

FOR CONTRACT NO.: 07-2X9204

INFORMATION HANDOUT

MATERIALS INFORMATION

GEOTECHNICAL DESIGN REPORT

ROUTE: 07-LA-91-R9.8/R12.1

Memorandum

*Flex your power!
Be energy efficient!*

To: MR. HECTOR OBESO, CHIEF
Office of Maintenance-D07

Date: March 24, 2010

File: 07-LA-91-PM9.7
07-930322
SD 5953091009.7
SLOPE EROSION SR91

Attention: Mr. Mesfin Hailu

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design-South 1, Branch C

Subject: GEOTECHNICAL DESIGN REPORT

1.0 INTRODUCTION

1.1 Purpose

In response to the request from your office, dated February 24, 2010, the Office of Geotechnical Design South 1 (OGDS1) has prepared this Geotechnical Design Report (GDR) to evaluate the storm water damage on the embankment fill slope under the Acacia Bridge UC along the eastbound State Route 91 PM 9.7.

1.2 Scope of work

Geotechnical tasks performed for the proposed GDR include:

- Field investigation including soil identification of Site.
- Attached pictures of the Site.
- As-Built Records research.
- Permanent recommendations for erosion mitigation.
- Preparation of this report presenting our findings, and recommendations.

1.3 Background

A series of severe winter storms, along with associated flooding, debris and mudflows during the period of January 17 to February 6, 2010 occurred throughout Southern California. D-7 Maintenance South Region contacted the Office of Geotechnical Design South 1 with a list of storm damage locations that had occurred since January 17, 2010.

OGDS1 conducted a field investigation on March 04, 2010 to evaluate the slope under Acacia Avenue Under-Crossing (UC), just below abutments 1 and 4 of Route 91 freeway.

At the time of our field investigation, a contractor was repairing slope damage by re-grading the slope face along with installing a temporary down drain pipe below the joint of the structures, approximately in the middle of the slope area, near Abutments 1 and 4.

2.0 EXISTING CONDITIONS

At the time of our field investigation maintenance reported that moderate to severe slope erosion from the joints of the bridges as well as from weep holes under the bridge occurred. Our office was not informed of the source of water that caused the erosion. There is 6-foot sidewalk at the toe of the slope on both sides of the Acacia Street with debris deposits. The slope is approximately 18 feet high with overall slope ratio of 2H: 1V. The slope length is approximately 150-175 feet. The slope material consists of mainly silty sand with no vegetations. The slope is stable.

3.0 RECOMMENDATION

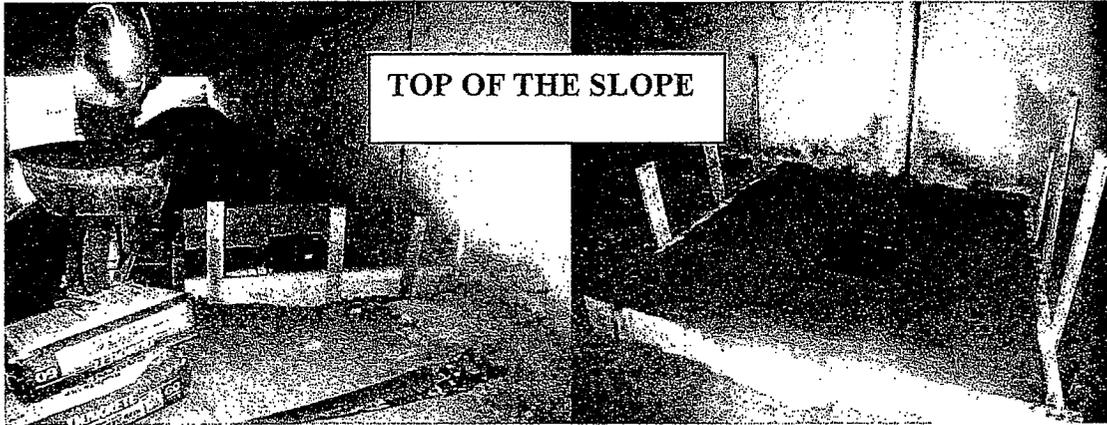
As discussed in Section 1.3 above the contractor has performed temporary drainage and repair of the slope. We highly recommend that the slope conditions described in the sections above be mitigated by emergency project by constructing slope paving as a long term solution following section 72-6 of the Caltrans Standard Specifications dated May 2006. This will also prevent water from causing erosion and allowing mud and debris from entering the sidewalk areas.

Structure Maintenance should inspect all joint seals at the freeway level to determine the cause of water seepage.

