Attachment E

U. S. DEPT. OF AGRICULTURE
BUREAU OF SOILS
MILTON WHITNEY, CHIEF

SOIL MAP

TEXAS
BROWNSVILLE SHEET

SOIL PROFILE
(3 feet deep)

Cameron clay
C
C

Laredo silty clay loam
Hsil
Sicl

Laredo silt loam
Sil
Sil

Laredo clay
C
C

Laredo silty clay
Sic
Sic
Sil

Lomalta clay
Sic
Sic

Point Isabel clay
C
C

Rio Grande silty clay
Sic
Fsl

LEGEND

C Clay
Hsil Heavy silty loam
Sicl Silty clay loam
Sil Silt loam
Sic Silty clay
Fsl Fine sandy loam

LEGEND

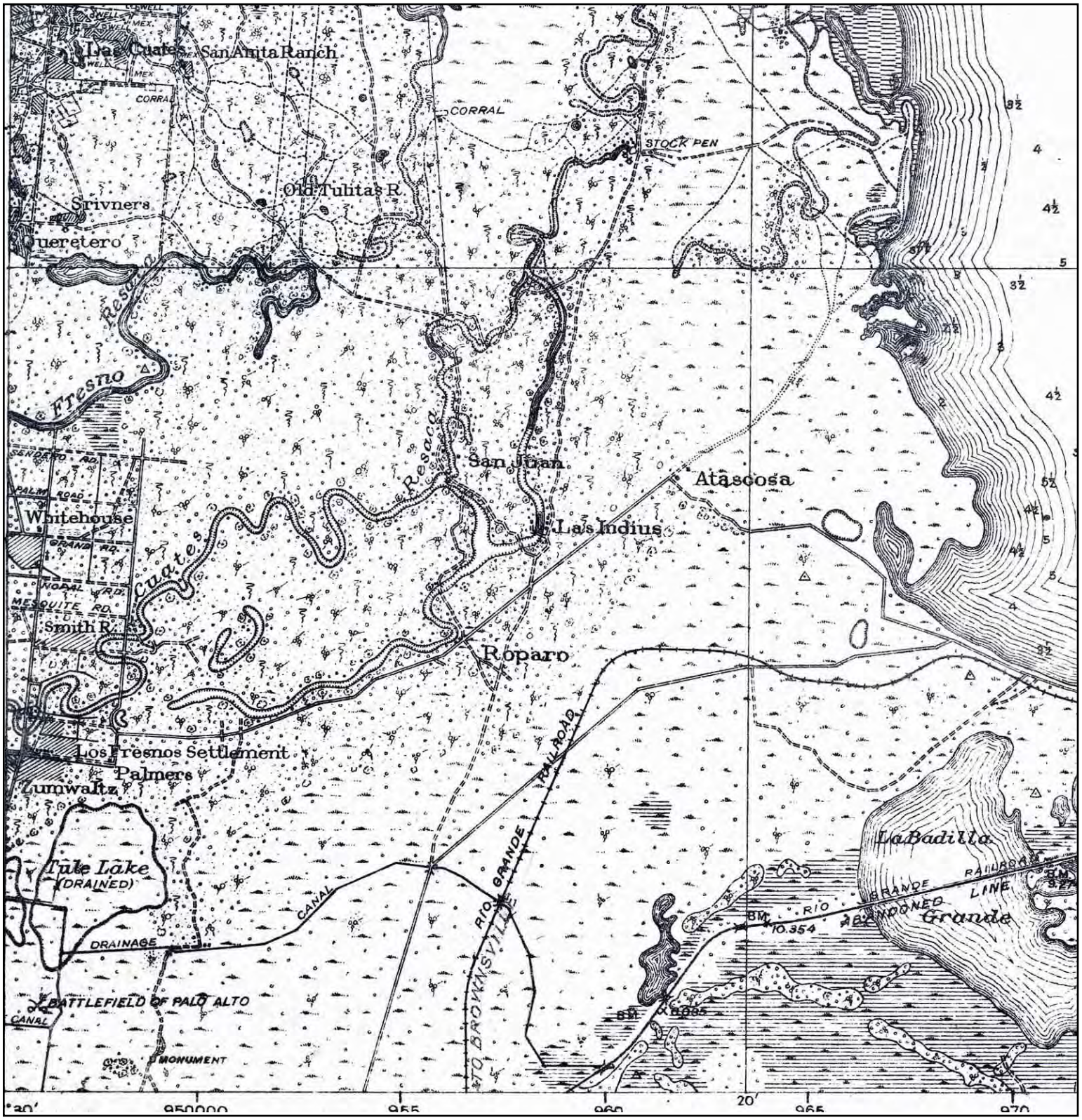
C Cameron clay
Li Laredo silty clay loam
La Laredo silt loam
Lc Laredo clay
Lsic Laredo silty clay
L Lomalta clay
Pc Point Isabel clay
Rg Rio Grande silty clay
Swampy areas

Soils surveyed by
A.W. Mangum and Ora Lee Jr.
1907

Scale 1 inch = 1 mile

Field Operations
Bureau of Soils
1907

Historical Topographic Map



N	TARGET QUAD NAME: POINT ISABEL MAP YEAR: 1922 SERIES: 30 SCALE: 1:125000	SITE NAME: Tenaska - Brownsville ADDRESS: Cameron County Brownsville, TX 78526 LAT/LONG: 26.027 / -97.501	CLIENT: ERM - Southwest, Inc. CONTACT: Amanda Ragatz INQUIRY#: 3490366.1 RESEARCH DATE: 01/09/2013

