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A JOINT VENTURE

FINAL MARINE GEOPHYSICAL SURVEY

SAN FRANCISCO-OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY PROJECT

VOLUME 2 - MAPS

Prepared for

CALIFORNIA DEPARTMENT OF TRANSPORTATION

March 2001

Earth Mechanics

Fugro - Earth Mechanics
A JOINT VENTURE

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March 5, 2001
Project No. 98-42-0054

California Department of Transportation
Engineering Service Center
Office of Structural Foundations
5900 Folsom Boulevard
Sacramento, California 95819-0128

Attention: Mr. Mark Willian
Contract Manager

Final Marine Geophysical Survey
SFOBB East Span Seismic Safety Project

Dear Mr. Willian:

The geologic and geotechnical studies for the San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Safety Project are being conducted by Fugro-Earth Mechanics (a joint venture of Fugro West, Inc., and Earth Mechanics, Inc.) under California Department of Transportation (Caltrans) Contract 59A0053. The two-dimensional (2-D) and three-dimensional (3-D) marine geophysical surveys were conducted over the entire survey corridor specified by Caltrans as part of Task 1 (initial site characterization, geophysical survey phase) of the referenced contract. A supplemental 2-D geophysical survey was conducted in the area around Yerba Buena Island as a part of the Task 5 final site characterization studies. The marine exploration borings were conducted in 1998 as part of the Task 3 preliminary site exploration and testing (Phase 1) and Task 5 final site characterization studies (Phases 2) of the referenced contract. Additionally, cone penetration test (CPT) soundings, multi-beam bathymetric surveys, and a tidal flat bathymetric survey were conducted in 2000 as part of Task 5.

Previous geophysical reports and maps produced by Fugro-Earth Mechanics (Fugro-EM) include the preliminary report, supplementary report, and final report of the 1998 Phase 1 2-D marine geophysical survey and the draft final report for the 1998 Phase 1 3-D survey. The preliminary findings of the 2000 Phase 3 marine geophysical survey were reported in a memorandum.

This Final Marine Geophysical Survey report presents the results of the data acquisition, processing, and interpretation of the data from the three marine geophysical surveys. The interpretations integrate all of the geophysical, geotechnical, bathymetry, and geological data collected by Fugro-EM from 1998 to 2000 and pre-1998 geotechnical data provided by Caltrans. The report is a stand-alone submittal and the data and interpretations presented in this report supersede all those presented in the previous reports.

The report is physically bound in two volumes. Volume 1 contains the main text, plates, and appendices, and Volume 2 contains the maps. Data and supporting information are presented on 16 large-scale maps, 2 large-scale cross sections, 120 plates, 9 tables, and 5 appendices. The latter address the field operations for the surveys and data processing of the navigation, bathymetric, and seismic reflection data.

Earth Mechanics

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A JOINT VENTURE

California Department of Transportation
March 5, 2001 (Fugro 98-42-0054)

On behalf of the project team, we appreciate the opportunity to contribute to Caltrans' design of the new bridge to replace the existing SFOBB East Span. Please call if we can answer any questions relative to the information presented in the enclosed report.

Sincerely,

FUGRO-EARTH MECHANICS, A Joint Venture

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SAN FRANCISCO-OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT

CALTRANS CONTRACT 59A0053

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MAPS

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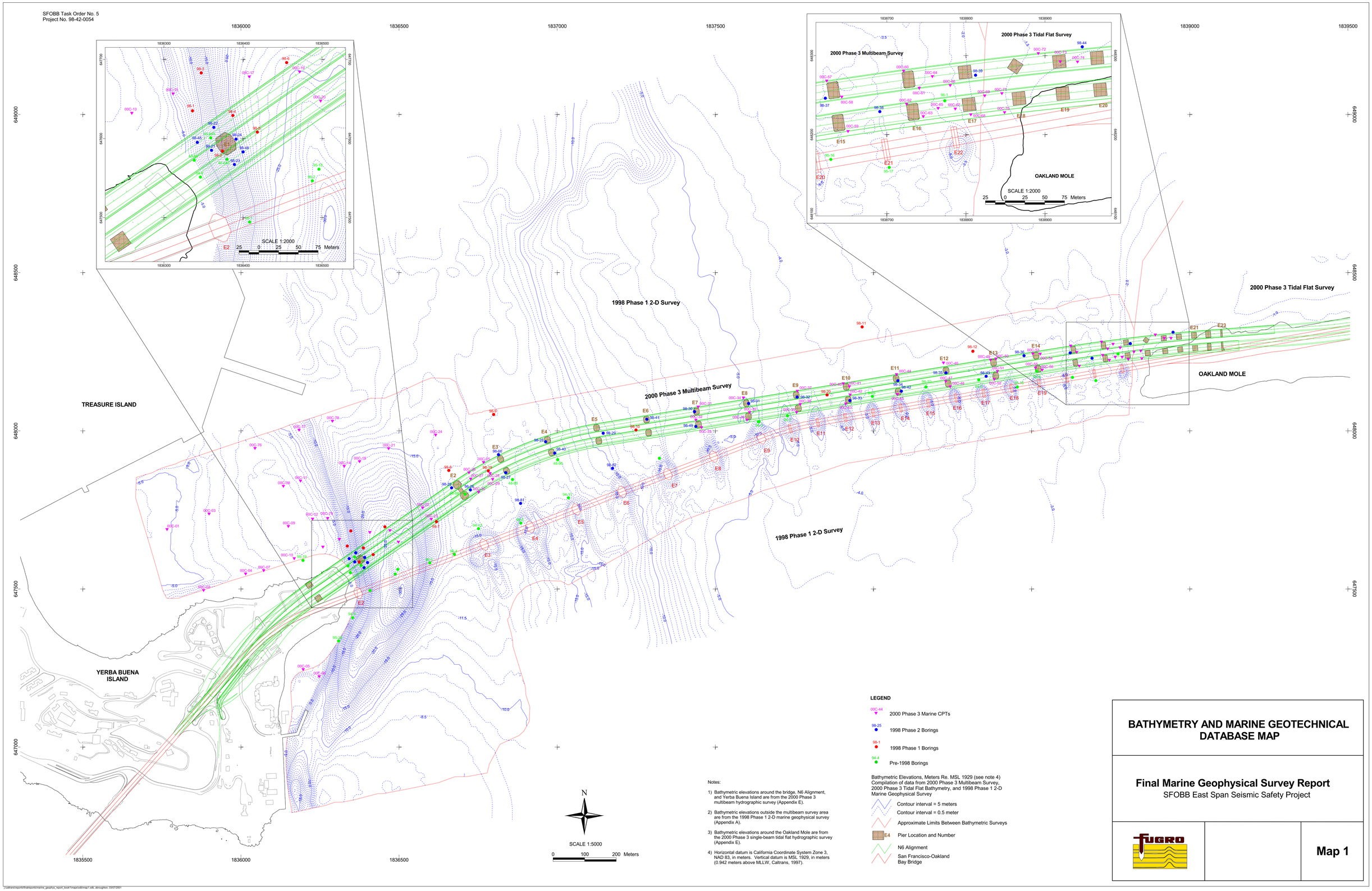

Notes:

1) Bathymetric elevations around the bridge, N6 Alignment, and Yerba Buena Island are from the 2000 Phase 3 multibeam hydrographic survey (Appendix E).

2) Bathymetric elevations outside the multibeam survey area are from the 1998 Phase 1 2-D marine geophysical survey (Appendix A).

3) Bathymetric elevations around the Oakland Mole are from the 2000 Phase 3 single-beam tidal flat hydrographic survey (Appendix E).

4) Horizontal datum is California Coordinate System Zone 3, NAD 83, in meters. Vertical datum is MSL 1929, in meters (0.942 meters above MLLW, Caltrans, 1997).

LEGEND

00C-44 — 2000 Phase 3 Marine CPTs

98-25 — 1998 Phase 2 Borings

98-1 — 1998 Phase 1 Borings

94-4 — Pre-1998 Borings

Bathymetric Elevations, Meters Re. MSL 1929 (see note 4)
Compilation of data from 2000 Phase 3 Multibeam Survey, 2000 Phase 3 Tidal Flat Bathymetry, and 1998 Phase 1 2-D Marine Geophysical Survey

- Contour interval = 5 meters
- Contour interval = 0.5 meter
- Approximate Limits Between Bathymetric Surveys
- E4 — Pier Location and Number
- N6 Alignment
- San Francisco-Oakland Bay Bridge

BATHYMETRY AND MARINE GEOTECHNICAL DATABASE MAP

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Map 1

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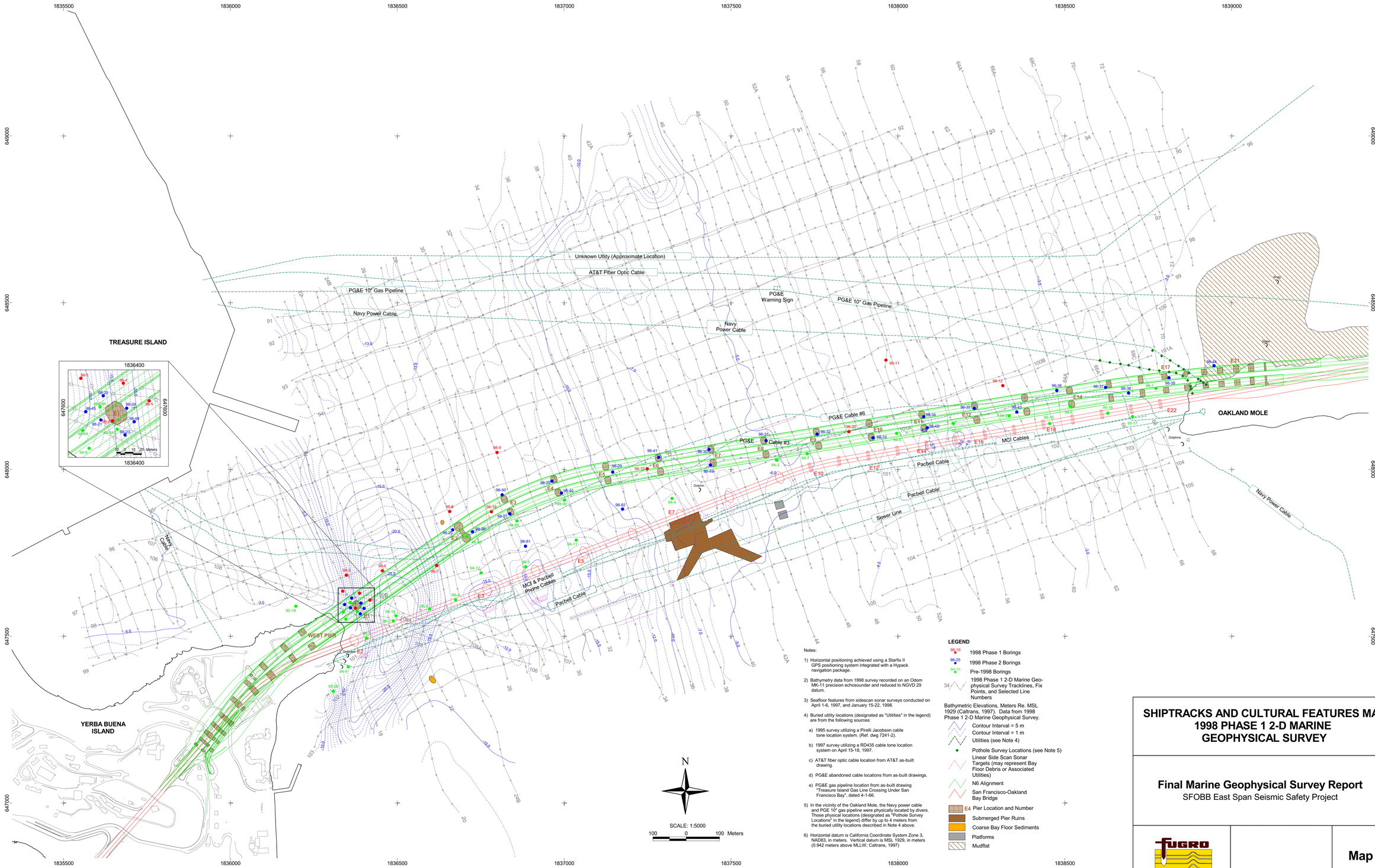

Notes:

1) Horizontal positioning achieved using a Starfix II GPS positioning system integrated with a Hypack navigation package.

