

FOR CONTRACT NO.: 06-0L8004

INFORMATION HANDOUT

MATERIALS INFORMATION

FOR

**TEMPORARY FENCE (TYPE BLUNT-NOSED LEOPARD LIZARD
EXCLUSIONARY FENCING)**

ROUTE: 06-Fre, Kin-5-19.4, 19.1

1. E-Fence™ Blunt-nosed Leopard Lizard(EF40L)
Manufactured by ERTEC Environmental Systems

Wildlife Barrier for Special-Status Small Vertebrates

- **Construction Site Special-Status Species Exclusion**
- **Directional Control**
- **Perimeter Control for Surveys**

GUIDE SPECIFICATION

PRODUCT:

E-Fence™

MANUFACTURER:

ERTEC®
1150 Ballena Blvd. Suite 250
Alameda, CA 94501
Phone: 866-521-0724
Fax: 510-521-3972
email: sales@ertecsystems.com
Web: www.ertecsystems.com

1.0 Description:

Special-Status-Species Exclusion and Control System (SSSES) for special-status small vertebrates shall conform to the details shown on the plans and these special provisions and shall be installed around the perimeter of construction sites and/or survey areas, to control movement as a directional barrier or in designated areas. The primary function of the SSSES is to prevent special-status small vertebrates from entering construction sites where they can be killed, injured or isolated or provide directional control within fragmented habitat.

2.0 Material:

Provide SSSES as shown on the plans.

- A. **Barrier Configuration.** Furnish SSSES with a configuration based on the species to be controlled as per Table B. Furnish barrier in minimal 100 to 150 foot segments (10" width at 150 feet, 20" width at 150 feet, 30" width at 150 feet, 40" width at 100 feet, 48" width (orange only at 100 feet) to minimize segment overlaps.
- B. **Barrier Materials & Structure.** Furnish SSSES manufactured from non-biodegradable materials which are UV and dimensionally stable for at least 4 years (non-black), at least 10 years (black). The system shall:
- a. comprise a monolithic rigid polymer matrix
 - b. be thermally extruded into an apertured sheet with rigid and thermally bonded strands
 - c. be made from recycled base polymers such as high density polyethylene (HDPE #2)
 - d. be made from recycled polymer feedstock – content minimum shall be 95%
 - e. be durable, so that it can be reused on several projects
 - f. conform to the requirements in Table A below
- D. **Product Sheet.** A copy of the manufacturer's product data sheet together with instructions for installation shall be furnished to the Engineer 5 days before installation.
- E. **Posts.** Installations shall use reusable metal T-Posts (0.75 lbs/ft assembled with spade). Posts should be installed every 5 to 10 feet (see installation instructions for specific configuration)

and species) and at each segment overlap. Install posts on 5 foot centers in areas of high wind. Install posts on 10 foot centers when fence height is 30 inches or less.

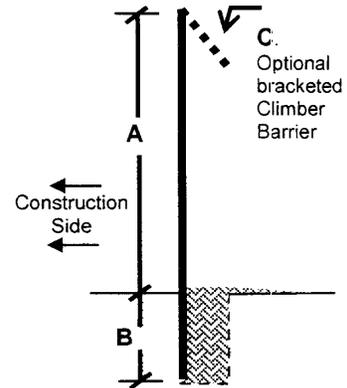
Table A: SSSES material property requirements

Specification	Design Characteristics	Mat'l Requirements HDPE or Recycled HDPE
Barrier Height	Animal	See Configuration Table B column 2
Section Length (for widths 20", 30", 40", 48") (ft)	Minimize joints	150, 150, 100, 100
Strand Deformation – 0.375" sphere pull-through at 68°F (lbs) (minimum)	Intrusion resistance, entrapment resistance	38
Distance between strands (in) (maximum)	Intrusion resistance, entrapment resistance	0.185
Strand thickness (in) (maximum)	Intrusion resistance, entrapment resistance	0.10
Distance between strand centers (in) (maximum)	Intrusion resistance, entrapment resistance	0.25
Mass per Unit Weight range (lbs/ft ²)	Installation ease	0.16 to 0.19
Tensile Strength – machine direction ASTM D4595 (lbs) (minimum)	Dimensional Stability	400
Tensile Strength – transverse direction ASTM D4595 (lbs) (minimum)	Dimensional Stability	325
Aperture Size – Cylinder PASS (dimensional range within which a cylinder will pass thru) (in)	Allow wind & water passage	0.141 - 0.156
Aperture Size – Cylinder NO PASS (smallest dimension that will not pass) (in)	Confine juvenile vertebrates	0.212
Ultraviolet stability - percent tensile strength retained ASTM D 4355	Long term property retention	96%
Thickness ASTM 5199 minimum (in)	Dimensional consistency, Deformation and intrusion resistance	0.115
Life in application minimum (yrs) ORANGE/BLACK	Durability, Reusability	4+/10+
Friction Coefficient (published base polymer data)	Climbing resistance, Resist accumulation of organic materials	<0.3
Shore Hardness (published base polymer data) at 68°F	Burrowing resistance	95
CBR Puncture strength ASTM D 6241 nominal (lbs)	Burrowing resistance, Intrusion resistance	237
Flow Rate ASTM D 4491 minimum gal/min/ft ²	Washout prevention	650
Low Temperature Brittleness (published base polymer data) ASTM D 746 (°F)	Extreme cold weather durability	-106
Operating Temperature (published base polymer data) range (°F)	All weather durability, Property retention	-30 to 160
Separation of stand planes (distance) (in - nominal)	Climbing resistance	0.02 - 0.04
Angle of strands (between stands and ground plane) (degrees)	Climbing resistance	70 to 80

3.0 System Configuration.

Table B: System Configuration requirements

Common Name (Scientific Name)	Barrier Height (in) A	Trench Depth (in) B	5' Bracketed Climber Barrier (Y/N) C	One-Way Funnel (Y/N)	Barrier Designation EF = Exclusion Fencing Digits = Sheet width (in) Letters: L = Climber Barrier, F = Funnel
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Frogs

California red-legged frog (<i>Rana draytonii</i>)	38	5	Y	N	EF48L	Configuration previously accepted by USFWS Barrier type: 4 strands/in
Foothill yellow-legged frog (<i>Rana boylei</i>)	30	5	Y	N	EF40L	Configuration previously accepted by USFWS Barrier type: 4 strands/in
Sierra Nevada yellow-legged frog (<i>Rana sierrae</i>)	30	5	Y	N	EF40L	Barrier type: 4 strands/in
Sierra Madre yellow-legged frog (<i>Rana muscosa</i>)	30	5	Y	N	EF40L	Barrier type: 4 strands/in
Northern leopard frog (<i>Rana pipiens</i>)	30	5	Y	N	EF40L	Barrier type: 4 strands/in
Lowland leopard frog (<i>Rana yavapaiensis</i>)	30	5	Y	N	EF40L	Barrier type: 4 strands/in
Oregon spotted frog (<i>Rana pretiosa</i>)	30	5	Y	N	EF40L	Barrier type: 4 strands/in
Northern red-legged frog (<i>Rana aurora</i>)	30	5	Y	N	EF40L	Barrier type: 4 strands/in
Cascades frog (<i>Rana cascadae</i>)	30	5	Y	N	EF40L	Barrier type: 4 strands/in
Coastal tailed frog (<i>Ascaphus truei</i>)	30	5	Y	N	EF40L	Barrier type: 4 strands/in

Toads

Colorado River toad (<i>Bufo alvarius</i>)	18	12	N	N	EF30	Barrier type: 4 strands/in
Arroyo toad (<i>Bufo microscaphus californicus</i>)	36	6	N	N	EF42	Configuration previously accepted by USFWS Barrier type: 4 strands/in
Yosemite toad (<i>Bufo canorus</i>)	18	12	N	N	EF30	Barrier type: 4 strands/in
Coach's spadefoot toad (<i>Scaphiopus couchii</i>)	18	12	N	N	EF30	Barrier type: 4 strands/in
Western spadefoot toad (<i>Spea hammondi</i>)	18	12	N	N	EF30	Barrier type: 4 strands/in

Turtles/Tortoises

Western pond turtle (<i>Actinemys marmorata</i>)	14	6	N	N	EF20	Configuration previously accepted by USFWS Barrier type: 4 strands/in
Northwestern pond turtle (<i>Clemmys marmorata marmorata</i>)	14	6	N	N	EF20	Barrier type: 4 strands/in
Southwestern pond turtle (<i>Clemmys marmorata pallida</i>)	14	6	N	N	EF20	Barrier type: 4 strands/in
Desert tortoise (<i>Gopherus agassizii</i>)	18	12	N	N	EF30	Configuration previously accepted by USFWS Barrier type: 4 strands/in

