

Memorandum

To : Yvonne Hoffmann
Environmental Planning

Date : March 20, 2014

File No. : SB-101- 2.0/12.3
South Coast HOV Lanes
ON700

From : **DEPARTMENT OF TRANSPORTATION**
Lyn Wickham
Hydraulics

Subject : Addendum to Location Hydraulic Study

A number of conditions potentially affecting the impacts of this project on FEMA floodplains have changed since the release of the DEIR/S:

- Project features have been added or modified.
- The F Modified configuration was chosen for the Cabrillo Boulevard/Hot Springs Road Interchange.
- The FEMA Flood Insurance Rate Maps were revised on December 4, 2012.

The changes to the proposed project would not create a significant encroachment or longitudinal encroachment on any of the base floodplains it crosses and would not significantly impact natural and beneficial floodplain values. Specific changes and their effects on the floodplain are described below. The attachments to the study have all been revised to reflect the revised project features and flood maps.

Cravens Lane Watershed

A sound wall has been added to the project within the limits of the floodplain at Cravens Lane. The proposed wall would be staggered in order to convey flood flows. The wall would not raise base flood elevations.

Arroyo Paredon Creek

The proposed bridge at Arroyo Paredon Creek would have two bays, each of which would have the same capacity as the existing bridges. The proposed bridge would convey close to the 25-year flow with both bays open. The bridge has been modified to block one bay in order to maintain its existing capacity until improvements are made by others upstream and downstream of Route 101. The combined effects of the proposed bridge and sound wall at this location would not raise base flood elevations.

Romero Creek

The revised FEMA FIRM modified the floodway at Romero Creek. The westerly limit of the revised floodway shifted to the east. The proposed sound wall to the west of the floodway has been extended to the revised floodway limit. The extended portion of the wall would incorporate flood gates in order to convey flood flows and would not raise base flood elevations.

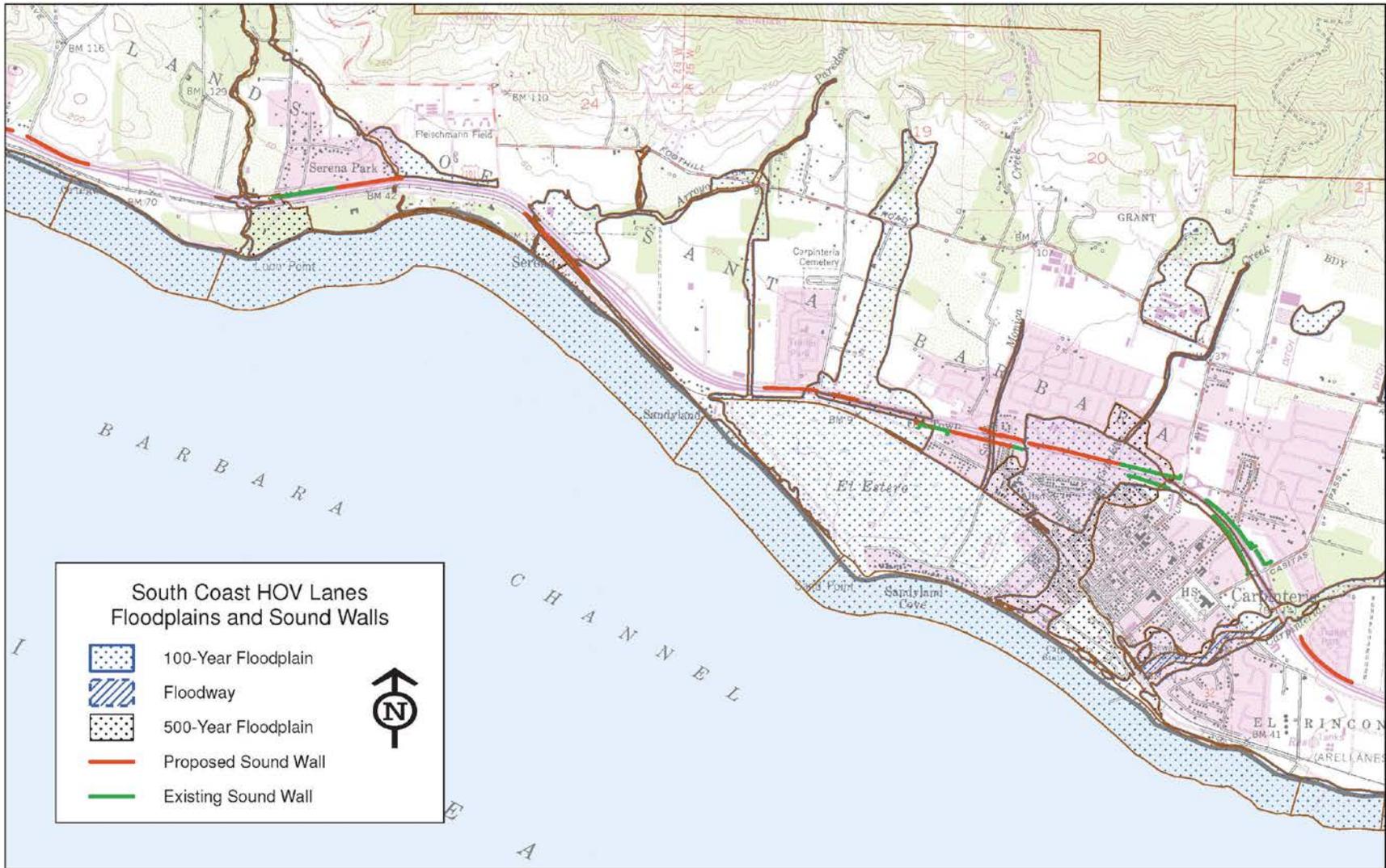
Montecito Creek

The sound walls located between the frontage road and Route 101 on both the northbound and southbound sides of the highway have been extended. The extended portions of the walls would encroach on the floodplain. The walls would be designed to pass flood flows and would not raise base flood elevations.

