FEDERAL EMERGENCY MANAGEMENT AGENCY

PAYMENT INFORMATION FORM

Community Name: SAN JOAQUIN AREA FLOOD CONTROL AGENCY

Project Identifier: SMITH CANAL CLOSURE DEVICE

THIS FORM MUST BE MAILED, ALONG WITH THE APPROPRIATE FEE, TO THE ADDRESS BELOW OR FAXED TO THE FAX NUMBER BELOW.

Type of Request:

☐ MT-1 application
☒ MT-2 application

FEMA
Fee Charge System Administrator
P.O. Box 22787
Alexandria, VA 22304
FAX (703) 317-3076

☐ EDR application

FEMA Project Library
847 South Pickett St.
Alexandria, VA 22304
FAX (703) 212-4090

Request No.: _____ (if known)

Amount: N/a

☐ INITIAL FEE* ☐ FINAL FEE ☐ FEE BALANCE** ☐ MASTER CARD ☐ VISA ☐ CHECK ☐ MONEY ORDER

*Note: Check only for EDR and/or Alluvial Fan requests (as appropriate).

**Note: Check only if submitting a corrected fee for an ongoing request.

COMPLETE THIS SECTION ONLY IF PAYING BY CREDIT CARD

CARD NUMBER

				—				—				—			
1	2	3	4		5	6	7	8	9	10	11	12	13	14	15	16

EXP. DATE

		—	
Month			Year

_____ _____

Date Signature

NAME *(AS IT APPEARS ON CARD)*: _____
(please print or type)

ADDRESS: _____
(*for your credit card receipt-please print or type*) _____

DAYTIME PHONE: _____

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

☒ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☐ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301 480287	City of Katy Harris County	TX TX	480301 48201C	0005D 0220G	02/08/83 09/28/90
060299	SAN JOAQUIN COUNTY	CA	06077C	0455F	10/16/09
060302	CITY OF STOCKTON	CA	06077C	0455F	10/16/09

2. a. Flooding Source: San Joaquin River

b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)
☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: SMITH CANAL CLOSURE DEVICE

4. FEMA zone designations affected: A (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

☒ Physical Change ☐ Improved Methodology/Data ☐ Regulatory Floodway Revision ☐ Base Map Changes
☐ Coastal Analysis ☐ Hydraulic Analysis ☐ Hydrologic Analysis ☐ Corrections
☐ Weir-Dam Changes ☒ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes
☐ New Topographic Data ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

Structures: ☐ Channelization ☒ Levee/Floodwall ☐ Bridge/Culvert
☐ Dam ☐ Fill ☐ Other (Attach Description)

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☐ Yes Fee amount: $_____

☒ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: JAMES B. GIOTTONINI, EXECUTIVE DIRECTOR	Company: SAN JOAQUIN AREA FLOOD CONTROL AGENCY	
Mailing Address: 22 E. WEBER AVENUE, RM 301 STOCKTON CA 95202	Daytime Telephone No.: 209-937-7900	Fax No.: 209-937-7115
	E-Mail Address: jim.giottonini@ci.stockton.ca.us	
Signature of Requester (required): James B. Giottonini	Date: 3/24/10	

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: MICHAEL NIBLOCK, COMMUNITY DEVELOPMENT DIRECTOR	Community Name: CITY OF STOCKTON	
Mailing Address: 345 N. EL DORADO STREET STOCKTON CA 95202	Daytime Telephone No.: 209-937-8444	Fax No.: 209-937-8893
	E-Mail Address: mike.niblock@ci.stockton.ca.us	
Community Official's Signature (required): Michael Niblock	Date: 3-23-10	

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: FINBARR J. O'REGAN	License No.: C57527	Expiration Date: 12/31/2011
Company Name: PETERSON BRUSTAD INC.	Telephone No.: 209-323-9864	Fax No.: 209-939-9029
Signature: Finbarr J O'Regan		Date: 3/23/10

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if …
☐ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans

Seal (Optional)

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☐ Yes Fee amount: $_____

☒ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

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Name: JAMES B. GIOTTONINI, EXECUTIVE DIRECTOR	Company: SAN JOAQUIN AREA FLOOD CONTROL AGENCY	
Mailing Address: 22 E. WEBER AVENUE, RM 301 STOCKTON CA 95202	Daytime Telephone No.: 209-937-7900	Fax No.: 209-937-7115
	E-Mail Address: jim.giottonini@ci.stockton.ca.us	
Signature of Requester (required): James B. Giottonini	Date: 3/24/10	