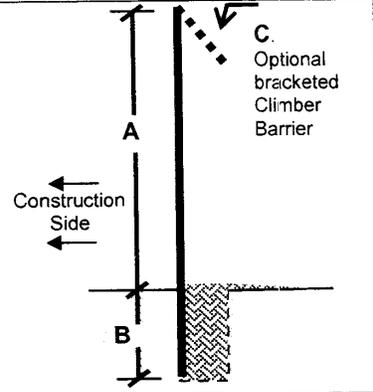
Common Name (Scientific Name)	Barrier Height (in) A	Trench Depth (in) B	5" Bracketed Climber Barrier (Y/N) C	One-Way Funnel (Y/N)	Barrier Designation EF = Exclusion Fencing L = Sheet width (in) Letters: L = Climber Barrier, F = Funnel	<p>C. Optional bracketed Climber Barrier</p> <p>Construction Side</p>
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Salamanders

Common Name (Scientific Name)	Barrier Height (in)	Trench Depth (in)	5" Bracketed Climber Barrier (Y/N)	One-Way Funnel (Y/N)	Barrier Designation	Configuration previously accepted by USFWS* Barrier type: 4 strands/in
California tiger salamander (<i>Ambystoma californiense</i>)	14	6	N	N	EF20	Configuration previously accepted by USFWS* Barrier type: 4 strands/in
Southern torrent salamander (<i>Rhyacotriton variegatus</i>)	14	6	N	N	EF20	Barrier type: 4 strands/in
California Coast range newt (<i>Taricha torosa</i>)	14	6	N	N	EF20	Barrier type: 4 strands/in
Inyo Mountain slender salamander (<i>Batrachoseps campii</i>)	14	6	N	N	EF20	Barrier type: 4 strands/in
Yellow-blotched salamander (<i>Ensatina eschscholtzii croceater</i>)	14	6	N	N	EF20	Barrier type: 4 strands/in
Large-blotched salamander (<i>Ensatina eschscholtzii klauberi</i>)	14	6	N	N	EF20	Barrier type: 4 strands/in
Limestone salamander (<i>Hydromantes brunus</i>)	14	6	N	N	EF20	Barrier type: 4 strands/in
Mt. Lydell salamander (<i>Hydromantes platycephalus</i>)	14	6	N	N	EF20	Barrier type: 4 strands/in
Shasta salamander (<i>Hydromantes shastae</i>)	14	6	N	N	EF20	Barrier type: 4 strands/in
Owens Valley web-toed salamander (<i>Hydromantes platycephalus</i>)	14	6	N	N	EF20	Barrier type: 4 strands/in
Scott Bar salamander (<i>Plethodon asupak</i>)	14	6	N	N	EF20	Barrier type: 4 strands/in
Del Norte salamander (<i>Plethodon eioagnatus elongatus</i>)	14	6	N	N	EF20	Barrier type: 4 strands/in

Snakes

Common Name (Scientific Name)	Barrier Height (in)	Trench Depth (in)	5" Bracketed Climber Barrier (Y/N)	One-Way Funnel (Y/N)	Barrier Designation	Configuration previously accepted by USFWS* Barrier type: 4 strands/in
Alameda Whip Snake (<i>Masticophis lateralis euryxanthus</i>)	30	5	N	Y	EF40	Configuration previously accepted by USFWS* Barrier type: 4 strands/in
San Joaquin Whip Snake (<i>Masticophis flagellum ruddocki</i>)	30	5	N	Y	EF40	Configuration previously accepted by USFWS* Barrier type: 4 strands/in
Giant Garter Snake (<i>Thamnophis gigas</i>)	35	5	N	N	EF40	Configuration previously accepted by USFWS* Barrier type: 4 strands/in
Rosy boa (<i>Lichanura trivirgata</i>)	30	5	N	Y	EF40F	Barrier type: 4 strands/in
Southern boa (<i>Charina umbratica</i>)	30	5	N	Y	EF40F	Barrier type: 4 strands/in
California Rat Snake (<i>Elephe rosaliae</i>)	30	5	N	Y	EF40F	Barrier type: 4 strands/in
San Diego ringneck snake (<i>Diadophis punctatus similis</i>)	30	5	N	Y	EF40F	Barrier type: 4 strands/in
California mountain kingsnake (<i>Lampropeltis zonata</i>)	30	5	N	Y	EF40F	Barrier type: 4 strands/in
Santa Cruz Island gopher snake (<i>Pituophis catenifer pumilis</i>)	30	5	N	Y	EF40F	Barrier type: 4 strands/in
Coast patch-nosed snake (<i>Salvadora hexalepis virgulata</i>)	30	5	N	Y	EF40F	Barrier type: 4 strands/in

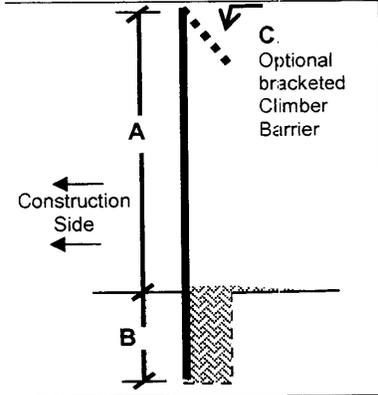
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Two-striped garter snake (<i>Thamnophis hammondi</i>)	30	5	N	Y	EF40F	Barrier type: 4 strands/in
Santa Catalina garter snake (<i>Thamnophis hammondi</i> ssp.)	30	5	N	Y	EF40F	Barrier type: 4 strands/in
South Coast garter snake (<i>Thamnophis sirtalis infernalis</i>)	30	5	N	Y	EF40F	Barrier type: 4 strands/in
San Francisco Garter Snake (<i>Thamnophis sirtalis tetraetania</i>)	30	5	N	Y	EF40F	Barrier type: 4 strands/in
Northern red-diamond rattle snake (<i>Crotalus ruber</i>)	30	5	N	Y	EF40F	Barrier type: 4 strands/in

Lizards, Skinks

Blunt-nosed leopard lizard (<i>Gambelia sila</i>)	30	5	Y	N	EF40L	Configuration previously accepted by USFWS* Barrier type: 4 strands/in
Coachella Valley fringe-toed lizard (<i>Uma inornata</i>)	24	24	Y	N	EF53L	Configuration previously accepted by USFWS* Barrier type: 4 strands/in
Coast (San Diego) horned lizard (<i>Phrynosoma coronatum blainvillii</i>);	30	5	Y	N	EF40L	Barrier type: 4 strands/in
Coast horned lizard (<i>Phrynosoma coronatum</i>)	30	5	Y	N	EF40L	Barrier type: 4 strands/in
Flat-tailed horned lizard (<i>Phrynosoma mcallii</i>)	30	5	Y	N	EF40L	Barrier type: 4 strands/in
Panamint alligator lizard (<i>Elgaria panamintina</i>)	30	5	Y	N	EF40L	Barrier type: 4 strands/in
Black legless lizard (<i>Anniella pulchra nigra</i>)	30	5	Y	N	EF40L	Barrier type: 4 strands/in
Silvery legless lizard (<i>Anniella pulchra pulchra</i>)	30	5	Y	N	EF40L	Barrier type: 4 strands/in
Coronado skink (<i>Plestiodon skiltonianus interparietalis</i>)	30	5	Y	N	EF40L	Barrier type: 4 strands/in

Small Mammals

San Joaquin kit fox (<i>Vulpes mutica mutica</i>)	35"	5	N	N	EF40	Configuration previously accepted by USFWS* Barrier type: 4 strands/in
Tipton Kangaroo Rat (<i>Dipodomys nitratoides nitratoides</i>)	35"	5	N	N	EF40	Configuration previously accepted by USFWS* Barrier type: 4 strands/in
Stephens' Kangaroo Rat (<i>Dipodomys stephensi</i>)	35"	5	N	N	EF40	Configuration previously accepted by USFWS* Barrier type: 4 strands/in
Salt Marsh Harvest Mouse <i>Reithrodontomys raviventris</i>	30"	5"	Y	N	EF40	Barrier type: 4 strands/in
Mount Lyell shrew (<i>Sorex lyelli</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in
Buena Vista Lake shrew (<i>Sorex ornatus relictus</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in
Monterey shrew (<i>Sorex ornatus salarii</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in
Southern California salt marsh shrew (<i>Sorex ornatus salicornicus</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in
Suisun shrew (<i>Sorex ornatus sinuosus</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in
Santa Catalina shrew (<i>Sorex ornatus willetti</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in
Salt-marsh wandering shrew (<i>Sorex vagrans halicoetes</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in