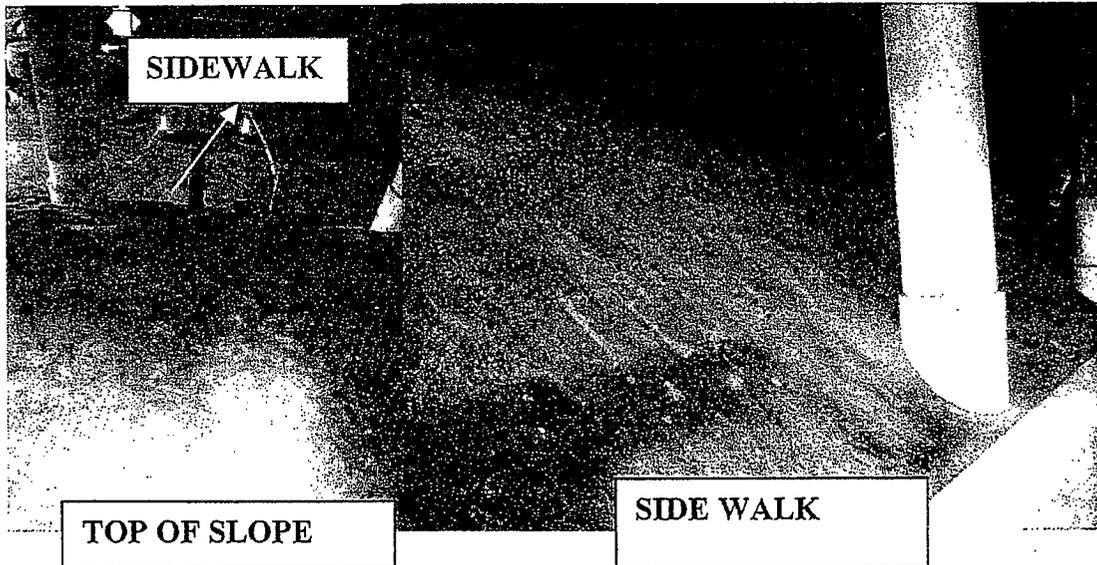
Hydraulics should be consulted to provide recommendations for swales to channel water from weep holes and bridge joints as part of slope paving mitigation.

4.0 CONSTRUCTION CONSIDERATION

- Existing slope surface should be prepared prior to placement of minor concrete.
- Existing slope surface should be removed to not allow loose material to remain below proposed slope paving section.
- Weep holes (relief holes) should be placed near bottom of slope paving to allow for hydrostatic pressure relief during excessive storm events.

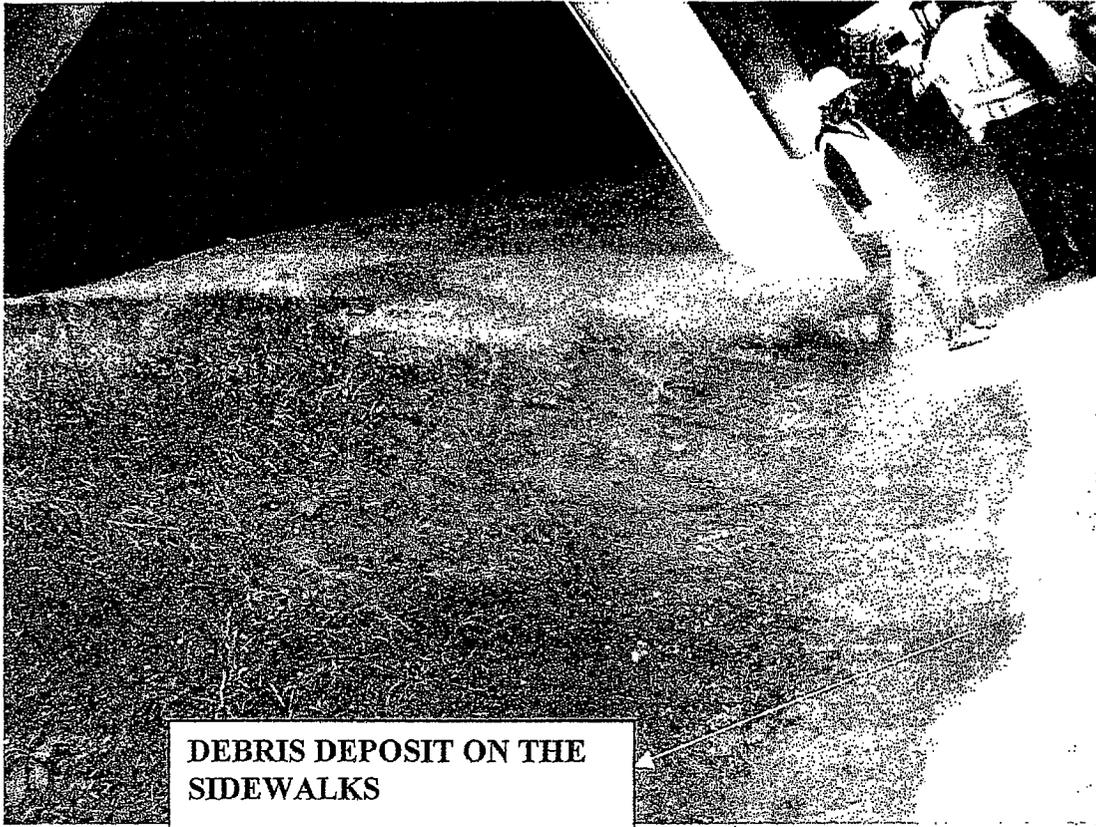


Contractor doing temporary repair.



