FAULTING AND BLUFF GEOLOGIC EVALUATION
PROPOSED LUSARDI RESIDENCE
8466 EL PASEO GRANDE
LA JOLLA, CALIFORNIA

PREPARED FOR:

LUSARDI CONSTRUCTION
ATTENTION: MR MIKE RAMSEY
1570 LINDA VISTA DRIVE
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PREPARED BY:

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CTE JOB NO. 10-8264G

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1.0 INTRODUCTION AND SCOPE OF SERVICES

1.1 Introduction

Construction Testing & Engineering, Inc. (CTE) has completed the requested fault and bluff evaluation for the proposed Lusardi residence, located at 8466 El Paseo Grande, in La Jolla, California. Figure 1 is an index map showing the approximate location of the site. It is our understanding that the proposed project calls for the demolition of the existing residence, and the construction of a new two-story residential structure, and associated improvements, including a retaining wall along the western side of the property landward of the existing seawall. It is also our understanding that the existing seawall is to remain as constructed.

A portion of the subject site is situated within the City of San Diego Seismic Safety Study, Hazard Category 12 for fault zones, and Category 48 for Coastal Bluffs. The remaining portion of the site is zoned as other terrain, Category 52. Figure 2 shows the location of the site and associated zone boundaries. The Category 12 zones are for faults considered potentially active, inactive, or activity level unknown, and a zone has been established around the interpreted location of the Scripps Fault that transects the northwestern corner of the site (Figure 2). A surface rupture hazard evaluation was requested by the City of San Diego for the subject site in their cycle review comments dated, July, 19, 2006.

Category 48 is a zone delineating generally stable broad beach areas. Category 52 zones are classified as other level areas, gently sloping to steep terrain with favorable geologic structure, and low risk.

The City of San Diego has published the "Coastal Bluffs and Beaches Guidelines", and the "Steep Hillside Guidelines" documents to assists in the interpretation and implementation of the Environmentally Sensitive Lands Regulations regarding proposed developments. Combined, these documents provide the criteria used to classify and establish appropriate regulations for the low lying cliffs delineating the boundary between the coastal beach and other terrain.

The purpose of our investigation and evaluation was to: 1) establish if faulting associated with Scripps fault transected the subject site, and if so, is there a surface rupture hazard and are associated structural setbacks required for the site; 2) Evaluate if the western margin (landward of the coastal beach) classifies as a sensitive coastal bluff, coastal bluff, or does not meet the criteria of either following the definitions of the Environmentally Sensitive Lands Regulations, the criteria outlined in the Coastal Bluffs and Beaches, and Steep Hillside Guidelines.

Based on the data available for review and the data from our investigation, it is our professional opinion that the site is not underlain by active faults and there is no indication of faulting from potentially active faults to the depths of our investigation. Therefore, we are not recommending any structural setbacks from the interpreted location of the Scripps fault at the northwest corner of the property.

Based on our interpretation of the height and location of the bluffs prior to previous site development, as well as our review and understanding of the Coastal Bluffs and Beaches and Steep Hillside Guidelines, it is our professional opinion that the site does not fall under the

jurisdiction of the Sensitive Coastal Bluffs and does not classify as a Coastal Bluff (Steep Hillside).

CTE previously completed a preliminary geotechnical investigation of the site and presented the findings and geotechnical recommendations in our report, dated March 24, 2006. The Preliminary Geotechnical Investigation report included previous field exploration, laboratory testing, geologic hazard evaluation, and engineering analysis. Specific recommendations for site grading and structure design for the proposed improvements were presented in our previous report. Information from our preliminary geotechnical investigation was used to supplement our current fault and bluff evaluation. The additional field exploration and laboratory testing completed for this report can also be used to supplement the findings from our preliminary investigation. However, the specific recommendations for site grading and structure design for the proposed improvements previously presented remain unchanged.

1.2 Scope of Services

The scope of services provided included:

- A review of available geologic and soils reports pertinent to the site and adjacent areas. References reviewed are presented in Appendix A.
- Evaluate potential faulting by establishing structural and stratigraphic continuity across the site, or lack thereof.
- Establish the geomorphology and topographic relief of the site area, prior to the construction of the seawall, to establish the bluff geometries prior to modification resulting from past construction.
- Laboratory testing of representative soil samples to provide data to substantiate field classifications and evaluate the geotechnical design characteristics of the soils.
- Preparation of this summary report of the investigations performed including at least three geologic cross-sections perpendicular to the bluff face.

2.0 SITE DESCRIPTION

2.1 General Conditions

The site is located at 8466 El Paseo Grande, in La Jolla, California. The property consists of an ocean front parcel located north of Kellogg Park on the west side of El Paseo Grande (Figure 1). Based upon available site plans, proposed improvements for the currently developed residential site include razing of the existing structure in order to construct a new two-story, single-family residence and associated improvements. The residential structure is expected to be supported by conventional shallow spread foundations with slabs-on-grade construction. Grading is expected to be limited to the elevation of the proposed structure. However, overexcavation and recompaction will be required.

It is our understanding that proposed design plans have been drawn under the assumption that the site does not classify as a sensitive coastal bluff, or coastal bluff based on previously completed projects of similar scope to the north and south of the subject site.

2.2 Site Topography

The site is situated at approximate elevations ranging from 25-feet above mean sea level near El Paseo Grande, to approximately 14–feet above mean sea level along the sidewalk behind the existing seawall. The property parcel extends across the coastal beach to the mean low water, with beach elevations ranging from approximately eight-feet below mean sea level at the base of the seawall to sea level. The present surface, east of the seawall, is generally flat with a slight westward slope ranging between two to three degrees. The beach profile at the time of this study

also has a gentle westward slope of approximately three degrees. A more detailed discussion of the site topography is presented in Section 6.1.

3.0 FIELD AND LABORATORY INVESTIGATIONS

3.1 Field Investigations

Field explorations were conducted on February 9, 2006 as part of the preliminary geotechnical investigation, and included site reconnaissance and the excavation of two subsurface exploratory borings, Borings B-1 and B-2, using a limited access portable drill-rig. The borings were advanced to a maximum depth of just less than twenty feet below grade (fbg), and sampled on approximately five-foot intervals.

Field explorations conducted as part of this study were completed from October 2 through October 12, 2006 and included the advancement of 13 additional borings (B-3 through B-15) that were either continuously sampled or sampled at select intervals to define the subsurface stratigraphy. The borings were advanced to maximum depths ranging between 11 and 41 feet below exiting grade. A geologist visually classified and logged soils in the field using the Unified Soil Classification System.

The field descriptions have been modified, where appropriate, to reflect laboratory test results. Exploration logs, including descriptions of the soil, are included in Appendix B. Approximate exploration locations are shown on Figure 2.

As shown on Figure 2, the borings were located around the perimeter of the existing structures with a distribution that provided the correlation of subsurface stratigraphy along three east-west oriented cross-section lines, A-A', B-B', and C-C' (Figures, 3, 4, and 5 respectively), and two additional cross-sections, D-D', along a north-south orientation, and E-E' along a northwest-southeast orientation (Figures 6 and 7, respectively).

Bulk and ring soil samples were collected from the borings, B-1 and B-2, for geotechnical laboratory analysis. Borings B-3 through B-15 were sampled with a Standard Penetration Sampler (SPT). Select soil samples were collected and placed in sealed plastic bags and transported to the CTE geotechnical laboratory for analysis.

3.2 Laboratory Investigation

Select soil samples were collected as part of this investigation for classification purposes and to provide supplemental data of the physical properties and engineering characteristics that were characterized during the preliminary investigation. The laboratory tests performed on the soil samples collected for this investigation included, Particle-Size Analysis, Atterberg Limits, Hydrometer, and Expansion Index Testing. Test method descriptions and laboratory results are included in Appendix C. Previous Laboratory tests were reported in the Preliminary Geotechnical Investigation dated March 24, 2006

4.0 GEOLOGY

4.1 General Geologic Setting

San Diego is located within the Peninsular Ranges physiographic province that is characterized by its northwest-trending mountain ranges, intervening valleys, and predominantly northwest-trending active regional faults. The San Diego Region can be further subdivided into the coastal plain area, a central mountain–valley area and the eastern mountain valley area. The project site lies within the coastal plain area of low relief that slopes gently toward the Pacific Ocean.

The coastal plain is characterized by geomorphic landforms known as marine terraces, which are ancient erosion surfaces or abrasion platforms cut by ocean –wave processes along past coastlines. These surfaces are recognized today as the relatively flat-lying mesas and terraces that range in elevation across the coastal plain of San Diego. The elevation differences of these marine terraces are the result of sea level changes that are associated with glacial retreat and advance throughout the Pleistocene, and uplift associated with activity on the Rose Canyon Fault Zone over the past two million years. The mesas or terraces have been incised by westward flowing drainages that have adjusted to the relative sea level changes in elevation. The combined effect of these processes is that older marine terraces are found at progressively higher elevations. Several distinct marine terraces present in the San Diego area include the Linda Vista Mesa (cut approximately 1.3 million years ago), the Nestor Terrace (cut approximately 120,000 years ago), and the Bird Rock Terrace (cut approximately 80,000 years ago). The marine terraces are typically covered with marine sediments, overlain by younger non-marine terrestrial deposits.

4.2 Site Geologic Conditions

According to mapping by Kennedy (1975), soils at the site consist of units of Quaternary Beach Deposits, Undifferentiated Quaternary-aged Alluvium and Slopewash deposits, and deposits of the Quaternary Bay Point Formation. The findings from our investigation were consistent with the mapping completed by Kennedy (1975). The sequence of deposits observed at the site included from the existing surface downward; Fill and disturbed material, Quaternary Slopewash (Qsw), a transitional unit between the slopewash and underlying Bay Point Formation (Qsw/QBp-1), and Quaternary Bay Point Formation.

4.2.1 Fill

This unit consists loose to medium stiff, re-worked Quaternary Slopewash as described below, with loose, silty sand, abundant organics, roots, and topsoil from turf and planter areas, with minor debris. Based on our aerial photograph review, the area behind the existing seawall consists of fill material. However, this area was not drilled during our investigation. Fill thicknesses are interpreted to typically range between two and five feet, with thicknesses up to eleven feet behind the seawall.

Depths of fill material ranging up to ten feet were reported in the geotechnical investigation completed for the residence just south of the subject site at 8450 El Paseo Grande by Earthworks Engineering, Inc., dated December 18, 2000. The description of this material appears to correlate with the base of the material we interpreted as Slopewash deposits.

4.2.2 Quaternary Slopewash (Qsw)

Quaternary Slopewash deposits were encountered near surface and in gradational contact with the overlying Fill material. The thickness of this deposit ranged between four to eight feet, and extended from the fill to depths of approximately 10 feet below existing grade. The lower contact is gradational with the underlying Bay Point Formation. Our current interpreted base of the slopewash material differs from our initial investigation, where the base of the slopewash material was the top of a distinctive "beach' sand. This "beach" sand is presently considered a unit within the underlying Quaternary Bay Point Formation, Unit Qbp- 4 on the geologic cross-sections.

The Quaternary Slopewash consists of a homogeneous deposit of loose to stiff, moist to wet, yellowish –gray brown to yellowish - olive brown, slightly mottled, silty to sandy Clay, varying to sandy clayey Silt, with rootlets, locally developed pinhole structure, some carbonate near the upper contact, and occasional carbon fragments. The unit is massive with locally developed weak discontinuous laminations. Upper and lower contacts are gradational.

4.2.3 Transitional (?) Quaternary Slopewash/Bay Point Formation; (Qsw / QBp-1)

Map Unit Qsw /QBp-1 is considered a transitional unit between the overlying Quaternary Slopewash and underlying Quaternary Bay Point Formation. The upper and lower contacts are both gradational. The stratigraphic position of unit, above a moderately well developed paleosol, the higher sand content and scattered pebbles indicate that this unit is the basal unit to the Quaternary Slopewash material. However, an overall increased

density, change in color, degree of mottling, locally weak soil development, and gradational nature of the lower contact suggest it is part of the Bay Point Formation. Regardless of the interpretation, the unit could be mapped and correlated as distinct stratigraphic layer across the site.

Qsw /Bp1: consists of medium stiff to stiff, locally loose when saturated, moist to wet, dark gray brown, light brown, orange brown, black, variably mottled, sandy Clay with visually estimated medium to coarse grained sand percentages up 30 percent, scattered pebbles, abundant organics (carbon fragments and disseminated carbon) throughout. Upper contact is locally gradational to distinct, and the lower contact is gradational with Bp2.

4.2.3 Bay Point Formation; (QBp-2 to QBp-4)

Quaternary-aged sedimentary deposits identified as the Bay Point Formation were encountered within our subsurface explorations beneath the slopewash. These soils were divided into three, map units based on lithologic differences, and degree of soil development. Contacts were gradational with overlying and underlying units. The units are described below and depicted on the geologic-cross-sections (Figures 3 through 7).

Map Unit (Bp2): Bp2 consists of stiff to very stiff, locally hard, moist to wet, dark reddish brown, dark gray-brown, black, dark orange-brown, extensively mottled, silty to sandy Clay, with distinctive coarse-red sand grains throughout, scattered organics (carbon

fragments, disseminated carbon, massive to moderate, subangular- blocky soil structure, with clay films. Soil horizonation Btb to Btvb. Diffuse upper and lower contacts.

Map Unit (Bp3): Bp3 is a transitional unit between the overlying (Bp2) clay and sands of the underlying unit (Bp4). Bp3 is stiff to very stiff silty sandy Clay to medium dense clayey Sand, moist to wet, mottled brown, orange-brown, gray, with black, weaker soil structure than overlying unit Bp2, granular to massive, with locally moderate subangular-blocky soil structure.

Unit (Bp4): Bp4 consists of a distinctive change in lithology from the clay and silt of the overlying units to medium dense to dense, wet, gray to black, fine-to coarse-grained silty to clayey Sand that grades downward into a poorly graded Sand with silt, abundant mafic mineral concentrations consisting primarily of black (biotite) mica. Unit is interpreted as a paleo-beach sand.

4.3 Groundwater Conditions

Groundwater was encountered within our subsurface explorations at the time of drilling at elevations consistent with the contact between map units Bp-3 and Bp-4 at an approximate elevation ranging between -2 feet below mean sea level to mean sea level. Perched groundwater was encountered during drilling locally along the top of map unit Bp-2 (paleosol) at approximate elevations ranging between 7- to 10- feet above mean sea level. The deposits above Bp-2, within Qsw/Bp-1 were loose to soft where the perched groundwater was observed. Although groundwater conditions will likely vary, especially during periods of sustained precipitation, and

tidal fluctuations it is not expected to affect the proposed development if recommendations regarding site drainage are carried out during design and construction.

5.0 LOCAL AND REGIONAL FAULTING

5.1 Regional Faulting

According to the California Geologic Survey, a fault is considered active if it displays evidence of activity in the last 11,000 years (Hart and Bryant, revised 1997). A potentially active fault displays evidence of activity prior to 11,000 years, but within the last 1.6 million years; or when supporting geologic evidence indicates timing of faulting as potentially active or non-active, but direct geologic evidence is lacking that could unequivocally prove timing of activity.

The onshore portion of the Rose Canyon Fault Zone (RCFZ) is located approximately 0.6 kilometers to the southwest of the subject site, and is the closest known active fault. The RCFZ generally extends southeastward along the eastern slopes of Mount Soledad, and along the eastern shore of Mission Bay. Further to the south, north of downtown San Diego, the fault appears to diverge into three distinct strands, the Coronado, Spanish Bight, and Silver Strand faults. These strands generally extend to the south and southwest, through San Diego Bay, into Coronado, and eventually to the Pacific Ocean.

Evidence of Holocene (within the last 11,000 years) surface rupture on strands of the RCFZ has been discovered and summarized in Treiman, 1993. In addition, several recent studies, including; Woodward-Clyde Consults [WCC] 1994; Rockwell and Murbach, 1998; Leighton and

Associates, 1998; Kleinfelder, 1999 and 2001 have further substantiated activity along the RCFZ.

Other principal active faults in this region include the Elsinore, Coronado Banks, San Jacinto, and San Andreas faults as shown on the Regional Fault Map, Figure 8. Epicenters of earthquakes with magnitudes greater than 5.0 that occurred between 1800 to 1999 are shown on Figure 8, (Toppazada and others, 2000).

5.2 Site Specific Faulting

The site is not located within a State of California defined Alquist-Priolo Earthquake Fault Zone. However, based on our review of the City of San Diego Seismic Safety Study, it appears that a concealed segment of the Scripps Fault is mapped across the extreme northwest corner of the property (Figure 9). The Scripps fault is considered to be a potentially active fault, and has been zoned as a Category 12 seismic hazard, according to the City of San Diego Seismic Safety Study. Category 12 zones are for faults considered potentially active, inactive, or activity level unknown. A surface rupture hazard evaluation was requested by the City of San Diego for the subject site in their cycle review comments dated, July, 19, 2006.

Excavation of fault trenches is considered to be the best method to investigate faulting. However, fault trench excavations were not feasible at the subject site due to limited access, and groundwater elevations that would prohibit trenching to the anticipated depths needed to expose the stratigraphy of sufficient age to evaluate the timing of faulting. Given these restraints, the faulting was evaluated by advancing and continuous sampling borings to sufficient depths to

establish stratigraphic and structural continuity across the site. This is considered a standard of practice methodology according the Note 49, "Guidelines For Evaluating Surface Rupture" (California Geological Survey, 2002).

A total of 15 borings were advanced at the site (B-1 through B-15) to depths ranging from 11 to 41 feet below existing grades. As shown on Figure 2, the borings were located around the perimeter of the existing structures with a distribution that provided the correlation of subsurface stratigraphy along three east-west oriented cross-section lines, A-A', B-B', and C-C' (Figures, 3, 4, and 5, respectively), and two additional cross-sections, D-D', along a north-south orientation, and E-E' along a northwest-southeast oriented (Figures 6 and 7, respectively). Lithostratigraphic (similar lithology) and a chronostratigraphic (time boundary) horizon could be correlated across the entire site. The cross-sections were correlated at there intersection points to provide internal consistency of the geologic interpretations. The lithostratigraphic horizons include the contact between map units Qsw and Qsw/Bp1, Bp-2 and Bp-3, Bp-3 and Bp-4. The chronostratigraphic horizon is the contact between map units Qsw/Bp-1 and Bp-2. This is based on the buried soil profile (paleosol) that represents the top of unit Bp-2. The correlations of these units are depicted on the Geologic cross-section A-A' through E-E' (Figures 3 through 7, respectively).

Based on our interpretation, the subsurface stratigraphy is laterally continuous and displays structural and stratigraphic continuity across the entire site. The mapped units have a slight westward dip of approximately three degrees, similar to the present slope of the coastal beach

and terrace surface. This slope is probably best represented by the contact between units Qsw/Bp-1 and Bp-2, with the top of Bp-2 at average elevation of 12 feet above mean sea level at the eastern end of the property, sloping westward to approximately mean sea level at the western end of the property adjacent to the seawall. This is a distance of approximately 160 feet with 12 feet of fall that equates to a gradient of 0.075, or approximately three degrees from horizontal. All the mapped contacts had similar gradients and therefore this gradient was taken as the average slope used to estimate the bluff edge (discussed below).