Common Name (Scientific Name)	Barrier Height (in) A	Trench Depth (in) B	5" Bracketed Climber Barrier (Y/N) C	One-Way Funnel (Y/N)	EF Digits = Letters: L = Climber Barrier, F = Funnel	Barrier Designation = Exclusion Fencing Sheet width (in) Climber Barrier, F = Funnel	
Monterey vagrant shrew (<i>Sorex vagrans paludivagus</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in	
Pygmy rabbit (<i>Brachylagus idahoensis</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in	
Riparian brush rabbit (<i>Sylvilagus bachmani riparius</i>)	35"	5	N	N	EF40	Configuration previously accepted by USFWS* Barrier type: 4 strands/in	
Sierra Nevada mountain beaver (<i>Aplodontia rufa californica</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in	
Point Arena mountain beaver (<i>Aplodontidae rufa nigra</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in	
Point Reyes mountain beaver (<i>Aplodontidae rufa phaea</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in	
Island fox (<i>Urocyon littoralis</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in	
Santa Catalina fox (<i>Urocyon littoralis catalinae</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in	
San Miguel fox (<i>Urocyon littoralis littoralis</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in	
Santa Cruz fox (<i>Urocyon littoralis santacruzae</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in	
Santa Rosa fox (<i>Urocyon littoralis santarosae</i>)	35"	5	N	N	EF40	Barrier type: 4 strands/in	

(Revision Date: September 3, 2011* (check www.ertecsystems.com for most current version))

4.0 Installation:

General E-Fence trenched installation (no Climber Barrier)

1. Excavate a trench a minimum of 4" wide and a minimum of 5" to 12" deep (depending on species, see Table B in specifications). The trench shall be cleared of obstructions.
2. Unless otherwise specified, T-posts shall be a minimum of 0.75 lbs/ft. Length of T-posts may be a minimum length between 3' and 5' dependent upon the wildlife species and the width of the barrier material. T-posts shall be driven a minimum of 16" into the ground. When the barrier does not have a climber barrier, T-posts shall be installed on the side of the trench closest to construction activities. T-posts shall be installed a maximum of 8' apart for fences over 30 inches. T-posts shall be installed a minimum of 10' apart for fences 30" or less. In areas with high winds, T-posts should be installed a maximum of 5' apart. The Project Engineer or Project Manager will specify.
3. Wrap 14 AWG galvanized guide wire around each T-post, so the guide wire is 3" to 4" from the top of the fence. Extend the guide wire from post to post, secure and pull wire tight between posts.
4. Insert barrier (fence material) into trench against the posts.
5. At segment overlaps, overlap segments a minimum of 6". Install a T-post at the section overlap. At 10" increments up and down the post, utilizing 14 AWG galvanized wire (8" cut wire segments), tie the fence to the post. Close gaps at the ends of the fence segment by threading 16 AWG galvanized wire, closing the segments together.
6. Using E-Fence™ wire ties, connect the guide wire to the fence at 3' intervals, as illustrated in Detail A of the installation guidelines. Crimp E-Fence wire-tie loops around guide wire tightly.
7. E-Fence must be installed in continuous lengths (100 or 150 feet). Do not cut segments into shorter panels.

8. If required: install optional snake funnels as specified. Ground clearance at small opening of funnel should be at least 1.0 inch. Attach funnel to E-Fence™ with galvanized 14 AWG wire. Close all gaps. Install 1"x2"x18" wood posts on each side of funnel. Attach E-Fence™ to posts on each side of funnel with non-corrodible screws with 1 inch washers.
9. Backfill trench with native soil.

General E-Fence trenched installation (with Climber Barrier)

1. Excavate a trench a minimum of 4" wide and a minimum of 5" to 12" deep (depending on species, see Table B in specifications). The trench shall be cleared of obstructions.
2. Unless otherwise specified, T-posts shall be a minimum of 0.75 lbs/ft. T-posts shall be driven a minimum of 16" into the ground. When installing fence with climber barrier, T-posts shall be installed on the side away from construction activities (on same side as climber barrier). T-posts shall be installed a maximum of 8' apart. In areas with high winds, T-posts should be installed a maximum of 5' apart. The Project Engineer or Project Manager will specify.
3. If necessary, cut-off top of T-Posts so that top of T-Posts will be 1" below the top of E-Fence climber barrier crease.
4. For E-Fence with climber barrier, wrap 14 AWG galvanized guide wire around top of each T-post, so the guide wire is 1 to 2 inches from the top of the fence. Extend the guide wire from post to post, secure and pull wire tight at each post.
5. Insert barrier into trench against the posts and hang climber barrier over 14 AWG wire and top of T-Posts.
6. At segment overlaps – overlap segments a minimum of 6". Install a T-post at the section overlap. At 10" increments up and down the post, utilizing 14 AWG galvanized wire (8" cut wire segments), tie the fence to the post. Close gaps at the ends of the fence segment by threading 14 AWG galvanized wire, closing the segments together.
7. Using E-Fence wire-ties, connect the guide wire to the fence at 3' intervals, as illustrated in Detail A of the installation guidelines. Crimp E-Fence wire-tie loops around the guide wire tightly.
8. Create climber barrier by bending top of E-Fence at crease downward 120 degrees. Top of fence should now be pointing down towards ground. See Detail B in the E-Fence installation guidelines.
9. Install E-Fence brackets every 3 feet.
10. E-Fence must be installed in continuous lengths (100 feet). Do not cut segments into shorter lengths.
11. If required: install optional snake funnels as specified. Ground clearance at small opening of funnel should be at least 1.0 inch. Attach funnel to E-Fence™ with 14 galvanized AWG wire. Close all gaps. Install 1"x2"x18" wood posts on each side of funnel. Attach E-Fence™ to posts on each side of funnel with non-corrodible screws with 1 inch washers.
12. Backfill trench with native soil.

E-Fence no-trench installation – (Desert Tortoise only)

1. Use this configuration with Desert tortoise only for that portion of the fence where fence material cannot be trenched more 6" below existing ground level due to hard substrate.
2. Vertical height shall be 18 inches. Horizontal leg shall be 12 inches. Roll length shall be 150 feet. Unwind 30 inch wide roll to 150 feet. Bend fence material at preformed crease, 12 inches from one side. Form a 90 degree bend along entire 150 foot length of barrier panel.
3. Unless otherwise specified, T-posts shall be equipped with a spade and a minimum of 0.75 lbs/ft. Length of T-posts may be a minimum length of 5 feet. T-posts shall be driven a minimum of 30" into the ground. T-posts shall be installed on the side of the barrier with construction activities. T-posts shall be installed a maximum of 10 feet apart for fences 30" or less.
4. Tie 14 AWG galvanized guide wire between T-posts, so the guide wire is 3 to 4 inches from the top of the fence. Extend the guide wire from post to post, secure and pull wire tight at each post.
5. Locate 18 inch vertical portion of barrier (fence material) against posts so that the horizontal segment points towards animal habitat. Ensure that there is a zero to 2 inch ground clearance at the bend. Ensure that the bent horizontal portion of the fence is lying on the ground.

6. Install 6 AWG galvanized U shaped hold-down-pins (12 inches in length) 2 inches from leading edge of horizontal flap as shown on plans. Install pins on 3 foot centers.
7. At barrier segment overlaps, overlap segments a minimum of 6". Install a T-post at the section overlap. At 6" increments along the post, utilizing 16 AWG galvanized wire ties (8" cut wire segments), tie the fence to the post. Close gaps at the ends of the fence segment by threading 16 AWG galvanized wire, closing the segments together.
8. Install E-Fence ties every 3.3 feet - tie E-Fence to Guide wire.
9. E-Fence must be installed in continuous lengths (150 feet). Do not cut segments into shorter panels.