MR. HECTOR OBESO
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MR. HECTOR OBESO
March 24, 2010
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SLOPE EROSION SR 91
07-930322
07-LA-91 PM 9.7

If you have any questions, please contact Amare Tsegie at (213) 620-2133 or Ted Liu at (213) 620-2136.

Prepared by:

Date: 03-24-10 Reviewed by:

Date 3/24/10



Amare Tsegie, P.E.,
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Office of Geotechnical Design South 1
Branch C



Chi-Tseng Ted Liu, Ph.D., P.E., G.E.
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Branch C



c.c. OGDS-1-Los Angeles File (2)
GS File- Sacramento
GS File Room
GS Corporate
Attachments

Memorandum

*Flex your power!
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To: MR. HECTOR OBESO, CHIEF
Office of Maintenance-D07

Date: March 25, 2010

Attention: Mr. Mesfin Hailu

File: 07-LA-91-PM10.2
07-930322
SD 5953091010.2
SLOPE EROSION SR91

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design-South 1, Branch C

Subject: GEOTECHNICAL DESIGN REPORT

1.0 INTRODUCTION

1.1 Purpose

In response to the request from your office, dated February 24, 2010, the Office of Geotechnical Design South 1 (OGDS1) has prepared this Geotechnical Design Report (GDR) to evaluate the storm water damage on the embankment fill slope under the Compton Creek Bridge Overhead (OH), near Santa Fe Avenue Under Crossing (UC), along the eastbound State Route 91 PM 10.2.

1.2 Scope of work

Geotechnical tasks performed for the proposed GDR include:

- Field investigation including soil identification of Site.
- Attached pictures of the Site.
- As-Built Records research.
- Permanent recommendations for erosion mitigation.
- Preparation of this report presenting our findings, and recommendations.

1.3 Background

A series of severe winter storms, along with associated flooding, debris and mudflows during the period of January 17 to February 6, 2010 occurred throughout Southern California. D-7 Maintenance South Region contacted the Office of Geotechnical Design South 1 with a list of storm damage locations that had occurred since January 17, 2010.

MR. HECTOR OBESO
March 25, 2010
Page 2

SLOPE EROSION SR 91
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07-LA-91 PM 10.2

OGDS1 conducted a field investigation on March 04, 2010 to evaluate the slope under Compton Creek OH (Br # 53-2235), just below abutments 12, near Santa Fe Avenue UC of State Route 91 freeway.

2.0 EXISTING CONDITIONS

At the time of our field investigation moderate to severe slope erosion from the joints of the bridges as well as from weep holes under the bridge occurred. Maintenance field personnel reported that the heavy rain on January 17 caused the erosion with gullies as deep as 3-feet, located just below the joints of the OH.

Debris deposits on the existing sidewalk, at the toe of the slope, adjacent to Santa Fe Ave was also observed.

The slope is approximately 18 feet high with overall slope ratio of 2H: 1V. The slope length is approximately 160 feet. The slope is stable and consists of mainly silty sand with no vegetation cover.

3.0 RECOMMENDATION

We recommend the slope conditions described in the sections above should be mitigated by emergency project by installing downrain pipes below the joint of the structures, under the bridge, and followed by reconstructing the slope in accordance with Section 19 of Standard Specification dated May 2006. The joint at the SE corner should be mitigated with concrete open channel or a swale.

As a long-term solution, we also recommend to pave the whole slope following section 72-6 of the Caltrans Standard Specifications dated May 2006. This will also prevent water from causing erosion and allowing mud and debris from entering the sidewalk area.

Structure Maintenance should inspect all joint seals at the freeway level to determine the cause of water seepage.

Hydraulics should be consulted to provide recommendations for swales to channel water from weep holes and bridge joints as part of slope paving mitigation.

4.0 CONSTRUCTION CONSIDERATION

- Existing slope surface should be prepared prior to placement of minor concrete.

MR. HECTOR OBESO
March 25, 2010
Page 3

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07-LA-91 PM 10.2

- Existing slope surface should be removed to not allow loose material to remain below proposed slope paving section.
- Weep holes (relief holes) should be placed near bottom of slope paving to allow for hydrostatic pressure relief during excessive storm events.

If you have any questions, please contact Amare Tsegie at (213) 620-2133 or Ted Liu at (213) 620-2136.

