Get Out Your Trowel – Archaeological Resources Management from CEQA through Construction

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Karen Frye, SFPUC, Moderator
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Randall Dean, San Francisco Planning Department
Kim Stern Liddell, San Francisco Public Utilities Commission
Best Practices and Current Approaches to Identify and Manage Archaeological Resources Under CEQA

*More data and fewer myths*

Jack Allen Meyer, MA
Principal Geoarchaeologist
Far Western Research, Davis, California
About me . . .

Nerd Alert!
Pursuant to § 15064.5, the CEQA Checklist for Initial Study (IS) asks:

Will the project cause, or have the potential to:

- Result in substantial adverse change in the significance of an historical resource?
- Result in substantial adverse change in the significance of an archeological resource,
- Disturb human remains, including those interred outside of formal cemeteries?
CEQA “Accidental Discovery” of Cultural Resources

- Lead Agency shall make provisions for “accidental finds” like the immediate evaluation (historical vs. unique) of the archeological resource.
- Work should stop within at least a 100-foot radius of the find, but can continue elsewhere in project area.
- Time and money should be allocated for appropriate mitigation such as avoidance (e.g. redesign) [§15064.5 (f)]
- If there is evidence that an archeological resource may be affected, then mitigation measures that are directed only toward “accidental discoveries” are not appropriate.
Appropriate Level of Effort =
Reasonable and Proportional Actions

Effort typically varies depending on . . .

- **Lead Agency** (standards, opinions, and permit type)
- **Project Area Size and Location** (big, small, good, bad)
- **Project Impacts** (horizontal, vertical, related earth-moving)
- **CEQA Requirements** (appropriate and proportional actions)
- **Research Goals** (site identification, testing, evaluation)

- “Reasonable and Proportional Actions” may range from . . .
  - (1) pre-field desktop study (records search, sensitivity assessment)
  - (2) survey, exploration, or testing in a project area, and/or
  - (3) archaeological data recovery and post-field analysis of a site.
  - (4) public interpretation, outreach (booklet, displays, school modules)
Current Approaches: From Desktop to Data Recovery

Pre-field Desktop Studies (Phase I):
- Archival research – relevant maps, records, reports, photos, “as-builts”
- Archaeological sensitivity assessments – site potential?
- Project constraints and risk analysis – budget, schedule, physical, etc.

Field Identification and Investigations:
- Extended Phase I: Subsurface exploration – auger, core, or backhoe?
- Phase II: Assess the nature, extent, and integrity of a site
- Phase III: Mitigation (data recovery) if cannot avoid or minimize impacts to site

Project Examples:
- Candlestick Point Project
- Central Corridor-Transit Center (SoMA)
- SE Water Control Plant
Beware of All or Nothing Perspectives

**ALL (error of commission)**
- All landscapes changed
- Sites could be buried anywhere
- Subsurface exploration always needed

**Nothing (error of omission)**
- No landscape changes
- Sites are not buried
- Surface survey always adequate

---

Gotta be a buried site here somewhere.

Like fish in a barrel!
Issue of Scale: Needles; Haystacks, and Pitchforks

Looking for buried arch-sites is like trying to find a needle in a haystack!

-- Eternal Skeptic
San Francisco Bay Area – A Big Haystack?
Only about 1/3 has Holocene-age deposits
Subsurface Exploration Methods – “Pitchforks”

Coring
• Can be used urban settings
• Can extend deeper than backhoe
• Can penetrate wet deposits
• No shoring needed
• Limits disturbances

• BUT . .
• Difficult in sandy/gravelly deposits
• Very small sample/discovery window
• More expensive than backhoe (3 times)

Backhoe
• Can be used in most settings
• Can reach 4 to 5 meters deep
• Can be used in most deposits
• Large sample/discovery window
• Lends itself to geomorphic study

• BUT . .
• Difficult in soft/wet deposits
• May require shoring to enter
• Not good in urban settings
Blind tests found **backhoe trenching** is the most effective and efficient method for locating buried sites, and for understanding geologic relationships compared to coring and geophysical methods.
Prehistoric Site Along I-80 in Solano County:
But buried deeper than vertical impacts!