E-Fence trenched installation (Desert tortoise only)

1. Excavate a trench a minimum 12" deep. The trench shall be cleared of obstructions.
2. Vertical height shall be a minimum of 18 inches. Depth of fence should be about 12 inches, minimum 6 inches. Roll length is 150 feet.
3. Unless otherwise specified, T-posts shall be equipped with a spade and a minimum of 0.75 lbs/ft. T-posts shall be driven a minimum of 30" into the ground. T-posts shall be installed a maximum of 10' apart for fences 30" or less.
4. Tie 14 AWG galvanized guide wire from T-Post to T-Post, so that the guide wire is 3" to 4" from the top of the fence. Extend the guide wire from post to post, secure and pull wire tight between posts.
5. Insert ERTEC E-Fence into trench and against the posts.
6. At segment overlaps, overlap segments a minimum of 6". Install a T-post at the section overlap. At 10" increments up and down the post, utilizing 16 AWG galvanized wire ties (8" cut wire segments), tie the fence to the post. Close gaps at the overlaps of the fence segments by threading 16 AWG galvanized wire, closing the segments together.
7. Install E-Fence ties every 3.3 feet - tie E-Fence to Guide wire. (see attached instructions for E-Fence ties)
8. E-Fence must be installed in continuous lengths (150 feet). Do not cut segments into shorter panels.
9. Backfill trench with native soil.

5.0 Maintenance:

Perform maintenance as required. Inspect areas of concentrated rainwater run-off following rainfall events and after high-wind events. Damage to the special-status-species exclusion barrier resulting from weather or the construction site vehicles, equipment, or operations shall be repaired immediately.

Split or torn segments shall be repaired with zip-ties or 16 gauge galvanized wire ties or replaced. Rills, gullies and other evidence of concentrated runoff which has undercut the SSSEB shall be corrected. Locations needing repair shall be repaired or replaced immediately after identifying the deficiency.

6.0 Method of Measurement:

Quantities of SSSSES to be paid for will be determined by the linear foot measured along the centerline of the installed barrier. Where SSSSES segments are joined and overlapped, the overlap will be measured as a single installed strip.

7.0 Basis of payment:

The contract price paid per linear foot for SSSSES shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing the SSSSES, complete in place, including trench excavation and backfill, and maintenance, as shown on the plans, and in these special provisions, and as directed by the Project Manager.

ERTEC E-Fence™

Description

ERTEC E-Fence™ is a patent pending, durable and low cost species exclusion and control barrier designed for projects in habitat where threatened small vertebrates are present. The fence is designed to exclude small vertebrate species from active construction areas, control movement within fragmented habitat and for survey perimeter control. The barrier is made from a heavy and rigid polymer matrix which is extruded for strength and durability. The extruded strands of the ERTEC polymer matrix will not separate, stretch or entrap even persistent intruders. It is non-toxic and environmentally safe. Even after extensive exposure to sun-light, harsh weather and salt water it continues to perform. Unlike Silt Fence or Plywood Fence, E-Fence allows wind and water flow-through. It provides very high reliability (up-time) which significantly reduces maintenance and monitoring costs. It can withstand abrasion without losing its shape or separating. Its smooth surface is highly resistant to adhesion, slippery to climbers, will resist accumulation of debris. E-Fence will last several years and is reusable. It is made from recycled HDPE is reusable and is fully recyclable as #2 at the end of life. E-Fence is configurable for individual species.



Applications

- Exclusion of threatened small vertebrates from construction sites
- Directional barrier to control movement in fragmented habitats
- Perimeter control for surveys
- Exclusion of certain small animals from

Product Benefits

- Very high reliability (high barrier up-time)
- ZERO waste
 - Recycled
 - Recyclable at end of life
 - Reusable on multiple projects
- Lower total cost
 - Very little maintenance
 - Significantly reduced monitoring

Documents

- Data Sheet
- Installation Details - General
- Specification and Recommended Configurations
- Installation Details – Desert Tortoise
- Case Study

2. Specialty Square Mesh Barrier Fencing (Item Number
BF136B)
Manufactured by BF Products Incorporated

EF 03/04/16

SPECIALTY SQUARE MESH BARRIER FENCE

ITEM ID: BF136B

COLOR: BLACK

MESH SIZE: 1/5" SQUARE

MATERIAL: HDPE (HIGH DENSITY POLYETHYLENE)

ULTRAVIOLET RESISTANCE: FULLY STABILIZED

TEMPERATURE RANGE: -60 DEGREES F. TO 180 DEGREES F

TENSILE YIELD: 3200 PSI

ULTIMATE TENSILE STRENGTH: 2600 PSI

ELONGATION AT BREAK: 150%

ROLL SIZE: 4' X 100'

WEIGHT: 36 LBS



Netting » Fencing » Screens » Deer Control Fence » Posts & Markers » Accessories » Poultry » Porous Paving » Grass Protecta

Catalog



Polyethylene Mesh Fence

Home > Fencing > Polyethylene Mesh Fence

5 item(s) - Page 1 of 1

View: Three column ↓



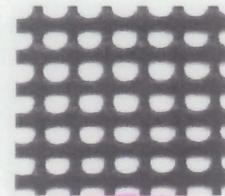
2' x 100' Black Polyethylene Mesh Fence - 1/2" Square

\$50.00



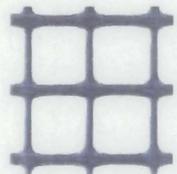
4' x 100' Black Polyethylene Mesh Fence - 1/2" Square

\$97.00



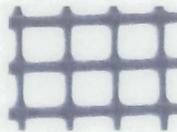
4' x 100' Black Polyethylene Mesh Fence - 1/5" Square

\$97.00



40' x 100' Green Polyethylene Mesh Fence - 1" Square

\$90.00



40' x 100' Green Polyethylene Mesh Fence - 1/2" Square

\$90.00

Categories

- Netting
- Fencing
 - Safety Fence
 - Snow Fence
 - Polyethylene Mesh Fence
 - Fabric Fence
 - Wire Mesh
 - Silt Fence
 - E-Z Pocket Net Fence
 - Outfield Fence Kits
- Screens
- Deer Control Fence
- Posts & Markers
- Accessories
- Poultry
- Porous Paving
- Grass Protecta

Search

Advanced search

Specially made Polyethylene Mesh Fencing will help control diseases by making cleaning of pens and cages easier. It is not affected by the usual agricultural chemicals used in cleaning. It will not deteriorate, rust, or corrode like metal mesh. It can be used on the sides of pens and pen bottoms. Polyethylene Mesh does not get hot under summer sun or cold to the touch in winter. There are no sharp edges to scratch or cut you or your birds. We have the mesh sizes to fit your needs.

- Not Affected by Droppings
- Adequate for Use in Temperature Range of -60° to 160° F
- Compound: Polyethylene

OUR MESH FEATURES:

Non-Corrosive • Flexible • Non-Conductive • Safe • Temp Range: -60 F to +260 F • Non-Toxic • Prevent abrasion damage • Lightweight • Strong but economical • Reusable • Weather resistant • U.V. Resistant • Prevents corrosion • Rustproof • No Sharp Edges • Heat-Sealable • Chemical Resistant • Won't unravel

INDUSTRIAL APPLICATIONS:

Air filters • Cages pens • Retaining Nets • Draining trays • Drying trays • Gabions • Machine guards • Partitions • Soil drainage • Utility Pole wraps • Window guards • Tree guards • Poultry flooring • Bin & small part separators • Filtering and screening • Fan and light guards • Pallet and tray dividers • Insulation retainers • Pallet covers • Plaster-Mesh Stucco • Truck bed covers • Vent covers • Kennel flooring • Garden/Temporary fencing

Our high quality polyethylene meshes are available in a variety of sizes, gauges, strengths and colors and can be used in place of wire cloth in industrial applications.

Note: Meshes will contract from SUMMER to WINTER. Please allow a little slack if installing between MID SPRING and MID FALL, when temperatures are higher.

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**1150 Ballena Blvd. Suite 250
Alameda, CA 94501
866-521-0724**

ERTEC Environmental Systems LLC
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3. Anti-Plugging Mesh (Modified from Stock Item
Number 009848)
Manufactured by Boddingtons®

* Need a special order,
600g/m²
Diamond Aperture 6mm x 4mm

BODDINGTONS

Anti-Plugging Mesh

Anti-Plugging Mesh

Golf ball anti-plugging mesh is a strong black high density polyethylene ground reinforcement mesh. The mesh is used on golf driving ranges to prevent golf balls from plugging into the fairway surface in wet conditions.

