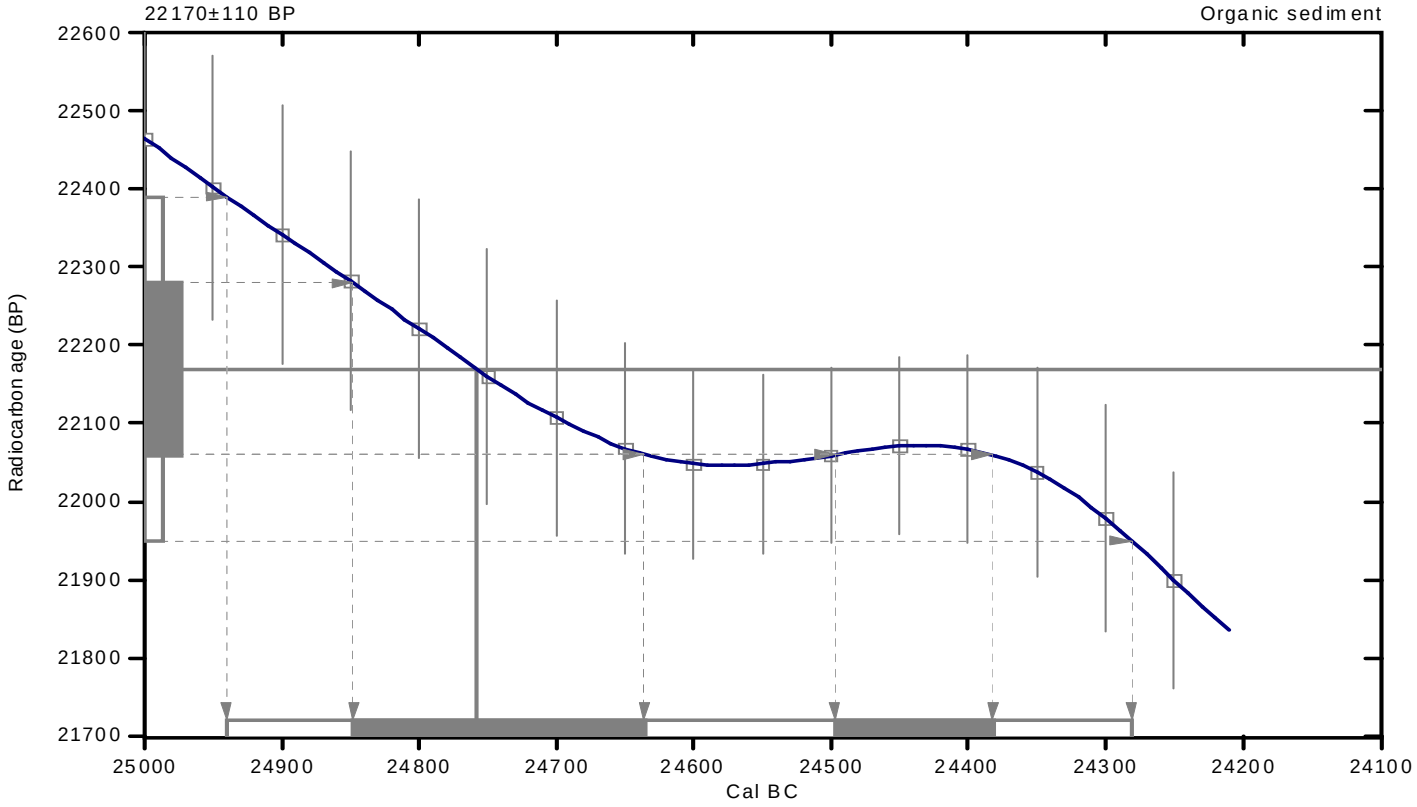
Conventional radiocarbon age[1]: **22170±110 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 24940 to 24280 (Cal BP 26890 to 26230)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 24760 (Cal BP 26710)

1 Sigma calibrated results: (68% probability) Cal BC 24850 to 24640 (Cal BP 26800 to 26590) and Cal BC 24500 to 24380 (Cal BP 26450 to 26330)



References:

Database used

INTCAL09

References to INTCAL09 database

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Mathematics used for calibration scenario

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Tel: 305 667 5167
Fax: 305 663 0964
Beta@radiocarbon.com
www.radiocarbon.com

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June 11, 2012

Mr. Thomas Blake
Fugro Consultants
4820 McGrath Street
Suite 100
Ventura, CA 93003-7778
USA

RE: Radiocarbon Dating Result For Sample T3C47@9.10ft

Dear Mr. Blake:

Enclosed is the radiocarbon dating result for one sample recently sent to us. It provided plenty of carbon for an accurate measurement and the analysis proceeded normally. As usual, the method of analysis is listed on the report sheet and calibration data is provided where applicable.

As always, no students or intern researchers who would necessarily be distracted with other obligations and priorities were used in the analysis. It was analyzed with the combined attention of our entire professional staff.

If you have specific questions about the analyses, please contact us. We are always available to answer your questions.

