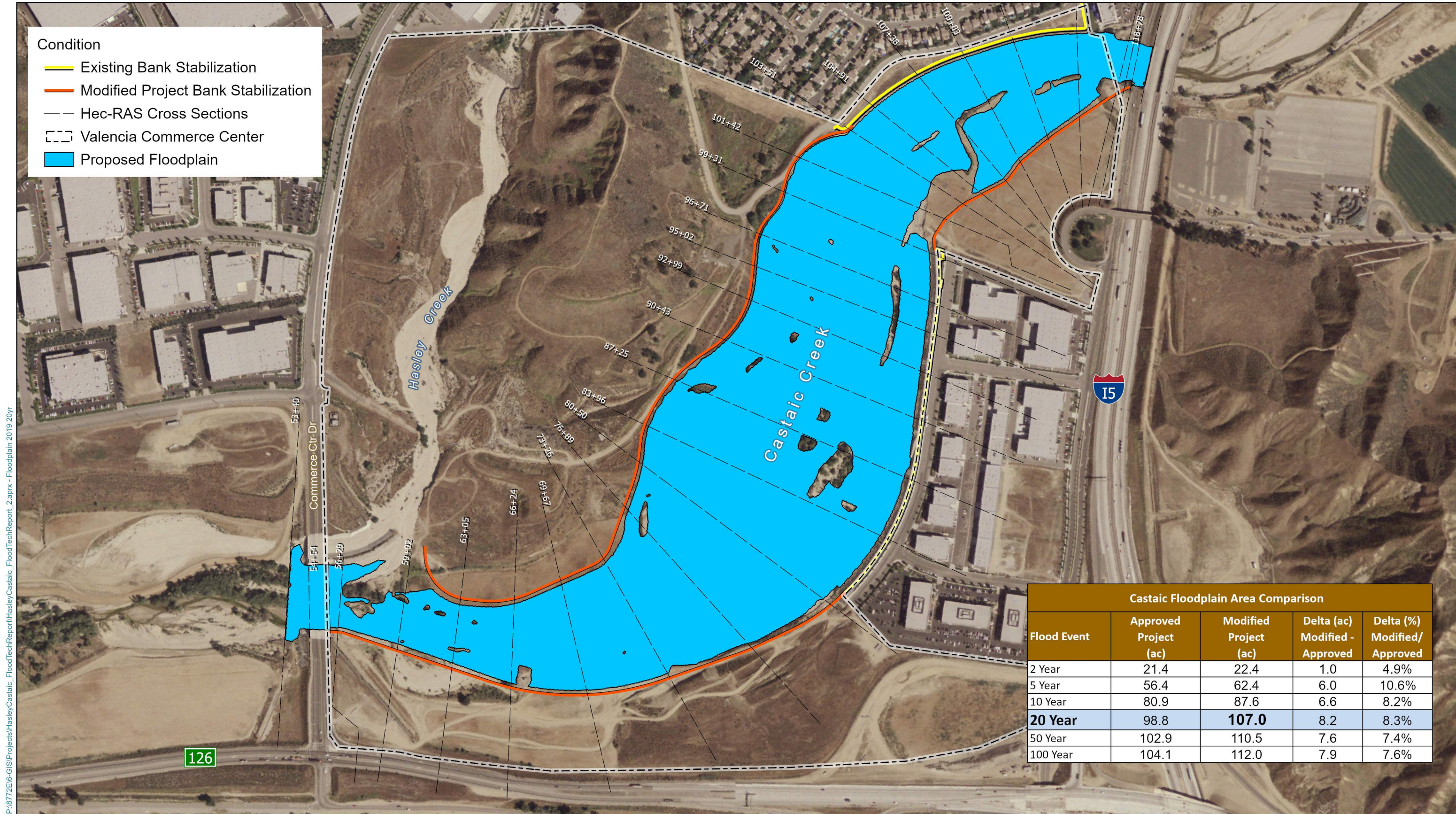


## **Appendix 5.5 (Continued)**

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Hydrology (Part 12 of 15)



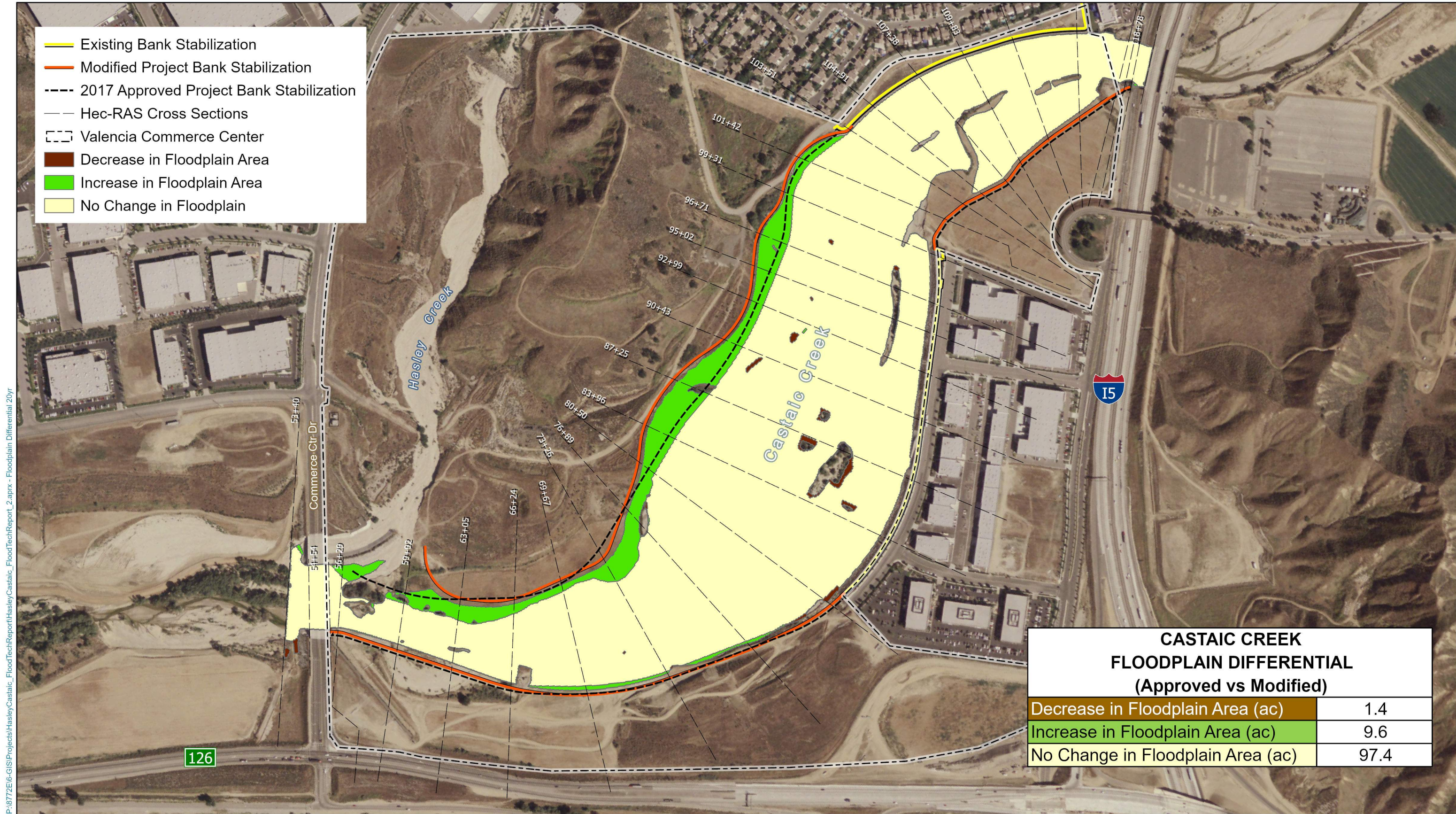


Castaic Floodplain Area Comparison				
Flood Event	Approved Project (ac)	Modified Project (ac)	Delta (ac) Modified - Approved	Delta (%) Modified/Approved
2 Year	21.4	22.4	1.0	4.9%
5 Year	56.4	62.4	6.0	10.6%
10 Year	80.9	87.6	6.6	8.2%
<b>20 Year</b>	<b>98.8</b>	<b>107.0</b>	<b>8.2</b>	<b>8.3%</b>
50 Year	102.9	110.5	7.6	7.4%
100 Year	104.1	112.0	7.9	7.6%

# CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

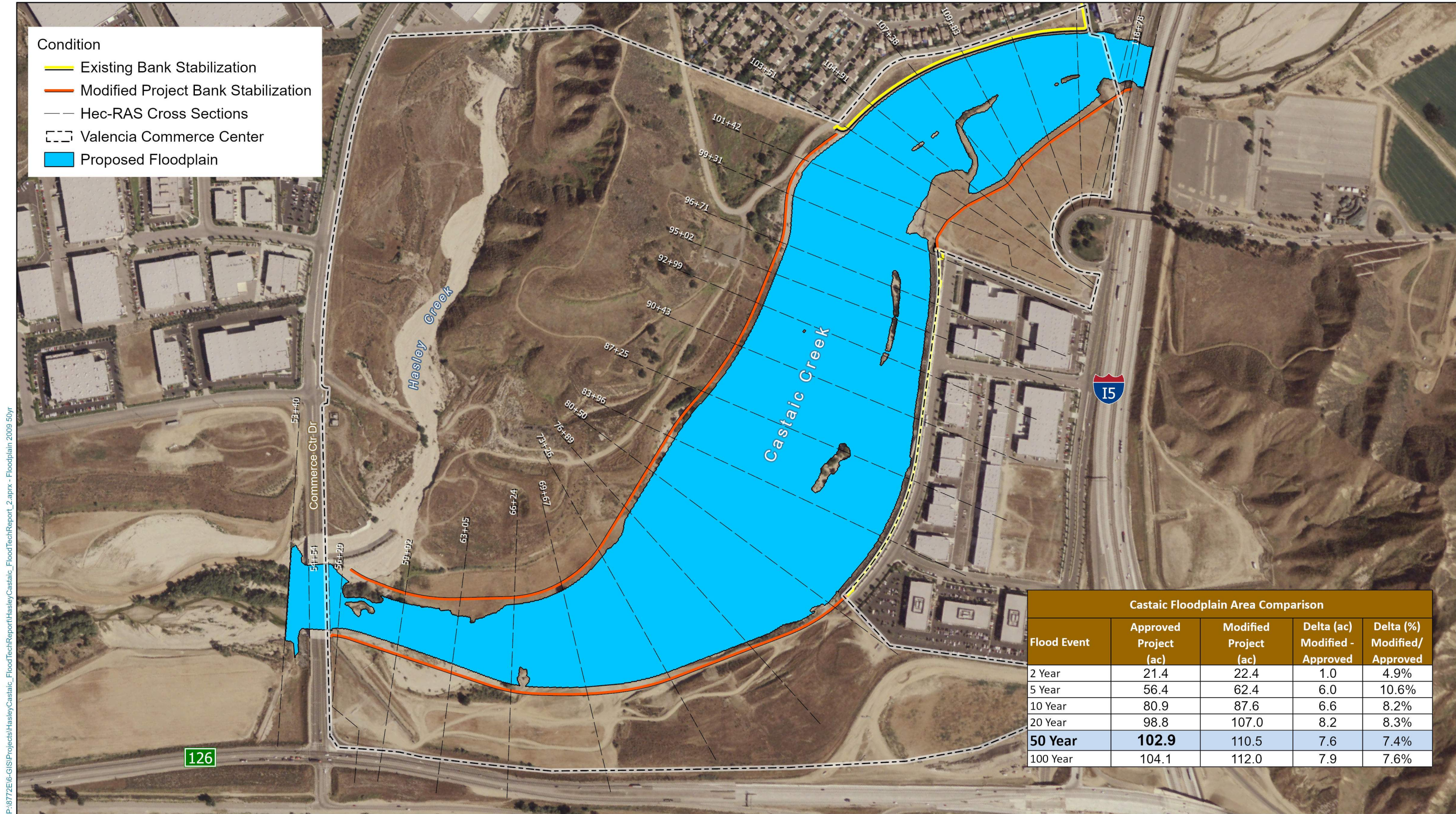
## 20-YEAR EVENT MODIFIED PROJECT FLOODPLAIN

Figure 3.11



**CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT**

**20-YEAR EVENT  
2017 APPROVED PROJECT VS MODIFIED PROJECT**

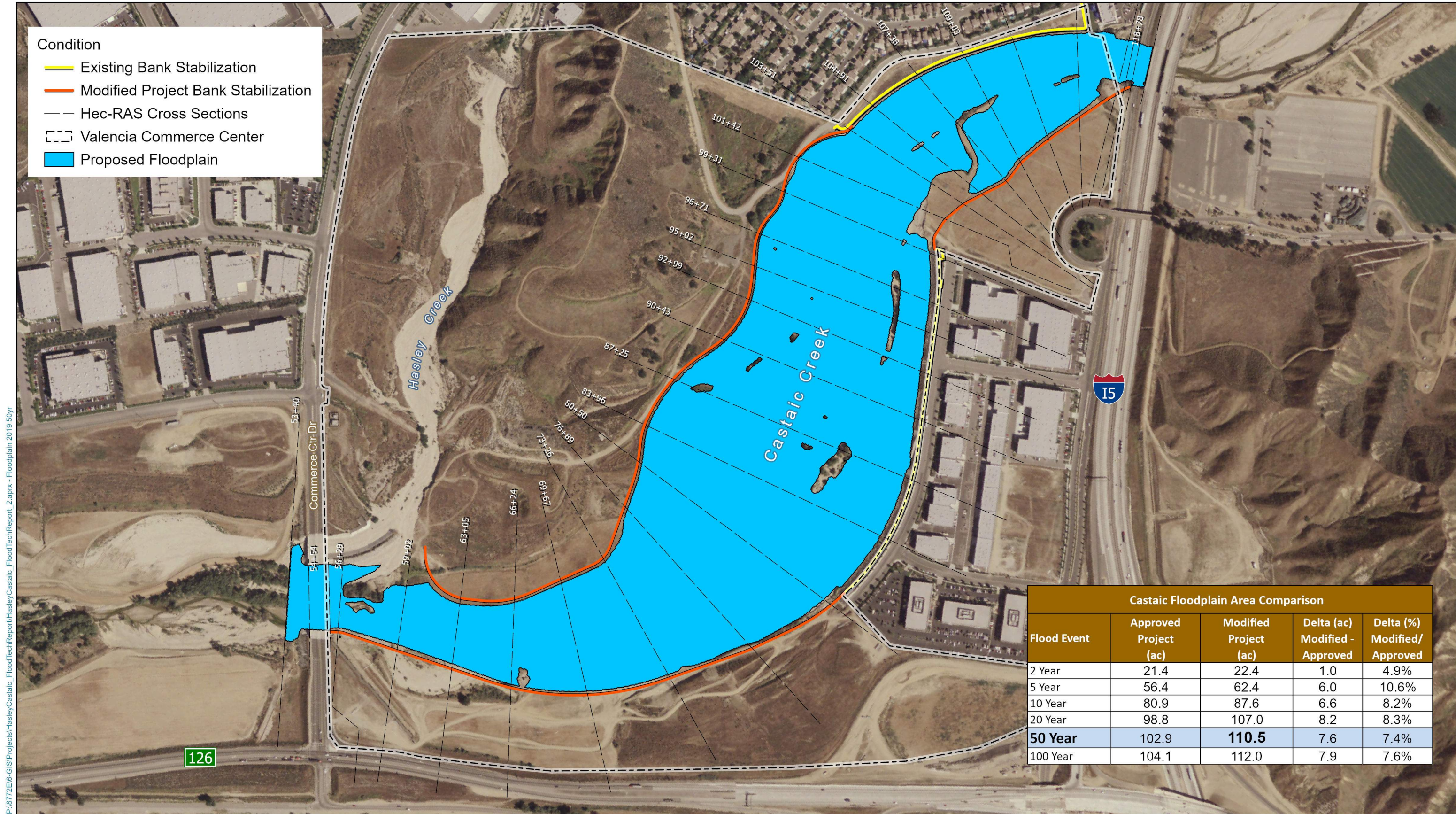


Castaic Floodplain Area Comparison				
Flood Event	Approved Project (ac)	Modified Project (ac)	Delta (ac) Modified - Approved	Delta (%) Modified/Approved
2 Year	21.4	22.4	1.0	4.9%
5 Year	56.4	62.4	6.0	10.6%
10 Year	80.9	87.6	6.6	8.2%
20 Year	98.8	107.0	8.2	8.3%
<b>50 Year</b>	<b>102.9</b>	<b>110.5</b>	<b>7.6</b>	<b>7.4%</b>
100 Year	104.1	112.0	7.9	7.6%

# CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

## 50-YEAR EVENT 2017 APPROVED PROJECT FLOODPLAIN

Figure 3.13

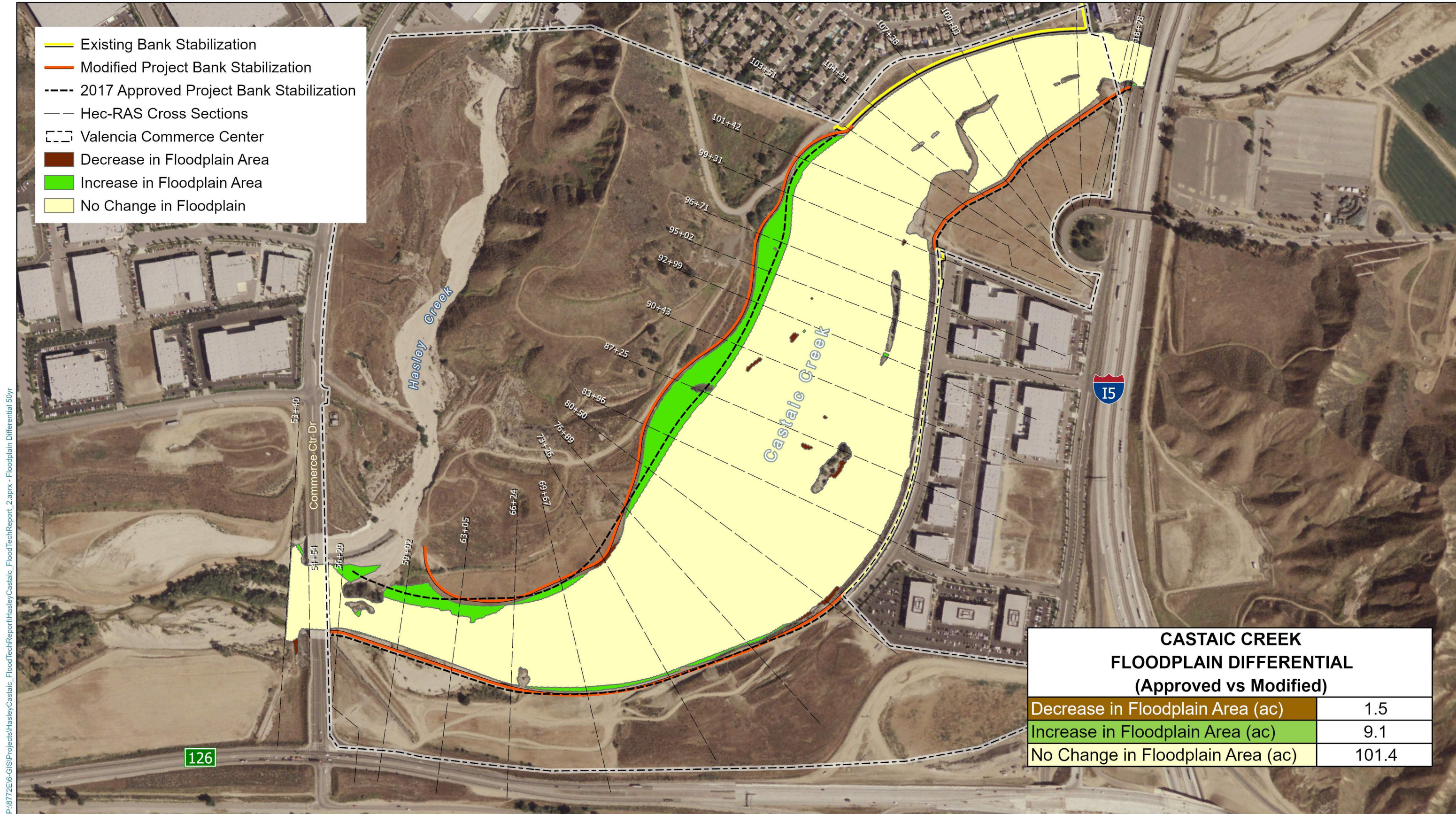


Castaic Floodplain Area Comparison				
Flood Event	Approved Project (ac)	Modified Project (ac)	Delta (ac) Modified - Approved	Delta (%) Modified/Approved
2 Year	21.4	22.4	1.0	4.9%
5 Year	56.4	62.4	6.0	10.6%
10 Year	80.9	87.6	6.6	8.2%
20 Year	98.8	107.0	8.2	8.3%
<b>50 Year</b>	102.9	<b>110.5</b>	7.6	7.4%
100 Year	104.1	112.0	7.9	7.6%

# CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

# 50-YEAR EVENT MODIFIED PROJECT FLOODPLAIN

Figure 3.14



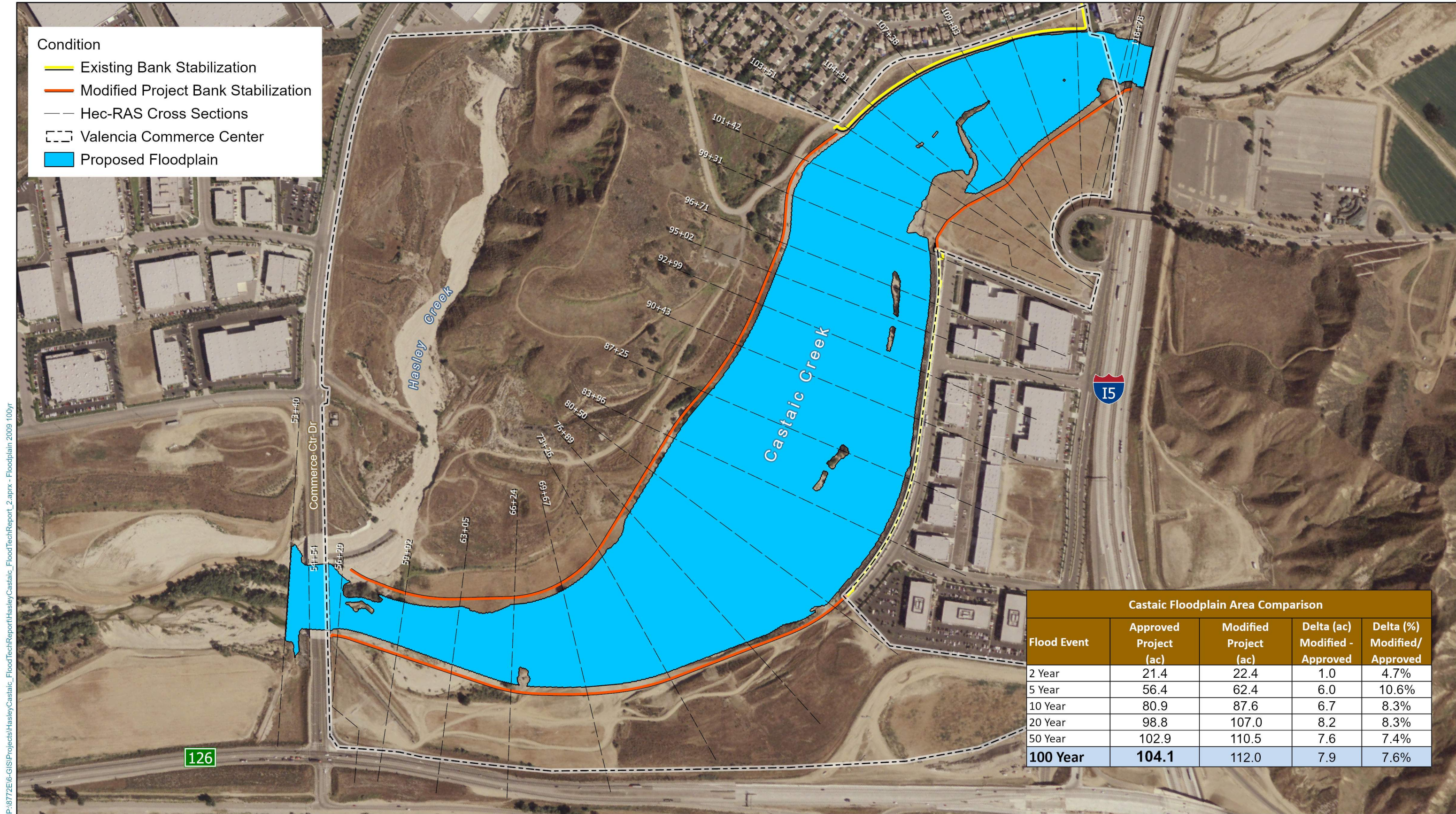
- Existing Bank Stabilization
- Modified Project Bank Stabilization
- - - 2017 Approved Project Bank Stabilization
- Hec-RAS Cross Sections
- Valencia Commerce Center
- Decrease in Floodplain Area
- Increase in Floodplain Area
- No Change in Floodplain

<b>CASTAIC CREEK FLOODPLAIN DIFFERENTIAL (Approved vs Modified)</b>	
Decrease in Floodplain Area (ac)	1.5
Increase in Floodplain Area (ac)	9.1
No Change in Floodplain Area (ac)	101.4

# CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

# 50-YEAR EVENT 2017 APPROVED PROJECT VS MODIFIED PROJECT

Figure 3.15

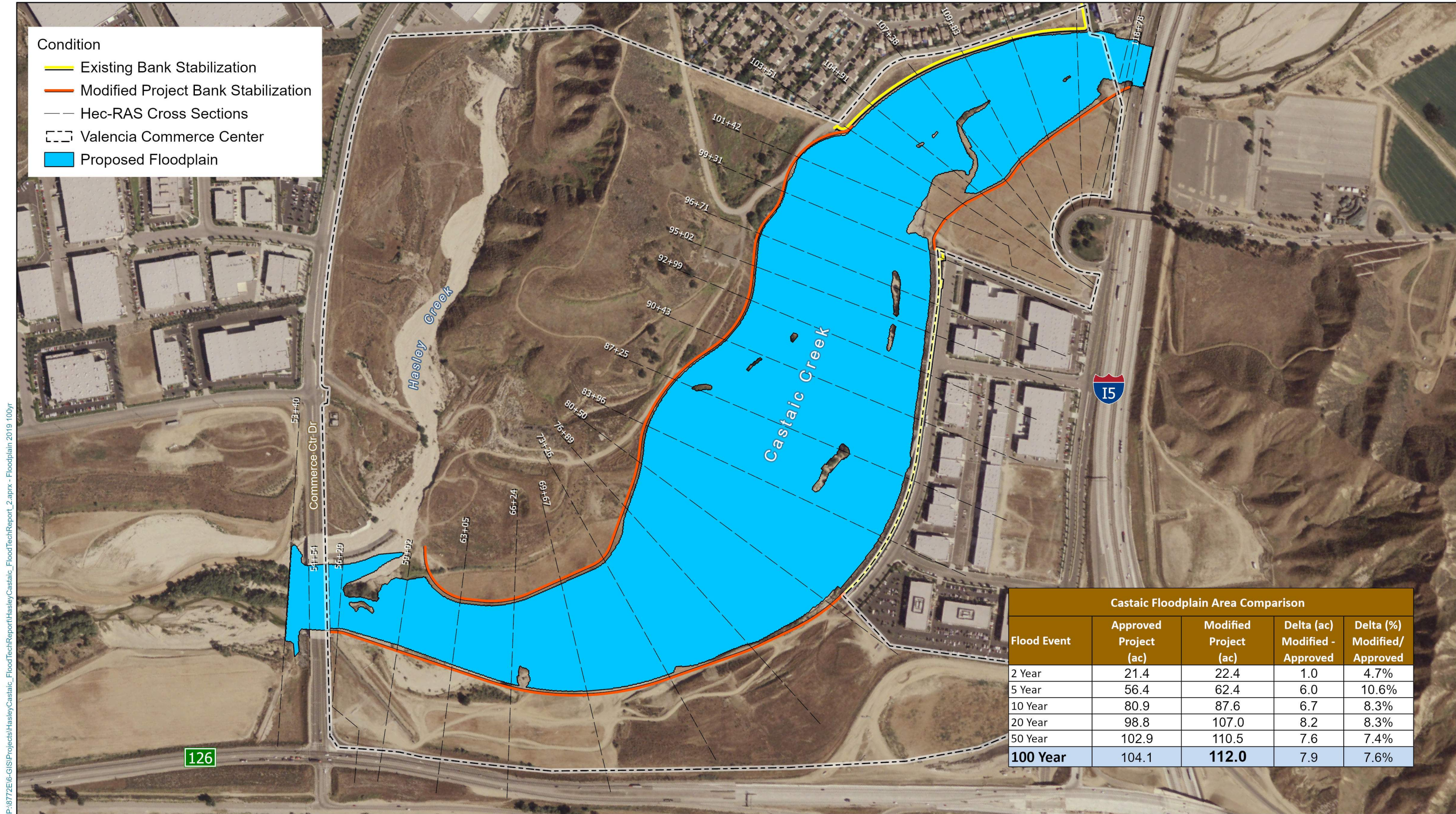


Castaic Floodplain Area Comparison				
Flood Event	Approved Project (ac)	Modified Project (ac)	Delta (ac) Modified - Approved	Delta (%) Modified/Approved
2 Year	21.4	22.4	1.0	4.7%
5 Year	56.4	62.4	6.0	10.6%
10 Year	80.9	87.6	6.7	8.3%
20 Year	98.8	107.0	8.2	8.3%
50 Year	102.9	110.5	7.6	7.4%
<b>100 Year</b>	<b>104.1</b>	<b>112.0</b>	<b>7.9</b>	<b>7.6%</b>

**CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT**

**100-YEAR EVENT  
2017 APPROVED PROJECT FLOODPLAIN**

Figure 3.16

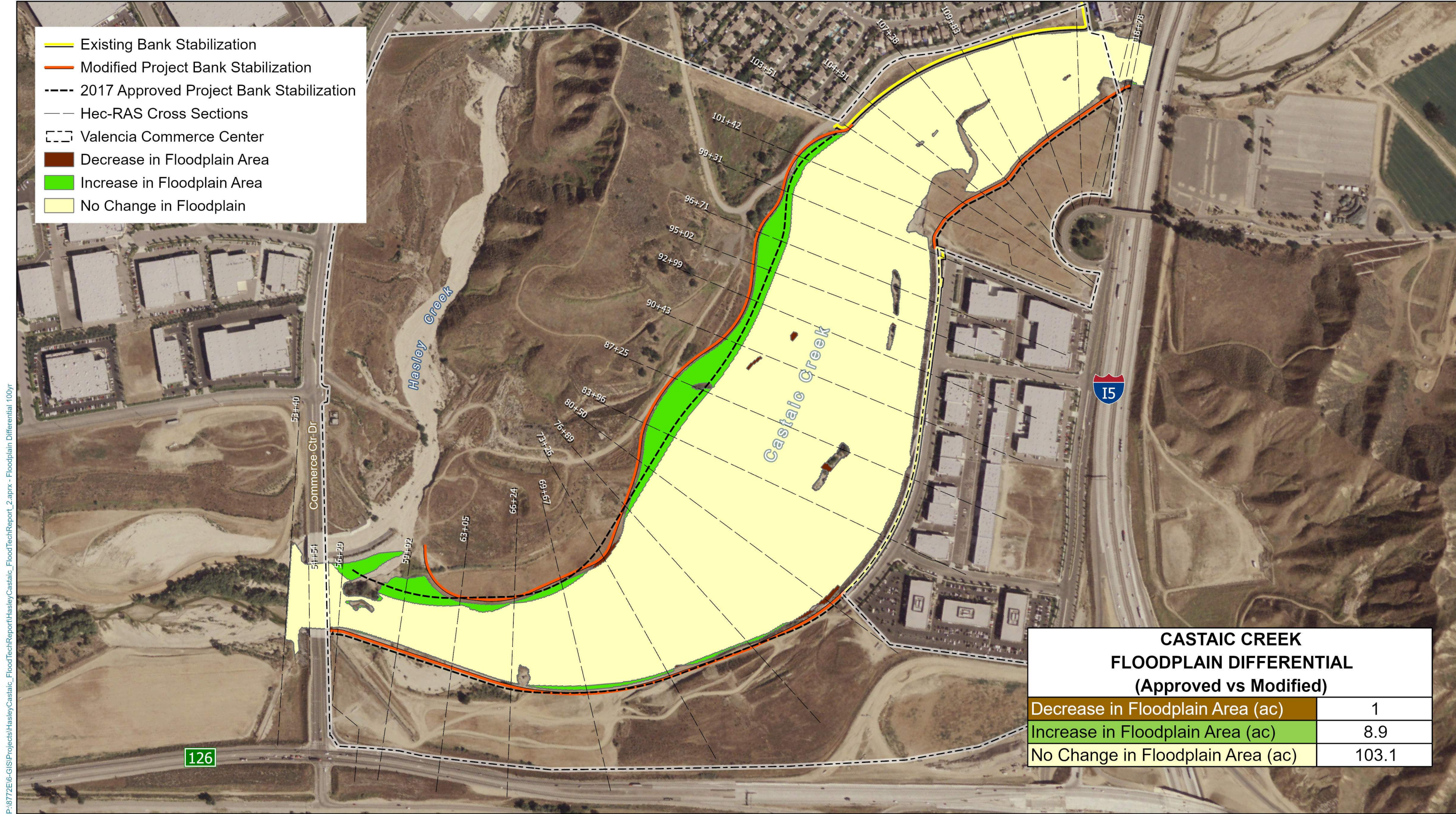


Castaic Floodplain Area Comparison				
Flood Event	Approved Project (ac)	Modified Project (ac)	Delta (ac) Modified - Approved	Delta (%) Modified/Approved
2 Year	21.4	22.4	1.0	4.7%
5 Year	56.4	62.4	6.0	10.6%
10 Year	80.9	87.6	6.7	8.3%
20 Year	98.8	107.0	8.2	8.3%
50 Year	102.9	110.5	7.6	7.4%
<b>100 Year</b>	<b>104.1</b>	<b>112.0</b>	<b>7.9</b>	<b>7.6%</b>

**CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT**

**100-YEAR EVENT  
MODIFIED PROJECT FLOODPLAIN**

Figure 3.17



**CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT**

**100-YEAR EVENT  
2017 APPROVED PROJECT VS MODIFIED PROJECT**



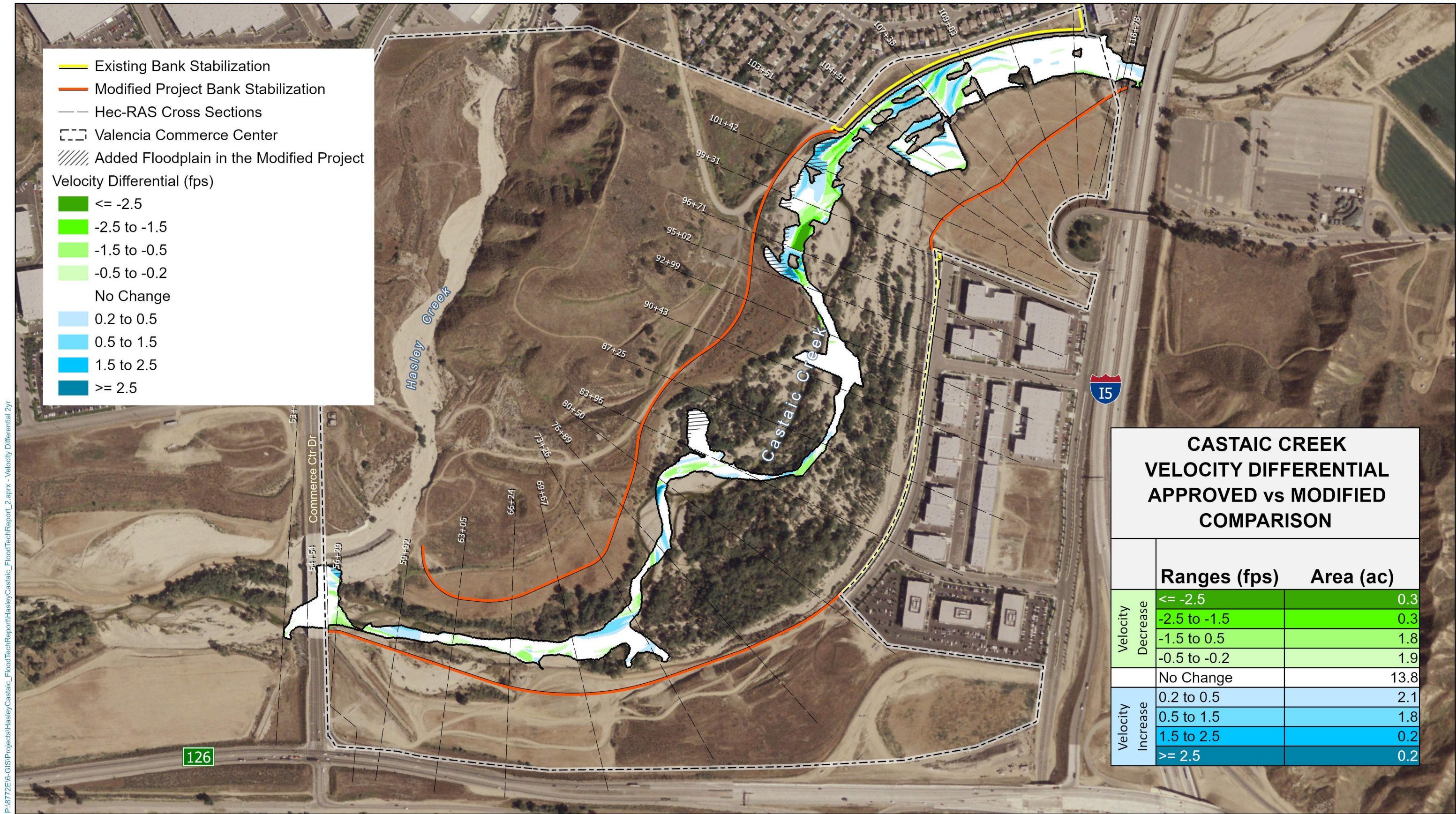
CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT

2-YEAR EVENT  
2017 APPROVED PROJECT VELOCITY DISTRIBUTION



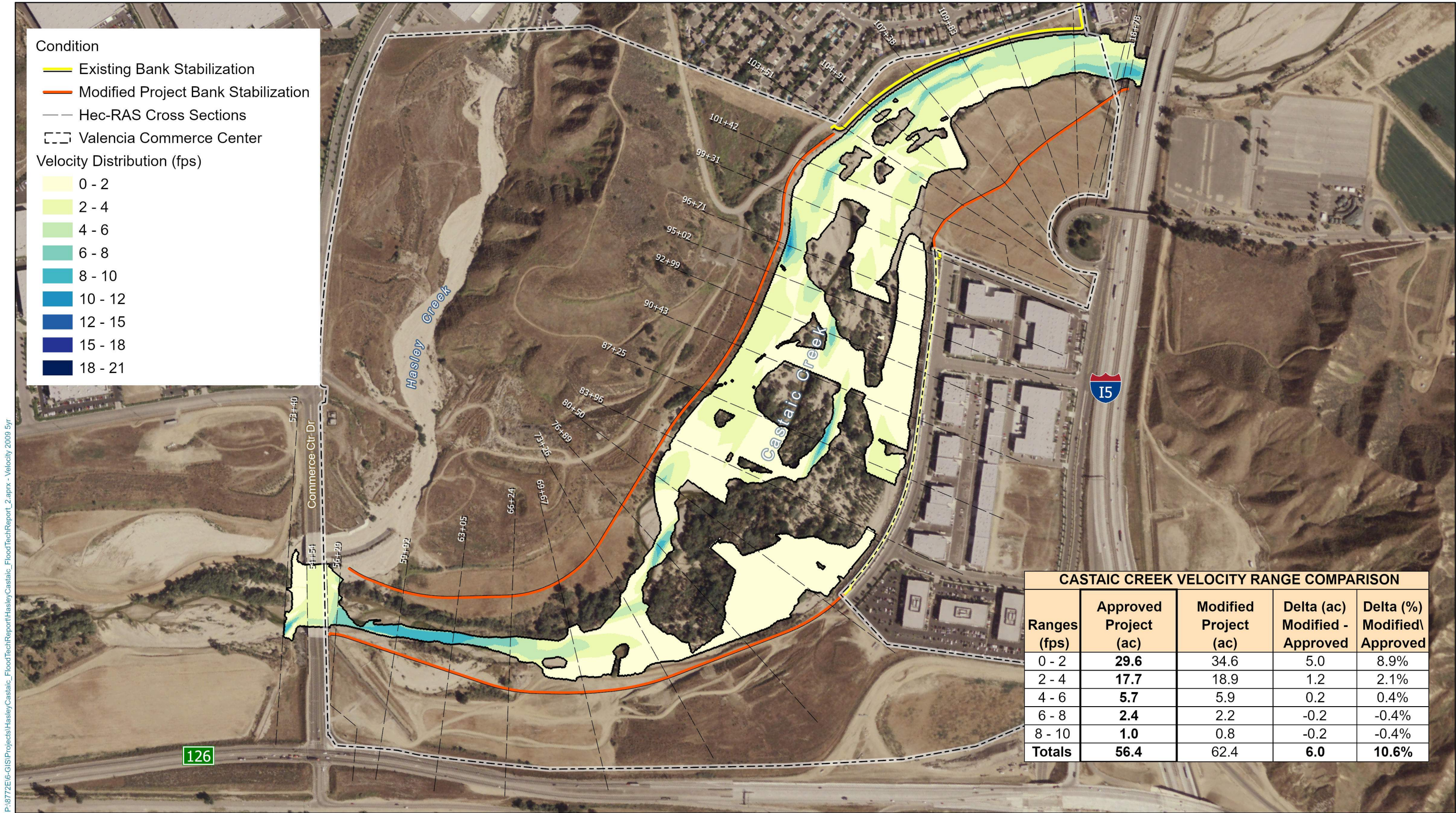
# CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

## 2-YEAR EVENT MODIFIED PROJECT VELOCITY DISTRIBUTION



**CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT**

**2-YEAR EVENT VELOCITY DIFFERENTIAL 2017 APPROVED PROJECT VS MODIFIED PROJECT**



CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT

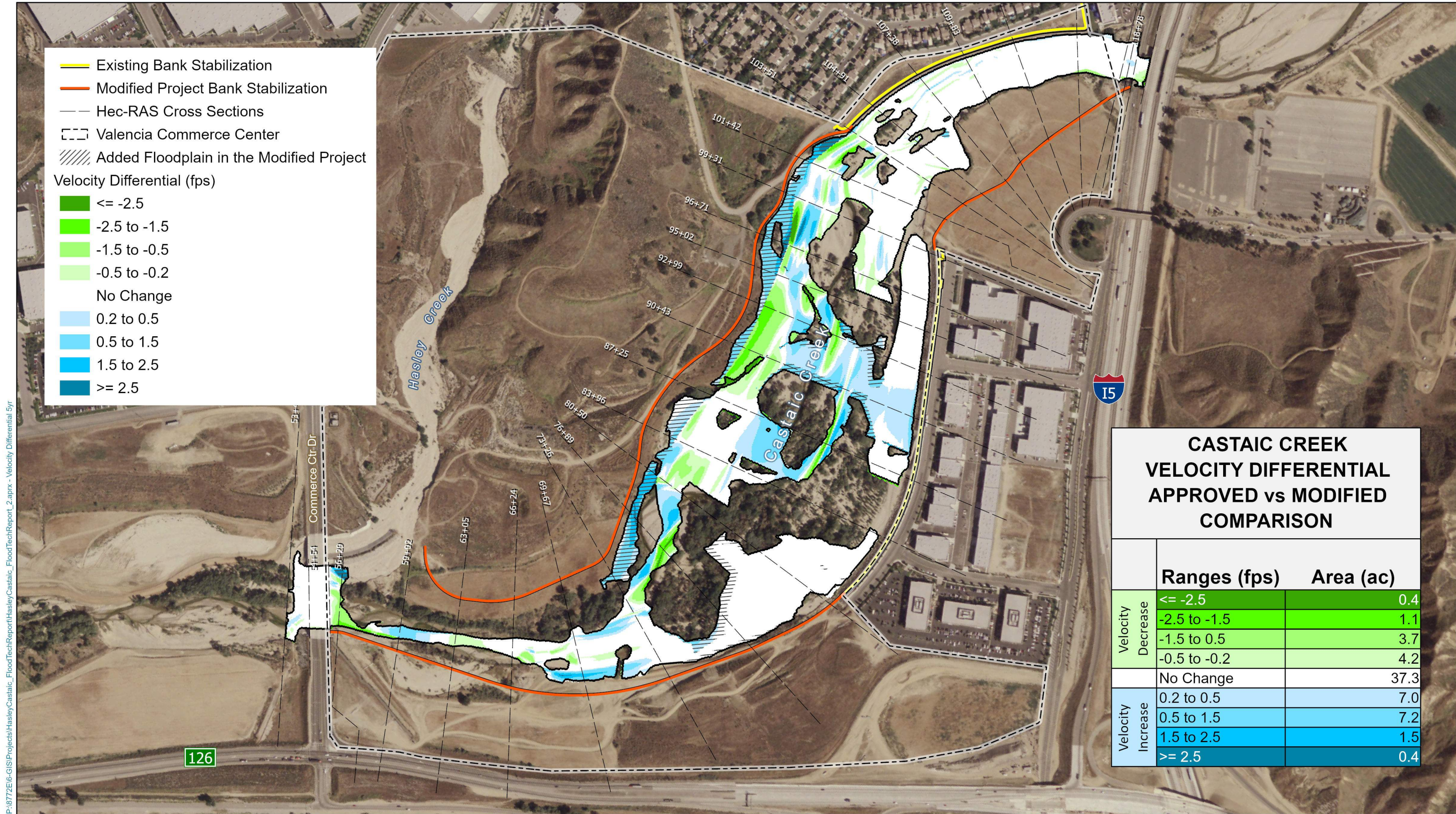
5-YEAR EVENT  
2017 APPROVED PROJECT VELOCITY DISTRIBUTION



CASTAIC CREEK VELOCITY RANGE COMPARISON				
Ranges (fps)	Approved Project (ac)	Modified Project (ac)	Delta (ac) Modified - Approved	Delta (%) Modified \ Approved
0 - 2	29.6	<b>34.6</b>	5.0	8.9%
2 - 4	17.7	<b>18.9</b>	1.2	2.1%
4 - 6	5.7	<b>5.9</b>	0.2	0.4%
6 - 8	2.4	<b>2.2</b>	-0.2	-0.4%
8 - 10	1.0	<b>0.8</b>	-0.2	-0.4%
<b>Totals</b>	<b>56.4</b>	<b>62.4</b>	<b>6.0</b>	<b>10.6%</b>

