

# INFORMATION HANDOUT

For Contract No. 05-1G4604  
At 05-SLO-101-R24.3

Identified by  
Project ID 0515000032

## MATERIALS INFORMATION

Water Source Information

Portions of NOA, ADL, and Asbestos and Lead Containing paint Survey

## PRODUCT INFORMATION

Alternative In Line Terminal System

SKT MGS

X Lite

X Tension

SOFT STOP

Alternative Flared Terminal System

FLEAT

SRT

X Tension

Transition Detail for 31" Terminal System End Treatment with Railing Splicing at Posts to MGS

11/20/2015

Ron Kramer, Senior Project Engineer  
Caltrans D5, Design II  
50 Higuera  
San Luis Obispo, CA 93401

**Subject:** Santa Fe Bridge Rail Replacement Project, Contract Number 05-1G4604

Mr. Kramer

I am confirming that we are able to supply at least 13,500 gallons of non-potable water for the Santa Fe Bridge Rail Replacement Project (Contract # 05-1G4604) from our Ready-Mixed Concrete (RMC) Plant. The San Luis Obispo RMC Plant is approximately 2 miles north-east of the Santa Fe Bridge at 131 Suburban Road, San Luis Obispo, CA 93401. We are able accommodate contractor needs with our existing water fill infrastructure. Contractors interested in obtaining non-potable water, ready-mixed concrete, or aggregate products should contact Joel Cabreros at 805-391-3087 to discuss pricing.

Sincerely,



Ben Calo, M.S.  
Operations Specialist

cc: Eric Riddiough  
Joel Cabreros

**STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION**

**INFORMATIONAL HANDOUT**

05-SLO-101-24.3  
Santa Fe UC Bridge Rail Repair & Shoulder Widen  
05-1G4601

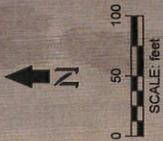
October 15, 2015

INDEX

Portions of NOA, ADL, and Asbestos and Lead Containing Paint Survey  
Report

Department of Transportation  
Construction Department  
1150 Laurel Lane  
San Luis Obispo, CA 93403

- LEGEND:**
- Approximate Location of Serpentine Outcropping/Exposure Area. (subsurface conditions can vary and are unknown)
  - NOC  North Outcropping Sample Location
  - SOC  South Outcropping Sample Location
  - A  Aerially-deposited Lead Boring Location
  - S  Shoulder Boring Location (proposed fill area)



**GEOCON CONSULTANTS, INC.**  
 4071 BIRDA STREET, LIVERMORE, CA 94550, PHONE 925.371.9900, FAX 925.371.9915

**Santa Fe Undercrossing Bridge Rail Repair**  
 San Luis Obispo, California

**GEOCON Proj. No. S9800-02-58**

**SITE PLAN**

EA No. 05-164601      October 2015      Figure 2

**TABLE 2**  
**Summary of Lead and pH Results**  
**US-101/Santa Fe UC**  
**San Luis Obispo, California**

| Sample ID | Sample Depth (feet) | Total Lead (mg/kg) | WET Lead (mg/l) | DI-WET Lead (mg/l) | TCLP Lead (mg/l) | pH  |
|-----------|---------------------|--------------------|-----------------|--------------------|------------------|-----|
| A1-0      | 0 to 0.5            | 56                 | 2.1             | ---                | ---              | 7.5 |
| A1-0.5    | 0.5 to 1            | 9.8                | ---             | ---                | ---              | --- |
| A1-1      | 1 to 1.5            | 10                 | ---             | ---                | ---              | --- |
| A1-1.5    | 1.5 to 2            | 13                 | ---             | ---                | ---              | --- |
| A1-2      | 2 to 2.5            | 5.3                | ---             | ---                | ---              | --- |
| A1-3      | 3 to 3.5            | 12                 | ---             | ---                | ---              | --- |
| A1-4      | 4 to 4.5            | 7.9                | ---             | ---                | ---              | --- |
| A2-0      | 0 to 0.5            | 13                 | ---             | ---                | ---              | --- |
| A2-0.5    | 0.5 to 1            | 3.0                | ---             | ---                | ---              | 7.6 |
| A2-1      | 1 to 1.5            | 2.0                | ---             | ---                | ---              | --- |
| A3-0      | 0 to 0.5            | 41                 | ---             | ---                | ---              | --- |
| A3-0.5    | 0.5 to 1            | 19                 | ---             | ---                | ---              | --- |
| A3-1      | 1 to 1.5            | 8.9                | ---             | ---                | ---              | 8.4 |
| A3-1.5    | 1.5 to 2            | 18                 | ---             | ---                | ---              | --- |
| A3-2      | 2 to 2.5            | 23                 | ---             | ---                | ---              | --- |
| A4-0      | 0 to 0.5            | 72                 | 4.3             | ---                | ---              | --- |
| A4-0.5    | 0.5 to 1            | 12                 | ---             | ---                | ---              | --- |
| A5-0      | 0 to 0.5            | 7.3                | ---             | ---                | ---              | --- |
| A5-0.5    | 0.5 to 1            | 3.4                | ---             | ---                | ---              | --- |
| A5-1      | 1 to 1.5            | 5.1                | ---             | ---                | ---              | --- |
| A5-1.5    | 1.5 to 2            | 6.6                | ---             | ---                | ---              | --- |
| A5-2      | 2 to 2.5            | 9.1                | ---             | ---                | ---              | 9.0 |
| A6-0      | 0 to 0.5            | 67                 | 1.7             | ---                | ---              | 7.8 |
| A6-0.5    | 0.5 to 1            | 33                 | ---             | ---                | ---              | --- |
| A6-1      | 1 to 1.5            | 23                 | ---             | ---                | ---              | --- |
| A6-1.5    | 1.5 to 2            | 5.8                | ---             | ---                | ---              | --- |
| A6-2      | 2 to 2.5            | 4.6                | ---             | ---                | ---              | --- |
| A7-0      | 0 to 0.5            | 240                | 7.9             | <1.0               | 0.098            | --- |
| A7-0.5    | 0.5 to 1            | 150                | 8.0             | <1.0               | 0.087            | 8.9 |
| A7-1      | 1 to 1.5            | 120                | 6.2             | <1.0               | <0.050           | --- |
| A7-1.5    | 1.5 to 2            | 35                 | ---             | ---                | ---              | --- |
| A7-2      | 2 to 2.5            | 10                 | ---             | ---                | ---              | --- |
| A8-0      | 0 to 0.5            | 45                 | ---             | ---                | ---              | --- |
| A8-0.5    | 0.5 to 1            | 10                 | ---             | ---                | ---              | --- |
| A8-1      | 1 to 1.5            | 9.2                | ---             | ---                | ---              | 9.1 |
| A8-1.5    | 1.5 to 2            | 11                 | ---             | ---                | ---              | --- |
| A8-2      | 2 to 2.5            | 13                 | ---             | ---                | ---              | --- |

**TABLE 2**  
**Summary of Lead and pH Results**  
**US-101/Santa Fe UC**  
**San Luis Obispo, California**

| Sample ID                       | Sample<br>Depth<br>(feet) | Total<br>Lead<br>(mg/kg) | WET<br>Lead<br>(mg/l) | DI-WET<br>Lead<br>(mg/l) | TCLP<br>Lead<br>(mg/l) | pH |
|---------------------------------|---------------------------|--------------------------|-----------------------|--------------------------|------------------------|----|
| <u>Hazardous Waste Criteria</u> |                           |                          |                       |                          |                        |    |
|                                 | TTL (mg/kg)               | 1,000                    | ---                   | ---                      | ---                    |    |
|                                 | STL (mg/l)                | ---                      | 5.0                   | ---                      | ---                    |    |
|                                 | TCL (mg/l)                | ---                      | ---                   | ---                      | 5.0                    |    |

**Notes:**

- mg/kg = Milligrams per kilogram
- mg/l = Milligrams per liter
- TCLP = Toxicity Characteristic Leaching Procedure
- TTL = Total Threshold Limit Concentration
- STL = Soluble Threshold Limit Concentration
- WET = Waste Extraction Test using citric acid as the extraction fluid
- DI-WET = Waste Extraction Test using deionized water as the extraction fluid