Hale Site,
2729 cal BP on Manzanita Shell (OS-85579)

Stratum

II  Ap  Dark grayish brown silt loam
     A  Dark grayish brown silt loam
     Cu Brown silt loam-clay loam

I   2Ab  Very dark grayish brown silty clay loam-silt loam, with prehistoric archaeological materials (bone, charcoal, fire-cracked rock, flaked stone, and shell)

2729 cal BP
4 meters deep!
Doyle Drive-Presidio Parkway Project

Cores

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Sea more than 100 meters (300 feet) lower during the Last Glacial Maximum

Sea more than 70 meters (230 feet) lower than present when people entered the region

Land Bridge to Farallon Islands

- 56 meters below current sea level (11,500 Years Ago)
- 125 meters below current sea level (22,000 Years Ago)
- 10 meters Bathymetric Contours

Additional Extent of California 22,000 Years Ago
Current California
Caltrans District 3
12,000 Years of Sea-Level Rise in 10 Seconds
San Francisco Bay Sea Level Curve

- **Elevation in Meters (NAVD88)**
- **Age cal BP**

- **Wavy Model**
- **Curve Model**
- **Arch-Site**

- 8 to 4 meters per 1000 years
- 2 meters per 1000 years
- 1 meter per 1000 years

Legend:
- • Wavy Model
- • Curve Model
- ▲ Arch-Site
Figure X (sealevelmap). Timing and Extent of Holocene Sea-Level Rise in the San Francisco Bay Region.
Before Arrival of San Francisco Bay – An Inland Valley
Stratigraphy at Ellis Landing Shellmound (CA-CCO-295)

Submerged Cultural Deposit
“BART” Skeleton (CA-SFR-28): Civic Center Station

Found while excavating BART tunnel below Market Street in 1969

Human skeleton 75 feet (~22.9 meters) below street surface
“BART” Skeleton (CA-SFR-28): Civic Center Station

BART Woman

![Diagram of Civic Center Station with geological layers and structures marked.](image-url)
“BART” Skeleton Discovery October 30th, 1969

Winfield Henn

Michael Mannion
BART worker Joe Pikul holds a 5,000-year-old human bone he found while excavating for the Civic Center Station in 1969.

[Photo: Peter Breining, The Chronicle]
Figure histpics. Cross Section of Major Stratigraphic Units Along Transect from Mission Bay to Yerba Buena Cove. Note approximate position of the BART and Transbay Man (TBM) Skeletons are projected.
Figure proverics, Overview of Deposits Exposed at and near the Transbay Skeleton Site.
Human Skeletons Have Been Found Below Sea Level at Four San Francisco Bay Locations!
Age and Elevation of “Submerged” Human Remains Compared to San Francisco Bay Sea-Level Curve

![Graph showing age and elevation compared to sea level curve with points labeled Potato Slough, Coyote Point, BART Skeleton, and Transbay Man.](image-url)
Archaeological Research Design and Treatment Plan for the Central SoMa Plan Area, San Francisco, California

Planning Department Case No. 2011.1356E

By:
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Figure 1. Central SoMa Plan Area Location.
Figure 7. Distribution of Prehistoric Sites in the General Vicinity of the Plan Area.
Analysis of Artificial Cut and Fill Using Modern and Historical Elevation Data

Figure 7. Distribution of Prehistoric Sites in the General Vicinity of the Plan Area.

Figure 31. Relative Landscape Change within the Central SoMa Plan Area (Mid-1800s to Present).
Analysis of Artificial Cut and Fill Using Modern and Historical Elevation Data

Figure 27. Profiles showing Ground Elevations in 1863 Compared to the Official Street Grades in 1931.

Adapted from Whiting, 1952, Plate 23-24.
Figure 32. Areas with a High to Highest Potential for Buried Prehistoric Sites in the Plan Area.

Figure 33. Extent of Submerged Prehistoric Site Potential Zones in the Plan Area.
Challenge of Coring in the City

Figure 39. Geologic Cross-Section of Plan Area along First Street, Incorporating Data from Geotechnical and Geoarchaeological Investigations.
Intact buried prehistoric deposit (SFR-151) at 11.8 ft below street surface identified in core sample.
Fieldwork used to refine and delimit horizontal and vertical potential for sites
Figure 3. Location of Previously Recorded Archaeological Sites in or near the Project Area. Note this is a 1945 U.S. Coast and Geodetic Survey Map.

Figure 4. Candlestick Point Sub-Phases CP-02 through CP-05 Records Search Area Results.

Additional Prehistoric Archaeological Testing for Subphases CP-02 and CP-04 of the Candlestick Point-Finwells Project
Shipyard Phase II Undeveloped Project
Analysis of Artificial Cut and Fill Using Modern and Historical Elevation Data

Figure 15. Relative Landscape Change within the Project Area (Mid-1800s to Present).

Figure 8. Elevation Transect along Jamestown Avenue.
Figure 11. Surface Sensitivity for Prehistoric Sites in the Project Area.