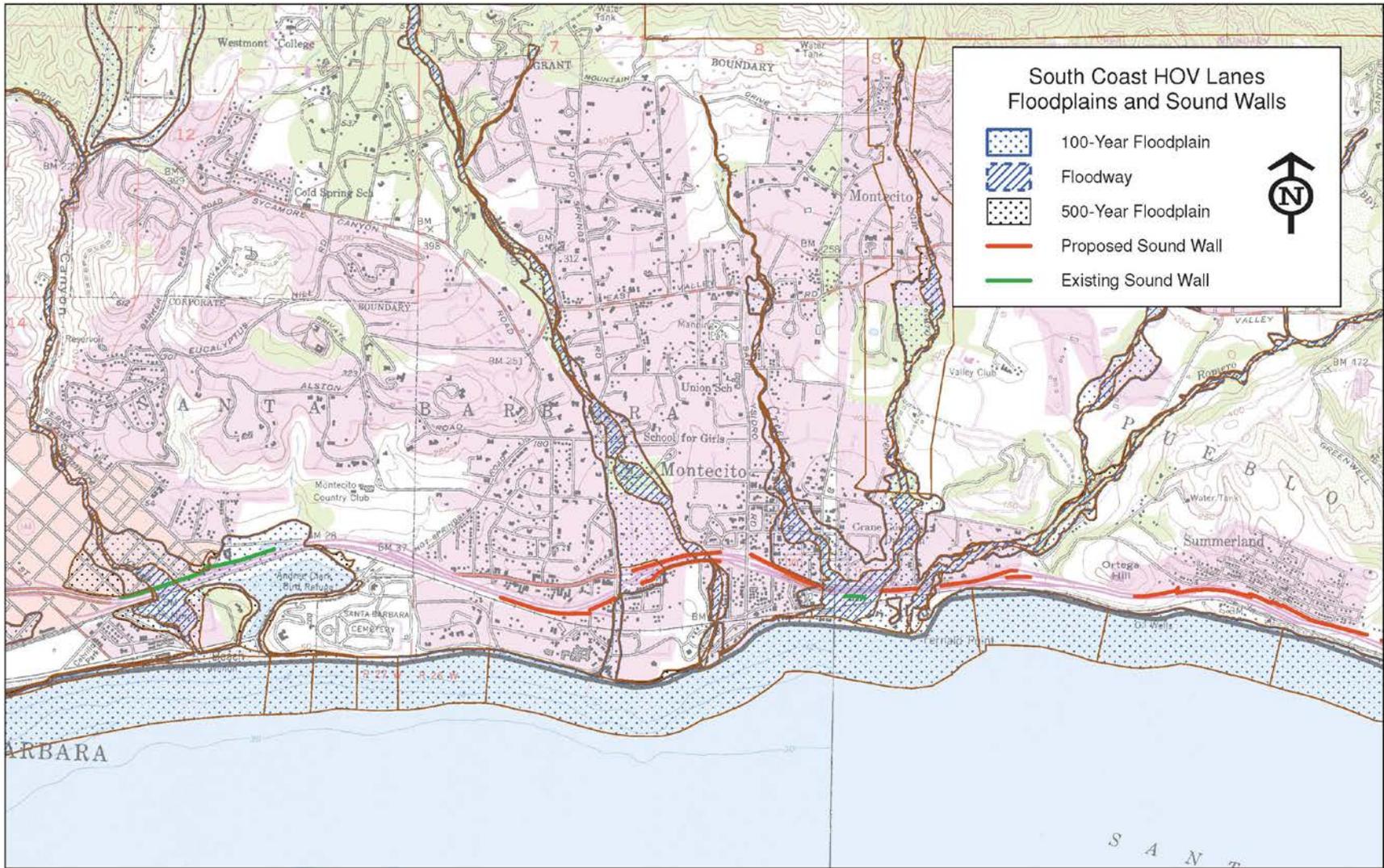
Sycamore Creek

The F Modified configuration was chosen for the Cabrillo Boulevard/Hot Springs Road Interchange. The configuration does not fall within the boundary of the Sycamore Creek floodplain and will have no impact on it.