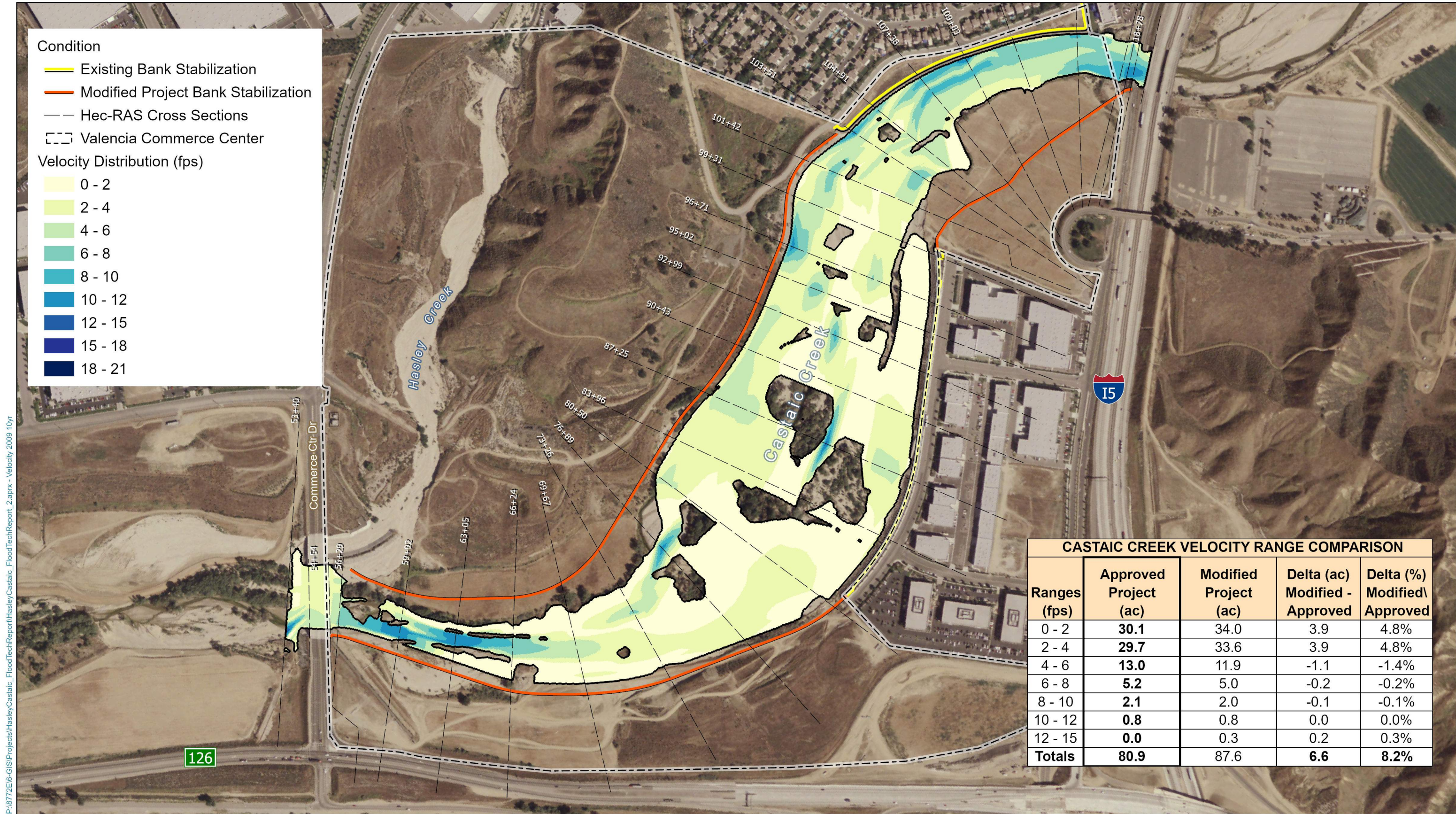
CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT

5-YEAR EVENT  
MODIFIED PROJECT VELOCITY DISTRIBUTION



**CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT**

**5-YEAR EVENT VELOCITY DIFFERENTIAL 2017 APPROVED PROJECT VS MODIFIED PROJECT**



**CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT**

**10-YEAR EVENT  
2017 APPROVED PROJECT VELOCITY DISTRIBUTION**

Figure 3.25

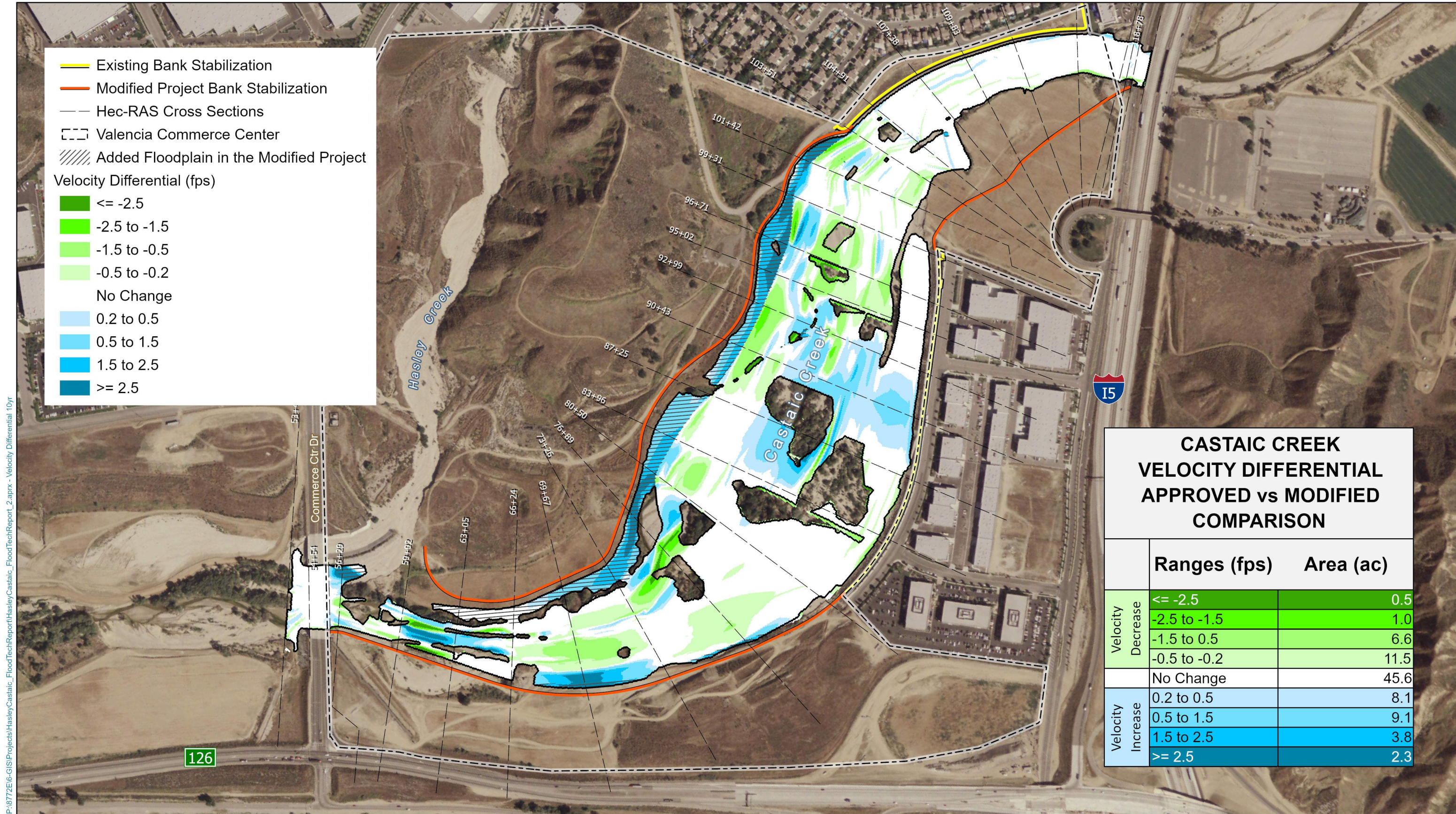


CASTAIC CREEK VELOCITY RANGE COMPARISON				
Ranges (fps)	Approved Project (ac)	Modified Project (ac)	Delta (ac) Modified - Approved	Delta (%) Modified \ Approved
0 - 2	30.1	<b>34.0</b>	3.9	4.8%
2 - 4	29.7	<b>33.6</b>	3.9	4.8%
4 - 6	13.0	<b>11.9</b>	-1.1	-1.4%
6 - 8	5.2	<b>5.0</b>	-0.2	-0.2%
8 - 10	2.1	<b>2.0</b>	-0.1	-0.1%
10 - 12	0.8	<b>0.8</b>	0.0	0.0%
12 - 15	0.0	<b>0.3</b>	0.2	0.3%
<b>Totals</b>	<b>80.9</b>	<b>87.6</b>	<b>6.6</b>	<b>8.2%</b>

# CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

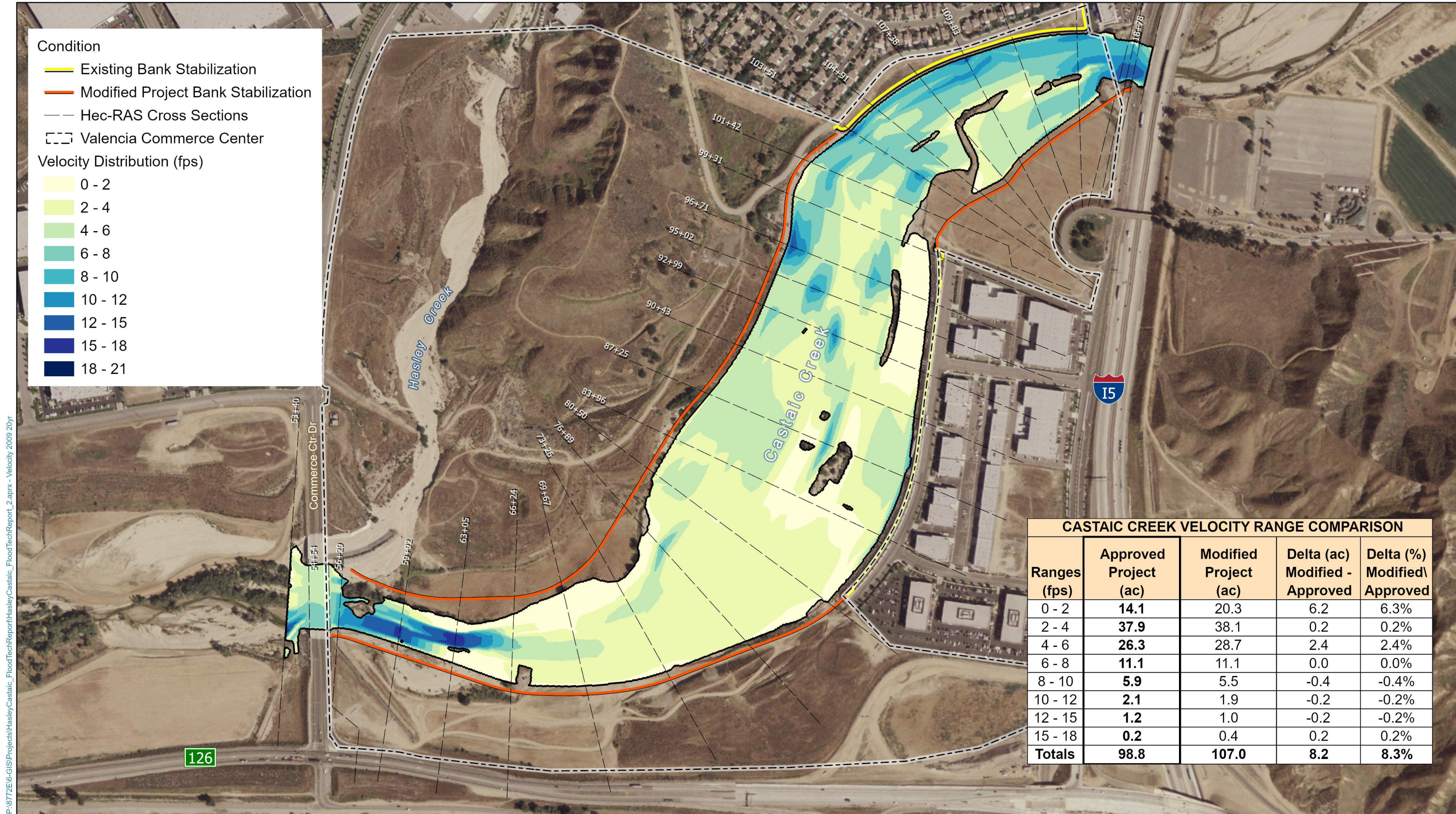
# 10-YEAR EVENT MODIFIED PROJECT VELOCITY DISTRIBUTION

Figure 3.26



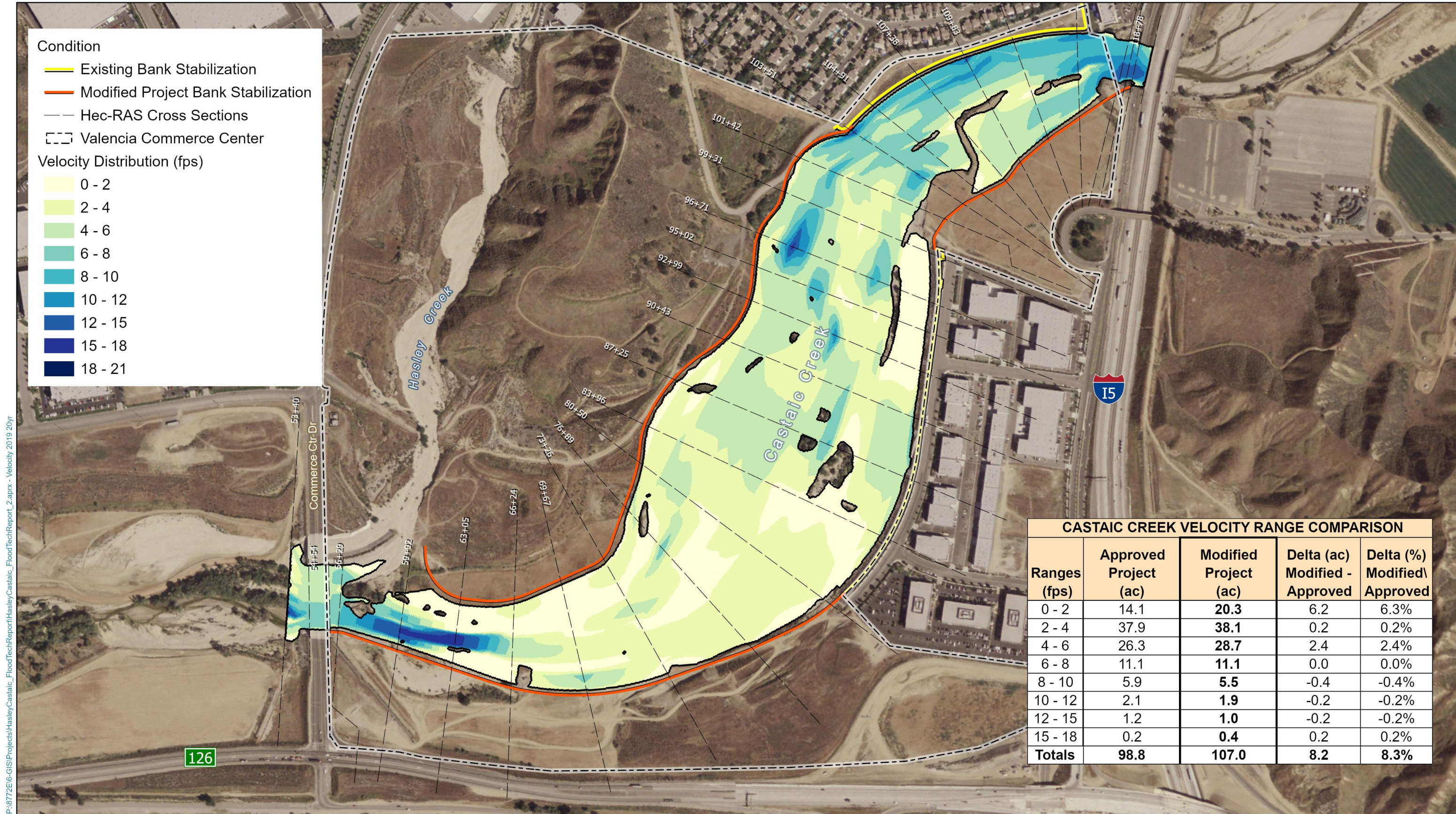
**CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT**

**10-YEAR EVENT VELOCITY DIFFERENTIAL 2017 APPROVED PROJECT VS MODIFIED PROJECT**



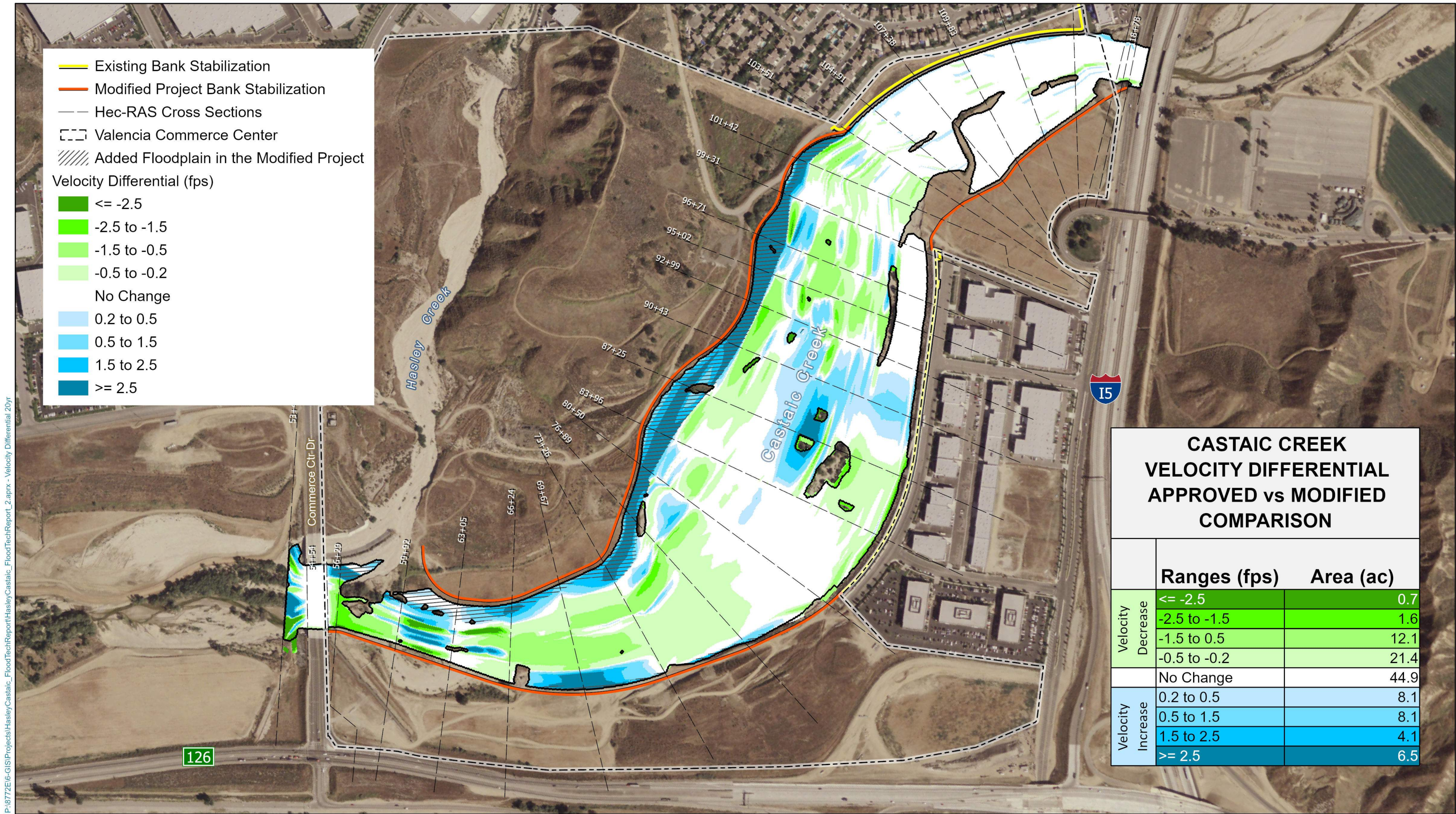
# CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