Figure 12. Extent of Buried Site Potential within the Project Area and Sub-Phases.
Figure 13. Extent of Submerged Archaeological Potential within the Project Area.

Archaeological Sensitivity Assessment and Testing Plan
For Sub-Phases 1-3 through 10-29 of the Emeryville Phase II Development Project, San Francisco, California
CANDLESTICK POINT:
Exploratory coring used as field identification method
Shell Concentration – Natural or Cultural?
CANDLESTICK POINT:
Additional coring used to assess the nature, extent, and context of shell concentration, and obtain larger sample
Hold it!

Something not generally known?
Shell Hash migrating over marsh!!

SE Bair Island – transgressive oyster shell hash beach: perched beach ridge above marsh scarp; beach face below scarp
Shell Concentration is Natural (non-Cultural)

**Determination based on:**

1. Lacks artifacts or features or other cultural items,

2. Deposit size (>17,655 m²) larger than known archaeological sites in Bay,

3. Contains mostly juvenile shells compared to adult shells in size,

4. Similar to natural shell deposits found along some Bay shores.
A Geoarchaeological Study of the Islais Creek Estuary: A Framework for Future Project-Specific Archaeological Investigations at the Southeast Water Pollution Control Plant, San Francisco, California

By:
Philip Kajiankoski, M.A.
Brian F. Byrd, Ph.D.
Jack Meyer, M.A.

September 2016 FINAL
Figure 4. Study Area Overlaid on the 1869 US Coast Survey Map.
Figure 8. Estimated Potential for Off-Shore Prehistoric Archaeological Sites.

Figure 9. Estimated Potential for both Near-Surface and Off-Shore Prehistoric Sites.
Flake from beach deposit
48-52 feet below surface

Submerged shell midden
below Bay Mud
Intact shell midden (SFR-171) buried by artificial fill

**Chronological Data**

- **#.# (OSL)** = Optically Stimulated Luminescence Date
- **Thousands of Years Before Present**
- **#### = Radiocarbon Date**
- **Calibrated Years Before Present, Median Probability**
- **All Dates on Shell, Except for Sample Denoted with an Asterisk that was from a Buried Soil**
- **= Shell Midden within Artificial Fill**
- **Notes: All cores projected onto common plane; Stratigraphic contacts dashed where inferred.**

**Submerged shell midden below Bay Mud**
SFPUC Constructing Public Outreach Watershed Center within Síí Túupentak (ALA-565/H)

Archaeological Fieldwork by Luby in 1990s and Far Western This Year

Ancestral Ohlone Village With Well-preserved Burials and Features

Village Occupied After AD 1520

Occupation May Have Continued After AD 1776, and Establishment of Nearby Spanish Missions
Pre-Construction Controlled Stripping of Watershed Center (1300 sq meters) Focus on Deep Impact Areas and Near Known Burials
Carefully Recover Burials and Features

Planned Controlled Stripping

Burials
Field Approach and Lab Methods

Carrying Out a Series of State-of-the-Art Scientific Studies on Each Individual Burial and Associated Artifacts

1. Burial Practices and Associated Artifact Analysis - Muwekma Ohlone and Far Western

2. Osteological Analysis - Diane DiGiuseppe and Dave Grant

3. Archeometric Analyses - Jelmer Eerkens UC Davis

4. Paleogenomics Analysis - Ripan Malhi, Univ of Illinois
Burial Practices and Associated Artifact Analysis

Careful Field Inventory And Documentation
Lab Analysis Of Associated Artifacts
Artifact Photography
Three-dimensional Scanning For Public Outreach
Osteological Analysis of Human Bone

Physical Characteristics, Health, And Personal Lives Of Individuals
- Age, Sex, And Stature
- Dental Wear And Disease
- Pathologies And Injuries
Archeometric Analyses

Goal - Gain Insight Into the Age Of Weaning And Changes In Diet, Health, And Residence Over an Individual’s Life

Analyses of Bone Collagen and Apatite Samples

C-14 Dating; Stable Isotope Ratios of Nitrogen, Carbon, Strontium, and Sulfur

Pilot Study of Teeth Calculus to Look for Bacteria (ID via their DNA), & Inhalant Chemical Compounds (e.g. Tobacco Nicotine).

