Appendix B Freeboard Profiles

Appendix B	Αr	pe	en	di	х	В
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1. Overview to Appendix B

Recent hydraulic modeling studies have provided 100-year (1 percent annual chance of occurrence) and 200-year (0.5 percent annual chance of occurrence) flood profiles for several urban channels in the Lower San Joaquin River Region. This appendix shows plots of:

- Water surface profiles
- Three feet above the water surface profiles (an indication of minimum freeboard for FEMA)
- Top of levees for each reach

Comparing the three feet above water surface with top of levees shows where freeboard is adequate.

Recent modeling studies were available for:

- Right levee of the San Joaquin River mainstem (including French Camp Slough and Walthall Slough) for RD 17
- Bear Creek System
- Lower Calaveras System
- Upper Calaveras System

Detailed modeling studies were not available to prepare similar plots for channels in the Delta South Region.

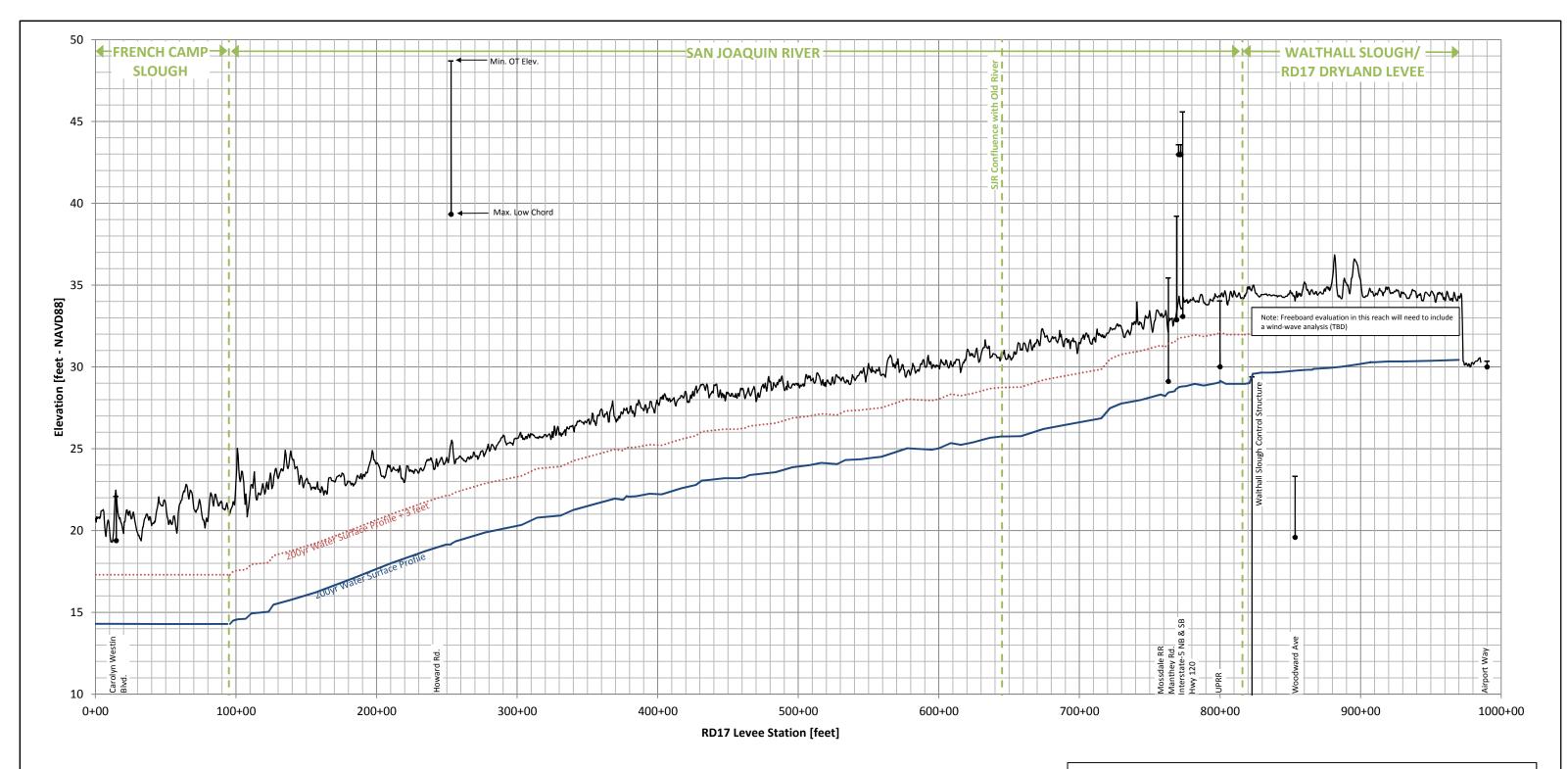
Appendix B	Αr	pe	en	di	х	В
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2. San Joaquin River

The 200-year water surface profile along the RD 17 levee alignment is based on modeling by Peterson-Brustad, Inc. for the City of Lathrop/Manteca 200 – Year Plan. The following map shows the RD 17 levee alignment. The profiles are shown on the following pages.



Appendix B	Αr	pe	en	di	х	В
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LEGEND

- + Stream Junction
- Bridge (Max. Low Chord; Min. OT Elev.)
- ----- PBI 200yr WSP
- PBI 200yr WSP + 3 feet

CITY OF LATHROP/MANTECA - 200-YEAR PLAN

200-year Water Surface Profile along the RD17 Levee Alignment -EVALUATION OF FREEBOARD-



Appendix B

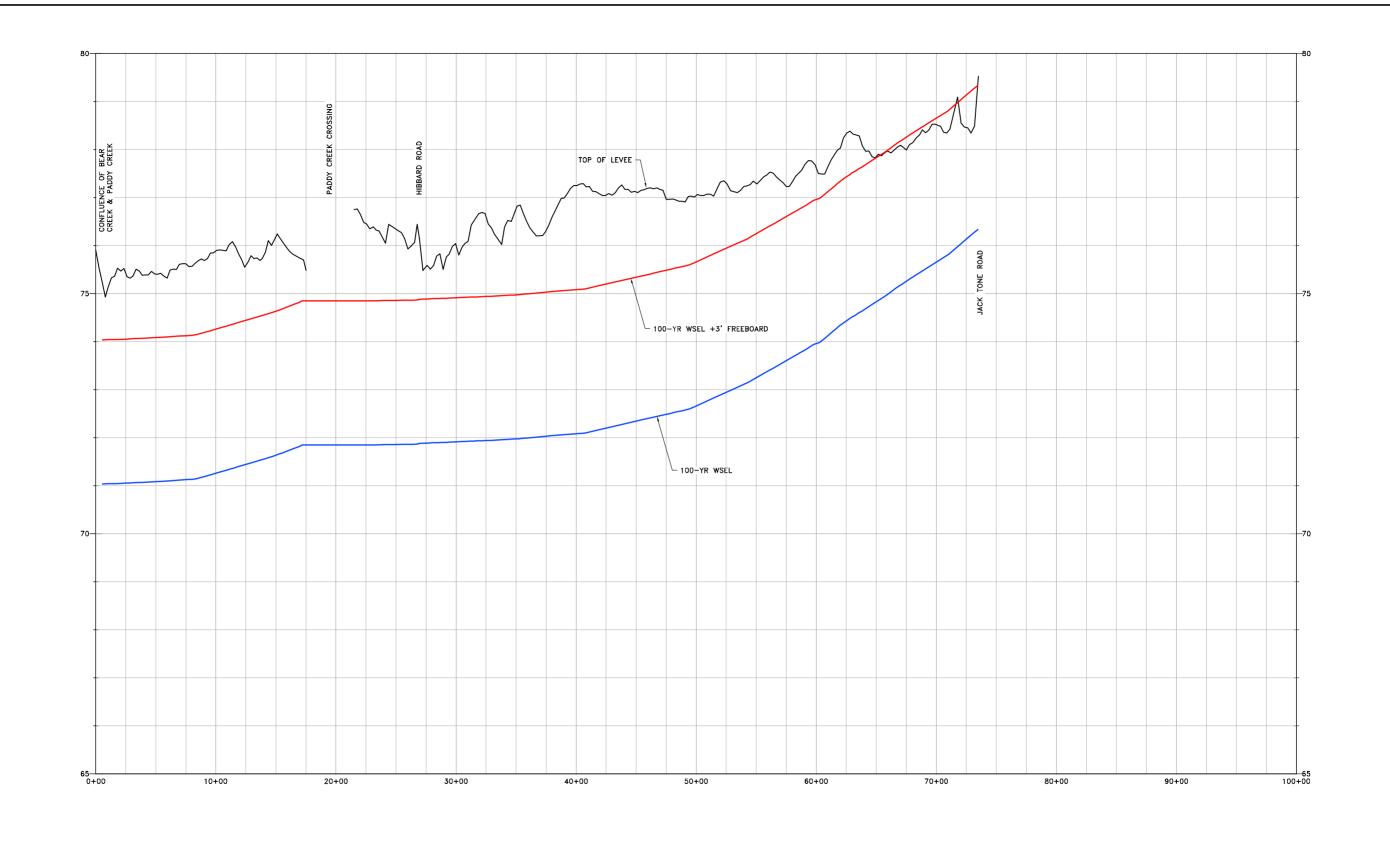
3. Bear Creek System

The 100-year and 200-year profiles are based on levee accreditation surveys by KSN, Inc. for Bear Creek, Pixley Slough, Paddy Creek, Mosher Diversion & Upper Mosher Creek, dated October 2014.

The follow Vicinity Map shows the project area for the levee accreditation surveys. The profiles are shown on the following pages.