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: MARK W. CONNELLY, ENGINEERING SERVICES MANAGER	Community Name: SAN JOAQUIN COUNTY	
Mailing Address: 1810 EAST HAZELTON AVENUE STOCKTON CA 95205	Daytime Telephone No.: 209-953-7617	Fax No.: 209-468-2999
	E-Mail Address: mconnelly@sjgov.org	
Community Official's Signature (required): Mark W. Connelly	Date: 3/24/10	

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: FINBARR J. O'REGAN	License No.: C57527	Expiration Date: 12/31/2011
Company Name: PETERSON BRUSTAD INC.	Telephone No.: 209-323-9864	Fax No.: 209-939-9029
Signature: Finbarr J. O'Regan		Date: 3/23/10

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if ...
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☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans

REGISTERED PROFESSIONAL ENGINEER
FINBARR J. O'REGAN
C 57527
Exp. 12/31/11
CIVIL
STATE OF CALIFORNIA
Seal (Optional)

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☐ Yes Fee amount: $_____

☒ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: CHRISTOPHER NEUDECK, DISTRICT ENGINEER	Company: RECLAMATION DISTRICT 1614	
Mailing Address: 711 N. PERSHING AVENUE STOCKTON CA 95202	Daytime Telephone No.: 209-946-0268	Fax No.: 209-946-0296
	E-Mail Address: cneudeck@ksninc.com	
Signature of Requester (required): Christopher H. Neudeck	Date: 3/23/10	

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: SEE PREVIOUS PAGES	Community Name:	
Mailing Address:	Daytime Telephone No.:	Fax No.:
	E-Mail Address:	
Community Official's Signature (required):	Date:	

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: FINBARR J. O'REGAN	License No.: C57527	Expiration Date: 12/31/2011
Company Name: PETERSON BRUSTAD INC.	Telephone No.: 209-323-9864	Fax No.: 209-939-9029
Signature: Finbarr J O'Regan		Date: 3/23/10

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if ...
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☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☐ Yes Fee amount: $_____

☒ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: THOMAS ROSTEN, DISTRICT ENGINEER	Company: RECLAMATION DISTRICT 828	
Mailing Address: 221 TUXEDO COURT, #E STOCKTON, CA 95204	Daytime Telephone No.: 209-466-1408	Fax No.: 209 466-8965
	E-Mail Address:	
Signature of Requester (required): Thomas Rosten	Date: 24 March 2010	

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: SEE PREVIOUS PAGES	Community Name:	
Mailing Address:	Daytime Telephone No.:	Fax No.:
	E-Mail Address:	
Community Official's Signature (required):	Date:	

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Certifier's Name: FINBARR J. O'REGAN	License No.: C57527	Expiration Date: 12/31/2011
Company Name: PETERSON BRUSTAD INC.	Telephone No.: 209-323-9864	Fax No.: 209-939-9029
Signature: Finbarr J O'Regan		Date: 8/23/10

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if ...
☐ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
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Seal (Optional)

U.S. DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B No. 1660-0016
Expires: 12/31/2010

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: San Joaquin River
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam/Basin.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Structure

1. **Name of Structure: Smith Canal Closure Device & Dad's Point Levee**

   Type (check one): ☐ Channelization ☐ Bridge/Culvert ☒ Levee/Floodwall ☐ Dam/Basin

   Location of Structure: Stockton, CA

   Downstream Limit/Cross Section: 27+00

   Upstream Limit/Cross Section: 00+81

2. **Name of Structure:**

   Type (check one): ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

   Location of Structure:

   Downstream Limit/Cross Section:

   Upstream Limit/Cross Section:

3. **Name of Structure:**

   Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam/Basin

   Location of Structure:

   Downstream Limit/Cross Section:

   Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source: N/A

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)]
- ☐ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: N/A

Name of Structure:

1. This revision reflects (check one):

- ☐ Bridge/culvert not modeled in the FIS
- ☐ Modified bridge/culvert previously modeled in the FIS
- ☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8):
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☐ Dimensions (height, width, span, radius, length)
- ☐ Shape (culverts only)
- ☐ Material
- ☐ Beveling or Rounding
- ☐ Wing Wall Angle
- ☐ Skew Angle
- ☐ Distances Between Cross Sections
- ☐ Erosion Protection
- ☐ Low Chord Elevations – Upstream and Downstream
- ☐ Top of Road Elevations – Upstream and Downstream
- ☐ Structure Invert Elevations – Upstream and Downstream
- ☐ Stream Invert Elevations – Upstream and Downstream
- ☐ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

D. DAM/BASIN

Flooding Source: N/A

Name of Structure:

1. This request is for (check one): ☐ Existing dam ☐ New dam ☐ Modification of existing dam

2. The dam was designed by (check one): ☐ Federal agency ☐ State agency ☐ Local government agency ☐ Private organization

   Name of the agency or organization:

3. The Dam was permitted as (check one):

   a. ☐ Federal Dam ☐ State Dam

      Provide the permit or identification number (ID) for the dam and the appropriate permitting agency or organization

      Permit or ID number Permitting Agency or Organization

   b. ☐ Local Government Dam ☐ Private Dam

      Provided related drawings, specification and supporting design information.