Attachment F

(Brownsville)

Scale 1/62500

Miles

Yards

Kilometers

Contour interval 5 feet

Datum is mean sea level

FIVE THOUSAND YARD GRID COMPUTED FROM "GRID SYSTEM FOR PROGRESSIVE MAPS IN THE U.S." ZONE D. U.S.C.& G.S. SPECIAL PUBLICATION NO 59

(THE LAST THREE DIGITS OF THE GRID NUMBERS ARE OMITTED)

NOTE; USERS OF THIS MAP ARE REQUESTED TO MARK HEREON CORRECTIONS AND ADDITIONS WHICH COME TO THEIR ATTENTION AND MAIL DIRECT TO "ENGINEER EIGHTH CORPS AREA, FT SAM HOUSTON TEX."

NOTE. Southern Pacific Railroad and extensions of Missouri Pacific Railroad added from survey made in 1928.

Polyconic Projection North American Datum

APPROXIMATE MEAN DECLINATION 1928
ANNUAL MAGNETIC INCREASE 2'

HARLINGEN, TEXAS.

EIGHTH CORPS AREA ENGINEER REPRODUCTION PLANT
1928.

2697-210

CAMERON COUNTY, TEXAS
COUNTY COMMISSIONERS
O. C. LANCY, COUNTY JUDGE
G. J. WEIKEL, S. H. BELL, J. S. BROWN, AND J. F. BAUGHN
W. O. WASHINGTON, COUNTY ENGINEER

DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

TEXAS
(CAMERON COUNTY)
BARREDA QUADRANGLE

HARLINGEN 7 MI.
SAN BENITO 1 MI.
RIO HONDO 10 MI.
RIO HONDO 9 MI. (Rio Hondo)
LOZANO 6 MI.
RIO HONDO EAST ROAD 7 MI.
LA PALOMA 4 MI.
SAM HOUSTON BOULEVARD 2 MI.
SAN JOSE RANCH ROAD 5 MI.
LOS FRESNO 1 MI. → PORT ISABEL 20 MI.
VILLA NUEVA 5 MI. ↓ BROWNSVILLE 10 MI.
STATE HY. NO 4 3 MI. (West Brownsville)
BROWNSVILLE 7 MI. (East Brownsville)

Coates Lake
Crigler
Kretston
Barreda
Soldado Ranch
Naranjas Ranch
Carazos Siding
Olmito
Naranja Vista
Olmito 28 B Tanks
AIRWAYS BEACON
BARREDA STATE PARK
RESACA DE LOS CUATES
RESACA DEL RANCHO VIEJO
RESACA DE LAS FLORES
Resaca de la Junta
Resaca del Palma
U. S. ROAD
LINE M
IOWA GARDENS ROAD
PACIFIC
MISSOURI
HIGHWAY
STATE HIGHWAY
NO 96
NO 48
NO 100
NO 6
PENN. AVE.
TRACT ROAD
RICE ROAD
NORTH ROAD
SECOND LIFT PUMPING
OLMITO MAIN
OLMITO ALICE
OLD MILITARY ROAD
SAN CARLOS BOULEVARD
DISTRICT ROAD
NORTH CANAL
CENTER GARDENS
BARREDA ROAD
MORIEGA ROAD
(La Paloma)
(Los Fresnos)

Topography by R. W. Burchard, W. B. Upton, Jr.,
W. R. Chenoweth and H. S. Milsted
Culture and drainage in part compiled from aerial photographs
Control by U. S. Geological Survey, U. S. Coast and Geodetic Survey
and International Boundary Commission
Surveyed in 1930

Scale 1/31680
1 Mile
5000 2500 0 5000 Feet
1 Kilometer
Contour interval 1 foot
Datum is mean sea level

APPROXIMATE MEAN DECLINATION, 1930

Polyconic projection. North American datum
5000 yard grid based upon U. S. zone system, D
Irrigation canals are not contoured
HARD IMPERVIOUSLY SURFACED ROADS
OTHER MAIN TRAVELED ROADS
INFORMATION FURNISHED BY CAMERON COUNTY, 1933

BARREDA, TEX.
Edition of 1936


CGI-2G-184

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LOS FRESNOS QUADRANGLE

TEXAS–CAMERON CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SW/4 LOS FRESNOS 15' QUADRANGLE

6536 III NE (RIO HONDO)
6536 III NW (LAGUNA ATASCOSA)
6536 III NE (LA COMA)
6436 II SE (OLMITO)
6535 IV NW (EAST BROWNSVILLE)
6535 IV NE (WEST BROWNSVILLE)
6535 III SE (LAGUNA VISTA)
6535 IV SW (PALMITO HILL)

97°30' 26°07'30" 97°22'30" 26°00'

Laureles · Charco Hondo · Los Cuates · La Penusca · Los Fresnos Sch · Los Fresnos · Agua Negra · Wardner Ranch · Resaca de los Cuates Ranch · Bayview · Gray Farms · Filtration Plant · Sewage Disposal · Landing Field · Historical Monument (Battle of Palo Alto) · Resaca de los Cuates · Resaca de las Antonias · LAKE BED · TULE · PALO ALTO BATTLEFIELD