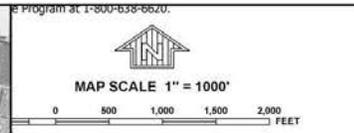
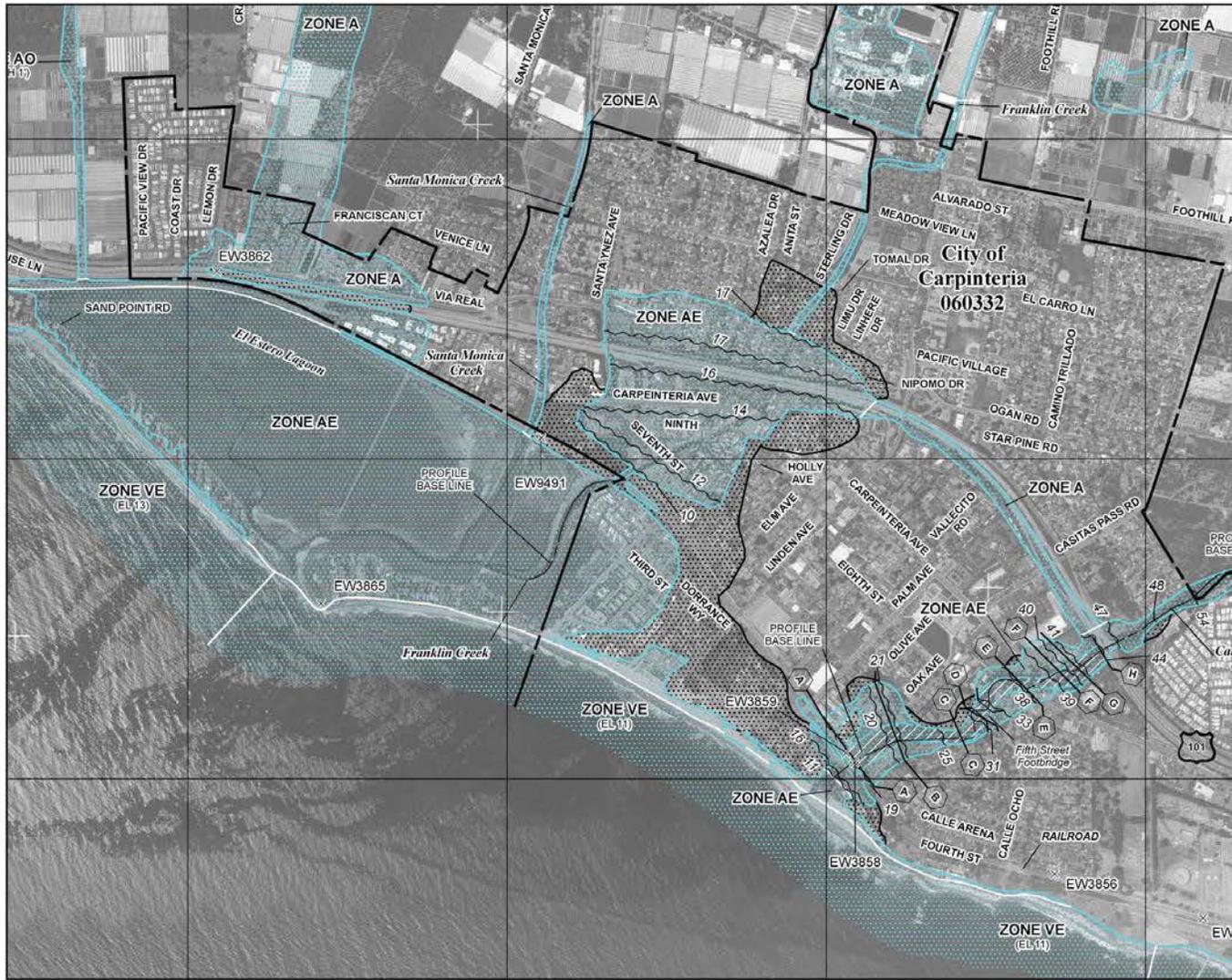
Attachments were updated as of December 2012



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City of Carpinteria
060332

NFP PANEL 1420G

FIRM
FLOOD INSURANCE RATE MAP
SANTA BARBARA COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 1420 OF 1835
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS	COMMUNITY	NUMBER	PANEL	SUFFIX
	CARPINTERIA, CITY OF	060332	1420	G
	SANTA BARBARA COUNTY	060331	1420	G

NATIONAL FLOOD INSURANCE PROGRAM

Notice to User: This Map Number shown below should be used when placing map orders. The Community Number shown above should be used on insurance applications for the insured community.

MAP NUMBER
06083C1420G

MAP REVISED
DECEMBER 4, 2012

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

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Program at 1-800-638-6620.



MAP SCALE 1" = 1000'

0 500 1,000 1,500 2,000 FEET

Santa Barbara County
Unincorporated
060331

NFP PANEL 1420G

FIRM
FLOOD INSURANCE RATE MAP
SANTA BARBARA COUNTY,
CALIFORNIA
AND INCORPORATED AREAS

PANEL 1420 OF 1835
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
CARPINTERIA CITY OF	06033	1420	0
SANTA BARBARA COUNTY	06031	1420	0

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MAP NUMBER
06083C1420G

MAP REVISED
DECEMBER 4, 2012

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ATTACHMENT D

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Program at 1-800-638-6620.



MAP SCALE 1" = 500'



JOINS PANEL 1420

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1412G

FIRM
FLOOD INSURANCE RATE MAP
SANTA BARBARA COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 1412 OF 1835
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

COMMUNITY NUMBER PANEL SUFFIX
 SANTA BARBARA COUNTY 060331 1412 G

Note to User: The Map Number shown here should be used when placing this order. The Community Number shown above should be used on insurance applications for this subject community.