4. Does the project involve revised hydrology? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

   Was the dam/basin designed using critical duration storm?

   ☐ Yes, provide supporting documentation with your completed Form 2.

   ☐ No, provide a written explanation and justification for not using the critical duration storm.

5. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

   If yes, then fill out Section F (Sediment Transport).
   If No, then attach your explanation for why debris/sediment analysis was not considered.

6. Does the Base Flood Elevation behind the dam or downstream of the dam change?

   ☐ Yes ☐ No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

	Stillwater Elevation Behind the Dam	
FREQUENCY (% annual chance)	FIS	REVISED
10-year (10%)		
50-year (2%)		
100-year (1%)		
500-year (0.2%)		
Normal Pool Elevation		

7. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

- ☐ upgrading of an existing levee/floodwall system
- ☒ a newly constructed levee/floodwall system
- ☐ reanalysis of an existing levee/floodwall system

b. Levee elements and locations are (check one):

☒ earthen embankment, dike, berm, etc.	Station 9+60 to 18+75
☒ structural floodwall	Station 18+75 to 27+00
☒ Other (describe): CLOSURE DEVICE	Station 00+81 to 09+60

c. Structural Type (check one):

- ☐ monolithic cast-in place reinforced concrete
- ☐ reinforced concrete masonry block
- ☒ sheet piling
- ☐ Other (describe):

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☒ No

If Yes, by which agency?

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

1. Plan of the levee embankment and floodwall structures.	Sheet Numbers: V003
2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system.	Sheet Numbers: C101-105, C401-404
3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure.	Sheet Numbers: S401-403
4. A layout detail for the embankment protection measures.	Sheet Numbers: N/A
5. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations.	Sheet Numbers: C101-5, C401-4, S401-3

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

3.0 feet or more at the downstream end and throughout	☒ Yes	☐ No
3.5 feet or more at the upstream end	☐ Yes	☐ No
4.0 feet within 100 feet upstream of all structures and/or constrictions	☐ Yes	☐ No

Coastal

1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater).	☐ Yes	☐ No
2.0 feet above the 1%-annual-chance stillwater surge elevation	☐ Yes	☐ No

E. LEVEE/FLOODWALL (CONTINUED)

2. Freeboard (continued)

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☒ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): ☒ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device
06+00	RIGHT	FLOODGATE	-9.85	FLOODGATE

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

a. The maximum levee slope landside is: 1H : 1V

b. The maximum levee slope floodside is: 1H : 1V

c. The range of velocities along the levee during the base flood is: (min.) to (max.)

d. Embankment material is protected by (describe what kind): Native veg and scattered rip rap & concrete debris

e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D_{100}	D_{50}	Thickness	
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								

(Extend table on an added sheet as needed and reference each entry)

E. LEVEE/FLOODWALL (CONTINUED)

4. Embankment Protection (continued)

f. Is a bedding/filter analysis and design attached? ☐ Yes ☒ No

g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

a. Identify locations and describe the basis for selection of critical location for analysis:
16+50

☒ Overall height: Sta. 16+50; height 19 ft.

☒ Limiting foundation soil strength:

Sta. 16+50, depth 22 to 34 ft

strength ϕ = 24-26 degrees, c = 100-200 psf

slope: SS = 1 (h) to 1 (v)

(Repeat as needed on an added sheet for additional locations)

b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

Circular Arc

c. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction	N/A	1.3
II	Sudden drawdown	1.4	1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage	1.33 to 1.48	1.4
VI	Earthquake (Case I)	1.16 to 1.43	1.0
(Reference: USACE EM-1110-2-1913 Table 6-1)			

d. Was a seepage analysis for the embankment performed? ☒ Yes ☐ No

If Yes, describe methodology used: Finite Element Analysis

e. Was a seepage analysis for the foundation performed? ☒ Yes ☐ No

f. Were uplift pressures at the embankment landside toe checked? ☒ Yes ☐ No

g. Were seepage exit gradients checked for piping potential? ☒ Yes ☐ No

h. The duration of the base flood hydrograph against the embankment is N/A hours.