2) Bathymetry data from 1998 survey recorded on an Odom MK-11 precision echosounder and reduced to NGVD 29 datum.

3) Seafloor features from sidescan sonar surveys conducted on April 1-6, 1997, and January 15-22, 1998.

4) Buried utility locations (designated as "Utilities" in the legend) are from the following sources:

a) 1995 survey utilizing a Pirelli Jacobson cable tone location system. (Ref. dwg 7241-2).

b) 1997 survey utilizing a RD435 cable tone location system on April 15-18, 1997.

c) AT&T fiber optic cable location from AT&T as-built drawing.

d) PG&E abandoned cable locations from as-built drawings.

e) PG&E gas pipeline location from as-built drawing "Treasure Island Gas Line Crossing Under San Francisco Bay", dated 4-1-66.

5) In the vicinity of the Oakland Mole, the Navy power cable and PGE 10" gas pipeline were physically located by divers. Those physical locations (designated as "Pothole Survey Locations" in the legend) differ by up to 4 meters from the buried utility locations described in Note 4 above.

6) Horizontal datum is California Coordinate System Zone 3, NAD83, in meters. Vertical datum is MSL 1929, in meters (0.942 meters above MLLW; Caltrans, 1997)

LEGEND

- 98-10 — 1998 Phase 1 Borings
- 98-25 — 1998 Phase 2 Borings
- 94-11 — Pre-1998 Borings
- 34 — 1998 Phase 1 2-D Marine Geophysical Survey Tracklines, Fix Points, and Selected Line Numbers

Bathymetric Elevations, Meters Re. MSL 1929 (Caltrans, 1997). Data from 1998 Phase 1 2-D Marine Geophysical Survey.

- Contour Interval = 5 m
- Contour Interval = 1 m
- Utilities (see Note 4)
- Pothole Survey Locations (see Note 5)
- Linear Side Scan Sonar Targets (may represent Bay Floor Debris or Associated Utilities)
- N6 Alignment
- San Francisco-Oakland Bay Bridge
- E4 Pier Location and Number
- Submerged Pier Ruins
- Coarse Bay Floor Sediments
- Platforms
- Mudflat

SHIPTRACKS AND CULTURAL FEATURES MAP 1998 PHASE 1 2-D MARINE GEOPHYSICAL SURVEY

Final Marine Geophysical Survey Report

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Map 2

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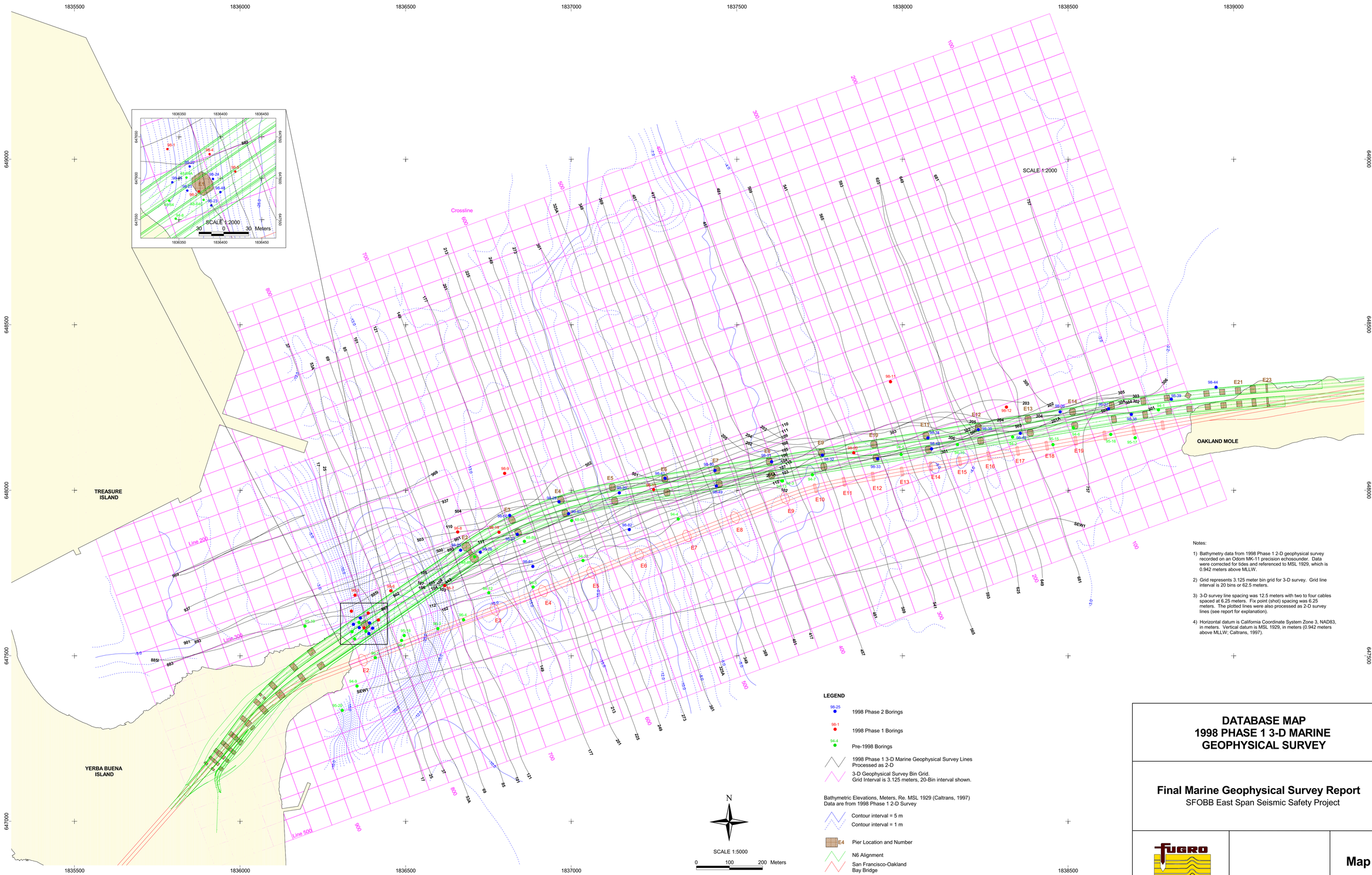

Notes:

1) Bathymetry data from 1998 Phase 1 2-D geophysical survey recorded on an Odom MK-11 precision echosounder. Data were corrected for tides and referenced to MSL 1929, which is 0.942 meters above MLLW.

2) Grid represents 3.125 meter bin grid for 3-D survey. Grid line interval is 20 bins or 62.5 meters.

3) 3-D survey line spacing was 12.5 meters with two to four cables spaced at 6.25 meters. Fix point (shot) spacing was 6.25 meters. The plotted lines were also processed as 2-D survey lines (see report for explanation).

4) Horizontal datum is California Coordinate System Zone 3, NAD83, in meters. Vertical datum is MSL 1929, in meters (0.942 meters above MLLW; Caltrans, 1997).

DATABASE MAP
1998 PHASE 1 3-D MARINE GEOPHYSICAL SURVEY

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Map 3

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LEGEND

2000 Phase 3 Geophysical Survey Lines

- 314 — Minisparker
- 7C — Boomer
- D — Bay Cable

Bold number is survey line number.
Small number is navigation fix number.
Every even-numbered fix is marked
and every 10th point is labeled.

- 00C-44 — 2000 Phase 3 Marine CPTs
- 98-25 — 1998-9 Phase 2 Borings
- 98-25 — 1998-9 Phase 2 Land CPTs
- 98-1 — 1998 Phase 1 Borings
- 94-4 — Pre-1998 Borings

Bathymetric Elevations, Meters
Re. MSL 1929 (Caltrans, 1997)
Data from 2000 Phase 3 Multibeam Survey

- Contour interval = 5 meters
- Contour interval = 0.5 meter
- N6 Alignment
- San Francisco-Oakland Bay Bridge
- E2 Pier Location and Number