BINGLEY ROAD · KRETZ ROAD · STANFORD ROAD · HENDERSON ROAD · WHIPPLE ROAD · POINT ISABEL OLD ROAD · OLD ALICE ROAD · PARKER LINE ROAD · SAN ROMAN BOULEVARD · OLD RAILROAD GRADE · SOUTHERN PACIFIC RAILROAD · PARDES LINE ROAD · OLMITO BRANCH · MAIN DITCH NO 2 · DITCH NO 3 · SPOIL BANK · LEVEE · PIPELINE · AQUEDUCT · ELEVATED DITCH

1.3 MI. TO TEX. 803 · 0.4 MI. TO TEX. 510 · 0.3 MI. TO TEX. 510 · 0.2 MI. TO TEX. 510 · 5 MI. TO U.S. 77 AND 83 · 6 MI. TO U.S. 77 AND 83 · 2 MI. · LAGUNA VISTA 6 MI. PORT ISABEL 11 MI. · 5.5 MI. TO TEX. 48 · BROWNSVILLE (P.O.) 7.3 MI. · 4.7 MI. TO TEX. 48 · BROWNSVILLE (P.O.) 9.2 MI.

2 360 000 FEET · 130 000 FEET · 160 000 FEET · 2890000m N. · 2877000m N. · 652000m E.

Mapped, edited, and published by the Geological Survey

Control by USGS and NOS/NOAA

Culture and drainage in part compiled from aerial photographs taken 1953. Topography by planetable surveys 1930
Revised 1955

Polyconic projection. **1927 North American Datum**
10,000-foot grid based on Texas coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 14, shown in blue

Water stages in this area vary with meteorological conditions
Approximate limits of occasional inundation are shown by dashed blue lines where mean high water is undetermined for lack of visual evidence
Dotted blue lines indicate the approximate limits of low water

To place on the predicted North American Datum 1983 move the projection lines 34 meters south and 26 meters east as shown by dashed corner ticks

MN
GN
0°41'
12 MILS
7°
124 MILS

UTM GRID AND 1983 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

Revisions shown in purple and woodland compiled from aerial photographs taken 1980 and other source data
This information not field checked. Map edited 1983

SCALE 1:24 000

1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

TEXAS
QUADRANGLE LOCATION

2697–122

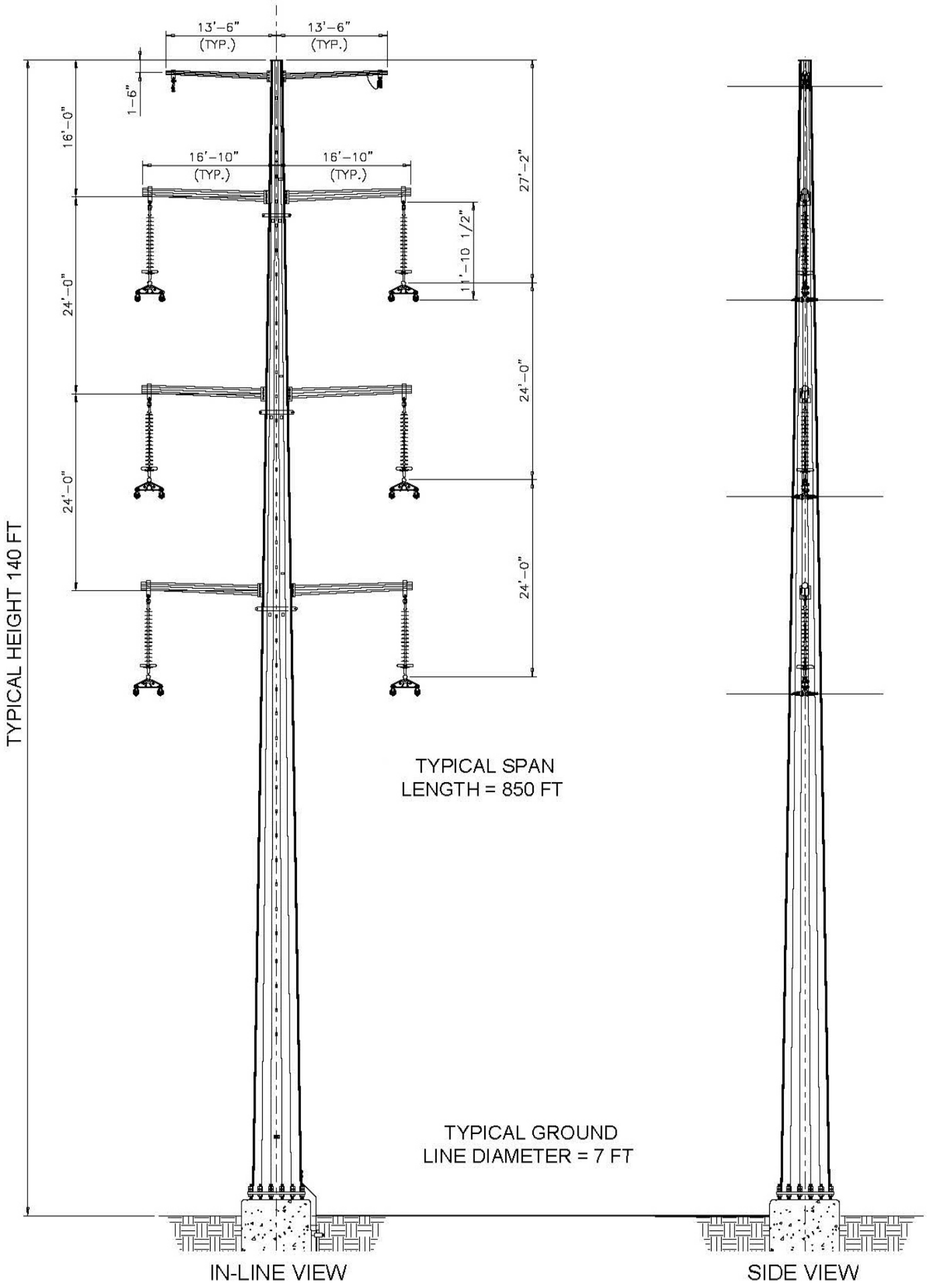
ROAD CLASSIFICATION
Heavy-duty · Light-duty
Medium-duty · Unimproved dirt
State Route