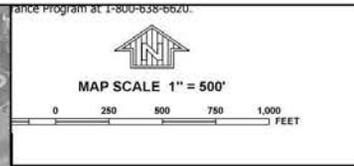
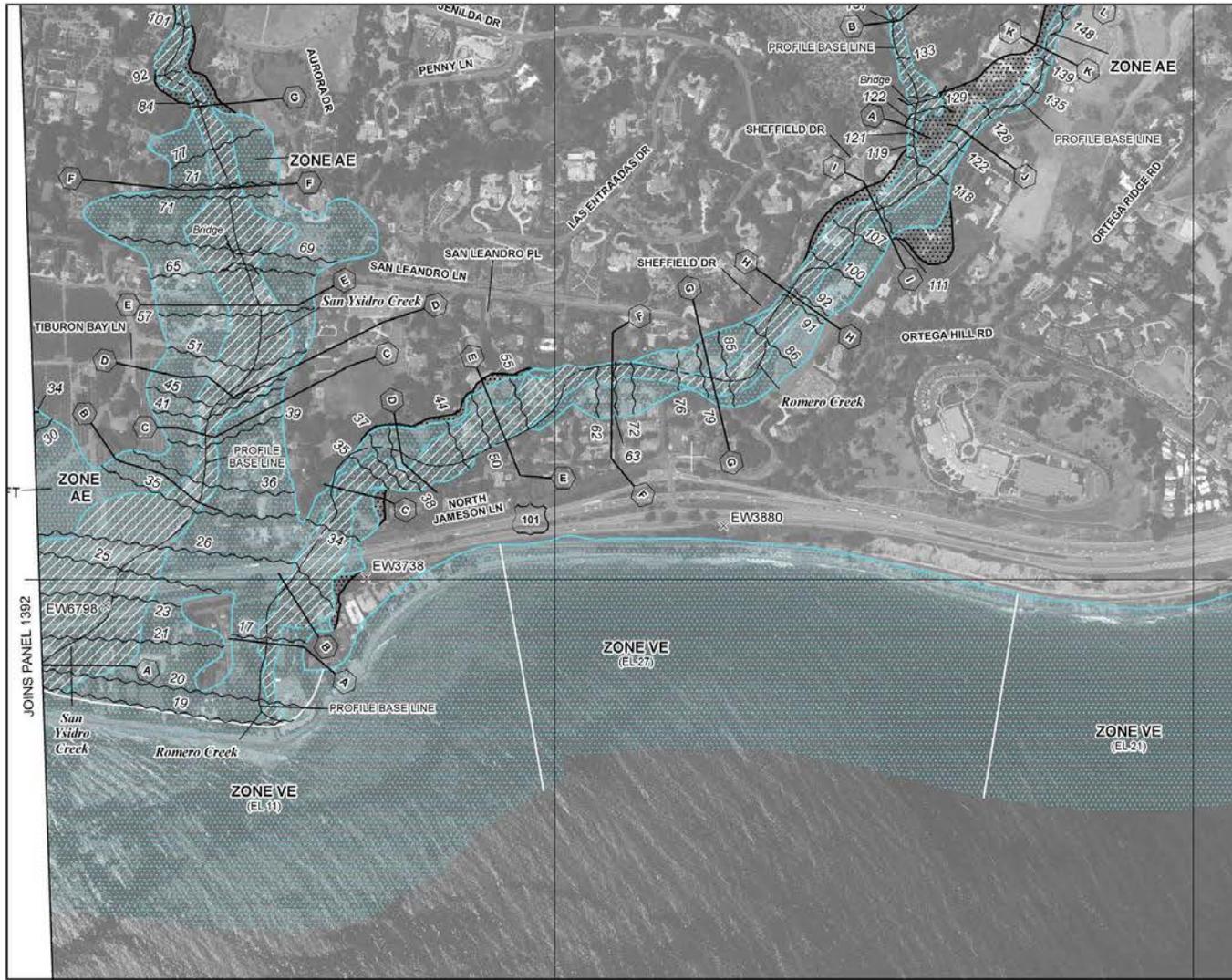
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MAP REVISED
 DECEMBER 4, 2012

Federal Emergency Management Agency

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ATTACHMENT E

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NFIP PANEL 1411G

FIRM
 FLOOD INSURANCE RATE MAP
 SANTA BARBARA COUNTY,
 CALIFORNIA
 AND INCORPORATED AREAS

PANEL 1411 OF 1835
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:
 COMMUNITY NUMBER PANEL SUFFIX
 SANTA BARBARA COUNTY 06033 1411 G