Appendix B	Αr	pe	en	di	х	В
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WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

EXISTING GROUND

- 100-YR FREEBOARD (FB)

TOP OF FLOODWALL 100-YR WATER SURFACE ELEVATION

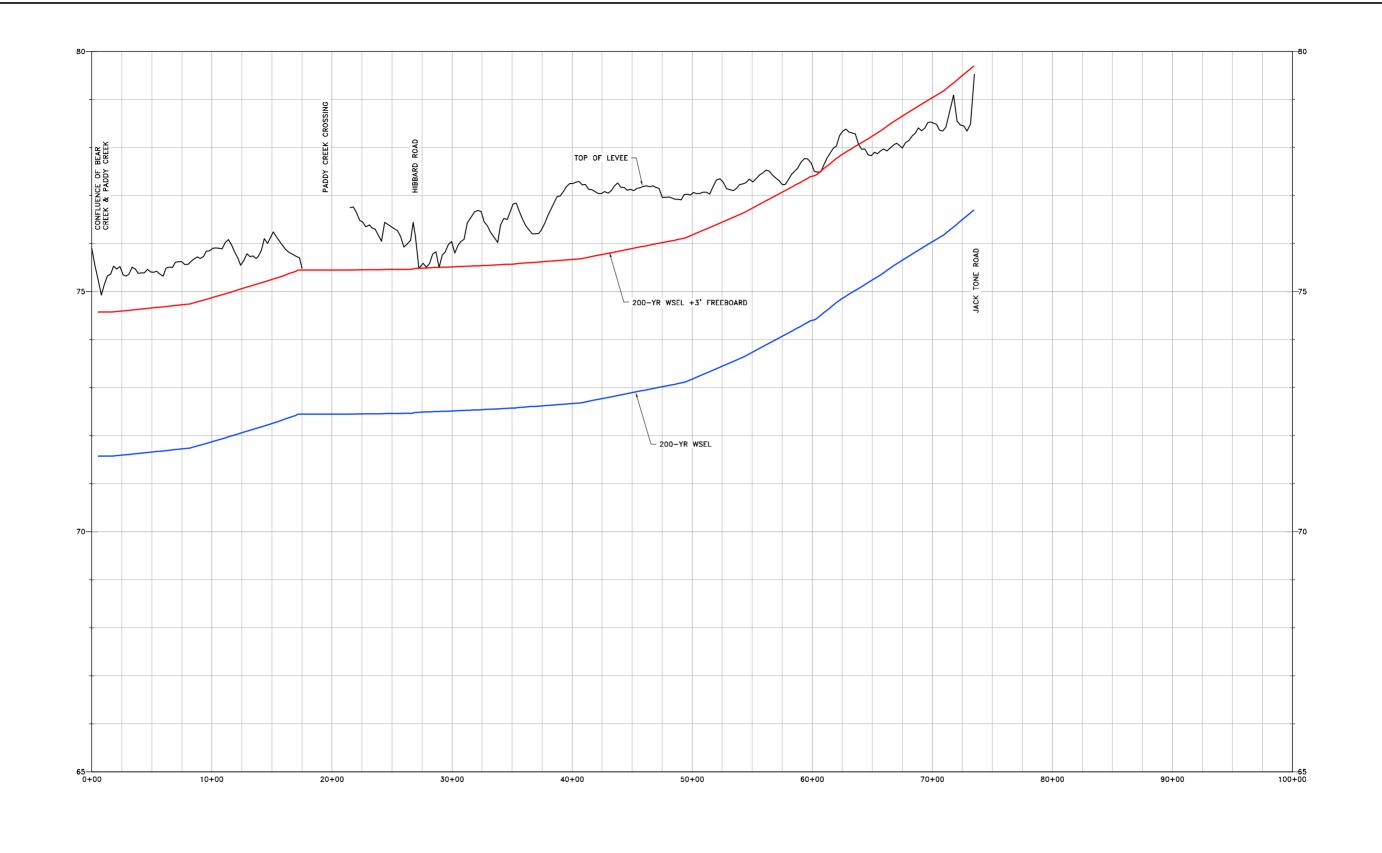
K KJELDSEN 711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268
N NEUDECK 1355 Halyard Drive, Suite 180 West Sacramento, CA 95691
INC. Civil Engineers (916) 403-5900 INC. Civil Engineers and Land Surveyors

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
SOUTH PADDY CREEK
LEVEE ACCREDITATION SURVEYS

Revisions Date By Aprvd. By No. Description Drawn JRT Check CHN HOR: 1"=400' VERT: 1"=1' Original Drawing Scale
O ½" 1"

Date OCTOBER 2014 Sheet Number Of **1** Project File No. 2091-0140

SOUTH PADDY CREEK - NORTH BANK 100-YEAR WATER SURFACE ELEVATION





WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

EXISTING GROUND TOP OF FLOODWALL

100-YR WATER SURFACE ELEVATION - 100-YR FREEBOARD (FB)

K KJELDSEN 711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268
N NEUDECK 1355 Halyard Drive, Suite 180 West Sacramento, CA 95691
INC. Civil Engineers (916) 403-5900 INC. Civil Engineers and Land Surveyors

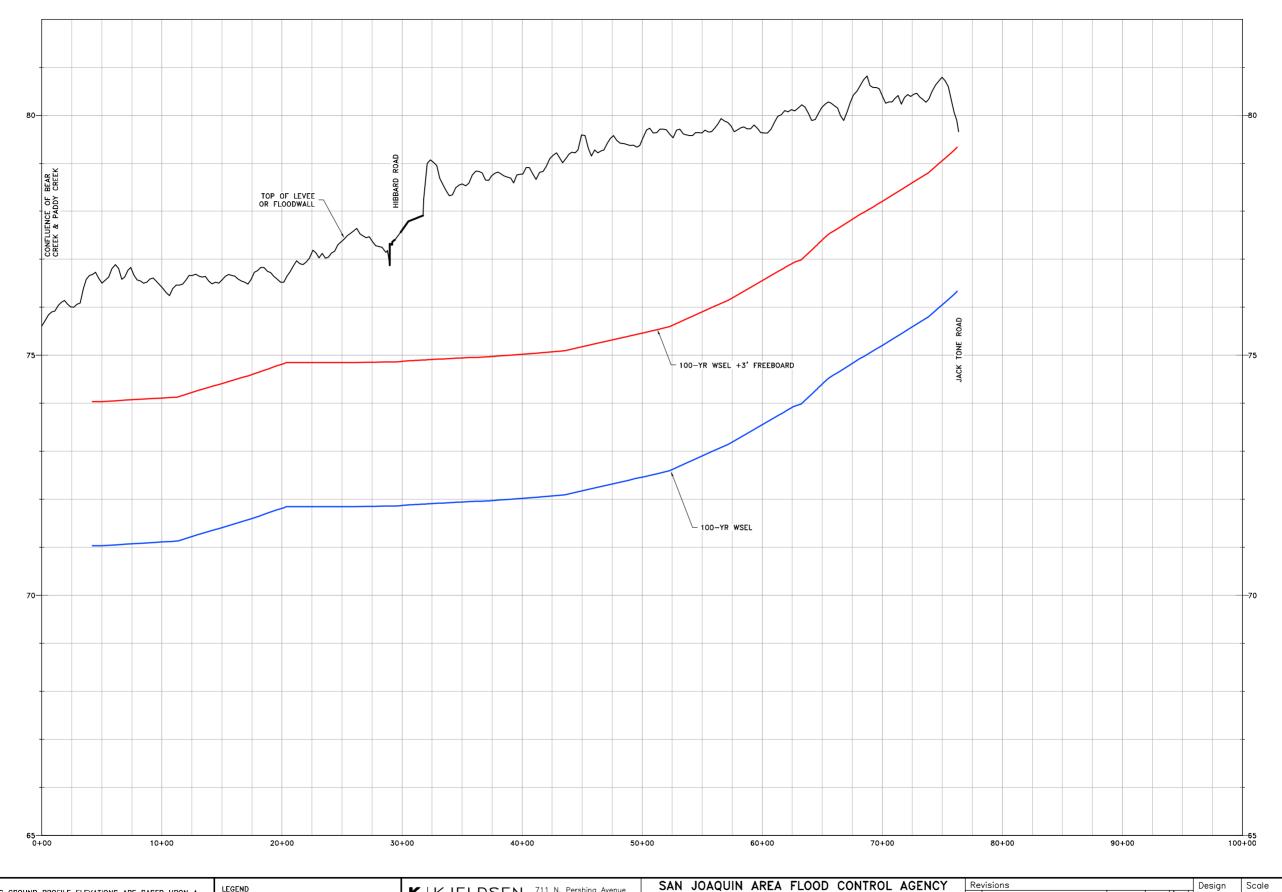
SAN JOAQUIN AREA FLOOD CONTROL AGENCY
SOUTH PADDY CREEK
LEVEE ACCREDITATION SURVEYS

SOUTH PADDY CREEK - NORTH BANK 200-YEAR WATER SURFACE ELEVATION

Revisions Date By Aprvd. By No. Description Drawn JRT Check CHN

Date OCTOBER 2014 HOR: 1"=400' VERT: 1"=1' Original Drawing Scale
O ½" 1"

Sheet Number Of **1** Project File No. 2091-0140





WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

EXISTING GROUND

TOP OF FLOODWALL 100-YR WATER SURFACE ELEVATION - 100-YR FREEBOARD (FB)

K KJELDSEN 711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268
N NEUDECK 1355 Halyard Drive, Suite 180 West Sacramento, CA 95691
INC. Civil Engineers (916) 403-5900 INC. Civil Engineers __ and Land Surveyors

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
SOUTH PADDY CREEK
LEVEE ACCREDITATION SURVEYS

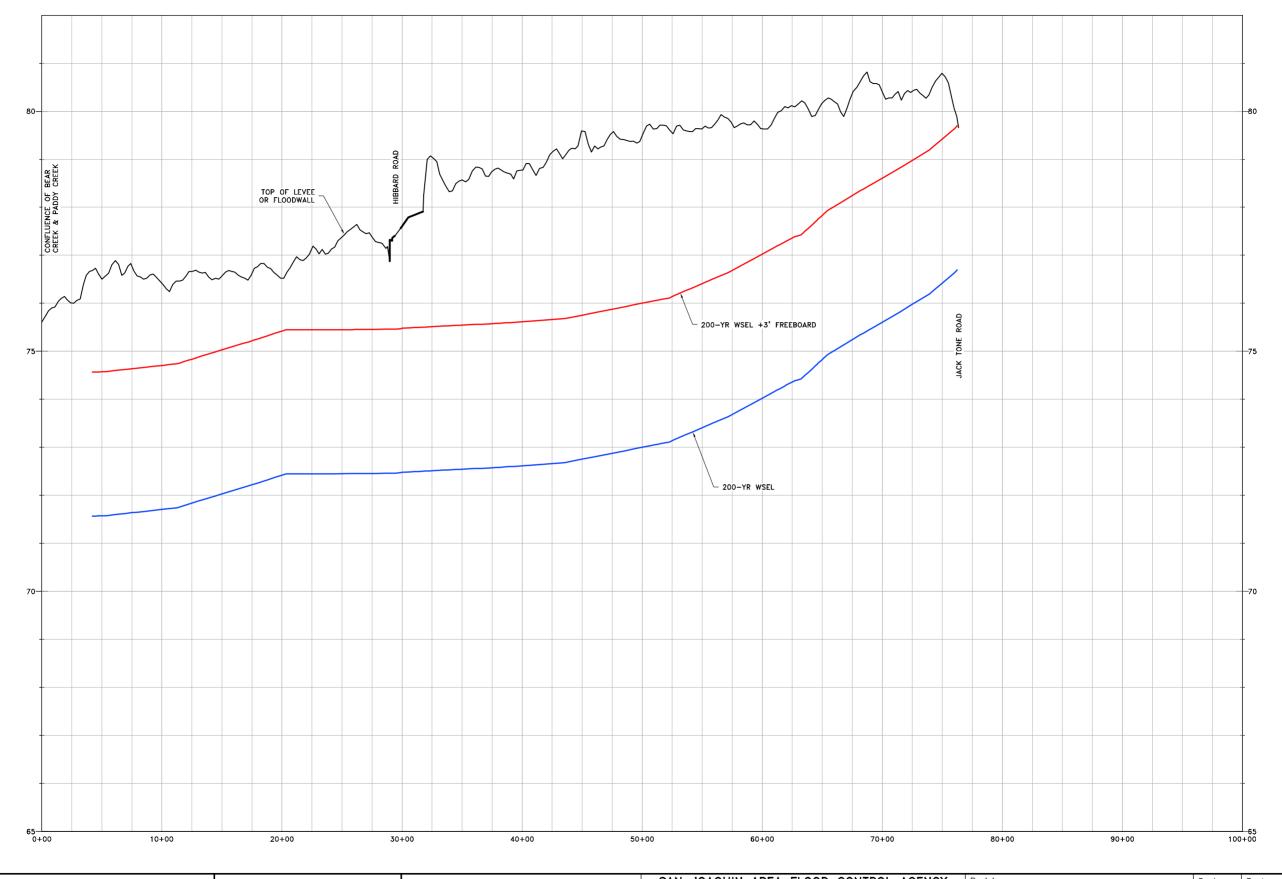
100-YEAR WATER SURFACE ELEVATION

SOUTH PADDY CREEK - SOUTH BANK

Date By Aprvd. No. Description Drawn JRT Check CHN

Date OCTOBER 2014 HOR: 1"=400' VERT: 1"=1' Sheet Number

Original Drawing Scale
O ½" 1" Project File No. 2091-0140





WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

EXISTING GROUND

TOP OF FLOODWALL

- 100-YR FREEBOARD (FB)