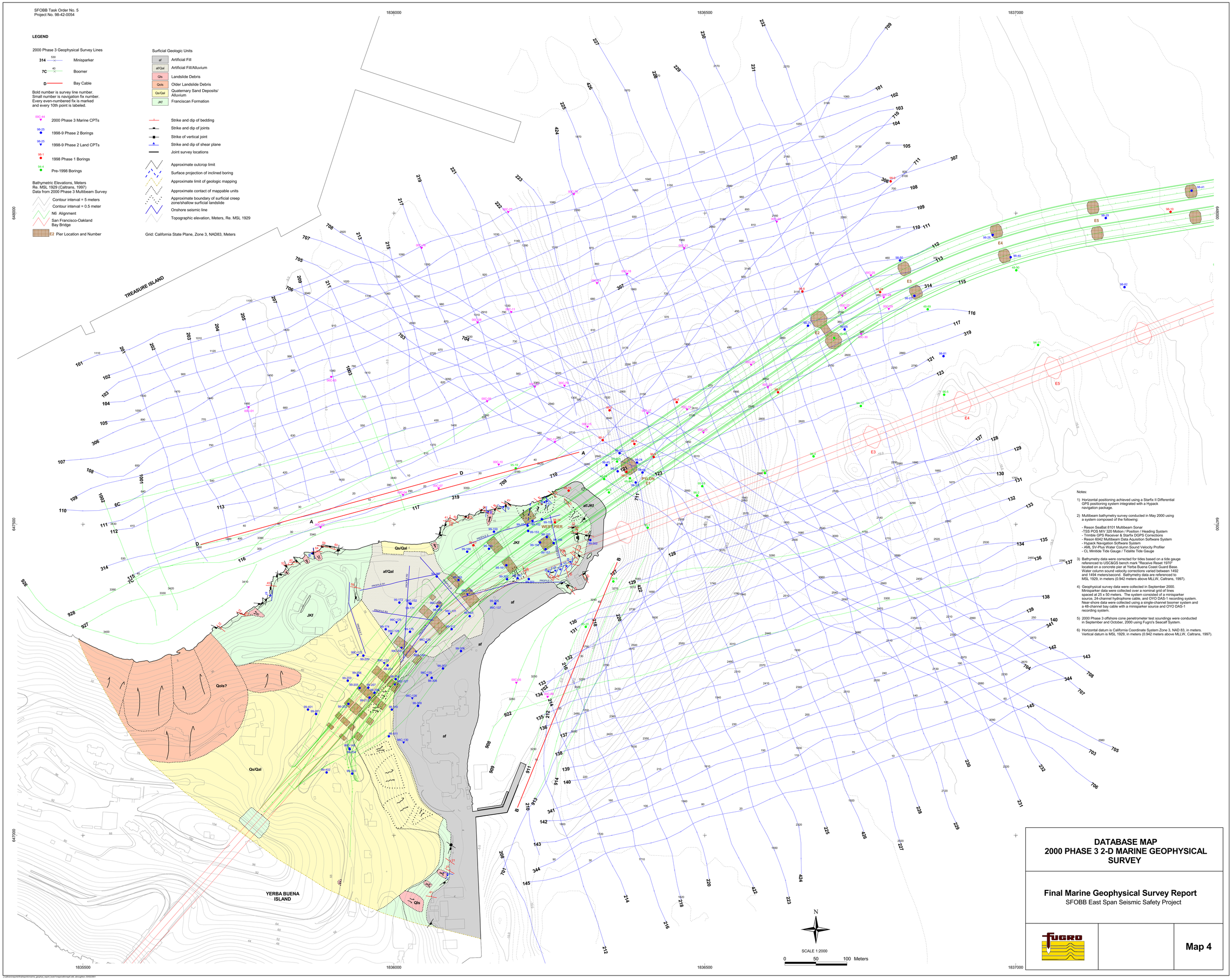
Surficial Geologic Units

- af — Artificial Fill
- af/Qal — Artificial Fill/Alluvium
- Qls — Landslide Debris
- Qols — Older Landslide Debris
- Qs/Qal — Quaternary Sand Deposits/ Alluvium
- JKf — Franciscan Formation

- Strike and dip of bedding
- Strike and dip of joints
- Strike of vertical joint
- Strike and dip of shear plane
- Joint survey locations

- Approximate outcrop limit
- Surface projection of inclined boring
- Approximate limit of geologic mapping
- Approximate contact of mappable units
- Approximate boundary of surficial creep zone/shallow surficial landslide
- Onshore seismic line
- Topographic elevation, Meters, Re. MSL 1929

Grid: California State Plane, Zone 3, NAD83, Meters



Notes:

1) Horizontal positioning achieved using a Starfix II Differential GPS positioning system integrated with a Hypack navigation package.

2) Multibeam bathymetry survey conducted in May 2000 using a system composed of the following:

- Reson SeaBat 8101 Multibeam Sonar
- TSS POS M/V 320 Motion / Position / Heading System
- Trimble GPS Receiver & Starfix DGPS Corrections
- Reson 6042 Multibeam Data Aquisition Software System
- Hypack Navigation Software System
- AML SV-Plus Water Column Sound Velocity Profiler
- CL Minitide Tide Gauge / Tidalite Tide Gauge

3) Bathymetry data were corrected for tides based on a tide gauge referenced to USC&GS bench mark "Receive Reset 1970" located on a concrete pier at Yerba Buena Coast Guard Base. Water column sound velocity corrections varied between 1492 and 1494 meters/second. Bathymetry data are referenced to MSL 1929, in meters (0.942 meters above MLLW, Caltrans, 1997).

4) Geophysical survey data were collected in September 2000. Minisparker data were collected over a nominal grid of lines spaced at 25 x 50 meters. The system consisted of a minisparker source, 24-channel hydrophone cable, and OYO DAS-1 recording system. Near-shore data were collected using a single-channel boomer system and a 48-channel bay cable with a minisparker source and OYO DAS-1 recording system.

5) 2000 Phase 3 offshore cone penetrometer test soundings were conducted in September and October, 2000 using Fugro's Seacalf System.

6) Horizontal datum is California Coordinate System Zone 3, NAD 83, in meters. Vertical datum is MSL 1929, in meters (0.942 meters above MLLW, Caltrans, 1997).

DATABASE MAP
2000 PHASE 3 2-D MARINE GEOPHYSICAL SURVEY

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Map 4

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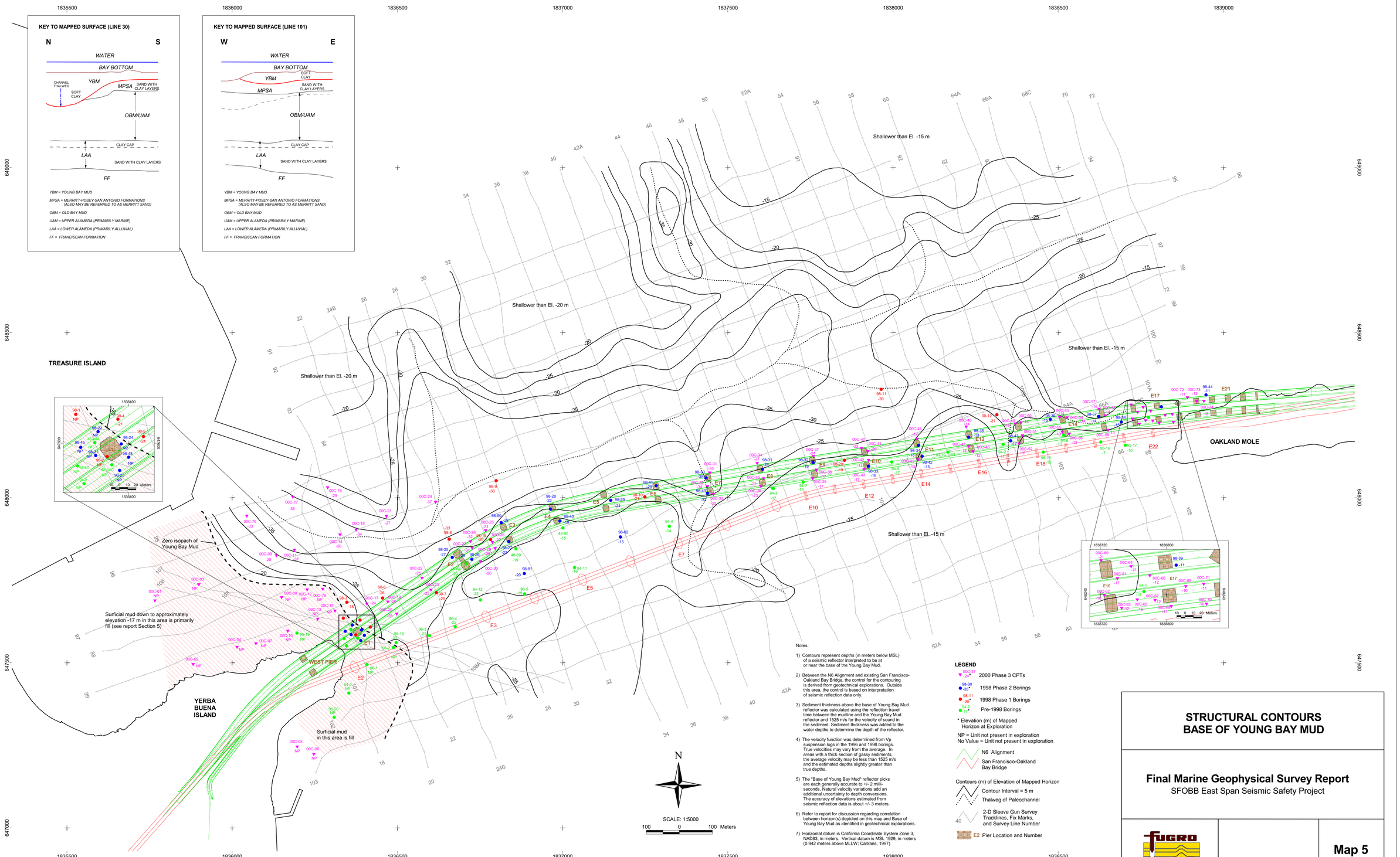

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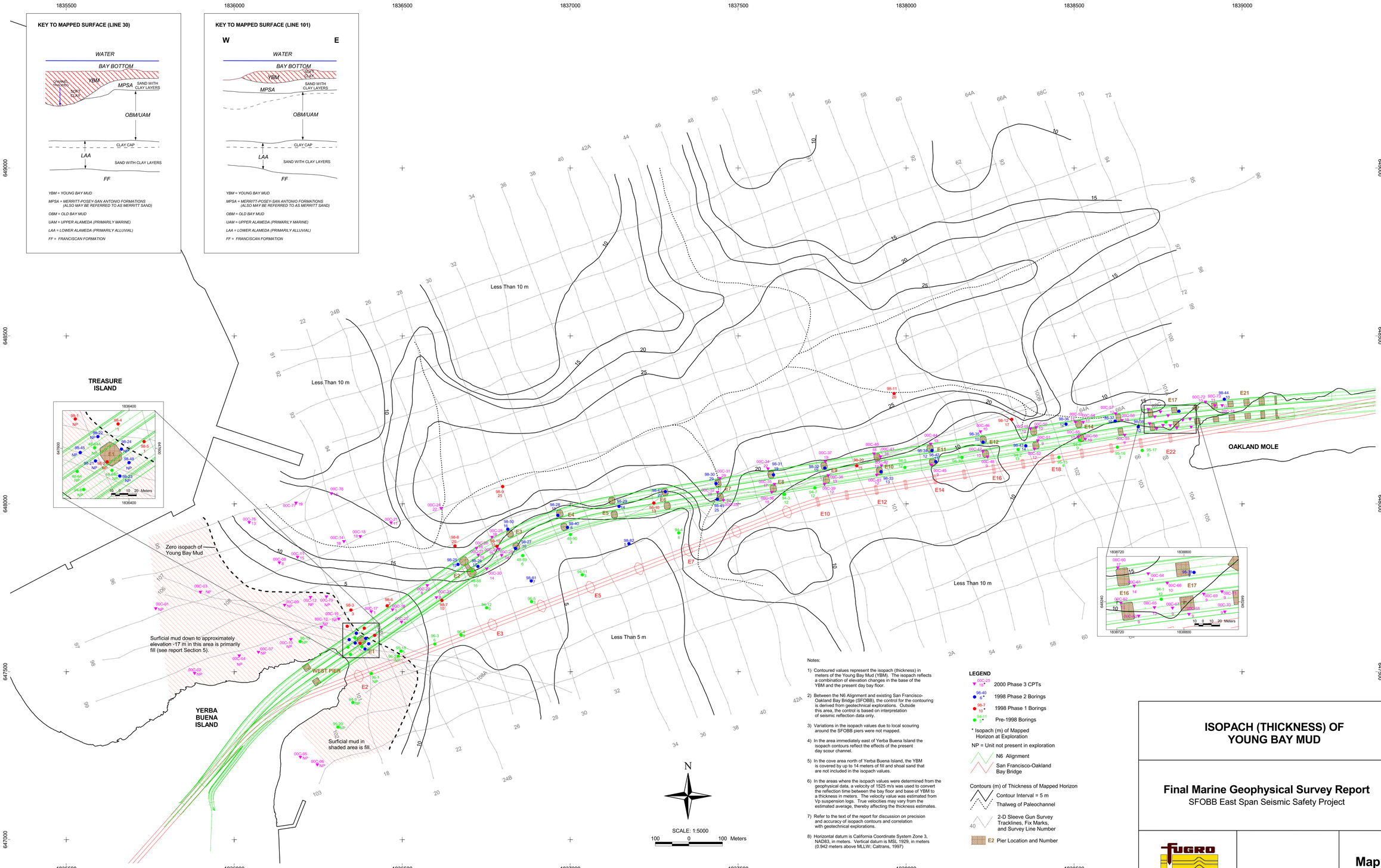