Stable Isotopes
Foods Contain Chemical “Tracers”
Some Linked To Type Of Food
Some Linked To Water Source
Some Linked To Underlying Geology
Stable Isotopes – Unique for Each Individual

Can See How One’s Residence and Diet Changed by Sampling Molar Teeth and Bone

Can Then Compare Differences Between Males vs Females, Old vs Young, etc

Strontium – Shifts in Residence During Lifetime

Nitrogen – Diet Changes and Age of Weaning

Image Use Courtesy of Dr. Jelmer Eerkens
Paleogenomic Analysis

Involves DNA Extraction, Then Building a Genomic Library

Generates about 200 Million Sequence Reads - Sorts Them Bioinformatically

Information On Sex, And Assess Ancestry

Trace the Past at an Individual & Community Level

DNA Only Analyzed as a Tool for History

History within Us!
Data Recovery at Moscone Center Site (SFR-114)
Data Recovery at Moscone Center Site (SFR-114)

Intact Shell Midden
15 ft below Howard St
Appropriate Level of Effort?

A Reasoned Approach that applies Proportional Actions in Good Faith
About you . . .

Nerd? We prefer the term INTELLECTUAL BADASS

“LaWhimsy”
Some Thoughts on Archeology in San Francisco

Randall Dean
San Francisco Planning Department
Association of Environmental Professionals
San Francisco May 2017
Some circumstances peculiar to archeology in San Francisco

- An exceptionally complex, multi-layered archeological record
- Growth tends to be accommodated with increasingly tall structures
- These tall structures tend to be constructed in “soft” soils and, thus, require deep foundation systems
- The same areas of “soft” soils tend to be of high archeological sensitivity
- The only form of archeological mitigation available is data recovery
Approaches to archeology peculiar to San Francisco

- Geoarcheology
- Archeological research design and treatment plans
- Current and substantive archeological issues
- Site record searches
- Strong pre-field research
- GIS (Geographical Information Systems) technologies
- Codified archeological districts
Prehistoric Period Archeo GIS Layer
Prehistoric Native American Shellmiddens on Mission Bay archeological district.
Data Types
Hispanic Period GIS Layer
Hispanic Period
Archeo GIS Layer

Some selected archeological features in Zones 2, 3, 4 & 5
Hispanic Period ARCHEO GIS Layer

Source documentation:

- Primary historical documents; historian accounts, archeological record documentation

Hendry & Bowman 1940
Black Survey 1854
R Ambro 2007
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The Settlement of Yerba Buena

based on various sources and superimposed on 1852 map
Chinese Sites Archeo GIS Layer
Tubbs and Company Cordage Works (1856-1962)

Chinese worker lodgings
San Francisco Pioneer Woolen Mill (1858-1893)

Chinese worker
domestic-related structures
### Composite database of 19\textsuperscript{th} century Chinese residents