LOS FRESNOS, TEX.
SW/4 LOS FRESNOS 15' QUADRANGLE
N2600—W9722.5/7.5

1955
PHOTOREVISED 1983
DMA ~~6536 III SW~~ SERIES V882

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1984

Attachment G


13'-6" (TYP.)
13'-6" (TYP.)
1-6"
16'-0"
16'-10" (TYP.)
16'-10" (TYP.)
27'-2"
11'-10 1/2"
24'-0"
24'-0"
24'-0"
24'-0"
TYPICAL HEIGHT 140 FT
TYPICAL SPAN LENGTH = 850 FT
TYPICAL GROUND LINE DIAMETER = 7 FT
IN-LINE VIEW
SIDE VIEW

Single-Pole

Attachment H

Memorandum

Date: April 28, 2014

To: John Uphoff, Tenaska

From: Chris Howell, Burns & McDonnell

Re: Response to NPS Inquiry regarding Noise

Below is a response to the NPS inquiry regarding noise impacts of the proposed Brownsville Generating Station. Each NPS comment regarding noise is restated and then a response is presented.

Palo Alto Battlefield NHL

Audible/Noise Effects

Section 6.2.3, pp. 70-71 Ambient Baseline Applicability

The NPS appreciates the effort to estimate audible effects using an ambient sound level measurement as a baseline for determination of effects in the area. We expressed concern on 3/04/14 and 3/07/14 via e-mails and meetings about the use of site MP3 as a surrogate for ambient sound levels at Palo Alto Battlefield NHP and NHL. Our concern is that due to proximity of site MP3 to Highway 550 and an asphalt plant, the recorded ambient sound levels may be higher than in the NHP and NHL, and therefore, generating station noise effects to more distant locations in the NHP and NHL will be underestimated using data from site MP3.

Response: We have updated the impacts previously presented as Table 6.5 to incorporate analysis using MP3 and MP4, and also adjustments to the ambient sound levels as detailed below. Due to the amount of data now being presented, the revised Table 6.5 is attached as Table 6-5a.

Section 6.2.3, pp. 70-72 Audibility Greater than Ambient Increase Noticeability

We appreciate the effort to estimate audible effects to the historic property. We shared our concerns in 3/04/14 and 3/07/14 e-mails and meetings about logarithmic addition of sound levels as an estimate audibility or noticeability of noise. Because the generating station is a new noise source with different broadband and/or tonal characteristics than the ambient sound level, we do not believe that ambient sound level increases will provide a conservative estimate. We anticipate that audibility and noticeability of the generating station will be greater than the "just noticeable" and "clearly noticeable" criteria traditionally utilized for increases in the same sound source.

Response: While rules-of-thumb for broadband noise were stated in the submission, no determination of audibility was performed. However, the current acoustical environment in the area contains sounds from various broadband-type sources – there are two highways, an asphalt plant, a water treatment facility outfall to the ditch next to proposed facility, etc. All of these sources are broadband-type sources similar to what would

emanate from a power plant. Therefore, noise from the power plant, assuming the magnitude did not significantly increase existing levels, should not be considered intrusive.

Section 6.2.3, Table 6-5, p. 71 Representative Locations for Historic Property Effects
The NPS suggests that the receiver locations in Table 6-5 and Figures 6-6 and 6-7 (pp. 73 and 74) be updated to better represent sensitive cultural soundscape locations (for the historic property).

These locations include:
- Living History Area / Picnic Area (adjacent to each other)
- Battlefield Overlook
- End of Mexican Line Trail (optional—can be omitted)
- End of the U.S. Line Trail
- Historic Road (in NE corner of park)

Receiver names, UTM coordinates, and a map were provided in a 3/17/14 e-mail. We recommend that the projected generating station noise level be compared to the estimated ambient sound level at these locations (using adjusted data from MP3 and/or MP4—see below).

Response: The locations of these receivers have been incorporated into the revised and attached Figure 6-6 and Figure 6-7. Additionally, the attached Table 6-5a incorporates MP4. The ambient sound levels presented for MP4, where appropriate, have been adjusted per the face-to-face discussions on 3/12/14. Those adjustments involved generally reducing sound by 3 decibels per doubling of distance. This was accomplished using the equation $Lp_2 = Lp_1 - 10 \log (D_2/D_1)$; where Lp1 is a known sound level at distance 1 (D_1) from a listener, and Lp2 is an unknown sound level at known distance 2 (D_2) from a listener.

Sec. 6.2.3, Tables 6-4 and 6-5, pp. 70-71 Adjustment of Ambient for the NHP and NHL
Especially given our concerns for ambient applicability and potential underestimation of audible effects, we appreciate our 3/12/14 face-to-face meeting with Tenaska and the exchange of information on how to reduce effects to the historic property. The NPS understands that the acoustic consultant noted the presence of asphalt plant noise at MP3 during midday hours but an absence during other hours. After discussion of the data and contributing noise sources, the NPS suggests that Tenaska's acoustic consultant attempt to filter or adjust ambient sound levels at site MP3 and/or MP4 to eliminate the asphalt plant noise and account for greater distances (and expected lower noise levels) from Highway 550. This approach will help to better justify use of MP3 and/or MP4 as a surrogate for ambient sound levels at more distant locations in the NHP

and NHL, which were not measured directly.