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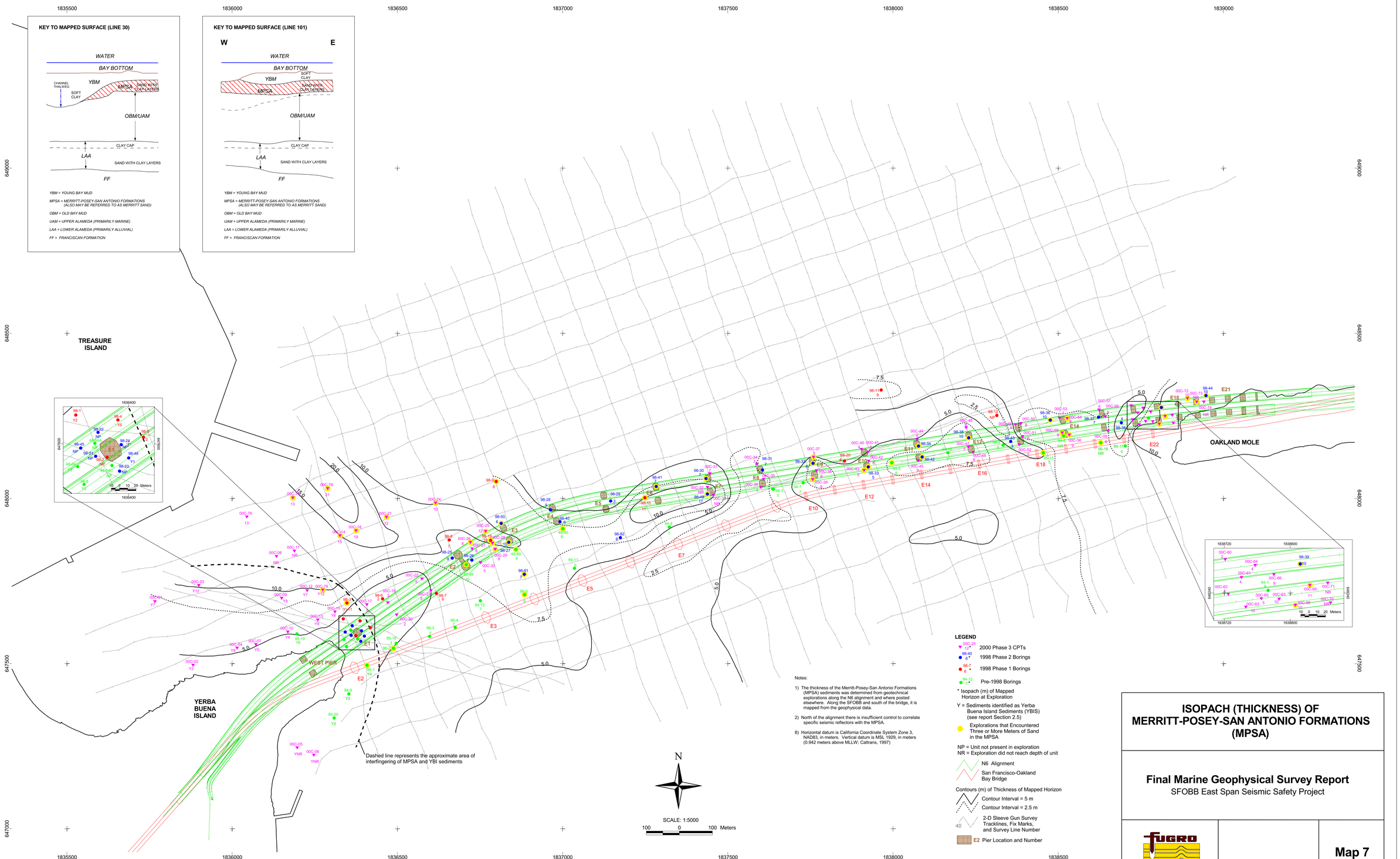

Notes:

1) The thickness of the Merritt-Posey-San Antonio Formations (MPSA) sediments was determined from geotechnical explorations along the N6 alignment and where posted elsewhere. Along the SFOBB and south of the bridge, it is mapped from the geophysical data.

2) North of the alignment there is insufficient control to correlate specific seismic reflectors with the MPSA.

8) Horizontal datum is California Coordinate System Zone 3, NAD83, in meters. Vertical datum is MSL 1929, in meters (0.942 meters above MLLW; Caltrans, 1997)

ISOPACH (THICKNESS) OF MERRITT-POSEY-SAN ANTONIO FORMATIONS (MPSA)

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Map 7

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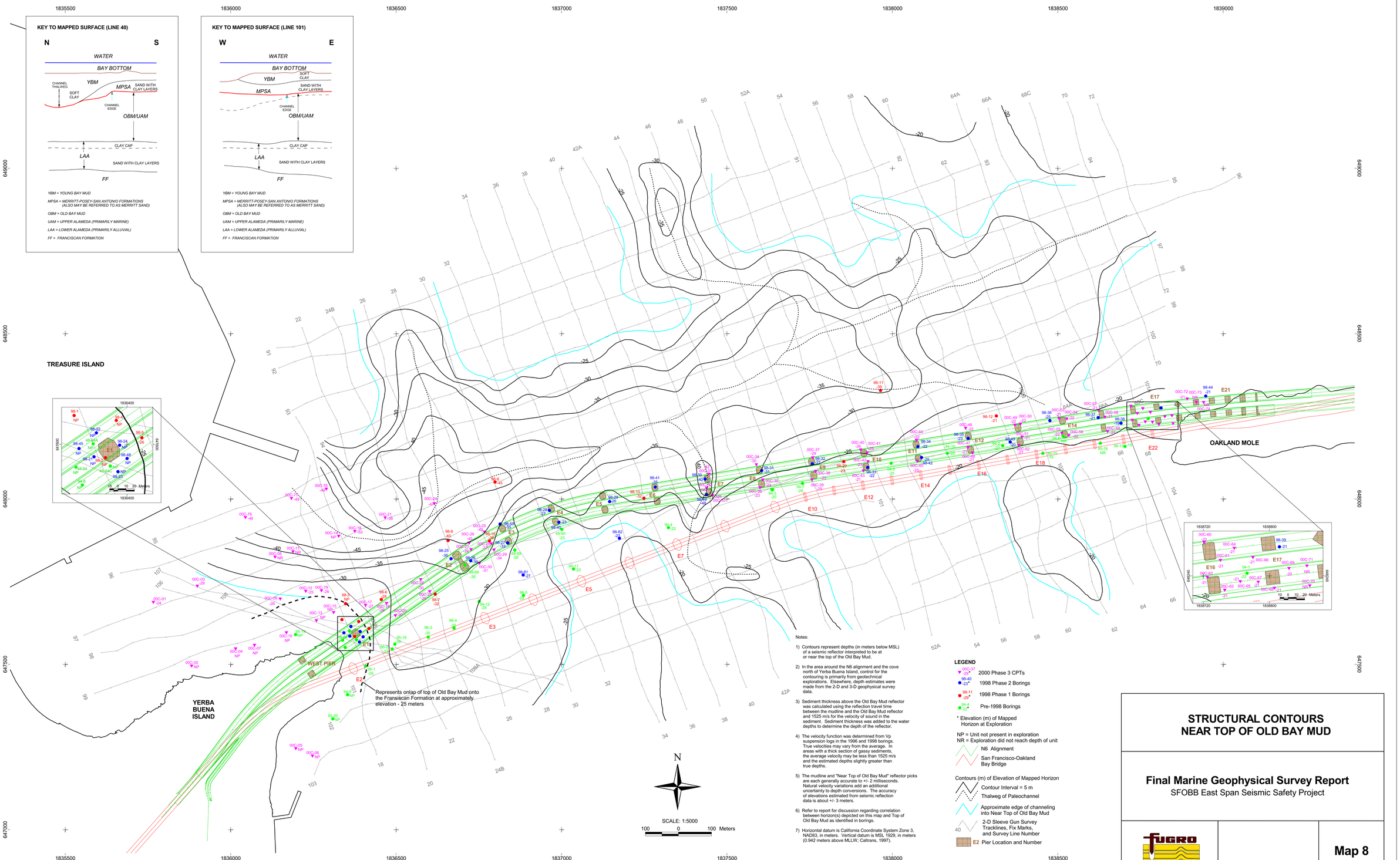

Notes:

1) Contours represent depths (in meters below MSL) of a seismic reflector interpreted to be at or near the top of the Old Bay Mud.

2) In the area around the N6 alignment and the cove north of Yerba Buena Island, control for the contouring is primarily from geotechnical explorations. Elsewhere, depth estimates were made from the 2-D and 3-D geophysical survey data.

3) Sediment thickness above the Old Bay Mud reflector was calculated using the reflection travel time between the mudline and the Old Bay Mud reflector and 1525 m/s for the velocity of sound in the sediment. Sediment thickness was added to the water depths to determine the depth of the reflector.

4) The velocity function was determined from Vp suspension logs in the 1996 and 1998 borings. True velocities may vary from the average. In areas with a thick section of gassy sediments, the average velocity may be less than 1525 m/s and the estimated depths slightly greater than true depths.

5) The mudline and "Near Top of Old Bay Mud" reflector picks are each generally accurate to +/- 2 milliseconds. Natural velocity variations add an additional uncertainty to depth conversions. The accuracy of elevations estimated from seismic reflection data is about +/- 3 meters.

6) Refer to report for discussion regarding correlation between horizon(s) depicted on this map and Top of Old Bay Mud as identified in borings.