The Bay Point Formation is considered to have formed approximately 120,000 to 80,000 years before present in this area (Kennedy, 1975). Kuhn, 1984, reported that a fossil horse bone was found to the north within the alluvial bluffs, and yielded an age of 55,000 years as determined by amino acid dating techniques (Bada, et al. 1974). In addition, based on Carbon -14 dating, 5,460 to 7,370 year old remains from Indian burial sites were discovered in the bluffs north of the Scripps Biology buildings (Shumway et.al. 1961; as reported in Kuhn, 1984). These bluffs, referred to as the low-lying alluvial bluffs, extend from just north of Scripps to Kellogg Park, and include the bluffs present at the subject site.

Based on the lateral and vertical stratigraphic and structural continuity of the deposits across the site, as depicted in Figures 3 through 7, and the age-constraints discussed above, it is clear that active faults do not cross the site. The existence of potentially active faults (faults older than 10,000 years and younger than 1.6 million years) could be present at depths below the limits of our investigation. However, there is no indication of faulting within the depths explored and it is

our professional opinion that the risk of surface rupture is very low to nil. Furthermore, because we found no evidence of faulting, such as offset lithology, structural warping, thickness changes or steps in lithologic units, we are not recommending any structural setbacks from the interpreted trace of the Scripps fault along the northwest property corner.

6.0 BLUFF EVALUATION

6.1 Review of Historic Topography

A series of topographic maps of the La Jolla Quadrangle were collected from EDR Environmental Data Resources, Inc., and from the County of San Diego Public Works. The topographic maps reviewed are presented in the table below.

TABLE I

Quadrangle	Year	Series	Scale
La Jolla	1930	15 minute	1:62500
La Jolla	1953	7.5 minute	1:24000
La Jolla	1967	7.5 minute	1:24000
La Jolla	1975	7.5 minute	1:24000
La Jolla	1977	1" = 200'	1:2400
La Jolla	1996	7.5 minute	1:24000

Based on our review, it appears that the site surface elevation was lower than 25 feet msl, and possibly lower than 20 feet msl on the 1930 and 1953 maps. The 1967, 1975, and 1996 maps indicate the surface elevation was between 20 to 25 feet msl. The 1977 map at a smaller scale than the other maps reviewed, indicated the surface elevation was between 15 to 25 feet from west to east across the site. The present surface elevations, as shown on Figure 2, range from 14 feet on the sidewalk behind the seawall, then approximately 17 feet msl from behind the retaining wall to 24 feet msl at the eastern end of the existing structures. Copies of the topographic maps are presented in Appendix D.

6.2 Review of Historic Photography

Aerial and surface photographs of the site and surrounding area were reviewed to help re-construct the site development history and provide correlative data with the review of the historic topographic maps. Aerial photographs were collected from the California Coastal Records Project (www.californiacoastline.org), (Appendix E), and a data search completed by EDR Environmental Data Resources Inc., (Appendix F), and historic surface photographs of the general site area were collected from Kuhn and Shepard, 1984 (Appendix G).

6.2.1 Aerial Photographs

Oblique aerial photographs of the La Jolla Shores area available from the California Coastal Project included photographs from 1972, 1979, 1987, 1989, 1995, and 2004. Aerial photographs from the EDR data search included photographs from 1948, 1953, 1963, 1974, 1989, 1994, and 2002.

Review of the aerial photographs shows the seawall and the residences south of the intersection of El Paseo Grande and Paseo Del Ocaso were constructed between the years of 1948 to 1953. It appears that some grading occurred at the subject site prior to or during 1948. Interpretation of the 1948 photograph suggests that the grading was to create beach access for the construction of the seawall. Parcels north of the subject site appeared to have been affected more from the grading, and only the western portion of the subject site appears to have been graded. It is apparent that the seawall was constructed on the coastal beach, seaward of the bluff face as it existed at that time. Indicating that fill was placed behind the seawall and in front of the bluff face.

6.2.2 Historic Area Photographs

Historic photographs of the area were collected from Kuhn and Sheppard, 1984. These photographs show the general La Jolla Shores area and particularly a section of the bluffs north of the subject site (approximately eight houses/parcels north of the subject site). A series of photographs at this location were taken in 1936, and during the winter storms of 1978, and subsequently in 1979. The 1936 photographs shows that the bluffs were steeply faced, with steps, gullies, and uneven surface topography, with a slope decreasing in elevation toward the south, consistent with historic and present day topography. Portions of the seawall were destroyed, but the seawall to the south remained intact. The step in the seawall in the 1979 photograph is a good reference point for location of the area in the more recent photographs collected from the California Coastal Records Protect Photographs.

According to Kuhn (1984), climatic conditions prior to 1978 were milder and the bluff faces became rounded and more vegetated than the steep faces show in the 1936 photograph. This implies the gradient of the bluff faces decreased during this time of mild climatic conditions.

6.3 Bluff Profiles

Three cross-sections were constructed perpendicular to the bluff, Cross-Section A-A', B-B' and C-C' (Figures 4, 5, and 6). The locations of the sections are shown on the Site Exploration and Location Map (Figure 3). Estimates of the coastal bluff edge were made following the Coastal Bluffs and Beaches Guidelines, and estimates of the toe of bluff were interpreted based on information from the western most boring on each section, the estimated location of the present day abrasion platform, and estimates of the width of fill placed behind the constructed seawall based on our aerial photograph and literature reviews. Additionally, it is our understanding, substantiated from conversations with the representatives of the City of San Diego Land Development Review Department, that the coastal bluff height criteria is not an elevation above mean sea level, but the actual vertical relief of the bluff between the toe of bluff and bluff edge.

Previous studies along the San Diego coastline have established the toe of bluff at the intersection of the bluff face with the top of present day beach deposits. Based on our review of historical topography, the coastal beach deposits within the site vicinity typically range in elevation from 7 to 10 feet above msl. During typical years, the vertical relief of the bluff – as measured from the top of the coastal beach deposits intersection with the bluff face to the top of bluff edge – varies from 2 to 5 feet.

In an atypical year, such as in severe storm years, like those in 1978, the beach deposits may be removed to the elevation of the abrasion platform. In such years, the vertical relief of the bluff as measured from the intersection of the present day abrasion platform with the bluff face to the top of the bluff would be approximately 10-feet along the western margin of the property.

6.4 Regulations

As previously mentioned, The City of San Diego Land Development documents "Coastal Bluffs and Beaches Guidelines", and the "Steep Hillside Guidelines" classify and establish appropriate regulations for the low-lying cliffs delineating the boundary between the coastal beach and other terrain at the site.

The subject site is located immediately adjacent to the La Jolla Shoes beach and is within The City of San Diego Seismic Safety Category 48, "Generally stable, board beach areas, coastal harbors". As a designated Coastal Beach area, the site first falls under the Coastal Bluffs and Beach Guidelines. The Steep Hillside guidelines apply to coastal bluffs that are not sensitive coastal bluffs and landforms that meet different criterion for steep hillsides than the coastal bluff criterion.

6.4.1 Coastal Beach

The Environmentally Sensitive Lands Regulations define a Coastal Beach as:

Coastal Beach means the land between the edge of the sea and the first line of terrestrial vegetation or development or the toe of an adjacent sensitive coastal bluff, whichever is most seaward.

In addition, the Coastal Bluffs and Beaches Guidelines state that "if a seawall exists, the landward limit of the beach is still the toe of the bluff. The seawall would represent encroachment onto the beach".

The subject site parcel extends from El Paseo Grande on the east to the mean low water line on the west, and therefore a portion of the site contains a coastal beach. Based on our interpretation, the eastward extent of the coastal beach is approximately five to seven feet east of the seawall. A line connecting the interpreted toe of bluff along the site is depicted on Figure 3. This line delineates the boundary between the City of San Diego Seismic Safety Study Category 48 (coastal beach) and Category 52 (other terrain).

6.4.2 Coastal Bluff verses Sensitive Coastal Bluff

As Shown on Figure 4, 5, and 6, an escarpment exists between the coastal beach and other terrain boundary at the site. To address the questions of whether this escarpment classifies as a Coastal Bluff, Steep Hillside, or a Sensitive Coastal Bluff the pre-modified (pre-grading, pre-seawall construction) geometry of the escarpment was required to be established and compared to the geometric criteria as defined in the Coastal Bluff and Beach and Steep Hillside Guidelines.

An escarpment located along the shoreline and adjacent to coastal beaches must qualify as a coastal bluff before it can qualify as a sensitive coastal bluff.

6.4.2.1 Definition of Coastal Bluff

The Environmentally Sensitive Lands Regulations define a Coastal Bluff as:

Coastal Bluff means an escarpment or steep face of rock, decomposed rock, or soil resulting from erosion, faulting, or folding of the land mass that has a vertical relief of 10 feet or more and is located in the coastal zone.

In addition, a "coastal bluff is a naturally formed precipitous landform that generally has a gradient of at least 200 percent (1:2 slope) with a vertical elevation of at least 10 feet."

Based on our analysis, the vertical relief along the escarpment varies from 2 to 5 feet if measured from the top of the coastal beach deposits intersection with the bluff face to the top of bluff edge or approximately 10 feet if measured from the abrasion platform along the western (seaward) portion of the property. The elevation change across the entire parcel ranges from sea level (measured from the abrasion platform) to approximately 25 feet above mean sea level.

For the escarpment to meet the classification of a coastal bluff, some portion of the vertical relief along the site has to have a gradient of at least 200 percent. To address this criterion, the site gradient was calculated across the area of the bluff face, between the abrasion platform and the bluff edge. This area is the potential steep hillside (discussed below), or coastal bluff portion of the site. As shown on Cross –Sections A-A', B-B' and C-C' (Figures 4, 5 and 6, respectively) the

gradients range from approximately 154 percent on Cross-Section A-A', to 166 percent on Cross-Section B-B', and 182 percent along Cross-Section C-C'. The average gradient across the entire site, from the base of the seawall to the eastern property limit, is approximately 17 percent.

The above calculated gradients across the site do not meet the criteria for a coastal bluff.

6.4.2.2 Definition of Sensitive Coastal Bluff

The Environmentally Sensitive Lands Regulations define a Sensitive Coastal Bluff as: "*Sensitive Coastal Bluff means a coastal bluff that is designated within Hazard Category Numbers 41 through 47, inclusive, on the City's Geologic Hazard Maps, plus an additional 100-foot landward strip located and contiguous to the coastal bluff edge.*"

Also according to the Coastal Bluff and Beach Guidelines, "[s]ensitive coastal bluffs are a form of coastal bluffs that are generally located along the shoreline and adjacent to coastal beaches.

As previously mentioned, our review of the City's Geologic Hazard Maps show the site falls within Hazard Categories 48 and 52, "coastal beaches" and "other terrain", respectively. Based on the City of San Diego classification of the site area as Categories 48 and 52, the escarpment at the site does not classify as a

sensitive coastal bluff, and therefore not as a coastal bluff, based on the site's location adjacent to a coastal beach. The City of San Diego Geologic Hazard Categories in the site area are shown on Figure 9.

Our interpretation that the escarpment at the site does not meet the criteria of a coastal bluff, based on the findings of our site specific investigation, is consistent with City of San Diego's more general classification of the site area that the escarpment is not a sensitive coastal bluff.

6.4.2.3 Definition of Steep Hillsides

According to the Environmentally Sensitive Lands Regulations, there are two criteria used to establish when steep hillside regulations are applicable to a proposed development. The first criterion is applicable if any portion of the site contains a natural gradient of at least 200 percent (200 feet of vertical distance for every 100 feet of horizontal distance) and a vertical elevation (vertical relief) of at least 10 feet. This is the same criteria for a coastal bluff, as described in the Coastal Bluff and Beach Guidelines, and discussed above in section 6.4.2.2.

The second criterion is when a development is proposed on a site containing any portions with a natural gradient of 25 percent (25 feet of vertical distance for every 100 feet of horizontal distance) and a vertical elevation of at least 50. This criterion is not applicable to the subject site, because the site elevation has been

and is presently today below 25 feet in elevation based on our review of historical topographic maps, and the present surveyed site topography.

Therefore, it is our professional opinion that the site does not classify as a steep hillside and is not subject to the steep hillside regulations. This finding is consistent with previous findings and rulings by the City of San Diego for similar projects to the north and south of the subject site.

7.0 CONCLUSION AND RECOMMENDATIONS

Based on the data available for review, as well as the data from our investigations, it is our professional opinion that the site is not underlain by active faults and there is no indication of faulting from potentially active faults to the depths of our investigation. Therefore, we are not recommending any structural setbacks from the interpreted location of the Scripps fault at the northwest corner of the property.

Based on the information obtained from our investigations, our interpretation of the height and location of the bluffs prior to development of the site, the calculated site gradients, and our review and understanding of the Coastal Bluffs and Beaches and Steep Hillside Guidelines, it is our professional opinion that the site does not fall under the jurisdiction of the Sensitive Coastal Bluffs and does not classify as a Coastal Bluff or Steep Hillside. These site specific findings support the regional Seismic Safety Study Category boundaries established City of San Diego for the site area.

8.0 LIMITATIONS OF INVESTIGATION

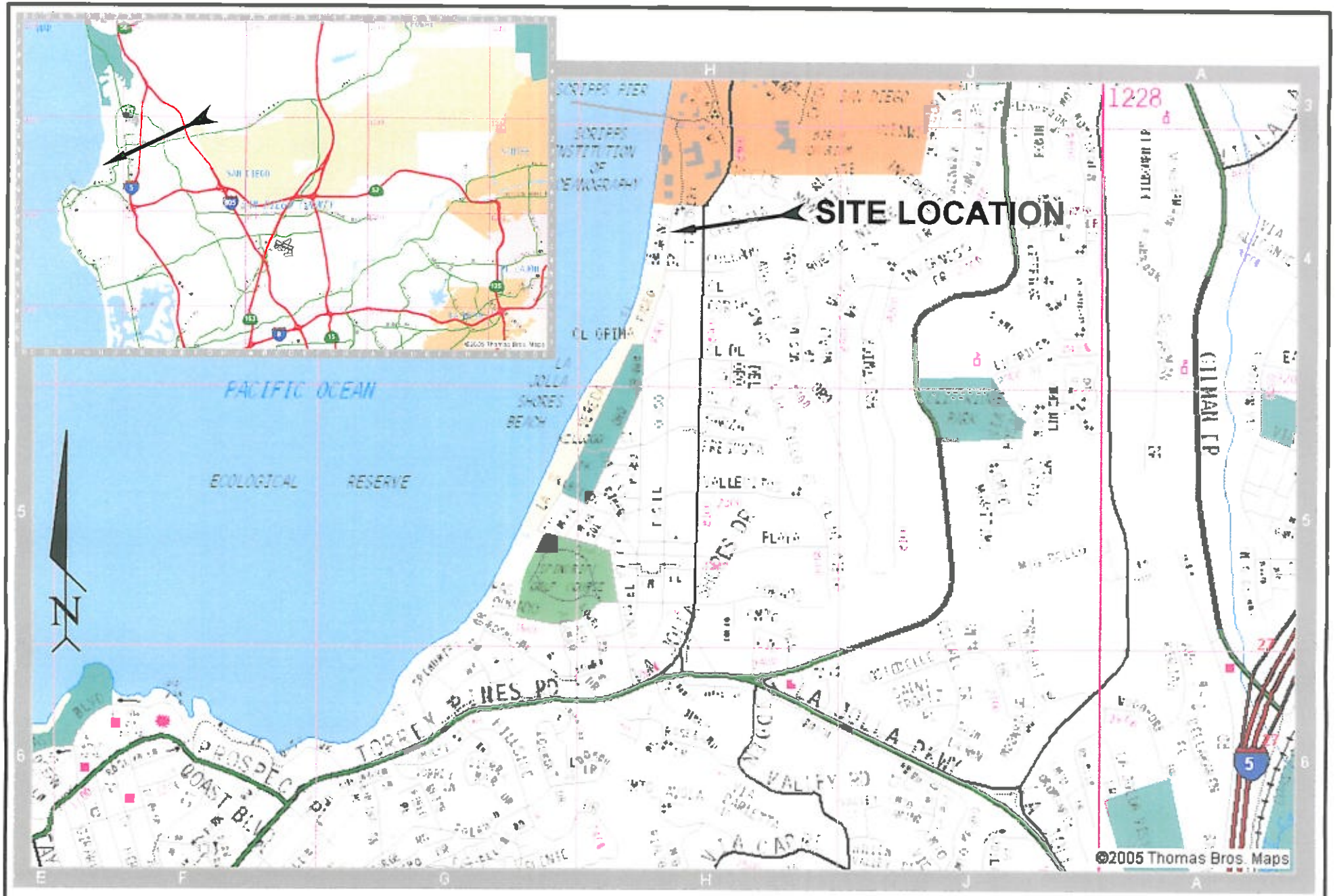
The field evaluation, laboratory testing and geotechnical and geologic analysis presented in this report have been conducted according to current engineering practice and the standard of care exercised by reputable geotechnical consultants performing similar tasks in this area. No other warranty, expressed or implied, is made regarding the conclusions, recommendations and opinions expressed in this report. Variations may exist and conditions not observed or described in this report may be encountered during construction.

Our conclusions and recommendations are based on an analysis of the observed conditions. If conditions different from those described in this report are encountered, our office should be notified and additional recommendations, if required, will be provided upon request. We appreciate this opportunity to be of service on this project. If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Respectfully submitted,
CONSTRUCTION TESTING & ENGINEERING, INC.