100-YR WATER SURFACE ELEVATION INC. Civil Engineers __ and Land Surveyors

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N NEUDECK 1355 Halyard Drive, Suite 180 West Sacramento, CA 95691 (916) 403-5900

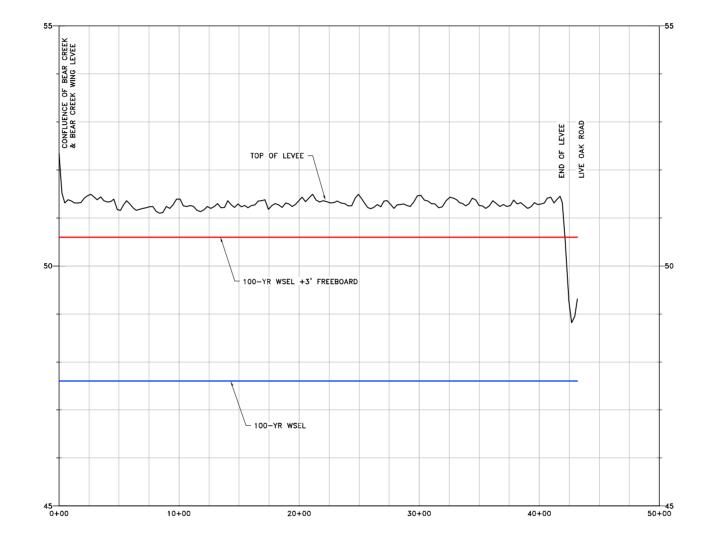
SAN JOAQUIN AREA FLOOD CONTROL AGENCY
SOUTH PADDY CREEK
LEVEE ACCREDITATION SURVEYS

SOUTH PADDY CREEK - SOUTH BANK 200-YEAR WATER SURFACE ELEVATION

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Date OCTOBER 2014 HOR: 1"=400' VERT: 1"=1' Sheet Number

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WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

LEGEND

EXISTING GROUND TOP OF FLOODWALL

100-YR FREEBOARD (FB)

100-YR WATER SURFACE ELEVATION INC.

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N NEUDECK 1355 Halyard Drive, Suite 180 West Sacramento, CA 95691
INC. Civil Engineers (916) 403-5900 C. Civil Engineers and Land Surveyors

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
BEAR CREEK WING LEVEE
LEVEE ACCREDITATION SURVEYS

BEAR CREEK WING LEVEE 100-YEAR WATER SURFACE ELEVATION

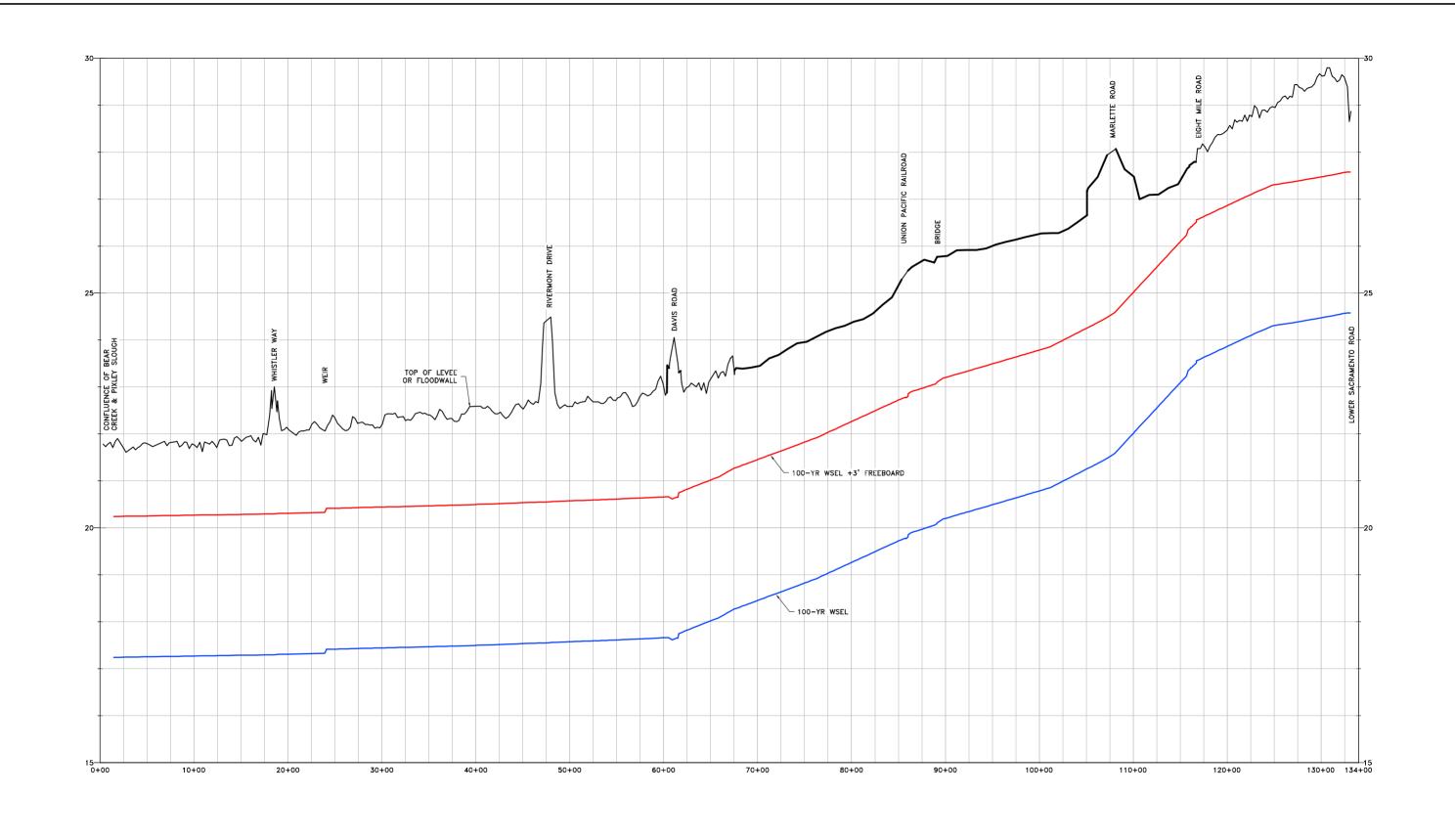
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Date OCTOBER 2014 Sheet Number

Original Drawing Scale
O ½" 1"

Of **1** Project File No. 2091-0140





WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

LEGEND EXISTING GROUND TOP OF FLOODWALL

--- 100-YR WATER SURFACE ELEVATION

100-YR FREEBOARD (FB)

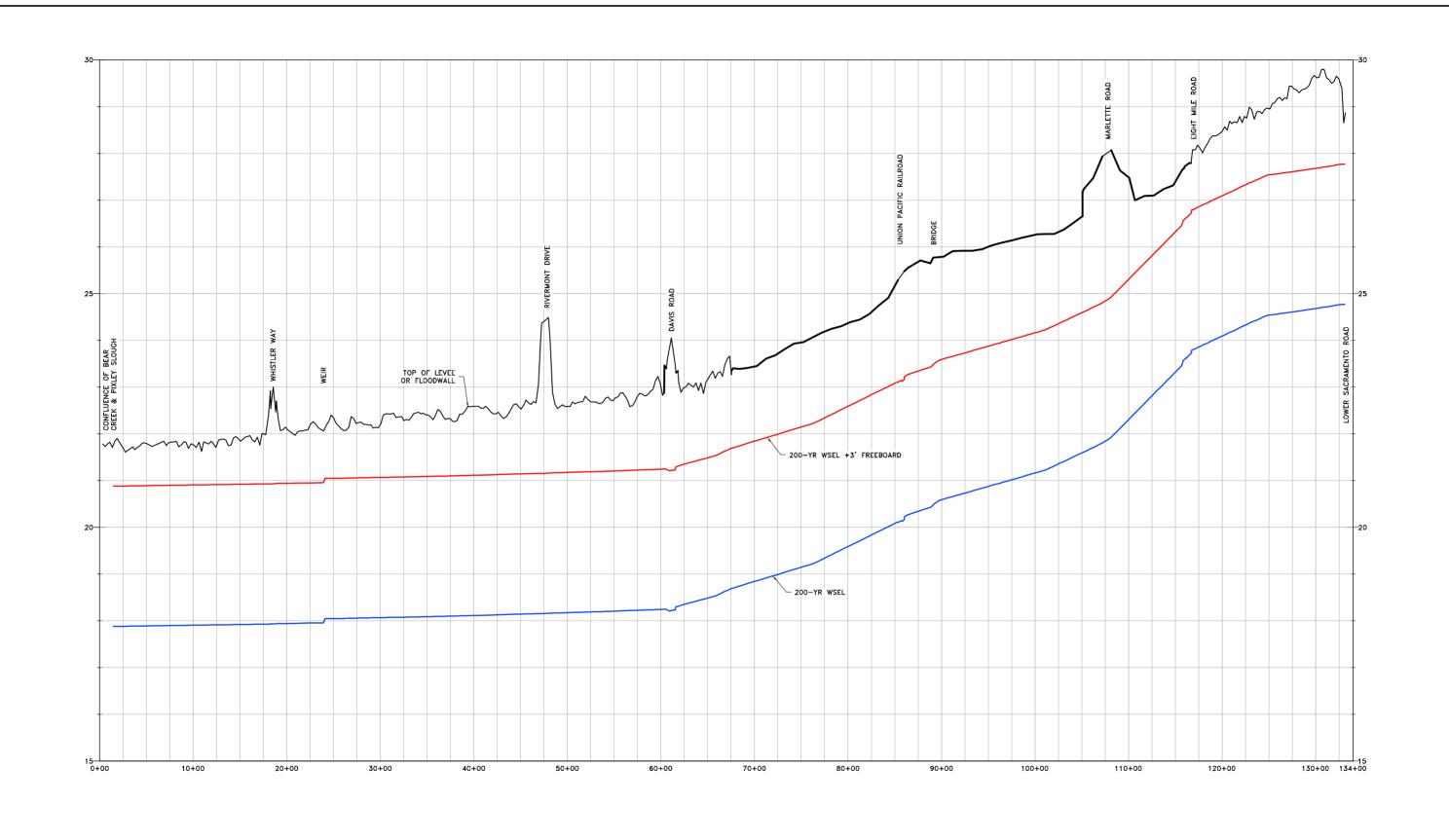
K KJELDSEN 711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268
N NEUDECK 1355 Halyard Drive, Suite 180 West Sacramento, CA 95691
INC. Civil Engineers (916) 403-5900 Civil Engineers and Land Surveyors INC.