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability FOR DUAL SHEET PILE WALL STRUCTURE

a. Describe analysis submittal based on Code (check one):

☐ UBC (1988) or ☒ Other (specify): EM 1110-2-2503

b. Stability analysis submitted provides for:

☒ Overturning ☒ Sliding If not, explain:

c. Loading included in the analyses were:

☒ Lateral earth @ P_A = 36.6 psf; P_p = 200 psf

☐ Surcharge-Slope @ N/A, ☐ surface psf

☐ Wind @ P_w = N/A psf

☐ Seepage (Uplift); N/A ☒ Earthquake @ P_{eq} = 0.13 %g

☐ 1%-annual-chance significant wave height: N/A ft.

☐ 1%-annual-chance significant wave period: N/A sec.

d. Summary of Stability Analysis Results: Factors of Safety.

Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5	00+81	05+45	06+05	07+95
Dead & Soil	1.5	1.5	00+81	05+45	06+05	07+95
Dead, Soil, Flood, & Impact	~~1.5~~ 1.25	1.5	00+81	05+45	06+05	07+95
Dead, Soil, & Seismic or Overtopping Flood	~~1.3~~ 1.1	1.3	00+81	05+45	06+05	07+95

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-~~2502~~ 2503)

(Note: Extend table on an added sheet as needed and reference)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum	987	SATISFIED BY ROTATIONAL ~~STABILITY DURING OVERTOPPING~~ FLOOD EVENT LOAD CASE
Maximum allowable	13340	

f. Foundation scour protection ☐ is, ☒ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

7. Settlement FOR DUAL SHEET PILE WALL STRUCTURE

a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☒ No

b. The computed range of settlement is ft. to ft.

c. Settlement of the levee crest is determined to be primarily from :

☐ Foundation consolidation
☐ Embankment compression
☒ Other (Describe): Weight of fill between sheet piles may consolidate the silt layer below and is dependent on the extent to which dredging of the silt is specified.

d. Differential settlement of floodwalls ☐ has ☒ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

a. Specify size of each interior watershed:

Draining to pressure conduit: acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☐ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☐ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm (River Watershed)	☒ Yes	☐ No
• Historical ponding probability	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

If No for any of the above, attach explanation.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

If No, attach explanation.

g. The rate of seepage through the levee system for the base flood is cfs

h. The length of levee system used to drive this seepage rate in item g: ft.

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability — FOR SINGLE SHEET PILE WALL

a. Describe analysis submittal based on Code (check one):

☐ UBC (1988) or ☒ Other (specify): EM 1110-2-2504

b. Stability analysis submitted provides for:

☒ Overturning ☒ Sliding If not, explain:

c. Loading included in the analyses were:

☒ Lateral earth @ P_A = 33.0 psf; P_p = 360 psf

☒ Surcharge-Slope @ , ☒ surface 300 psf

☐ Wind @ P_w = N/A psf

☐ Seepage (Uplift); N/A ☒ Earthquake @ P_{eq} = 0.13 %g

☐ 1%-annual-chance significant wave height: N/A ft.

☐ 1%-annual-chance significant wave period: N/A sec.

d. Summary of Stability Analysis Results: Factors of Safety.

Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	~~1.5~~ N/A	07+95	09+05	18+75	27+00
Dead & Soil	1.5	~~1.5~~ N/A	07+95	09+05	18+75	27+00
Dead, Soil, Flood, & Impact	1.5	~~1.5~~ N/A	07+95	09+05	18+75	27+00
Dead, Soil, & Seismic	~~1.3~~ 1.25	~~1.3~~ N/A	07+95	09+05	18+75	27+00
Overtopping Flood	1.1					

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-~~2502~~ 2504)

(Note: Extend table on an added sheet as needed and reference)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum	N/A	N/A
Maximum allowable	N/A	N/A

f. Foundation scour protection ☐ is, ☒ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

7. Settlement FOR SINGLE SHEET PILE WALL

a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☒ No

b. The computed range of settlement is ft. to ft.

c. Settlement of the levee crest is determined to be primarily from :

☐ Foundation consolidation
☐ Embankment compression
☒ Other (Describe): NOT LIKELY TO EFFECT SHEET PILE DESIGN

d. Differential settlement of floodwalls ☐ has ☒ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

a. Specify size of each interior watershed:

Draining to pressure conduit: acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☐ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☐ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm (River Watershed)	☒ Yes	☐ No
• Historical ponding probability	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

If No for any of the above, attach explanation.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

If No, attach explanation.

g. The rate of seepage through the levee system for the base flood is cfs

h. The length of levee system used to drive this seepage rate in item g: ft.