Martin E. Siem CEG #2311
Senior Engineering Geologist

Dan T. Math, GE#2665
Principal Engineer



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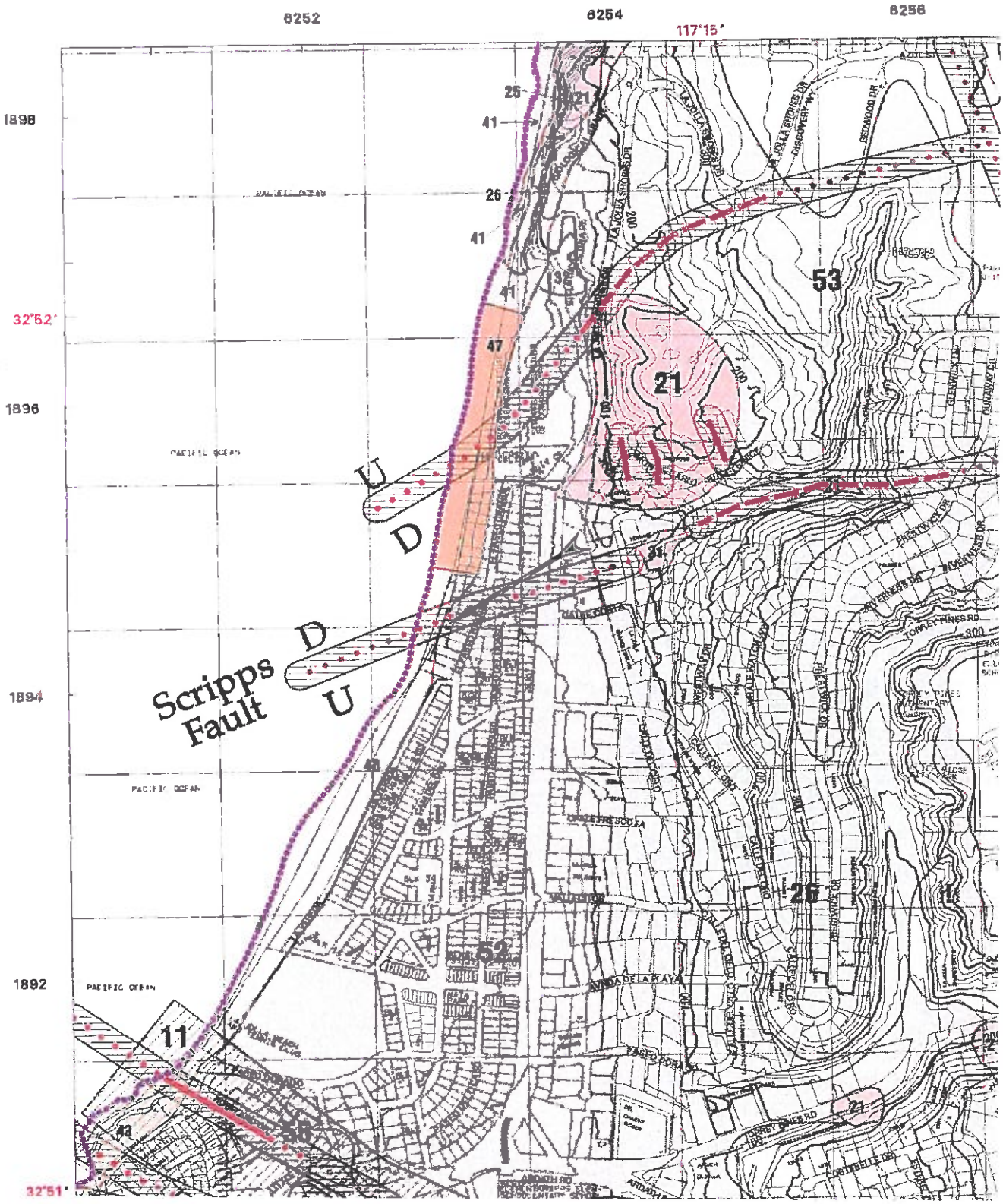
SITE INDEX MAP
PROPOSED LUSARDI RESIDENCE
8466 EL PASEO GRANDE
LA JOLLA, CALIFORNIA

CTE JOB NO	10-8264G
SCALE	NO SCALE
DATE	1/07
FIGURE	1



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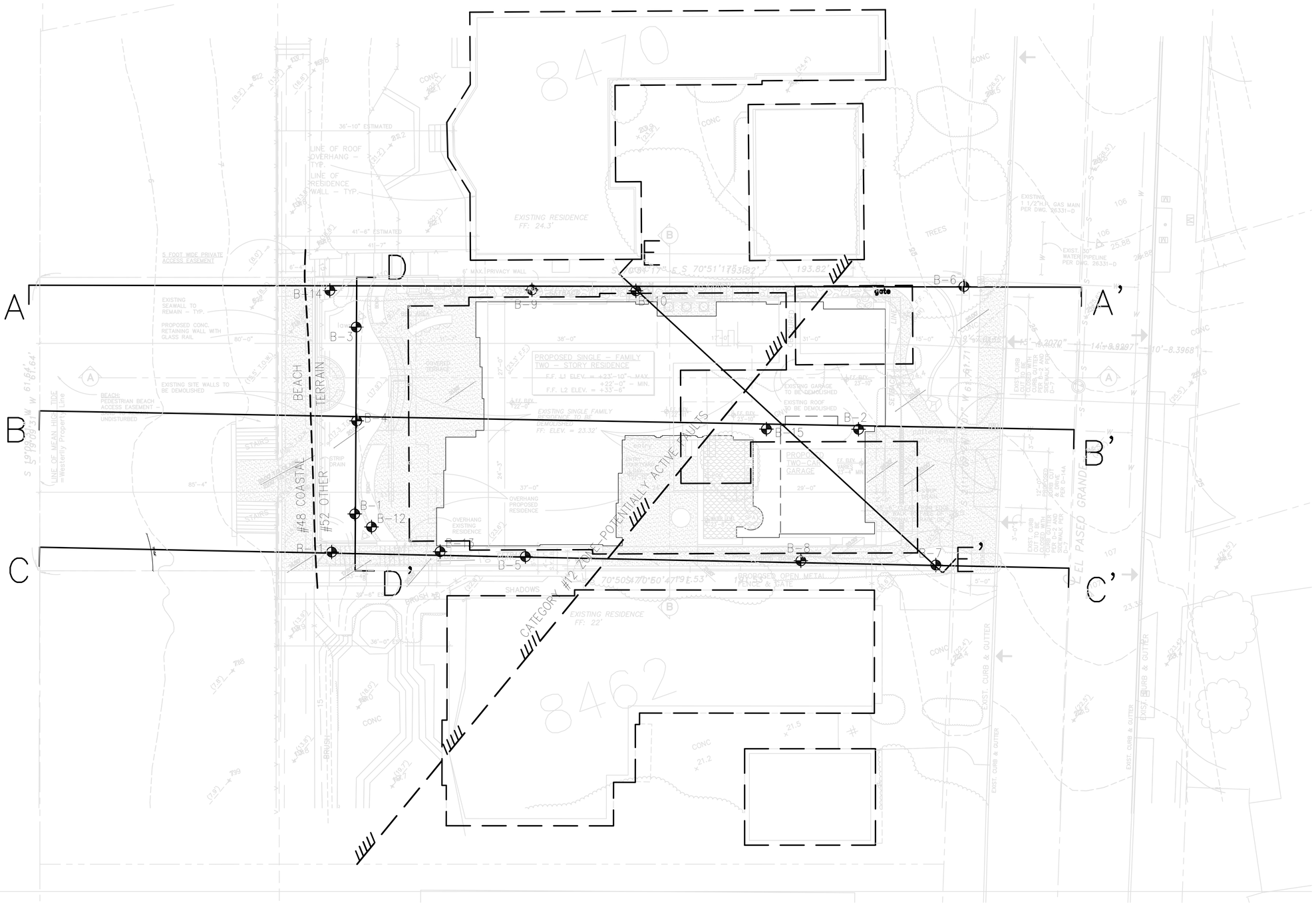
SEISMIC SAFETY STUDY MAP

LUSARDI RESIDENCE
LA JOLLA, CALIFORNIA

CTE JOB NO:	10-8264G
SCALE:	NO SCALE
DATE:	1/07
FIGURE:	2



LEGEND

B-1 APPROXIMATE BORING LOCATION

A A' LOCATION OF GEOLOGIC CROSS SECTION

CITY OF SAN DIEGO SEISMIC SAFETY HAZARD CATEGORY BOUNDARY
#48 COASTAL BEACH
#52 OTHER TERRAIN

#12 POTENTIALLY ACTIVE FAULTS
ZONED ON HATCHERED SIDE OF BOUNDARY LINE

NOTE:SOURCE DRAWING FROM HAYER ARCHITECTURE

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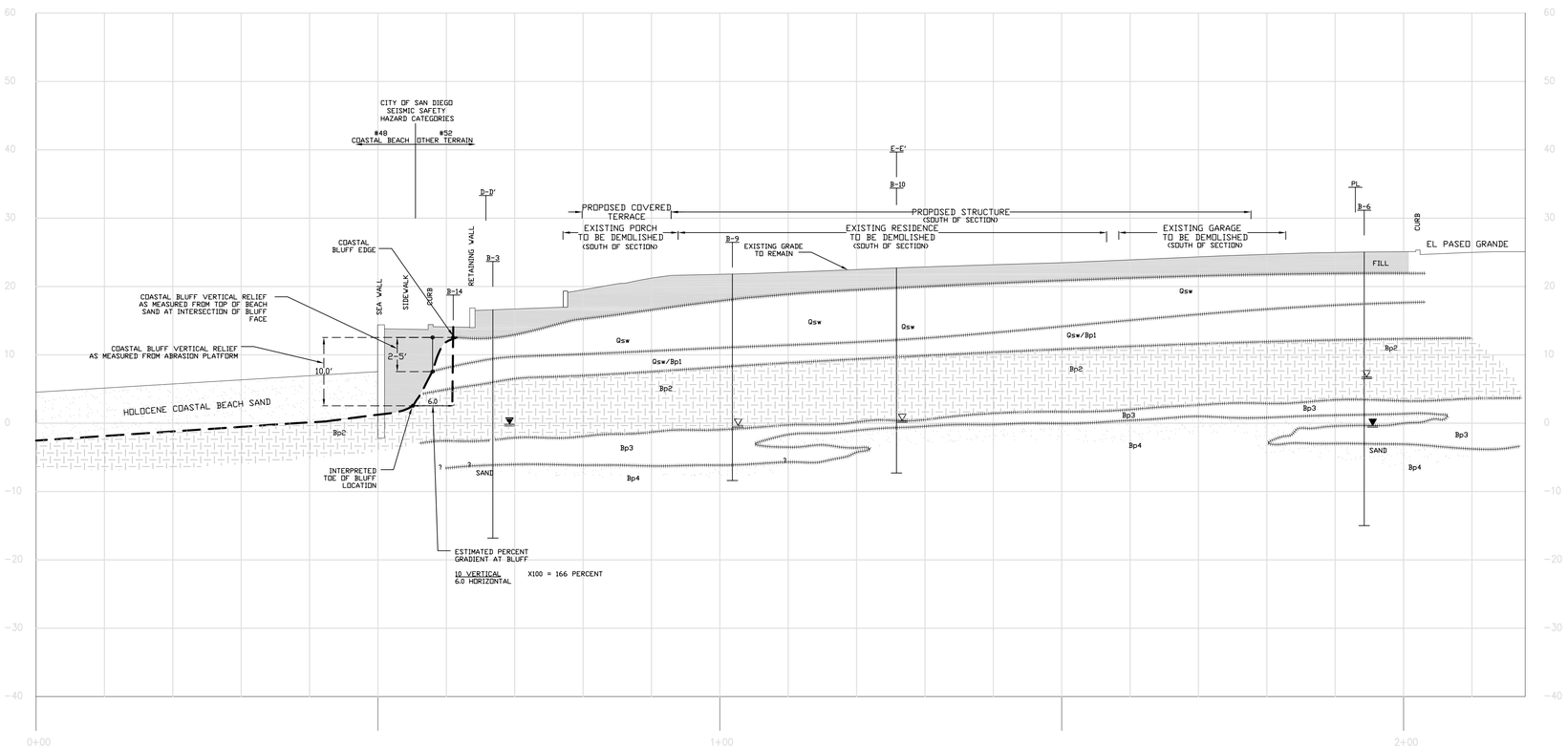
SITE EXPLORATION LOCATION MAP

LUSARDI RESIDENCE
8466 EL PASEO GRANDE
LA JOLLA, CALIFORNIA

SCALE:	DATE:
1"=10'	01/07
CTE Job No.:	FIGURE:
10-8264G	3

VIEW LOOKING NORTH



Explanation

Fill: Consists of loose to medium stiff, reworked Quaternary Slope Wash as described below, with loose, silty sand, abundant organics, roots, topsoil form turf and planter areas, minor debris.

Quaternary Slope Wash (Qsw): consists of loose to stiff, moist to wet, yellowish -gray brown to yellowish - olive brown, slightly mottled, silty to sandy Clay, varying to sandy clayey Silt, with rootlets, locally developed pinhole structure, some carbonate near the upper contact, and occasional carbon fragments. The unit is massive with locally developed weak discontinuous laminations. Upper and lower contacts are gradational.

Unit 1 (Qsw/Bp1): consists of medium stiff to stiff, locally loose when saturated, moist to wet, dark gray brown, light brown, orange brown, black, variably mottled, sandy Clay with visually estimated medium to coarse grained sand percentages up 30 percent, scattered pebbles, abundant organics (carbon fragments and disseminated carbon) throughout. Upper contact is locally gradational to distinct, and the lower contact is gradational with Bp2.

Quaternary Bay Point Formation

Unit 2 (Bp2): Bp2 consists of stiff to very stiff, locally hard, moist to wet, dark reddish brown, dark gray-brown, black, dark orange-brown, extensively mottled, silty to sandy Clay, with distinctive coarse-red sand grains throughout, scattered organics (carbon fragments, disseminated carbon, massive to moderate, subangular- blocky soil structure, with clay films Soil horizonation Btb to Btvb. Diffuse upper and lower contacts.

Unit 3 (Bp3): Bp3 consists appears to be a transitional unit between the overlying (Bp2) clay and sands of the underlying unit (**Bp4**). Bp3 is stiff to very stiff silty sandy Clay to medium dense clayey Sand, moist to wet, mottled brown, orange-brown, gray, with black, weaker soil structure than overlying unit Bp2, granular to massive, with locally moderate subangular-blocky soil structure.

Unit 4 (Bp4): Bp4 consists of a distinctive change in lithology from the clay and silt of the overlying units to medium dense to dense, wet, gray to black, fine-to coarse-grained silty to clayey Sand that grades downward into a poorly graded Sand with silt, abundant black mica. Unit is interpreted as a paleo-beach sand.

- Gradation contact between mapped units.
- Approximate location or inferred (?) location of geologic contacts
- Zones of carbonate accumulation
- Existing Grade
- Proposed Final grade
- Perched groundwater observed
- Groundwater at time of drilling

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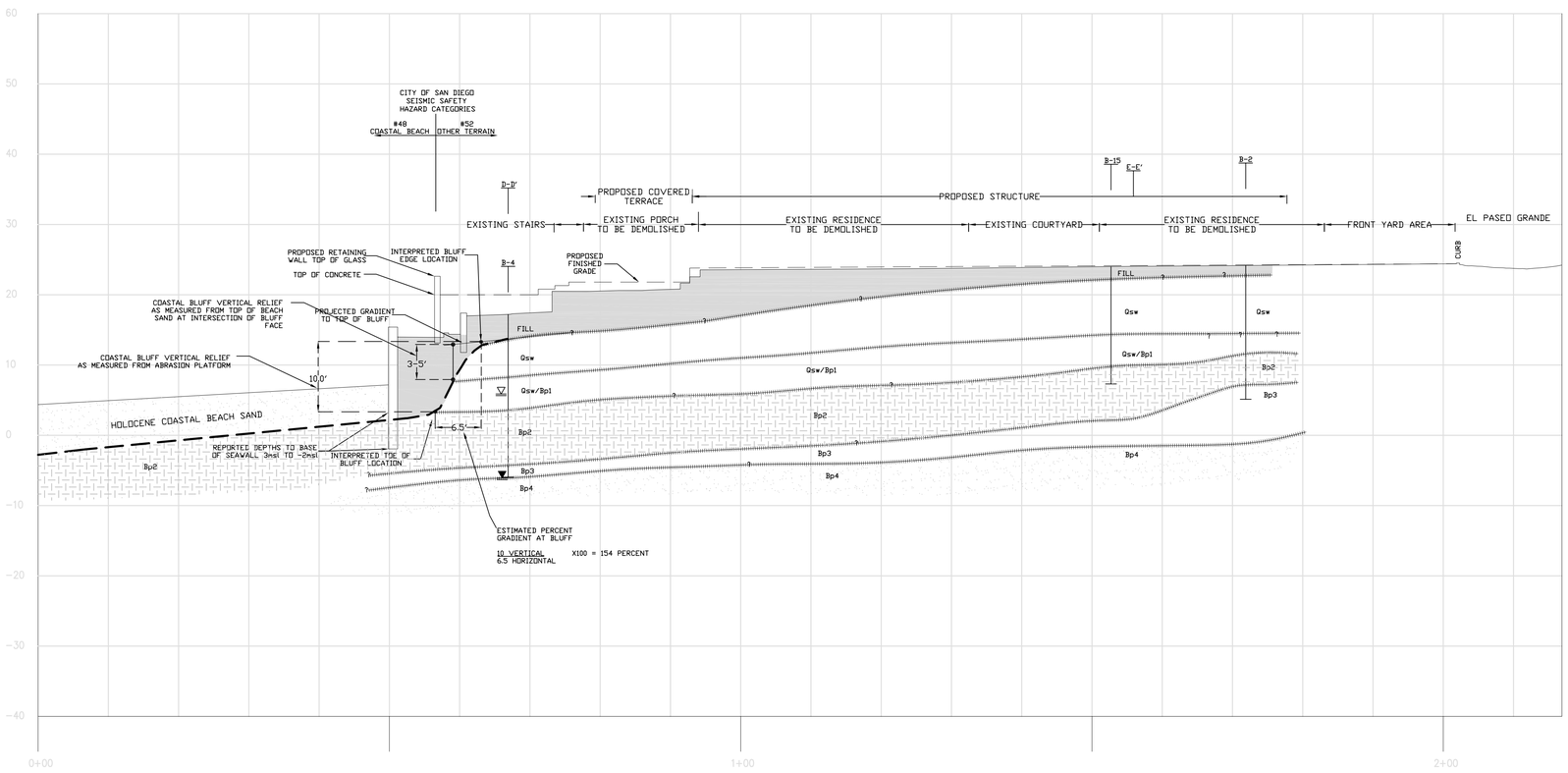
CROSS SECTION A-A'

LUSARDI RESIDENCE
8466 EL PASEO GRANDE
LA JOLLA, CALIFORNIA

SCALE:	DATE:
1"=10'	01/07
CTE Job No.:	FIGURE:
10-8264G	4

VIEW LOOKING NORTH



Explanation

Fill: Consists of loose to medium stiff, reworked Quaternary Slope Wash as described below, with loose, silty sand, abundant organics, roots, topsoil form turf and planter areas, minor debris.

Quaternary Slope Wash (Qsw): consists of loose to stiff, moist to wet, yellowish -gray brown to yellowish - olive brown, slightly mottled, silty to sandy Clay, varying to sandy clayey Silt, with rootlets, locally developed pinhole structure, some carbonate near the upper contact, and occasional carbon fragments. The unit is massive with locally developed weak discontinuous laminations. Upper and lower contacts are gradational.

Unit 1 (Qsw/Bp1): consists of medium stiff to stiff, locally loose when saturated, moist to wet, dark gray brown, light brown, orange brown, black, variably mottled, sandy Clay with visually estimated medium to coarse grained sand percentages up 30 percent, scattered pebbles, abundant organics (carbon fragments and disseminated carbon) throughout. Upper contact is locally gradational to distinct, and the lower contact is gradational with Bp2.

Quaternary Bay Point Formation

Unit 2 (Bp2): Bp2 consists of stiff to very stiff, locally hard, moist to wet, dark reddish brown, dark gray-brown, black, dark orange-brown, extensively mottled, silty to sandy Clay, with distinctive coarse-red sand grains throughout, scattered organics (carbon fragments, disseminated carbon, massive to moderate, subangular- blocky soil structure, with clay films Soil horizonation Btb to Btvb. Diffuse upper and lower contacts.

Unit 3 (Bp3): Bp3 consists appears to be a transitional unit between the overlying (Bp2) clay and sands of the underlying unit (Bp4). Bp3 is stiff to very stiff silty sandy Clay to medium dense clayey Sand, moist to wet, mottled brown, orange-brown, gray, with black, weaker soil structure than overlying unit Bp2, granular to massive, with locally moderate subangular-blocky soil structure.

Unit 4 (Bp4): Bp4 consists of a distinctive change in lithology from the clay and silt of the overlying units to medium dense to dense, wet, gray to black, fine-to coarse-grained silty to clayey Sand that grades downward into a poorly graded Sand with silt, abundant black mica. Unit is interpreted as a paleo-beach sand.