Response: Burns & McDonnell noise specialists attempted to filter and/or manipulate the data measured for MP3 and MP4 such that they may be used as a surrogate for the five locations identified within the NHP and NHL. Per NPS suggestion, the L_{50} statistical metric was considered so as to remove the influence of transient sound sources. Next, the distance to the nearest roadway (Highway 500) was considered when appropriate, as described below the table. Below is a table of distances to each location, including MP3 and MP4 for reference. The last column included in the table states which measurement point from the original study was used as a surrogate for actual data at that location. A surrogate point denoted as "MP# adjusted" indicates that the measured sound level at the measurement point indicated (i.e., MP4) was adjusted and used for the identified location. The adjustment was made to account for the identified location being located farther from Highway 550 than the identified measurement point.

Distance to NHP/NHL Location from Nearest Roadway

Identified Location	Distance to Nearest Roadway (meters)	Surrogate MP
MP3	690	-
MP4	830	-
Living History Area / Picnic Area	450	MP3
Battlefield Overlook	1050	MP4
End of Mexican Line Trail	990	MP4
End of the U.S. Line Trail	1400	MP4 adjusted
Historic Road	4090	MP4 adjusted

The Living History Area/Picnic Area is actually closer to the highway than any of the measurement points, but to be conservative, the same L_{50} value as MP3 was used. The Battlefield Overlook and the End of Mexican Line Trail are both slightly farther away from the highway than MP4, but not significantly so. Therefore, the MP4 L_{50} values were used for both locations without adjustment. For the End of U.S. Line Trail and the Historic Road, an adjustment was made to the MP4 L_{50} values to account for the greater distances from Highway 500 than MP4. That adjustment entailed subtracting 3 decibels for every doubling of distance from the highway (standard rule of thumb for sound attenuation from a line source – the highway). The results are detailed below and in the attached figures and table.

Section 6.2.3, Tables 6-4 and 6-5, pp. 70-72 Need for Mitigation

The predicted noise level increases in Table 6-5 are anticipated to increase further with the lower ambient sound levels expected in the NHP and NHL. In addition, the NPS anticipates that audibility and noticeability of the generating station will be greater than predicted using the "just

noticeable" and "clearly noticeable" criteria for Table 6-5 noise level increases. Given that audible effects to the historic property would very likely be greater than predicted, the NPS urges Tenaska to consider all reasonable techniques for mitigation of noise to the NHP and NHL. The NPS gathered from our 3/12/14 face-to-face meeting with Tenaska that the noise specifications of generating station equipment have already been established and the creation earth berms is one of the only practical options for noise mitigation. The NPS requests that Tenaska create a new figure in addition to Figure 6-7 that shows predicted generating station noise contours with the addition of an earth berm on the east side of the generating station. We also request that Tenaska and its noise consultant carefully consider minimum earth berm height and the height of high sound pressure level (SPL) noise sources such as blowers, turbine inlets/exhausts, compressors, and steam blows from pressure release valves. Wherever possible, the height of high SPL noise sources should be kept or moved below the height of the earth berm. The earth berm may also be used to minimize the visual effects of light and moving steam on the landscape.

Response: Presented in the revised Table 6-5a are the surrogate L_{50} data, modeling results, cumulative sound levels (i.e., logarithmic addition of surrogate L_{50} and modeling results), and the expected increases over the surrogate L_{50} sound levels. Results are presented for the base facility operation and then an alternate scenario where a 15-foot tall berm is constructed.

To graphically demonstrate the effect the berm would have towards reducing sound levels in the NHP and NHL, Figures 6-7a and Figure 6-7b have been created and are attached. Figure 6-7a represents the base, no-berm scenario while Figure 6-7b represents the 15 foot berm scenario. As can be seen in the attached table and figures, a 15-foot tall berm has a minimal effect on reducing sound level impacts in the NHP and NHL (i.e., there is predicted to be less than a 3-dB decrease due to the berm).

CJH

Attachments

Attachments

Table 6-5a Surrogate NHP and NHL L50 Sound Levels and Expected Brownsville Generating Station Impacts

L50 Sound Levels

Time Period	MP	L50 (dBA)	Adj. to 1400 (dBA)	Adj. to 4090 (dBA)
12-2 PM	MP3	41.4		
6-8 PM	MP3	43.7		
12-2 AM	MP3	36.4		
6-8 AM	MP3	38.3		
12-2 PM	MP4	41.0	38.7	34.1
6-8 PM	MP4	40.1	37.8	33.2
12-2 AM	MP4	43.2	40.9	36.3
6-8 AM	MP4	33.0	30.7	26.1

Surrogate Point Designation

MP	Distance to HWY (m)	Surrogate MP
MP3	690	
MP4	830	
Living History Area	450	MP3
U.S. Line Trail	1050	MP4
Battlefield Overlook	990	MP4
Mexican Line Trail	1400	MP4 adjusted
Historic Road	4090	MP4 adjusted