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability — CLOSURE GATE STRUCTURE

a. Describe analysis submittal based on Code (check one):

☐ UBC (1988) or ☒ Other (specify): ASCE 7-05

b. Stability analysis submitted provides for:

☒ Overturning ☒ Sliding If not, explain:

c. Loading included in the analyses were:

☐ Lateral earth @ P_A = N/A psf; P_p = N/A psf

☐ Surcharge-Slope @ N/A, ☐ surface N/A psf

☐ Wind @ P_w = N/A psf

☐ Seepage (Uplift); N/A ☒ Earthquake @ P_{eq} = 0.13 %g

☐ 1%-annual-chance significant wave height: N/A ft.

☐ 1%-annual-chance significant wave period: N/A sec.

d. Summary of Stability Analysis Results: Factors of Safety.

Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5	5+45	6+05		
Dead & Soil	1.5	1.5	5+45	6+05		
Dead, Soil, Flood, & Impact	1.5	1.5	5+45	6+05		
Dead, Soil, & Seismic	1.3	1.3	5+45	6+05		

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502) ASCE 7-05 & EM 110-2-2100

(Note: Extend table on an added sheet as needed and reference)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum	N/A	N/A
Maximum allowable	N/A	N/A

f. Foundation scour protection ☐ is, ☒ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

7. Settlement CLOSURE GATE STRUCTURE

a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☒ Yes ☐ No

b. The computed range of settlement is 0 ft. to 0.0416 ft.

c. Settlement of the levee crest is determined to be primarily from :

☐ Foundation consolidation
☐ Embankment compression
☒ Other (Describe): Steel piles (quantity = 72) with 4'0" thick concrete foundation and gate structure.

d. Differential settlement of floodwalls ☒ has ☐ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

a. Specify size of each interior watershed:

Draining to pressure conduit: acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☐ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☐ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm (River Watershed)	☒ Yes	☐ No
• Historical ponding probability	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

If No for any of the above, attach explanation.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

If No, attach explanation.

g. The rate of seepage through the levee system for the base flood is cfs

h. The length of levee system used to drive this seepage rate in item g: ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? ☒ Yes ☐ No

If Yes, include the number of pumping plants: 9
For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps	SEE ATTACHED SHEETS	
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☒ is not a problem
Hydrocompaction ☐ is ☒ is not a problem
Heave differential movement due to soils of high shrink/swell ☐ is ☒ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☒ No

Attach supporting documentation

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☒ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage

a. Specify size of each interior watershed: LOUIS PARK
Draining to pressure conduit: 0 acres
Draining to ponding area: 21.33 acres

b. Relationships Established

Ponding elevation vs. storage	☒ Yes	☐ No
Ponding elevation vs. gravity flow	☒ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☒ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: 0 cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm	☒ Yes	☐ No
• Historical Ponding	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

Historical ponding was not analyzed because no records of historical ponding are available.
Coastal wave overtopping was not analyzed because the area analyzed is not a coastal area.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

g. The rate of seepage through the levee system for the base flood is N/A cfs.

h. The length of levee system used to drive this seepage rate in item g: N/A ft.

i. Will pumping plants be used for interior drainage? ☐ Yes ☒ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

The number of pumps	
The ponding storage capacity	
The maximum pumping rate	
The maximum pumping head	
The pumping start elevation	
The pumping stop elevation	
Is the discharge facility protected?	
Is there a flood warning plan?	
How much time is available between warning and flooding?	

Will the pumps be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage

a. Specify size of each interior watershed: OCCIDENTAL AVENUE
Draining to pressure conduit: 0 acres
Draining to ponding area: 5.6 acres

b. Relationships Established

Ponding elevation vs. storage	☒ Yes	☐ No
Ponding elevation vs. gravity flow	☒ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☒ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: 0 cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm	☒ Yes	☐ No
• Historical Ponding	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

Historical ponding was not analyzed because no records of historical ponding are available.
Coastal wave overtopping was not analyzed because the area analyzed is not a coastal area.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

g. The rate of seepage through the levee system for the base flood is N/A cfs.

h. The length of levee system used to drive this seepage rate in item g: N/A ft.

i. Will pumping plants be used for interior drainage? ☐ Yes ☒ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

The number of pumps	
The ponding storage capacity	
The maximum pumping rate	
The maximum pumping head	
The pumping start elevation	
The pumping stop elevation	
Is the discharge facility protected?	
Is there a flood warning plan?	
How much time is available between warning and flooding?	