**TABLE 5**  
**Summary of NOA Results**  
**US-101/Santa Fe UC**  
**San Luis Obispo, California**

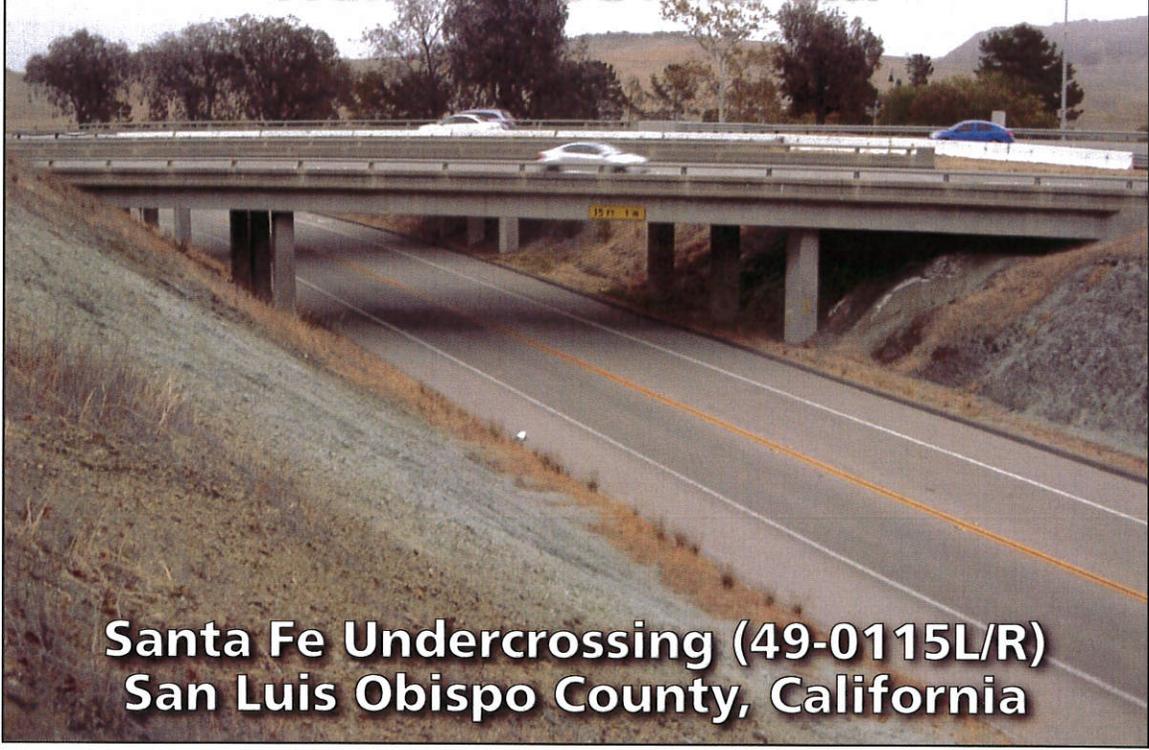
| Sample ID | Sample Depth (feet) | Asbestos Content |
|-----------|---------------------|------------------|
| A1-0      | 0 to 0.5            | 2.25%            |
| A1-1      | 1 to 1.5            | <0.25%           |
| A1-2      | 2 to 2.5            | <0.25%           |
| A1-3      | 3 to 3.5            | <0.25%           |
| A1-4      | 4 to 4.5            | <0.25%           |
| A2-0      | 0 to 0.5            | 3.00%            |
| A2-1      | 1 to 1.5            | 3.75%            |
| A3-0      | 0 to 0.5            | None Detected    |
| A3-1      | 1 to 1.5            | None Detected    |
| A3-2      | 2 to 2.5            | None Detected    |
| A4-0      | 0 to 0.5            | <0.25%           |
| A4-0.5    | 0.5 to 1            | <0.25%           |
| A5-0      | 0 to 0.5            | 2.00%            |
| A5-1      | 1 to 1.5            | 2.50%            |
| A5-2.5    | 2.5 to 3            | None Detected    |
| A6-0      | 0 to 0.5            | 2.25%            |
| A6-1      | 1 to 1.5            | <0.25%           |
| A6-2      | 2 to 2.5            | 3.50%            |
| A7-0      | 0 to 0.5            | <0.25%           |
| A7-1      | 1 to 1.5            | <0.25%           |
| A7-2      | 2 to 2.5            | None Detected    |
| A7-3      | 3 to 3.5            | <0.25%           |
| A7-4      | 4 to 4.5            | None Detected    |
| A8-0      | 0 to 0.5            | <0.25%           |
| A8-1      | 1 to 1.5            | None Detected    |
| A8-2      | 2 to 2.5            | <0.25%           |
| A8-3      | 3 to 3.5            | None Detected    |
| A8-4      | 4 to 4.5            | None Detected    |
| NOC-TOP   | Surface             | 10.00%           |
| NOC-MID   | Surface             | 14.75%           |
| NOC-BOT   | Surface             | 13.75%           |

**TABLE 5**  
**Summary of NOA Results**  
**US-101/Santa Fe UC**  
**San Luis Obispo, California**

| Sample ID | Sample Depth (feet) | Asbestos Content |
|-----------|---------------------|------------------|
| SOC-TOP   | Surface             | 12.25%           |
| SOC-MID   | Surface             | 13.00%           |
| SOC-BOT   | Surface             | 15.00%           |
| S9-0      | 0 to 0.5            | 0.50%            |
| S9-1      | 1 to 1.5            | <0.25%           |
| S10-0     | 0 to 0.5            | <0.25%           |
| S10-1     | 1 to 1.5            | 0.50%            |
| S11-0     | 0 to 0.5            | <0.25%           |
| S11-1     | 1 to 1.5            | <0.25%           |

ND = None detected at 0.25% target analytical sensitivity.

# ASBESTOS AND LEAD-CONTAINING PAINT SURVEY REPORT



**Santa Fe Undercrossing (49-0115L/R)  
San Luis Obispo County, California**

**PREPARED FOR:**

**CALIFORNIA DEPARTMENT OF TRANSPORTATION  
DISTRICT 5  
50 HIGUERA STREET  
SAN LUIS OBISPO, CALIFORNIA**



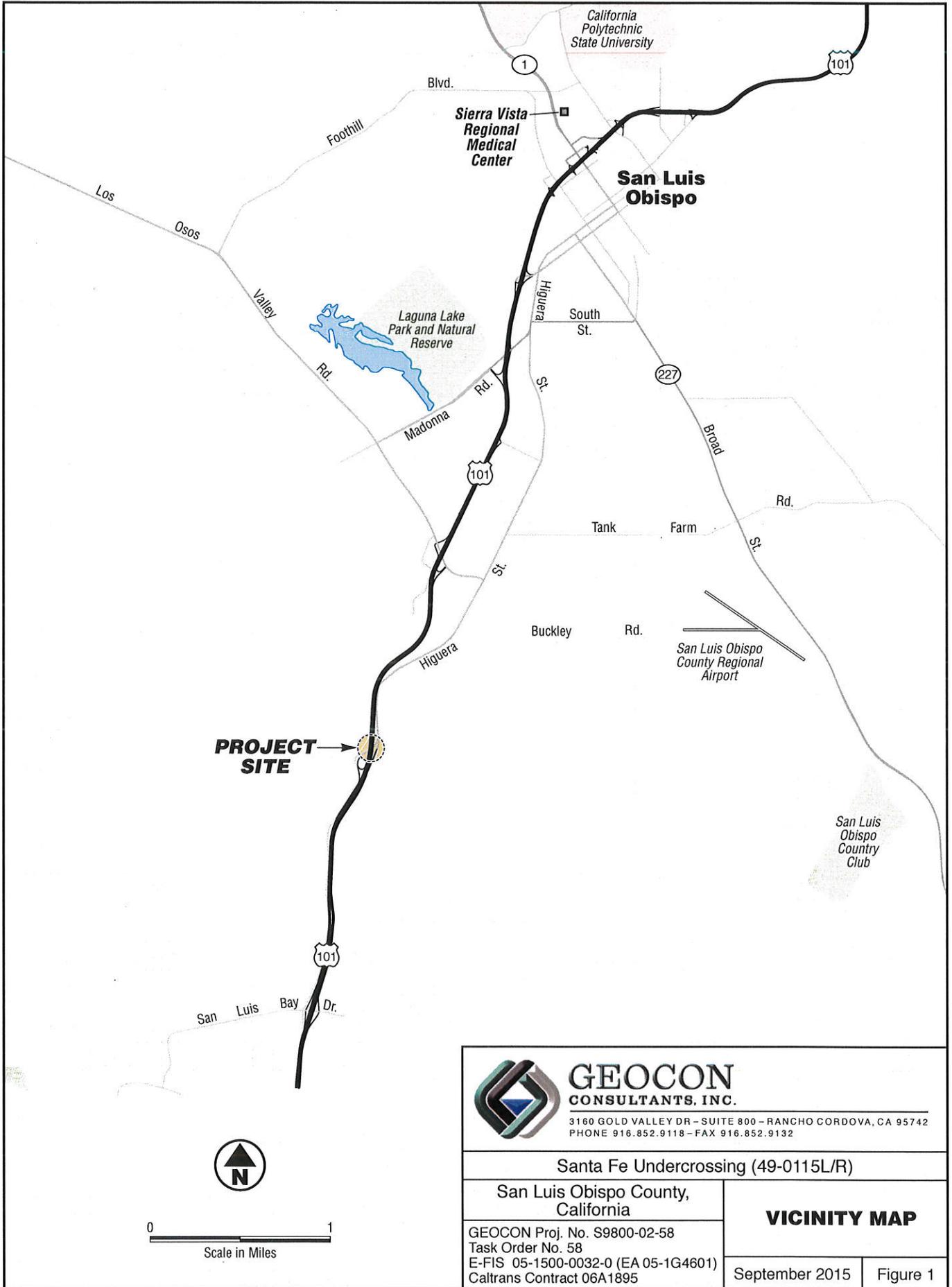
**PREPARED BY:**

**GEOCON CONSULTANTS, INC.  
3160 GOLD VALLEY DRIVE, SUITE 800  
RANCHO CORDOVA, CALIFORNIA 95742**



**GEOCON PROJECT NO. S9800-02-58  
TASK ORDER NO. 58  
E-FIS 05-1500-0032-0 (EA 05-1G4601)  
CONTRACT NO. 06A1895**

**SEPTEMBER 2015**



**GEOCON**  
CONSULTANTS, INC.

3160 GOLD VALLEY DR - SUITE 800 - RANCHO CORDOVA, CA 95742  
PHONE 916.852.9118 - FAX 916.852.9132

Santa Fe Undercrossing (49-0115L/R)