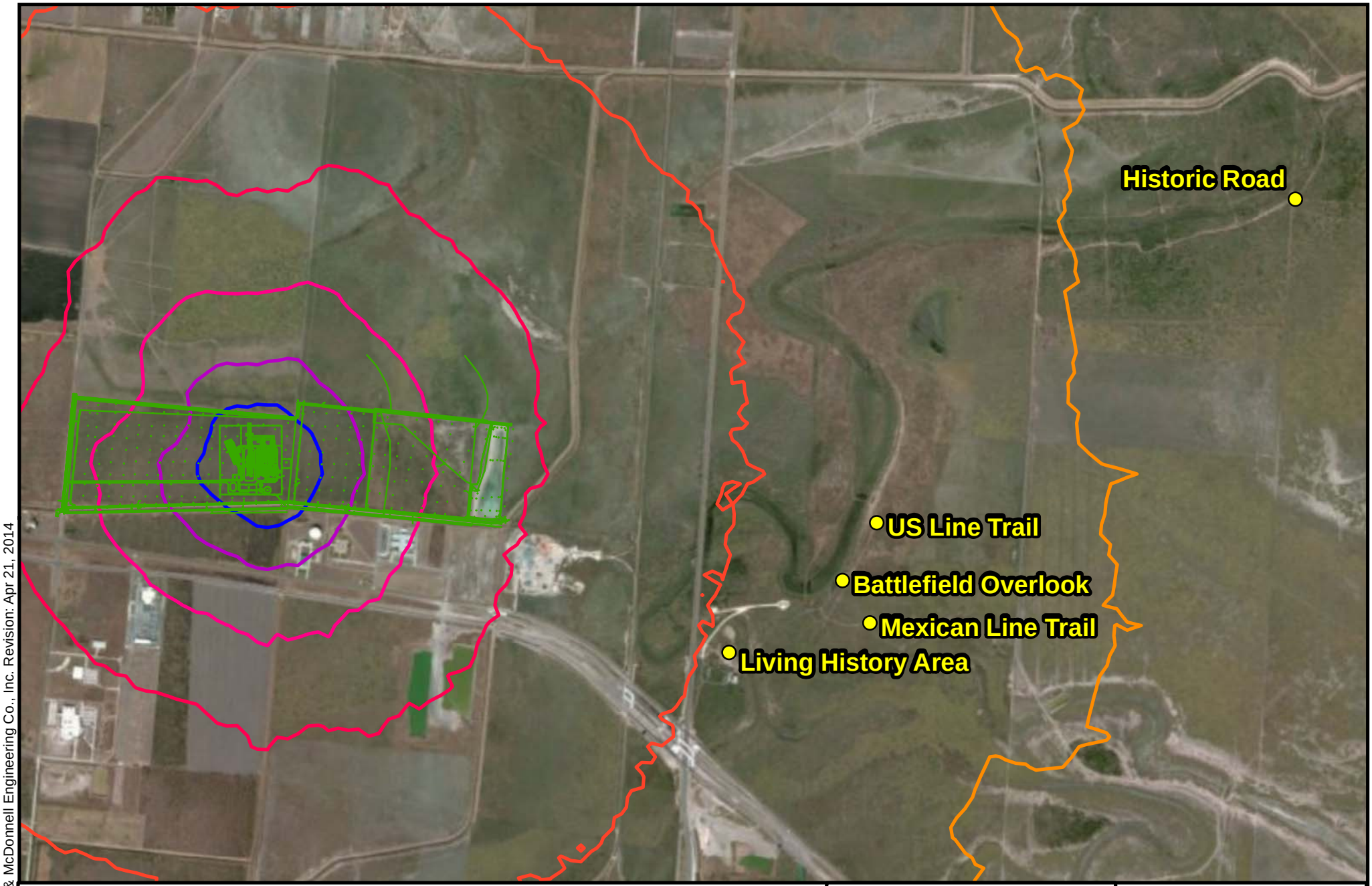
Modeling Results

MP	No Berm(dBA)	15' Berm(dBA)
MP3		
MP4		
Living History Area	44.4	42.5
U.S. Line Trail	42.6	40.7
Battlefield Overlook	43.0	41.0
Mexican Line Trail	43.0	40.6
Historic Road	37.6	35.8

Cumulative Impacts Analysis

Loc.	Time Period	Surrogate L50 (dBA)	No Berm SPL (dBA)			With 15' Berm SPL (dBA)			Benefit provided by 15' Berm Over Base (dBA)*
			Predicted	Cumulative	Increase	Predicted	Cumulative	Increase	
Living Histroy Area	12-2 PM	41.4	44.4	46.2	4.8	42.5	45.0	3.6	1.9
	6-8 PM	43.7	44.4	47.1	3.4	42.5	46.2	2.5	1.9
	12-2 AM	36.4	44.4	45.0	8.6	42.5	43.5	7.1	1.9
	6-8 AM	38.3	44.4	45.4	7.1	42.5	43.9	5.6	1.9
US Line Trail	12-2 PM	41.0	42.6	44.9	3.9	40.7	43.9	2.9	1.9
	6-8 PM	40.1	42.6	44.5	4.4	40.7	43.4	3.3	1.9
	12-2 AM	43.2	42.6	45.9	2.7	40.7	45.1	1.9	1.9
	6-8 AM	33.0	42.6	43.1	10.1	40.7	41.4	8.4	1.9
Battlefield Overlook	12-2 PM	41.0	43.0	45.1	4.1	41.0	44.0	3.0	2.0
	6-8 PM	40.1	43.0	44.8	4.7	41.0	43.6	3.5	2.0
	12-2 AM	43.2	43.0	46.1	2.9	41.0	45.2	2.0	2.0
	6-8 AM	33.0	43.0	43.4	10.4	41.0	41.6	8.6	2.0
Mexican Line Trail	12-2 PM	38.7	43.0	44.4	5.7	40.6	42.8	4.0	2.4
	6-8 PM	37.8	43.0	44.2	6.3	40.6	42.4	4.6	2.4
	12-2 AM	40.9	43.0	45.1	4.2	40.6	43.8	2.8	2.4
	6-8 AM	30.7	43.0	43.3	12.5	40.6	41.0	10.3	2.4
Historic Road	12-2 PM	34.1	37.6	39.2	5.1	35.8	38.0	4.0	1.8
	6-8 PM	33.2	37.6	38.9	5.8	35.8	37.7	4.5	1.8
	12-2 AM	36.3	37.6	40.0	3.7	35.8	39.1	2.8	1.8
	6-8 AM	26.1	37.6	37.9	11.8	35.8	36.2	10.2	1.8