- Gradation contact between mapped units.
- Approximate location or inferred (?) location of geologic contacts
- Zones of carbonate accumulation
- Existing Grade
- Proposed Final grade
- Perched groundwater observed
- Groundwater at time of drilling

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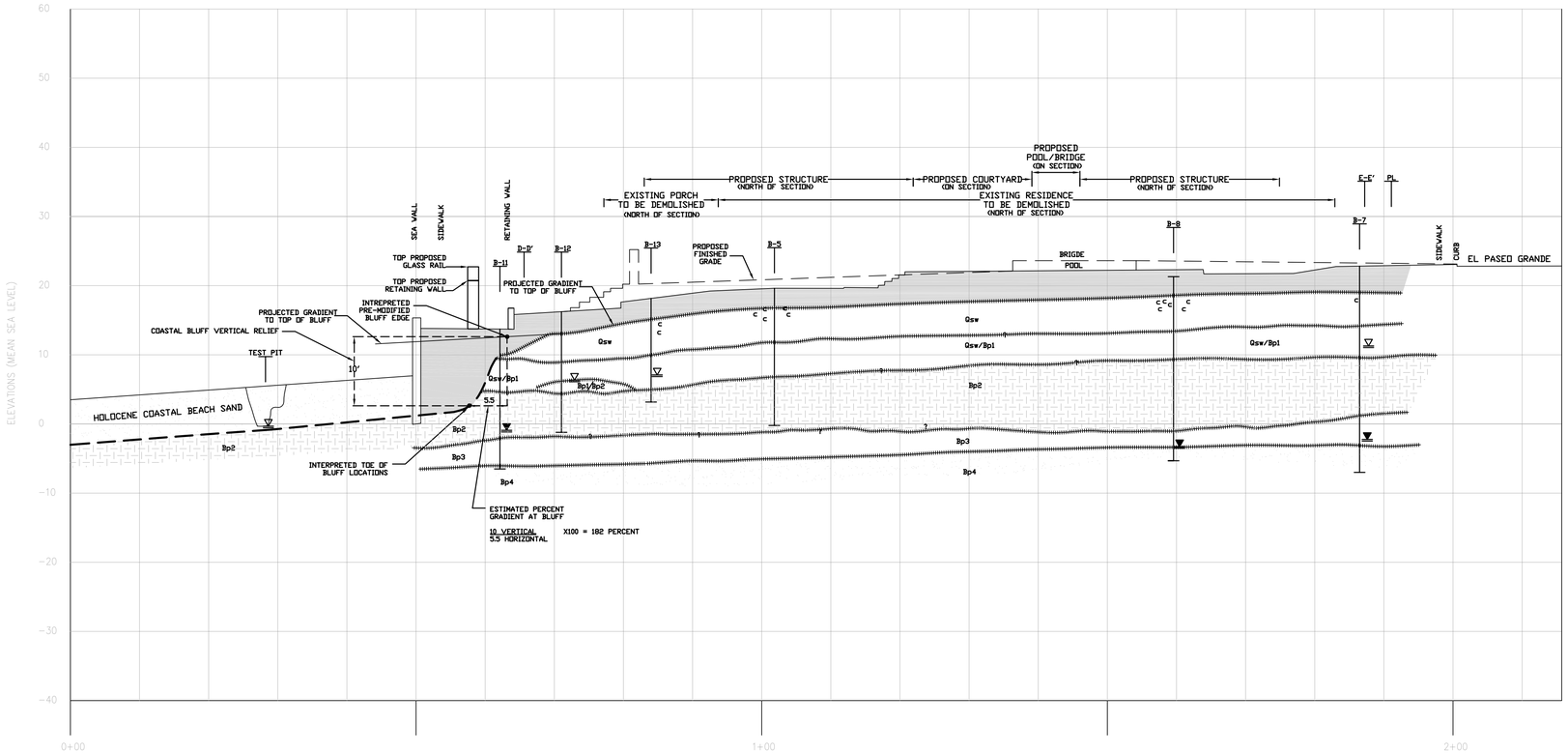
CROSS SECTION B-B'
LUSARDI RESIDENCE
8466 EL PASEO GRANDE
LA JOLLA, CALIFORNIA

SCALE:	DATE:
1"=10'	01/07
CTE Job No.:	FIGURE:
10-8264G	5



Explanation

Fill: Consists of loose to medium stiff, reworked Quaternary Slope Wash as described below, with loose, silty sand, abundant organics, roots, topsoil form turf and planter areas, minor debris.

Quaternary Slope Wash (Qsw): consists of loose to stiff, moist to wet, yellowish -gray brown to yellowish - olive brown, slightly mottled, silty to sandy Clay, varying to sandy clayey Silt, with rootlets, locally developed pinhole structure, some carbonate near the upper contact, and occasional carbon fragments. The unit is massive with locally developed weak discontinuous laminations. Upper and lower contacts are gradational.

Unit 1 (Qsw/Bp1): consists of medium stiff to stiff, locally loose when saturated, moist to wet, dark gray brown, light brown, orange brown, black, variably mottled, sandy Clay with visually estimated medium to coarse grained sand percentages up 30 percent, scattered pebbles, abundant organics (carbon fragments and disseminated carbon) throughout. Upper contact is locally gradational to distinct, and the lower contact is gradational with Bp2.

Quaternary Bay Point Formation

Unit 2 (Bp2): Bp2 consists of stiff to very stiff, locally hard, moist to wet, dark reddish brown, dark gray-brown, black, dark orange-brown, extensively mottled, silty to sandy Clay, with distinctive coarse-red sand grains throughout, scattered organics (carbon fragments, disseminated carbon, massive to moderate, subangular- blocky soil structure, with clay films Soil horizonation Btb to Btvb. Diffuse upper and lower contacts.

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- Gradation contact between mapped units.
- Approximate location or inferred (?) location of geologic contacts
- c c c c — Zones of carbonate accumulation
- Existing Grade
- Proposed Final grade
- Perched groundwater observed
- Groundwater at time of drilling

\\Cte_server\projects\10-8264G\cross section C.dwg 1/24/2007 2:59:17 PM PST

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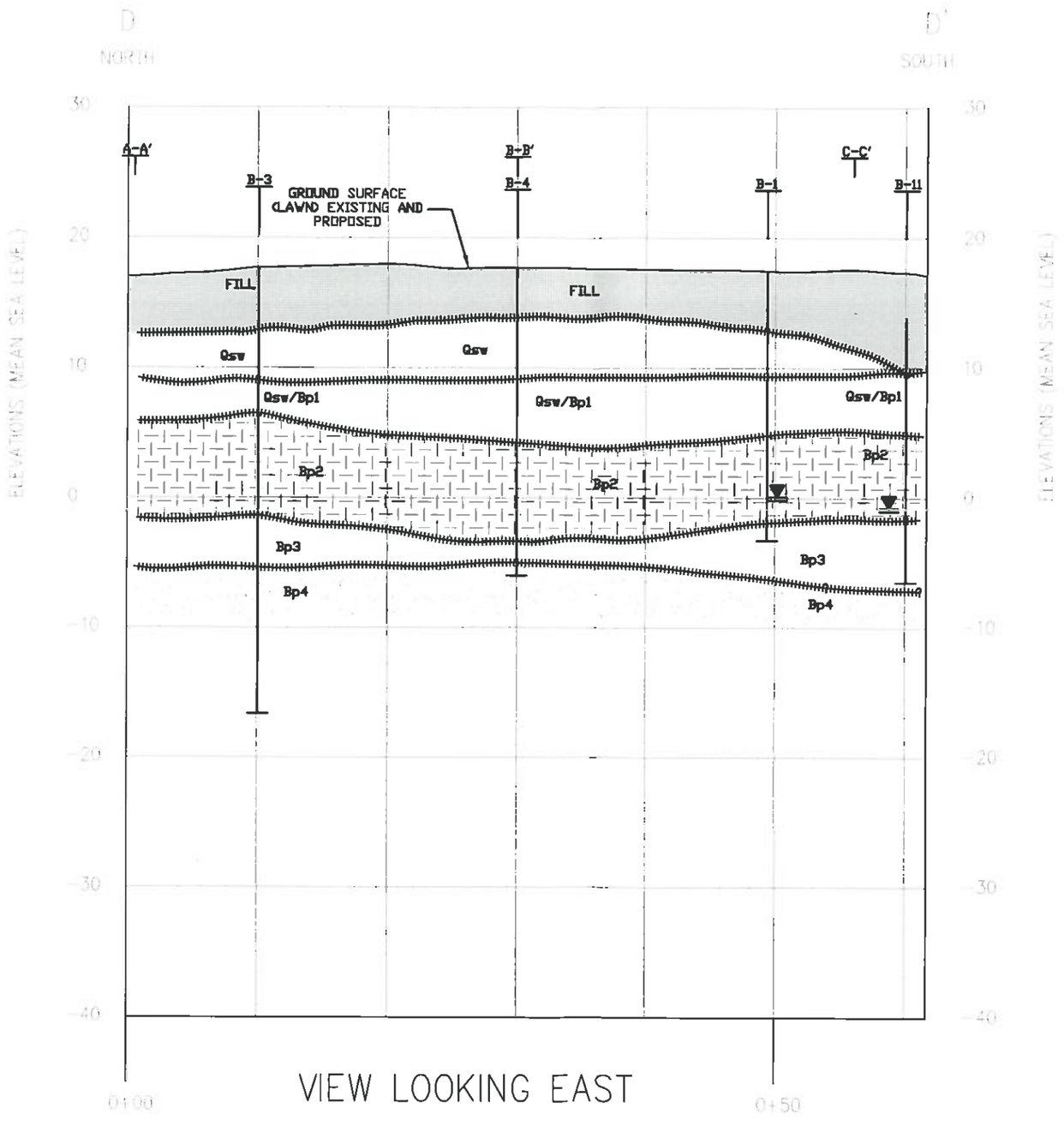
CROSS SECTION C–C'
LUSARDI RESIDENCE
8466 EL PASEO GRANDE
LA JOLLA, CALIFORNIA

SCALE:	DATE:
1"=10'	01/07
CTE Job No.:	FIGURE:
10-8264G	6



VIEW LOOKING EAST

SEE FIGURE 3 FOR EXPLANATION

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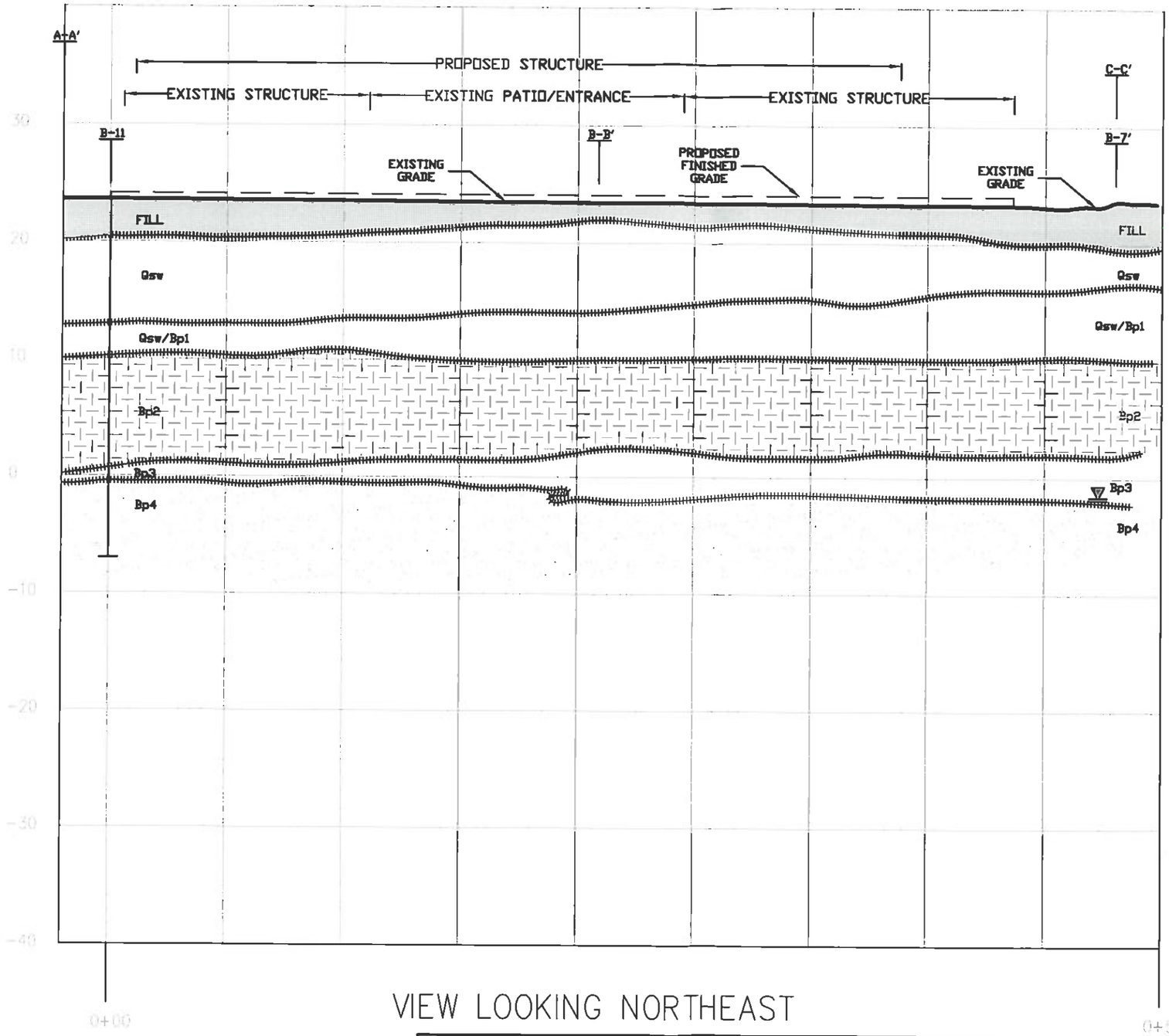
CROSS SECTION D–D'

LUSARDI RESIDENCE
8466 EL PASEO GRANDE
LA JOLLA, CALIFORNIA

CTE JOB NO:	10-8264G
SCALE:	1"=10'
DATE:	01/07
FIGURE:	7



VIEW LOOKING NORTHEAST

SEE FIGURE 3 FOR EXPLANATION

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CROSS SECTION E-E'

LUSARDI RESIDENCE
8466 EL PASEO GRANDE
LA JOLLA, CALIFORNIA

CTE JOB NO:	10-8264G
SCALE:	1"=10'
DATE:	01/07
FIGURE:	8

LEGEND

HOLOCENE (ACTIVE) FAULT MOVEMENT

HISTORIC FAULT MOVEMENT

/// LINEAR ALIGNED EARTHQUAKE EPICENTERS

QUATERNARY FAULT (YOUNGER THAN 1.6 MILLION YEARS) DISPLACEMENT, AGE UNDIFFERENTIATED

PRE-QUATERNARY (OLDER THAN 1.6 MILLION YEARS) DISPLACEMENT FAULT

0 1 2

SCALE 1" = 12 MILES

PERIOD	1800-1868	1869-1931	1932-1999
MAGNITUDE ≥ 7.0			
6.5-6.9			
5.5-5.9			
5.0-5.4			

40 LAST TWO DIGITS OF M ≥ 6.5 EARTHQUAKE YEAR

APPROXIMATE SITE LOCATION

NOTES: FAULT MAP ADAPTED AFTER JENNINGS, 1994, CDMG MAP NO. 6; REFERENCE FOR ADDITIONAL EXPLANATION

EPICENTERS OF AND AREAS DAMAGED BY M>5 CALIFORNIA EARTHQUAKES, 1800-1999 ADAPTED AFTER TOPPOZADA, BRANUM, PETERSEN, HALLSTORM, CRAMER, AND REICHLE, 2000, CDMG MAP SHEET 49

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REGIONAL FAULT AND SEISMICITY MAP

LUSARDI RESIDENCE
8466 EL PASEO GRANDE
LA JOLLA, CALIFORNIA

CTE JOB NO:	10-8284G
SCALE:	1 inch = 12 miles
DATE:	01/07
FIGURE:	9

APPENDIX A

REFERENCES CITED

REFERENCES CITED

1. Hart, E.W. and Bryant, E., 1997, "Fault-Rupture Hazard Zones in California, Alquist Priolo, Special Studies Zones Act of 1972," California Division of Mines and Geology, Special Publication 42, revised.

2. Martin, Ross, 2000, "Digital Images of Official Maps of Alquist-Priolo Earthquake Fault Zones of California, Southern Region," California Division of Mines and Geology, CD 2000-003.

3. Tan, S.S. and Giffen, D.G., 1995, "Landslide Hazards in the Southern Part of the San Diego Metropolitan Area, San Diego County, California," California Division of Mines and Geology, Landslide Hazard Identification Map No. 33.

4. Tan, S. S. and M. P. Kennedy, 1975, "Geology of the San Diego Metropolitan Area, California", La Jolla Quadrangle, California Division of Mines and Geology, DMG Bulletin 200.