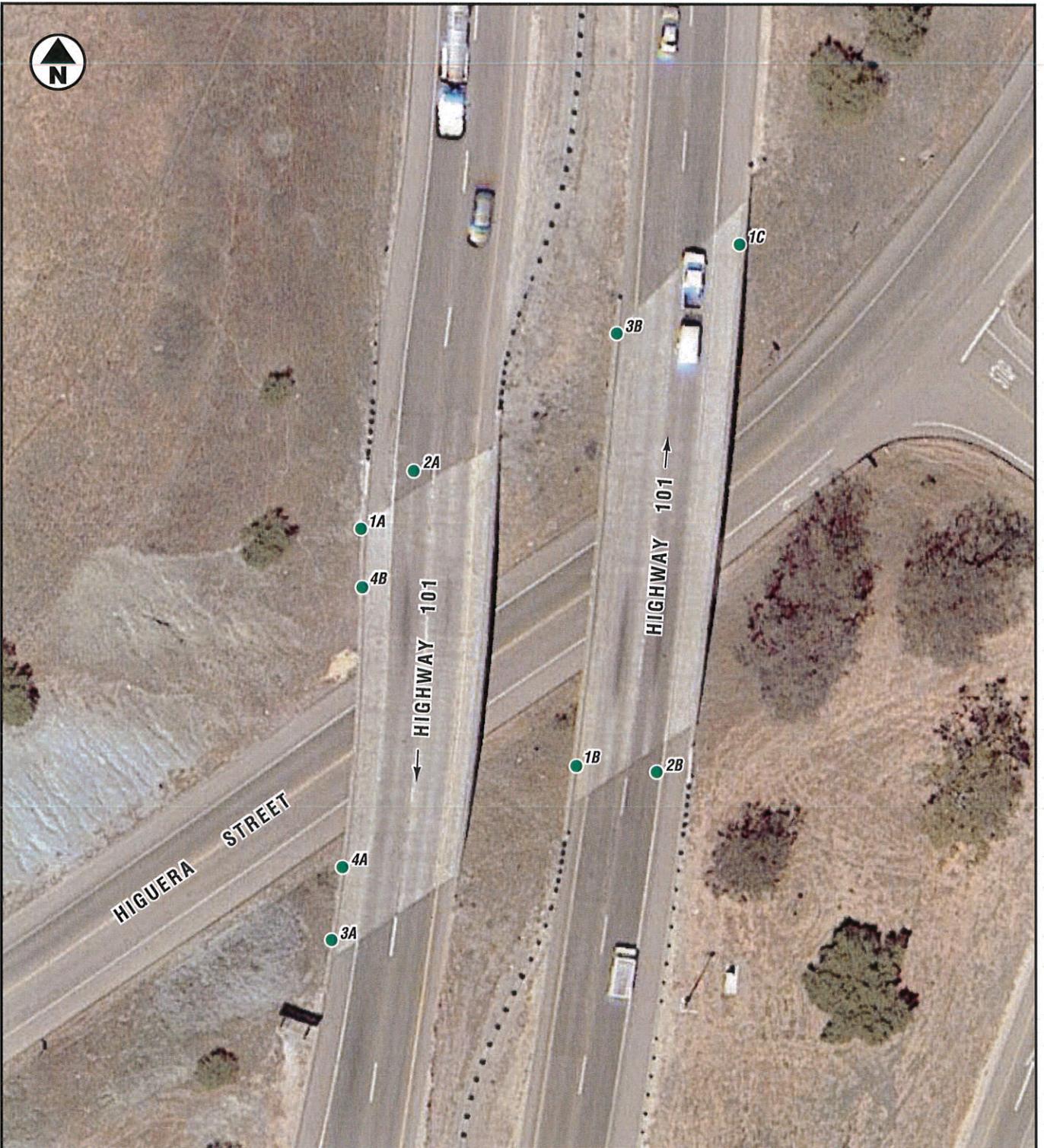
San Luis Obispo County,  
California

**VICINITY MAP**

GEOCON Proj. No. S9800-02-58  
Task Order No. 58  
E-FIS 05-1500-0032-0 (EA 05-1G4601)  
Caltrans Contract 06A1895

September 2015

Figure 1



LEGEND:

- Approximate Asbestos Sample Location



**GEOCON**  
CONSULTANTS, INC.

3160 GOLD VALLEY DR - SUITE 800 - RANCHO CORDOVA, CA 95742  
PHONE 916.852.9118 - FAX 916.852.9132

Santa Fe Undercrossing (49-0115L/R)

San Luis Obispo County,  
California

GEOCON Proj. No. S9800-02-58  
Task Order No. 58  
E-FIS 05-1500-0032-0 (EA 05-1G4601)  
Caltrans Contract 06A1895

**SITE PLAN**

September 2015

Figure 2



**Photo 1 – Santa Fe UC (49-0115L/R) at PM 24.3 on Highway 101 in San Luis Obispo County, California**



**Photo 2 – Bridge span and columns**



**Photo 3 – Bridge deck and barriers (barrier rail shims are asbestos sheet packing)**



**GEOCON**  
CONSULTANTS, INC.

3160 GOLD VALLEY DR - SUITE 800 - RANCHO CORDOVA, CA 95742  
PHONE 916.852.9118 - FAX 916.852.9132

**PHOTOGRAPHS 1, 2, & 3**

Santa Fe Undercrossing  
San Luis Obispo County, California

S9800-02-58

September 2015



Photo 4 – Bridge expansion joint

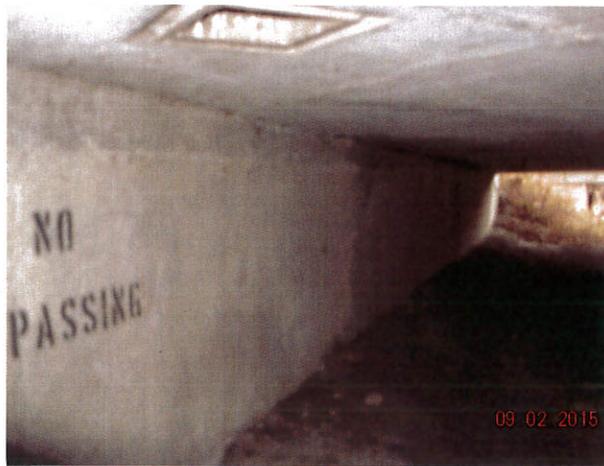


Photo 5 – Bridge abutment



Photo 6 – Bridge deck



**GEOCON**  
CONSULTANTS, INC.

3160 GOLD VALLEY DR - SUITE 800 - RANCHO CORDOVA, CA 95742  
PHONE 916.852.9118 - FAX 916.852.9132

**PHOTOGRAPHS 4, 5, & 6**

Santa Fe Undercrossing  
San Luis Obispo County, California

S9800-02-58

September 2015

TABLE 1  
 SUMMARY OF ANALYTICAL LABORATORY TEST RESULTS - ASBESTOS  
 SANTA FE UNDERCROSSING (49-0115L/R)  
 CALTRANS CONTRACT 06A1895, TASK ORDER NO. 58, E-FIS 05-1500-0032-0 (EA 05-1G4601)  
 SAN LUIS OBISPO COUNTY, CALIFORNIA  
 Polarized Light Microscopy (PLM) - EPA Test Method 600/R-93/116

| Sample Group No. | Material Description         | Approximate Quantity | Friable   | Site Photos | Asbestos Content |
|------------------|------------------------------|----------------------|-----------|-------------|------------------|
| 1                | Concrete                     | NA                   | NA        | 1 through 6 | ND               |
| 2                | Asphalt                      | NA                   | NA        | 3 and 6     | ND               |
| 3                | Joint fill material          | NA                   | NA        | 4           | ND               |
| 4                | <b>Sheet packing (shims)</b> | <b>3 square feet</b> | <b>No</b> | <b>3</b>    | <b>35%</b>       |

Notes:

NA = Not applicable (asbestos not detected)  
 ND = Not detected



Air Pollution Control District  
San Luis Obispo County

October 7, 2015

Caltrans  
Yvonne Hoffmann  
50 Higuera Street  
San Luis Obispo CA 93401

**SUBJECT:** Caltrans Agreement for Construction Projects Less than One Acre within the County of San Luis Obispo and Associated Asbestos Dust Control Measures

Dear Ms. Hoffmann:

The District has received your latest submittal for compliance with the California Code of Regulations Section 93105 Naturally Occurring Asbestos ATCM (NOA).

After review of the documentation, the District approves and recognizes the Blanket Agreement for Caltrans Construction Projects Less than One Acre as of the date of this letter. The first applicable project will be the Santa Fe Underscrossing Bridge Rail.

**The Plan is specific for projects in NOA disturbing less than one acre.** For projects of grading or soil disturbance of greater than 1 acre, additional requirements apply. This approval does not relieve Caltrans or their Contractors, from any other necessary approvals by other agencies such as Cal-OSHA. If Caltrans or its Contractors subsequently increase the scope of work beyond one acre with any naturally occurring asbestos, serpentine, or ultramafic rock in the project disturbance area, then:

1. Caltrans or operator must comply with the requirements of CCR 93105;
2. Caltrans or operator must report the increase of scope to the APCO no later than the next business day.

Thank you for your forward thinking and assistance in implementing the provisions of this regulation. For questions regarding equipment permitting, please call our Compliance and Engineering Division. If you have any questions regarding this authorization, please contact me at (805) 781-5912.

Very truly yours,

A handwritten signature in black ink, appearing to read "Tim Fuhs".

Tim Fuhs  
Air Quality Specialist

cc: Joel Kloth, PG - Caltrans

h:\plan\ceqa\project\_review\3000\3900\3925-1\noa\_adcm.doc

**DEPARTMENT OF TRANSPORTATION**

50 HIGUERA STREET  
SAN LUIS OBISPO, CA 93401-5415  
PHONE (805) 542-4759  
FAX (805) 549-3233  
TTY 711  
<http://www.dot.ca.gov/dist05/>



*Serious drought  
Help save water!*

October 5, 2015

Tim Fuhs  
San Luis Obispo County, APCD  
3433 Roberto Court  
San Luis Obispo, CA 93401

Dear Mr. Fuhs:

Attached is a proposed blanket agreement to for any Caltrans projects constructed in the County of San Luis Obispo where Naturally Occurring Asbestos (NOA) is likely to be found. If the blanket proposal is approved, the eligible projects would disturb less than an acre and would implement adequate dust measures to address NOA as required by the California Code of Regulations, Title 17 Section 93105, "Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations".

The project known as the Santa Fe Undercrossing Bridge Rails project is the first project that would fall under this blanket approval. The project will reconstruct a section of damaged bridge rail, widen the shoulders on U.S. 101, and require that the bridge false work be constructed from South Higuera Street, which lies below the bridge, not far from the southbound onramp and Johnson Ranch trailhead. A map is attached.

A check for \$287.00 is enclosed to cover the fee per the attached fee schedule.

Sincerely,

  
YVONNE HOFFMANN  
Associate Environmental Planner

Enclosure

**Blanket Agreement -- Caltrans Construction Projects (< 1-acre disturbance)  
For Grading Within San Luis Obispo County**

Caltrans typically tries to minimize construction work in areas that might impact Naturally Occurring Asbestos (NOA) materials. However, there are situations where grading of these materials cannot be avoided due to the nature of the job.

Testing for NOA and Aerially Deposited Lead occur during the project's design phase. If a geological evaluation determines the presence of NOA, serpentine, or ultramafic rock within the project limits that cannot be avoided during project construction, the following dust control measures will be incorporated into the contract specifications.

- (1) Areas of one acre or less meeting the criteria in subsections (b)(1) or (b)(2): No person shall engage in any construction or grading operation on property where the area to be disturbed is one (1.0) acre or less unless all of the following dust mitigation measures are initiated at the start and maintained throughout the duration of the construction or grading activity:
  - (A) Construction vehicle speed at the work site must be limited to fifteen (15) miles per hour or less;
  - (B) Prior to any ground disturbance, sufficient water must be applied to the area to be disturbed to prevent visible emissions from crossing the property line;
  - (C) Areas to be graded or excavated must be kept adequately wetted to prevent visible emissions from crossing the property line;
  - (D) Storage piles must be kept adequately wetted, treated with a chemical dust suppressant, or covered when material is not being added to or removed from the pile;
  - (E) Equipment must be washed down before moving from the property onto a paved public road; and
  - (F) Visible track-out on the paved public road must be cleaned using wet sweeping or a HEPA filter equipped vacuum device within twenty-four (24) hours.

In addition, Caltrans will meet the following regulations that deal specifically with road projects and road maintenance, which includes slides or other related issues.