* This column demonstrates the berm's impact on modeled values only, not the overall impacts as those are more subject to ambient sounds. A minimum increase or decrease of 3 dBA between two sound levels is generally accepted as the amount that is required before a person perceives the difference in sound levels.



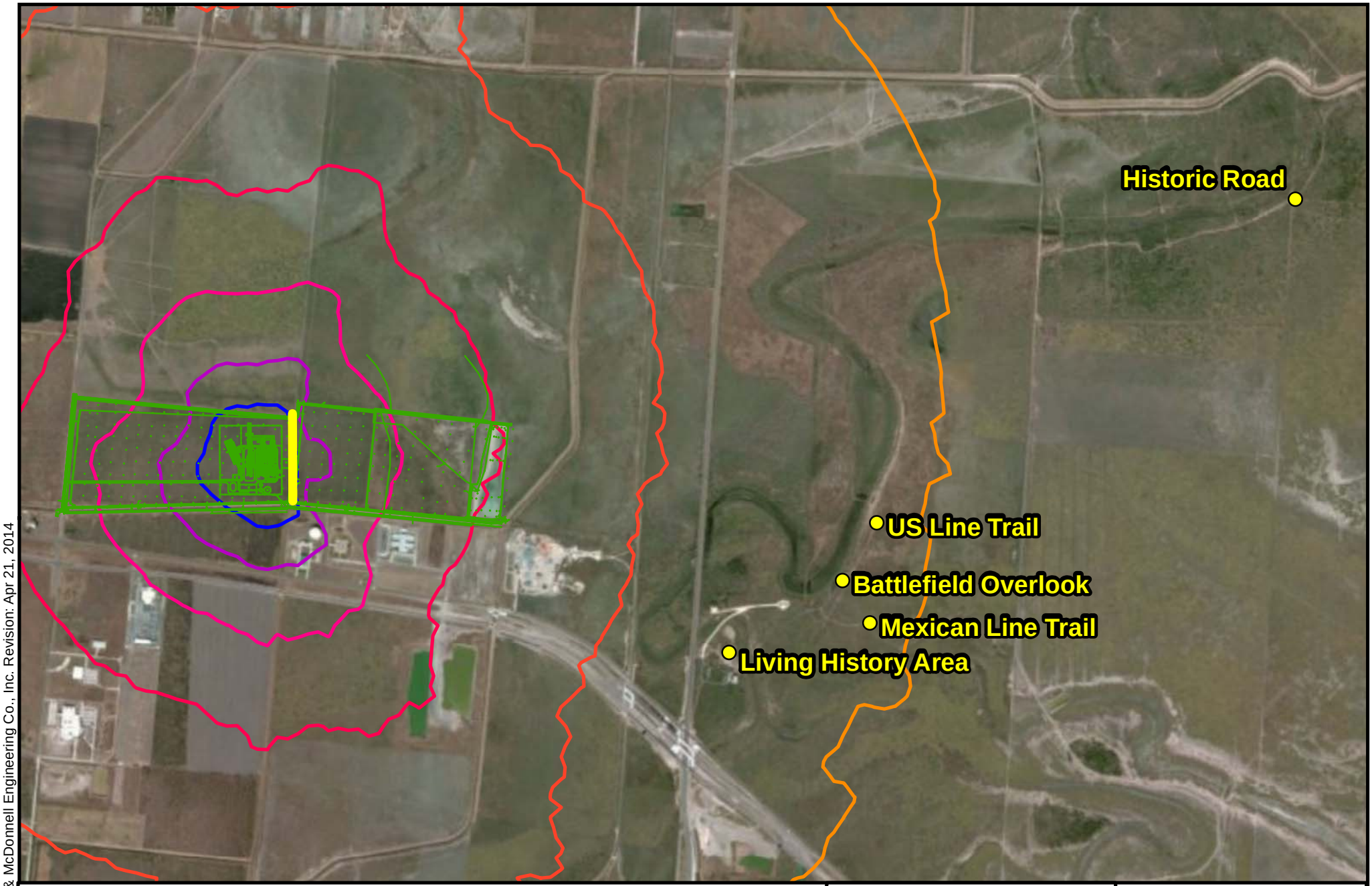
40 dBA
45 dBA
50 dBA
55 dBA
60 dBA
65 dBA