APPENDIX B

EXPLORATION LOGS

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GEOTECHNICAL | CONSTRUCTION ENGINEERING TESTING AND INSPECTION
1441 MONTIEL ROAD, SUITE 115 | ESCONDIDO, CA 92026 | 760 746 4955

PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	1 of 1
CTE JOB NO:	10-8264G	DRILL METHOD:	TRIPOD DRILL RIG	DRILLING DATE:	2/9/2006
LOGGED BY:	STEVE H.	SAMPLE METHOD:	BULK AND RING	ELEVATION:	~

BORING: B-1

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SC	Fill	Medium dense, very moist, medium to dark grayish brown clayey SAND (SC).	WA MAX
			7			CL	Qsw	Stiff, moist, medium grayish brown sandy CLAY (CL).	WA, MD AL
5						SC	Qsw	Dense, moist, medium to dark brown, fine to medium-grained clayey SAND (SC).	
			20				BP_1		WA
10								? ? ? ? ?	
							BP_2	Based on cross-section correlations.	
15									
									WA
			26				BP_3	Dense, saturated, medium gray and brown, fine to medium-grained clayey SAND (SC).	
20								Total Depth 20' Groundwater Observed at 18'	
25									

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GEOTECHNICAL | CONSTRUCTION ENGINEERING TESTING AND INSPECTION
1441 MONTIEL ROAD, SUITE 115 | ESCONDIDO, CA 92026 | 760 747 4500

PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	1 of 1
CTE JOB NO:	10-8264G	DRILL METHOD:	TRIPOD DRILL RIG	DRILLING DATE:	2/9/2006
LOGGED BY:	STEVE H.	SAMPLE METHOD:	BULK AND RING	ELEVATION:	~23

BORING: B-2

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests
0						SC	Fill	Medium dense, moist, medium yellowish brown fine to medium-grained clayey SAND (SC).	
						CL	Qsw	SLOPEWASH (Qsw): Stiff, moist, medium brown sandy CLAY (CL).	
5			10						EI CHEM
									MD
								? ? ? ? ?	
10			12				Qsw BP_1		
						SC		Medium dense, moist, medium to dark brown fine to medium-grained clayey SAND (SC).	
							BP_2		
15			22						
							BP_2	Dense, saturated, medium grayish brown, fine to medium-grained clayey SAND (SC).	
			27						
20								Total Depth 19' Groundwater Not Observed	
25									

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GEOTECHNICAL | CONSTRUCTION ENGINEERING TESTING AND INSPECTION
1441 MONTIEL ROAD, SUITE 110 | ESCONDIDO, CA 92026 | 760.746.4005

PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	1	of	2
CTE JOB NO:	10-8264G	DRILL METHOD:	TRIPOD, SOLID STEM	DRILLING DATE:			10/2/2006
LOGGED BY:	D. RIES	SAMPLE METHOD:	BULK AND CONTINUES SPT	ELEVATION:			17.5

BORING: B-3

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
0								0-0.3' TURF:	Hand Augered to 1.5 feet
						CL		0.3'-1.5': Soft, very moist, (irrigation), grayish brown fine sandy CLAY (CL) with silt, fine roots.	
			3			SC	Fill	1.5'-2.5': Soft to loose, moist to very moist, grayish brown clayey fine SAND (SC) with thin rootlets, occasional fine gravel, (possible fill).	
								2.5'-3': Soft, moist, yellowish grayish brown, CLAY (CL), trace fine sand, no roots, pinholes, porous.	EI
			5					3'-3.3': Continues soft to loose, moist to very moist, clayey fine SAND (SC) with thin rootlets, occasional fine gravel, (possible fill).	
5			4			CL		3.3'-6': Soft, moist, yellowish gray brown, CLAY (CL), trace fine sand, no roots, pinholes porous.	
			7				Qsw	6'-7': medium stiff, moist, yellowish gray brown CLAY (CL), at 7' becomes dark brown, less porous.	GA AL
							Qsw		
			10				BP_1	8.5'-10': Stiff, moist, dark yellow, gray, brown, orange, mottling, silty CLAY (CL) with trace fine to medium grained sand, scattered coarse grains, and organics.	
10			14					10'-11.5': Stiff, moist, mottled dark gray, brown, with dark orange brown blotches, silty CLAY (CL), with fine sand, scattered medium to coarse sand, trace fine gravel.	
			8			CL	BP_2	11.5'-15': Increasing sand content, grading to fine sandy CLAY (CL), mottled.	
			10						
15			18					15'-16.5': Becomes very stiff.	
					▼			Groundwater at 17'	
			12					17'-18.5': Stiff, wet, mottled dark reddish brown and dark gray dark brown, fine sandy CLAY (CL).	
			17			CL-SC	BP_3	18.5'-20': Grades to very stiff to medium dense, wet, mottled gray brown, orange brown, sandy CLAY to clayey fine SAND (SC), with medium to coarse grains.	
20			24			CL-ML		20'-21.5': Very stiff, wet, mottled gray, gray orange brown sandy silty CLAY to clayey sandy SILT.	GA
			18			SM	BP_4	22'-24': Medium dense, wet, yellowish brown, silty fine SAND (SM) with CLAY.	
			24			SP		24'-24.5': Medium dense, wet, dark brownish gray, SAND (SP), silt to clay, fine to medium grained, at 24.2' a 1/2" thick clay trace layer.	
25									

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1441 MONTIEL ROAD, SUITE 115 | ESCONDIDO, CA 92026 | 760.746.4955

PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	2 of 2
CTE JOB NO:	10-8264G	DRILL METHOD:	TRIPOD, SOLID STEM	DRILLING DATE:	10/2/2006
LOGGED BY:	D. RIES	SAMPLE METHOD:	BULK AND CONTINUES SPT	ELEVATION:	17.5

BORING: B-3

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
25			38			SP-SM		25'-26.5': Dense, wet, dark brown gray and black poorly graded, SAND with silt (SP-SM), fine to medium grained with occasional coarse sand grains, light and dark laminations.	GA
			16					26.5'-27.8': Becomes medium dense.	
			9			SM		27.8'-28': Medium dense, wet, brown silty SAND (SM).	
						SP-SM		28'-29': Medium dense, wet, dark brown, gray, black, poorly graded SAND with silt (SP-SM).	
30						SP		29'-29.5': Loose, wet, brown silty SAND (SM).	
			46					30.5': Dense, wet, grading from last sample to yellow gray clean medium grained SAND (SP).	
			40					32': Dense, wet, yellow, gray, SAND (SP).	
35								Total Depth 33.5' Groundwater at 17' Backfill with Bentonite	
40									
45									
50									

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PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	1 of 1
CTE JOB NO	10-8264G	DRILL METHOD:	6" TRIPOD	DRILLING DATE:	9/3/2006
LOGGED BY:	S.C.	SAMPLE METHOD:	SPT	ELEVATION:	17.5

BORING: B-4

Depth (Feet)	Bulk Sample / Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
0							0-0.3' TURF:	
					CL		0.3'-1.5': Soft, very moist, gray brown fine sandy CLAY with silt and roots.	
		4				Fill	1.5'-2.5': Same as above.	
		3			CL	Qsw	3': Soft, moist, yellow, gray, brown, black silty CLAY (CL), lots of roots, weak laminations.	AL
5		4					Becomes mottled yellow, gray, brown silty CLAY with small roots, porous. 5'-7.5': Soft, moist, mottled yellow, gray, brown silty CLAY with small roots, porous.	
		5			ML		7.5'-8': Medium stiff, moist, gray brown clayey SILT (ML) with rootlets, porous.	
		8			CL	Qsw	8'-9.5': Stiff, moist, mottled faint orange to orange tint, dark brown,	
						BP_1	gray silty CLAY, porous, with sand (increasing content with depth).	
10		7		▽			9.5'-11': Medium stiff, moist, dark gray with light gray brown patches silty CLAY with fine to medium grained sand, porous, noroots, small concretions of fine orange SAND.	
		12					11': No recovery	
						BP_2	13'-14': Stiff, moist, mottled orange, reddish brown, gray, dark gray with black abundant organics, silty CLAY.	
		12					14'-14.5': Hard clay seam with stiff, moist, orange gray silty CLAY.	
15		17			CL		15'-16.5': Very stiff, moist, mottled dark brown, dark red, dary gray red brown, black silty CLAY with trace sand, organics, roots, black root casts.	
		17			ML-CL		17'-18.5': Very stiff, moist, mottled dark brown dark red, dark gray red brown, gray, silty CLAY to clayey SILT with sand.	
		24			SM-ML		18.5'-20': Very stiff, slightly moist, mottled reddish, light brown, gray silty CLAY to sandy SILT and small red inclusions.	
20		16			SC	BP_3	20'-20.5': Very stiff to stiff to medium dense, moist, orange brown, brown gray sandy CLAY to clayey SAND with organic fragments. 20.5'-21.5': Pockets of gray sandy CLAY occasional fine gravel, root casts.	
		23		▼	SP-SM SC	BP_4	21.9'-22.5: Dense, wet, black, gray, yellow SAND (SP) with silt. 22.5'-23': Dense, wet, yellow, gray, brown, black clayey SAND (SC).	
25							End of Boring at 23' Perched Groundwater at 11' Groundwater observed during drilling at 22'	

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PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	1 of 1
CTE JOB NO:	10-8264G	DRILL METHOD:	6" TRIPOD	DRILLING DATE:	9/3/2006
LOGGED BY:	S.C.	SAMPLE METHOD:	SPT	ELEVATION:	20.5

BORING: B-5

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
0								Cored Cement	
			7			CL	Fill	1.5'-2.75': Medium stiff, moist, yellow gray brown, silty CLAY with trace sand, no roots, porous.	
			12				Qsw	3'-4.5': Medium stiff, moist, gray brown CLAY, non-porous, with carbonate.	
5			8			CL		5.5'-7.5': Stiff, moist, yellow brown silty CLAY with fine to medium grained sand, occasional coarse black grains, faint laminations.	HA
			11			ML	Qsw	7.5'-8': Stiff, moist, red brown clayey SILT with trace sand.	
							BP_1		
10					▽			Groundwater at 13'	
			16			CL-SC	BP_2	13'-14.5': Very stiff, slightly moist, mottled orange gray brown sandy CLAY to clayey SAND with layers of red brown sandy SILT.	
15			18					15.5'-17': Very stiff, slightly moist, mottled orange brown gray with areas of red brown sandy CLAY to clayey SAND and coarse black grains organics.	
			34			CL		18.5'-20': Hard, slightly moist, mottled red, gray, brown, sandy CLAY lots of coarse black grains, roots near 20'.	
20								Total Depth 20' bgs Groundwater Observed 13' bgs	
25									

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PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	1 of 2
CTE JOB NO:	10-8264G	DRILL METHOD:	6" TRIPOD	DRILLING DATE:	9/3/2006
LOGGED BY:	S.C.	SAMPLE METHOD:	SPT	ELEVATION:	24.5

BORING: B-6

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
0						SM		0-0.33': Medium dense, slightly moist, yellow gray silty fine to medium SAND (SM).	
						ML		0.33'-0.5': Becomes red brown.	
						CL	Fill	0.5'-2.5': Slightly moist, brown SILT with clay (ML), occasional roots.	
								2.5': Moist, yellow brown CLAY with fine SAND.	
			4					3'-4.5': Stiff, moist, mottled yellow gray brown, fine to medium sandy CLAY, porous, visible bedding.	
5			5				Qsw	4.5'-6': Medium stiff, slightly moist, mottled yellow gray, CLAY, occasional rootlets.	
			11					6'-8': Becomes stiff.	
			11				Qsw	8'-9': Stiff, slightly moist, dark gray light gray brown, fine sandy CLAY with occasional pebbles and coarse grain size charcoal.	
			14				BP_1	9'-10.5': Stiff, moist, dark gray brown, silty CLAY with trace sand.	
10									
			16			ML		11'-12.5': Very stiff, moist, brown to black, abundant organics, sandy SILT to sandy CLAY.	
						ML/CL			
			17				BP_2	12.5'-17' Very stiff, moist, mottled dark brown, reddish orange brown, dark gray, orange gray, brown siltyCLAY to clayey SILT with trace sand and oxidized orange red coarse sand grains.	
15			21			CL-SC			
			17						
					▼	SC		18'-19.5': Very stiff, wet, mottled dark gray dark red orange gray, clayey SAND with organics.	
			21						
20								20'-21.5': Becomes hard.	
			32						
						CL	BP_3	22'-23': Hard, moist, mottled orange brown, gray, black with organics, sandy CLAY with red oxidized coarse pebbles.	
			25			SM		23': Medium dense, wet, gray silty fine to coarse silty SAND with clay lense.	
							BP_4		
							BP_3	24.5'-25.5': Stiff, slightly moist, mottled orange gray brown, black organics, sandy CLAY with bright red coarse grains.	
25			26						

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PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	2 of 2
CTE JOB NO:	10-8264G	DRILL METHOD:	6" TRIPOD	DRILLING DATE:	9/3/2006
LOGGED BY:	S.C.	SAMPLE METHOD:	SPT	ELEVATION:	24.5

BORING: B-6

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
25									
			22			CL	BP_3	26'-27.5': Medium dense, moist, mottled orange brown, brown gray, sandy CLAY with black organics.	
			44			SC	BP_4	28'-28.75': Very dense, wet, mottled orange black brown, clayey SAND. 28.75'-29.5': Very dense, wet, black yellow clayey medium grained SAND with occasional pebbles.	
30			49			SP-SM		29.5'-31.5': Very dense, wet, black yellow clayey medium grained, poorly graded SAND (SP-SM) with SILT and occasional fine gravel.	GA
35			54					@ 35' Becomes very dense.	
								End of Boring at 36.5' Groundwater Observed during Drillat at 18' and 23'	
40									
45									
50									

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PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	1 of 2
CTE JOB NO.	10-8264G	DRILL METHOD:	6" TRIPOD	DRILLING DATE:	9/3/2006
LOGGED BY:	S C.	SAMPLE METHOD:	SPT	ELEVATION:	-23.5

BORING: B-7

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
0						CL		0-1.5': Excavates medium stiff, moist, yellow gray brown, fine to medium-grained sandy CLAY (CL).	
						SC	Fill	@ 1.5' Clayey SAND (SC).	
						CL		@ 2' Sandy CLAY (CL). 2.5'-4': Medium stiff, moist, yellow gray CLAY with roots, trace sand.	
			6					Medium stiff, moist, yellow gray CLAY with carbonate.	
5			5				Qsw	5'-6.5': Becoming brown with depth.	
								? ? ? ? ?	
							Qsw BP1		
10					▼	SC		10'-11.5': Loose, wet, yellow gray brown, with black organics clayey fine to coarse SAND with pebbles, and red coarse grains.	
			7					11.5'-13': Loose, moist, yellow brown sandy SILT with organics.	
			7					? ? ? ? ?	
15							BP2		
						CL			
			21					18'-19.5': Medium dense, moist, mottled dark red, brown, gray sandy CLAY with red coarse grains.	
20			18						
						ML-CL	BP3	20.75'-21': Stiff, moist, mottled orange brown, gray, orange brown clayey sandy SILT to sandy CLAY.	
25									

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PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	2 of 2
CTE JOB NO:	10-8264G	DRILL METHOD:	6" TRIPOD	DRILLING DATE:	9/3/2006
LOGGED BY:	S.C.	SAMPLE METHOD:	SPT	ELEVATION:	-23.5

BORING: B-7

Depth (Feet)	Sample: Bulk	Sample: Driven	Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
25				18		▼	CL-SC		Medium dense, moist to wet, mottled yellow gray brown with black organics.	
									Dug to 30', caved in up to 24'	
30									End of Boring at 30' Peached Groundwater at 10' Groundwater Observed during drilling at 25'	
35										
40										
45										
50										

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PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	1 of 1
CTE JOB NO:	10-8264G	DRILL METHOD:	6" TRIPOD	DRILLING DATE:	9/3/2006
LOGGED BY:	S.C	SAMPLE METHOD:	SPT	ELEVATION:	21 8

BORING: B-8

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
0									
			8			SC ML CL	Fill	UNDOCUMENTED FILL: 0.5': Loose, dry, light brown clayey medium grained SAND. 0.5'-1': Soft, slightly moist, brown, SILT. 1'-2.5': Stiff, slightly moist, brown silty CLAY with occasional fine gravel.	
			5				Qsw	2.5'-3': Medium stiff, slightly moist, mottled yellow gray, brown silty CLAY with roots, occasional black organics, carbonate stringers.	
5			5						
			8				Qsw	7.5'-8': Stiff, moist, yellow brown, CLAY, occasional organics. 8'-9': Stiff, moist, brown CLAY with silt.	
			8				BP_1	9'-10.5': Stiff, moist, yellow gray CLAY with sand and organics.	
10			18			CL		10.5'-11.75': Very stiff, moist, brown, sandy fine to medium CLAY.	
						CL	BP_2	11.75-17': Very stiff, moist, mottled orange, gray, brown with black organics sandy CLAY.	
15									
			17					17-17.75': Medium dense, moist, mottled orange, gray, brown, black organics clayey SAND.	
			12			CL		17.75'-18.5': Very stiff, slightly moist, mottled dark gray, dark reddish brown sandy CLAY. 18.5': Becomes stiff.	GA
20									
					▼	SC	BP_3	23'-24.5': Hard medium dense, moist to wet, mottled orange, gray, brown clayey fine to medium-grained silty SAND.	
			16						
25			16				BP_4	24.5.5-26': Medium dense, wet, mottled orange, gray, brown, black clayey sandy SILT to fine to coarse-grained silty SAND with silt layers/patches.	
								End of Boring at 26' Observed Groundwater at time of Drilling 22.4'	

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PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	1 of 2
CTE JOB NO:	10-8264G	DRILL METHOD:	6" TRIPOD	DRILLING DATE:	9/3/2006
LOGGED BY:	S.C.	SAMPLE METHOD:	SPT	ELEVATION:	22

BORING: B-9

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
0									
			7			CL	Fill	1'-2.5': Medium stiff, moist, yellow brown sandy CLAY with fine gravel.	
			4					2.5'-4': Becomes soft.	
			12					4'-5.5': Stiff, slightly moist, yellow gray, fine sandy CLAY.	
5			7			CL	Qsw	5.5'-7': 0.75' Becomes medium stiff.	
10			10			CL	BP_1	10'-13': Stiff, slightly moist, orange to dark brown, with black organics, sandy CLAY.	
			12						
								? ? ? ? ?	
15							BP_2	Upper BP_2 contact based on cross-section intrpretation.	
			27					18'-19.5': Very stiff, moist, mottled dark red brown with, black organics fine sandy CLAY.	
20			28			CL-SC		19.5'-21: Very stiff, moist, dark red brown, with black organics fine sandy CLAY to clayey SAND.	
						CL		21'-21.5': Very stiff, moist, mottled orange, dark red brown, with black organics fine sandy CLAY.	
			30		▼	SC		21.5'-22.5': Dense, wet, mottled, orange gray brown, clayey SAND, with red coarse grain-fine gravel size inclusions.	
25									

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PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	2 of 2
CTE JOB NO:	10-8264G	DRILL METHOD:	6" TRIPOD	DRILLING DATE:	9/3/2006
LOGGED BY:	S.C.	SAMPLE METHOD:	SPT	ELEVATION:	22

BORING: B-9

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
25								21.5'-22.5': Dense, wet, mottled, orange gray brown, clayey SAND, with red coarse grain-fine gravel size inclusions.	
			25			SC		27.5'-29': Very stiff, wet, light brown, gray, with black organics sandy CLAY with silt. Approaching silty SAND with clay. ~ 30' Cave in	
30								Total Depth 30' Groundwater Observed during Drilling at 22'	
35									
40									
45									
50									

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PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	1 of 1
CTE JOB NO:	10-8264G	DRILL METHOD:	6" TRIPOD	DRILLING DATE:	9/3/2006
LOGGED BY:	S.C.	SAMPLE METHOD:	SPT	ELEVATION:	23.5

BORING: B-10

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
0									
			7			CL	Fill	1'-2.5': Medium stiff, moist, brown sandy SILT to silty SAND, with roots with coarse oxidized red grains	
			11				Qsw	3': Stiff, moist, yellow brown sandy SILT with CLAY.	
5			7			SC		6.5'-6.75': Medium stiff, moist, yellow brown gray, clayey fine to medium grainded SAND, with trace fine gravel.	
			9			CL		6.75'-7': Stiff, moist, gray brown fine sandy CLAY to sandy SILT. 7.5'-9': Becomes yellow brown.	
10			12			CL		9'-10.5': Stiff, moist, mottled yellow gray brown, fine sandy CLAY occasional black organics.	
			18				BP_1	10.5'-12': Very stiff, moist, slightly mottled dark brown to brown with distinctive orange fine gravel and black organics, sandy CLAY.	
								? ? ? ? ?	
							BP_2		
15							BP_4		
			14			CL		18-19.5': Stiff, slightly moist, mottled dark brown dark red brown gray with black organics, sandy CLAY.	GS AL
20			19					19.5'-21': Becomes increasing organic precentage very stiff.	
			16					21'-22.5': Less organics.	
					▼	CL	BP_3	Medium dense, wet, mottled, orange, dark red brown fine sandy CLAY.	
			15			SC	BP_4	23'-24.5': Medium dense, wet, orange, gray black clayey medium grained SAND.	
25									

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PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	1 of 1
CTE JOB NO:	10-8264G	DRILL METHOD:	6" TRIPOD	DRILLING DATE:	9/3/2006
LOGGED BY:	S.C.	SAMPLE METHOD:	SPT	ELEVATION:	~14.5