7) Horizontal datum is California Coordinate System Zone 3, NAD83, in meters. Vertical datum is MSL 1929, in meters (0.942 meters above MLLW; Caltrans, 1997).

STRUCTURAL CONTOURS NEAR TOP OF OLD BAY MUD

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Map 8

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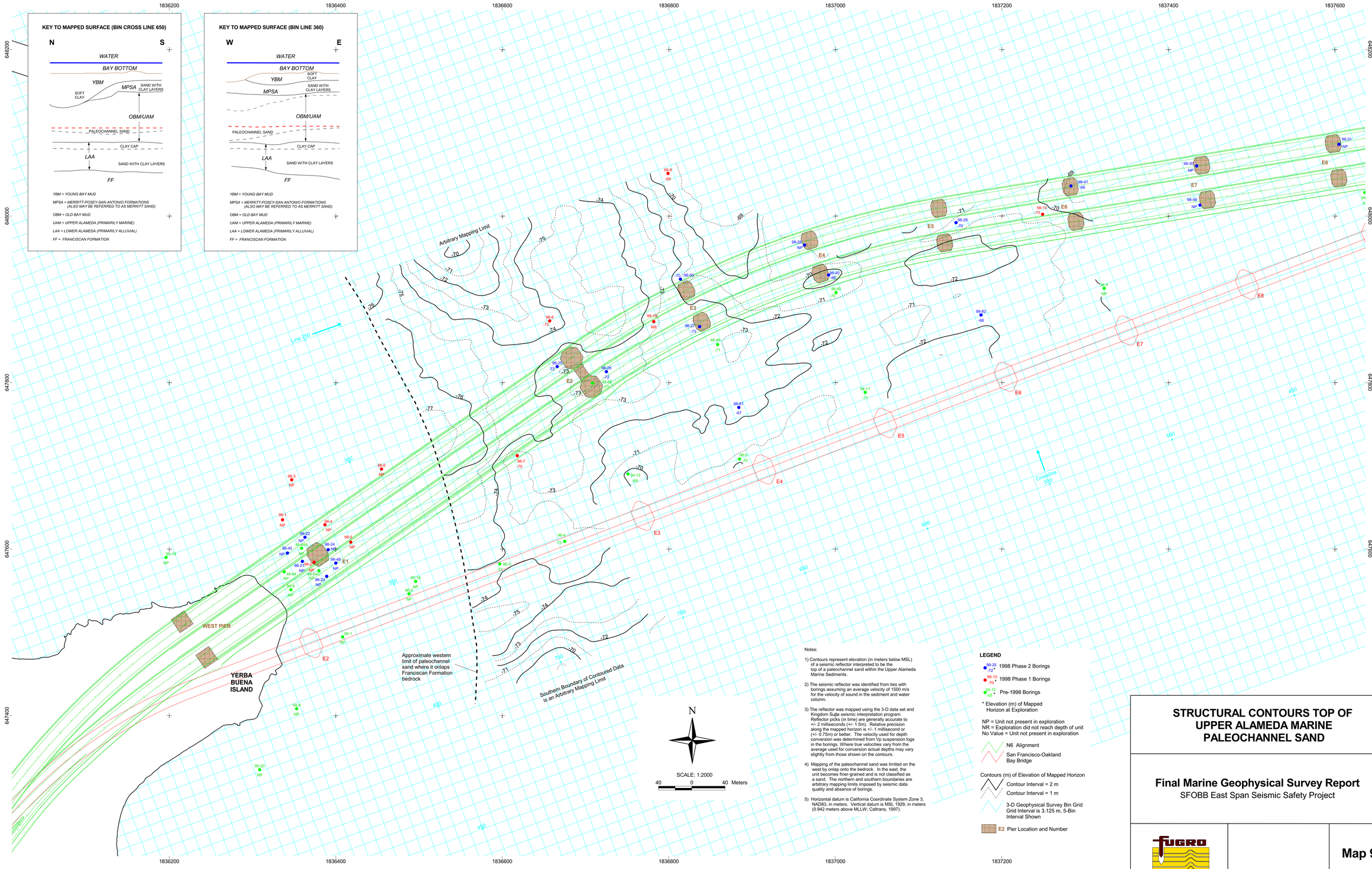

Notes:

1) Contours represent elevation (in meters below MSL) of a seismic reflector interpreted to be the top of a paleochannel sand within the Upper Alameda Marine Sediments.

2) The seismic reflector was identified from ties with borings assuming an average velocity of 1500 m/s for the velocity of sound in the sediment and water column.

3) The reflector was mapped using the 3-D data set and Kingdom Suite seismic interpretation program. Reflector picks (in time) are generally accurate to +/- 2 milliseconds (+/- 1.5m). Relative precision along the mapped horizon is +/- 1 millisecond or (+/- 0.75m) or better. The velocity used for depth conversion was determined from Vp suspension logs in the borings. Where true velocities vary from the average used for conversion actual depths may vary slightly from those shown on the contours.

4) Mapping of the paleochannel sand was limited on the west by onlap onto the bedrock. In the east, the unit becomes finer-grained and is not classified as a sand. The northern and southern boundaries are arbitrary mapping limits imposed by seismic data quality and absence of borings.

5) Horizontal datum is California Coordinate System Zone 3, NAD83, in meters. Vertical datum is MSL 1929, in meters (0.942 meters above MLLW; Caltrans, 1997).

LEGEND

98-25 -72* 1998 Phase 2 Borings

98-10 -70* 1998 Phase 1 Borings

94-12 -68 Pre-1998 Borings

* Elevation (m) of Mapped Horizon at Exploration

NP = Unit not present in exploration
NR = Exploration did not reach depth of unit
No Value = Unit not present in exploration

N6 Alignment

San Francisco-Oakland Bay Bridge

Contours (m) of Elevation of Mapped Horizon

Contour Interval = 2 m

Contour Interval = 1 m

3-D Geophysical Survey Bin Grid Grid Interval is 3.125 m, 5-Bin Interval Shown

E2 Pier Location and Number

STRUCTURAL CONTOURS TOP OF UPPER ALAMEDA MARINE PALEOCHANNEL SAND

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Map 9a

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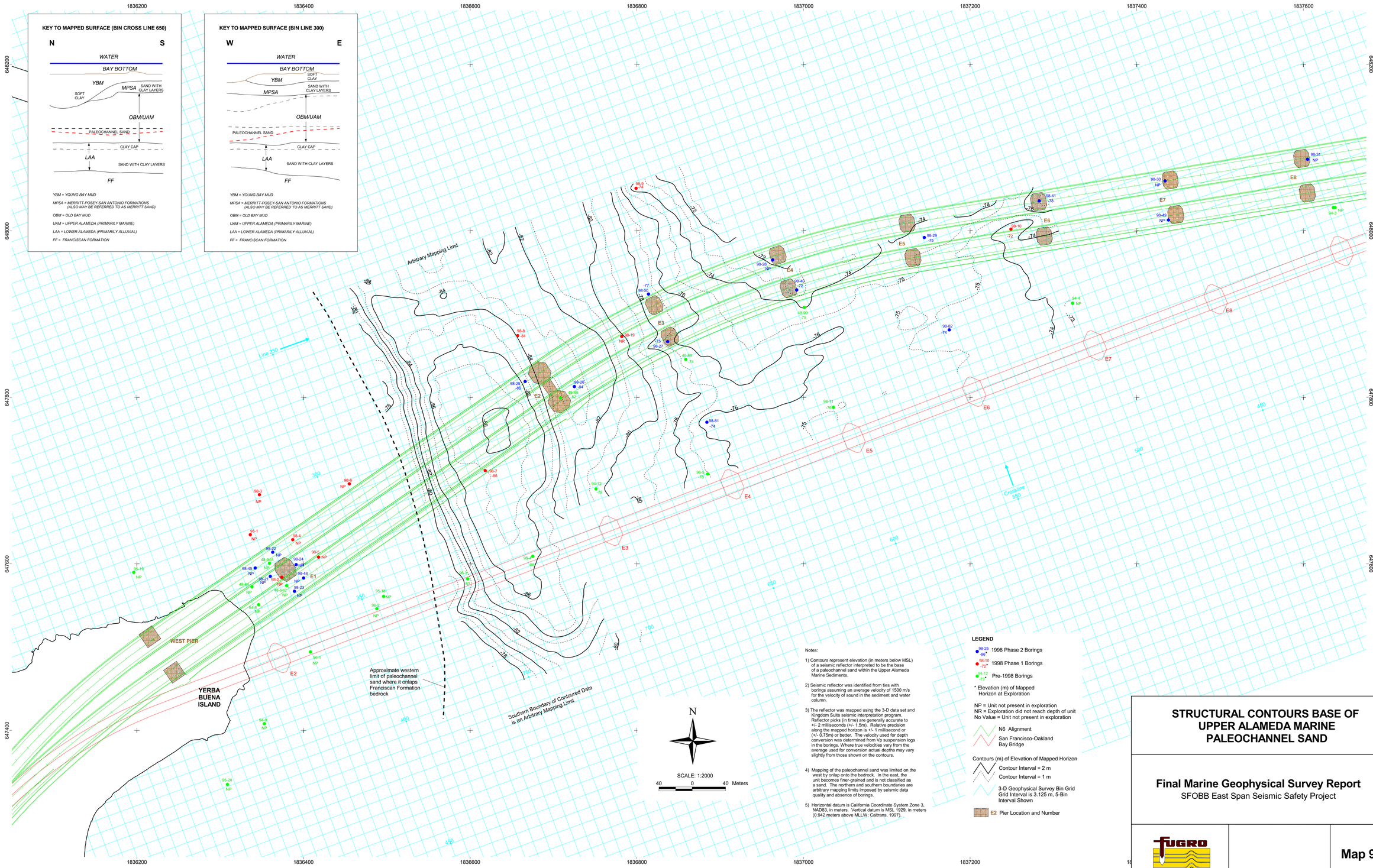

Notes:

1) Contours represent elevation (in meters below MSL) of a seismic reflector interpreted to be the base of a paleochannel sand within the Upper Alameda Marine Sediments.

2) Seismic reflector was identified from ties with borings assuming an average velocity of 1500 m/s for the velocity of sound in the sediment and water column.

3) The reflector was mapped using the 3-D data set and Kingdom Suite seismic interpretation program. Reflector picks (in time) are generally accurate to +/- 2 milliseconds (+/- 1.5m). Relative precision along the mapped horizon is +/- 1 millisecond or (+/- 0.75m) or better. The velocity used for depth conversion was determined from Vp suspension logs in the borings. Where true velocities vary from the average used for conversion actual depths may vary slightly from those shown on the contours.

4) Mapping of the paleochannel sand was limited on the west by onlap onto the bedrock. In the east, the unit becomes finer-grained and is not classified as a sand. The northern and southern boundaries are arbitrary mapping limits imposed by seismic data quality and absence of borings.