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<td></td>
<td>Industrial/Retail</td>
<td>Shoe Factory</td>
<td>Hop Sing</td>
<td>1882</td>
<td>Bishop Co. Directory</td>
<td></td>
</tr>
<tr>
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<td>422</td>
<td></td>
<td>Industrial/Retail</td>
<td>Cigar Factory</td>
<td>Colfax Co.</td>
<td>1895</td>
<td>Langley’s Chinese Directory</td>
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</tr>
<tr>
<td>Battery</td>
<td>422</td>
<td></td>
<td>Industrial/Retail</td>
<td>Cigars</td>
<td>Yng Chong</td>
<td>1895</td>
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</tr>
<tr>
<td>Battery</td>
<td>711</td>
<td></td>
<td>Service</td>
<td>Laundry</td>
<td>Wm Hn Co.</td>
<td>1895</td>
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<td></td>
</tr>
<tr>
<td>Battery</td>
<td>1024</td>
<td></td>
<td>Service</td>
<td>Laundry</td>
<td>Ah Sing</td>
<td>1895</td>
<td>Langley’s Chinese Directory</td>
<td></td>
</tr>
<tr>
<td>Battery</td>
<td>1024</td>
<td></td>
<td>Service</td>
<td>Laundry</td>
<td>Ah Sing</td>
<td>1895</td>
<td>Langley’s Chinese Directory</td>
<td></td>
</tr>
<tr>
<td>Battery</td>
<td>near Broadway</td>
<td></td>
<td>Service</td>
<td>Laundry</td>
<td>Ah Lung</td>
<td>1839</td>
<td>Langley’s SF Directory</td>
<td>Addresses subject to the changes made in street numbers.</td>
</tr>
<tr>
<td>Beary</td>
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<td>Service</td>
<td>Laundry</td>
<td>Wing Lee</td>
<td>1882</td>
<td>Wells Fargo Directory</td>
<td></td>
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<tr>
<td>Belden Place</td>
<td>17</td>
<td></td>
<td>Service</td>
<td>Laundry</td>
<td>Lee Joe &amp; Co.</td>
<td>1895</td>
<td>Langley’s Chinese Directory</td>
<td></td>
</tr>
<tr>
<td>Belden Place</td>
<td>19</td>
<td></td>
<td>Industrial</td>
<td>Shoos/Boots</td>
<td>Kwong Wo Hop &amp; Co.</td>
<td>1895</td>
<td>Langley’s Chinese Directory</td>
<td></td>
</tr>
<tr>
<td>Berry</td>
<td>126</td>
<td></td>
<td>Service</td>
<td>Laundry</td>
<td>Wing Lee</td>
<td>1875</td>
<td>Bishop Co. Directory</td>
<td></td>
</tr>
<tr>
<td>Berry</td>
<td>206</td>
<td></td>
<td>Service</td>
<td>Laundry</td>
<td>Lee Charley</td>
<td>1895</td>
<td>Langley’s Chinese Directory</td>
<td></td>
</tr>
<tr>
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<td></td>
<td>Residential</td>
<td>Chinese Boarding</td>
<td>—</td>
<td>1887</td>
<td>Sanborn Map Vol 1</td>
<td>Map 20A. Between First and Second Street.</td>
</tr>
<tr>
<td>Brannan</td>
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<td></td>
<td>Service</td>
<td>Laundry</td>
<td>Lung Tong San</td>
<td>1895</td>
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<td></td>
</tr>
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<td></td>
<td>Service</td>
<td>Laundry</td>
<td>Sun Tong Sang</td>
<td>1875</td>
<td>Bishop Co. Directory</td>
<td></td>
</tr>
<tr>
<td>Brannan</td>
<td>403</td>
<td></td>
<td>Service</td>
<td>Laundry</td>
<td>Lee John</td>
<td>1875</td>
<td>Bishop Co. Directory</td>
<td></td>
</tr>
</tbody>
</table>
Maritime Archeo GIS Layer
Buried Storeship
GIS layer
The *Niantic* and *General Harrison* storeships - ship plan views
Aerial view of projected locations of various 19th century buried ships/storeships
<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>partner</th>
<th>Owner</th>
<th>Captain</th>
<th>Length</th>
<th>Beam</th>
<th>Tonnage</th>
<th>Expiration</th>
<th>Country</th>
<th>State</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Depth</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1864</td>
<td>Suicide</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Golden Gate Shipwrecks
Known Wrecks from 1797-1954
Geodatabase table of 19th wharves (color-coded by date of construction)
Aerial view of the projected location of the prison/asylum ship the *Euphemia*
Drawing of the whaler the *Lydia* indicating the portion archeologically removed in 1979.
Harrison archeological data recovery project (2001)
Why archeology should seem like Greek to us
...in the past, things are rarely what the seem
Angela Locke Barton  Hispanic Period
Archeological District
Chris Bowman  Overseas Chinese
Rumika Chaudhry  Hispanic Period, Overseas Chinese
Alex Makovics  Maritime
Lisa Pesnichak  Prehistoric Period
Allison Vanderslice  Yerba Buena Period
Mike Wynne  GIS Analyst
Debra Dwyer  GIS Supervisor
Cultural Resources Management During Construction

Kimberly Stern Liddell
San Francisco Public Utilities Commission
Environmental Construction Compliance Manager
Process for CatEx Review
Preliminary Archaeological Checklist (PAC)

- Standardized checklist approach
- SFPUC archeologist and/or consultant archaeologist does preliminary review
- SFPUC has formally adopted Standard Construction Measures addressing cultural resources
- Affords SFPUC greater management of project schedule
- SF Planning as CEQA Lead Agency has final discretion
San Francisco Public Utilities Commission
Preliminary Archeological Checklist (PAC)

A. PROJECT INFORMATION:

Date: 3/20/2017  
SFPUC Archeological Reviewer: Sally Morgan

Project name: TLOM Modesto Tow Gecotenical investigation  
Case No. 