BORING: B-11

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
0						SC	Fill	SLOPEWASH: 1'-2.5': Wet, brown clayey fine SAND with gravel.	
			2						
			2					2.5'-4': No recovery.	
			6				BP_1	4'-5.5': Medium stiff, moist, brown to mottled orange brown black, organics, fine sandy CLAY, last two inches are medium stiff, moist, dark brown	
5						CL		CLAY. 5.5'-6.25': Medium stiff, moist, mottled light to dark gray brown sandy CLAY with black organic fragments (charcoal).	
			5					7'-8': Medium stiff, moist, mottled dark gray, brown with black organics, sandy CLAY, trace coarse sand and pebbles.	
			9			SC-CL		8'-8.5': Stiff, moist, dark brown sandy CLAY, to clayey SAND with coarse orange grains	
			18			CL		8.5'-9.5': Stiff to very stiff, moist, mottled brown to orange brown sandy CLAY with coarse orange grains and with wood chips.	
10							BP_2	9.5'-10': Very stiff, moist, heavily mottled orange reddish brown sandy CLAY with fine gravel.	
			11					10'-13': Stiff, moist, mottled dark brown orange brown, dark gray sandy CLAY, with abundant black organics.	
			13						
			13		▼			13'-14.5': Stiff, moist, mottled dark reddish brown, dark brown, gray sandy CLAY, with black organics	
15						CL-SC		14.5'-16': Very stiff, moist to wet, mottled dark brown, dark red, orange gray brown with black organics, sandy CLAY, with coarse red grains.	
			17						
			16			SC	BP_3	16'-19.5': Grades to stiff to very stiff, mottled orange brown, brown, gray, clayey SAND.	
			11						
						SC	BP_4	Hole cave back to 10'. Clayey sands at bottom.	
20									
								End of Boring 20.5' Groundwater Observed during Drilling at 14.5'	
25									

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PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	1 of 1
CTE JOB NO:	10-8264G	DRILL METHOD:	6" TRIPOD	DRILLING DATE:	9/3/2006
LOGGED BY:	S.C.	SAMPLE METHOD:	SPT	ELEVATION:	~17.5

BORING: B-12

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
0						SC	Fill	0-1.8': Loose, moist, orange brown clayey fine to medium SAND with small roots. @ 1.8': Loose, moist, gray brown clayey fine SAND. 2'-2.5': Soft, slightly moist, yellow brown clayey fine SAND with roots.	
			3					2.5'-3.5': Very soft, moist, yellow gray clayey fine to coarse SAND with gravel and roots (orange oxidation on gravel).	
			5			CL	Qsw	4'-7': Medim stiff, slightly moist, yellow gray fine sandy CLAY, black root casts.	
5			9			CL-SC		7'-7.5': Medium stiff, moist, brown to spotty yellow sandy CLAY to clayey SAND.	
			14			CL	Qsw / BP_1	7.6'-9': Stiff, moist, mottled yellow orange, gray-brown fine sandy CLAY with occasional coarse sand grains and black organics, roots.	
			9		▼	CL	BP_1	9'-9.5': Stiff, moist to wet, dark brown with brick red grains silty CLAY with sand.	
10			18			CL	BP_2	10.5'-12.5': Very stiff, moist, mottled brown, orange gray sandy CLAY.	
			18				BP_2	12.5': Very stiff, slightly moist, red brown clayey SAND to sandy CLAY.	
			15						
15			14			CL		15'-16.5': Very stiff to stiff, moist, mottled dark brown, dark gray to red sandy to silty CLAY with organics (charcoal) abundant organics at 15' interval.	
								End of Boring at 16.5' Groundwater Observed at 9.5'	
20									
25									

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PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	1 of 1
CTE JOB NO:	10-8264G	DRILL METHOD:	6" TRIPOD	DRILLING DATE:	9/3/2006
LOGGED BY:	S.C.	SAMPLE METHOD:	SPT	ELEVATION:	19

BORING: B-13

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
0								0-1'	
			3			SC	Fill	@ 1' Loose, slightly moist, yellow light gray, clayey SAND with micas. 1'-1.5': Very loose, slightly moist, yellow gray clayey fine to medium SAND.	
								1.5'-2.5': Very soft, slightly moist, yellow gray sandy CLAY.	
			5					3'-6': Medium stiff, slightly moist, yellow gray fine sandy CLAY with rootlets.	
5			4			CL	Qsw	4.5'-6': With carbonate.	
			5					6'-8.25': Becomes soft.	
			3						
			9				Qsw BP_1	8.25'-10': Moist, dark gray orange brown dark green, gray fine to coarse sandy CLAY, with occassional pebbles.	
10			9			CL		10.5': Stiff, moist to wet, mottled dark orange brown, light brown to dark brown, gray, sandy SILT with clay to sandy CLAY, grading downward to clayey fine to coarse-grained SAND.	
			12		▼	SC			
			20			CL	BP_2	13.5': Vert stiff, moist, mottled dark brown dark red orange gray brown sandy CLAY.	
15								End of Boring at 15'	
								Groundwater Observed during Drilling at 13.5'	
20									
25									

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GEOTECHNICAL | CONSTRUCTION ENGINEERING TESTING AND INSPECTION
1441 MONTIEL ROAD, SUITE 115 | ESCONDIDO, CA 92026 | 760.746.4955

PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	1 of 1
CTE JOB NO:	10-8264G	DRILL METHOD:	6" TRIPOD	DRILLING DATE:	9/3/2006
LOGGED BY:	S.C	SAMPLE METHOD:	SPT	ELEVATION:	14.5

BORING: B-14

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
0									
						SC	Fill	0-1' TOPSOIL: @ 1' Loose, moist, yellow gray, clayey SAND with roots.	
						CL		1.5'-3': Very soft, moist, yellow gray fine sandy CLAY.	
			2				Qsw	3'-3.75': Becomes soft.	
			5					3.75'-6': Medium stiff, moist, gray brown sandy CLAY.	
5			5						
			11			CL	Qsw BP_1	6'-7.25': Stiff, moist, dark gray silty CLAY with sand.	
			11					7.25'-7.5': Stiff, slightly moist, orange brown sandy CLAY. 7.5'-8': Becomes mottled orange to gray brown. 8'-9': Becomes mottled orange to gray brown..	
						SC-CL	BP_2	9'-10.5': Very stiff, slightly moist, mottled red gray brown, clayey SAND to sandy CLAYwith gravel size pieces of charoal.	
10			17						
								End of Boring at 10.5' Groundwater Not Observed	
15									
20									
25									

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1441 MONTIEL ROAD, SUITE 115 | ESCONDIDO, CA 92026 | 760.746.4955

PROJECT:	LUSARDI RESIDENCE	DRILLER:	PACIFIC DRILLING	SHEET:	1 of 1
CTE JOB NO.	10-8264G	DRILL METHOD:	6" TRIPOD	DRILLING DATE:	9/3/2006
LOGGED BY:	S.C.	SAMPLE METHOD:	SPT	ELEVATION:	~23

BORING: B-15

Depth (Feet)	Bulk Sample	Driven Type	Blows/Foot	Dry Density (pcf)	Moisture (%)	U.S.C.S. Symbol	Graphic Log	DESCRIPTION	Laboratory Tests/Comments
0						SC	Fill	0-1.5': Loose, moist, brown, clayey SAND with roots.	
						CL	Qsw	2'-3.5': Soft, moist, yellow brown, fine sandy CLAY with roots.	
			3						
			9					3.5'-5': Medium stiff, moist, gray brown sandy CLAY with occasional charcoal.	
5			3					5'-6.5': Soft, moist, yellow gray sandy CLAY with occasional orange grains.	
			6					6.5'-8': Becomes medium stiff.	
			5						
10			9			CL-SC	Qsw	9.25'-9.5': Medium stiff, moist, dark brown, fine to coarse sandy CLAY to clayey SAND.	
						CL	BP_1	9.5'-10.25': Stiff, moist, dark brown sandy CLAY.	
						SC		10.25'-11': Stiff, moist, mottled orange ,gray, brown clayey SAND.	
								? ? ? ? ?	
15			15			CL	BP_2	15'-16.5': Very stiff, moist, mottled dark orange reddish orange dark gray, dark brown, sandy CLAY with some black charcoal fragments.	
								End of Boring at 16.5' Groundwater Not Observed during Drilling	
20									
25									

APPENDIX C

LABORATORY METHODS AND RESULTS

APPENDIX C
LABORATORY METHODS AND RESULTS

Laboratory tests were performed on representative soil samples to detect their relative engineering properties. Tests were performed following test methods of the American Society for Testing Materials or other accepted standards. The following presents a brief description of the various test methods used. Laboratory results are presented in the following section of this Appendix.

Classification

Soils were classified visually according to the Unified Soil Classification System. Visual classifications were supplemented by laboratory testing of selected samples according to ASTM D2487.

Particle-Size Analysis

Particle-size analyses were performed on selected representative samples according to ASTM D422.

Expansion Index

Expansion testing was performed on selected samples of the matrix of the onsite soils according to Building Code Standard No. 29-2.

Atterberg Limits

The procedure of ASTM D4518-84 was used to measure the liquid limit, plastic limit and plasticity index of representative samples.

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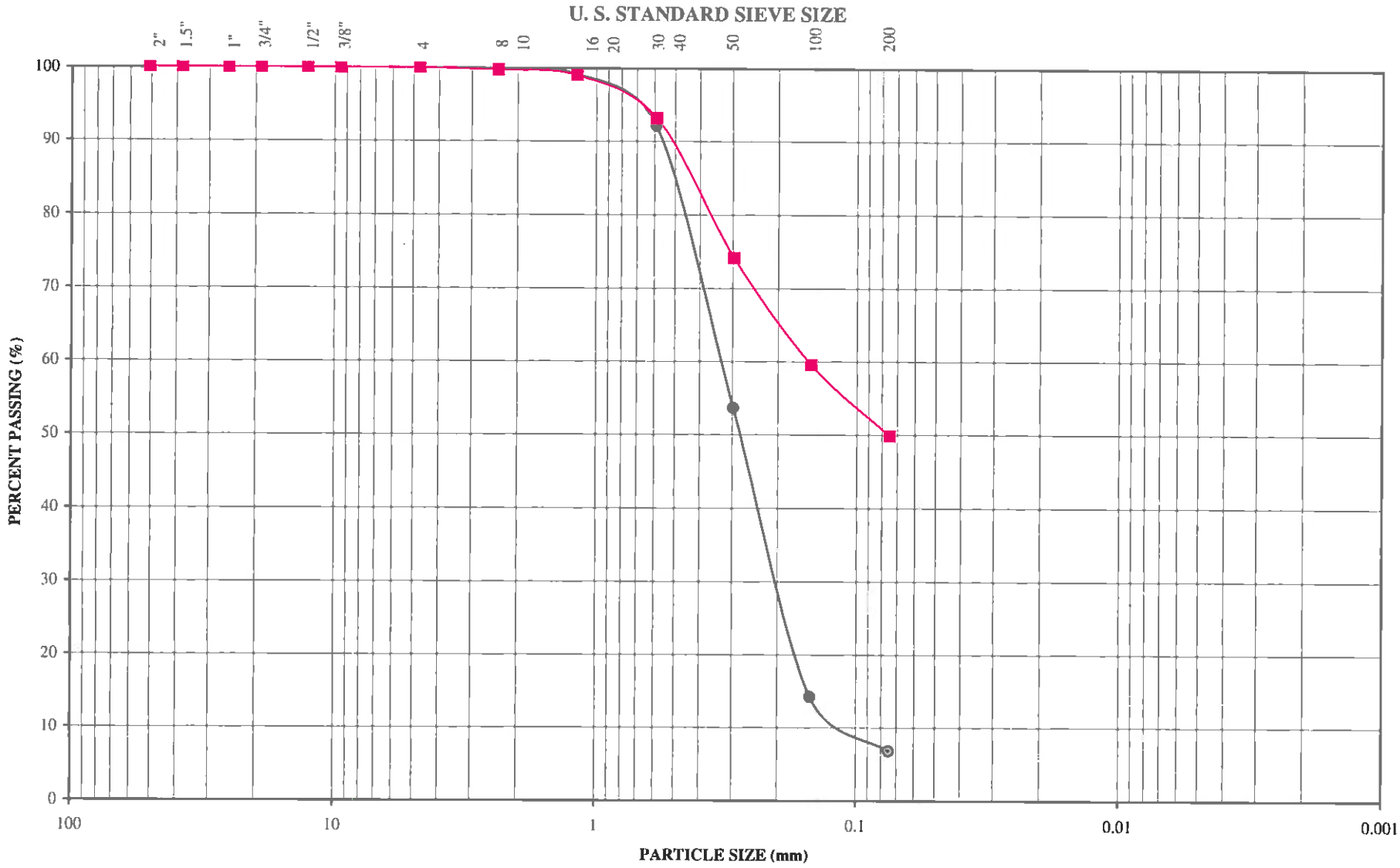
EXPANSION INDEX TEST

UBC 18-2

LOCATION	DEPTH (feet)	EXPANSION INDEX	EXPANSION POTENTIAL
B-3	2-7	41	LOW

ATTERBERG LIMITS

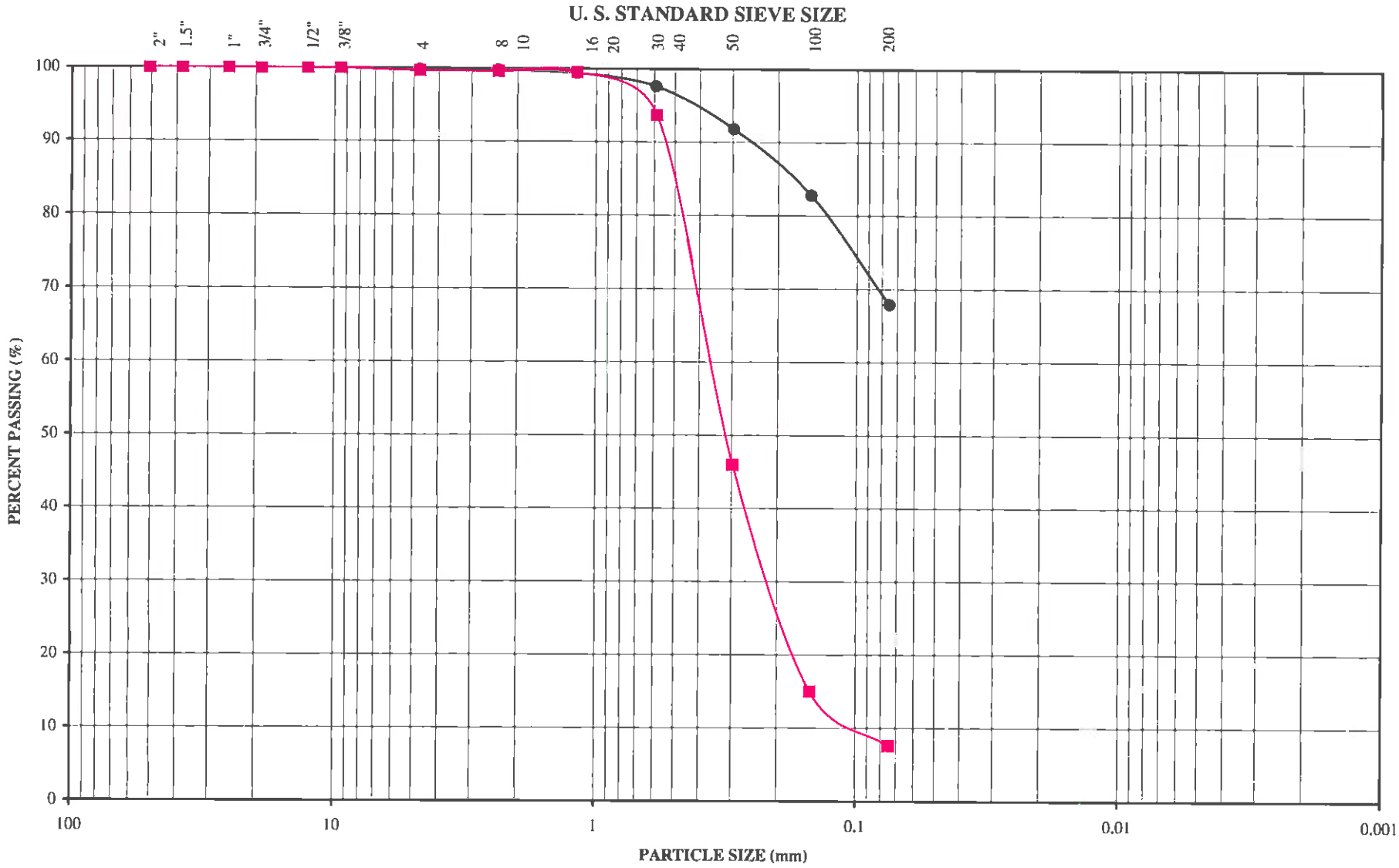
LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	CLASSIFICATION
B-3	6-7.5	37	26	CL
B-4	3-4.5	41	29	CL
B-10	18-19.5	27	16	CL



PARTICLE SIZE ANALYSIS

CONSTRUCTION TESTING & ENGINEERING, INC.
GEOTECHNICAL AND CONSTRUCTION ENGINEERING TESTING AND INSPECTION
2414 VINEYARD AVENUE, SUITE G ESCONDIDO CA. 92029 (760) 746-4955

Sample Designation	Sample Depth (feet)	Symbol	Liquid Limit (%)	Plasticity Index	Classification
B-3	25-26.5	●	-	-	SP-SM
B-3	20-21.5	■	-	-	CL-SC
CTE JOB NUMBER:		10-8264G		FIGURE:	C-1