The cost of the analysis was charged to the MASTERCARD card provided. A receipt is enclosed with the mailed report copy. Thank you. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,

Digital signature on file

BETA ANALYTIC INC.
DR. M.A. TAMERS and MR. D.G. HOOD
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX:305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Thomas Blake

Report Date: 6/11/2012

Fugro Consultants

Material Received: 6/1/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 323148	12370 +/- 60 BP	-23.2 o/oo	12400 +/- 60 BP

SAMPLE : T3C47@9.10ft
ANALYSIS : AMS-TIMEGUIDE delivery
MATERIAL/PRETREATMENT : (organic sediment): acid washes
2 SIGMA CALIBRATION : Cal BC 12930 to 12180 (Cal BP 14880 to 14130)

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.2:lab. mult=1)

Laboratory number: **Beta-323148**

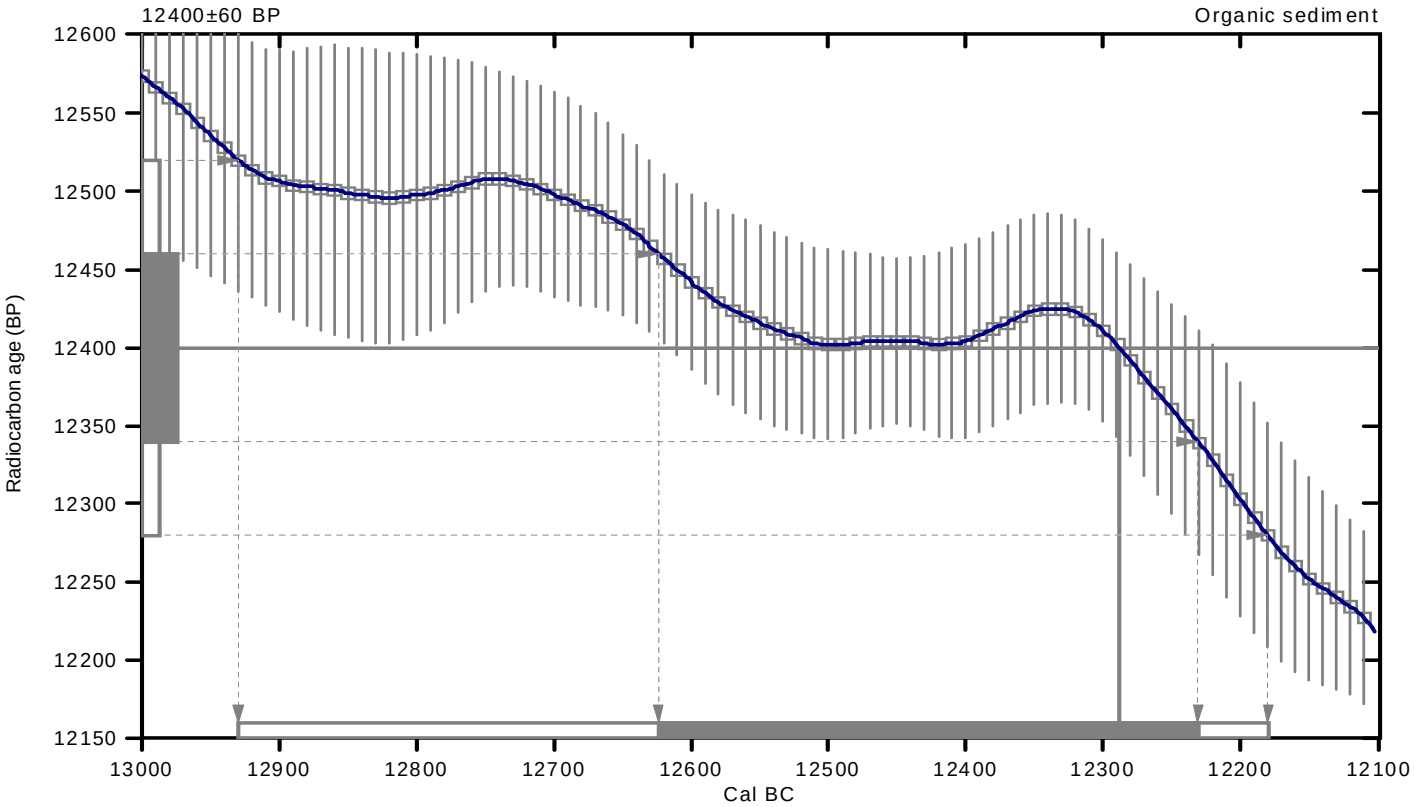
Conventional radiocarbon age: **12400±60 BP**

2 Sigma calibrated result: (95% probability) **Cal BC 12930 to 12180 (Cal BP 14880 to 14130)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal BC 12290 (Cal BP 14240)

1 Sigma calibrated result: (68% probability) Cal BC 12620 to 12230 (Cal BP 14570 to 14180)



References:

Database used

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Mathematics used for calibration scenario

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