Will the pumps be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage

a. Specify size of each interior watershed: PINETREE DRIVE

Draining to pressure conduit: 0 acres
Draining to ponding area: 7.78 acres

b. Relationships Established

Ponding elevation vs. storage	☒ Yes	☐ No
Ponding elevation vs. gravity flow	☒ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☒ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: 0 cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm	☒ Yes	☐ No
• Historical Ponding	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

Historical ponding was not analyzed because no records of historical ponding are available.
Coastal wave overtopping was not analyzed because the area analyzed is not a coastal area.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

g. The rate of seepage through the levee system for the base flood is N/A cfs.

h. The length of levee system used to drive this seepage rate in item g: N/A ft.

i. Will pumping plants be used for interior drainage? ☐ Yes ☒ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

The number of pumps	
The ponding storage capacity	
The maximum pumping rate	
The maximum pumping head	
The pumping start elevation	
The pumping stop elevation	
Is the discharge facility protected?	
Is there a flood warning plan?	
How much time is available between warning and flooding?	

Will the pumps be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage

a. Specify size of each interior watershed: KINGSLEY AVENUE

Draining to pressure conduit: 0 acres
Draining to ponding area: 18.03 acres

b. Relationships Established

Ponding elevation vs. storage	☒ Yes	☐ No
Ponding elevation vs. gravity flow	☒ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☒ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: 0 cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm	☒ Yes	☐ No
• Historical Ponding	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

Historical ponding was not analyzed because no records of historical ponding are available.
Coastal wave overtopping was not analyzed because the area analyzed is not a coastal area.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

g. The rate of seepage through the levee system for the base flood is N/A cfs.

h. The length of levee system used to drive this seepage rate in item g: N/A ft.

i. Will pumping plants be used for interior drainage? ☐ Yes ☒ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

The number of pumps	
The ponding storage capacity	
The maximum pumping rate	
The maximum pumping head	
The pumping start elevation	
The pumping stop elevation	
Is the discharge facility protected?	
Is there a flood warning plan?	
How much time is available between warning and flooding?	

Will the pumps be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage

a. Specify size of each interior watershed: YOSEMITE LAKE PUMP STATION

Draining to pressure conduit: 1,935.91 acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☒ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☒ No
Differential head vs. gravity flow	☐ Yes	☒ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: 276.3 cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm	☒ Yes	☐ No
• Historical Ponding	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

Historical ponding was not analyzed because no records of historical ponding are available.
Coastal wave overtopping was not analyzed because the area analyzed is not a coastal area.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

g. The rate of seepage through the levee system for the base flood is N/A cfs.

h. The length of levee system used to drive this seepage rate in item g: N/A ft.

i. Will pumping plants be used for interior drainage? ☒ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	YOSEMITE LAKE PUMP STATION
The number of pumps	4
The ponding storage capacity	193 acre-feet temporary street ponding storage available, 160.6 acre-feet used.
The maximum pumping rate	124,000 GPM
The maximum pumping head	13 FT
The pumping start elevation	NOT AVAILABLE
The pumping stop elevation	NOT AVAILABLE
Is the discharge facility protected?	YES
Is there a flood warning plan?	NO
How much time is available between warning and flooding?	N/A

Will the pumps be automatic? ☒ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage

a. Specify size of each interior watershed: RYDE AVENUE PUMP STATION

Draining to pressure conduit: 167.1 acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☒ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☒ No
Differential head vs. gravity flow	☐ Yes	☒ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: 14.5 cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm	☒ Yes	☐ No
• Historical Ponding	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

Historical ponding was not analyzed because no records of historical ponding are available.
Coastal wave overtopping was not analyzed because the area analyzed is not a coastal area.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

g. The rate of seepage through the levee system for the base flood is N/A cfs.

h. The length of levee system used to drive this seepage rate in item g: N/A ft.

i. Will pumping plants be used for interior drainage? ☒ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	RYDE AVENUE PUMP STATION
The number of pumps	2
The ponding storage capacity	16.7 acre-feet temporary street ponding storage available, 21.1 acre-feet needed.
The maximum pumping rate	6,500 GPM
The maximum pumping head	10 FT
The pumping start elevation	NOT AVAILABLE
The pumping stop elevation	NOT AVAILABLE
Is the discharge facility protected?	YES
Is there a flood warning plan?	NO
How much time is available between warning and flooding?	N/A