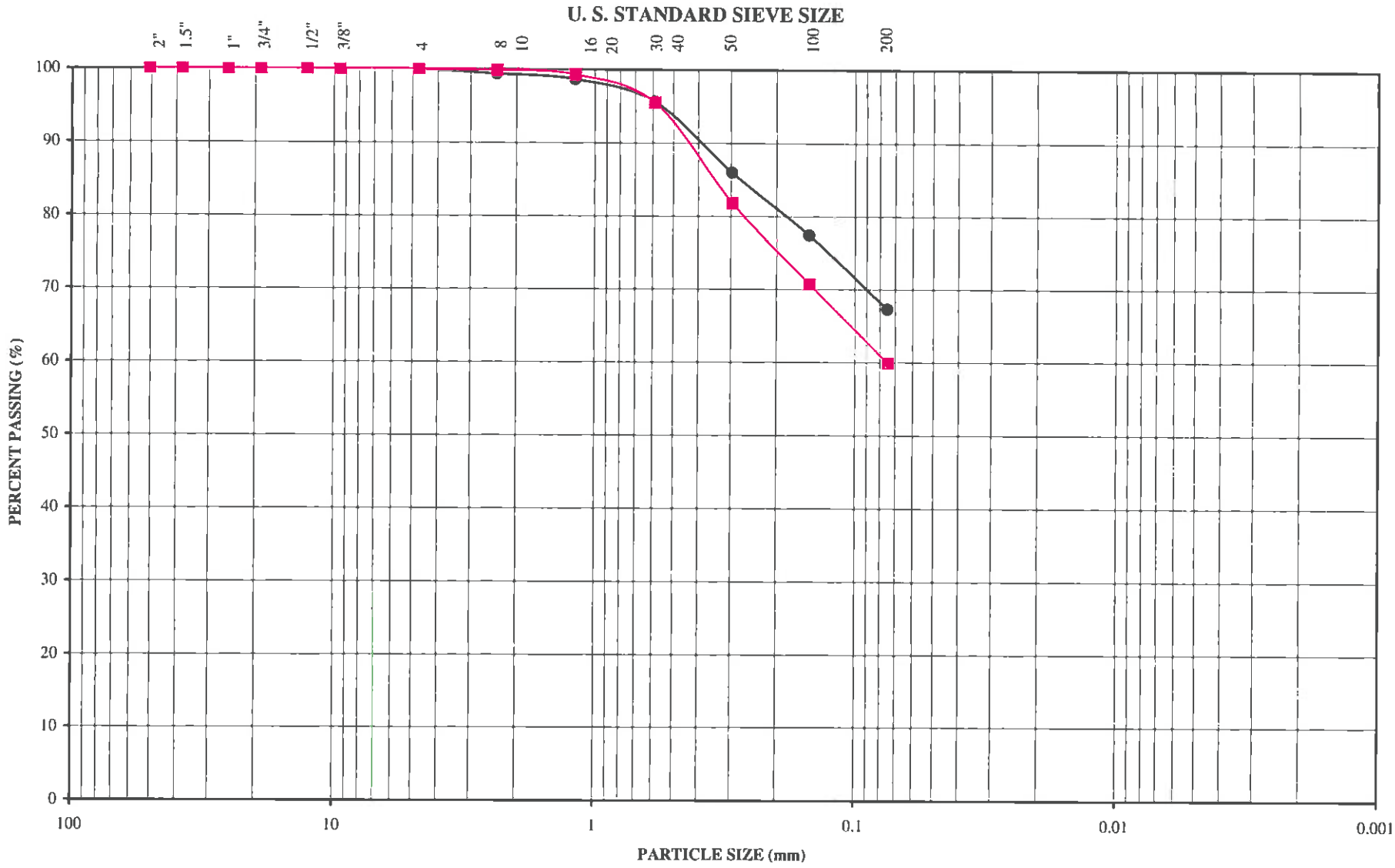


PARTICLE SIZE ANALYSIS

CONSTRUCTION TESTING & ENGINEERING, INC.
GEOTECHNICAL AND CONSTRUCTION ENGINEERING TESTING AND INSPECTION
2414 VINEYARD AVENUE, SUITE G ESCONDIDO CA 92029 (760) 746-4955

Sample Designation	Sample Depth (feet)	Symbol	Liquid Limit (%)	Plasticity Index	Classification
B-3	6-7.5	●	-	-	CL
B-6	29.5-31.5	■	-	-	SP-SM

CTE JOB NUMBER: 10-8264G FIGURE: C-2



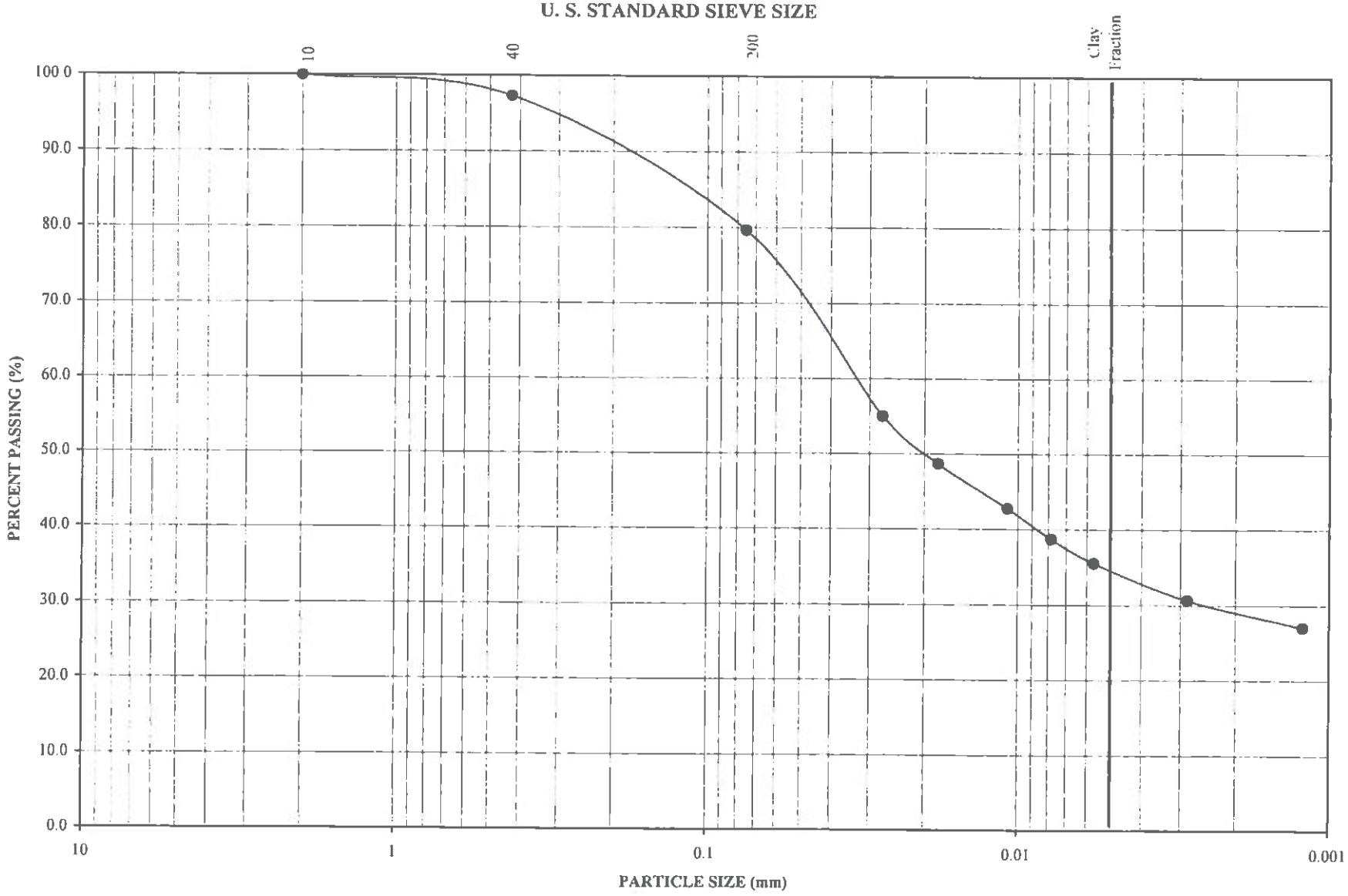
PARTICLE SIZE ANALYSIS

CONSTRUCTION TESTING & ENGINEERING, INC.
GEOTECHNICAL AND CONSTRUCTION ENGINEERING TESTING AND INSPECTION
2414 VINEYARD AVENUE, SUITE G ESCONDIDO CA 92029 (760) 746-4955

Sample Designation	Sample Depth (feet)	Symbol	Liquid Limit (%)	Plasticity Index	Classification
B-8	17-18.5	●	-	-	CL
B-10	18-19.5	■	-	-	Cl

CTE JOB NUMBER: 10-8264G FIGURE: C-3

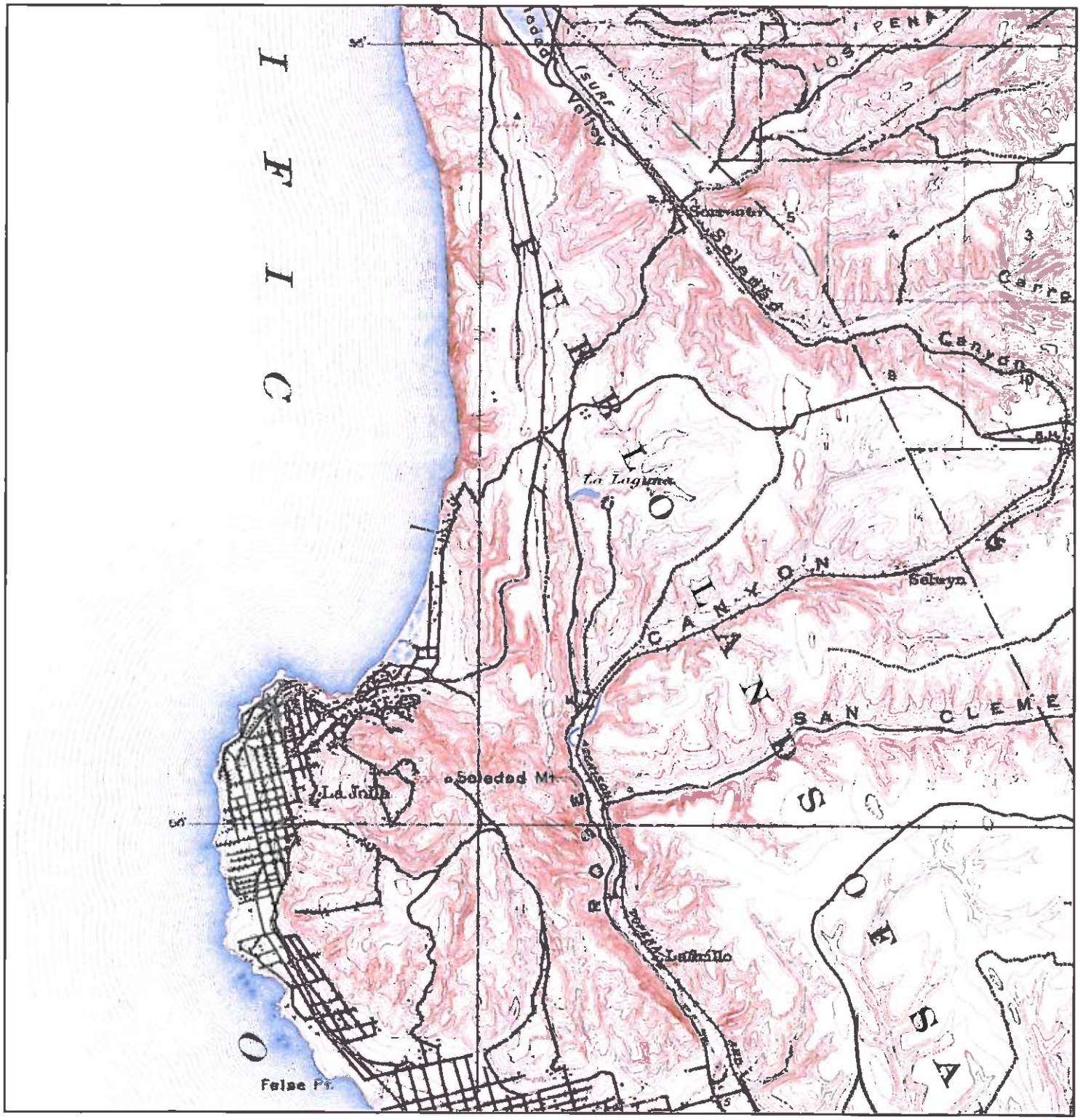
Lusardi Residence
10-8264G
Lab#16769 B5@5.5-7.0'



APPENDIX D

HISTORIC TOPOGRAPHIC MAPS

Historical Topographic Map



N

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GEOTECHNICAL AND CONSTRUCTION ENGINEERING TESTING AND INSPECTION
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LA JOLLA 15' QUAD. 1930
LUSARDI RESIDENCE
LA JOLLA, CALIFORNIA

CTE JOB NO.	10-8264G
SCALE	1:62500
DATE	12/06
FIGURE	D-1

Historical Topographic Map

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GEOTECHNICAL AND CONSTRUCTION ENGINEERING TESTING AND INSPECTION
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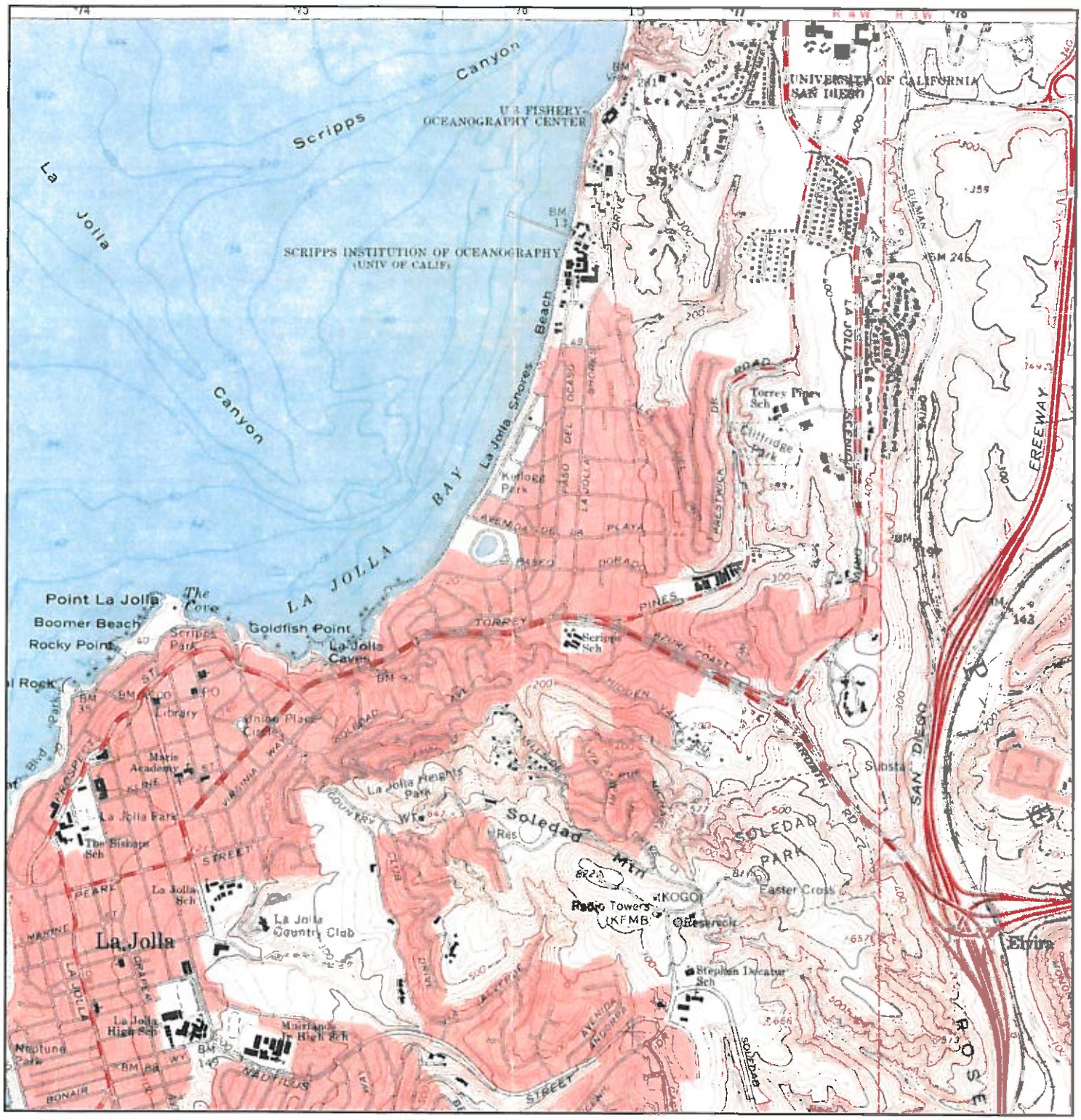
LA JOLLA 7.5' QUAD. 1953
LUSARDI RESIDENCE
LA JOLLA, CALIFORNIA

CTE JOB NO	10-8264G
SCALE	1:24000
DATE	12/06
FIGURE	D-2

Historical Topographic Map



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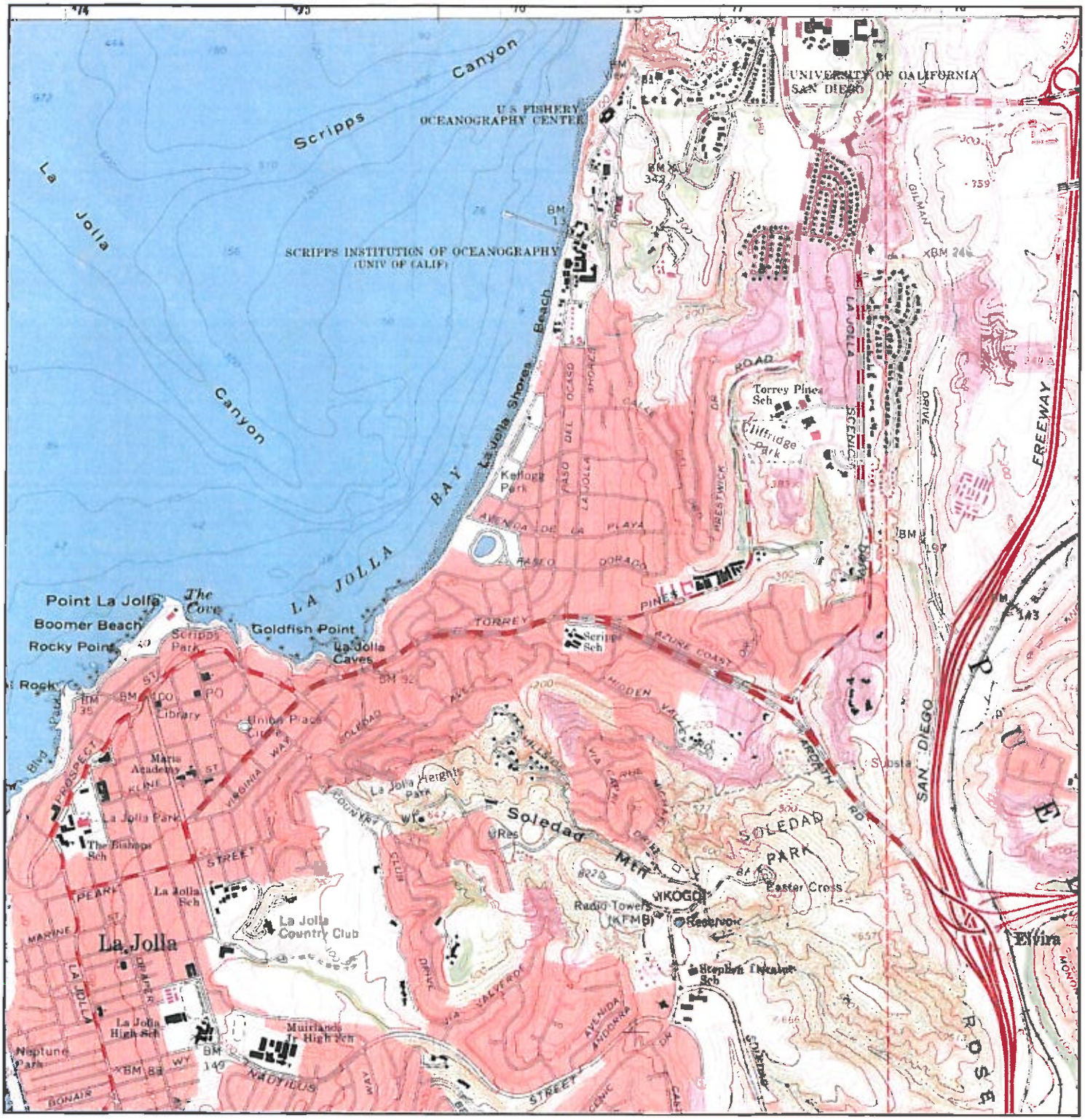
1441 MONTIEL ROAD, STE 115 ESCONDIDO CA 92026 (760) 746-4955