Application type:  
□ EE  
□ CatEx  
□ In City  
□ Outside of City

Project address: 

EP planner: Tim Johnson  
EP Archeological Reviewer designer: Adrian Franzecke

APN/Cross streets: 5 SP PL ROW, Modesto and Riverbank OR City/County: Stanislaus

1. PROJECT DESCRIPTION: (include description of construction methods, all potentially ground-disturbing activities including parking, staging, equipment and spoil storage, temporary and permanent work areas, utility lines)

SFPUC proposes to conduct geotechnical drilling near 10 existing electrical transmission towers within SFPUC's San Joaquin pipeline transmission line right of way in the vicinity the towns of Modesto and Riverbank. At each site, a geotechnical drill rig would drill a hole approximately 6 inches in diameter and up to approximately 25 feet deep to obtain soil samples. Investigation sites would be located within 100 feet of each of 10 existing transmission towers within the right of way, with the specific location to be determined by on-site SFPUC personnel. Each investigation site would require use of an approximately foot by 100 foot staging area within the existing transmission line ROW corridor to accommodate mobilization of the drill rig and support equipment. This use would not entail ground disturbance. The area of potential ground disturbance disturbance would be confined to a 10 foot by 10 foot area surrounding the 6-inch-diameter hole at each drill site. Once drilling is completed and required samples have been obtained, drill holes would be backfilled and the ground surface returned to its pre-investigation condition.

SFPUC Preliminary Archeological Checklist

1. POTENTIAL GROUND DISTURBANCE

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Project Component</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Excavation (basement, elevator, utilities, seismic retrofit, remediation, underground vaults, septic tank system, culverts, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum depth:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pipeline replacement or installation (specify cut and cover, directional drilling, pipe bursting, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tunnels, transport storage boxes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bore pits, test pits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shallow Building Foundation (Mat, Spread Footings, etc.) Depth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Piles, pier, micropiles, pilings, piling replacement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Grading, scraping</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Demolition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Construction staging, spoils on unpaved area, fill</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Road construction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Geotechnical trenching (dimensions):</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New rip rap</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Well or seawall modification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other (specify):</td>
</tr>
</tbody>
</table>

Anticipated maximum extent of project ground disturbance:

Vertical: 25 ft  
Horizontal 10x10 area (approx) plus 5° core to depth at each location

APE Map Attached:  
□ Yes  
□ No  
□ N

1. PREVIOUS SOILS DISTURBANCE AT PROJECT SITE:

Has the project site been previously disturbed by any of the following?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Component of disturbance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Existing Foundation (footings, pier, pile, micropiles, etc.) Depth:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Site remediation/LST installation or removal, other excavation Depth:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Site Grading</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Demolition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dredging</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Piling installation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Riprap</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seawall construction</td>
</tr>
</tbody>
</table>
|     |    | Other (specify): pipeline installation/TL corridor maintenance (e.g. clearing), ongoing

4. Has the entire project area previously been disturbed to the maximum depth of proposed project disturbance?

<table>
<thead>
<tr>
<th>Yes</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
</tbody>
</table>

(Attach documentary evidence, including plans and profiles of prior trenching, utility street occupancy, historic photos, specifications from prior projects, etc.)

List attachments:

SFPUC 1/20/2015: Subject to revision
SFPUC Preliminary Archeological Checklist

B. ARCHIVAL AND ARCHEOLOGICAL DATA ASSESSMENT

1. ARCHIVAL AND DATA REVIEW

Date of survey: 1/29/99

Resources reviewed:
- Maps of the project area (city map, county map, state map)
- Local government records (city, county, state)
- Historical records (archival, newspaper, civil records)
- Archaeological survey reports
- Environmental impact statements

Findings:
- No previously documented resources present
- Archeological research suggests resources are or may be present within the project area

If positive results, attach documentation and memo summarizing results.

2. ARCHEOLOGICAL FIELD INVENTORY

Results:
- Not warranted, no exposed ground surface in project area
- Results negative
- Results positive
- Results inconclusive

Archaeologist: John L. Marsh, Deputy Director, URS
Date of Survey: 3/1/99

Attach Archeological Survey Report to memo, which may contain results of archival review.

3. SUMMARY OF RESULTS

Site History/Formation:
In 2008, URS conducted a records search, Native American outreach, and complete intensive archaeological surveys with negative results. The only archeological resources identified along the corridor between Oakland Portal and the Temescal are two prehistoric sites and a historic site, all near Oakland Portal. These results are typical of many areas in the San Joaquin Valley, where the site area is near a creek or other water source. All are within the right of way corridor, which is maintained relatively free of vegetation and which has been disturbed repeatedly by pipeline and transmission line construction and by ongoing maintenance. If a surface site were present, it would be expected that the project would have exposed it. The archaeological sensitivity of the corridor in general appears to be low. Although the records search is more than 10 years old, it is unlikely that any additional investigations have been conducted by other parties, or additional resources recorded, since the corridor facilities are managed and maintained by SFPUC. The geotechnical investigation would entail small areas of surface ground disturbance and a 9-inch diameter disturbance at depth, at 10 widely distributed locations. On this basis, the potential for significant impacts to result from the limited ground disturbance also would be low.