Prepared by:

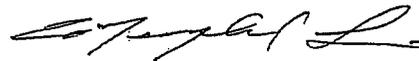
Date: 3-25-10

Reviewed by:

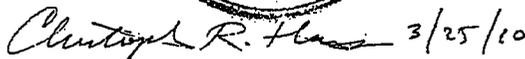
Date 3/25/10



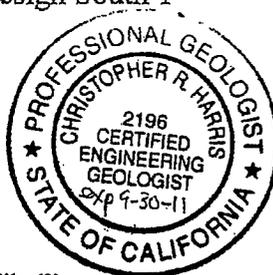
Amare Tsegie, P.E.,
Transportation Engineer
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Branch C



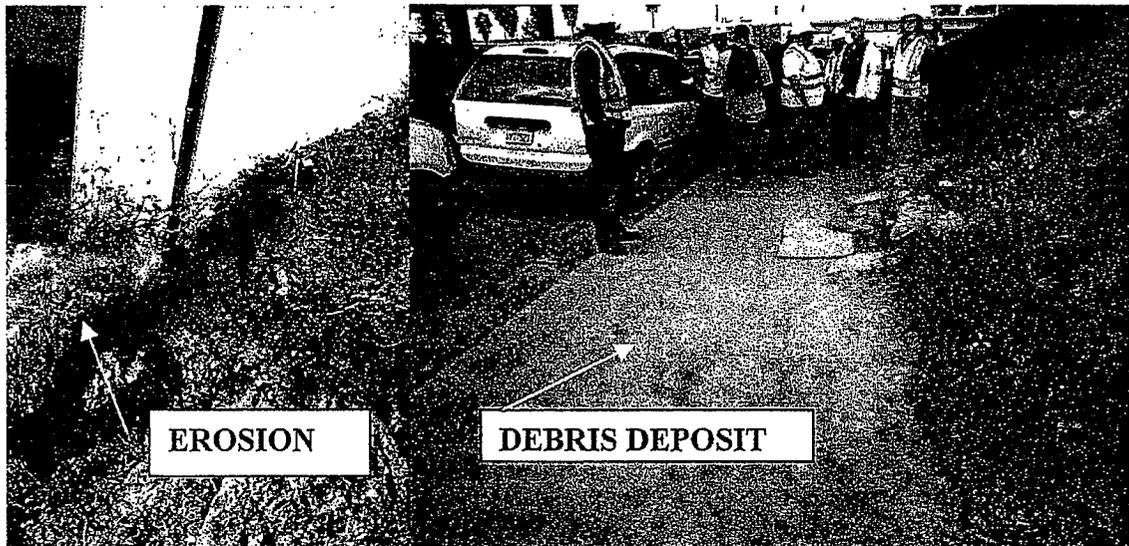
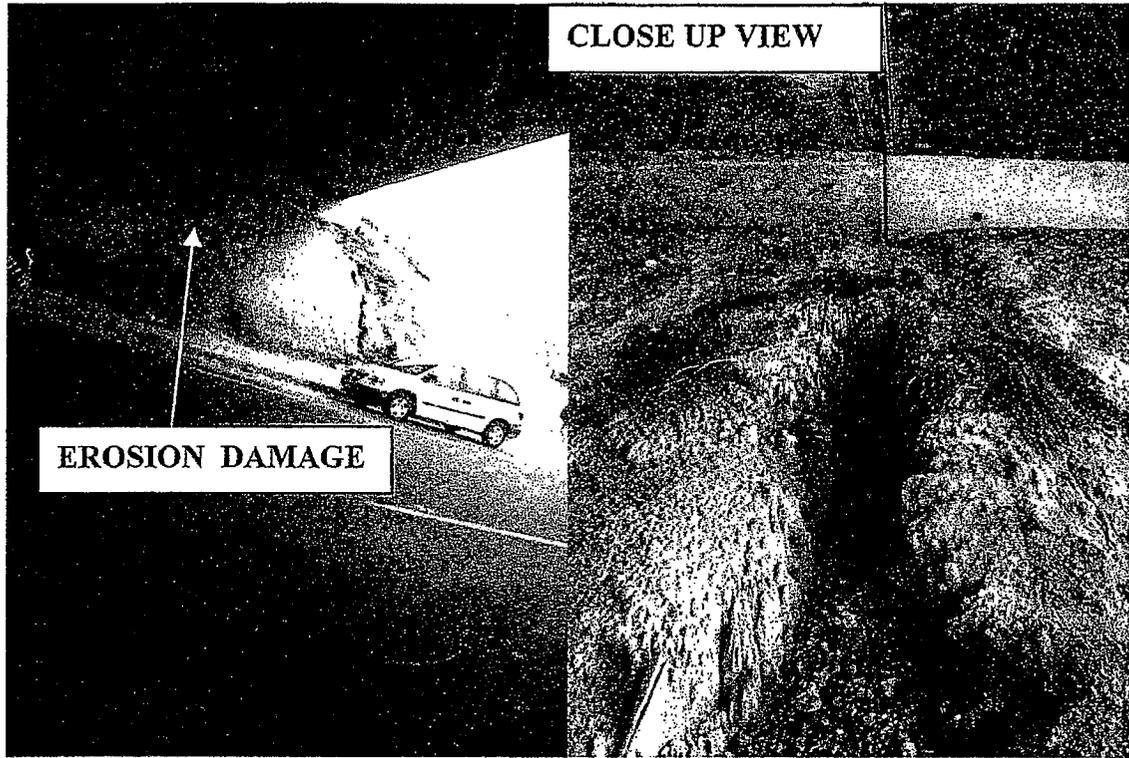
Chi-Tseng Ted Liu, Ph.D., P.E., G.E.
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Branch C