5) Horizontal datum is California Coordinate System Zone 3, NAD83, in meters. Vertical datum is MSL 1929, in meters (0.942 meters above MLLW; Caltrans, 1997).

LEGEND

98-25 -86* 1998 Phase 2 Borings

98-10 -72* 1998 Phase 1 Borings

94-12 -79* Pre-1998 Borings

* Elevation (m) of Mapped Horizon at Exploration

NP = Unit not present in exploration
NR = Exploration did not reach depth of unit
No Value = Unit not present in exploration

N6 Alignment

San Francisco-Oakland Bay Bridge

Contours (m) of Elevation of Mapped Horizon

Contour Interval = 2 m

Contour Interval = 1 m

3-D Geophysical Survey Bin Grid
Grid Interval is 3.125 m, 5-Bin Interval Shown

E2 Pier Location and Number

STRUCTURAL CONTOURS BASE OF UPPER ALAMEDA MARINE PALEOCHANNEL SAND

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Map 9b

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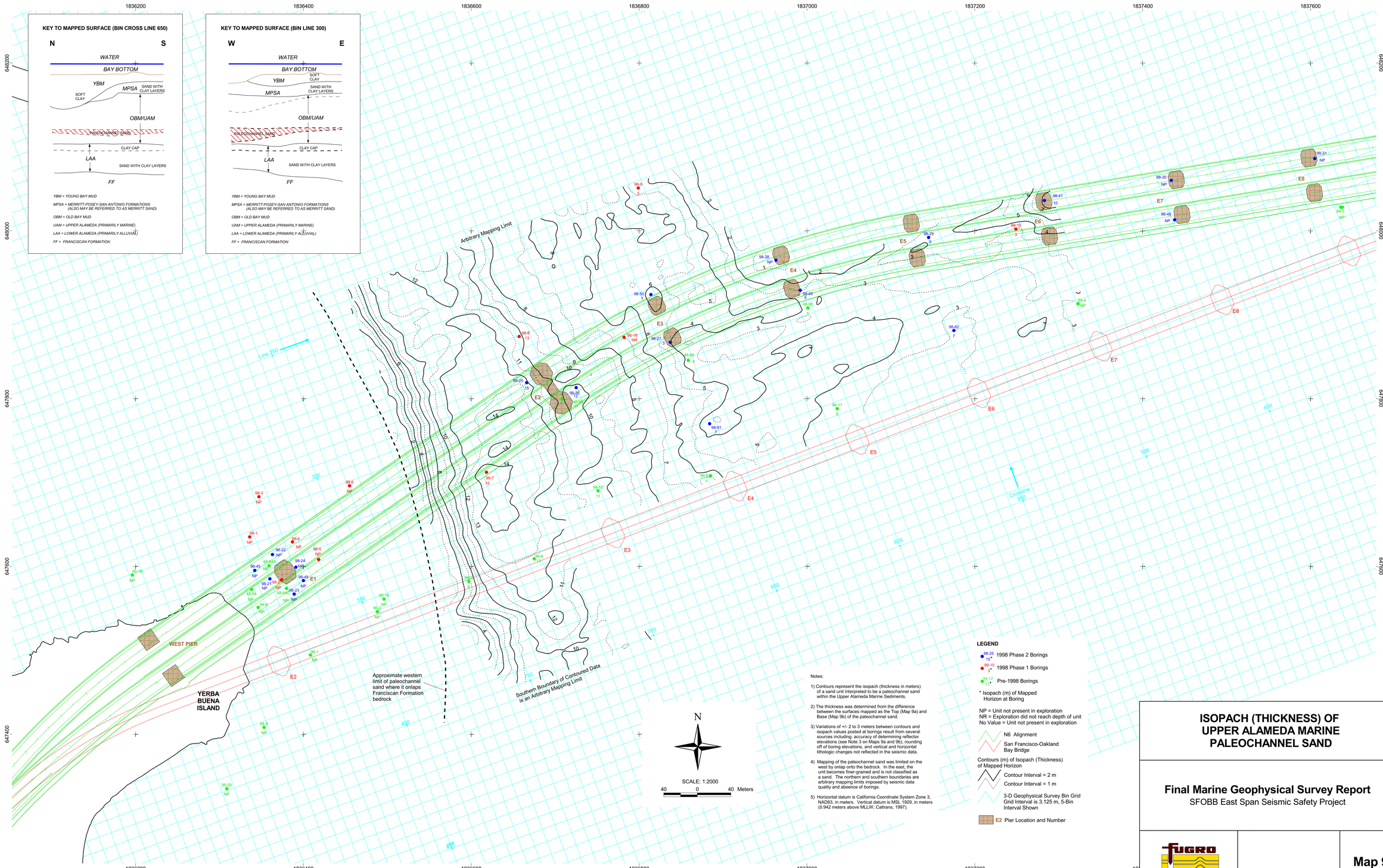

Notes:

1) Contours represent the isopach (thickness in meters) of a sand unit interpreted to be a paleochannel sand within the Upper Alameda Marine Sediments.

2) The thickness was determined from the difference between the surfaces mapped as the Top (Map 9a) and Base (Map 9b) of the paleochannel sand.

3) Variations of +/- 2 to 3 meters between contours and isopach values posted at borings result from several sources including: accuracy of determining reflector elevations (see Note 3 on Maps 9a and 9b), rounding off of boring elevations, and vertical and horizontal lithologic changes not reflected in the seismic data.

4) Mapping of the paleochannel sand was limited on the west by onlap onto the bedrock. In the east, the unit becomes finer-grained and is not classified as a sand. The northern and southern boundaries are arbitrary mapping limits imposed by seismic data quality and absence of borings.

5) Horizontal datum is California Coordinate System Zone 3, NAD83, in meters. Vertical datum is MSL 1929, in meters (0.942 meters above MLLW; Caltrans, 1997).

ISOPACH (THICKNESS) OF UPPER ALAMEDA MARINE PALEOCHANNEL SAND

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Map 9c

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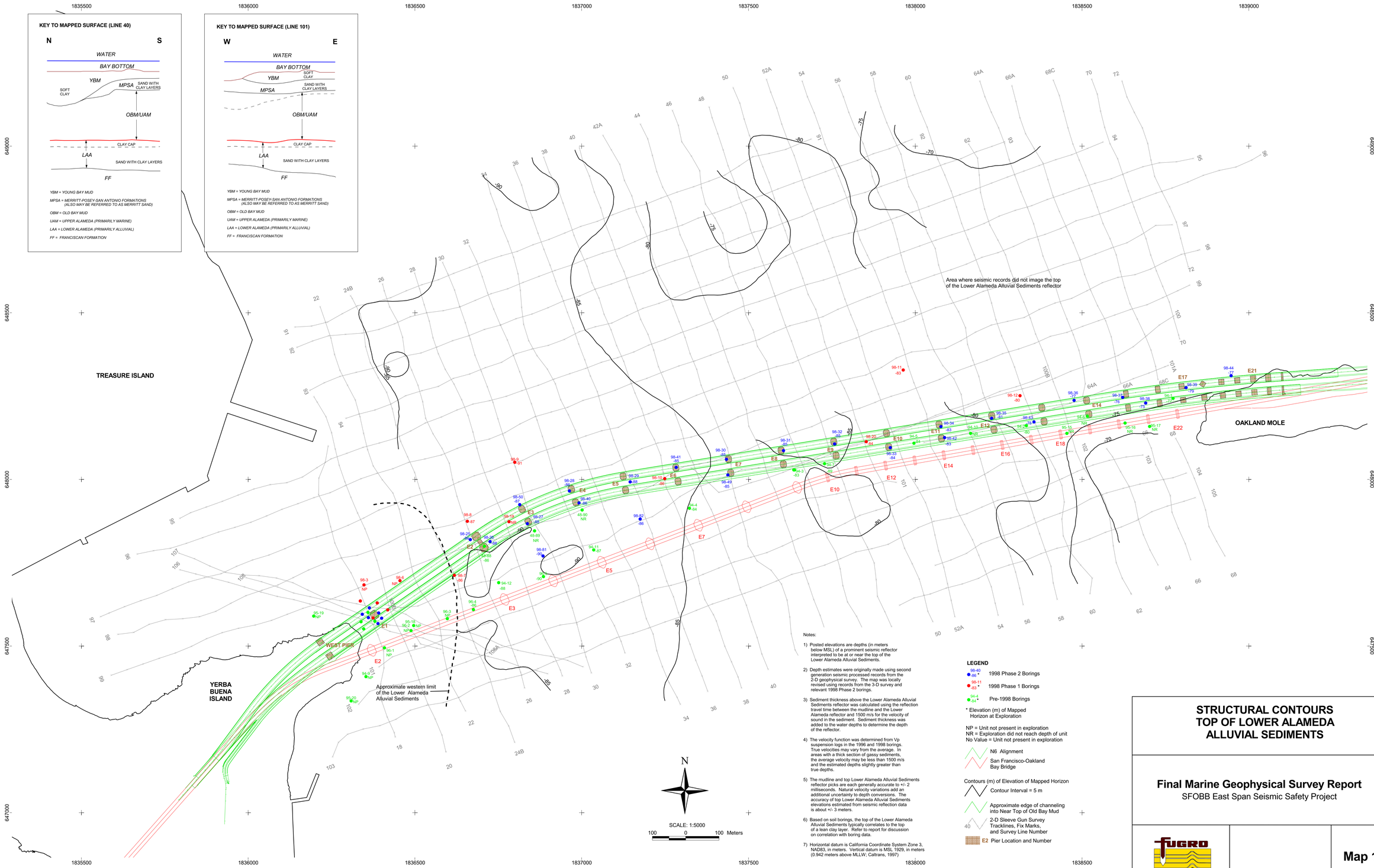

Notes:

1) Posted elevations are depths (in meters below MSL) of a prominent seismic reflector interpreted to be at or near the top of the Lower Alameda Alluvial Sediments.

2) Depth estimates were originally made using second generation seismic processed records from the 2-D geophysical survey. The map was locally revised using records from the 3-D survey and relevant 1998 Phase 2 borings.

3) Sediment thickness above the Lower Alameda Alluvial Sediments reflector was calculated using the reflection travel time between the mudline and the Lower Alameda reflector and 1500 m/s for the velocity of sound in the sediment. Sediment thickness was added to the water depths to determine the depth of the reflector.

4) The velocity function was determined from Vp suspension logs in the 1996 and 1998 borings. True velocities may vary from the average. In areas with a thick section of gassy sediments, the average velocity may be less than 1500 m/s and the estimated depths slightly greater than true depths.

5) The mudline and top Lower Alameda Alluvial Sediments reflector picks are each generally accurate to +/- 2 milliseconds. Natural velocity variations add an additional uncertainty to depth conversions. The accuracy of top Lower Alameda Alluvial Sediments elevations estimated from seismic reflection data is about +/- 3 meters.

6) Based on soil borings, the top of the Lower Alameda Alluvial Sediments typically correlates to the top of a lean clay layer. Refer to report for discussion on correlation with boring data.