(d) Requirements for Road Construction and Maintenance. These requirements shall apply to roads that are not part of a construction or grading project, quarry, or surface mine.

(1) No person shall conduct any road construction or maintenance activities that disturb any area that meets any criterion listed in subsections (b)(1) or (b)(2) unless all of the following conditions are met.

(A) The APCD is notified in writing at least fourteen (14) days before the beginning of the activity or in accordance with a procedure approved by the district.

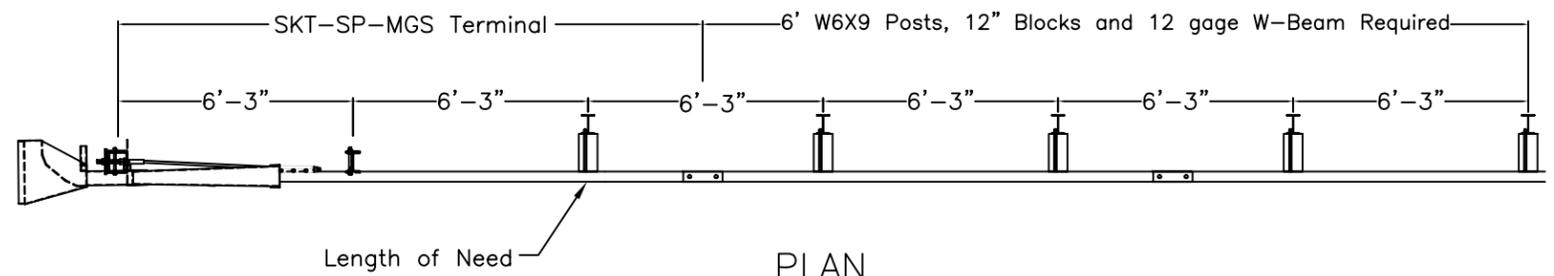
(B) All the following dust control measures are implemented during any road construction or maintenance activity:

1. Unpaved areas subject to vehicle traffic must be stabilized by being kept adequately wetted, treated with a chemical dust suppressant, or covered with material that contains less than 0.25 percent asbestos;
2. The speed of any vehicles and equipment traveling across unpaved areas must be no more than fifteen (15) miles per hour unless the road surface and surrounding area is sufficiently stabilized to prevent vehicles and equipment traveling more than 15 miles per hour from emitting dust that is visible crossing the project boundaries;
3. Storage piles and disturbed areas not subject to vehicular traffic must be stabilized by being kept adequately wetted, treated with a chemical dust suppressant, or covered with material that contains less than 0.25 percent asbestos; and
4. Activities must be conducted so that no track-out from any road construction project is visible on any paved roadway open to the public.

- (C) Equipment and operations must not cause the emission of any dust that is visible crossing the project boundaries.
- (2) No person shall conduct any road construction or maintenance activity that disturbs the ground surface in an area that meets the criteria in subsection (b)(3) unless:
  - (A) The APCD is notified no later than the next business day of the discovery that the area meets the criteria in subsection (b)(3); and
  - (B) The requirements of subsections (d)(1)(B) through (d)(1)(C), are implemented within twenty-four (24) hours of the discovery.
- (3) Exemptions from the Requirements for Road Construction and Maintenance. The following exemptions may apply in addition to the applicable general exemptions specified in subsection (c).
  - (A) Emergency Road Repairs: Subsection (d)(1)(A) shall not apply when construction of a road or firebreak, or a road repair is necessary due to a landslide, flood, or other emergency or to mitigate a condition that constitutes an imminent hazard to the public. The owner/operator shall notify the APCD no later than the next business day of the action taken and the condition establishing the applicability of this subsection.
  - (B) Remote locations: The APCD may provide an exemption from the requirements of subsection (d) for any activity which will occur at a remote location.
    1. The district shall grant or deny a request for an exemption within ninety (90) days of the receipt of a complete application.
    2. If the request for an exemption is denied, the APCD shall provide written reasons for the denial.

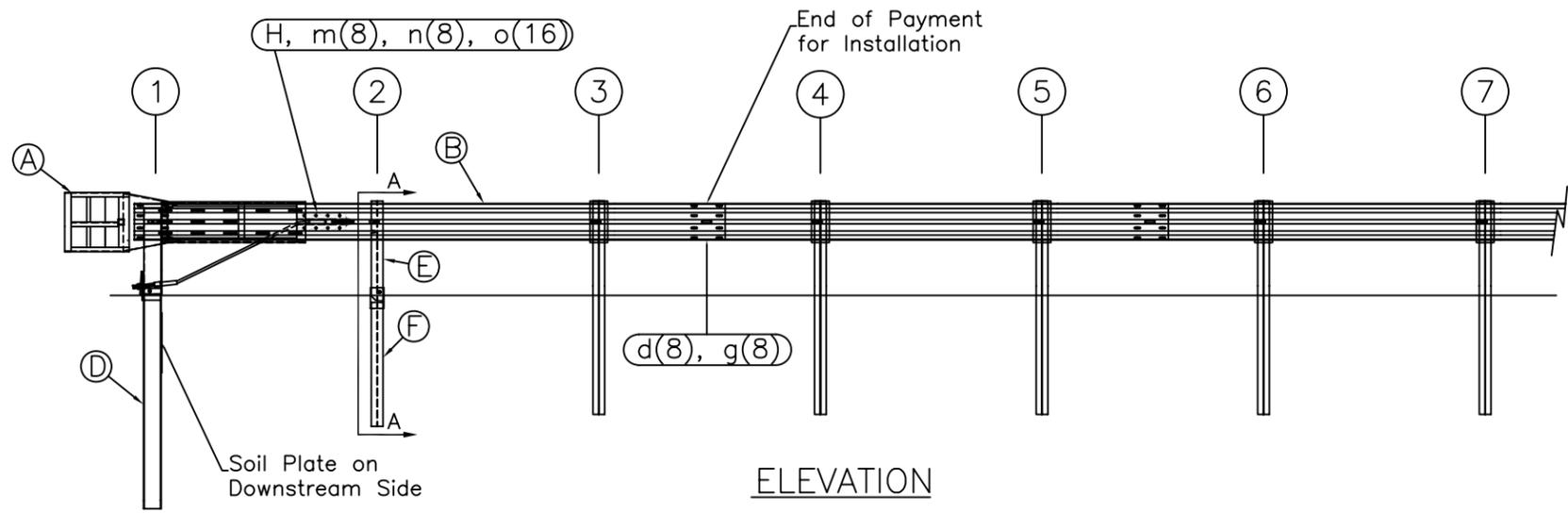
Caltrans Contact: Joel Kloth, PG  
Engineering Geologist  
Phone: (805) 549-3196 Email: [joel.kloth@dot.ca.gov](mailto:joel.kloth@dot.ca.gov)

Approved by: \_\_\_\_\_, San Luis Obispo County APCD

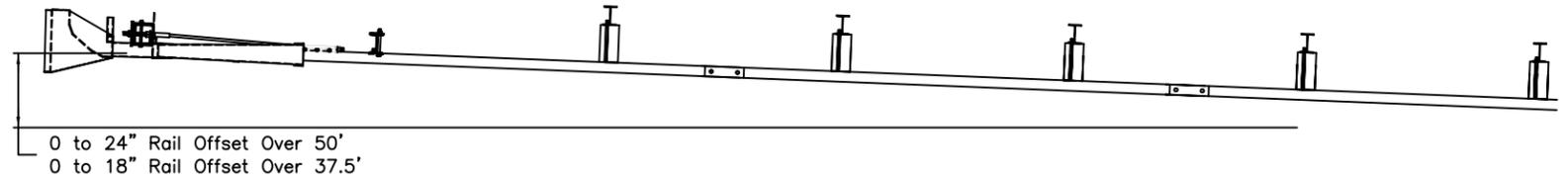


PLAN

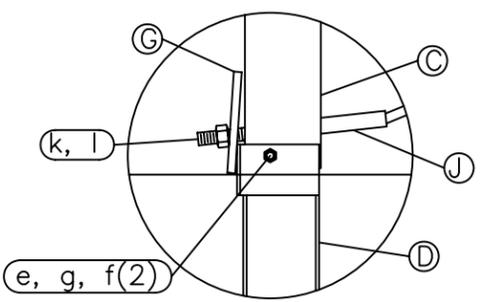
TRAFFIC →



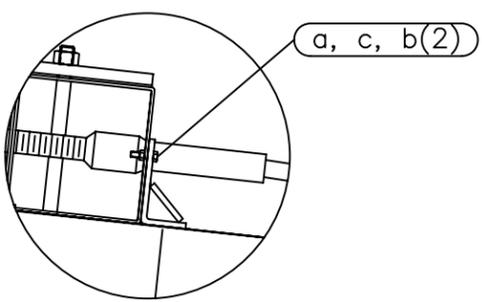
ELEVATION



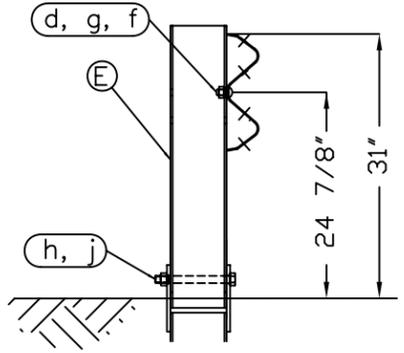
OPTIONAL FLARED INSTALLATION  
25:1 maximum flare rate