c.c. OGDs-1-Los Angeles File (2)
GS File- Sacramento
GS File Room
GS Corporate
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Memorandum

*Flex your power!
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To: MR. HECTOR OBESO, CHIEF
Office of Maintenance-D07

Date: March 25, 2010

File: 07-LA-91-PM10.3
07-930322
SD 5953091010.2
SLOPE EROSION SR91

Attention: Mr. Mesfin Hailu

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design-South 1, Branch C

Subject: GEOTECHNICAL DESIGN REPORT

1.0 INTRODUCTION

1.1 Purpose

In response to the request from your office, dated February 24, 2010, the Office of Geotechnical Design South 1 (OGDS1) has prepared this Geotechnical Design Report (GDR) to evaluate the storm water damage on the embankment fill slope east of the Compton Creek Bridge Overhead (OH), along the westbound State Route 91 PM 10.3.

1.2 Scope of work

Geotechnical tasks performed for the proposed GDR include:

- Field investigation including soil identification of Site.
- Attached pictures of the Site.
- As-Built Records research.
- Permanent recommendations for erosion mitigation.
- Preparation of this report presenting our findings, and recommendations.

1.3 Background

A series of severe winter storms, along with associated flooding, debris and mudflows during the period of January 17 to February 6, 2010 occurred throughout Southern California. D-7 Maintenance South Region contacted the Office of Geotechnical Design South 1 with a list of storm damage locations that had occurred since January 17, 2010.

OGDS1 conducted a field investigation on March 04, 2010 to evaluate the embankment fill slope east of Compton Creek OH (Br # 53-2235), along the westbound State Route 91 freeway.

2.0 EXISTING CONDITIONS

At the time of our field investigation moderate slope erosion on the upper portion of the slope just below the existing Metal Beam Guard Rail (MBGR) occurred. Maintenance field personnel reported that the heavy rain on January 17 caused the erosion with gullies as deep as 2-feet. There is an overhead sign structure at the top of the slope, which is protected with MBGR. The cause of erosion is run-off overtopping the existing 2-inch high dike (Type C dike), located in front of the terminal section of the Metal Beam Guard Rail (MBGR).

The slope is approximately 23 feet high with overall slope ratio of 2H: 1V. The slope is stable and consists of mainly silty sand and clay, with some vegetation cover.

3.0 RECOMMENDATION

Hydraulics should be consulted to provide recommendations for the slope conditions described in the sections above to be mitigated by emergency project. The 2-inch dike is insufficient to control runoff on the slope. Hydraulics also shall provide a means of draining the run-off down the slope with out causing further slope erosion. We also recommend, temporarily placing sand bags behind the terminal section of MBGR to direct or channel runoff and mitigate overtopping of the existing Type C dike until the permanent fix is completed.

In addition we recommend the slope be repaired by filling the erosion gullies to reconstruct the embankment and covered with jute mesh. To encourage vegetative growth, applying hydro seeding and mulching is also recommended.

4.0 CONSTRUCTION CONSIDERATION

- Reconstruct the slope following Section 19 of Standard Specification.
- Apply hydro seeding and jute mesh over the re-constructed slope to encourage vegetative growth and minimize erosion.

MR. HECTOR OBESO
March 25, 2010
Page 3

SLOPE EROSION SR 91
07-930322
07-LA-91 PM 10.3

If you have any questions, please contact Amare Tsegie at (213) 620-2133 or Ted Liu at (213) 620-2136.

Prepared by:

Date: 3-25-10

Reviewed by:

Date 3/25/2010



Amare Tsegie, P.E.,
Transportation Engineer
Office of Geotechnical Design South 1
Branch C

Chi-Tseng Ted Liu, Ph.D., P.E., G.E.
Senior Transportation Engineer
Office of Geotechnical Design South 1
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 3-25-10
Christopher Harris, P.G., C.E.G.
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MR. HECTOR OBESO
March 25, 2010
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SLOPE EROSION SR 91
07-930322
07-LA-91 PM 10.3



07-LA-91-PM 10.3

Memorandum

*Flex your power!
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To: MR. HECTOR OBESO, CHIEF
Office of Maintenance-D07

Date: March 30, 2010

Attention: Mr. Mesfin Hailu

File: 07-LA-91-PM10.8
07-930322
SD 5953091010.8
SLOPE EROSION SR91

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design-South 1, Branch C

Subject: GEOTECHNICAL DESIGN REPORT

1.0 INTRODUCTION

1.1 Purpose

In response to the request from your office, dated February 24, 2010, the Office of Geotechnical Design South 1 (OGDS1) has prepared this Geotechnical Design Report (GDR) to evaluate the storm water damage on the embankment fill slope west of the Susanna Under-Crossing (UC), along the westbound State Route 91 PM 10.8.