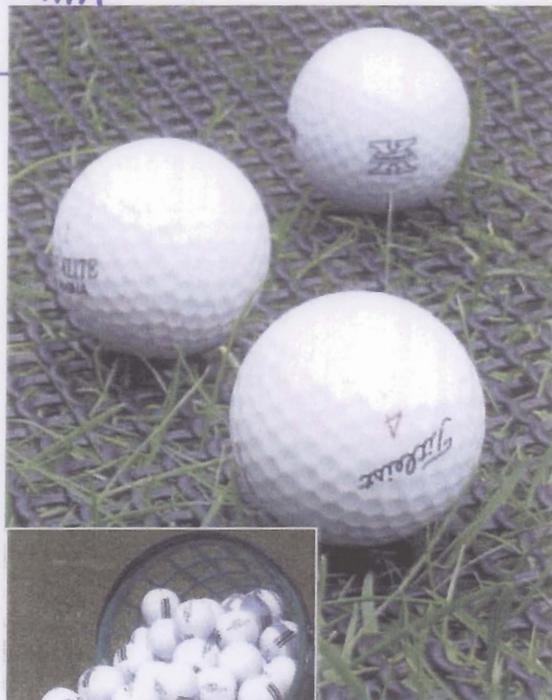
The plugging of the golf balls is a major problem as balls are missed by the ball collection machines. These golf balls are either lost into the surface or manual collection is required, which is an expensive and time consuming operation.

The stabilisation mesh is simply laid onto the existing grass surface and pinned, ensuring that the mesh is flat against the surface. If laid in the growing season, the grass will grow quickly through the mesh apertures and will disappear from view, whilst stabilising the surface and preventing any further plugging of the golf balls.

- Easy to install
- Grass grows through the mesh apertures
- Rot resistant
- The range can be used immediately after installation

The golf ball anti-plugging mesh eliminates any plugging issues:

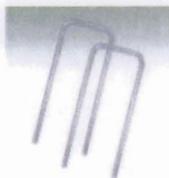
The Problem:



Golf ball anti-plugging mesh is supplied on 2m wide rolls and is available in black. The mesh should be overlapped by 100mm on installation to ensure a full coverage is applied. Within a few weeks the mesh will disappear as the grass grows through the mesh holes. Golf balls can be collected easily, with fewer lost balls.

Fixing Pins & Pegs

Steel U-pins or plastic pegs to secure GrassCarpet™ to the ground. Yellow marker pegs are available if required.



PRODUCT	U-PINS	BLACK PEGS
MATERIAL	STEEL	PLASTIC
SIZE (mm)	170 x 70 x 6 dia	140 long
OUTER	50 pack	100 pack
PART No.	041824	055029

Technical Specifications

ROLL SIZE	MESH APERTURE	COLOUR	WEIGHT	TENSILE STRENGTH	MATERIAL	PART No.
2m x 30m	7mm x 7mm	BLACK	720g/m ²	8kN/m (MD)	HDPE 100% Recycled	009848
2m x 30m	25mm x 29mm	GREEN	550g/m ²	5.9kN/m (MD)	HDPE 100% Recycled	049202

MD - Machine Direction TD - Transverse Direction

Blackwater Trading Estate • The Causeway • Maldon • Essex CM9 4GG • England
Tel: +44 (0) 1621 874200 Fax: +44 (0) 1621 874299
e.mail: sales@boddingtons-ltd.com • www.boddingtons-ltd.com

BODDINGTONS

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Horticulture & Gardening

[Introduction](#)

Horticulture Meshes

[Garden Mesh](#)

[Plastic Netting / Garden Net](#)

[Deer Fencing](#)

[Sentree™ Treeguard](#)

[Windbreak Fencing Mesh](#)

[Shelter Shade Fence / Garden Fencing Mesh](#)

[Insect Mesh](#)

[Litter Fencing](#)

[Plastic Anti-Bird Netting](#)

[Plant Support Netting / Pea & Bean Net](#)

Ground reinforcement

[TurfProtecta® Turf Reinforcement Mesh](#)

[GrassProtecta® slip-resistant Grass Reinforcement Mesh](#)

[BodPave® 85 Grass Pavers / Gravel Pavers](#)

[Bodpave® Paving Grids](#)

[Advanced Turf®](#)

[Golf Ball Anti-Plugging Mesh](#)

[Bodcell™ Tree root protection](#)

[TurfCarpet™ soil-less turf](#)

[GrassCarpet™ reinforcement](#)

[Safety Rubber Matting](#)

[Blokroot™ root barrier](#)

[Weed Control Fabric / Landscape Ground Cover](#)

Metal Wire Fencing

[Chicken Wire / Chicken Fencing](#)

[Wire Netting / Hexagonal Mesh Fencing](#)

[Rabbit Fencing / Metal Wire Fence Netting](#)

[Welded Wire Mesh](#)

[Stock Fencing / Galvanised Wire Netting](#)

[Barbed Wire / Galvanised Line Straining Wire](#)

[Product Downloads](#)

Golf ball anti-plugging mesh

Golf ball anti-plugging mesh is a strong black high density polyethylene ground reinforcement / stabilisation mesh. The plastic mesh is used on golf driving ranges to prevent golf balls from plugging into the fairway surface in wet conditions.

The plugging of the golf balls is a major problem as balls are missed by the ball collection machines. These golf balls are either lost into the surface or manual collection is required, which is an expensive time-wasting alternative.

The plastic stabilisation mesh is simply laid onto the existing grass surface and pinned every metre, ensuring that the mesh is flat against the surface. If laid in the growing season, the grass will grow quickly through the mesh apertures and will disappear from view, whilst stabilising the surface and preventing and further plugging of the golf balls.

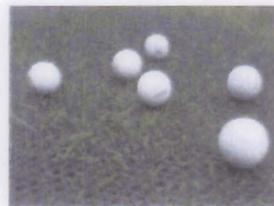
- Easy to install using U-pins
- Grass grows through the mesh apertures

The golf ball anti-plugging mesh eliminates any plugging issues :

The Problem:



The Remedy :



Product Details

Roll Size	Mesh Aperture	Weight	Colour	Material	Part No.
2m x 30m	7mm x 7mm	730g/m2	HDPE	Black	009848

U-Pins

To secure Anti-plugging mesh the ground, use our metal U-Pins at 1m intervals.





[Product Leaflet](#)

	Material	Size	Quantity	Part Number
	Steel	150mm x 50mm x 8mm dia.	50 in bag	041824

Other stabilisation / reinforcement products that may be of interest include [Turf reinforcement mesh](#) and [GrassProtecta™ Grass Protection Mesh](#)

4. Geotechnical Design Report

Memorandum

*Flex your power!
Be energy efficient!*

To: FRANK GONZALEZ
Senior Transportation Engineer
District 6 Maintenance Design

Attention: Rene Siqueiros
Shue X. Vue

Date: October 6, 2011

File: 06-FRE, KIN-5
PM 19.4, 19.1
06-0L8001
Project ID. 06 0000 0334
Two CMS

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES – MS 5

Subject: Geotechnical Design Report

Introduction

Per your email request, dated on September 28, 2011, a Geotechnical Design Report (GDR) is provided for the maintenance project on Interstate 5. This project has two separate locations. One is in Fresno County (PM 19.4) and another location is in Kings County (PM 19.1). See Plate No. 1, Vicinity Map.

This project proposes to relocate two existing Model 500 Changeable Message Signs (CMS) and to construct two new Maintenance Vehicle Pullouts (MVP) at each of the new CMS location. The first location is in Fresno County near Coalinga 1.4 miles north of Interstate 5 and Highway 145 intersection. The second location is in Kings County near Kettleman City at the Milham Avenue Overcrossing (OC).

This memorandum documents the geotechnical recommendations regarding the foundation of the two CMS signs.

Pertinent Reports and Investigations

In preparing of this report, following documents were reviewed:

1. Western Regional Climate Center for 1955-2010.
2. Geologic Map of California: Santa Cruz sheet: California Division of Mines and Geology, dated 1958 and Fresno sheet, California Division of Mines and Geology, dated 1965.

3. As-built Log of Test Boring (LOTB): Milham Avenue (Br. #45-0071), dated June 26, 1967.
4. Groundwater Level Data Wells 22S19E18N003M, 22S18E13K001M, 19S16E05N001M, 18S16E31N001M, and 18S16E32N001M, from Department of Water Resources.

Existing Facilities and Proposed Improvements

This project proposes to relocate two existing CMS's and construct two maintenance vehicle pullouts at each of the new CMS location. Both signs are located on Interstate 5. Near both locations, Interstate 5 is currently a 4-lane divided roadway paved with asphalt concrete aligned in a generally north-south direction. This stretch of roadway is built on cuts and fills. There are underdeveloped hill sides on either side of the roadway. No utility lines run parallel along the roadway in the median or the sides.