Post #1 Connection Detail



Impact Head Connection Detail



SECTION A-A  
Post #2

| ITEM | QTY | BILL OF MATERIALS                          | ITEM NO.   |
|------|-----|--|------------|
| A    | 1   | IMPACT HEAD                                | S3000      |
| B    | 1   | W-BEAM GUARDRAIL END SECTION, 12 Ga.       | MGS-SF1303 |
| C    | 1   | FIRST POST TOP (6X6X $\frac{1}{2}$ " Tube) | TPHP1A     |
| D    | 1   | FIRST POST BOTTOM (6' W6X15)               | TPHP1B     |
| E    | 1   | SECOND POST ASSEMBLY TOP                   | UHP2A      |
| F    | 1   | SECOND POST ASSEMBLY BOTTOM                | HP3B       |
| G    | 1   | BEARING PLATE                              | E750       |
| H    | 1   | CABLE ANCHOR BOX                           | S760       |
| J    | 1   | BCT CABLE ANCHOR ASSEMBLY                  | E770       |

| HARDWARE (ALL DIMENSIONS IN INCHES) |    |  |           |
|-------------------------------------|----|--|-----------|
| a                                   | 2  | 5/16 x 1 HEX BOLT GRD 5                | B5160104A |
| b                                   | 4  | 5/16 WASHER                            | W0516     |
| c                                   | 2  | 5/16 HEX NUT                           | N0516     |
| d                                   | 9  | 5/8 Dia. x 1 1/4 SPLICE BOLT (POST #2) | B580122   |
| e                                   | 1  | 5/8 Dia. x 9 HEX BOLT GRD 5            | B580904A  |
| f                                   | 3  | 5/8 WASHER                             | W050      |
| g                                   | 10 | 5/8 Dia. H.G.R NUT                     | N050      |
| h                                   | 1  | 3/4 Dia. x 8 1/2 HEX BOLT GRD A449     | B340854A  |
| j                                   | 1  | 3/4 Dia. HEX NUT                       | N030      |
| k                                   | 2  | 1 ANCHOR CABLE HEX NUT                 | N100      |
| l                                   | 2  | 1 ANCHOR CABLE WASHER                  | W100      |
| m                                   | 8  | CABLE ANCHOR BOX SHOULDER BOLT         | SB58A     |
| n                                   | 8  | 1/2 A325 STRUCTURAL NUT                | N055A     |
| o                                   | 16 | 1 1/16 OD x 9/16 ID A325 STR. WASHER   | W050A     |

GENERAL NOTES:

- All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
- The lower sections of the Posts 1&2 shall not protrude more than 4 in above the ground (measured along a 5' cord). Site grading may be necessary to meet this requirement.
- The lower sections of the hinged posts should not be driven with the upper post attached. If the post is placed in a drilled hole, the backfill material must be satisfactorily compacted to prevent settlement.
- When competent rock is encountered, a 12"  $\varnothing$  post hole, 20 in. deep cored into the rock surface may be used if approved by the engineer for post 1. Granular material will be placed in the bottom of the hole, approximately 2.5" deep to provide drainage. The first post can be field cut to length, placed in the hole and backfilled with suitable backfill. The soil plate may be trimmed if required.
- A site evaluation should be considered if there is less than 25' between the outlet side of the terminal and any adjacent driving lane.
- The breakaway cable assembly must be taut. A locking device (vice grips or channel lock pliers) should be used to prevent the cable from twisting when tightening nuts.



|   |  |        |          |
|---|--|--------|----------|
| <b>SKT-SP-MGS Terminal<br/>Midwest Guardrail System<br/>31" Top of Rail</b> |  | Sheet: | 1        |
|   |  | Date:  | 02/24/10 |
| Drawing Name:<br>SKT-SP-S-MGS   |  | By:    | JRR      |
|   |  | Scale: | None     |
|   |  | Rev:   | 0        |

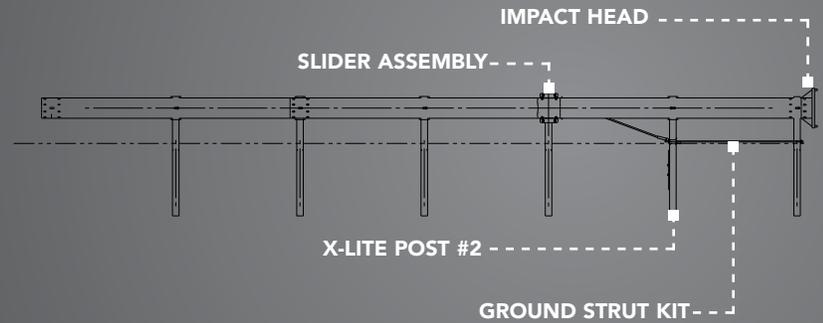
## X-LITE® | REDIRECTIVE, GATING GUARDRAIL TERMINAL

- LOW COST HAZARD PROTECTION
- AVAILABLE AS A TANGENT OR FLARED SYSTEM
- SIMPLE INSTALLATION
- NCHRP 350 TL-3 ACCEPTED



**PHYSICAL SPECIFICATIONS**

|                           |                   |               |
|---------------------------|-------------------|---------------|
| Classification            | R-G               |               |
| Length                    | 37' 6"            | 11.43 m       |
| Width                     | Tangent or Flared |               |
| Height                    | 27 5/8" or 31"    | 710 or 790 mm |
| Straight / Variable Flare | 4'                | 1.2 m         |
| Test Level                | NCHRP 350         | TL-3          |



**CRASHWORTHY, AFFORDABLE NCHRP 350 TL-3 END TERMINAL**

The Redirective, Gating, NCHRP 350 TL-3 X-LITE Guardrail End Terminal features excellent impact performance at an affordable price. Utilizing a superior telescoping, non-extruding design, the X-LITE Guardrail End Terminal provides the life saving performance of a redirective, gating terminal without the high cost. The X-LITE Terminal has been engineered to allow maximum interchangeably for flared and tangent roadside applications. This results in significant savings in inventory and maintenance costs. In addition, The X-LITE Terminal has been designed using many standard, non-proprietary guardrail components. The Terminal is available with I-Beam steel posts using wood or composite blockouts.

**FREQUENTLY ASKED QUESTIONS**

**What makes the X-LITE Terminal different from the other redirective, gating terminals on the market?**

The X-LITE Terminal utilizes a telescoping, non-extruding design to provide safe and consistent performance. The X-LITE Terminal is also engineered with maximum interchangeability between flared and tangent roadside applications. Lastly, The X-LITE Terminal is engineered using simple design and standard guardrail components that can be procured in kit or system form.

**Can the X-LITE Terminal be attached to concrete barrier?**

Yes, The X-LITE Terminal can be attached to concrete barrier with the addition of standard transitions.

**Can the X-LITE Terminal be installed using composite blockouts?**

Yes, The X-LITE Terminal can be installed using either wood or composite blockouts.

**FEATURES**

- » Utilizes a non-extruding, fixed impact head design
- » Uses similar components for tangent and flared systems
- » W-Beam telescopes during impact
- » 27 5/8" or 31" (710 mm or 790 mm) height option
- » Easy to install
- » Designed using many standard non-proprietary W-Beam guardrail components
- » BLON begins at post 3

**WHERE TO USE**

Side of road where a recommended clear zone and recoverable slope is attainable.

**DISTRIBUTED BY:**



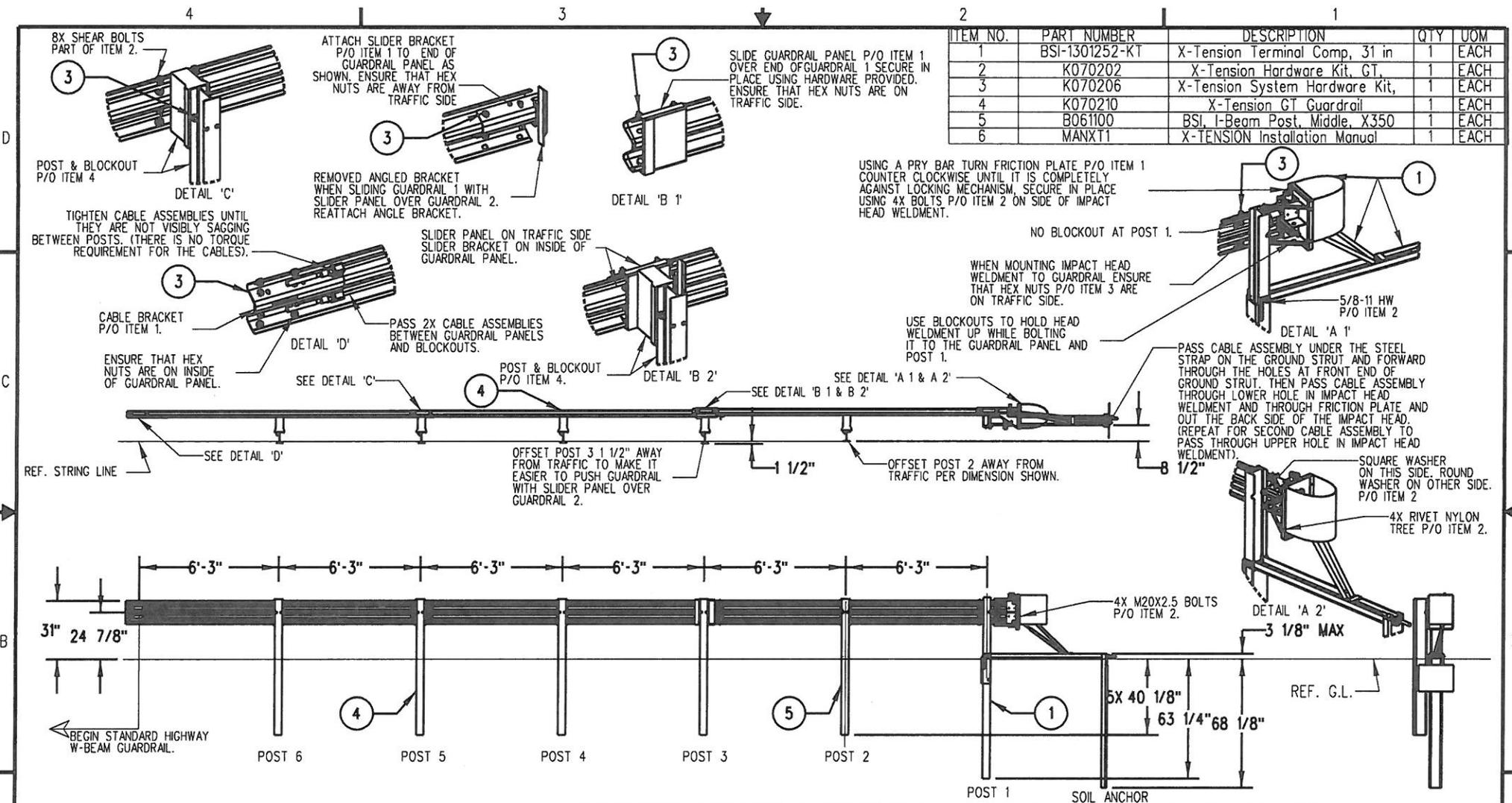
Lindsay Transportation Solutions Sales and Services, Inc.

180 River Road • Rio Vista, CA 94571 • +1 707.374.6800 U.S. Toll Free: 888.800.3691 • www.barrriersystemsinc.com

General details for the X-LITE System are subject to change without notice to reflect improvements and upgrades.