1.2 Scope of work

Geotechnical tasks performed for the proposed GDR include:

- Field investigation including soil identification of Site.
- Attached pictures of the Site.
- As-Built Records research.
- Permanent recommendations for erosion mitigation.
- Preparation of this report presenting our findings, recommendations constructions considerations.

1.3 Background

A series of severe winter storms, along with associated flooding, debris and mudflows during the period of January 17 to February 6, 2010 occurred throughout Southern California. D-7 Maintenance South Region contacted the Office of Geotechnical Design South 1 with a list of storm damage locations that had occurred since January 17, 2010.

MR. HECTOR OBESO
March 30, 2010
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SLOPE EROSION SR 91
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OGDS1 conducted a field investigation on March 04, 2010 to evaluate the embankment fill slope west of Susanna UC, (Br # 53-2252), along the eastbound State Route 91 freeway. This location was properly reconstructed on January of 2009, under emergency contract 07-2X3203. Recommendations at that time by this office included reconstruction of the slope and increasing the height of the existing 2-inch (Type C dike) Asphalt dike.

2.0 EXISTING CONDITIONS

At the time of our field investigation severe slope erosion on the portion of the slope just below the existing Metal Beam Guard Rail (MBGR) occurred. Maintenance field personnel reported that the heavy rain on January 17 caused the erosion with gullies as deep as 5-feet. The existing 4-inch (Type "F") dike transitioned to 2-inch (Type "C") dike in front of the terminal section of MBGR is the cause for run-off overtopping the 2-inch high dike. No sign of overtopping of runoff observed over the section where we have 4-inch dike.

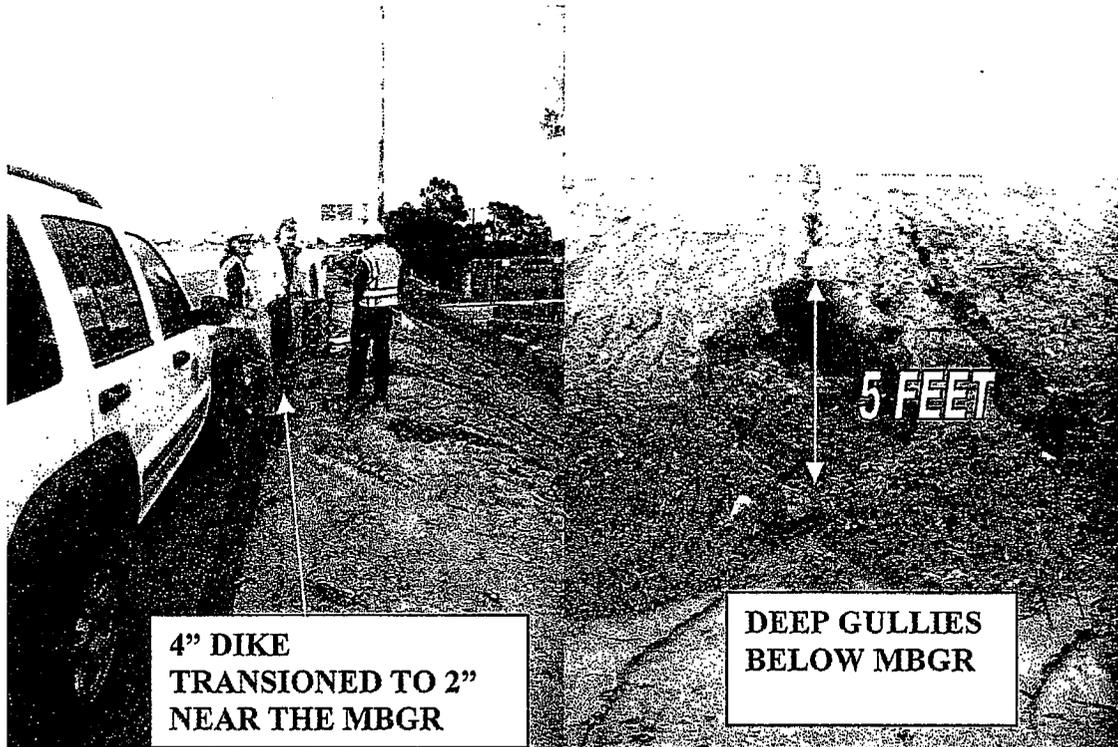
The slope is approximately 25 feet high with overall slope ratio of 2H: 1V. The slope is stable and consists of mainly sandy silt, some clay, and scattered gravel with some vegetation cover.