Physical Setting

The physical setting of the project site and the surrounding area was reviewed to provide climate, topography and drainage, man-made and natural features, geology characteristics to aid in project design and construction planning. The following is a discussion of the review:

Climate

Information regarding the climate in the project area is provided by the Western Regional Climate Center period of record from 1955 to 2010. There is one station located near Kettleman City (#044534). The average annual total precipitation is 6.75 in. The majority of this precipitation falls between October and May. The average daily minimum temperature ranges from 35.2° F in January to 68.2° F in July, and the average daily maximum temperature ranges from 55.2° F in January to 100.7° F in July. Freezing temperatures and snowfall are not common at the project site. Yearly updates are available at the Western Regional Climate Center web site.

Topography & Drainage

The site is located in the western edge of the Great Valley geomorphic province of California. It is on the west side of the Sierra Nevada Mountain Range and the east side of the Coast Mountain Range. The rolling terrain is typical because the region is located at the edge between the Great Valley and the Coast Mountain Range. The approximate ground elevation near the Fresno CMS

is 567 ft, and the approximately elevation of the Kings County CMS is 473 ft. The vicinity around the project area is mainly occupied by farmland and un-used land.

Man-made and Natural Features of Engineering and Construction Significance

There is no overhead power line that runs along the highway on either side. There is no railroad crosses the roadway near the two CMS locations. No river intersects the proposed project areas.

Regional Geology

The California Department of Conservation, Division of Mines and Geology Geologic Map of California, Fresno sheet (1965) and Santa Cruz sheet (1958) were used to determine the geologic formations in the project area. A section from these maps showing the project locations are attached as Plates No. 2 and No. 3. The project locations are mapped as being in an area of Recent Alluvial Fan Deposits in the Great Valley (Q_f) and Pleistocene nonmarine formed during the Quaternary Period of the Cenozoic Era between 10 thousand and 1.6 million years ago.

Exploration

This office received the request for geotechnical recommendations on September 28, 2011, and the scheduled Ready to List (RTL) date was October 1, 2011. Due to the limited time frame that was given to this office, drilling was not done before the completion of this report.

Since the Milham Avenue OC is near the proposed CMS at the Kings County location, the as-built LOTB for this bridge is sufficient to provide data needed for the analyses. Since there is no structure near the proposed CMS at the Fresno County location, a verification boring at this location has been proposed. LOTB of this boring will be provided to the District as soon as it becomes available.

Geotechnical Testing

Corrosion

Due to time constraint, no sample was tested for corrosion. Due to the fact that groundwater is deep below the ground surface and the sandy nature of the soil within the areas, soil at the two locations are not expected to be corrosive.

Geotechnical Conditions

In general, the soil characteristics within the project area, according to exiting as-built LOTB, consist of fine to medium grained, medium dense to very dense sandy materials with lenses of silt and gravels.

Groundwater

The State Department of Water Resources (DWR) has monitored groundwater level wells across California for decades. There are five monitoring wells that are within the vicinity of the project areas (data recorded range from 1960-2008). Based on data obtained from the monitoring wells, the average groundwater elevation within the vicinity of the Fresno Location is -187.8 ft, and it is 67.5 ft for the Kings County location. These elevations correspond to groundwater depths of 650.5 and 209.0 ft from ground surface, respectively for each location. Groundwater conditions will vary according to variations in rainfall, well pumping, and construction activities.

According to as-built LOTB, drilled in August 1962, there was no groundwater to the maximum depth of about 46 ft.

For design purposes, groundwater elevation was assumed to be -160 ft at the Fresno County Location, and it assumed to be 76 ft at the Kings County Location.

Geotechnical Recommendations

The soil conditions at both of the Fresno and Kings County CMS Locations are expected to satisfy the 2006 standard model requirements. The Office of Geotechnical Design North recommends that the proposed standard plan (2006) pile foundation for a Model 500 Changeable Message Sign can be constructed as planned. This model should consist of a single cast-in-drilled-hole (CIDH) pile of 22-ft in embedment length and 5 ft in diameter.

Since there is no existing as-built LOTB that is sufficiently close to the proposed CMS at the Fresno County Location, one verification boring is being planned for this location in case different site condition does exist. If different soil condition is observed during subsurface investigation, modification from the above recommendation will be provided.

Construction Considerations

1. All earthworks shall follow Section 19 of Caltrans Standard Specifications.
2. Loose sand may be encountered during pile construction. Temporary casing may be needed for CIDH piles construction if caving occurs. If temporary casing is used during installation of CIDH piles, it shall be removed while the concrete is being placed in order to develop the required pile capacity.
3. Groundwater is not anticipated during construction of the CIDH piles.

Project Information

Standard Special Provision S5-280, "Project Information", discloses to bidders and contractors a list of pertinent information available for their inspection prior to bid opening. The following is an excerpt from SSP S5-280 disclosing information originating from Geotechnical Services. Items listed to be included in the Information Handout will be provided in Acrobat (.pdf) format to the addressee(s) of this report via electronic mail.

Data and information attached with the project plans are:

None

Data and information included in the Information Handout provided to the bidders and contractors are:

Geotechnical Design Report for EA 06-0L8001, dated October 6, 2011.

Data and information available for inspection at the District Office:

None.

Data and information available for inspection at the Transportation Laboratory are:

None.

If you have any questions or comments, please call me, Carolyn Zhen-Ru, at (916) 227-1055 or my supervisor, John Huang, at (916) 227-1037.



CAROLYN ZHEN-RU, P.E.
Transportation Engineer, Civil
Office of Geotechnical Design – North
Branch E

JOHN HUANG, P.E.
Senior Materials and Research Engineer
Office of Geotechnical Design – North
Branch E

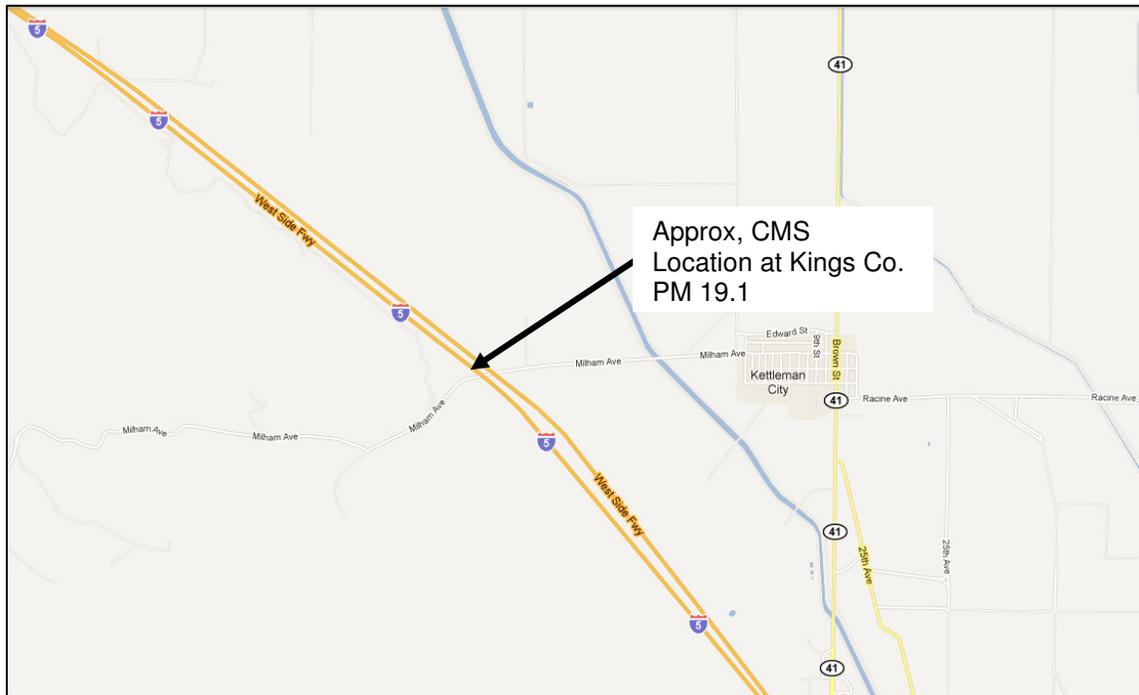
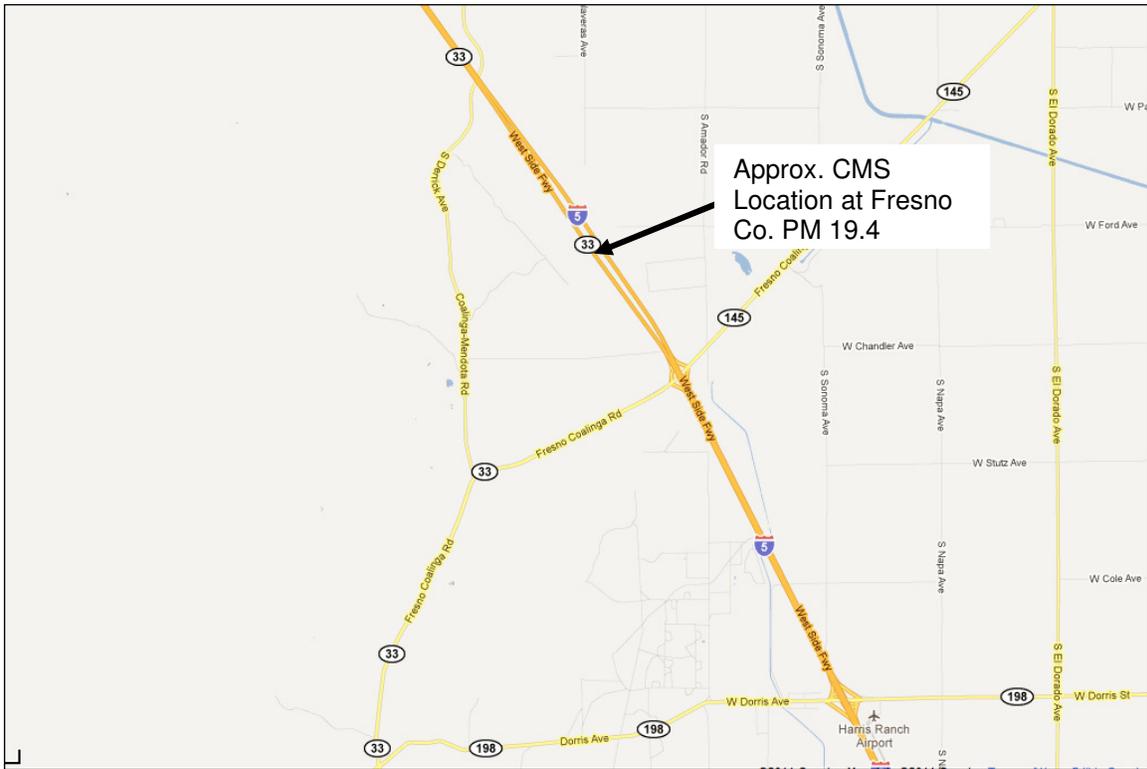
- c: John Huang (Geotechnical Services, Geotechnical Design North)
- Earl Jones (D06 Project Manager)
- Mark Willian (Geotechnical Services, Corporate Unit)
- Ted Mooradian (D06 District Materials Engineer)
- District Construction R.E. Pending File
- Julie A Gonzalez (D06 Office Engineer)