Will the pumps be automatic? ☒ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☒ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage

a. Specify size of each interior watershed: PLYMOUTH ROAD PUMP STATION

Draining to pressure conduit: 90.44 acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☒ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☒ No
Differential head vs. gravity flow	☐ Yes	☒ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: 32 cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm	☒ Yes	☐ No
• Historical Ponding	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

Historical ponding was not analyzed because no records of historical ponding are available.
Coastal wave overtopping was not analyzed because the area analyzed is not a coastal area.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

g. The rate of seepage through the levee system for the base flood is N/A cfs.

h. The length of levee system used to drive this seepage rate in item g: N/A ft.

i. Will pumping plants be used for interior drainage? ☒ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	PLYMOUTH ROAD PUMP STATION
The number of pumps	3
The ponding storage capacity	9 acre-feet temporary street ponding storage available, 2.6 acre-feet used.
The maximum pumping rate	14,320 GPM
The maximum pumping head	7 FT
The pumping start elevation	NOT AVAILABLE
The pumping stop elevation	NOT AVAILABLE
Is the discharge facility protected?	YES
Is there a flood warning plan?	NO
How much time is available between warning and flooding?	N/A

Will the pumps be automatic? ☒Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☒ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage

a. Specify size of each interior watershed: MOREING PUMP STATION

Draining to pressure conduit: 35.92 acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☒ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☒ No
Differential head vs. gravity flow	☐ Yes	☒ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: 12.25 cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm	☒ Yes	☐ No
• Historical Ponding	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

Historical ponding was not analyzed because no records of historical ponding are available.
Coastal wave overtopping was not analyzed because the area analyzed is not a coastal area.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

g. The rate of seepage through the levee system for the base flood is N/A cfs.

h. The length of levee system used to drive this seepage rate in item g: N/A ft.

i. Will pumping plants be used for interior drainage? ☒ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	MOREING PUMP STATION
The number of pumps	2
The ponding storage capacity	3.5 acre-feet temporary street ponding storage available, 1.2 acre-feet used.
The maximum pumping rate	5,500 GPM
The maximum pumping head	6 FT
The pumping start elevation	NOT AVAILABLE
The pumping stop elevation	NOT AVAILABLE
Is the discharge facility protected?	YES
Is there a flood warning plan?	NO
How much time is available between warning and flooding?	N/A

Will the pumps be automatic? ☒Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☒ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage

a. Specify size of each interior watershed: BUENA VISTA NORTH PUMP STATION

Draining to pressure conduit: 121.63 acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☒ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☒ No
Differential head vs. gravity flow	☐ Yes	☒ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: 12.25 cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm	☒ Yes	☐ No
• Historical Ponding	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

Historical ponding was not analyzed because no records of historical ponding are available.
Coastal wave overtopping was not analyzed because the area analyzed is not a coastal area.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

g. The rate of seepage through the levee system for the base flood is N/A cfs.

h. The length of levee system used to drive this seepage rate in item g: N/A ft.

i. Will pumping plants be used for interior drainage? ☒ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	BUENA VISTA NORTH PUMP STATION
The number of pumps	2
The ponding storage capacity	12 acre-feet temporary street ponding storage available, 10.6 acre-feet used.
The maximum pumping rate	5,500GPM
The maximum pumping head	7 FT
The pumping start elevation	NOT AVAILABLE
The pumping stop elevation	NOT AVAILABLE
Is the discharge facility protected?	YES
Is there a flood warning plan?	NO
How much time is available between warning and flooding?	N/A

Will the pumps be automatic? ☒Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☒ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage

a. Specify size of each interior watershed: LAKE DRIVE PUMP STATION

Draining to pressure conduit: 4.22 acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☒ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☒ No
Differential head vs. gravity flow	☐ Yes	☒ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: 6 cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm	☒ Yes	☐ No
• Historical Ponding	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

Historical ponding was not analyzed because no records of historical ponding are available.
Coastal wave overtopping was not analyzed because the area analyzed is not a coastal area.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

g. The rate of seepage through the levee system for the base flood is N/A cfs.

h. The length of levee system used to drive this seepage rate in item g: N/A ft.

i. Will pumping plants be used for interior drainage? ☒ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	LAKE DRIVE PUMP STATION
The number of pumps	1
The ponding storage capacity	0.6 acre-feet temporary street ponding storage available, 0.06 acre-feet used.
The maximum pumping rate	2,700 GPM
The maximum pumping head	6 FT
The pumping start elevation	NOT AVAILABLE
The pumping stop elevation	NOT AVAILABLE
Is the discharge facility protected?	YES
Is there a flood warning plan?	NO
How much time is available between warning and flooding?	N/A