# 20-YEAR EVENT 2017 APPROVED PROJECT VELOCITY DISTRIBUTION



CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT

20-YEAR EVENT  
MODIFIED PROJECT VELOCITY DISTRIBUTION



— Existing Bank Stabilization  
 — Modified Project Bank Stabilization  
 — Hec-RAS Cross Sections  
 [ ] Valencia Commerce Center  
 [ ] Added Floodplain in the Modified Project

Velocity Differential (fps)

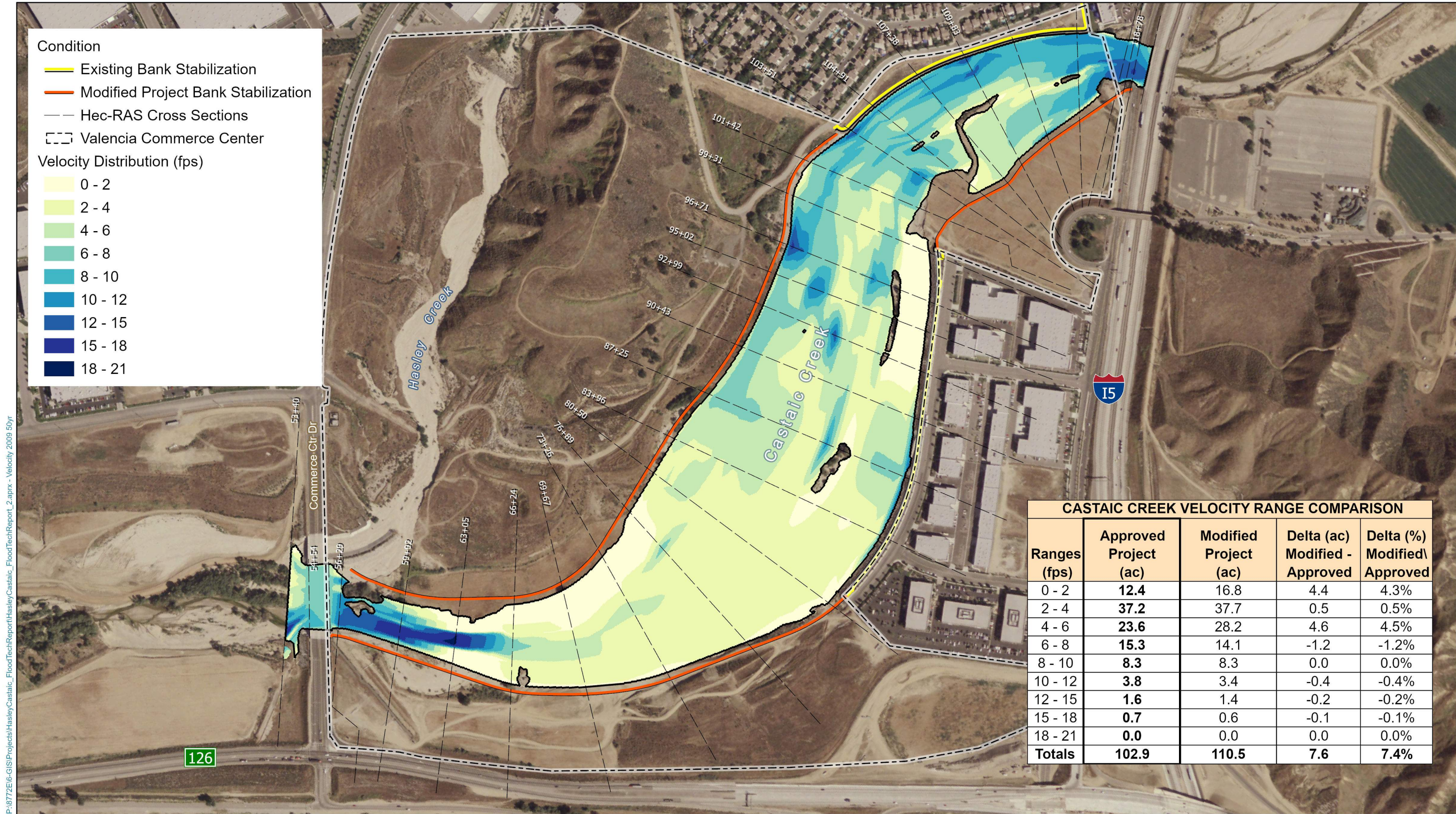
- $\le -2.5$
- -2.5 to -1.5
- -1.5 to -0.5
- -0.5 to -0.2
- No Change
- 0.2 to 0.5
- 0.5 to 1.5
- 1.5 to 2.5
- $\ge 2.5$

CASTAIC CREEK VELOCITY DIFFERENTIAL APPROVED vs MODIFIED COMPARISON		
	Ranges (fps)	Area (ac)
Velocity Decrease	$\le -2.5$	0.7
	-2.5 to -1.5	1.6
	-1.5 to 0.5	12.1
	-0.5 to -0.2	21.4
	No Change	44.9
Velocity Increase	0.2 to 0.5	8.1
	0.5 to 1.5	8.1
	1.5 to 2.5	4.1
	$\ge 2.5$	6.5

**CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT**

**20-YEAR EVENT VELOCITY DIFFERENTIAL  
2017 APPROVED PROJECT VS MODIFIED PROJECT**

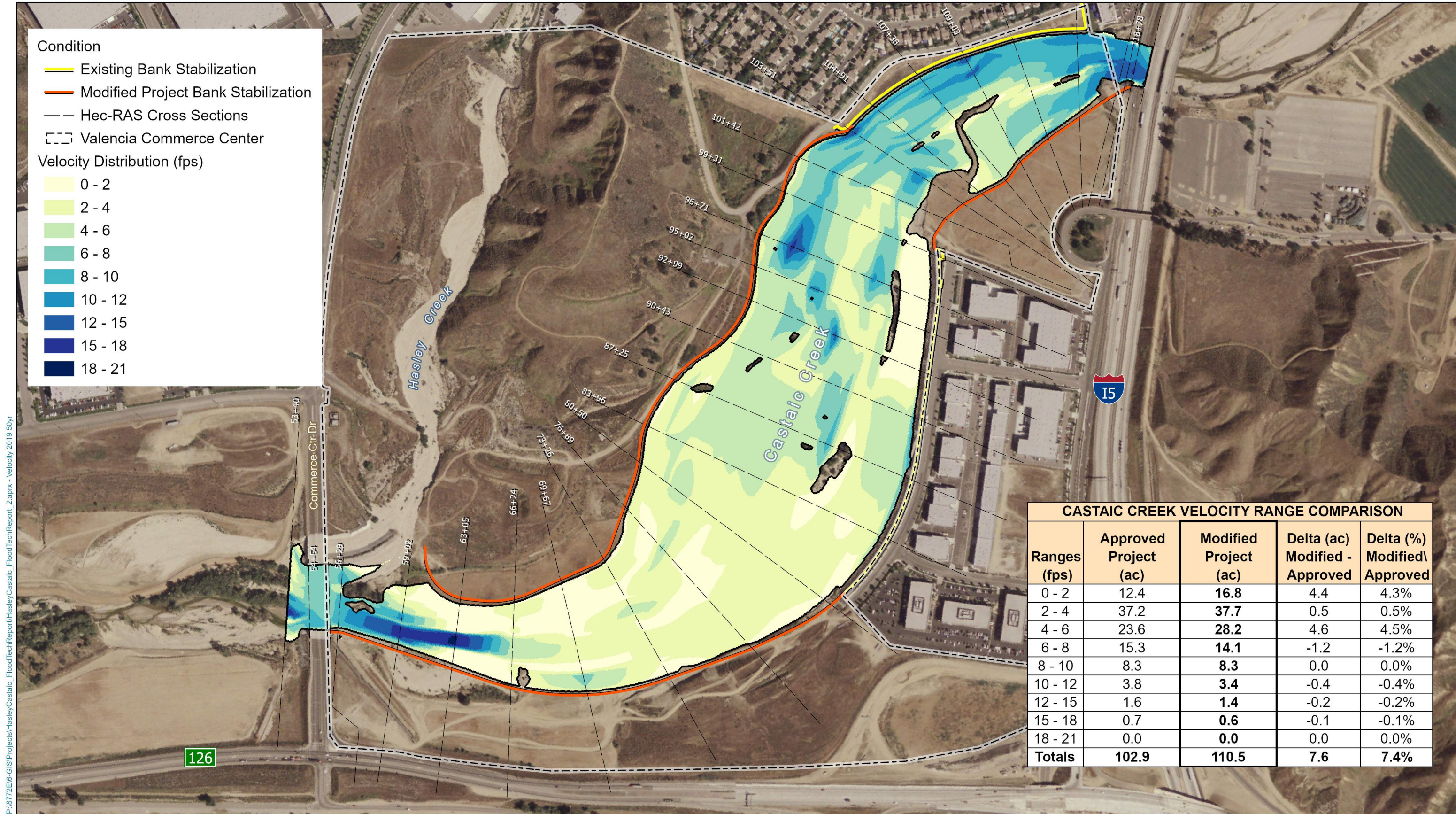
Figure 3.30



CASTAIC CREEK VELOCITY RANGE COMPARISON				
Ranges (fps)	Approved Project (ac)	Modified Project (ac)	Delta (ac) Modified - Approved	Delta (%) Modified \ Approved
0 - 2	12.4	16.8	4.4	4.3%
2 - 4	37.2	37.7	0.5	0.5%
4 - 6	23.6	28.2	4.6	4.5%
6 - 8	15.3	14.1	-1.2	-1.2%
8 - 10	8.3	8.3	0.0	0.0%
10 - 12	3.8	3.4	-0.4	-0.4%
12 - 15	1.6	1.4	-0.2	-0.2%
15 - 18	0.7	0.6	-0.1	-0.1%
18 - 21	0.0	0.0	0.0	0.0%
<b>Totals</b>	<b>102.9</b>	<b>110.5</b>	<b>7.6</b>	<b>7.4%</b>

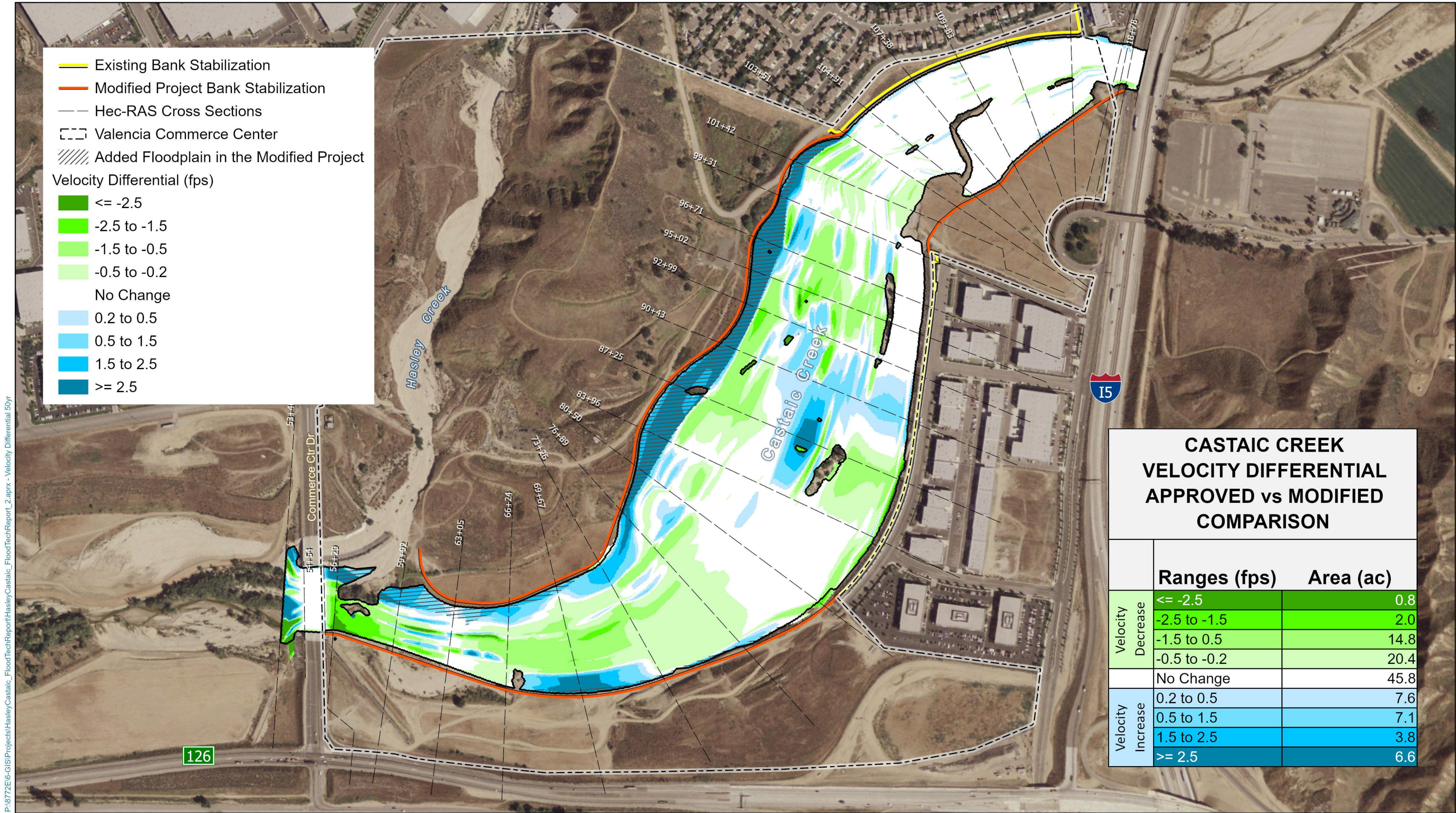
**CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT**

**50-YEAR EVENT  
2017 APPROVED PROJECT VELOCITY DISTRIBUTION**



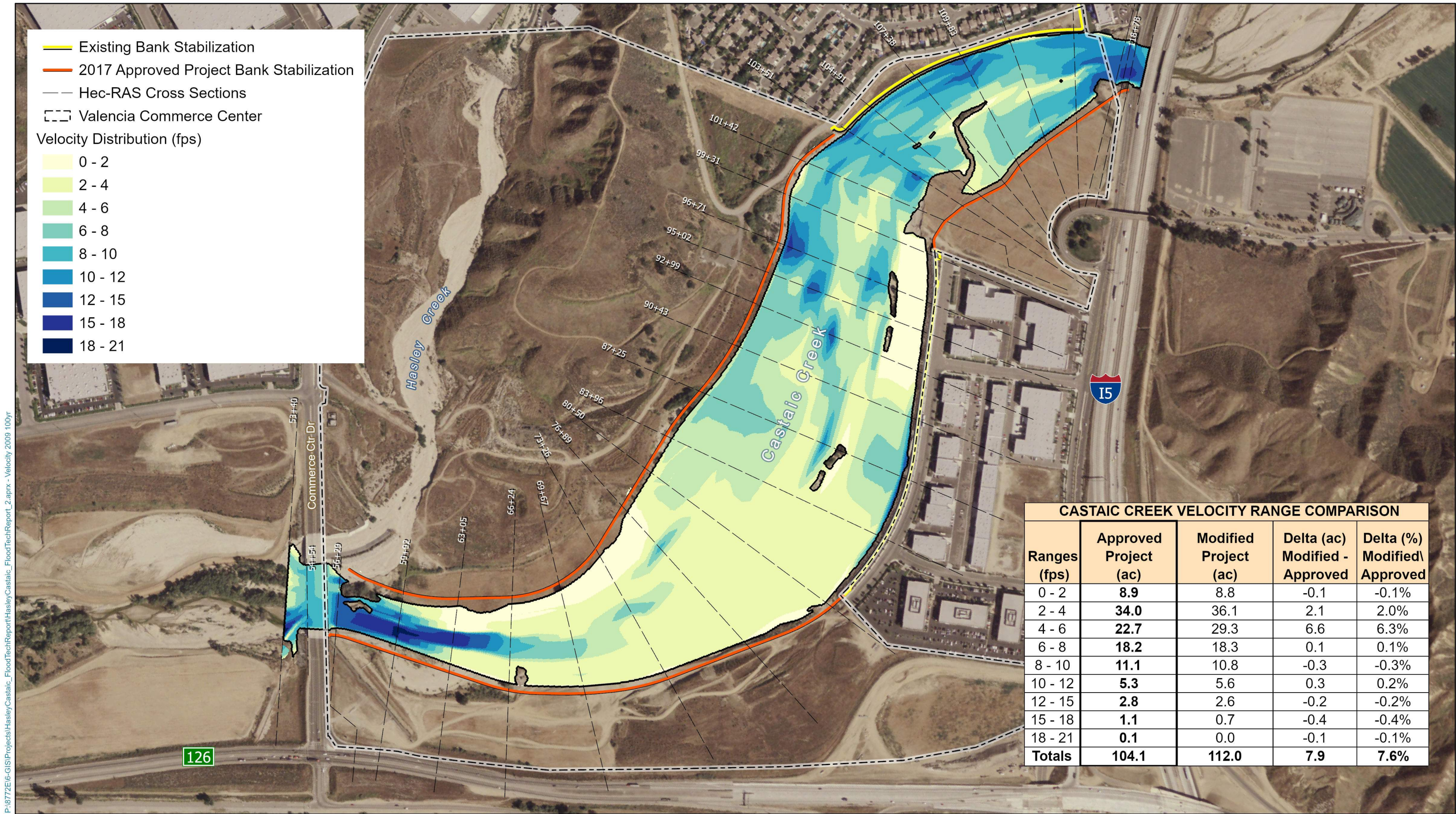
CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT

50-YEAR EVENT  
MODIFIED PROJECT VELOCITY DISTRIBUTION



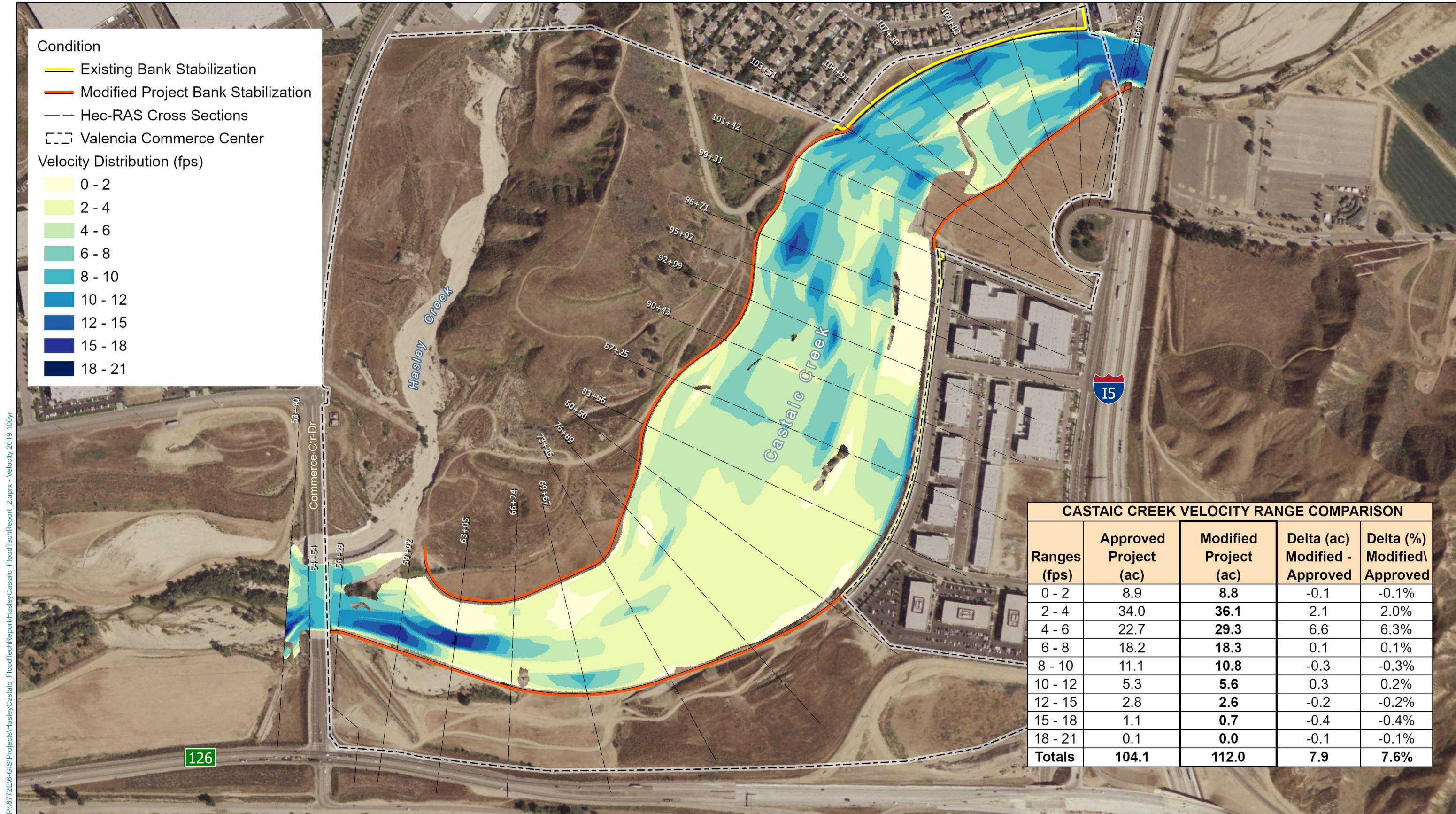
**CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT**