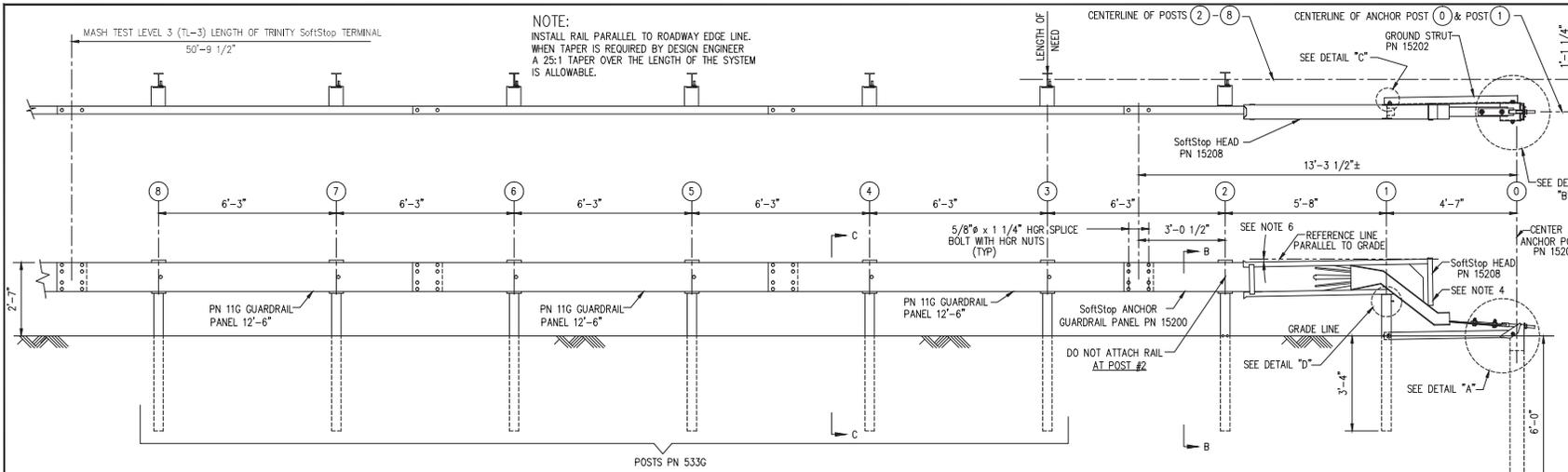
Additional information is available from Lindsay Transportation Solutions Sales and Services, Inc. © Lindsay Transportation Solutions, Inc.

PT # XL04-03252013



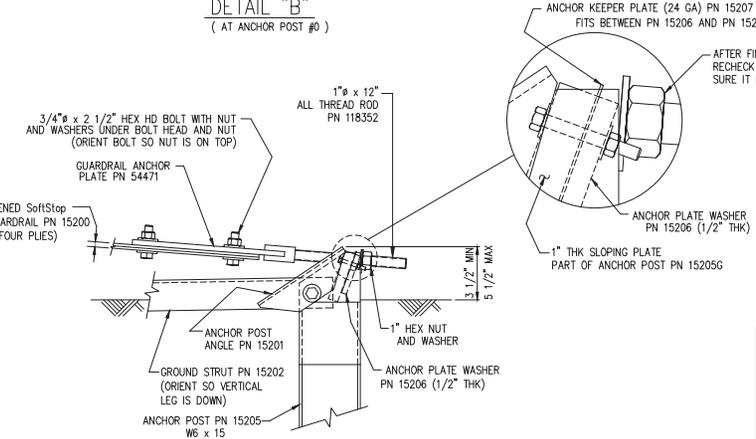
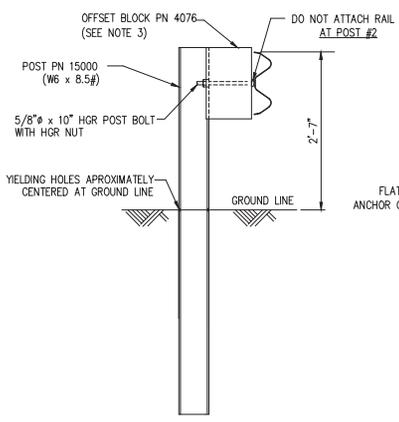
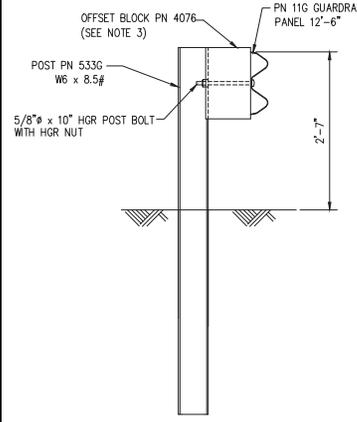
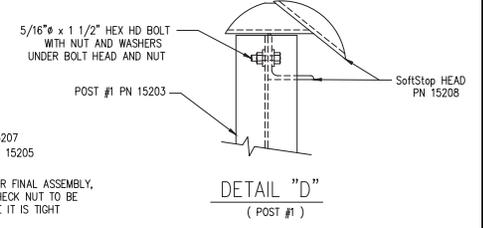
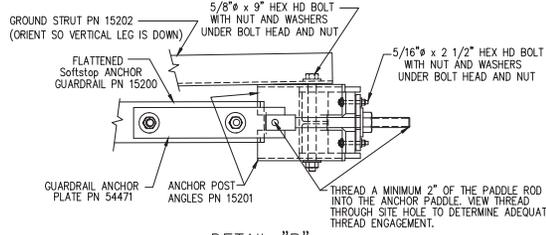
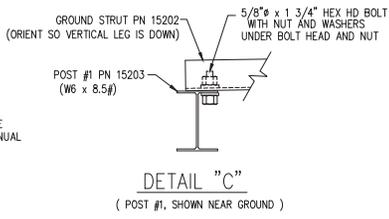
- NOTES: UNLESS OTHERWISE SPECIFIED.
- SYSTEM TO BE INSTALLED PER MANUFACTURER SPECIFICATIONS.
  - ONLY TIGHTEN THE CABLE ASSEMBLIES USING THE NUTS AT THE CABLE BRACKET (SEE DETAIL 'D'). DO NOT TIGHTEN THE CABLES AT THE FRONT OF THE GROUND ANCHOR.
  - WHEN DRIVING STEEL POST, ENSURE THAT A DRIVING CAP WITH TIMBER OR PLASTIC INSERT IS USED TO PREVENT DAMAGE TO THE GALVANIZING TO THE TOP OF THE POST.

|   |  |  |  |  |                                   |   |                                |
|---|--|--|--|--|-----------------------------------|---|--------------------------------|
| <small>© 2012 BARRIER SYSTEMS INC. THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BARRIER SYSTEMS INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF BARRIER SYSTEMS INC. IS PROHIBITED.</small> |  | <small>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACTIONS DECIMAL ANGLES ± 1/16 .XX ± .03 ± 1/2° .XXX ± .010</small> |  |  |                                   | <small>BARRIER SYSTEMS INC. 3333 Voco Valley Parkway, Ste 800 Vacaville, CA 95688 Tel: 800-800-5691 www.barriersystemsinc.com</small> |                                |
| <b>APPROVALS</b>  |  |  |  | <b>TITLE</b><br>X-TENSION GUARDRAIL TERMINAL SYSTEM<br>STEEL POST WITH COMPOSITE BLOCKOUT<br>31" RAIL HEIGHT |                                   |   |                                |
| <small>DRAWN BY:</small> NMV<br><small>DRAWN DATE:</small> 2/08/13<br><small>APPR'D BY:</small> JMT<br><small>APPR'D DATE:</small> 2/08/13  | <small>THRD ANGLE PROJECTION</small><br> | <small>REV</small><br>2067<br>2022   | <small>DATE</small><br>03/02/13<br>2/08/13 | <small>SIZE</small><br>B   | <small>DWG NO.</small><br>XTGTSS5 | <small>REV.</small><br>B  | <small>SHEET</small><br>1 OF 1 |
| <small>DO NOT SCALE DRAWING</small>   |  |  |  | <small>SCALE</small><br>1:50   | <small>SCALE</small><br>1:50      |   |                                |



| BILL OF MATERIAL |     |                                  |         |
|------------------|-----|----------------------------------|---------|
| PART NUMBER      | QTY | DESCRIPTION                      |         |
| 11G              | 3   | 12/12/6/31.5/S GUARDRAIL (12GA)  |         |
| 15200C           | 1   | SoftStop ANCHOR GUARDRAIL (12GA) |         |
| 15208A           | 1   | SoftStop HEAD                    |         |
| 15203G           | 1   | POST #1 4'-9 1/2" (SYTP)         |         |
| 15000G           | 1   | POST #2 6'-0" (SYTP)             |         |
| 4076B            | 7   | OFFSET BLOCK 6 x 8 x 14          |         |
| 54471G           | 1   | GUARDRAIL ANCHOR PLATE           |         |
| 15205A           | 1   | ANCHOR POST ANGLE                |         |
| 15201G           | 2   | ANCHOR POST ANGLE 10" LG         |         |
| 15207G           | 1   | ANCHOR KEEPER PLATE (24 GA)      |         |
| 15206G           | 1   | ANCHOR PLATE WASHER (1/2" THK)   |         |
| 15202G           | 1   | GROUND STRUT x 4'-8 1/4"         |         |
| 533G             | 6   | POST #3-#8 6'-0"                 |         |
|                  |     | HARDWARE                         | OR      |
| 4902G            | 1   | 1" WASHER                        | F-436   |
| 3908G            | 1   | 1" HEX NUT                       | A563 DH |
| 3717G            | 2   | 3/4" x 2 1/2" HEX HD BOLT        | A-325   |
| 3701G            | 4   | 3/4" WASHER                      | F-436   |
| 3704G            | 2   | 3/4" HEX NUT                     | A563 DH |
| 3360G            | 32  | 5/8" x 1 1/4" HGR SPLICE BOLT    | A-307   |
| 3500G            | 7   | 5/8" x 10" HGR POST BOLT         | A-307   |
| 3391G            | 1   | 5/8" x 1 3/4" HEX HD BOLT        | A-325   |
| 4489G            | 1   | 5/8" x 9" HEX HD BOLT            | A-325   |
| 4372G            | 4   | 5/8" WASHER                      | F-436   |
| 118352G          | 1   | 1" x 12" ALL THREAD ROD          | A193 B7 |
| 3340G            | 41  | 5/8" HGR HEX NUT                 | A563 A  |
| 105285G          | 2   | 5/16" x 2 1/2" HEX HD BOLT       | GR-5    |
| 105286G          | 1   | 5/16" x 1 1/2" HEX HD BOLT       | GR-5    |
| 3240G            | 6   | 5/16" WASHER                     | A563 A  |
| 3245G            | 3   | 5/16" HEX NUT                    | A563 A  |

- NOTES:
- REFER TO SoftStop ASSEMBLY MANUAL.
  - SoftStop IS A MASH TEST LEVEL 3 (TL-3) END TREATMENT.
  - 8" NOMINAL DEEP PLASTIC OFFSET BLOCKS (ROUTED) ARE ACCEPTABLE ALTERNATES.
  - MANUFACTURER SUGGESTS CUSTOMER TO PROVIDE REFLECTORIZATION OF THE TERMINAL.
  - 25' GUARDRAIL PANELS (12GA) ARE AN ACCEPTABLE ALTERNATE TO SHOWN 12'-6" PANELS.
  - IT IS ACCEPTABLE TO INSTALL THE SoftStop HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT. SEE SoftStop ASSEMBLY MANUAL FOR SPECIFIC DETAILS.