7) Horizontal datum is California Coordinate System Zone 3, NAD83, in meters. Vertical datum is MSL 1929, in meters (0.942 meters above MLLW, Caltrans, 1997)

LEGEND

98-40 -86 * 1998 Phase 2 Borings

98-11 -83 * 1998 Phase 1 Borings

94-4 -84 * Pre-1998 Borings

* Elevation (m) of Mapped Horizon at Exploration

NP = Unit not present in exploration
NR = Exploration did not reach depth of unit
No Value = Unit not present in exploration

N6 Alignment

San Francisco-Oakland Bay Bridge

Contours (m) of Elevation of Mapped Horizon

Contour Interval = 5 m

Approximate edge of channeling into Near Top of Old Bay Mud

40 2-D Sleeve Gun Survey Tracklines, Fix Marks, and Survey Line Number

E2 Pier Location and Number

STRUCTURAL CONTOURS TOP OF LOWER ALAMEDA ALLUVIAL SEDIMENTS

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Map 10

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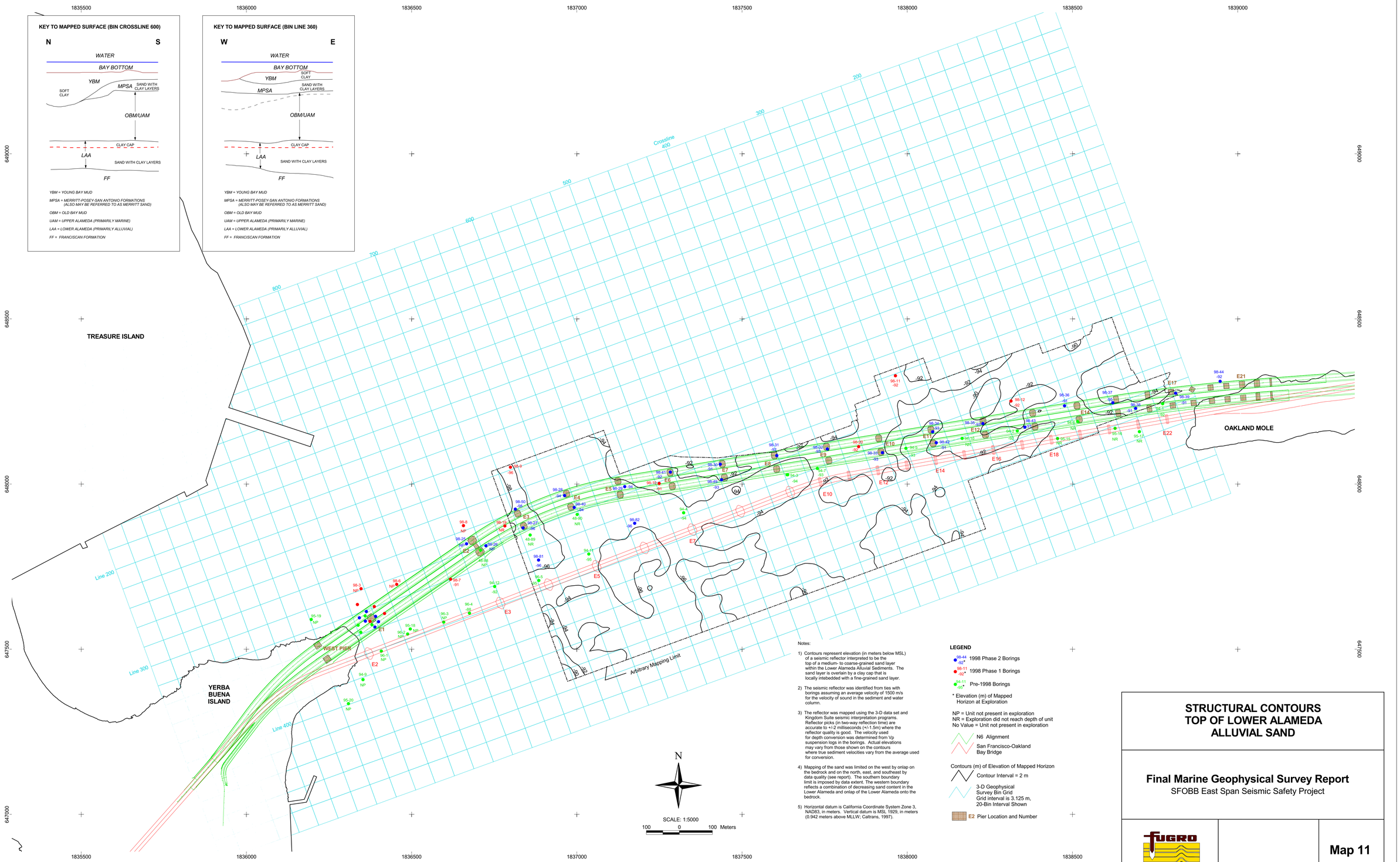

Notes:

1) Contours represent elevation (in meters below MSL) of a seismic reflector interpreted to be the top of a medium- to coarse-grained sand layer within the Lower Alameda Alluvial Sediments. The sand layer is overlain by a clay cap that is locally intebedded with a fine-grained sand layer.

2) The seismic reflector was identified from ties with borings assuming an average velocity of 1500 m/s for the velocity of sound in the sediment and water column.

3) The reflector was mapped using the 3-D data set and Kingdom Suite seismic interpretation programs. Reflector picks (in two-way reflection time) are accurate to +/-2 milliseconds (+/-1.5m) where the reflector quality is good. The velocity used for depth conversion was determined from Vp suspension logs in the borings. Actual elevations may vary from those shown on the contours where true sediment velocities vary from the average used for conversion.

4) Mapping of the sand was limited on the west by onlap on the bedrock and on the north, east, and southeast by data quality (see report). The southern boundary limit is imposed by data extent. The western boundary reflects a combination of decreasing sand content in the Lower Alameda and onlap of the Lower Alameda onto the bedrock.

5) Horizontal datum is California Coordinate System Zone 3, NAD83, in meters. Vertical datum is MSL 1929, in meters (0.942 meters above MLLW; Caltrans, 1997).

LEGEND

98-44 -92* 1998 Phase 2 Borings

98-11 -92* 1998 Phase 1 Borings

94-11 -95* Pre-1998 Borings

* Elevation (m) of Mapped Horizon at Exploration

NP = Unit not present in exploration
NR = Exploration did not reach depth of unit
No Value = Unit not present in exploration

N6 Alignment

San Francisco-Oakland Bay Bridge

Contours (m) of Elevation of Mapped Horizon

Contour Interval = 2 m

3-D Geophysical Survey Bin Grid
Grid interval is 3.125 m,
20-Bin Interval Shown

E2 Pier Location and Number

STRUCTURAL CONTOURS TOP OF LOWER ALAMEDA ALLUVIAL SAND

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Map 11

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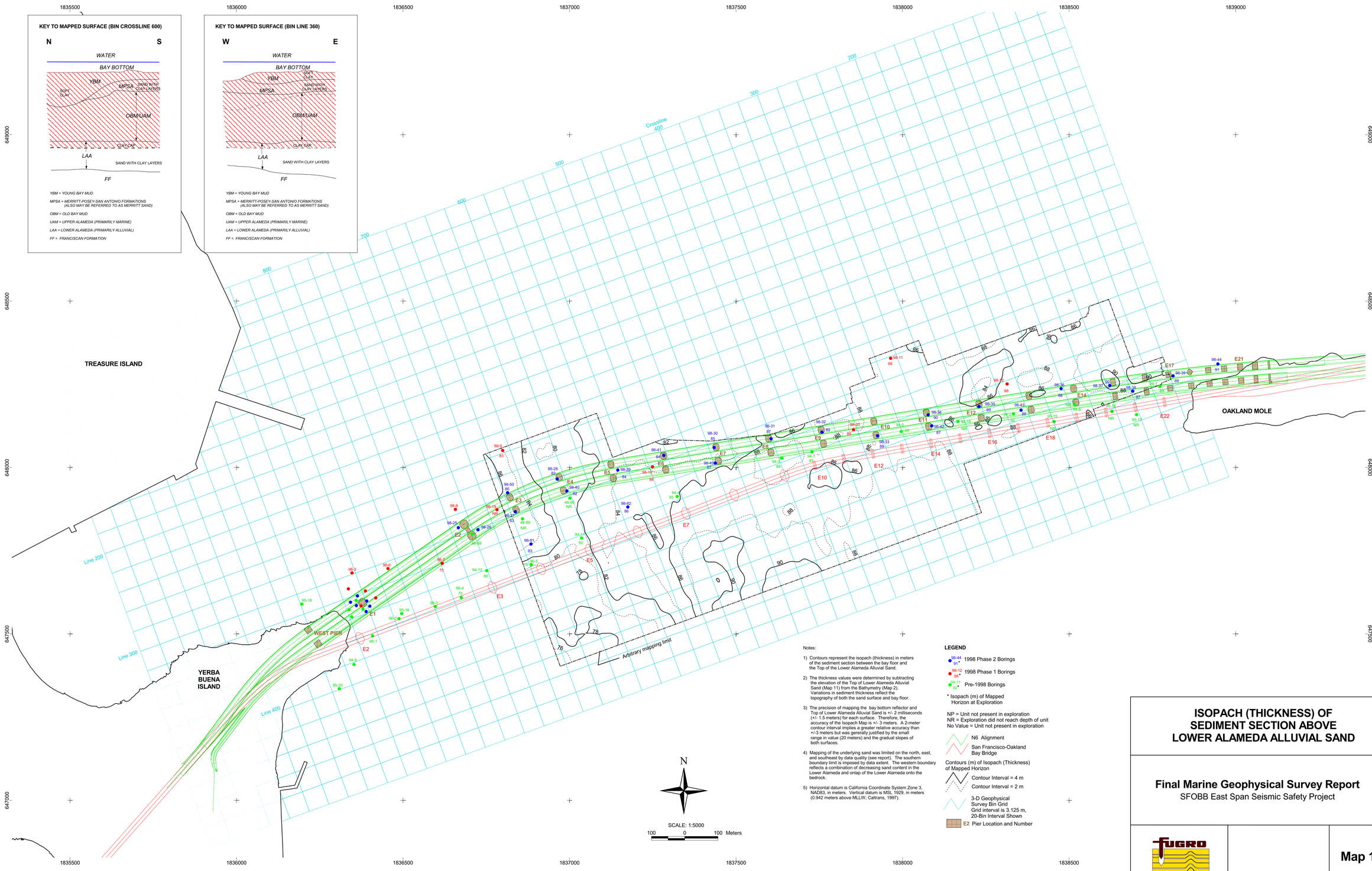

Notes:

1) Contours represent the isopach (thickness) in meters of the sediment section between the bay floor and the Top of the Lower Alameda Alluvial Sand.

2) The thickness values were determined by subtracting the elevation of the Top of Lower Alameda Alluvial Sand (Map 11) from the Bathymetry (Map 2). Variations in sediment thickness reflect the topography of both the sand surface and bay floor.