**50-YEAR EVENT VELOCITY DIFFERENTIAL 2017 APPROVED PROJECT VS MODIFIED PROJECT**



CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT

100-YEAR EVENT  
2017 APPROVED PROJECT VELOCITY DISTRIBUTION

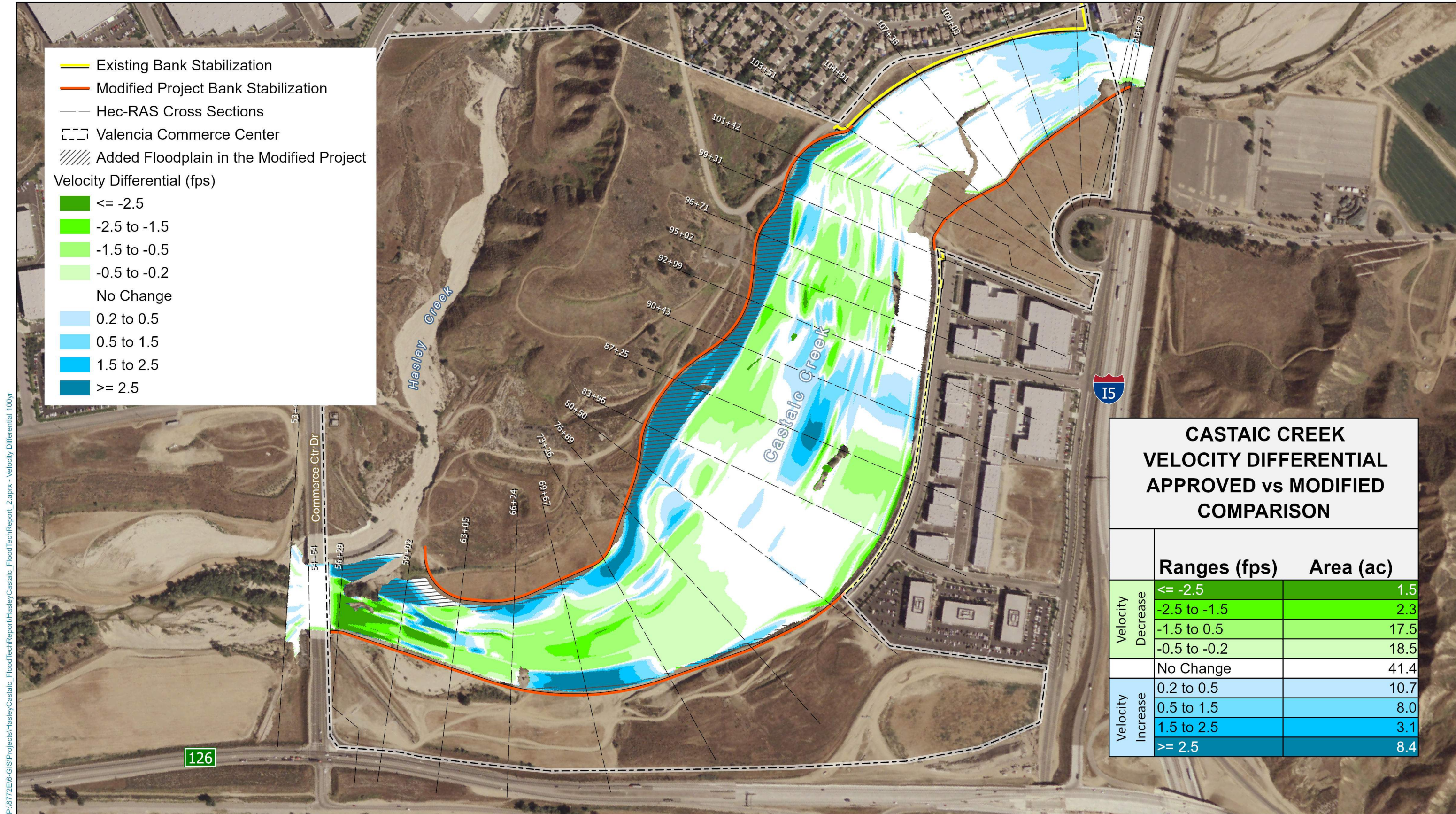


CASTAIC CREEK VELOCITY RANGE COMPARISON				
Ranges (fps)	Approved Project (ac)	Modified Project (ac)	Delta (ac) Modified - Approved	Delta (%) Modified\ Approved
0 - 2	8.9	8.8	-0.1	-0.1%
2 - 4	34.0	36.1	2.1	2.0%
4 - 6	22.7	29.3	6.6	6.3%
6 - 8	18.2	18.3	0.1	0.1%
8 - 10	11.1	10.8	-0.3	-0.3%
10 - 12	5.3	5.6	0.3	0.2%
12 - 15	2.8	2.6	-0.2	-0.2%
15 - 18	1.1	0.7	-0.4	-0.4%
18 - 21	0.1	0.0	-0.1	-0.1%
<b>Totals</b>	<b>104.1</b>	<b>112.0</b>	<b>7.9</b>	<b>7.6%</b>

# CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

# 100-YEAR EVENT MODIFIED PROJECT VELOCITY DISTRIBUTION

Figure 3.35



— Existing Bank Stabilization  
 — Modified Project Bank Stabilization  
 — Hec-RAS Cross Sections  
 □ Valencia Commerce Center  
 ▨ Added Floodplain in the Modified Project

Velocity Differential (fps)

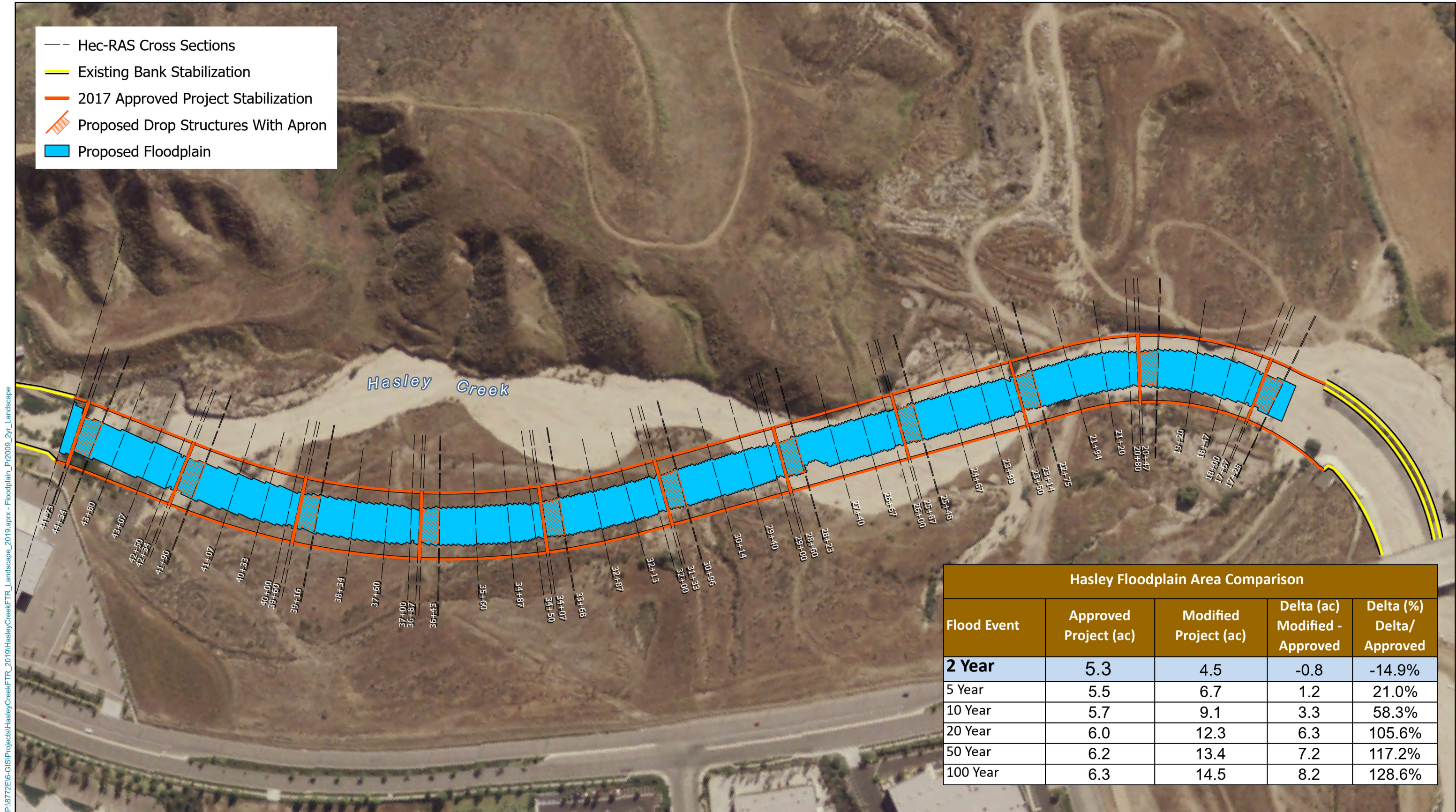
- ≤ -2.5
- -2.5 to -1.5
- -1.5 to -0.5
- -0.5 to -0.2
- No Change
- 0.2 to 0.5
- 0.5 to 1.5
- 1.5 to 2.5
- ≥ 2.5

CASTAIC CREEK VELOCITY DIFFERENTIAL APPROVED vs MODIFIED COMPARISON		
	Ranges (fps)	Area (ac)
Velocity Decrease	≤ -2.5	1.5
	-2.5 to -1.5	2.3
	-1.5 to 0.5	17.5
	-0.5 to -0.2	18.5
	No Change	41.4
Velocity Increase	0.2 to 0.5	10.7
	0.5 to 1.5	8.0
	1.5 to 2.5	3.1
	≥ 2.5	8.4

**CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT**

**100-YEAR EVENT VELOCITY DIFFERENTIAL  
2017 APPROVED PROJECT VS MODIFIED PROJECT**

Figure 3.36

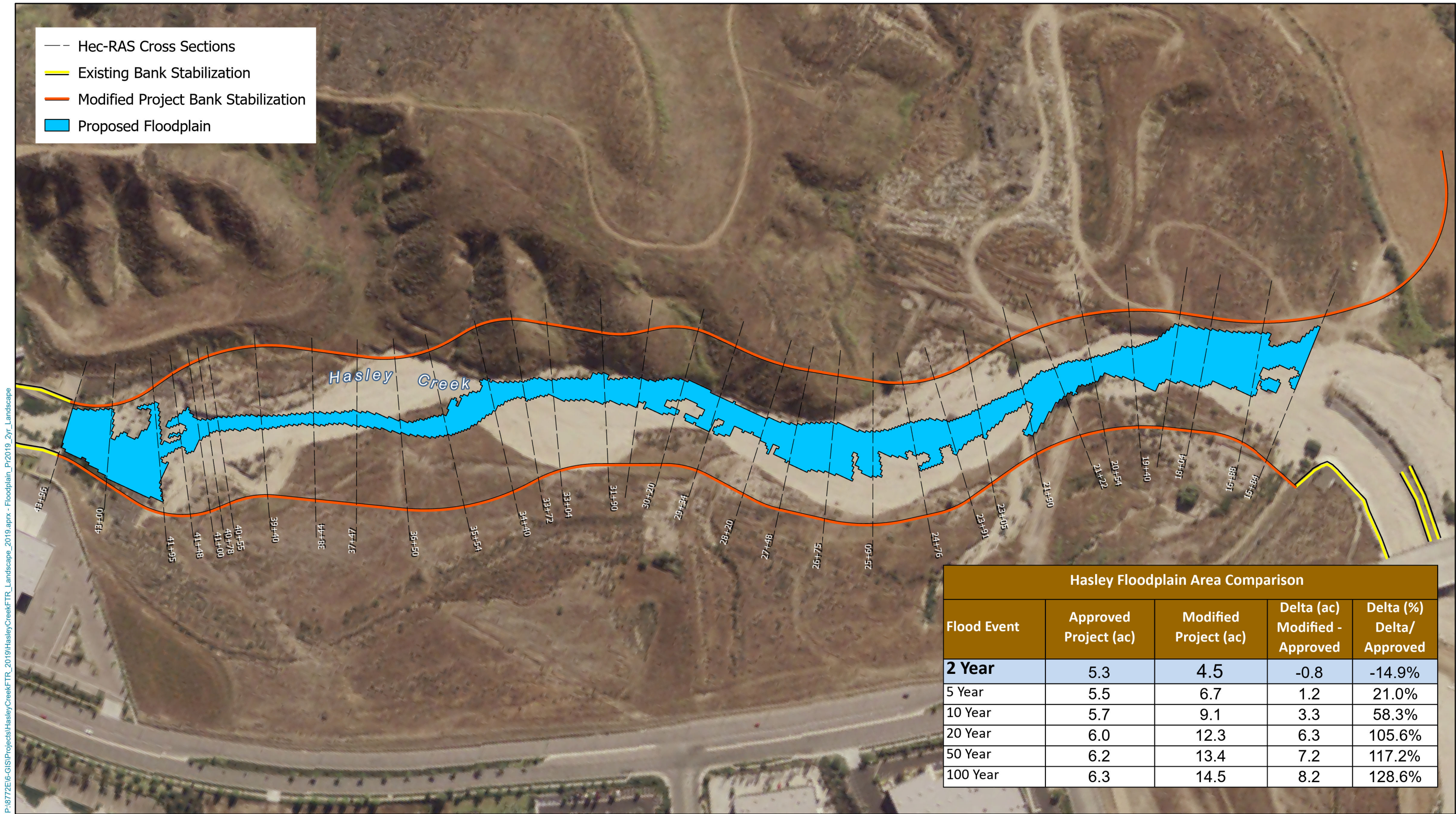


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# CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

## 2-YEAR EVENT 2017 APPROVED PROJECT FLOODPLAIN

Figure 3.37

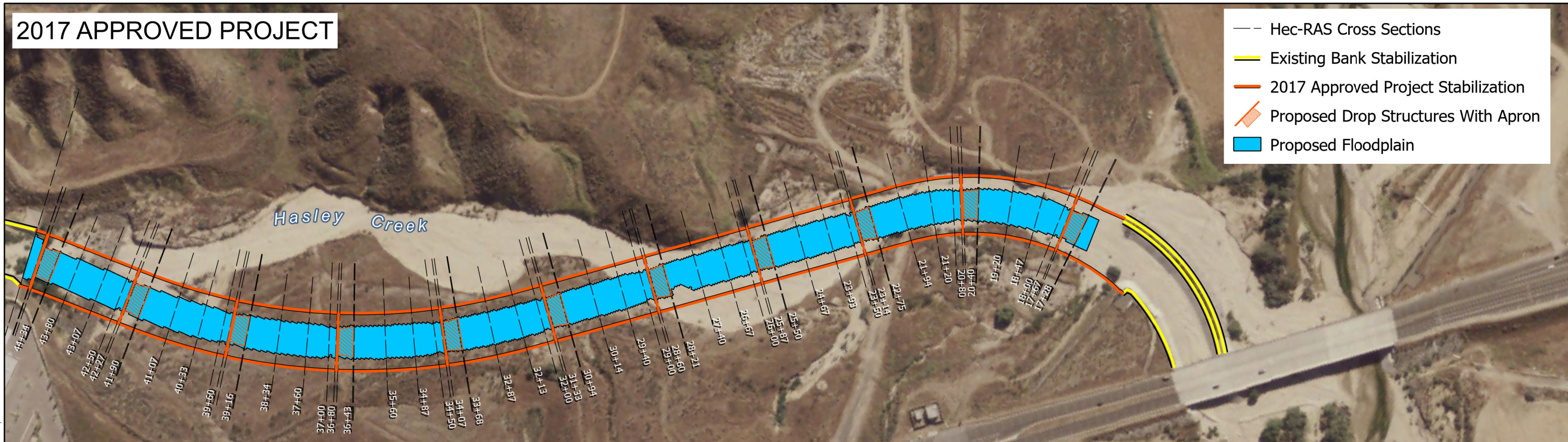


**CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT**

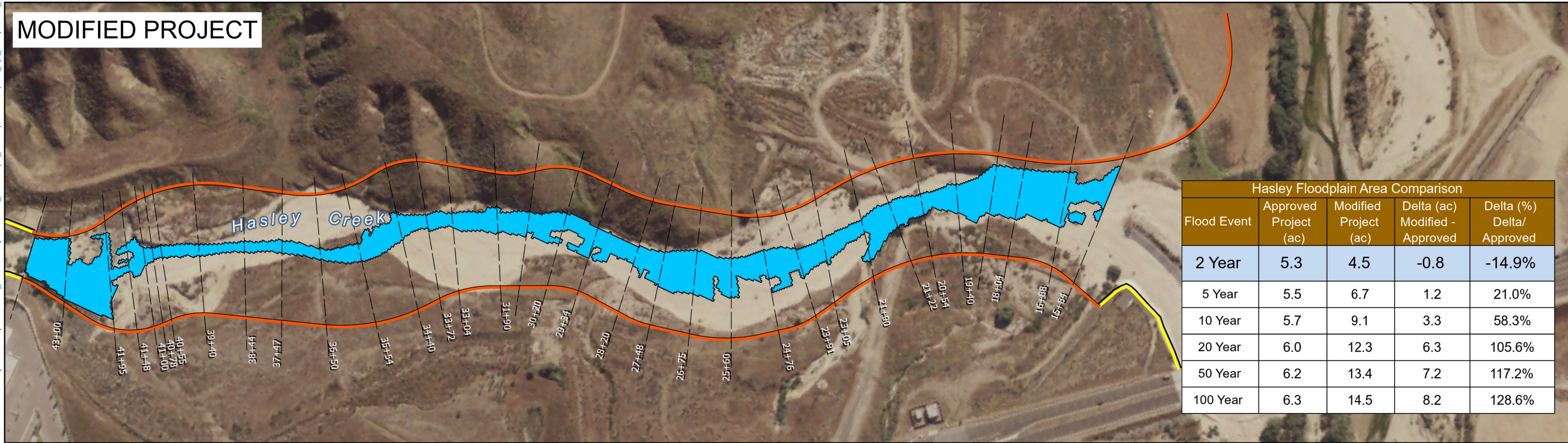
**2-YEAR EVENT  
MODIFIED PROJECT FLOODPLAIN**

**2017 APPROVED PROJECT**

- Hec-RAS Cross Sections
- Existing Bank Stabilization
- 2017 Approved Project Stabilization
- ▨ Proposed Drop Structures With Apron
- Proposed Floodplain



**MODIFIED PROJECT**

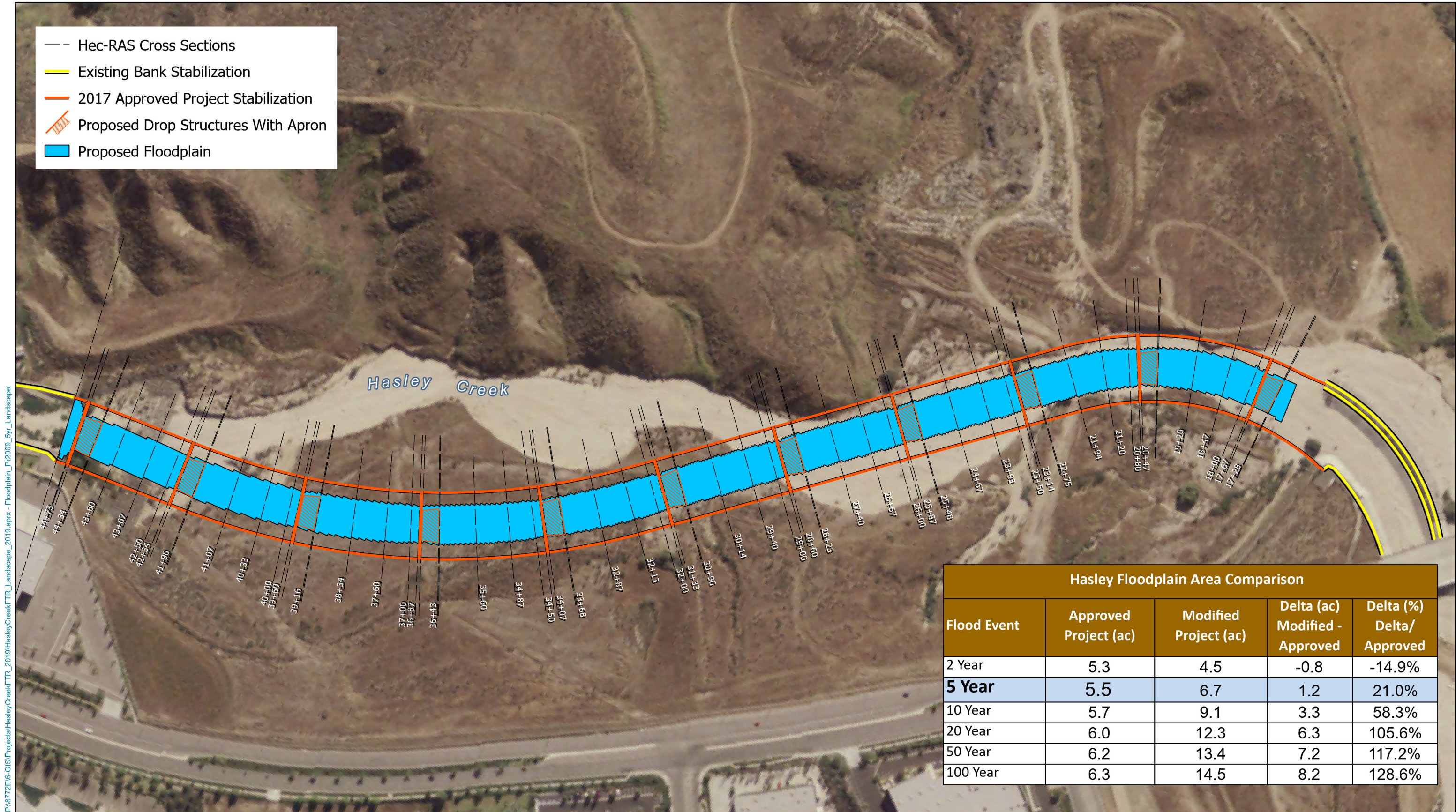


Hasley Floodplain Area Comparison				
Flood Event	Approved Project (ac)	Modified Project (ac)	Delta (ac) Modified - Approved	Delta (%) Delta/Approved
2 Year	5.3	4.5	-0.8	-14.9%
5 Year	5.5	6.7	1.2	21.0%
10 Year	5.7	9.1	3.3	58.3%
20 Year	6.0	12.3	6.3	105.6%
50 Year	6.2	13.4	7.2	117.2%
100 Year	6.3	14.5	8.2	128.6%

**CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT**

**2-YEAR EVENT FLOODPLAIN COMPARISON**

Figure 3.39

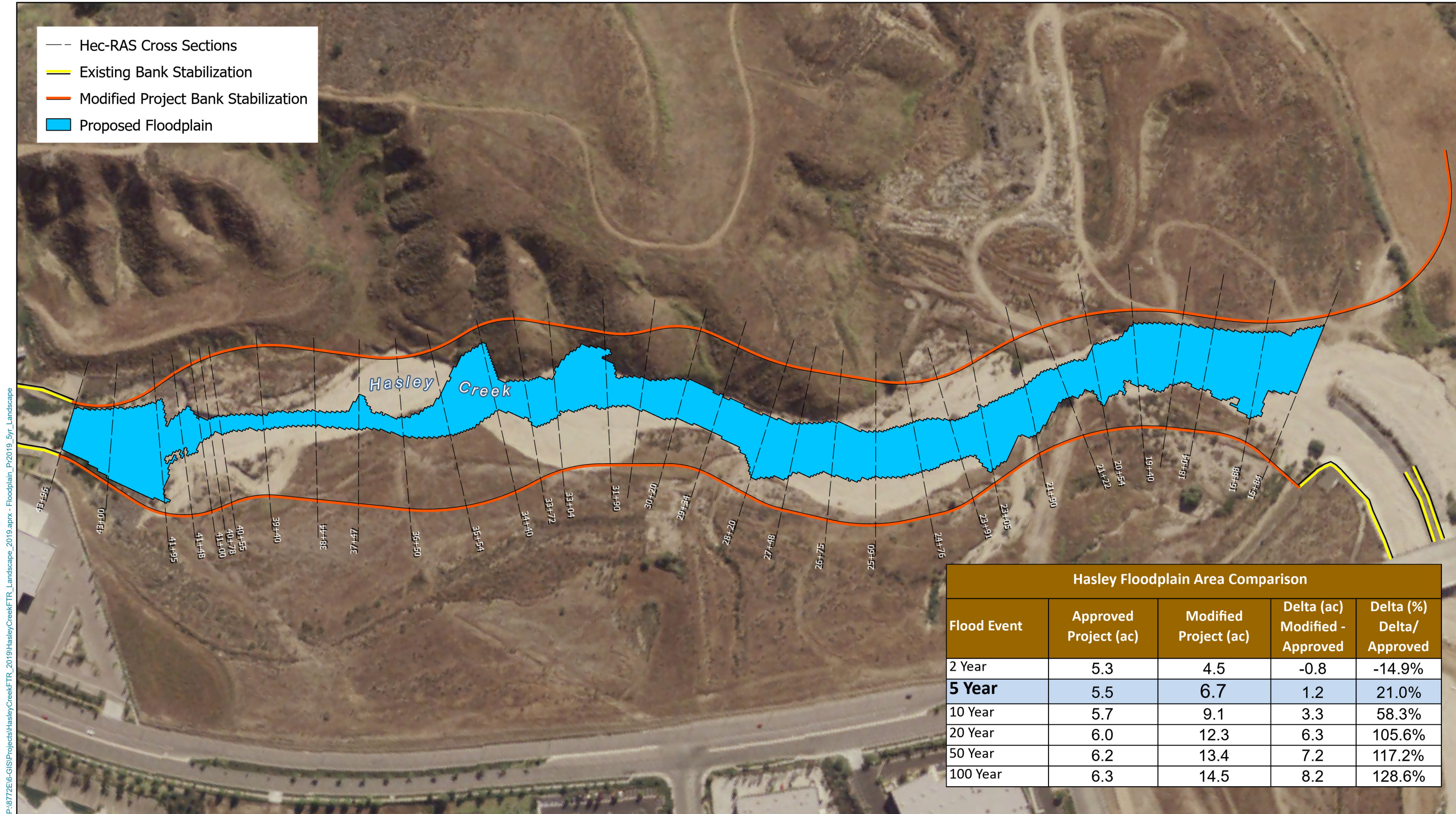


P:\8772E\6-G\SI\Projects\Castaic\CastaicFTR\_2019.aprx - Floodplain\_P12009\_5yr\_Landscape

# CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

## 5-YEAR EVENT 2017 APPROVED PROJECT FLOODPLAIN

Figure 3.40



P:\8772E\6-G\Projects\Castaic\CastaicCreekFTR\_2019.aprx - Floodplain\_Pr2019\_5yr\_Landscape

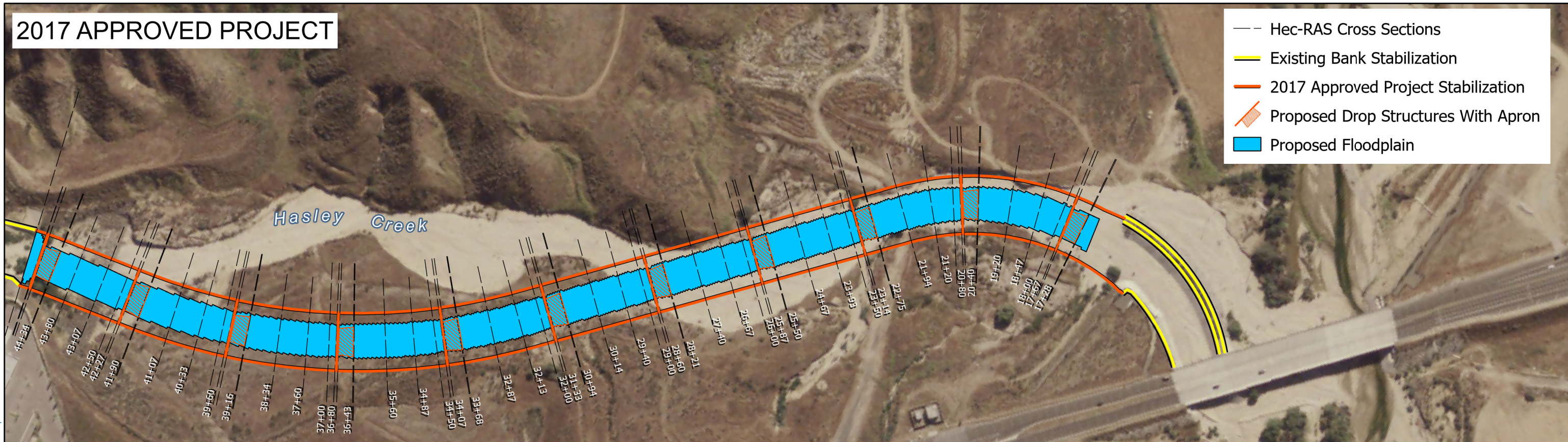
# CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

## 5-YEAR EVENT MODIFIED PROJECT FLOODPLAIN

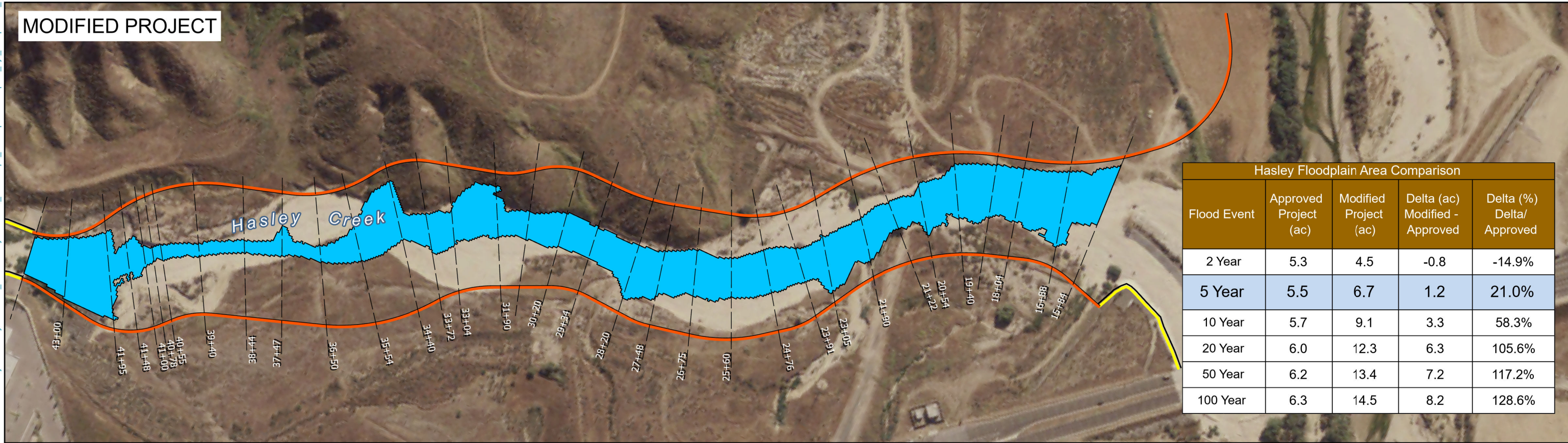
Figure 3.41

**2017 APPROVED PROJECT**

- Hec-RAS Cross Sections
- Existing Bank Stabilization
- 2017 Approved Project Stabilization
- Proposed Drop Structures With Apron
- Proposed Floodplain



**MODIFIED PROJECT**

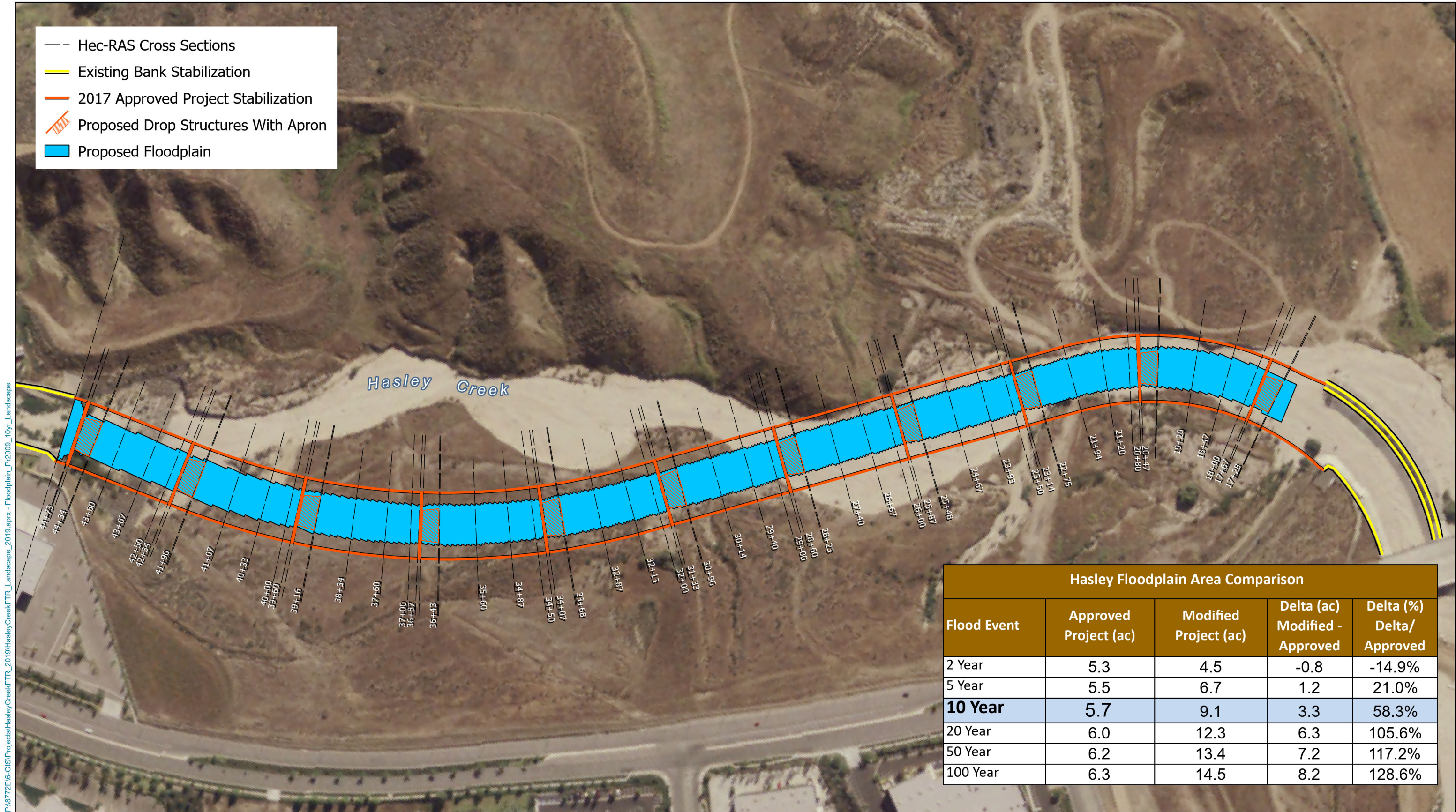


Hasley Floodplain Area Comparison				
Flood Event	Approved Project (ac)	Modified Project (ac)	Delta (ac) Modified - Approved	Delta (%) Delta/ Approved
2 Year	5.3	4.5	-0.8	-14.9%
5 Year	5.5	6.7	1.2	21.0%
10 Year	5.7	9.1	3.3	58.3%
20 Year	6.0	12.3	6.3	105.6%
50 Year	6.2	13.4	7.2	117.2%
100 Year	6.3	14.5	8.2	128.6%

**CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT**

**5-YEAR EVENT FLOODPLAIN COMPARISON**

Figure 3.42








**CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT**

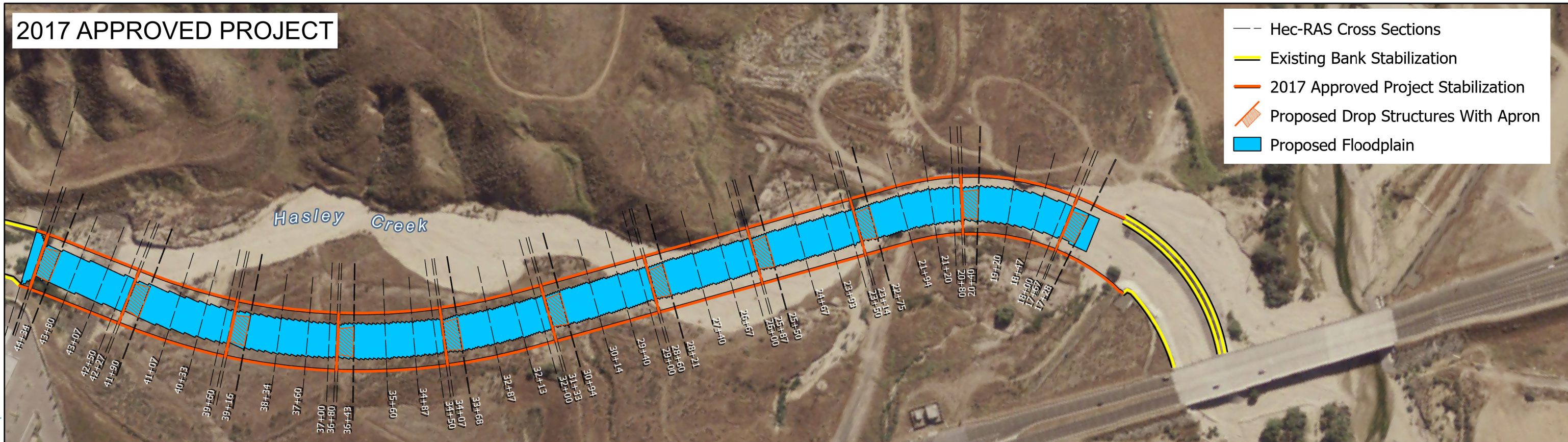
**10-YEAR EVENT  
2017 APPROVED PROJECT FLOODPLAIN**

Figure 3.43

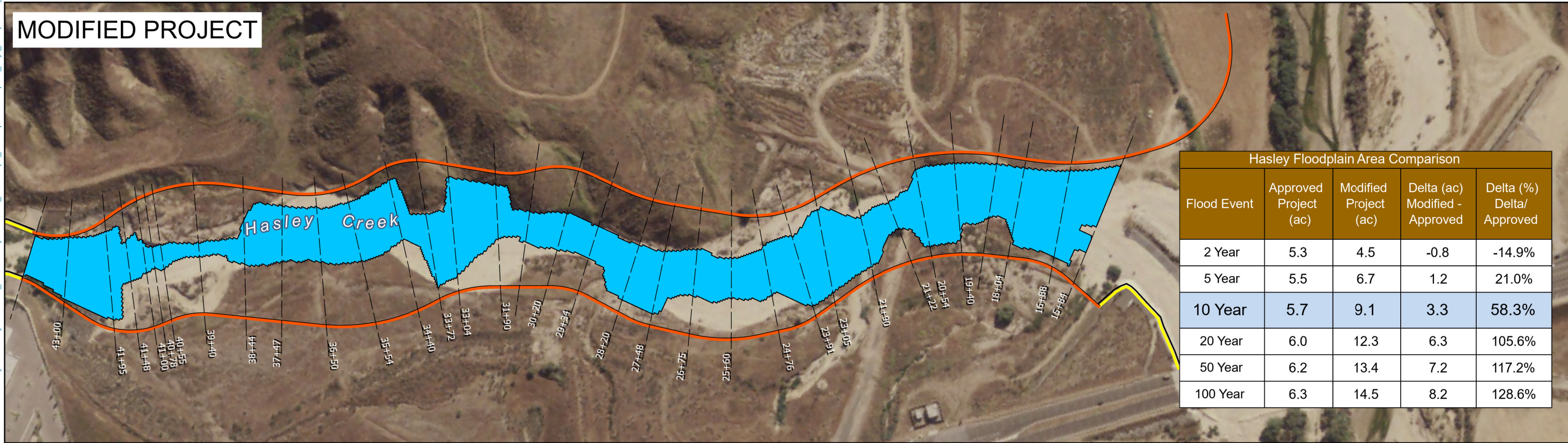


# 2017 APPROVED PROJECT

-  Hec-RAS Cross Sections
-  Existing Bank Stabilization
-  2017 Approved Project Stabilization
-  Proposed Drop Structures With Apron
-  Proposed Floodplain



# MODIFIED PROJECT

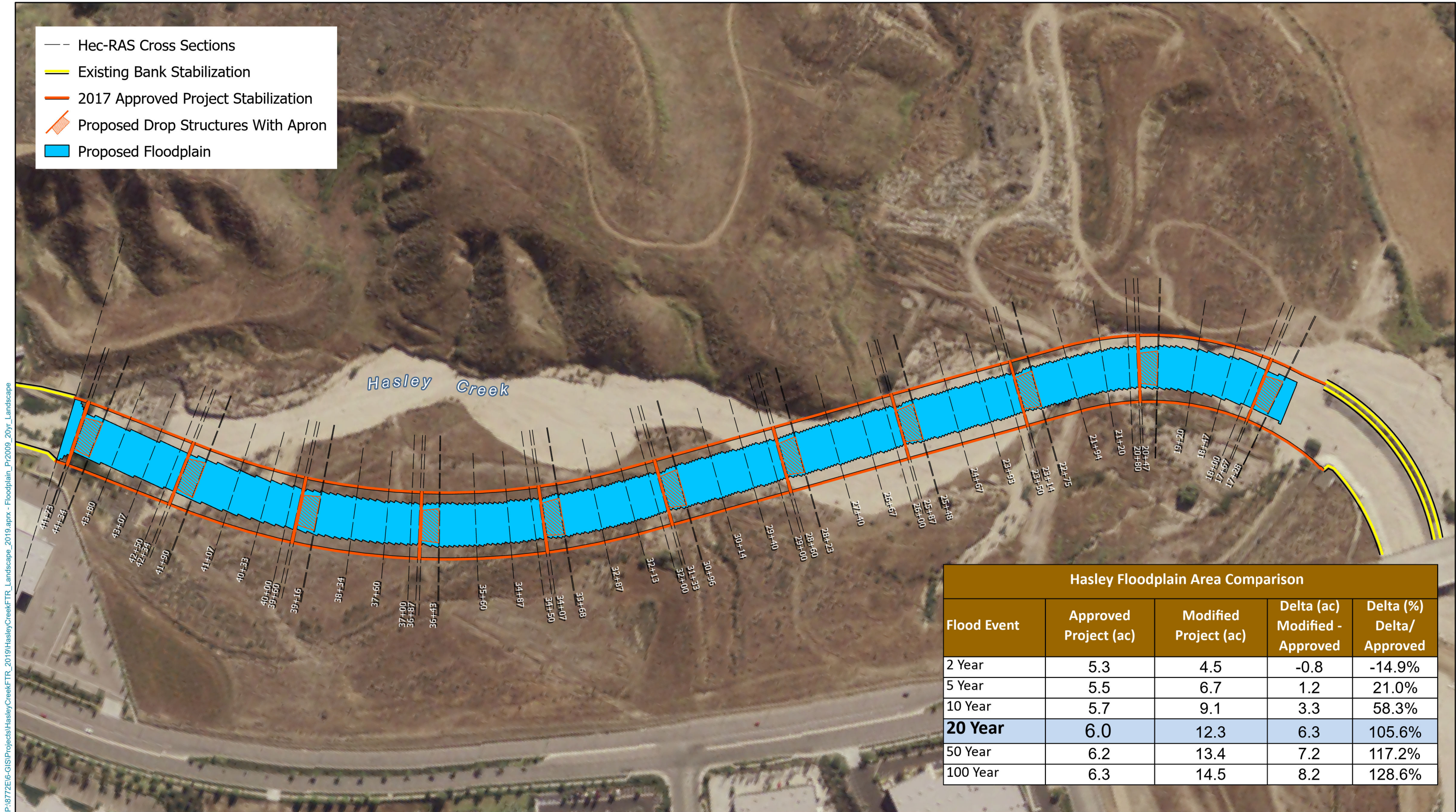


Hasley Floodplain Area Comparison				
Flood Event	Approved Project (ac)	Modified Project (ac)	Delta (ac) Modified - Approved	Delta (%) Delta/ Approved
2 Year	5.3	4.5	-0.8	-14.9%
5 Year	5.5	6.7	1.2	21.0%
<b>10 Year</b>	<b>5.7</b>	<b>9.1</b>	<b>3.3</b>	<b>58.3%</b>
20 Year	6.0	12.3	6.3	105.6%
50 Year	6.2	13.4	7.2	117.2%
100 Year	6.3	14.5	8.2	128.6%

## CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

## 10-YEAR EVENT FLOODPLAIN COMPARISON

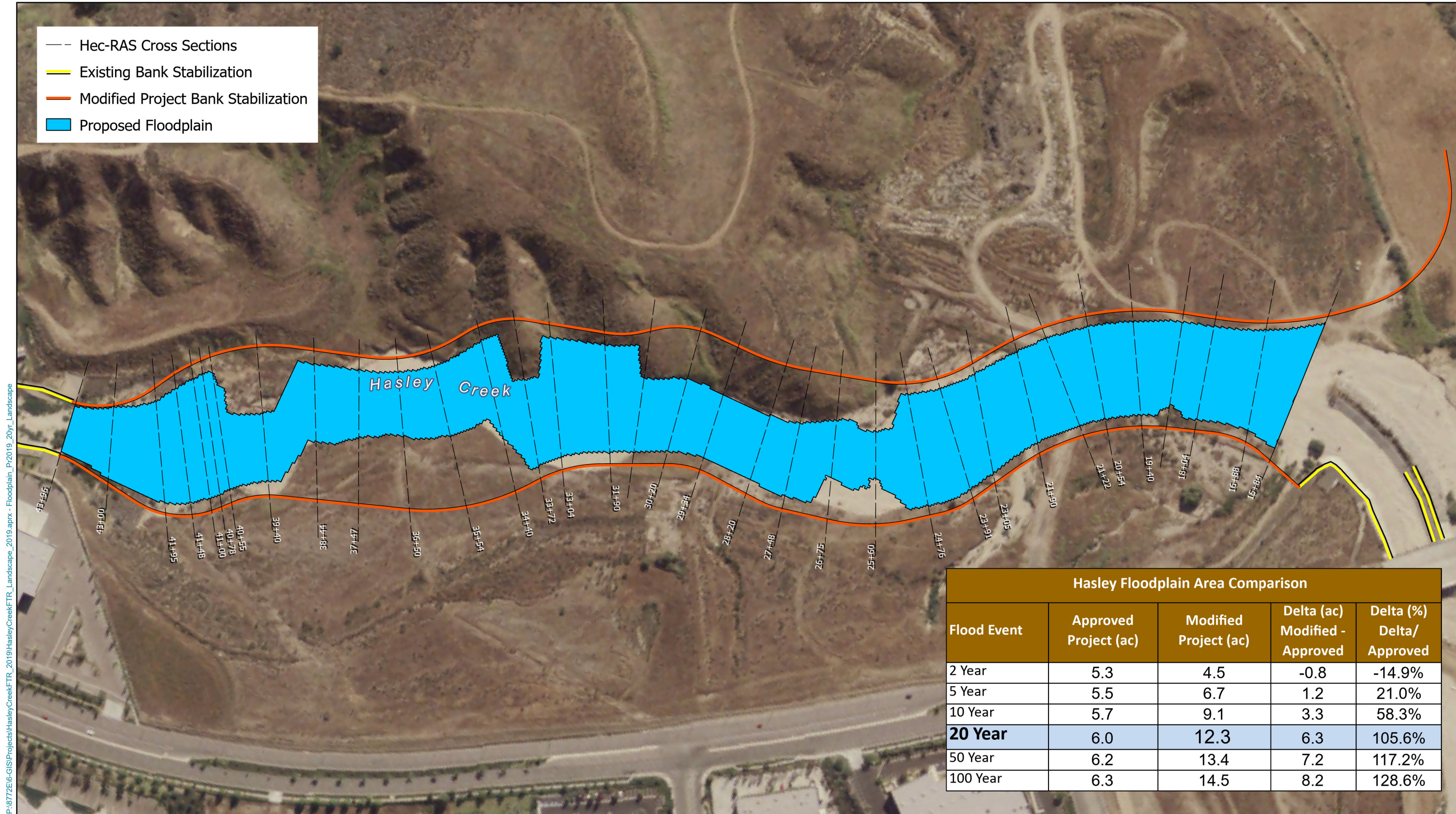
Figure 3.45



CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT

20-YEAR EVENT  
2017 APPROVED PROJECT FLOODPLAIN

Figure 3.46



Hasley Floodplain Area Comparison				
Flood Event	Approved Project (ac)	Modified Project (ac)	Delta (ac) Modified - Approved	Delta (%) Delta/ Approved
2 Year	5.3	4.5	-0.8	-14.9%
5 Year	5.5	6.7	1.2	21.0%
10 Year	5.7	9.1	3.3	58.3%
<b>20 Year</b>	<b>6.0</b>	<b>12.3</b>	<b>6.3</b>	<b>105.6%</b>
50 Year	6.2	13.4	7.2	117.2%
100 Year	6.3	14.5	8.2	128.6%

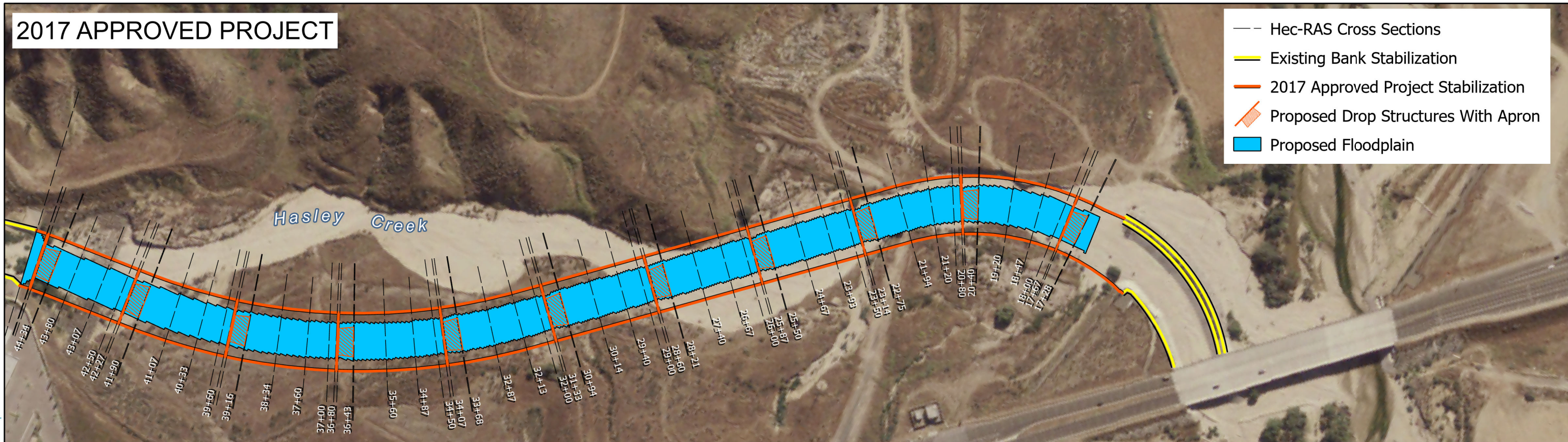
CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

20-YEAR EVENT MODIFIED PROJECT FLOODPLAIN

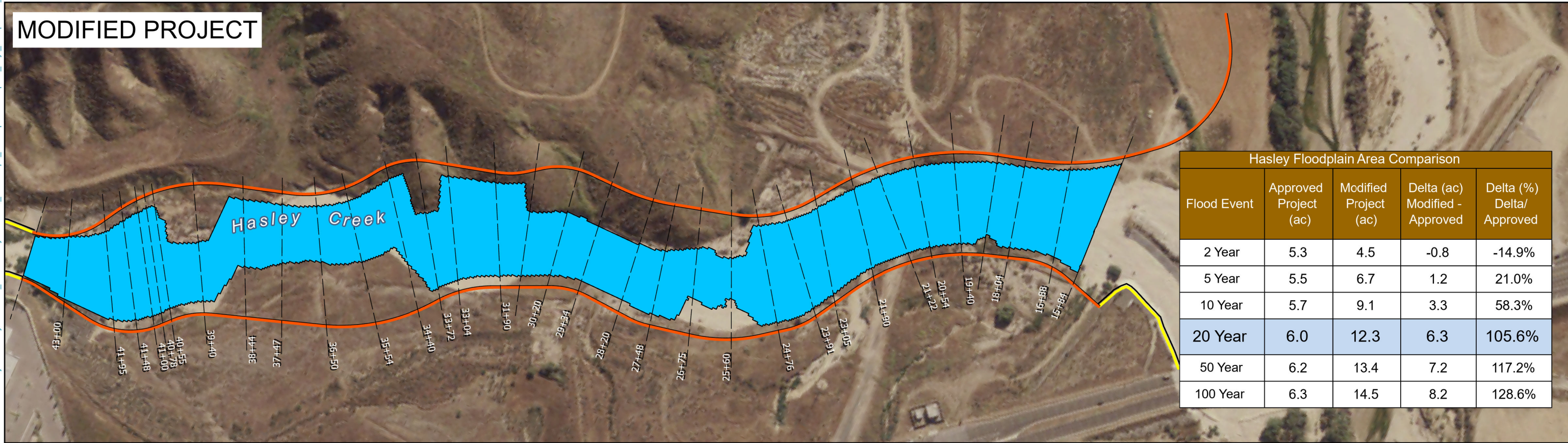
Figure 3.47

**2017 APPROVED PROJECT**

- Hec-RAS Cross Sections
- Existing Bank Stabilization
- 2017 Approved Project Stabilization
- Proposed Drop Structures With Apron
- Proposed Floodplain



**MODIFIED PROJECT**

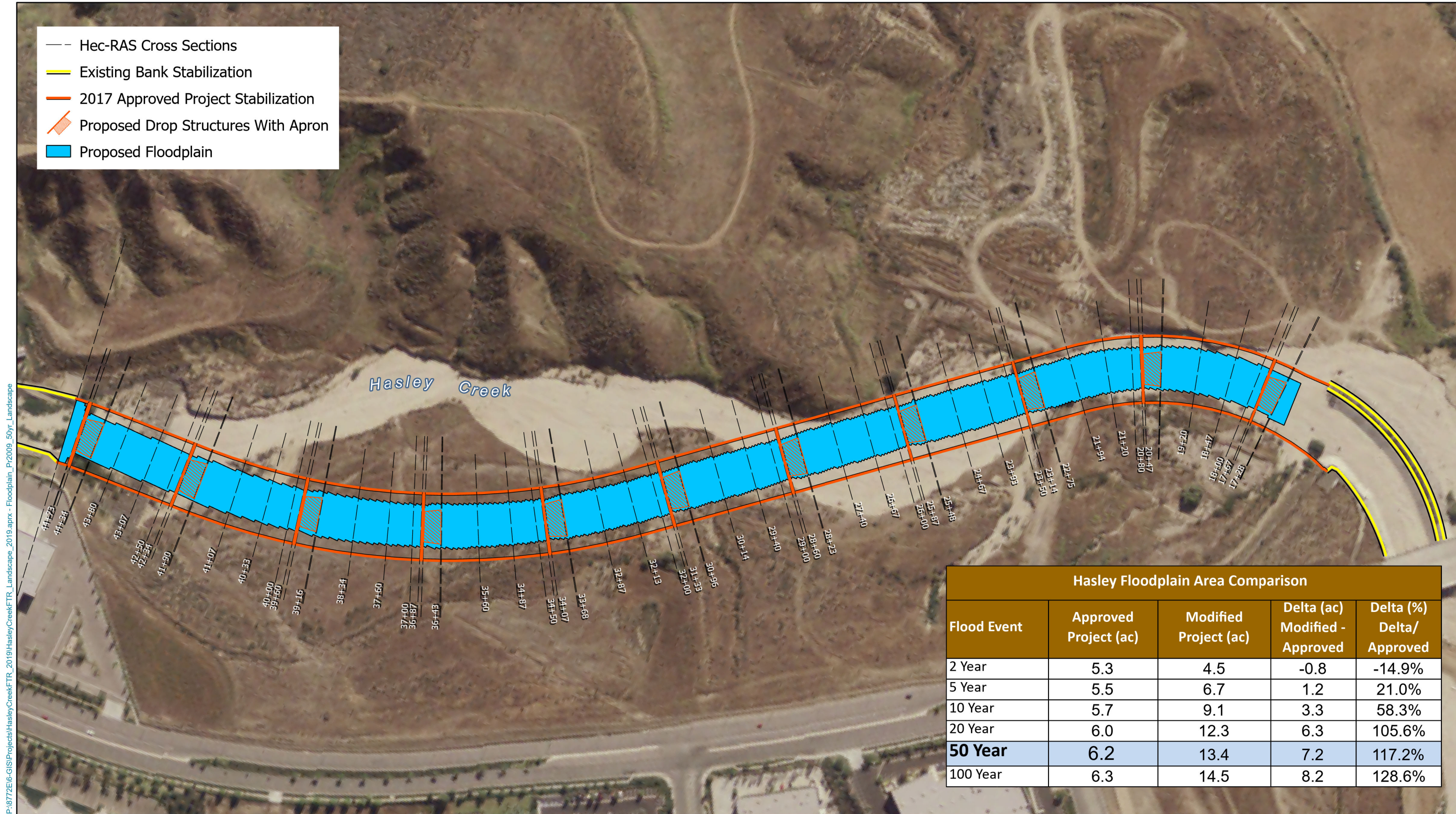


Hasley Floodplain Area Comparison				
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50 Year	6.2	13.4	7.2	117.2%
100 Year	6.3	14.5	8.2	128.6%

**CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT**

**20-YEAR EVENT FLOODPLAIN COMPARISON**

Figure 3.48

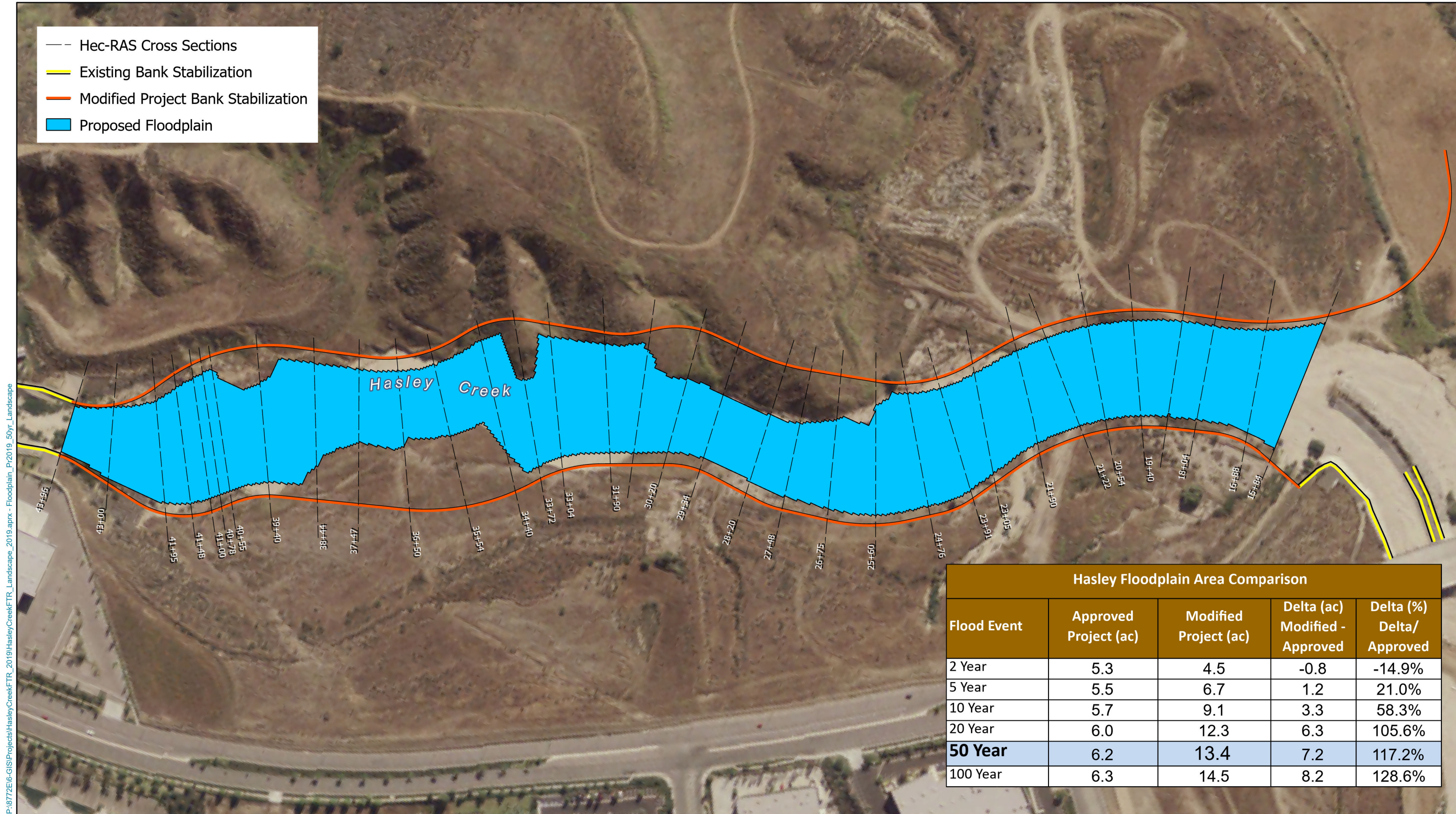


P:\8772E\6-G\SI\Projects\Castaic\CastaicFTR\_2019.aprx - Floodplain\_P12009\_50yr\_Landscape

# CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

# 50-YEAR EVENT 2017 APPROVED PROJECT FLOODPLAIN

Figure 3.49



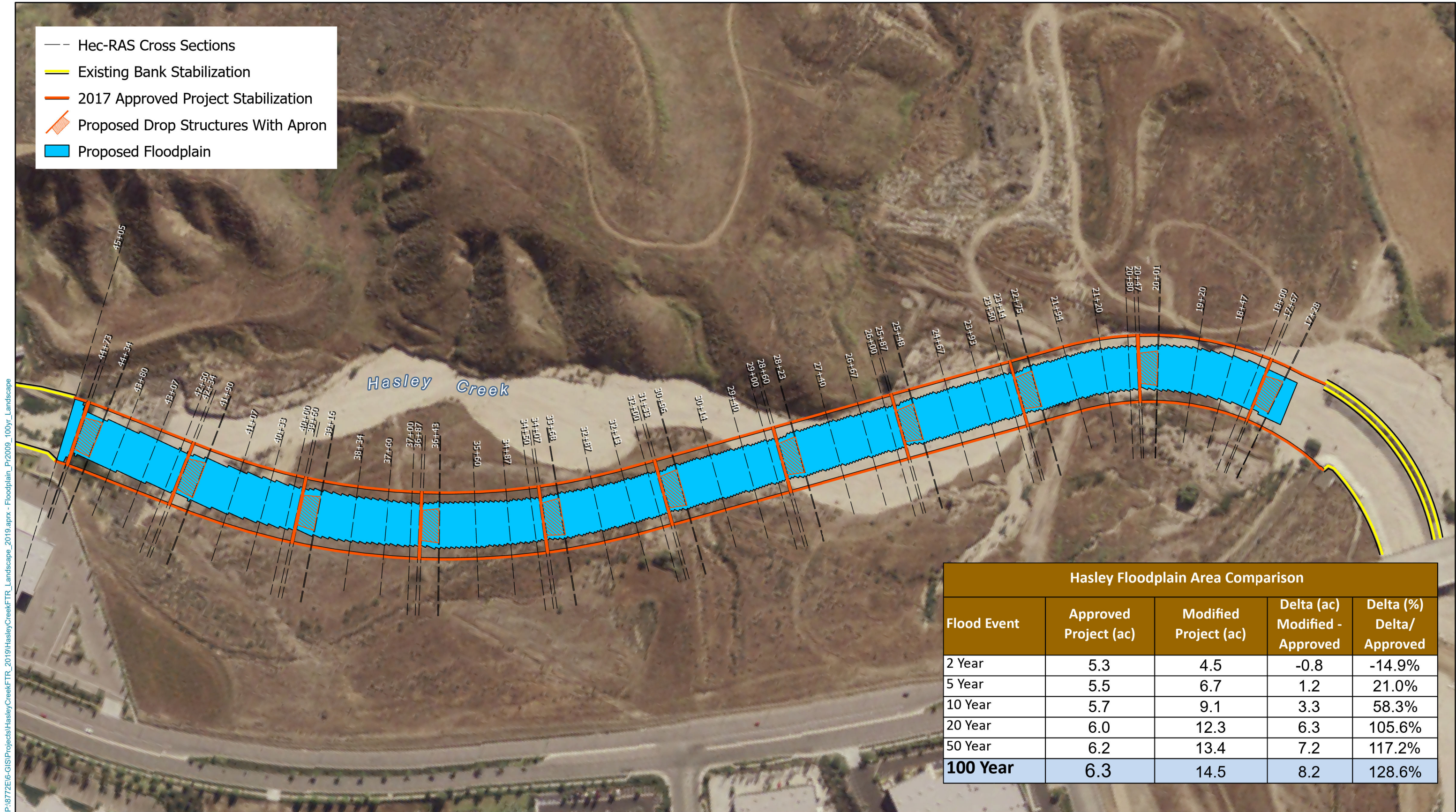
Hasley Floodplain Area Comparison				
Flood Event	Approved Project (ac)	Modified Project (ac)	Delta (ac) Modified - Approved	Delta (%) Delta/ Approved
2 Year	5.3	4.5	-0.8	-14.9%
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20 Year	6.0	12.3	6.3	105.6%
<b>50 Year</b>	<b>6.2</b>	<b>13.4</b>	<b>7.2</b>	<b>117.2%</b>
100 Year	6.3	14.5	8.2	128.6%

CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

50-YEAR EVENT MODIFIED PROJECT FLOODPLAIN

Figure 3.50

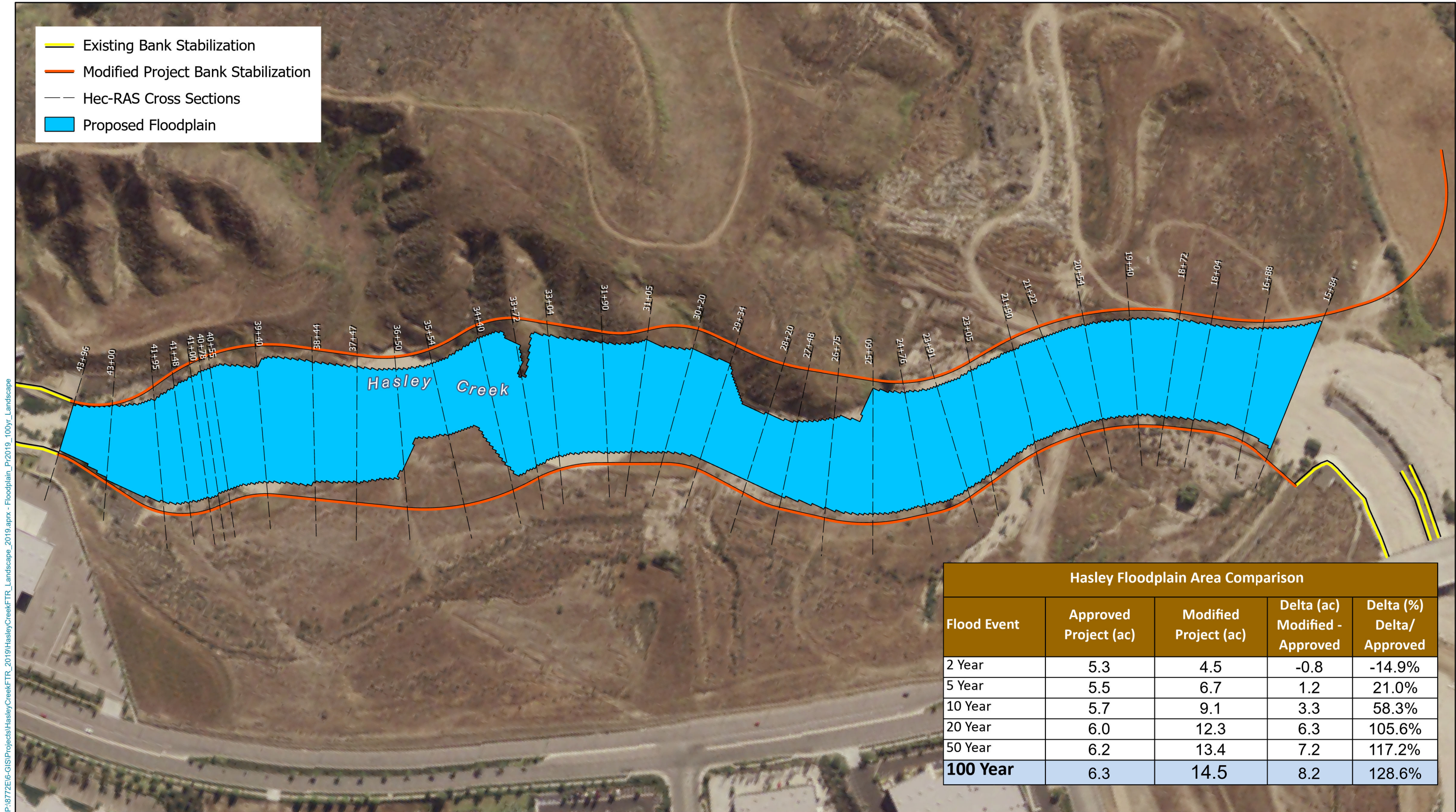




CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT

100-YEAR EVENT  
2017 APPROVED PROJECT FLOODPLAIN

Figure 3.52

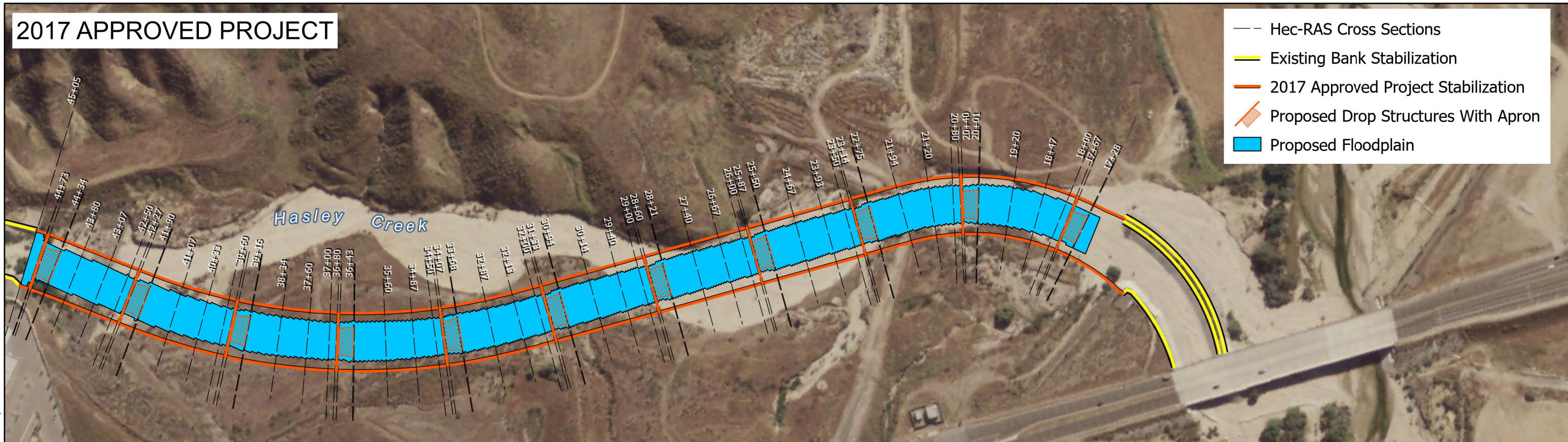


CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT

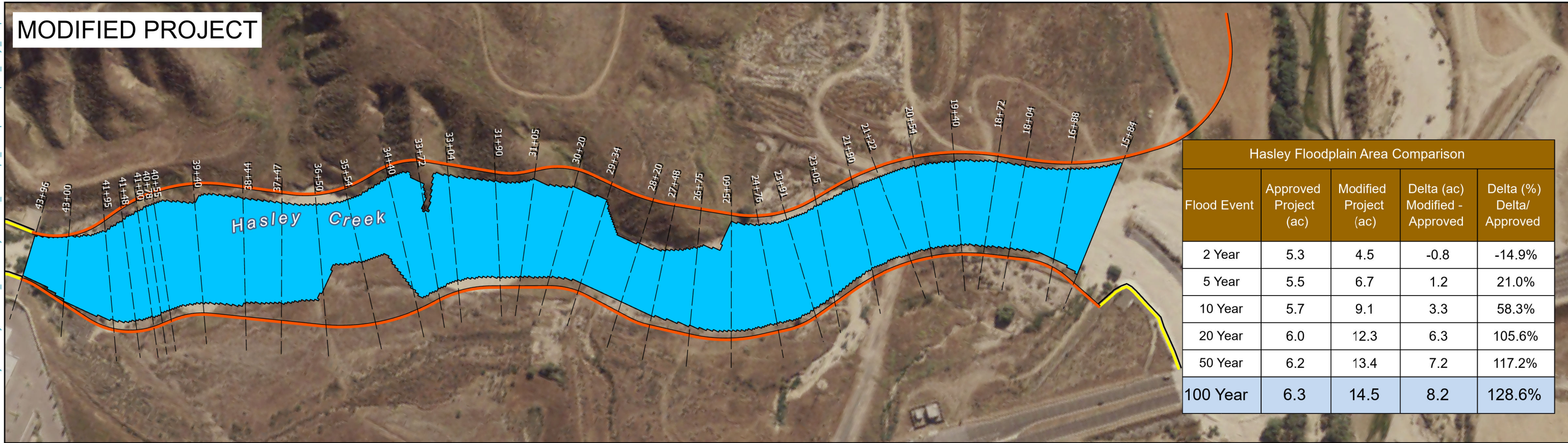
100-YEAR EVENT  
MODIFIED PROJECT FLOODPLAIN

Figure 3.53

# 2017 APPROVED PROJECT



# MODIFIED PROJECT

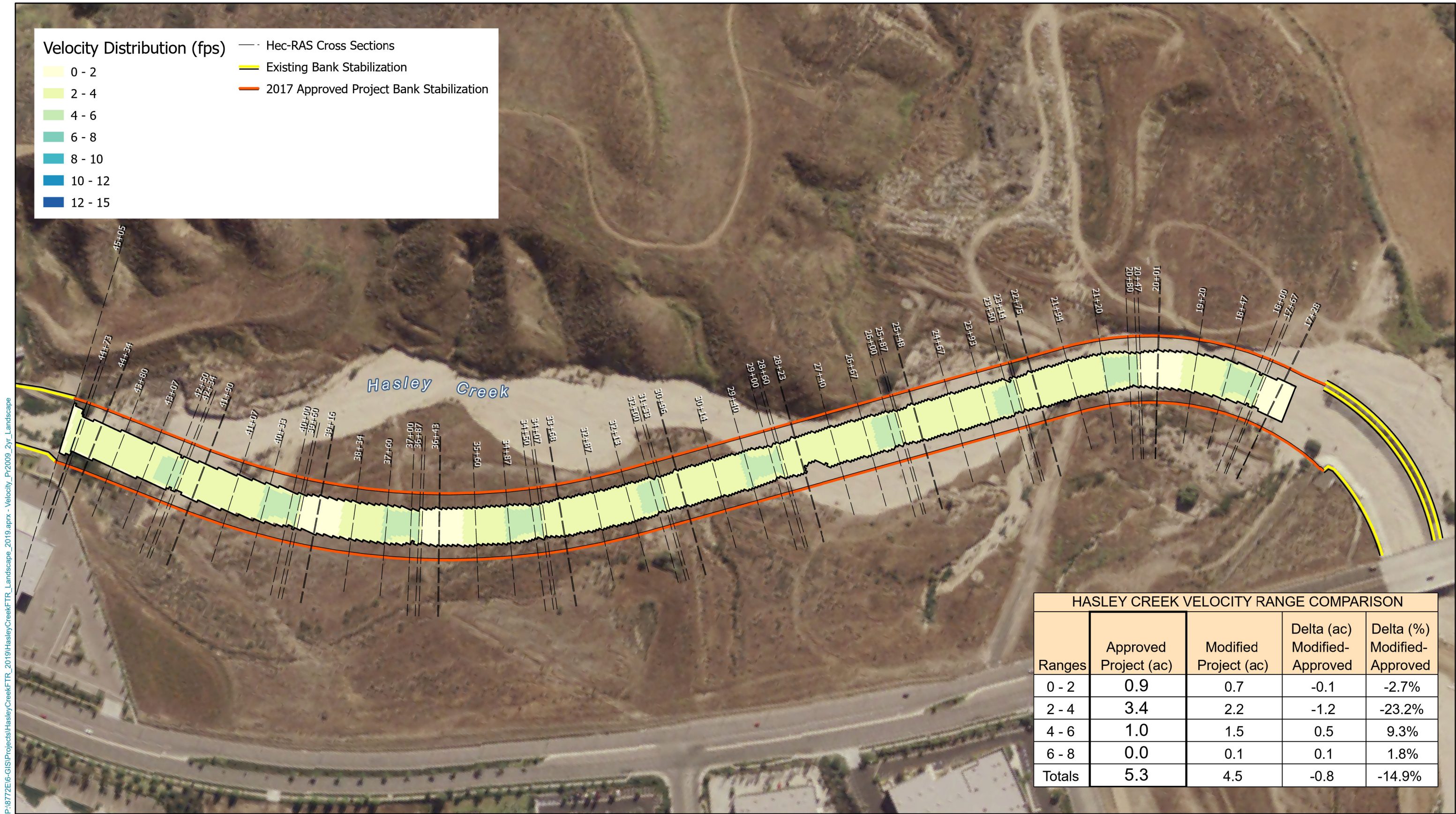


Hasley Floodplain Area Comparison				
Flood Event	Approved Project (ac)	Modified Project (ac)	Delta (ac) Modified - Approved	Delta (%) Delta/ Approved
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## CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

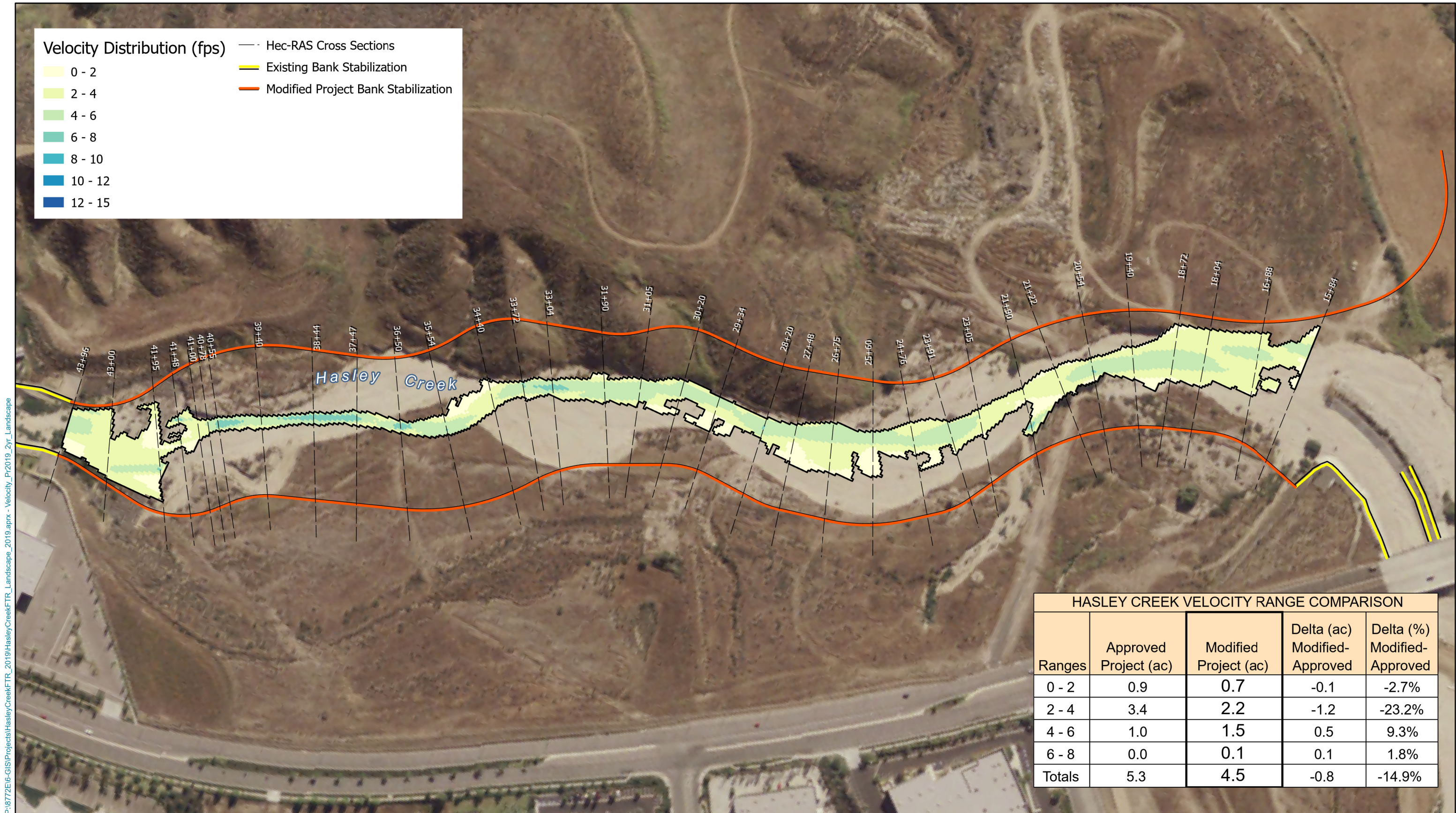
## 100-YEAR EVENT FLOODPLAIN COMPARISON

Figure 3.54



**CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT**

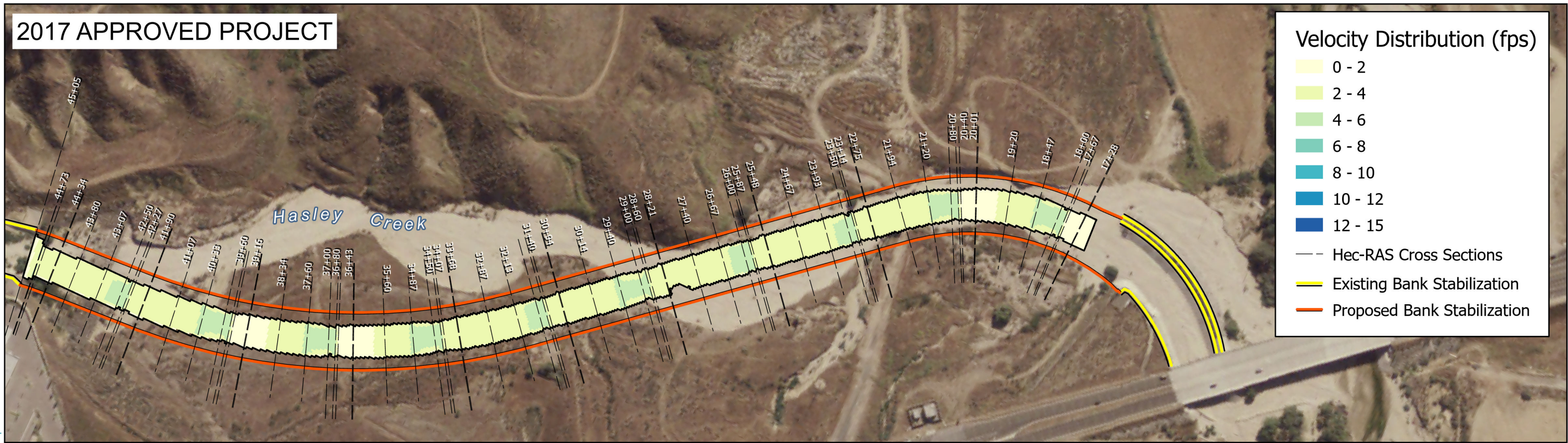
**2-YEAR EVENT  
2017 APPROVED PROJECT VELOCITY DISTRIBUTION**



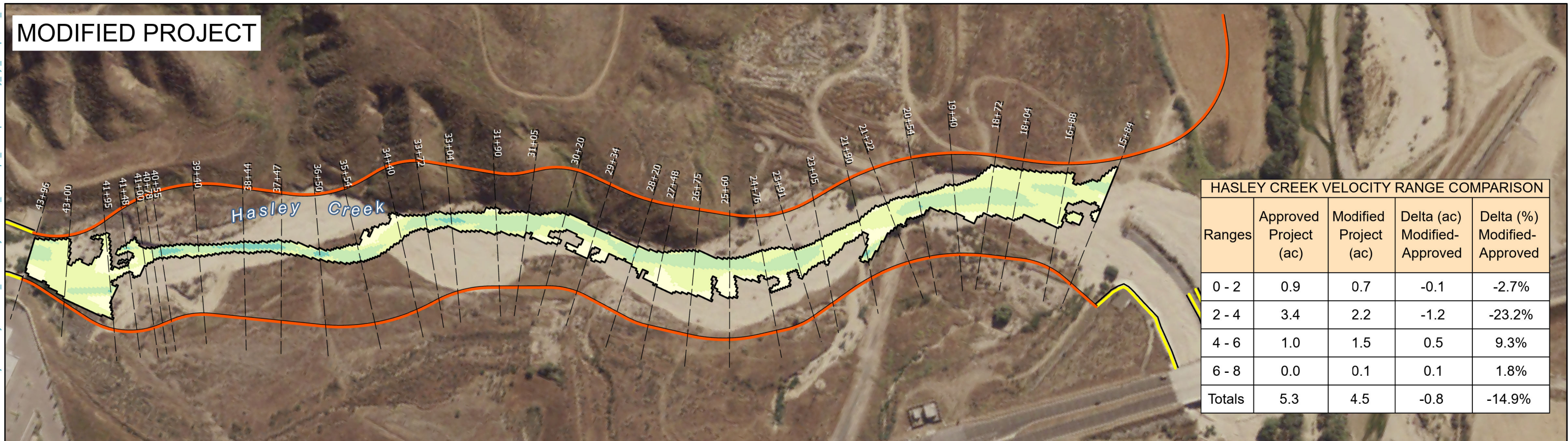
**CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT**

**2-YEAR EVENT  
MODIFIED PROJECT VELOCITY DISTRIBUTION**

# 2017 APPROVED PROJECT

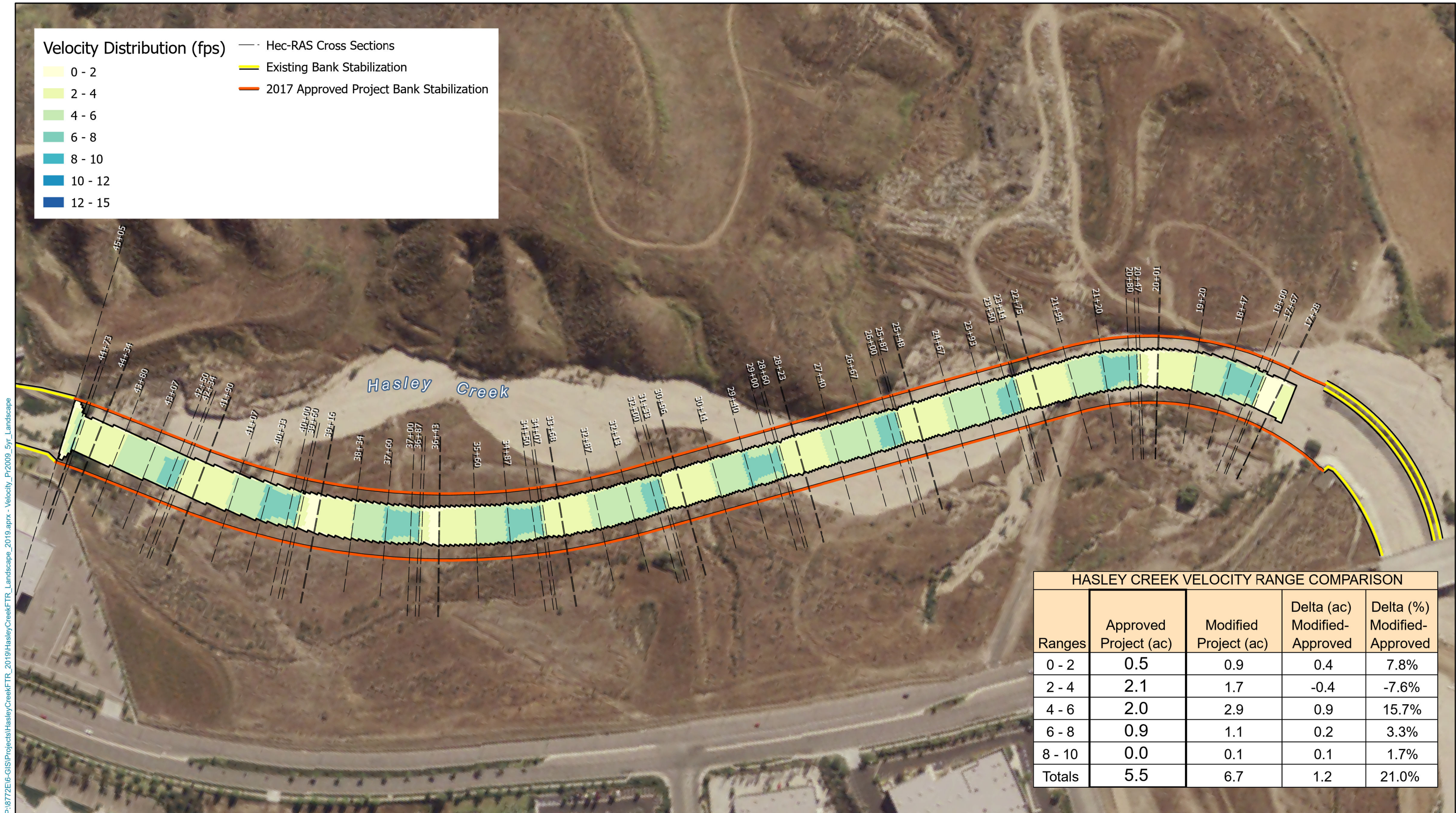


# MODIFIED PROJECT



## CASTAIC CREEK AND HASLEY CREEK FLOOD TECHNICAL REPORT

## 2-YEAR EVENT VELOCITY COMPARISON



**CASTAIC CREEK AND HASLEY CREEK  
FLOOD TECHNICAL REPORT**

**5-YEAR EVENT  
2017 APPROVED PROJECT VELOCITY DISTRIBUTION**