SFPUC Preliminary Archeological Checklist

Recorded/documented archeological sites/ investigations in the vicinity of the project site: none recorded in vicinity of any work locations.

C. CONCLUSIONS AND RECOMMENDATIONS

1. NO EFFECTS TO ARCHEOLOGICAL RESOURCES EXPECTED:
- Project effects limited to previously-disturbed soils
- Project effects limited to culturally sterile soils
- Based on assessment under B above, no potentially CEQA-significant archeological resources are expected within project-affected soils.

2. AVOIDANCE AND TREATMENT MEASURES NECESSARY TO AVOID SIGNIFICANT IMPACTS TO CRM-ELIGIBLE ARCHEOLOGICAL RESOURCES:
- No potential to adversely affect archeological resources may be avoided by implementation of SFPUC Standard Archeological Measure I (Identification during Construction), with implementation of Standard Archeological Measures II (Monitoring) and III (Testing/Data Recovery) in the event of a discovery during construction.

The potential of the project to adversely affect archeological resources may be avoided by implementation of the SFPUC Standard Archeological Measure II (Archaeological Monitoring) during construction.

The potential of the project to adversely affect archeological resources may be avoided by implementation of the SFPUC Standard Archeological Measure III (Archaeological Testing) prior to or during construction.

CEQA evaluation of the project requires preparation and implementation of an archeological research design and treatment plan (ARDTP) by a qualified archeological consultant. See attached scope of work for the ARDT.

D. EP ARCHEOLOGIST/ERD ARCHEOLOGICAL DESIGNEE REVIEW

☐ I concur with the conclusions and recommendations provided in Section C, above.

Additional/alternative measures recommended (detail):
- The archeological inventory and records search on which this document is based are more than a decade old. However, considering the level of impact from Geoprobe testing, I believe that Standard Measure 1 is appropriate in this case.

☐ Meeting requested.
Invest Upfront

- Reduces risk to construction schedule and cost
- May reduce monitoring during construction
- Allow time for data recovery if needed
- May be worth doing under a separate contract agreement from prime construction contract
Case Study: BDPL 3/4 Seismic Reliability Upgrade at Hayward Fault Project

Figure 2: Project Location (USGS Niles, Calif. 1980 and Milpitas, Calif. 1980)
Case Study: BDPL 3/4 Seismic Reliability Upgrade at Hayward Fault Project
Case Study: BDPL 3/4 Seismic Upgrade at Hayward Fault Project

<table>
<thead>
<tr>
<th>Planned</th>
<th>Implemented</th>
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<tbody>
<tr>
<td>5 bores</td>
<td>37 bores</td>
</tr>
<tr>
<td>4 backhoe test units (15’L x 10’W x 15’D)</td>
<td>2 backhoe test units (15’L x 4.5’W x 18’D) and relocated</td>
</tr>
<tr>
<td>15 shovel test units (1’L x 1’W x 2’D)</td>
<td>0 shovel test units</td>
</tr>
</tbody>
</table>
Case Study: BDPL 3/4 Seismic Reliability Upgrade at Hayward Fault Project
Case Study: BDPL 3/4 Seismic Reliability Upgrade at Hayward Fault Project

- Bore program strongly suggested project area in depositional environments of flood plain, channel and/or near channel deposits not conducive for human occupation

- Occupational core east of project on an elevated shallow knoll between east bank of Agua Caliente Creek and west bank of Agua Fria Creek

- Would have provided excellent view of surrounding area within a foothill/riparian ecotone with immediate access to water
Case Study: BD3/4 Seismic Reliability Upgrade at Hayward Fault Project

Benefits to the Project

- Enhanced boring program allowed greater area of evaluation and site understanding
- Series approach allowed fine tuning methods
- Greatly reduced concern going into the project
- Reduced monitoring
Case Study: Sunol Yard Long Term Improvements Project

- Controlled stripping
Get Creative during Construction

Case Study: Bay Division Seismic Reliability Upgrade Project
Case Study: Bay Division Seismic Reliability Upgrade Project

Native American remains 1 site

No significant resources other 5 sites
Get Creative during Construction

Pre-trenching

- Small crew ahead of mainline crew
- Small backhoe with modified flat blade
- 4 to 6” lifts
- Archaeological and Native American Monitors
- Soft backfill of pipe trench
Case Study: Bay Division Seismic Reliability Upgrade Project
Case Study: Bay Division Seismic Reliability Upgrade Project