LA JOLLA 7.5' QUAD. 1967
LUSARDI RESIDENCE
LA JOLLA, CALIFORNIA

CTE JOB NO	10-8264G
SCALE	1:24000
DATE	12/06
FIGURE	D-3

Historical Topographic Map



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LA JOLLA 7.5' QUAD. 1975
LUSARDI RESIDENCE
LA JOLLA, CALIFORNIA

CTE JOB NO.	10-8264G
SCALE	1:24000
DATE	12/06
FIGURE	D-4

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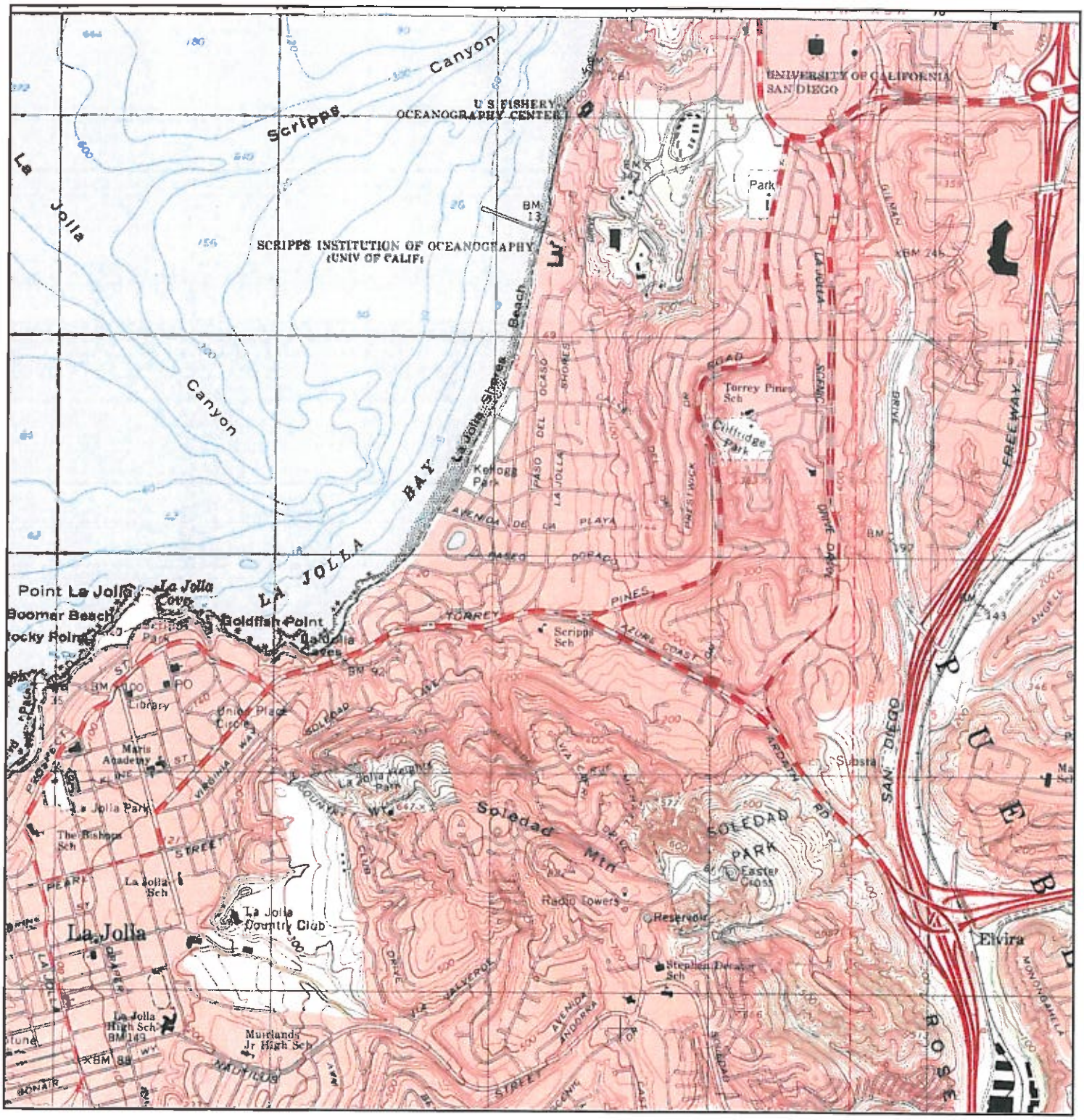
LA JOLLA QUAD. 1977
LUSARDI RESIDENCE
LA JOLLA, CALIFORNIA

CTE JOB NO.	10-8264G
SCALE:	1:2400
DATE:	12/06
FIGURE:	D-5

Historical Topographic Map



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LA JOLLA 7.5' QUAD. 1996
LUSARDI RESIDENCE
LA JOLLA, CALIFORNIA

CTE JOB NO	10-8264G
SCALE	1:24000
DATE	12/06
FIGURE	D-6

APPENDIX E

CALIFORNIA COASTAL RECORDS PROJECT PHOTOGRAPHS

1972

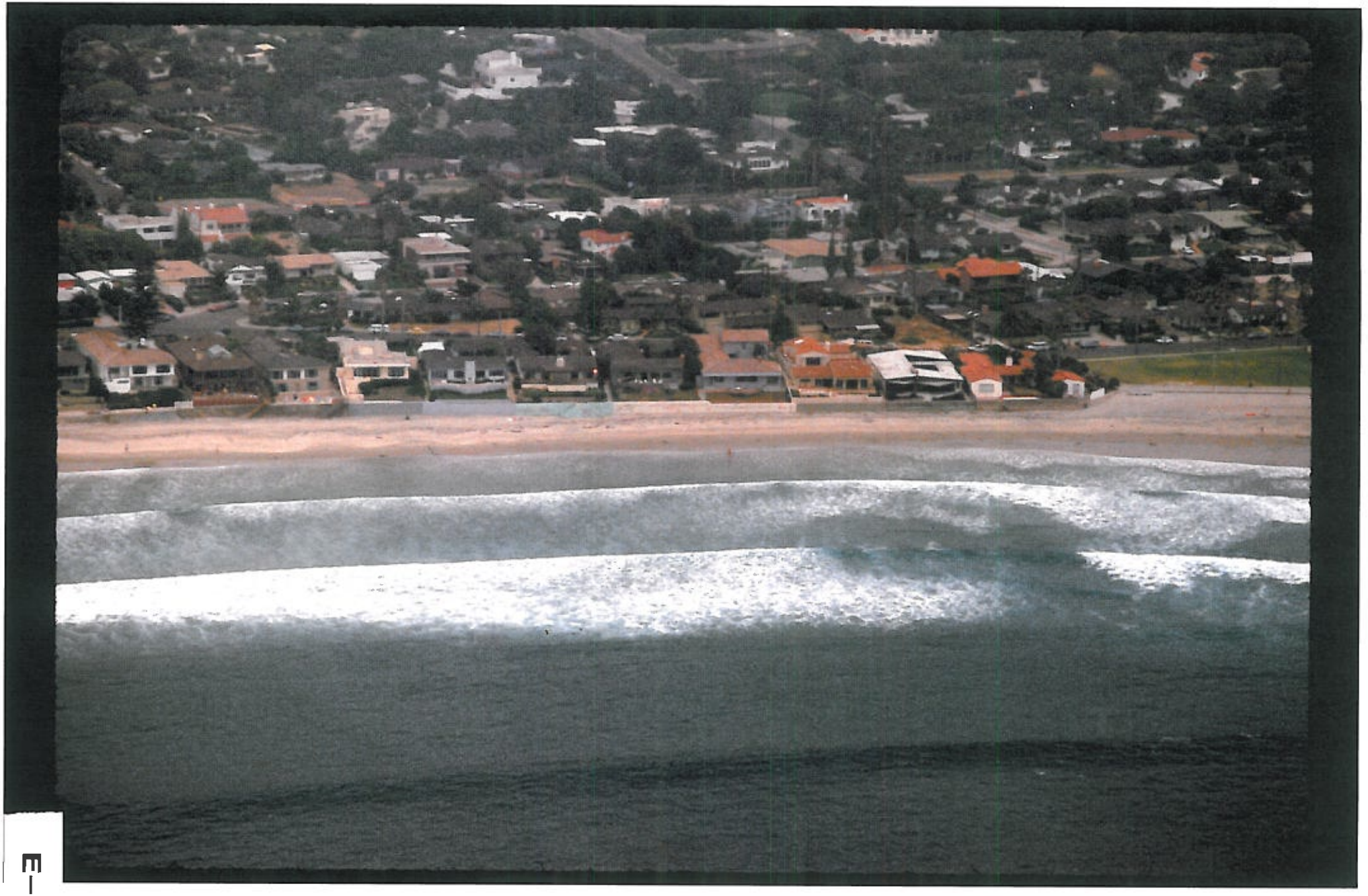
E-1

1979

E-2

E-3

1979



E-4

1987

E-5

1989

1995

E-6

E-7

2004

APPENDIX F

EDR HISTORICAL AERIAL PHOTOGRAPHS

Date EDR Searched Historical Sources:

Aerial Photography August 28, 2006

Target Property:

8466 El Paseo Grande
La Jolla, CA 92037

Year	*Scale*	*Details*	*Source*
1948	Aerial Photograph. Scale: 1"=666'	Flight Year: 1948	Pacific Air
1953	Aerial Photograph. Scale: 1"=555'	Flight Year: 1953	Park
1963	Aerial Photograph. Scale: 1"=555'	Flight Year: 1963	Cartwright
1974	Aerial Photograph. Scale: 1"=600'	Flight Year: 1974	AMI
1989	Aerial Photograph. Scale: 1"=666'	Flight Year: 1989	USGS
1994	Aerial Photograph. Scale: 1"=666'	Flight Year: 1994	USGS
2002	Aerial Photograph. Scale: 1"=666'	Flight Year: 2002	USGS

INQUIRY #: 1743767.2

YEAR: 1948

= 666'

N

F-2

INQUIRY #: 1743767.2

YEAR: 1953

= 555'

N

F-3


INQUIRY #: 1743767.2
YEAR: 1963
= 555'
N
F-4

INQUIRY #: 1743767.2

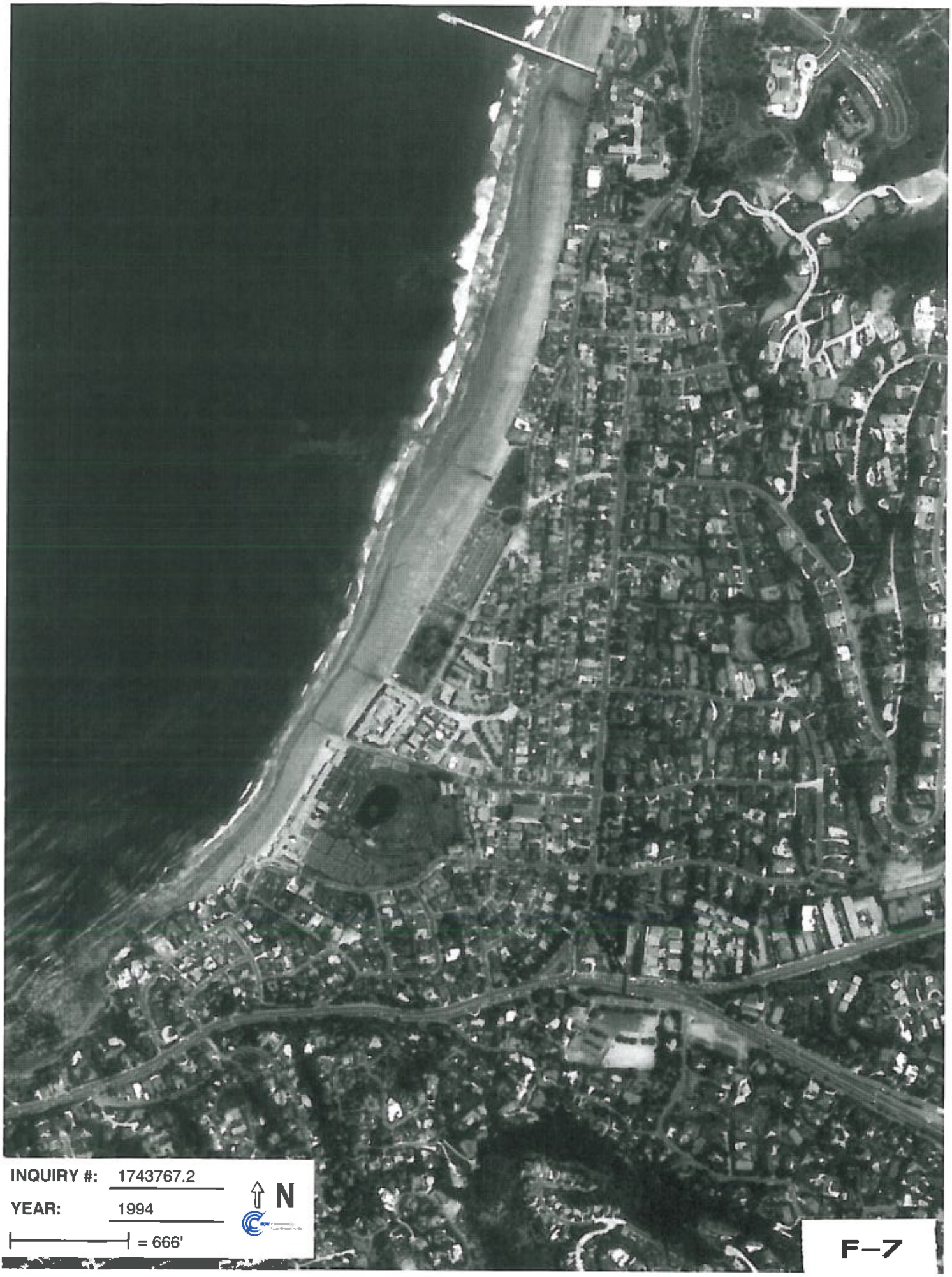
YEAR: 1974

= 600'

N

F-5

F-6



INQUIRY #: 1743767.2

YEAR: 1994

= 666'

N

F–7

F-8

APPENDIX G

PUBLISHED HISTORICAL PHOTOGRAPHS

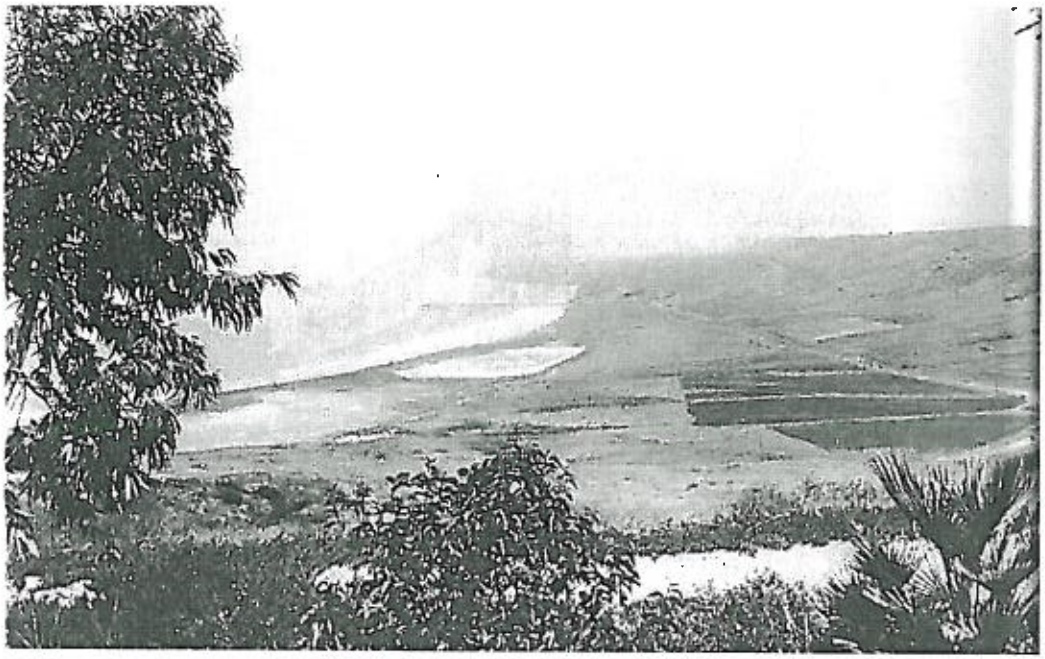


Photo #1: La Jolla Shores 1930 (T. Shepard Collection; in Kuhn, 1984)

Photo #2: View of low-lying alluvial cliffs 1936 (approximate location at 8516 El Paseo Grande Cliff erosion rate at that time estimated at one foot per year (photo from U.S. Grant View Kuhu, 1984)

Photo #3: View at same location as Photo #2 during heavy storms of 1978 (Kuhn, 1984)

Photo #4: Same Location as Photo #3 1978 (Kuhn, 1984)

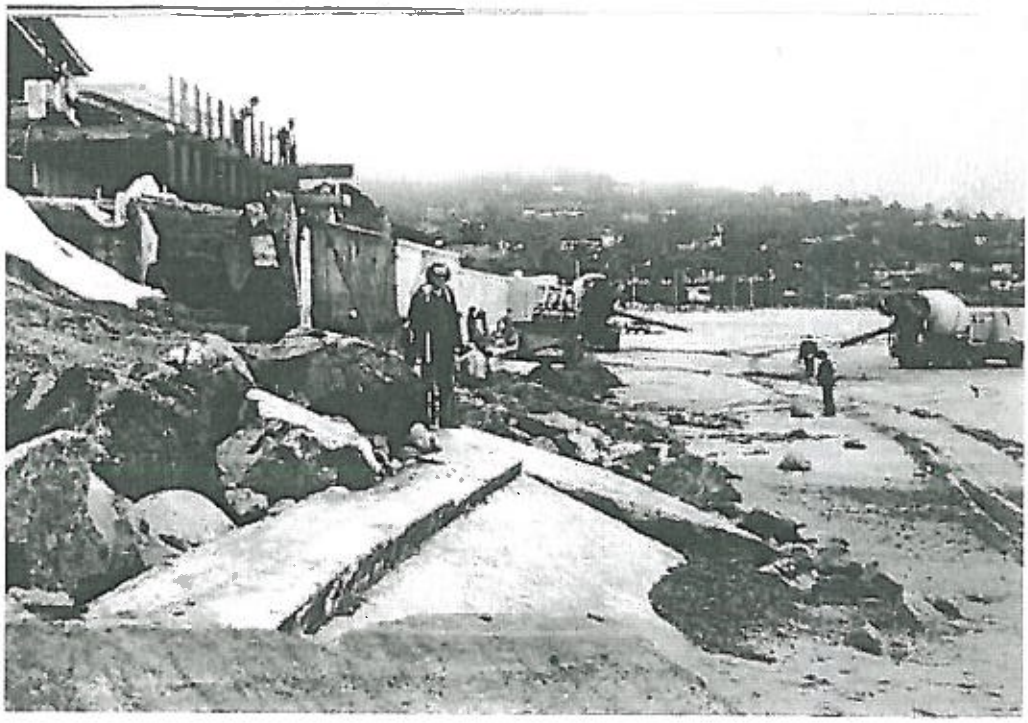


Photo #5: Same location as Photo #2-#5, showing partial collapse of seawall in 1978 (Kuhn, 1984)

Photo #6: Up to 15 feet local retreat in general area as Photo #5 (Kuhn, 1984)

Photo #7: 1979 view at 8516 El Paseo Grande with new seawall constructed (Kuhn, 1984)