0 600 1,200 2,400 3,600
Feet

N
W E
S

Burns & McDonnell
SINCE 1898

Figure 6-7a
Sound Contours at
Palo Alto Battlefield
National Park



40 dBA
45 dBA
50 dBA
55 dBA
60 dBA
65 dBA
15-Foot Tall Berm

0 600 1,200 2,400 3,600
Feet

N
W E
S

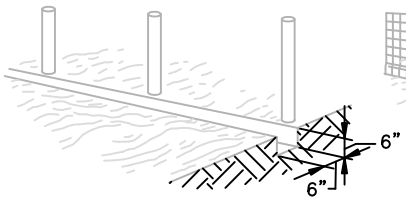
Burns & McDonnell
SINCE 1898

Figure 6-7b
Sound Contours
with 15-Foot Berm at
Palo Alto Battlefield
National Park

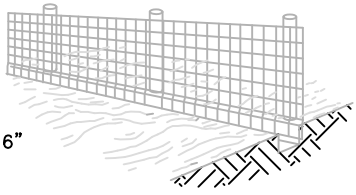
Attachment I

Tenaska Brownsville Generating Station
Erosion Control - Silt Fence Detail
18 Apr 2014
Prepared By: D L Williams

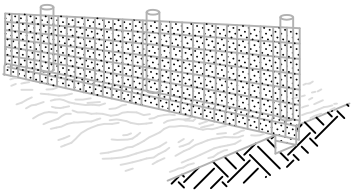
1. SET POSTS AND EXCAVATE A 6"X6" TRENCH UPSLOPE ALONG THE LINE OF POSTS.



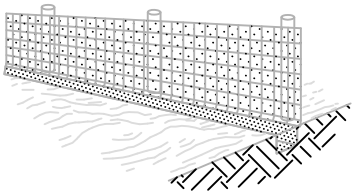
2. STAPLE WIRE FENCING TO THE POSTS.



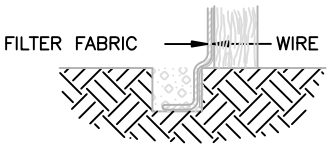
3. ATTACH THE FILTER FABRIC TO THE WIRE FENCE AND EXTEND IT INTO THE TRENCH.



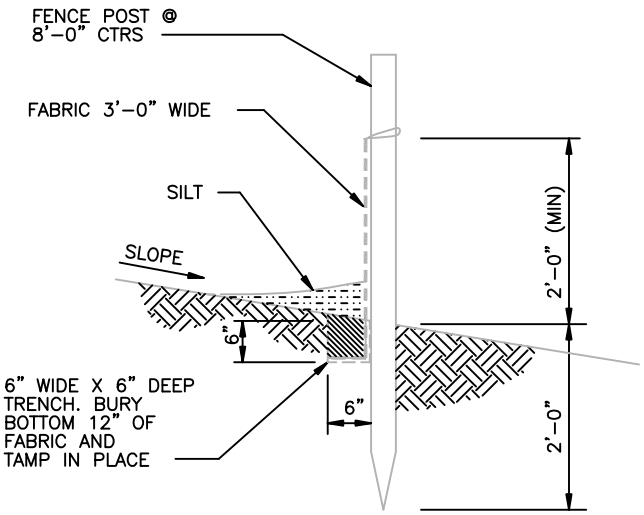
4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



EXTENSION OF FABRIC AND WIRE INTO THE TRENCH



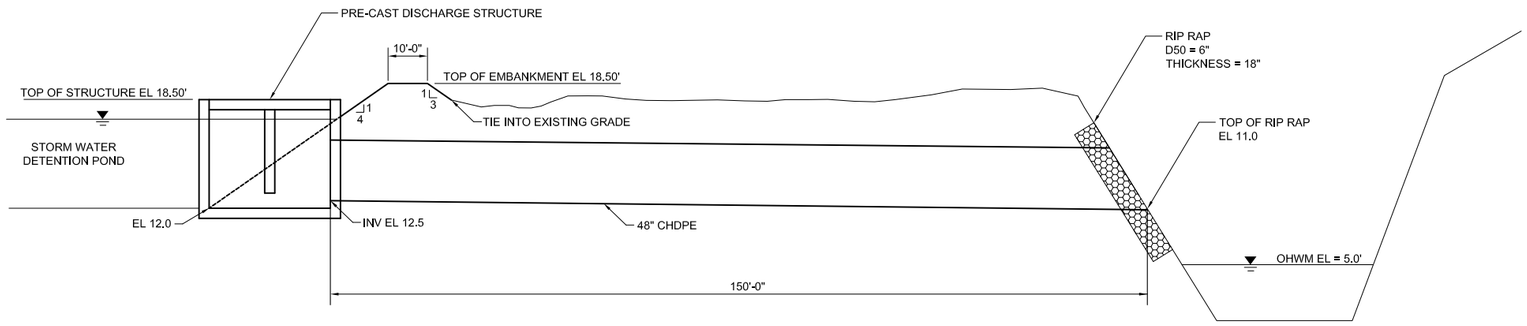
PLANS



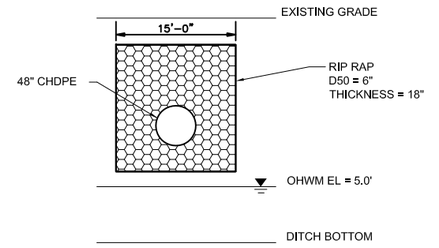
ELEVATION

SILT FENCE CONSTRUCTION DETAIL

NO SCALE



STORM WATER OUTFALL AND
DISCHARGE STRUCTURE - LOOKING EAST



PIPE DISCHARGE - LOOKING NORTH