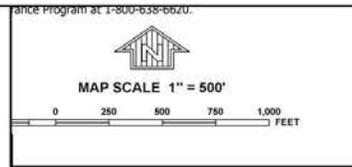
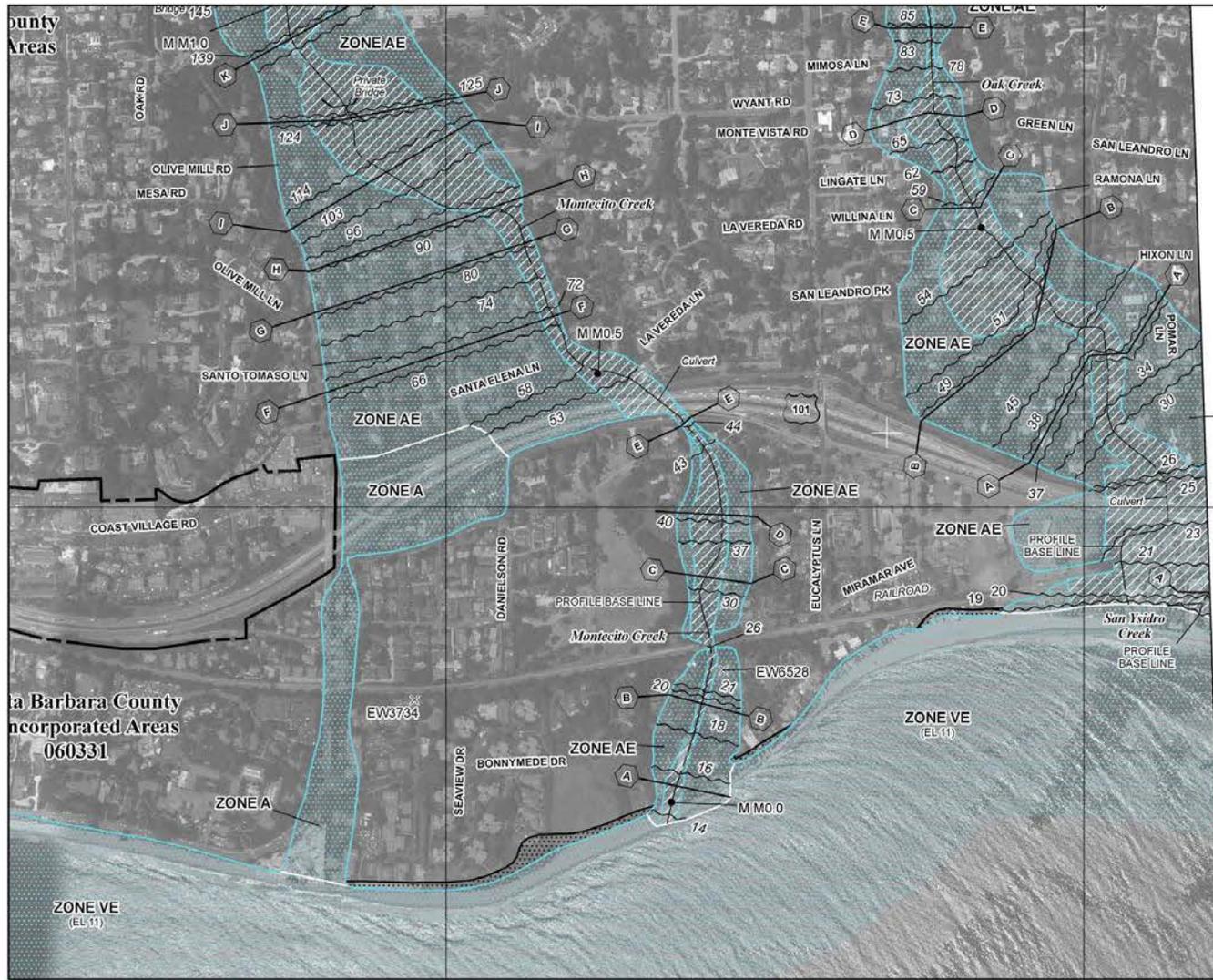
Notice to User: The Map Number shown below should be used when placing map orders, the Community Number shown above should be used on insurance applications for the insured community.

MAP NUMBER
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MAP REVISED
 DECEMBER 4, 2012

Federal Emergency Management Agency

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ance Program at 1-800-638-6620.

NFIP PANEL 1392G

FIRM
FLOOD INSURANCE RATE MAP
SANTA BARBARA COUNTY,
CALIFORNIA
AND INCORPORATED AREAS

PANEL 1392 OF 1835
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
SANTA BARBARA COUNTY 060331 1392 G
SANTA BARBARA, CITY OF 060335 1392 G