LIST OF ATTACHMENTS

Plate 1 Vicinity Map

Plate 2 and 3 Geology Maps

As-Built LOTB for Milham Avenue Overcrossing



Scale: No Scale



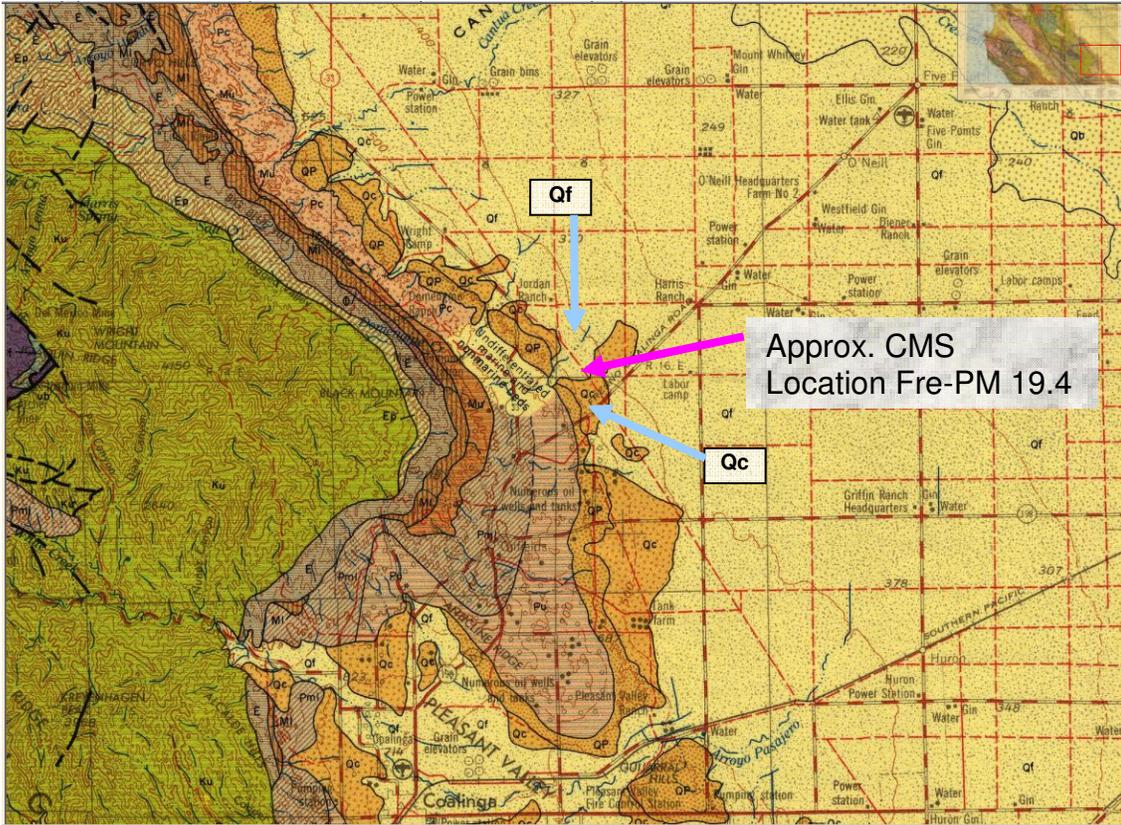

CALTRANS
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design - North

06 0000 0334
 Date: Sept. 2011

VICINITY MAP

**06-FRE, KIN-5 PM 19.4, 19.1
 GEOTECHNICAL DESIGN REPORT**

Plate
 No. 1



Geologic Map of California: Santa Cruz Sheet; California Division of Mines and Geology, 1958

Explanation of Relevant Formations:

- Qf** – Recent Alluvial Fan Deposits: Sediments deposited.
- Qc** – Pleistocene Nonmarine.



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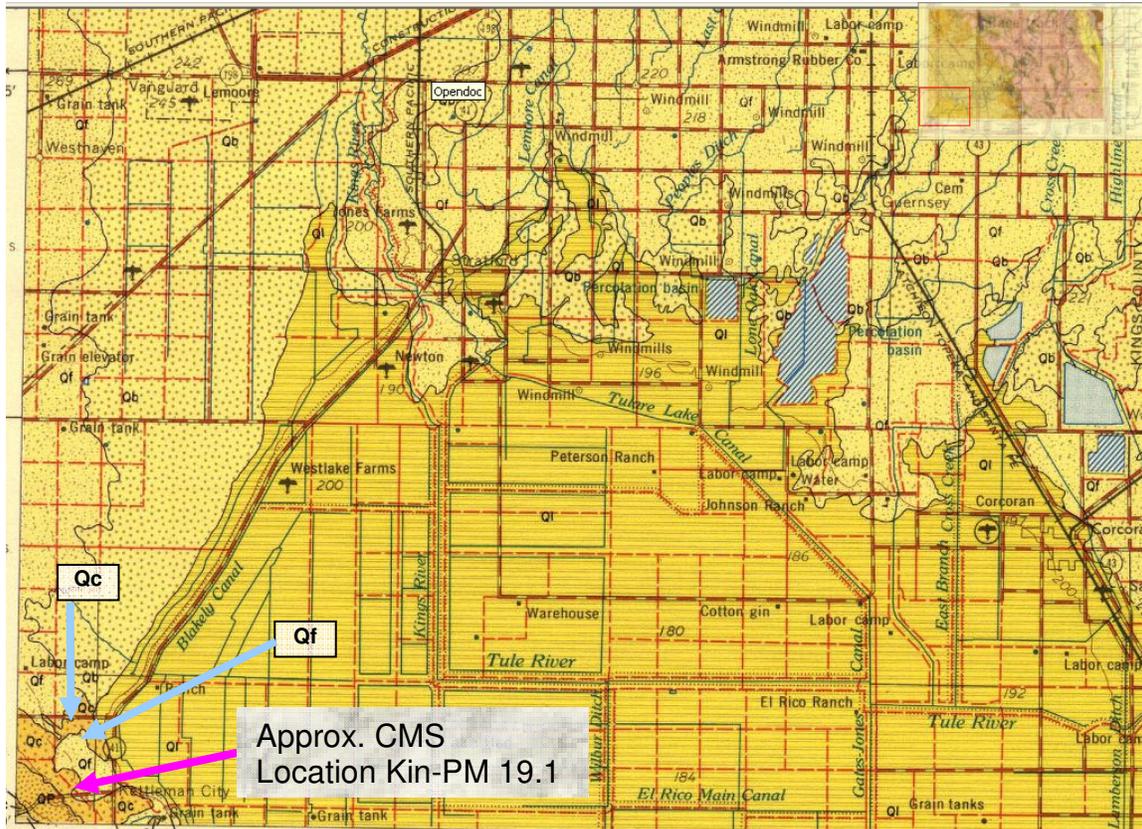
06 0000 0334