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
PIXLEY SLOUGH
LEVEE ACCREDITATION SURVEYS

PIXLEY SLOUGH - NORTH BANK 100-YEAR WATER SURFACE ELEVATION

Revisions Date By Aprva. No. Description Drawn JRT Check CHN HOR: 1"=500' VERT: 1"=1' Original Drawing Scale
O ½" 1"

Date OCTOBER 2014 Sheet Number Of **1** Project File No. 2091-0140





WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

LEGEND EXISTING GROUND TOP OF FLOODWALL

100-YR WATER SURFACE ELEVATION

100-YR FREEBOARD (FB)

K KJELDSEN 711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268
N NEUDECK 1355 Halyard Drive, Suite 180 West Sacramento, CA 95691
INC. Civil Engineers (916) 403-5900 Civil Engineers and Land Surveyors INC.

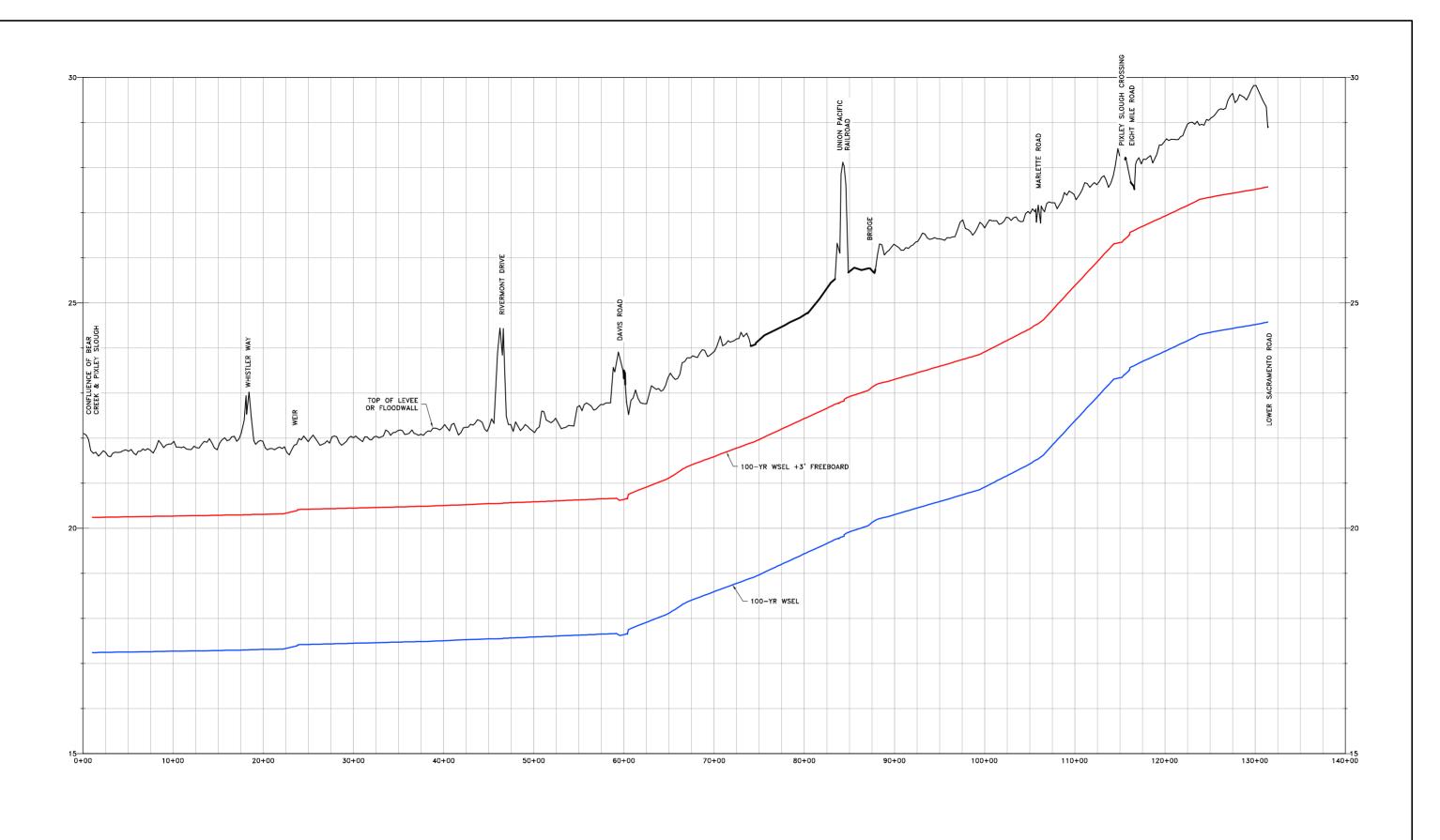
SAN JOAQUIN AREA FLOOD CONTROL AGENCY
PIXLEY SLOUGH
LEVEE ACCREDITATION SURVEYS

200-YEAR WATER SURFACE ELEVATION

PIXLEY SLOUGH - NORTH BANK

Revisions Date By Aprva. No. Description Drawn JRT Check CHN HOR: 1"=500' VERT: 1"=1' Original Drawing Scale
O ½" 1"

Date OCTOBER 2014 Sheet Number Of **1** Project File No. 2091-0140





WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

LEGEND

EXISTING GROUND

100-YR WATER SURFACE ELEVATION

100-YR FREEBOARD (FB)

TOP OF FLOODWALL

Civil Engineers and Land Surveyors INC.

K KJELDSEN 711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268
N NEUDECK 1355 Halyard Drive, Suite 180 West Sacramento, CA 95691
INC. Civil Engineers (916) 403-5900

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
PIXLEY SLOUGH
LEVEE ACCREDITATION SURVEYS

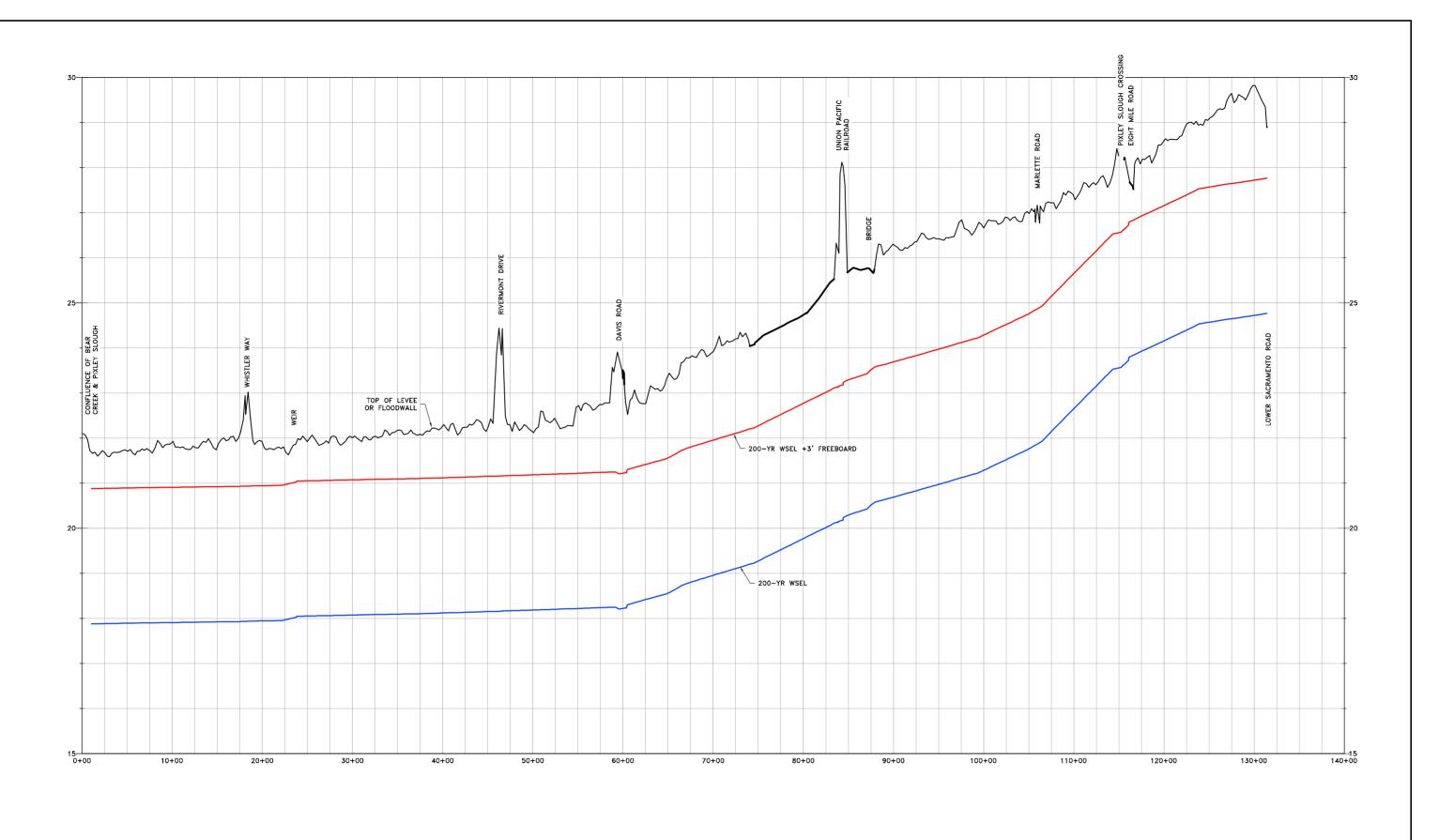
100-YEAR WATER SURFACE ELEVATION

PIXLEY SLOUGH - SOUTH BANK

Revisions Date By Aprva. No. Description Drawn JRT Check CHN

HOR: 1"=500' VERT: 1"=1' Original Drawing Scale
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Date OCTOBER 2014 Sheet Number Of **1** Project File No. 2091-0140





WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

LEGEND

EXISTING GROUND

TOP OF FLOODWALL 100-YR WATER SURFACE ELEVATION 100-YR FREEBOARD (FB)

K | KJELDSEN 711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268 **

SINNOCK

SINNOCK**

(209) 946–0268*

NEUDECK**

West Sacramento, CA 95691

(916) 403–5900

(916) 403–5900 Civil Engineers and Land Surveyors

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
PIXLEY SLOUGH
LEVEE ACCREDITATION SURVEYS

PIXLEY SLOUGH - SOUTH BANK 200-YEAR WATER SURFACE ELEVATION

Revisions Date By Aprva. No. Description Drawn JRT Check CHN HOR: 1"=500' VERT: 1"=1' Original Drawing Scale
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Date OCTOBER 2014 Sheet Number Of **1** Project File No. 2091-0140

Appendix B

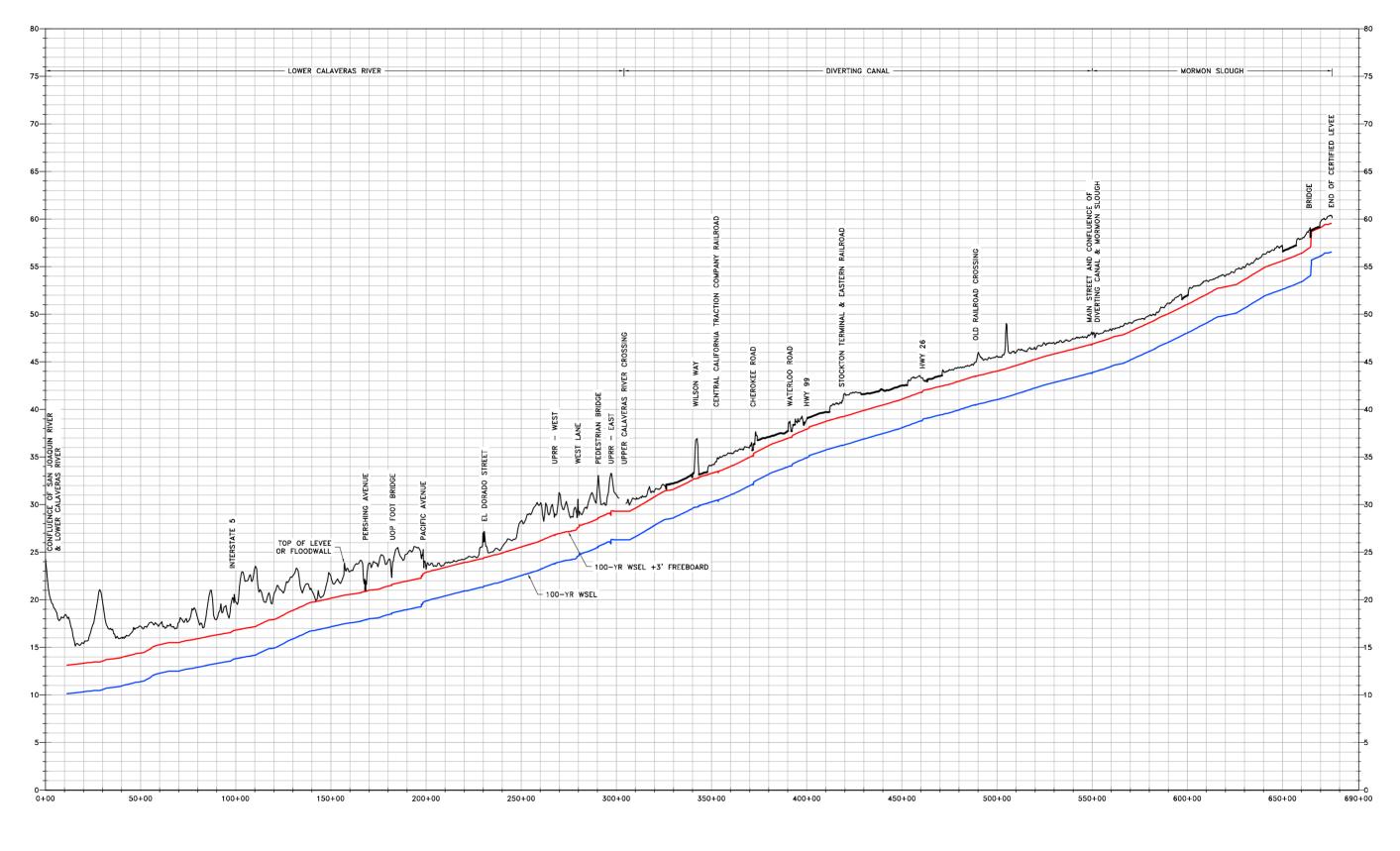
4. Lower Calaveras System

The 100-year and 200-year profiles are based on levee accreditation surveys by KSN, Inc. for Lower Calaveras River, Stockton Diverting Canal, Mormon Slough & Potter Creek, dated October 2014.

The following Vicinity Maps show the project area for the levee accreditation surveys. The profiles are shown on the following pages.









WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

LEGEND EXISTING GROUND TOP OF FLOODWALL

100-YR FREEBOARD (FB)

100-YR WATER SURFACE ELEVATION . Civil Engineers and Land Surveyors INC.

K KJELDSEN 711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268 NEUDECK 1355 Halyard Drive, Suite 180
NEUDECK West Sacramento, CA 95691
INC. Civil Engineers (916) 403-5900

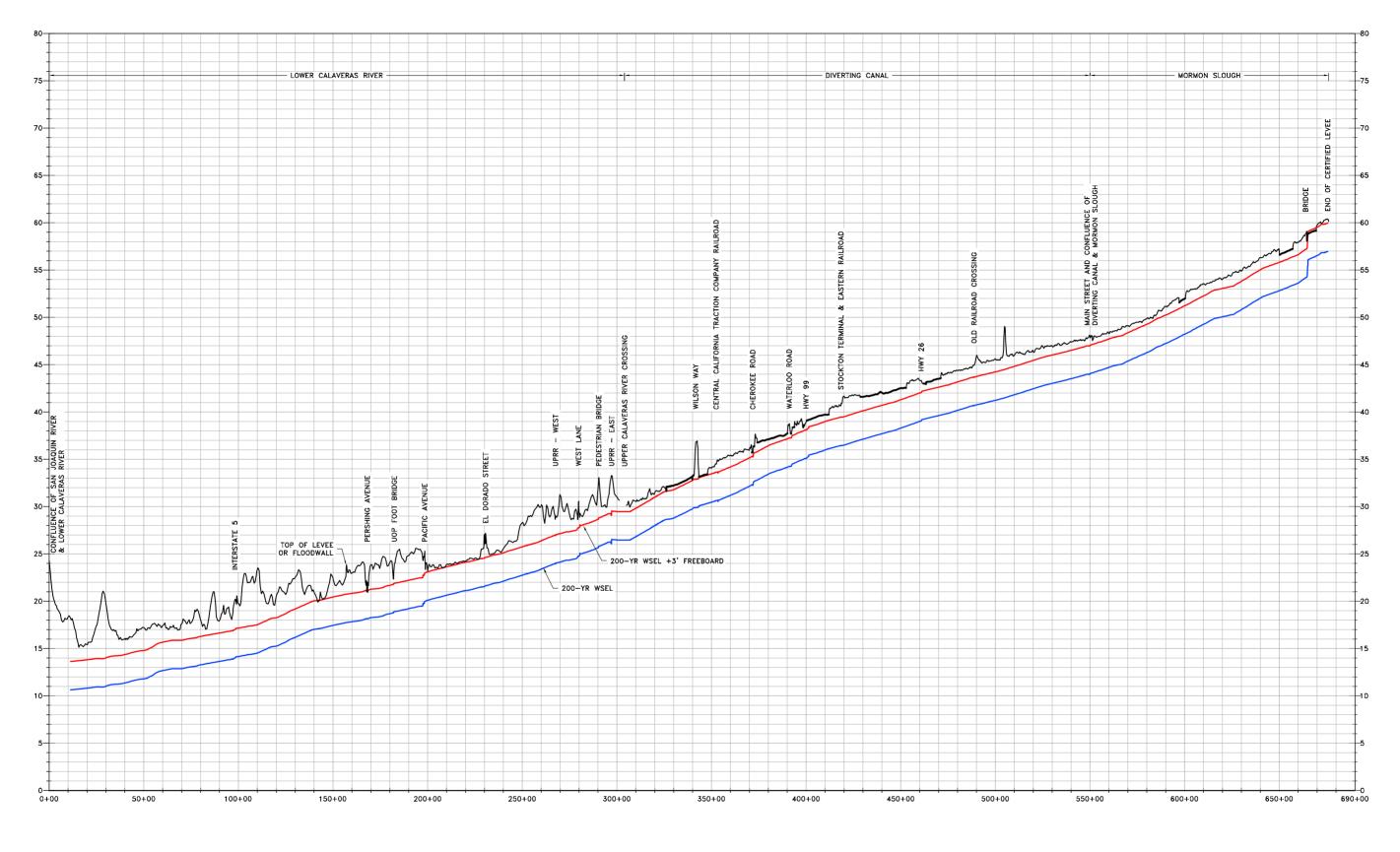
SAN JOAQUIN AREA FLOOD CONTROL AGENCY | Rev LOWER CAL, DIVERTING CANAL, MORMON SLOUGH | No. | LEVEE ACCREDITATION SURVEYS

LOWER CALAVERAS, DIVERTING CANAL, & MORMON SLOUGH - NORTH BANK 100-YEAR WATER SURFACE ELEVATION

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Of **1** Project File No. 2091-0140





WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

LEGEND EXISTING GROUND TOP OF FLOODWALL

K | KJELDSEN 711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268

SAN JOAQUIN AREA FLOOD CONTROL AGENCY LOWER CAL, DIVERTING CANAL, MORMON SLOUGH LEVEE ACCREDITATION SURVEYS LOWER CALAVERAS, DIVERTING CANAL,

Date By Apriva.