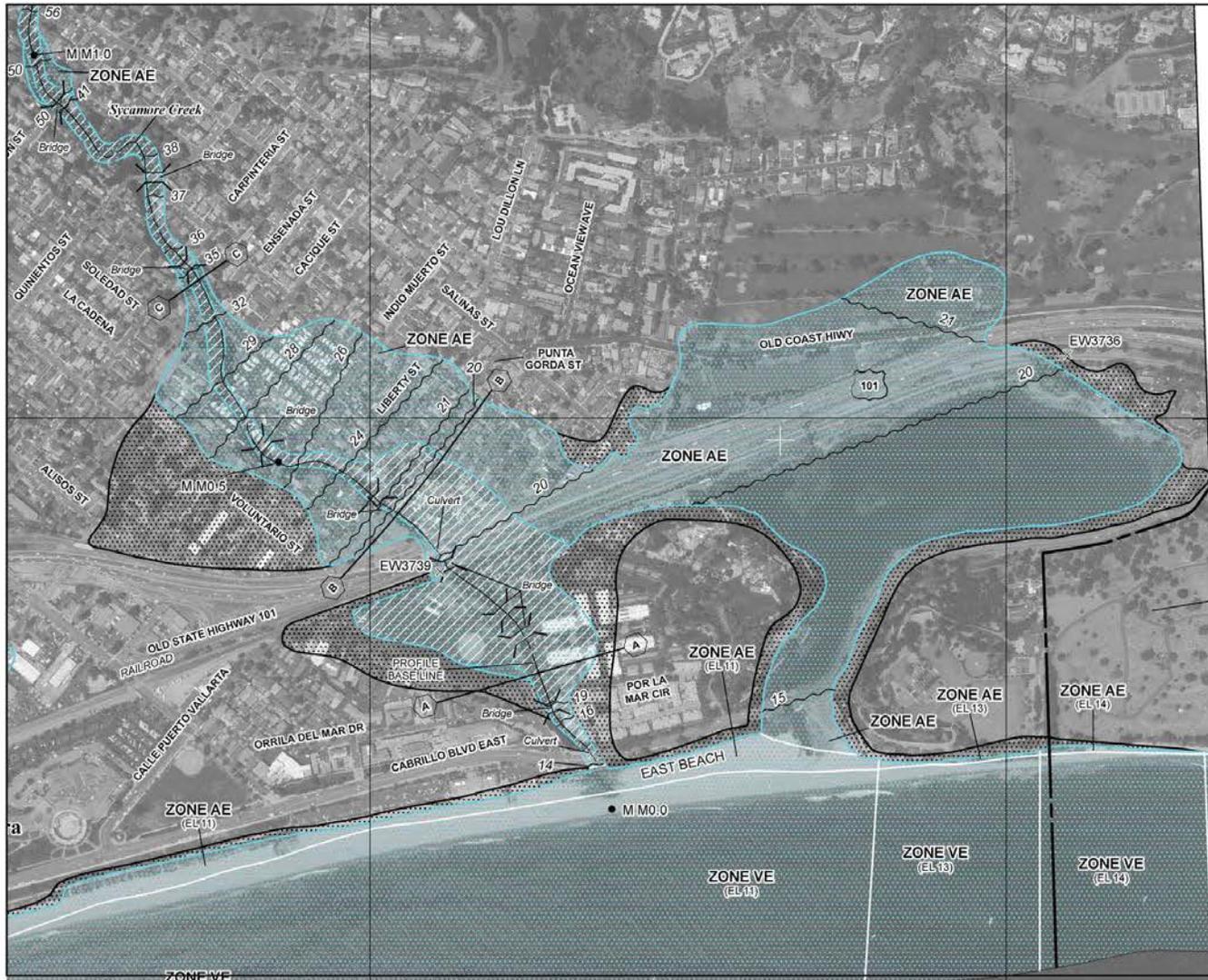
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MAP NUMBER
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MAP REVISED
DECEMBER 4, 2012

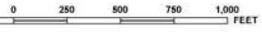
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

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Program at 1-800-638-6620.


MAP SCALE 1" = 500'


JOINS PANEL 1392

PANEL 1391G

FIRM
FLOOD INSURANCE RATE MAP
SANTA BARBARA COUNTY,
CALIFORNIA
AND INCORPORATED AREAS

PANEL 1391 OF 1835
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
SANTA BARBARA COUNTY	06033	1391	G
SANTA BARBARA, CITY OF	06035	1391	G

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MAP NUMBER
06083C1391G
MAP REVISED
DECEMBER 4, 2012

Federal Emergency Management Agency

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LOCATION HYDRAULIC STUDY

South Coast 101 HOV Lanes
In Santa Barbara County on Route 101 between 0.22 mile south of the Bailard
Avenue Overcrossing and Sycamore Creek

SB-101-1.4/12.3

05-0N7000

June 2011



PREPARED BY:

Wendelyn E. Wickham

Wendelyn E. Wickham, PE
Caltrans District 5 Hydraulics

6/1/11

Date

Flood History

The worst flooding in the area took place in 1966, 1969, 1971, 1995 and 1998. The storms in 1966 and 1969 caused considerable damage throughout the area due to flooding, erosion and debris deposition. The Santa Monica and Franklin Creek channels were lined in response to those storms. In 1969, Carpinteria Creek escaped its banks at Route 101 and ran down the highway to Franklin Creek, causing the highway to be closed for 2 weeks. A local resident described Route 101 as “flowing like a river.” San Ysidro Creek also overtopped the highway, which was closed from Montecito to Carpinteria. In 1971, Toro Creek overtopped Route 101, overturning large trucks and closing the highway for several hours.

The 1995 floods overtopped Route 101 at Franklin, Arroyo Paredon, San Ysidro and Oak Creeks, closing the highway. Sycamore Creek flooded the neighborhood upstream of Route 101. Residents of the neighborhood broke through the sound wall along the highway in order to facilitate the passage of flood flows. The sound wall has since been replaced and now incorporates flood gates that allow flood flows to pass unobstructed. In 1998, Arroyo Paredon, Romero, San Ysidro, Oak and Montecito Creeks overtopped their banks.

Floodplain Descriptions

Within the project limits, FEMA defines floodplains for Carpinteria, Franklin, Santa Monica, Arroyo Paredon, Garrapata, Toro, Romero, San Ysidro, Oak, Montecito and Sycamore Creeks and for the Arroyo Paredon Overflow and an unnamed watershed at Cravens Lane. A floodway is a portion of the base floodplain which must be kept free of encroachment. Floodways are a regulatory tool used to manage development in floodplains. FEMA defines floodways at Route 101 for Romero, San Ysidro, Oak, Montecito and Sycamore Creeks.