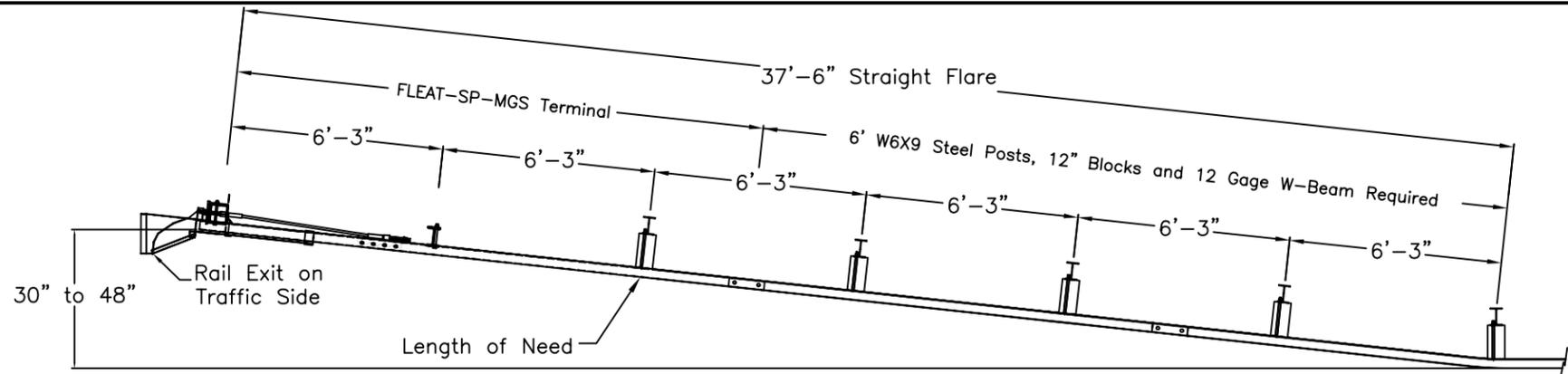
The drawings and the information shown thereon are copyrighted by Trinity Highway Products (2012) and the sole property of Trinity Highway Products. Neither the drawings nor such information is to be used for any purpose other than that which it was specifically furnished from Trinity Highway Products LLC, nor is any reproduction authorized without written permission.

**SoftStop**

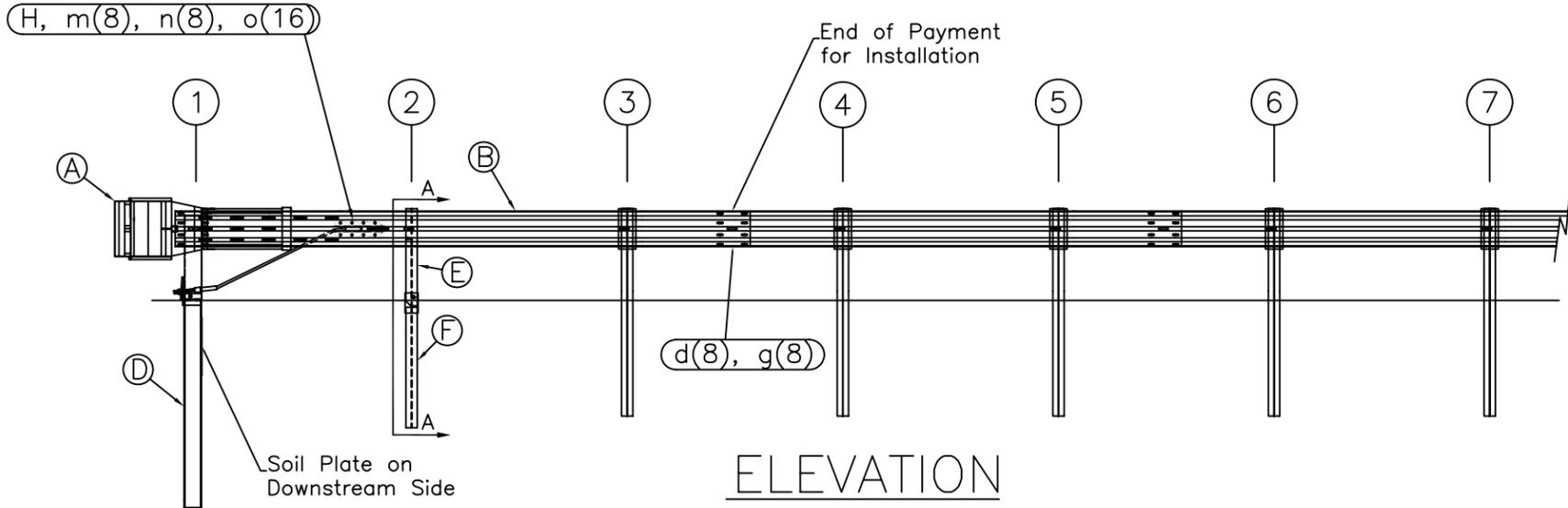
TRINITY SoftStop TERMINAL (8" BLOCKS)  
PLAN, ELEVATION & SECTION  
MASH TEST LEVEL 3 (TL-3)

DRAWN BT  
CHECKED BS  
SCALE N.T.S.  
DATE 11/14/12  
ENG. FILE # SS 646-01EM  
SHEET# E1 OF 1  
DRAWING NO. SS 646

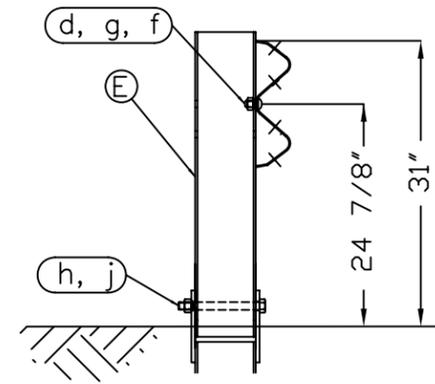
TRINITY HIGHWAY PRODUCTS, LLC.  
2525 STEMMONS FREEWAY  
DALLAS, TX 75207



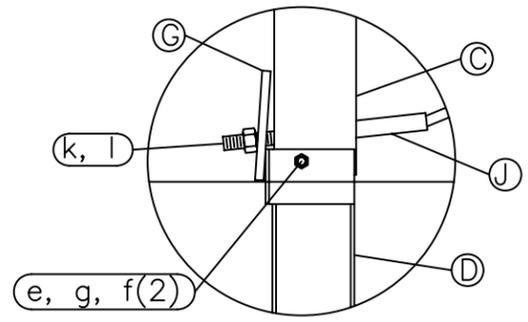
PLAN



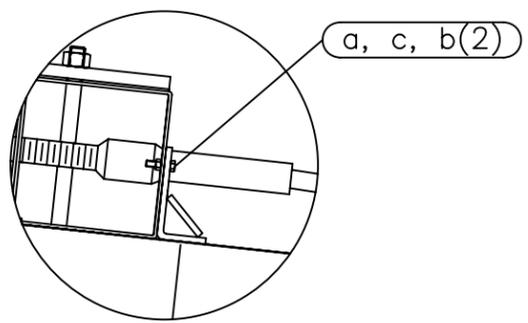
ELEVATION



SECTION A-A  
Post #2



Post #1 Connection Detail



Impact Head Connection Detail

| ITEM | QTY | BILL OF MATERIALS                          | ITEM NO.   |
|------|-----|--|------------|
| A    | 1   | IMPACT HEAD                                | F3000      |
| B    | 1   | W-BEAM GUARDRAIL END SECTION, 12 Ga.       | MGS-SF1303 |
| C    | 1   | FIRST POST TOP (6X6X $\frac{1}{8}$ " Tube) | TPHP1A     |
| D    | 1   | FIRST POST BOTTOM (6' W6X15)               | TPHP1B     |
| E    | 1   | SECOND POST ASSEMBLY TOP                   | UHP2A      |
| F    | 1   | SECOND POST ASSEMBLY BOTTOM                | HP3B       |
| G    | 1   | BEARING PLATE                              | E750       |
| H    | 1   | CABLE ANCHOR BOX                           | S760       |
| J    | 1   | BCT CABLE ANCHOR ASSEMBLY                  | E770       |

| HARDWARE (ALL DIMENSIONS IN INCHES) |    |  |           |
|-------------------------------------|----|--|-----------|
| a                                   | 2  | 5/16 x 1 HEX BOLT GRD 5                | B5160104A |
| b                                   | 4  | 5/16 WASHER                            | W0516     |
| c                                   | 2  | 5/16 HEX NUT                           | N0516     |
| d                                   | 9  | 5/8 Dia. x 1 1/4 SPLICE BOLT (POST #2) | B580122   |
| e                                   | 1  | 5/8 Dia. x 9 HEX BOLT GRD 5            | B580904A  |
| f                                   | 3  | 5/8 WASHER                             | W050      |
| g                                   | 10 | 5/8 Dia. H.G.R NUT                     | N050      |
| h                                   | 1  | 3/4 Dia. x 8 1/2 HEX BOLT GRD A449     | B340854A  |
| j                                   | 1  | 3/4 Dia. HEX NUT                       | N030      |
| k                                   | 2  | 1 ANCHOR CABLE HEX NUT                 | N100      |
| l                                   | 2  | 1 ANCHOR CABLE WASHER                  | W100      |
| m                                   | 8  | CABLE ANCHOR BOX SHOULDER BOLT         | SB58A     |
| n                                   | 8  | 1/2 A325 STRUCTURAL NUT                | N055A     |
| o                                   | 16 | 1 1/16 OD x 9/16 ID A325 STR. WASHER   | W050A     |