September 2011

GEOLOGY MAP

**06-Fre, Kin-5 PM 19.4, 19.1
 GEOTECHNICAL DESIGN REPORT**

Plate No.
 2



Geologic Map of California: Fresno Sheet; California Division of Mines and Geology, 1965.

Explanation of Relevant Formations:

- Qf – Recent Alluvial Fan Deposits: Sediments deposited.
- Qc – Pleistocene Nonmarine.



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September 2011

GEOLOGY MAP

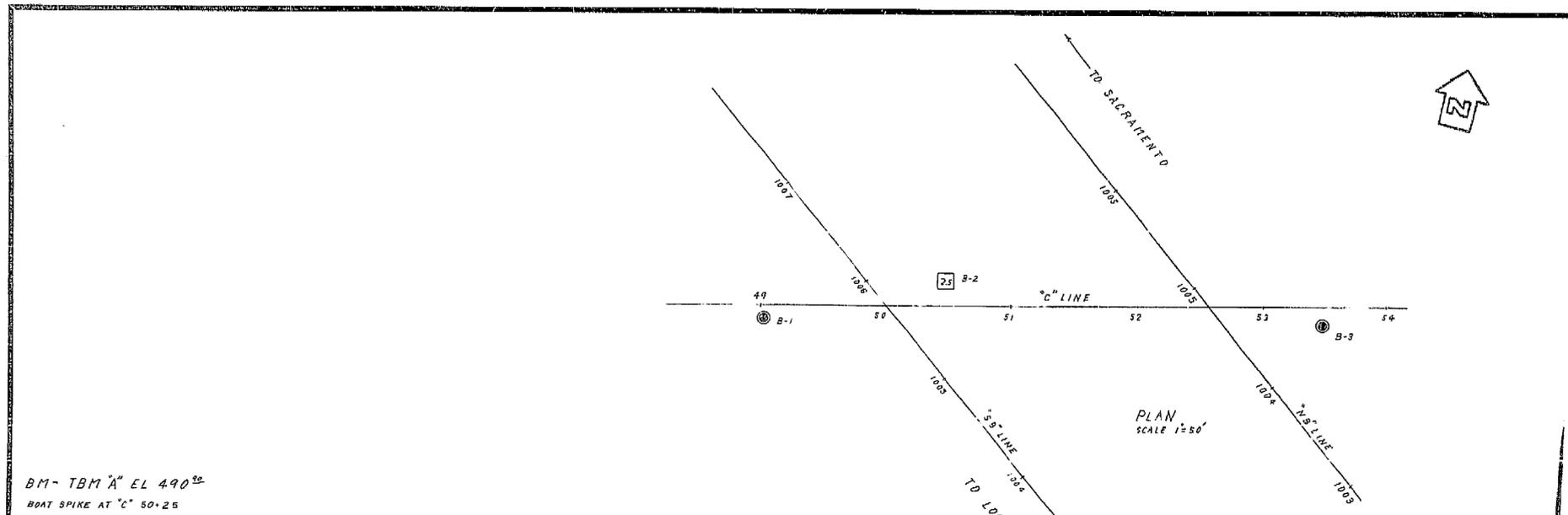
**06-Fre, Kin-5 PM 19.4, 19.1
 GEOTECHNICAL DESIGN REPORT**

Plate No.
 3

FED. ROAD DIV. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
7	CAL.			9	9

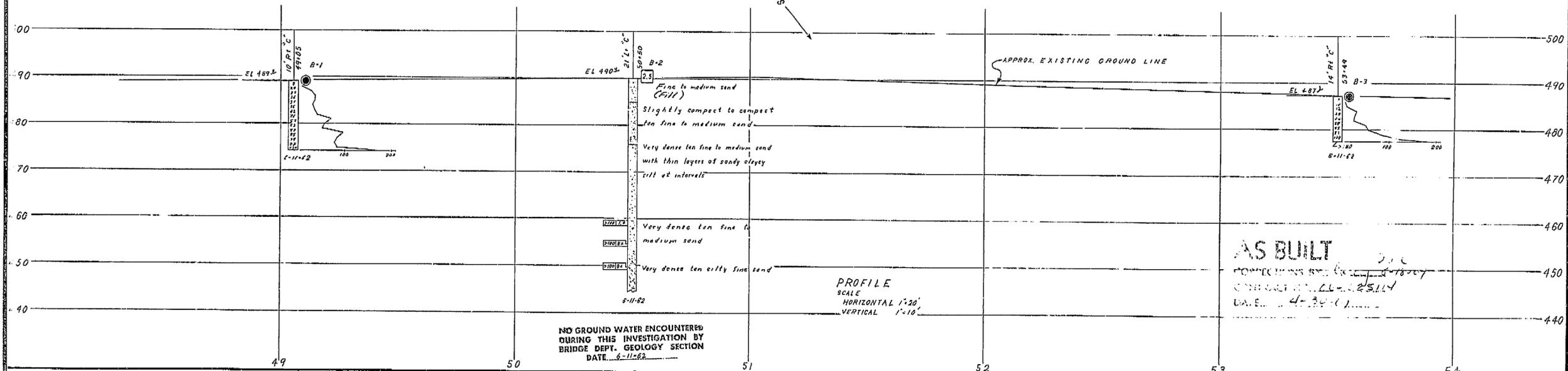
CONTRACT NO.	SECTION	SHEET NO.	TOTAL SHEETS
06-025114	5	77	91

DATE APPROVED: June 26, 1967



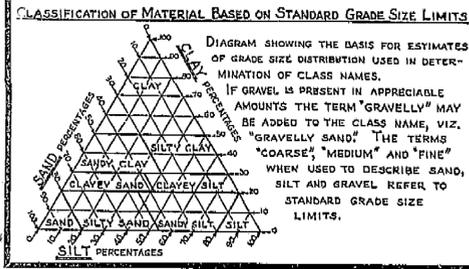
AS BUILT PLANS
 Contract No. 06-025114
 Date Completed 5-1-69
 Document No. 60000716

BM - TBM "A" EL 490.25
 BOAT SPIKE AT "C" 50+25



NO GROUND WATER ENCOUNTERED
 DURING THIS INVESTIGATION BY
 BRIDGE DEPT. GEOLOGY SECTION
 DATE 6-11-62

AS BUILT
 CORRECTIONS BY [Signature]
 CONTRACT NO. 06-025114
 DATE 4-29-69



LEGEND OF EARTH MATERIALS

GRAVEL	SILTY CLAY OR CLAYEY SILT
SAND	PEAT AND/OR ORGANIC MATTER
SILT	FILL MATERIAL
CLAY	IGNEOUS ROCK
SANDY CLAY OR CLAYEY SAND	SEDIMENTARY ROCK
SANDY SILT OR SILTY SAND	METAMORPHIC ROCK

LEGEND OF BORING OPERATIONS

● PENETROMETER	○ 2 1/2" CONE PENETROMETER
□ SAMPLER BORING (DRY)	□ ROTARY BORING (WET)
□ AUGER BORING (DRY)	□ JET BORING
□ CORE BORING	□ TEST PIT

NOTE

Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
 DEPARTMENT OF PUBLIC WORKS
 DIVISION OF HIGHWAYS

MILHAM AVENUE OVERCROSSING

LOG OF TEST BORINGS

SCALE As Noted BRIDGE 45-71 1/2 DRAWING 45-71-4

FIELD STUDY
 DRAWING
 CHECKED
 APPROVED

70