3.0 RECOMMENDATIONS

Hydraulics should be consulted to provide recommendations for the slope conditions described in the sections above to be mitigated by emergency project. The 2-inch dike is insufficient to control runoff on the slope. Hydraulics also shall provide a means of draining the run-off down the slope without causing further slope erosion. We also recommend, temporarily placing sand bags behind the terminal section of MBGR to direct or channel runoff and mitigate overtopping of the existing Type C dike until the permanent fix is completed.

Reconstruction of the slope (again) by filling the erosion gullies to reconstruct the embankment. The slope shall be covered with jute mesh following Section 19 of the Standard Specifications. Should the height of the dike not be increased as previously recommended, then, pavement of the slope (100-foot in length along the shoulder) per Section 72-6 of Standard Specifications will be required.

To encourage vegetative growth, applying hydro seeding and mulching is highly recommended.



**4" DIKE
TRANSIONED TO 2"
NEAR THE MBGR**

**DEEP GULLIES
BELOW MBGR**

07-LA-91-PM 10.8



**CLOSE UP
VIEW**

**EROSION
BELOW MBGR**

MR. HECTOR OBESO
March 30, 2010
Page 3

SLOPE EROSION SR 91
07-930322
07-LA-91 PM 10.8

4.0 CONSTRUCTION CONSIDERATIONS

- Reconstruct the slope following Section 19 of Standard Specification.
- Apply hydro seeding and jute mesh over the re-constructed slope to encourage vegetative growth and minimize erosion.

If you have any questions, please contact Amare Tsegie at (213) 620-2133 or Ted Liu at (213) 620-2136.

Prepared by:

Date:

Reviewed by:

Date 4/1/2010

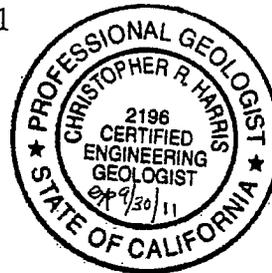


Amare Tsegie, P.E.,
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Branch C

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Christopher Harris, P.G., C.E.G.
Engineering Geologist
Office of Geotechnical Design South 1
Branch C



c.c. OGDS-1-Los Angeles File (2)
GS File- Sacramento
GS File Room

Memorandum

*Flex your power!
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To: MR. HECTOR OBESO, CHIEF
Office of Maintenance-D07

Date: April 12, 2010

File: 07-LA-91-PM11.7
07-930322
SD 5953091011.7
SLOPE EROSION SR91

Attention: Mr. Mesfin Hailu

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Geotechnical Services
Office of Geotechnical Design-South 1, Branch C

Subject: GEOTECHNICAL DESIGN REPORT

1.0 INTRODUCTION

1.1 Purpose

In response to the request from your office, dated February 24, 2010, the Office of Geotechnical Design South 1 (OGDS1) has prepared this Geotechnical Design Report (GDR) to evaluate the storm water damage at the end of Gore area between the connector of West Bound (WB) State Route 91 to North Bound (NB) State Route 710 and Atlantic Avenue On-ramp to NB R 710.

1.2 Scope of work

Geotechnical tasks performed for the proposed GDR include:

- Field investigation including soil identification of Site.
- Attached pictures of the Site.
- Permanent recommendations for erosion mitigation.
- Preparation of this report presenting our findings, and recommendations.

1.3 Background

A series of severe winter storms, along with associated flooding, debris and mudflows during the period of January 17 to February 6, 2010 occurred throughout Southern California. D-7 Maintenance South Region contacted the Office of Geotechnical Design South 1 with a list of storm damage locations that had occurred since January 17, 2010.

OGDS1 conducted a field investigation on March 05, 2010 to evaluate the fill slope condition at the Gore area between the WB R91 Connector and Atlantic On-Ramp to NB R 710, at PM 11.7

2.0 EXISTING CONDITIONS

At the time of our field investigation slumping on the upper portion of slope was observed. Maintenance field personnel reported that the intense rain on January 17 caused 10-15-foot wide area of the upper portion of the slope to slump, approximately 10 feet down the slope. The WB SR 91 connector near the gore area is in full super-elevated curve allowing surface run-off to overtop the existing approximately 2-inch dike near the gore area, causing erosion damage of the fill slope (as shown on attached pictures). No drainage device was observed at the site to carry the concentrated run-off from the connector and the gore area, at the top of the slope, to the bottom of the slope.

The fill slope is approximately 27 feet in height and 60-feet in slope width with overall slope ratio 1.8 H: 1V. The slope is grossly stable and consists of primarily, uniform grain sized, sandy material with some silt and clay. The slope area is highly vegetated.