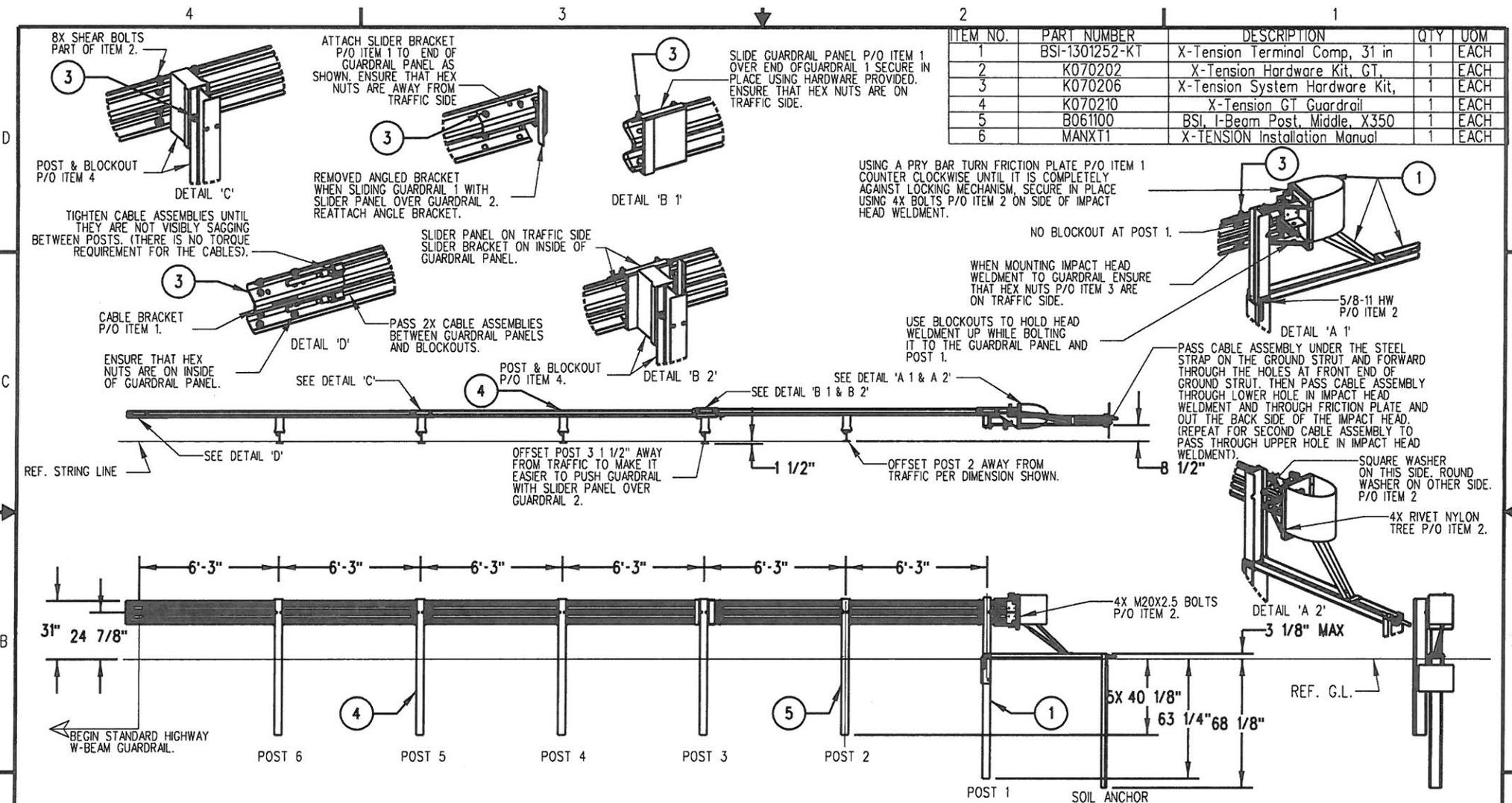
GENERAL NOTES:

- All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
- The lower sections of the Posts 1&2 shall not protrude more than 4 in above the ground (measured along a 5' cord). Site grading may be necessary to meet this requirement.
- The lower sections of the hinged posts should not be driven with the upper post attached. If the post is placed in a drilled hole, the backfill material must be satisfactorily compacted to prevent settlement.
- When competent rock is encountered, a 12" Ø post hole, 20 in. deep cored into the rock surface may be used if approved by the engineer for post 1. Granular material will be placed in the bottom of the hole, approximately 2.5" deep to provide drainage. The first post can be field cut to length, placed in the hole and backfilled with suitable backfill. The soil plate may be trimmed if required.
- The breakaway cable assembly must be taut. A locking device (vice grips or channel lock pliers) should be used to prevent the cable from twisting when tightening nuts.

**Road Systems, Inc.**  
Big Spring, TX  
Phone: 432-263-2435  
or Phone: 330-346-0721

|   |  |        |          |
|---|--|--------|----------|
| <b>FLEAT-SP-MGS Terminal<br/>Midwest Guardrail System<br/>31" Top of Rail</b> |  | Sheet: | 1        |
|   |  | Date:  | 02/24/10 |
| Drawing Name:<br><b>FLT-SP-S-MGS</b>  |  | By:    | JRR      |
|   |  | Scale: | None     |
| Scale:<br>None  |  | Rev:   | 0        |





| ITEM NO. | PART NUMBER    | DESCRIPTION                    | QTY | UOM  |
|----------|----------------|--------------------------------|-----|------|
| 1        | BSI-1301252-KT | X-Tension Terminal Comp, 31 in | 1   | EACH |
| 2        | K070202        | X-Tension Hardware Kit, GT,    | 1   | EACH |
| 3        | K070206        | X-Tension System Hardware Kit, | 1   | EACH |
| 4        | K070210        | X-Tension GT Guardrail         | 1   | EACH |
| 5        | B061100        | BSL I-Beam Post, Middle, X350  | 1   | EACH |
| 6        | MANXT1         | X-TENSION Installation Manual  | 1   | EACH |

- NOTES: UNLESS OTHERWISE SPECIFIED.
- SYSTEM TO BE INSTALLED PER MANUFACTURER SPECIFICATIONS.
  - ONLY TIGHTEN THE CABLE ASSEMBLIES USING THE NUTS AT THE CABLE BRACKET (SEE DETAIL 'D'). DO NOT TIGHTEN THE CABLES AT THE FRONT OF THE GROUND ANCHOR.
  - WHEN DRIVING STEEL POST, ENSURE THAT A DRIVING CAP WITH TIMBER OR PLASTIC INSERT IS USED TO PREVENT DAMAGE TO THE GALVANIZING TO THE TOP OF THE POST.

|   |      |  |       |
|---|------|--|-------|
| 1/2012 BARRIER SYSTEMS INC.<br>THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BARRIER SYSTEMS INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF BARRIER SYSTEMS INC. IS PROHIBITED. |      | UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.<br>TOLERANCES ARE:<br>FRACTIONS DECIMAL ANGLES<br>$\pm 1/16$ $\pm .015$ $\pm 1/2^\circ$<br>$\pm .003$ $\pm .010$                              |       |
| <b>APPROVALS</b><br>DRAWN BY: NMV<br>DRAWN DATE: 2/08/13<br>APPR'D BY: JMT<br>APPR'D DATE: 2/08/13  |      | THIRD ANGLE PROJECTION<br><br>INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5-1994<br>DO NOT SCALE DRAWING |       |
| REV   | ECN* | DATE   | SCALE |
| B   | 2067 | 03/02/13   | B     |
| A   | 2022 | 2/08/13  | B     |
| SCALE   | 1:50 | DATE   | SCALE |

**LINDSAY**  
TRANSPORTATION SOLUTIONS

BARRIER SYSTEMS INC.  
3333 Voco Valley Parkway, Ste 800  
Vacoala, CA 95688  
Tel: 800-800-5691  
www.barriersystemsinc.com

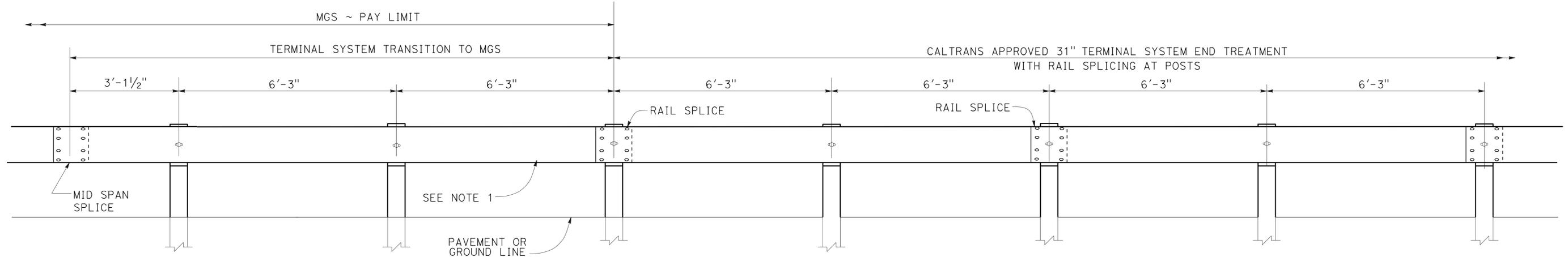
TITLE: X-TENSION GUARDRAIL TERMINAL SYSTEM  
STEEL POST WITH COMPOSITE BLOCKOUT  
31" RAIL HEIGHT

SIZE: B  
DWC NO.: B  
SCALE: 1:50  
SHEET: 1 OF 1

|  |        |       |                          |           |              |
|--|--------|-------|--------------------------|-----------|--------------|
| Dist   | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
| 05   | SLO    | 101   | R24.3                    |           |              |
| <i>Kari Bhana</i><br>REGISTERED CIVIL ENGINEER   |        |       | 1-28-16                  | DATE      |              |
| PLANS APPROVAL DATE  |        |       |                          |           |              |
| <small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small> |        |       |                          |           |              |



NOTE:  
1. USE 15'-7 1/2" LENGTH RAIL.



**TRANSITION DETAIL FOR 31" TERMINAL SYSTEM END TREATMENT WITH RAIL SPLICING AT POSTS TO MIDWEST GUARDRAIL SYSTEM**

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**Caltrans**  
 DESIGN  
 FUNCTIONAL SUPERVISOR  
 RON R. KRAEMER  
 CALCULATED/DESIGNED BY  
 CHECKED BY  
 REVISED BY  
 DATE REVISED