Carpinteria Creek

The base floodplain shown in the FEMA Flood Insurance Rate Map (FIRM) for Carpinteria Creek (Attachment C) is contained in the main creek channel upstream of Route 101. At Route 101, the bridge doesn't have capacity for the 100-year flow. A portion of the flow escapes onto the highway and runs along it to Linden Avenue, then spreads out and inundates a large area adjacent to Franklin creek. Caltrans is proposing a project to replace the Linden Avenue and Casitas Pass Road Interchanges on Route 101, which is planned to be constructed before the South Coast HOV Lanes project. The Linden and Casitas project will also replace the bridges at Carpinteria Creek to pass flood flows and eliminate the flooding caused by the diversion of flow towards Franklin Creek. The floodplain conditions for the HOV project are assumed to reflect the changes made by the Linden and Casitas project. More detailed information for the Carpinteria Creek floodplain is available in the Location Hydraulic Study for the Linden and Casitas project.

Franklin and Santa Monica Creeks

Franklin and Santa Monica Creeks are flood control channels that were designed to pass the 100-year flow. The FEMA FIRM (Attachment C) shows the 100-year flow contained within its channel for both creeks, except for the flooding adjacent to Franklin Creek caused by the overflow from Carpinteria Creek. The Linden and Casitas project will eliminate that flooding, as described above, leaving the Franklin Creek floodplain entirely confined within its channel in the vicinity of Route 101.

Cravens Lane Watershed

The FEMA FIRM (Attachment C) shows a floodplain deriving from an unnamed watershed in the vicinity of Cravens Lane near the north limit of the City of Carpinteria. There is no defined swale for the watershed and FEMA has no detailed study for it. Flood flows sheet through the neighborhood upstream of Route 101, then cross it at a low point near Cravens Lane.

Arroyo Paredon Creek and Overflow

The 100-year flow for Arroyo Paredon Creek overtops its banks upstream of Route 101 at Foothill Road. The overflow takes a separate route from the main channel and does not return to it. The FEMA FIRM (Attachment D) shows the 100-year floodplains for the main channel and its overflow. The floodplain for the main channel is approximately 1000 feet wide at Route 101 and has defined base flood elevations. No detailed study was done for the overflow, which crosses Route 101 near Sandpoint Road just north of the City of Carpinteria.

Toro and Garrapata Creeks

The floodplains for Toro and Garrapata Creeks are both based on detailed studies by FEMA. The FIRM for the creeks (Attachment E) states that the 100-year flow for Garrapata Creek is contained in the culvert under Route 101 and shows a floodplain approximately 600 feet wide at the highway for Toro Creek.

Romero, San Ysidro and Oak Creeks

Romero, San Ysidro and Oak Creeks all overtop their banks well upstream of the Route 101 and their combined flows flood a large portion of the developed areas upstream and downstream of the highway. FEMA performed detailed analyses and defined floodways for all three creeks. The FIRM (Attachments F and G) shows the combined floodplain extending for approximately half a mile along the highway from the Romero Creek Bridge to Miramar Avenue. The floodway for Romero Creek and the combined floodway for San Ysidro and Oak Creeks are approximately 300 feet and 1000 feet wide, respectively, at the highway.

Montecito Creek

Montecito Creek overtops its banks upstream of Route 101 during a 100-year storm, flooding the neighborhood to the west and south of the main channel. A portion of the flow runs down Olive Mill Road to the ocean. The FEMA FIRM (Attachment G) shows the floodplain extending along the highway from the Montecito Creek Bridge to Olive Mill Road. A floodway is defined at the highway in the vicinity of the bridge.

Sycamore Creek

The FEMA FIRM for Sycamore Creek (Attachment H) shows the 100-year floodplain extending for half a mile along Route 101. The majority of the 100-year flow for Sycamore Creek escapes from the main channel before it reaches the highway. The escaped flow floods the neighborhood east of the creek and sheets across the highway between Los Patos Way and the Sycamore Creek Bridge. A floodway is defined at Route 101 between Canada Street and the bridge.

FLOODPLAIN IMPACTS

Federal Regulations

23 CFR 650 defines significant encroachments and risks for the base floodplain. An encroachment is any work done within the limits of the floodplain. A significant encroachment is one which could significantly interrupt a route required for emergency operations, pose a significant risk, or significantly impact natural and beneficial floodplain values. Risks are consequences of encroachments that could lead to flooding which would cause property loss or hazard to life.

44 CFR Chapter 1 60.3 places requirements on development within FEMA base floodplains and regulatory floodways. Development is allowed in the floodplain only if it does not cause flood elevations to rise more than one foot. Development in a floodway is prohibited unless it would not result in any increase to base flood elevations.

Encroachments

Carpinteria Creek

The project does not propose any work at Carpinteria Creek and would not encroach on its base floodplain.

Franklin and Santa Monica Creeks

The project proposes to widen the bridges at Franklin and Santa Monica Creeks and construct sound walls within the limits of the floodplain for Santa Monica Creek. Franklin and Santa Monica Creeks are both carried by flood control channels designed for their 100-year flows in the vicinity of Route 101. The 100-year floodplain for Santa Monica Creek is contained in its main channel. At Franklin Creek, the current floodplain

extends beyond the main channel only due to the effect of overflow from Carpinteria Creek. That overflow is assumed to be eliminated by the Linden and Casitas project before this project is constructed. The floodplain for Franklin Creek would then be contained in its main channel as well. The proposed widened bridges would have a greater waterway area than the main creek channels and would not encroach on their base floodplains. The sound walls proposed at Santa Monica Creek would be placed on the bridge, above flood elevations, and would not encroach on the floodplain.