3) The precision of mapping the bay bottom reflector and Top of Lower Alameda Alluvial Sand is +/- 2 milliseconds (+/- 1.5 meters) for each surface. Therefore, the accuracy of the Isopach Map is +/- 3 meters. A 2-meter contour interval implies a greater relative accuracy than +/-3 meters but was generally justified by the small range in value (20 meters) and the gradual slopes of both surfaces.

4) Mapping of the underlying sand was limited on the north, east, and southeast by data quality (see report). The southern boundary limit is imposed by data extent. The western boundary reflects a combination of decreasing sand content in the Lower Alameda and onlap of the Lower Alameda onto the bedrock.

5) Horizontal datum is California Coordinate System Zone 3, NAD83, in meters. Vertical datum is MSL 1929, in meters (0.942 meters above MLLW; Caltrans, 1997).

LEGEND

98-44 91* 1998 Phase 2 Borings

95-12 88* 1998 Phase 1 Borings

94-11 82* Pre-1998 Borings

* Isopach (m) of Mapped Horizon at Exploration

NP = Unit not present in exploration
NR = Exploration did not reach depth of unit
No Value = Unit not present in exploration

N6 Alignment

San Francisco-Oakland Bay Bridge

Contours (m) of Isopach (Thickness) of Mapped Horizon

Contour Interval = 4 m

Contour Interval = 2 m

3-D Geophysical Survey Bin Grid
Grid interval is 3.125 m, 20-Bin Interval Shown

E2 Pier Location and Number

ISOPACH (THICKNESS) OF SEDIMENT SECTION ABOVE LOWER ALAMEDA ALLUVIAL SAND

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Map 12

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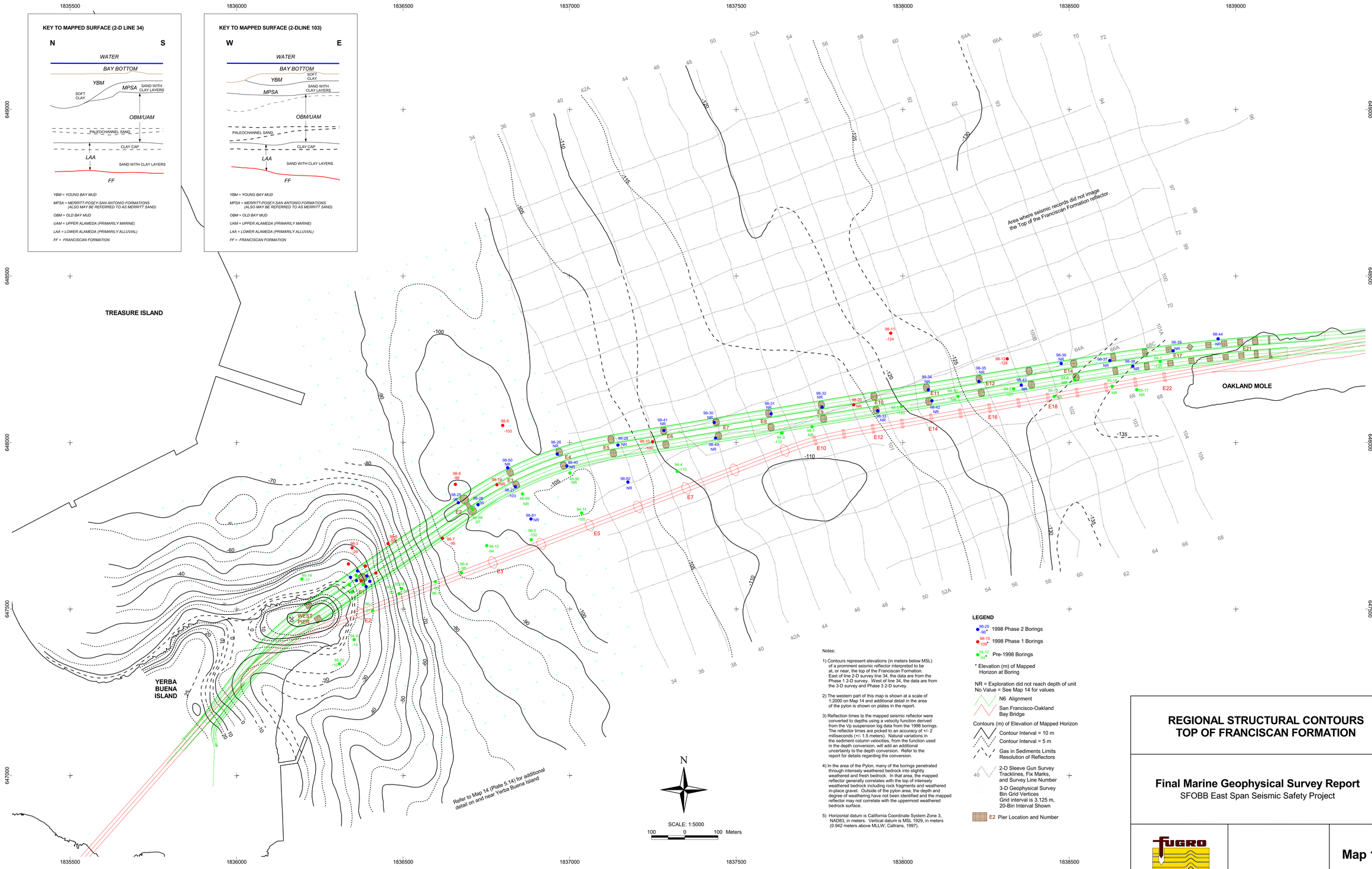

Notes:

1) Contours represent elevations (in meters below MSL) of a prominent seismic reflector interpreted to be at, or near, the top of the Franciscan Formation. East of line 2-D survey line 34, the data are from the Phase 1 2-D survey. West of line 34, the data are from the 3-D survey and Phase 3 2-D survey.

2) The western part of this map is shown at a scale of 1:2000 on Map 14 and additional detail in the area of the pylon is shown on plates in the report.

3) Reflection times to the mapped seismic reflector were converted to depths using a velocity function derived from the Vp suspension log data from the 1998 borings. The reflector times are picked to an accuracy of +/- 2 milliseconds (+/- 1.5 meters). Natural variations in the sediment column velocities, from the function used in the depth conversion, will add an additional uncertainty to the depth conversion. Refer to the report for details regarding the conversion.

4) In the area of the Pylon, many of the borings penetrated through intensely weathered bedrock into slightly weathered and fresh bedrock. In that area, the mapped reflector generally correlates with the top of intensely weathered bedrock including rock fragments and weathered in-place gravel. Outside of the pylon area, the depth and degree of weathering have not been identified and the mapped reflector may not correlate with the uppermost weathered bedrock surface.

5) Horizontal datum is California Coordinate System Zone 3, NAD83, in meters. Vertical datum is MSL 1929, in meters (0.942 meters above MLLW; Caltrans, 1997).

REGIONAL STRUCTURAL CONTOURS TOP OF FRANCISCAN FORMATION

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Map 13

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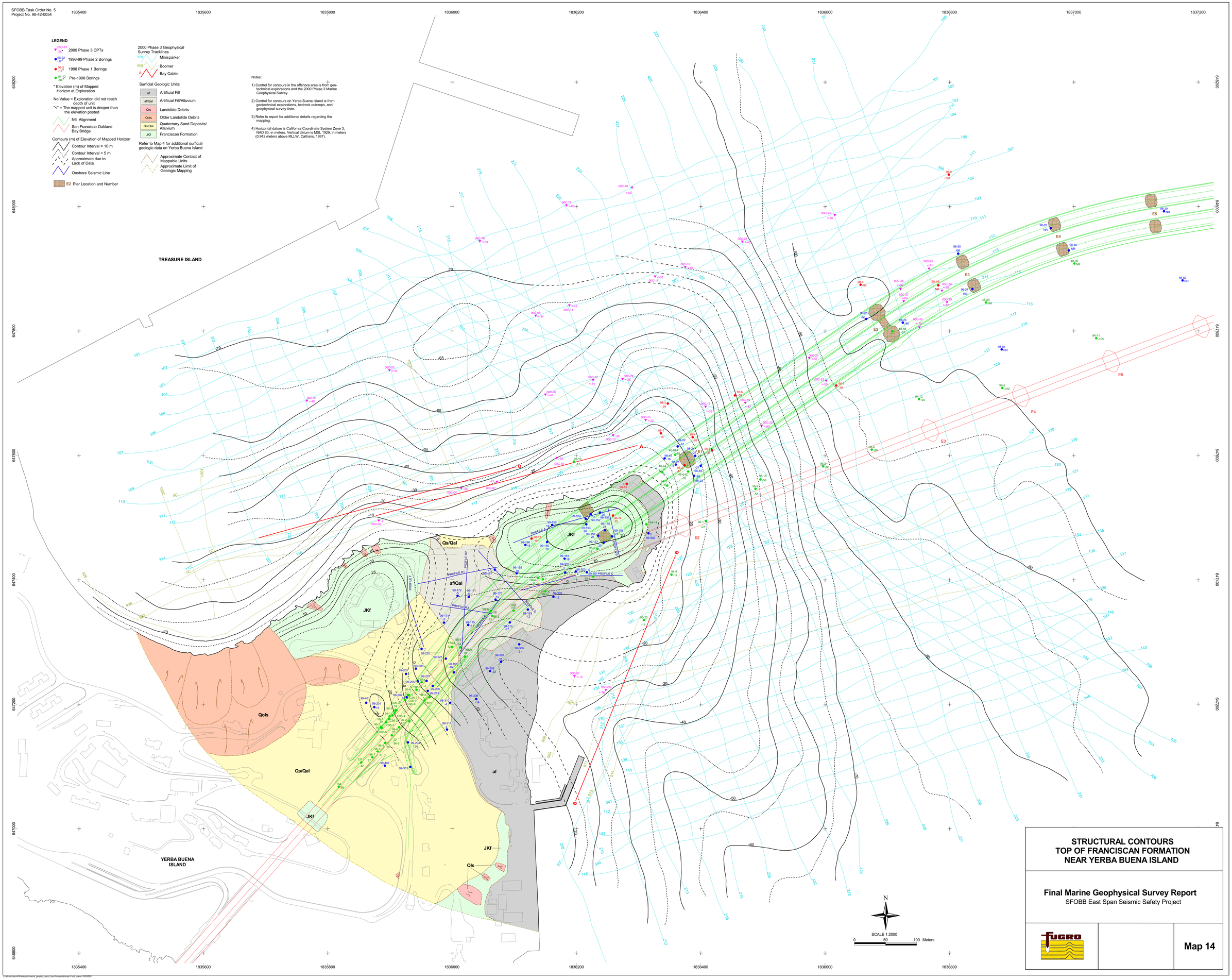

STRUCTURAL CONTOURS
TOP OF FRANCISCAN FORMATION
NEAR YERBA BUENA ISLAND

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Map 14