HOR: 1"=2500' VERT: 1"=5" Original Drawing Scale
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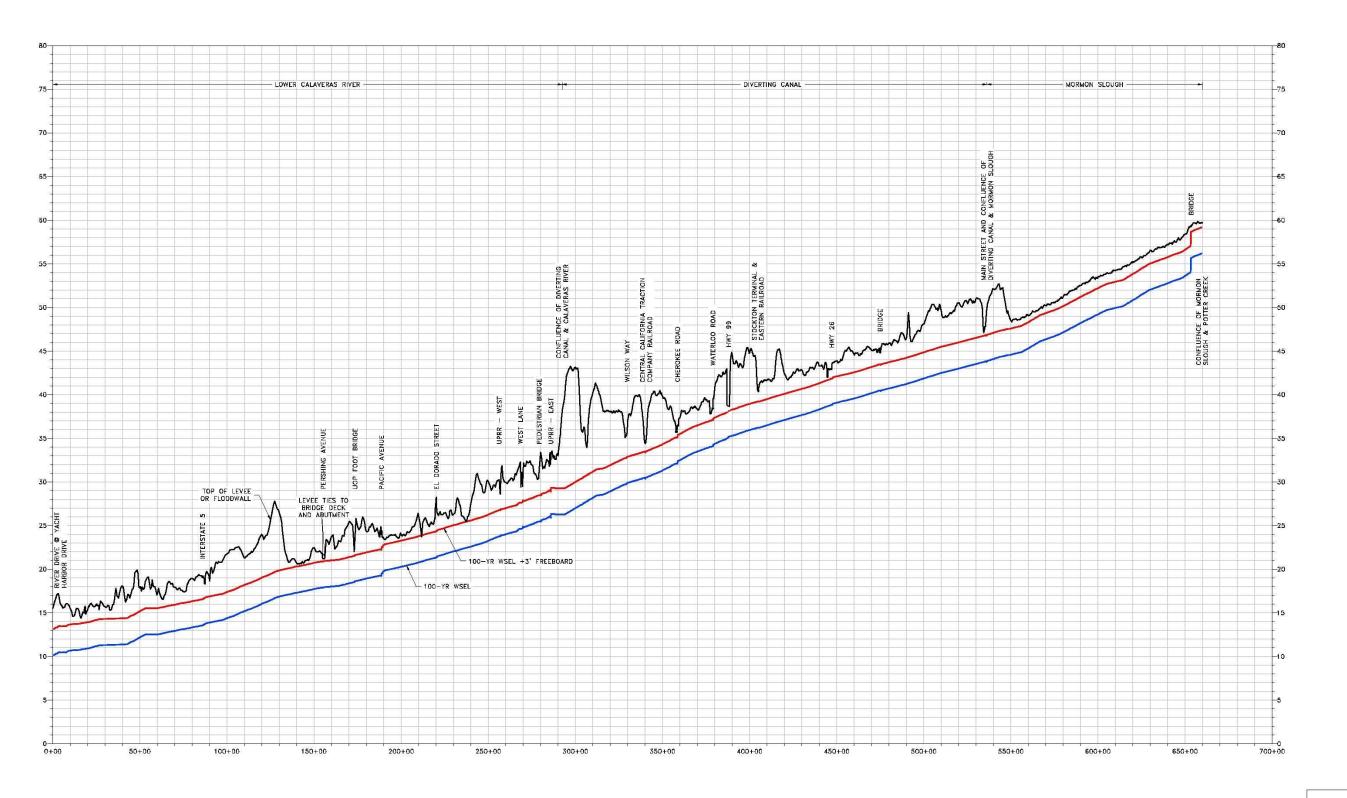
Date OCTOBER 2014 Sheet Number Of **1**

Project File No. 2091-0140

100-YR WATER SURFACE ELEVATION 100-YR FREEBOARD (FB)

S SINNOCK NEUDECK 1355 Halyard Drive, Suite 180
NEUDECK West Sacramento, CA 95691
INC. Civil Engineers (916) 403-5900 . Civil Engineers and Land Surveyors INC.

& MORMON SLOUGH - NORTH BANK 200-YEAR WATER SURFACE ELEVATION





WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON GRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

TOP OF FLOODWALL

EXISTING GROUND

100-YR WATER SURFACE ELEVATION

K | KJELDSEN 711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268 S SINNOCK_ N NEUDECK 1355 Halyard Drive, Suite 180
NC. Civil Engineers (916) 403-5900

LOWER CALAVERAS, DIVERTING CANAL, & MORMON SLOUGH — SOUTH BANK 100-YEAR WATER SURFACE ELEVATION

SAN JOAQUIN AREA FLOOD CONTROL AGENCY Revisions
LOWER CAL, DIVERTING CANAL, MORMON SLOUGH
LEVEE ACCREDITATION SURVEYS

Revisions
No. Description

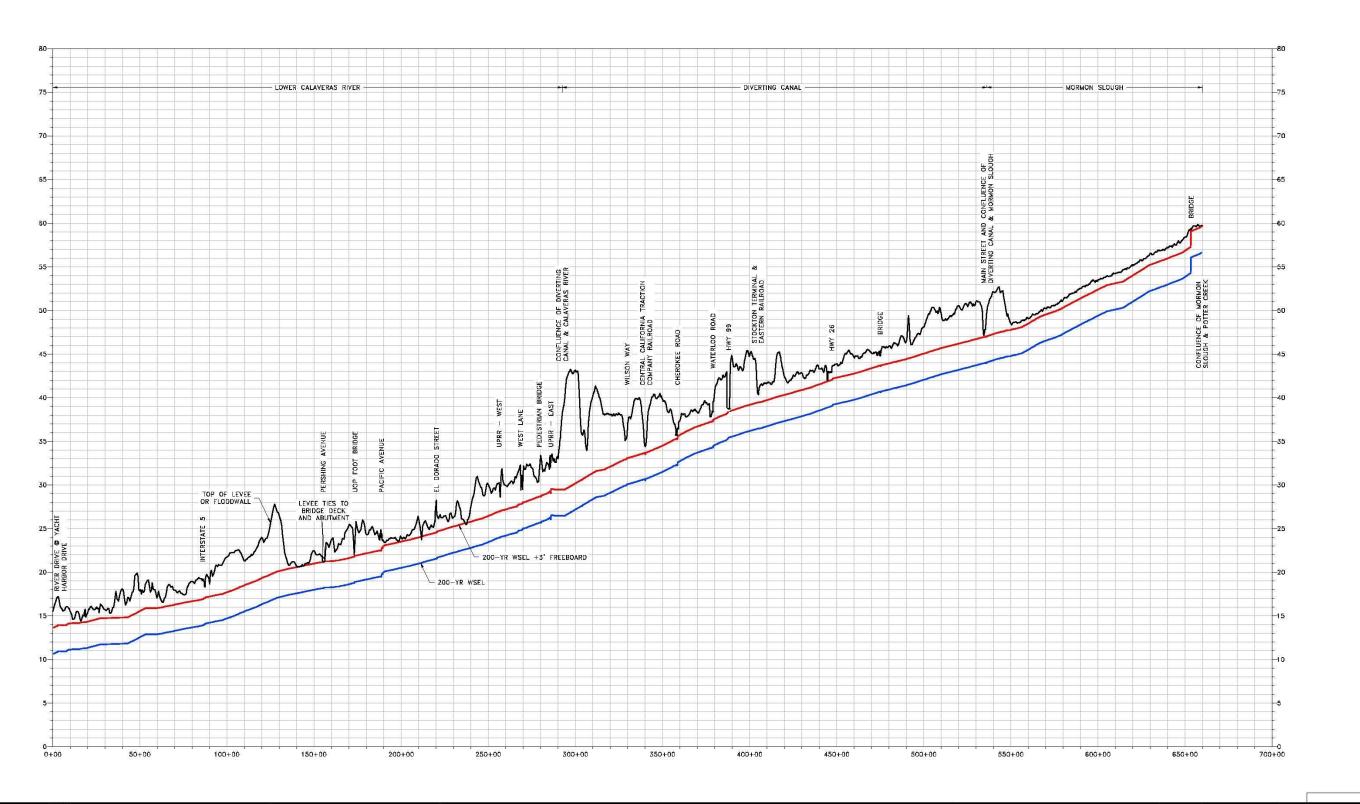
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Of 1 Project File No. 2091-0140

100-YR FREEBOARD (FB)

www.ksninc.com

. Civil Engineers and Land Surveyors





WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON GRUSTAD INC. 2014 STUDY

EXISTING GROUND TOP OF FLOODWALL

100-YR WATER SURFACE ELEVATION

K | KJELDSEN 711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268 S SINNOCK_ N NEUDECK 1355 Halyard Drive, Suite 180
NC. Civil Engineers (916) 403-5900

SAN JOAQUIN AREA FLOOD CONTROL AGENCY Revisions
LOWER CAL, DIVERTING CANAL, MORMON SLOUGH
LEVEE ACCREDITATION SURVEYS

Revisions
No. Description LOWER CALAVERAS, DIVERTING CANAL, & MORMON SLOUGH — SOUTH BANK 200-YEAR WATER SURFACE ELEVATION

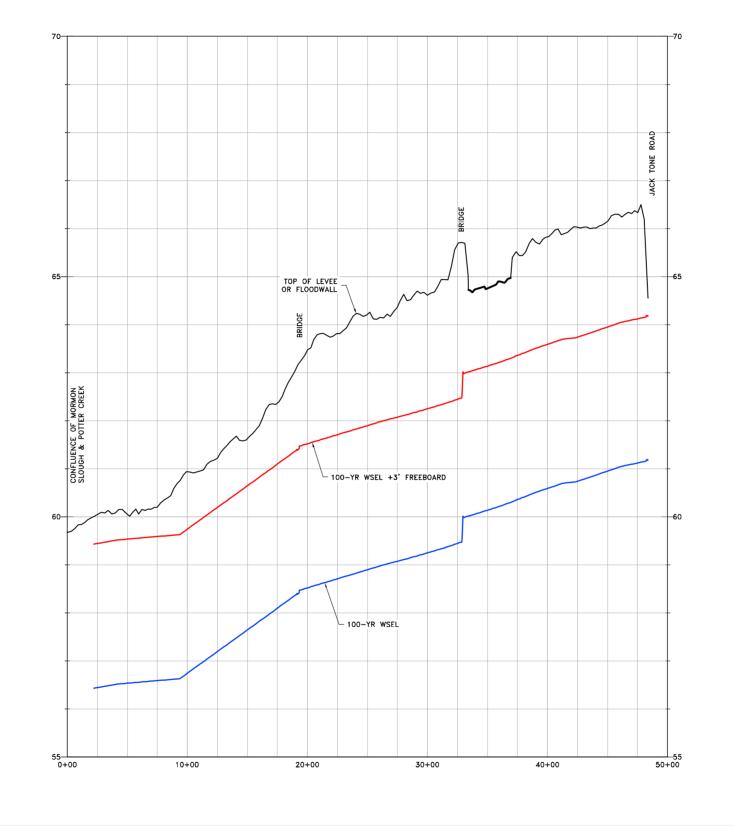
Date By Aprvd. Drawn JRT Original Drawing Scale Check CHN

Of 1 Project File No. 2091-0140

VERTICAL DATUM: NAVD 88

. Civil Engineers and Land Surveyors 100-YR FREEBOARD (FB)

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WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

LEGEND

EXISTING GROUND TOP OF FLOODWALL 100-YR WATER SURFACE ELEVATION

100-YR FREEBOARD (FB)

K KJELDSEN 711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268
N NEUDECK 1355 Halyard Drive, Suite 180 West Sacramento, CA 95691
INC. Civil Engineers (916) 403-5900 INC. Civil Engineers and Land Surveyors