Cravens Lane Watershed

The project proposes to construct a sound wall within the limits of the floodplain at the Cravens Lane watershed. The proposed work would encroach only a short distance into the floodplain, which is very wide in comparison to the limits of the encroachment. A hydraulic analysis indicates that the encroachment would have no effect on base flood elevations.

Arroyo Paredon Creek and Overflow

The project does not propose any work that might encroach on the floodplain at the Arroyo Paredon Overflow. At Arroyo Paredon Creek, the project would replace the bridge and construct a sound wall on the south side of the highway within the limits of the floodplain. The proposed bridge would have more capacity than the existing one and the sound wall would be designed to pass flood flows. A hydraulic analysis indicates that the combined effects of both features would be to lower base flood elevations.

Toro and Garrapata Creeks

The project proposes to replace the bridge at Toro Creek. The bridge would be designed to pass the 100-year flow and would not raise base flood elevations. No work is being proposed at Garrapata Creek.

Romero, San Ysidro and Oak Creeks

The project proposes to replace the bridges at Romero, Oak, and San Ysidro Creeks and construct sound walls on the north side of Route 101 within the limits of the combined floodplain and floodways for the creeks. The proposed bridges would maintain the capacity of the existing ones and would not increase base flood elevations.

The proposed sound walls will incorporate flood gates in order to pass flood flows. Preliminary hydraulic modeling indicated that the sound walls would raise base flood elevations within the floodways defined for all three creeks, even when the maximum possible flood conveyance through the walls is provided with flood gates. The wall sections within the limits of the floodways were eliminated order to avoid raising base flood elevations.

Montecito Creek

The project proposes to construct sound walls within the limits of the floodplain and floodway at Montecito Creek. The sound walls would be located between the frontage road and Route 101 on both the northbound and southbound sides of the highway and would encroach on the floodplain. Hydraulic modeling and field reviews of the area show that the majority of the 100-year flow that escapes the main channel does not reach the highway at the sound wall locations due to the local topography. Both sound walls would be designed to pass any flood flows that might reach them and would not increase base flood elevations.

Sycamore Creek

The project proposes to reconstruct the interchange at Cabrillo Boulevard. Interchange configurations J, M and M Modified include raising the elevation of the Union Pacific Railroad by as much as 4 feet within the limits of the Sycamore Creek floodplain from the Los Patos UP to 600 feet north of Salinas Street. The floodplain is very wide in comparison to the limits of the encroachment. A hydraulic analysis indicates that the encroachment would have no significant effect on base flood elevations.

Longitudinal Encroachments

A longitudinal encroachment is one in the direction of flow and generally refers to a condition in which a highway runs along the edge of a creek or river for a long distance. The proposed project crosses all affected floodplains transversely and does not create any longitudinal encroachments.

Natural and Beneficial Floodplain Values

The project would not create a significant impact on natural and beneficial floodplain values. Refer to the Natural Environment Study for a more detailed discussion of this subject.

CONCLUSION

The proposed project would not create a significant encroachment or longitudinal encroachment on any of the base floodplains it crosses and would not significantly impact natural and beneficial floodplain values.

The project and its potential impacts have been discussed with the Santa Barbara County Flood Control Department (SBCFCD). The SBCFCD Floodplain Manager has stated that the County will not require FEMA approval of the project if it doesn't raise base flood elevations. The Cities of Santa Barbara and Carpinteria could require FEMA approval of work within the floodplains in their jurisdictions. FEMA will be contacted during final design regarding any conditional approval or map revisions that might be required.

REFERENCES

1. 23 CFR 650
2. 44 CFR Chapter 1 60.3
3. FEMA Flood Insurance Study, Santa Barbara County, Revised 9/30/05
4. FEMA Flood Insurance Rate Maps, Santa Barbara County, Panel Numbers 1391, 1392, 1411, 1412, and 1420, Revised 9/30/05
5. FEMA Letter of Map Revision for Franklin Creek, Panel 1420, Case No. 08-09-1482P, Revised 4/15/09.
6. Santa Barbara County Flood Control and Water Conservation District Flood Reports from 1969, 1995 and 1998
7. *Carpinteria Valley Watershed Work Plan*, Santa Barbara Soil Conservation District, Santa Barbara County Flood Control and Water Conservation District and City of Carpinteria, November 1968
8. *Montecito Streams*, US Army Corps of Engineers, June 1974
9. *Santa Barbara Stream Group*, US Army Corps of Engineers, April 1975
10. Caltrans Structure Maintenance Department Supplementary Bridge Reports
11. Caltrans District 5 Hydraulics Department Historic Records

ATTACHMENTS

- A. Floodplains and Sound Walls for East Project
- B. Floodplains and Sound Walls for West Project
- C. FEMA FIRM for Carpinteria, Franklin, and Santa Monica Creeks, and the Cravens Lane watershed
- D. FEMA FIRM for Arroyo Paredon Creek and Overflow
- E. FEMA FIRM for Toro and Garrapata Creeks
- F. FEMA FIRM for Romero and San Ysidro Creeks
- G. FEMA FIRM for Oak and Montecito Creeks
- H. FEMA FIRM for Sycamore Creek