Will the pumps be automatic? ☒Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☒ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage

a. Specify size of each interior watershed: GARDENA PUMP STATION

Draining to pressure conduit: 54.66 acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☒ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☒ No
Differential head vs. gravity flow	☐ Yes	☒ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: 12.5 cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm	☒ Yes	☐ No
• Historical Ponding	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

Historical ponding was not analyzed because no records of historical ponding are available.
Coastal wave overtopping was not analyzed because the area analyzed is not a coastal area.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

g. The rate of seepage through the levee system for the base flood is N/A cfs.

h. The length of levee system used to drive this seepage rate in item g: N/A ft.

i. Will pumping plants be used for interior drainage? ☒ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	GARDENA PUMP STATION
The number of pumps	2
The ponding storage capacity	5.4 acre-feet temporary street ponding storage available, 2.5 acre-feet used.
The maximum pumping rate	5,600 GPM
The maximum pumping head	8 FT
The pumping start elevation	NOT AVAILABLE
The pumping stop elevation	NOT AVAILABLE
Is the discharge facility protected?	YES
Is there a flood warning plan?	NO
How much time is available between warning and flooding?	N/A

Will the pumps be automatic? ☒ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☒ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage

a. Specify size of each interior watershed: FRANKLIN AVENUE PUMP STATION

Draining to pressure conduit: 425.22 acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☒ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☒ No
Differential head vs. gravity flow	☐ Yes	☒ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: 34 cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm	☒ Yes	☐ No
• Historical Ponding	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

Historical ponding was not analyzed because no records of historical ponding are available.
Coastal wave overtopping was not analyzed because the area analyzed is not a coastal area.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

g. The rate of seepage through the levee system for the base flood is N/A cfs.

h. The length of levee system used to drive this seepage rate in item g: N/A ft.

i. Will pumping plants be used for interior drainage? ☒ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	FRANKLIN AVENUE PUMP STATION
The number of pumps	2
The ponding storage capacity	42 acre-feet temporary street ponding storage available, 41 acre-feet used.
The maximum pumping rate	15,260 GPM
The maximum pumping head	10 FT
The pumping start elevation	NOT AVAILABLE
The pumping stop elevation	NOT AVAILABLE
Is the discharge facility protected?	YES
Is there a flood warning plan?	NO
How much time is available between warning and flooding?	N/A

Will the pumps be automatic? ☒ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☒ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage

a. Specify size of each interior watershed: BUENA VISTA SOUTH PUMP STATION

Draining to pressure conduit: 477.47 acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☒ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☒ No
Differential head vs. gravity flow	☐ Yes	☒ No

c. The river flow duration curve is enclosed: ☐ Yes ☒ No

d. Specify the discharge capacity of the head pressure conduit: 86.7 cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm	☒ Yes	☐ No
• Historical Ponding	☐ Yes	☒ No
• Coastal wave overtopping	☐ Yes	☒ No

Historical ponding was not analyzed because no records of historical ponding are available.
Coastal wave overtopping was not analyzed because the area analyzed is not a coastal area.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☒ No

g. The rate of seepage through the levee system for the base flood is N/A cfs.

h. The length of levee system used to drive this seepage rate in item g: N/A ft.

i. Will pumping plants be used for interior drainage? ☒ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	BUENA VISTA SOUTH PUMP STATION
The number of pumps	3
The ponding storage capacity	47 acre-feet temporary street ponding storage available, 36.4 acre-feet used.
The maximum pumping rate	38,900 GPM
The maximum pumping head	7 FT
The pumping start elevation	NOT AVAILABLE
The pumping stop elevation	NOT AVAILABLE
Is the discharge facility protected?	YES
Is there a flood warning plan?	NO
How much time is available between warning and flooding?	N/A

Will the pumps be automatic? ☒Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

E. LEVEE/FLOODWALL (CONTINUED)

10. Operational Plan And Criteria

    a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☒ Yes ☐ No

    b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations?
    ☒ Yes ☐ No

    c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations?
    ☐ Yes ☒ No

    If the answer is No to any of the above, please attach supporting documentation.

11. Maintenance Plan

    a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☒ Yes ☐ No
    If No, please attach supporting documentation.

12. Operations and Maintenance Plan

    Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

F. SEDIMENT TRANSPORT

Flooding Source: N/A

Name of Structure:

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume acre-feet

Debris load associated with the base flood discharge: Volume acre-feet

Sediment transport rate (percent concentration by volume)

Method used to estimate sediment transport:

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition:

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport:
Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.