3.0 RECOMMENDATIONS

3.1 Install Drainage Inlet

Hydraulics shall be consulted to provide recommendations for new downdrain near the top of the slope to be mitigated by emergency project. Hydraulics also shall provide a means of draining the run-off, from the gore area from the top, down the slope without causing further slope erosion.

3.2 Slope Repair and Dike

We recommend reconstructing the entire 60-foot slope width in accordance with section 19 of the Standard Specifications. Increasing the height of the berm (dike) near the gore area, at the end of the connector is also recommended. The onsite material can be used to rebuild the slope. The material shall be benched as shown in Figure 2 and a minimum of 90% relative compaction shall be achieved. If no re-vegetation is done as part of this project, the slope shall be Hydro-seeded and covered with jute mesh upon completion of grading.

3.3 Planting

We highly recommend, as part of this project the slope be re-vegetated. The Landscape Architecture Unit should be consulted to provide recommendations for planting the repaired slope in accordance with Section 20 of Standard Specification

4.0 CONSTRUCTION CONSIDERATIONS

- Reconstruct the entire slope following Section 19 of Standard Specification refer to figure 2 of the schematic diagram, below. The slope backcut shall be benched per Section 19 of Standard Specification.
- The temporary backcut shall be no steeper than 1V: 1.5H unless approved by the Resident Engineer and OGDS1
- No shoulder or lane closure is required in this area

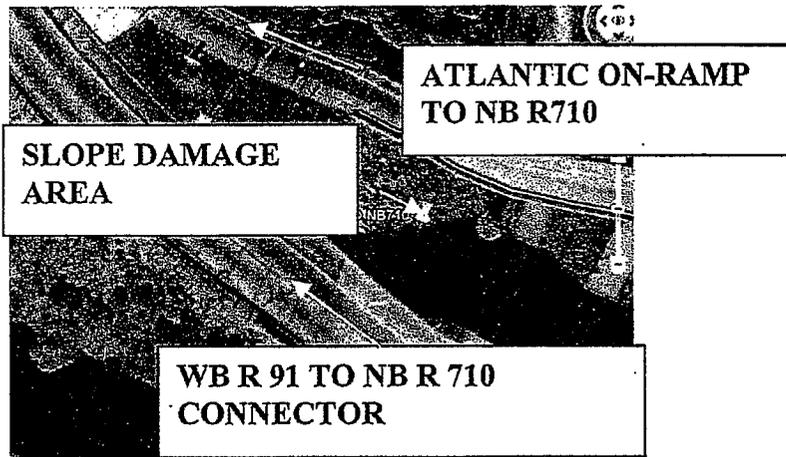


FIGURE 1

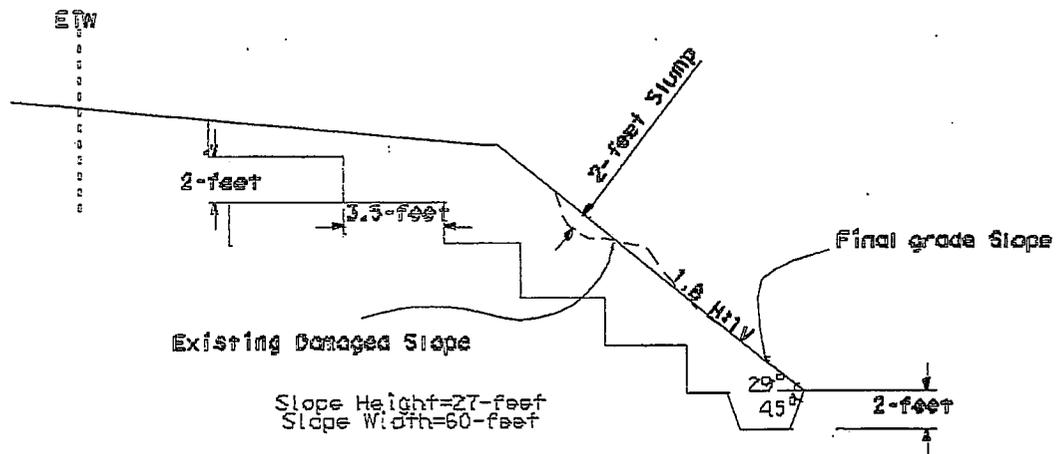


FIGURE 2, SCHEMATIC DIAGRAM (NOT TO SCALE)

MR. HECTOR OBESO
April 12, 2010
Page 4

SLOPE EROSION SR 91
07-930322
07-LA-91 PM 11.7

If you have any questions, please contact Amare Tsegie at (213) 620-2133 or Ted Liu at (213) 620-2136.

Prepared by: Date: Reviewed by: Date 4/12/2010



Amare Tsegie, P.E.,
Transportation Engineer
Office of Geotechnical Design South 1
Branch C



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Christopher Harris, P.G., C.E.G.
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