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
POTTER CREEK
LEVEE ACCREDITATION SURVEYS

100-YEAR WATER SURFACE ELEVATION

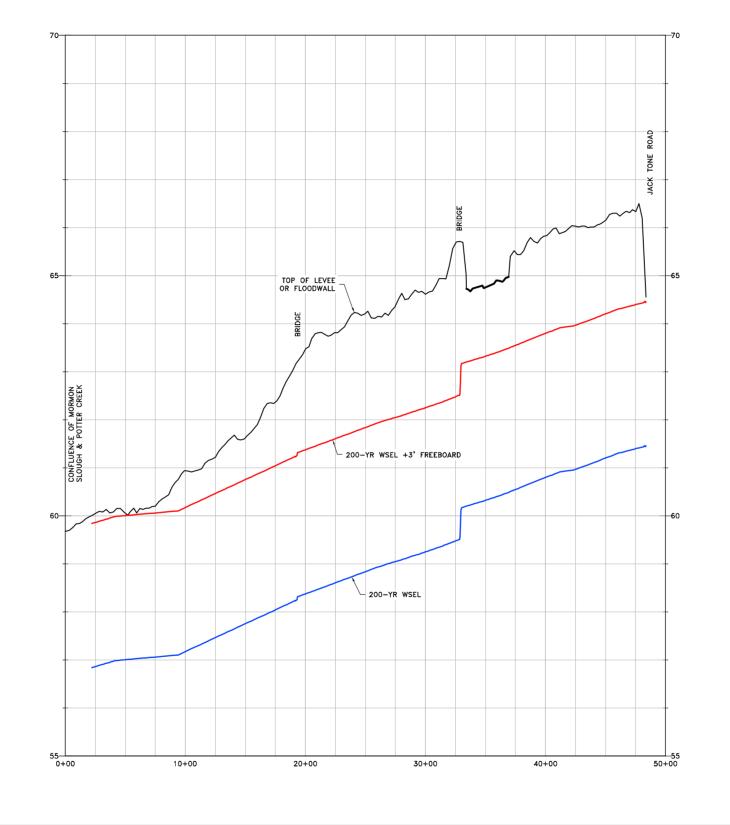
POTTER CREEK - SOUTH BANK

Revisions Date By Aprvd. By No. Description Drawn JRT Check CHN

HOR: 1"=400' VERT: 1"=1'

Date OCTOBER 2014 Sheet Number Of **1**

Original Drawing Scale
O ½" 1" Project File No. 2091-0140





WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

LEGEND 100-YR WATER SURFACE ELEVATION

EXISTING GROUND TOP OF FLOODWALL

100-YR FREEBOARD (FB)

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INC. Civil Engineers (916) 403-5900

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
POTTER CREEK
LEVEE ACCREDITATION SURVEYS

200-YEAR WATER SURFACE ELEVATION

POTTER CREEK - SOUTH BANK

Revisions Date By Aprvd. By No. Description Drawn JRT Check CHN

HOR: 1"=400' VERT: 1"=1'

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Original Drawing Scale
O ½" 1" Project File No. 2091-0140

INC. Civil Engineers and Land Surveyors

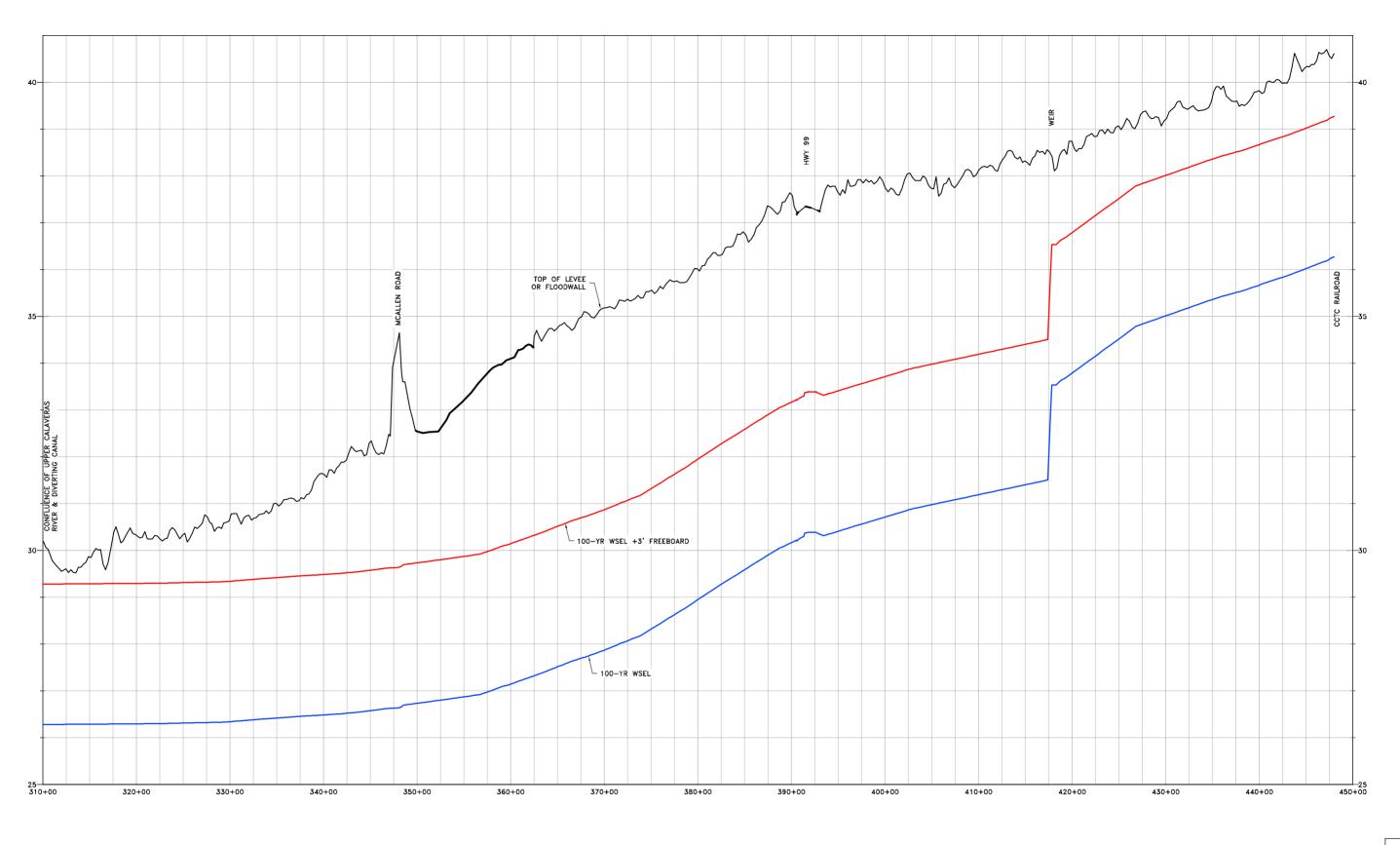
5. Upper Calaveras System

The 100-year and 200-year profiles are based on levee accreditation surveys by KSN, Inc. for Upper Calaveras River, dated October 2014.

The follow Vicinity Map shows the project area for the levee accreditation surveys. The profiles are shown on the following pages.



Appendix B	Αr	pe	en	di	х	В
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WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

LEGEND

EXISTING GROUND TOP OF FLOODWALL

100-YR WATER SURFACE ELEVATION

100-YR FREEBOARD (FB)

K KJELDSEN 711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268
N NEUDECK 1355 Halyard Drive, Suite 180 West Sacramento, CA 95691
INC. Civil Engineers (916) 403-5900 C. Civil Engineers and Land Surveyors INC.

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
UPPER CALAVERAS RIVER
LEVEE ACCREDITATION SURVEYS

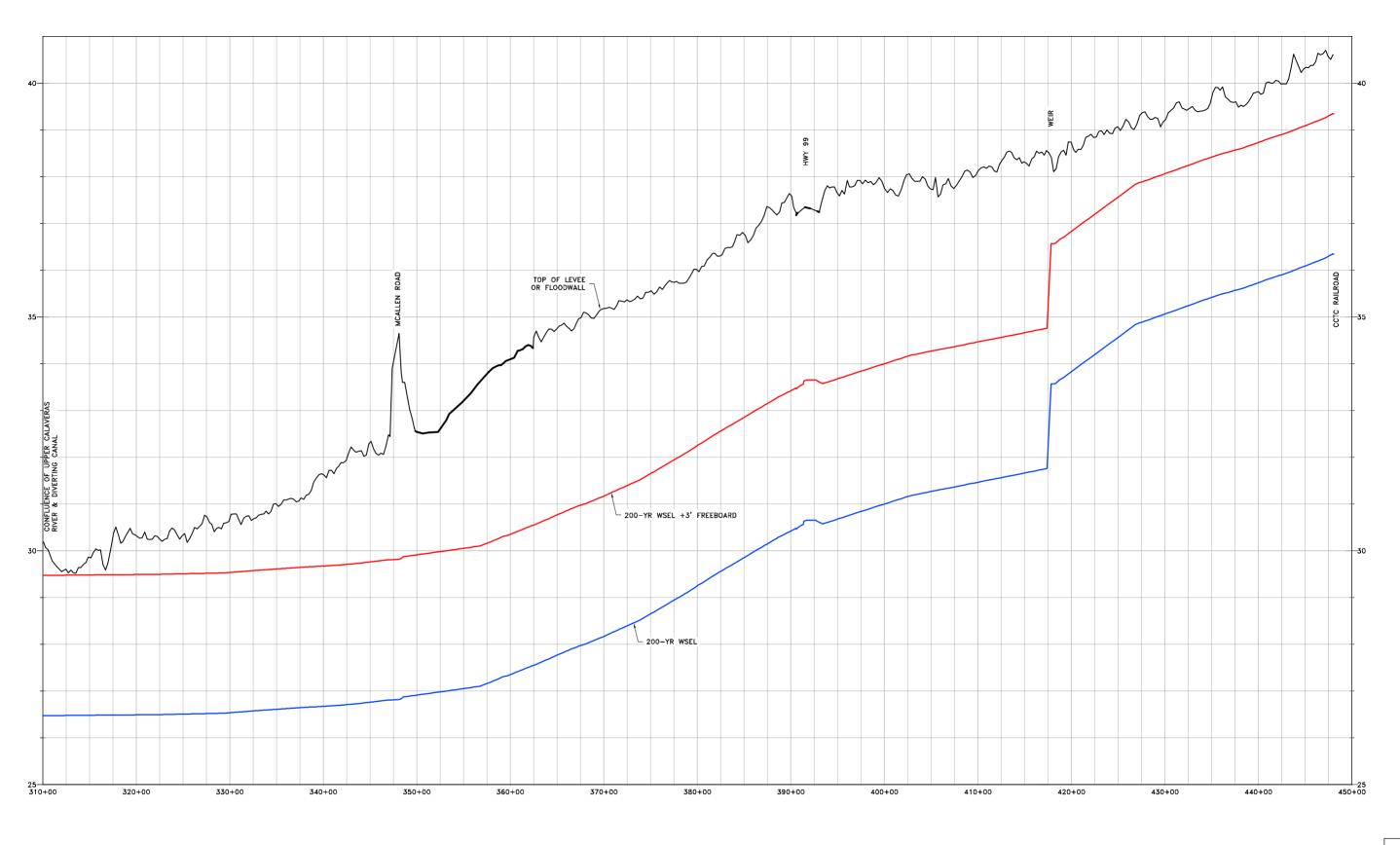
100-YEAR WATER SURFACE ELEVATION

UPPER CALAVERAS RIVER - NORTH BANK

Revisions Date By Aprva. No. Description Drawn JRT Check CHN HOR: 1"=500' VERT: 1"=1'

Date OCTOBER 2014 Sheet Number Original Drawing Scale
O ½" 1" Of **1**

Project File No. 2091-0140





WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

LEGEND EXISTING GROUND TOP OF FLOODWALL

--- 100-YR WATER SURFACE ELEVATION

K KJELDSEN 711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268
N NEUDECK 1355 Halyard Drive, Suite 180 West Sacramento, CA 95691
INC. Civil Engineers (916) 403-5900 INC.