- 4 adults, ~ 25 to 45 years
- Charred material - AD 660 to 810 (~ 1,200 to 1,340 years ago)
Case Study: Bay Division Seismic Reliability Upgrade Project

Benefits to the Project

- Reduced cost of having to stop or relocate entire mainline crew
- Provided ample time to work with the Most Likely Descendant (MLD) to appropriately treat the resource
Fine Tuning Monitoring

- Perform a sensitivity analysis
- Proximity to previously recorded sites
- Historic water resources
- Geoarchaeological setting
Address Cultural Resources in Contract Documents in Project-Specific Manner

Build time into contract documents upfront

- All parties clear on requirements
- Contractor able to incorporate into schedule
- Reduces schedule delays and change order costs

Consider “pre-purchasing” days for work stoppage or relocation to address discoveries

- Projects with high likelihood of discoveries
Case Study: Sunol Yard Long Term Improvements Project

- Mexican Period Sunol Adobe or Hadswell homestead (1840’s to 1860’s)
Case Study: Sunol Yard Long Term Improvements Project

K. Archeological Investigation – Demolition of the existing administration building and cottage shall be completed within the first three months after NTP has been issued for Construction. Contractor shall provide submittals for the demolition of these two buildings immediately upon receiving NTP as detailed in General Requirements 00 72 00. After demolishing this particular facility, as described in Section 01 35 43, Contractor’s schedule shall allow up to four weeks before beginning construction of the new Sunol Administration Building (during which time City will complete archeological work should it become necessary). Contractor shall allow archeological team access to the site during this time period to complete their investigation. Archeological pits, if necessary, will be soft backfilled without compaction. Contractor shall ensure that after the new building excavation has taken place that all areas beneath the new building meet compaction requirements prior to installing the new foundation system. Contractor shall also dispose of any excess soil remaining from the archeological excavation. See environmental specifications for additional details on steps to take if a discovery is made during construction.
Addressing Cultural Resources in Contract Documents

Only include what Contractor needs to know from mitigation measures in specifications

- Notification of work approaching cultural resources area
- Identification of where monitoring is required
- Unanticipated discoveries procedures
- Contacts
Managing Discoveries

- Meet in field with MLD and agencies immediately
- Allow archaeologist to discuss findings with MLD and agencies directly
- Don’t be presumptive about the process, treat each discovery situation as a unique situation
Interpretive Programs

- Panels
- Websites
- Educational materials
- Close involvement of the MLD, commissioned for contribution
Ohlone Families

Today you enjoy visiting this natural area. But did you know that for thousands of years Ohlone Indian children and their families lived and played here too?

Ohlone cared deeply about their families and had strong community ties. Ohlone life meant working together and helping one another. Boys and girls learned all the skills they would need in life from their parents and other adults in their village. But life was not all about work. Ohlone families also had time for singing and dancing, laughing, and playing. They had favorite games such as stick dice, hand game, hoop and pole, and juggling. They also competed in marathon-like races and team sports. Shinny is an Ohlone game that is similar to field hockey today. Just as you might go to football and baseball games today, families traveled to distant villages to watch exciting shinny tournaments.

Hummingbird Gets Fire

Storytelling was an important way of learning in one Ohlone story. Hummingbird brings fire to the people after the world floods so they can cook and keep warm again. That’s how Hummingbird got his red breast! Remember that the next time you see Hummingbird.

Living with Nature

Ohlone families were experts at living with nature. In Ohlone culture, boys learned from the men how to hunt and fish. Girls learned from the women how to harvest nutritious roots, seeds, nuts, and greens for a healthy diet and for medicines. Houses, boats, baskets, rope, and tools of all kinds were made from materials found in the natural world. Ohlone people traveled by foot and also in boats made of bundled tule reeds. In these boats, they would stream like we use highways today. They traveled down to the San Francisco Bay for hunting and food gathering, to visit friends and relatives in neighboring villages, and to attend seasonal festivals where they enjoyed dancing, singing, and feasting.

Ohlone People Today

Many Ohlone families still live in the San Francisco Bay Area today. They live modern lives and also honor and keep the memory of their ancestors alive by practicing their cultural traditions and working to protect the ancient cultural sites and sacred places they left behind.
Archeological Site on the Peninsula

Project Overview
What happens when we find important archaeological sites and artifacts while installing a new pipeline? What can these discoveries teach us about Native Americans who lived in California 10,000 or more years ago?

Archaeology
Environment
Games
Language
Ohlone History in San Mateo Area
Traditional Lifeways