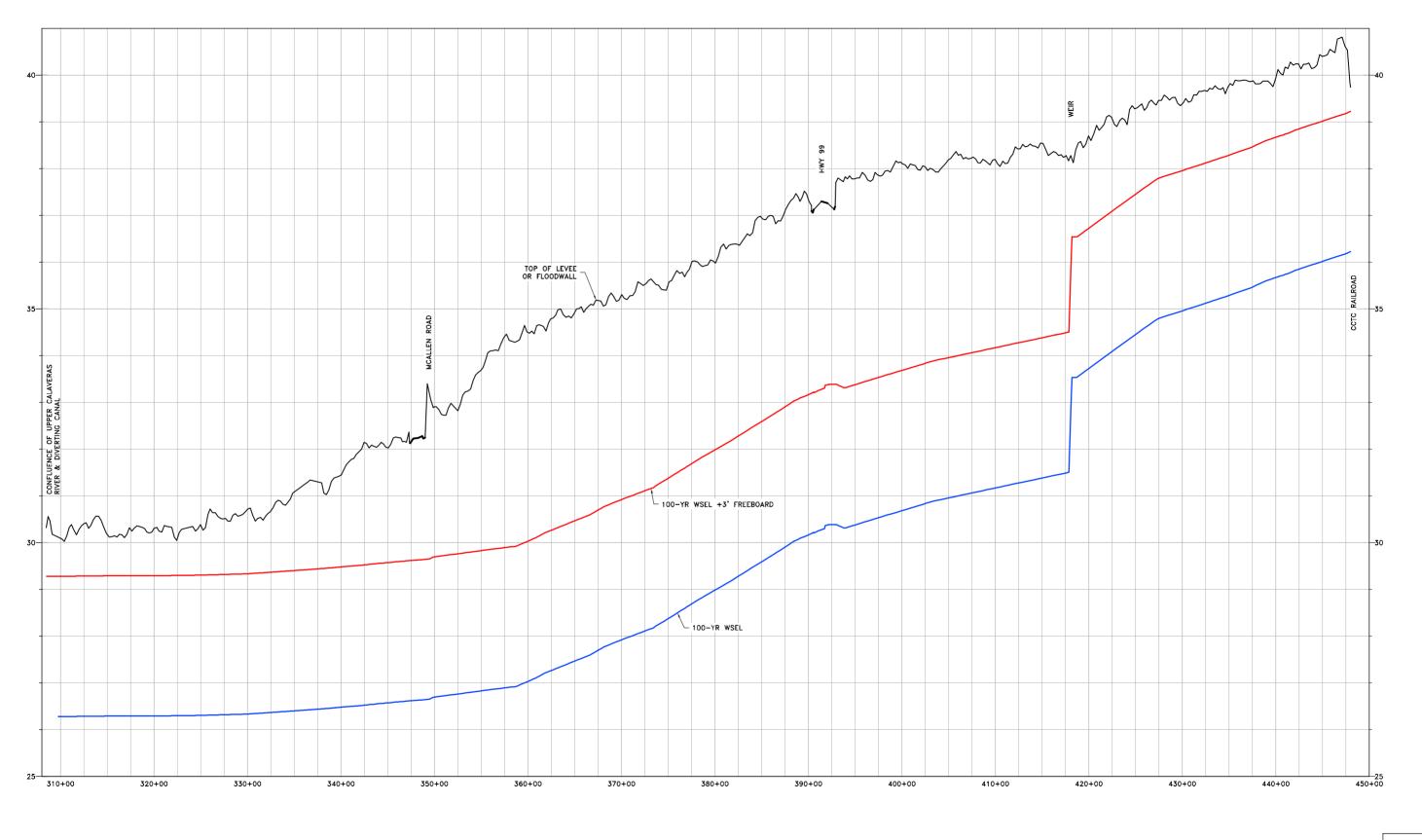
SAN JOAQUIN AREA FLOOD CONTROL AGENCY
UPPER CALAVERAS RIVER
LEVEE ACCREDITATION SURVEYS

Revisions Date By Aprva. No. Description Drawn JRT Check CHN

HOR: 1"=500' VERT: 1"=1'

Date OCTOBER 2014 Sheet Number Original Drawing Scale
O ½" 1" Of **1** Project File No. 2091-0140

C. Civil Engineers and Land Surveyors UPPER CALAVERAS RIVER - NORTH BANK 100-YR FREEBOARD (FB) 200-YEAR WATER SURFACE ELEVATION VERTICAL DATUM: NAVD 88





WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

LEGEND EXISTING GROUND TOP OF FLOODWALL

100-YR FREEBOARD (FB)

100-YR WATER SURFACE ELEVATION C. Civil Engineers and Land Surveyors INC.

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N NEUDECK 1355 Halyard Drive, Suite 180 West Sacramento, CA 95691
INC. Civil Engineers (916) 403-5900

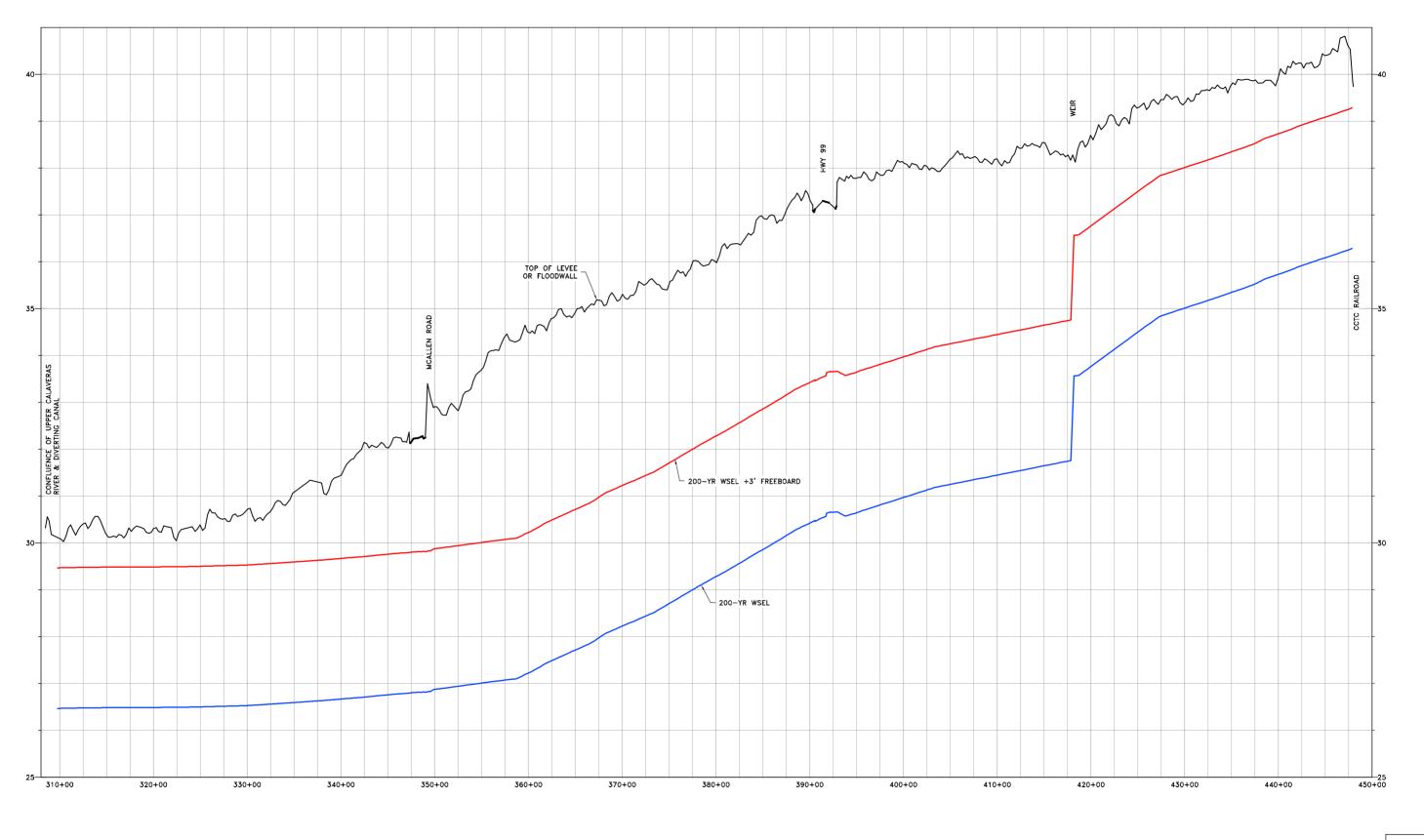
SAN JOAQUIN AREA FLOOD CONTROL AGENCY
UPPER CALAVERAS RIVER
LEVEE ACCREDITATION SURVEYS

100-YEAR WATER SURFACE ELEVATION

UPPER CALAVERAS RIVER - SOUTH BANK

Revisions Date By Aprva. No. Description Drawn JRT Check CHN HOR: 1"=500' VERT: 1"=1' Original Drawing Scale
O ½" 1"

Date OCTOBER 2014 Sheet Number Of **1** Project File No. 2091-0140





WATER SURFACE ELEVATION (WSEL) BASED ON PETERSON BRUSTAD INC. 2014 STUDY

VERTICAL DATUM: NAVD 88

LEGEND EXISTING GROUND TOP OF FLOODWALL

100-YR FREEBOARD (FB)

K KJELDSEN 711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268
N NEUDECK 1355 Halyard Drive, Suite 180 West Sacramento, CA 95691
INC. Civil Engineers (916) 403-5900 100-YR WATER SURFACE ELEVATION C. Civil Engineers and Land Surveyors INC.

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
UPPER CALAVERAS RIVER
LEVEE ACCREDITATION SURVEYS

200-YEAR WATER SURFACE ELEVATION

No. Description UPPER CALAVERAS RIVER - SOUTH BANK

Revisions Date By Aprva. Drawn JRT Check CHN

Date OCTOBER 2014 HOR: 1"=500' VERT: 1"=1' Sheet Number

Original Drawing Scale
O ½" 1" Of **1** Project File No. 2091-0140