

TECHNICAL MEMORANDUM

March 3, 2016

Project: Cities of Lathrop and Manteca
Urban Levee Design Criteria (ULDC) Evaluation

Subject: 7.12 – Encroachments

Prepared by: Erik E. Almaas, P.E.

Reviewed by: Christopher H. Neudeck, P.E.
David A. Peterson, P.E.

1.0 PURPOSE

Detailed analyses and documentation have been performed and developed of the existing levee system of Reclamation District No. 17 (RD17) in order to determine the extent of Urban Levee Design Criteria (ULDC) compliance. The purpose of this technical memorandum is to present the data sources, assumptions, analyses, and results as they pertain to ULDC Item No. 7.12 – Encroachments. The team responsible for undertaking this effort consists of Peterson, Brustad, Inc. (PBI), Kjeldsen, Sinnock and Neudeck, Inc. (KSN), and ENGEQ, Inc.

2.0 PROJECT BACKGROUND

Legislation passed in 2007 substantially limits the ability of urban communities to approve residential, commercial and industrial development after July 2016 unless they have an Urban Level of Flood Protection (ULOP) or are making adequate progress toward achieving ULOP 200-year flood protection. Background on this mandate was summarized in "*Position Paper for City of Lathrop, Compliance with SB5: ULOP 200-Year Flood Protection for Lathrop (RD 17)*" dated February 3, 2014, by Glenn Gebhardt, City Engineer for the City of Lathrop.

In April 2014, PBI prepared a Strategic Plan for ULOP Compliance for RD17 communities, which outlined a strategic plan for complying with SB5 for the area protected by RD17 levees on a schedule that will meet the requirements of the law. The main component of this Strategic Plan was to perform a comprehensive ULDC analysis and identify areas of deficiencies for each of the ULDC criteria. The analyses presented in this technical memorandum pertain to one of these ULDC criteria: 7.12 – Encroachments.

3.0 LEVEE ASSESSMENT

The analyses described in this technical memorandum have been developed at a detailed level using an assessment of the existing levee system to determine the extent of ULDC deficiencies. The assessment was based on a combination of new and existing information.

3.1 Data Sources

Existing data sources that were utilized in the levee assessment are as follows:

- Levee Topographic Survey, performed by KSN and Aerial Photomapping Services in 2014

3.2 Assumptions

Assumptions that were made in the levee assessment are as follows:

Separate Ongoing Projects:

Construction is currently underway on the RD17 Levee Seepage Repair Project (LSRP). The purpose of this project is to provide seepage remediation of various RD17 levee reaches along the San Joaquin River. Phase I and Phase II have both been completed at a combined cost of approximately \$9 million. Phase III is in the midst of the design and permitting stages and is estimated to cost \$35 million. The source of funding for LSRP is primarily from annual RD17 property owner assessments and DWR Early Implementation Program (EIP) grants. For purposes of this ULDC analysis, it was assumed that LSRP Phase III will be completed.

Basis of ULDC Analysis:

ULDC stipulates that existing encroachments within the levee prism and visibility right-of-way need to be assessed as to their impact on the reliable performance of the levee. A preliminary hazard assessment is required to be performed to determine if an encroachment has the potential to be a high hazard. Encroachments deemed as such need to have a full engineering evaluation to demonstrate that the hazard is acceptable, or be removed or modified. A flowchart that details the assessment process is shown below in Figure 1.

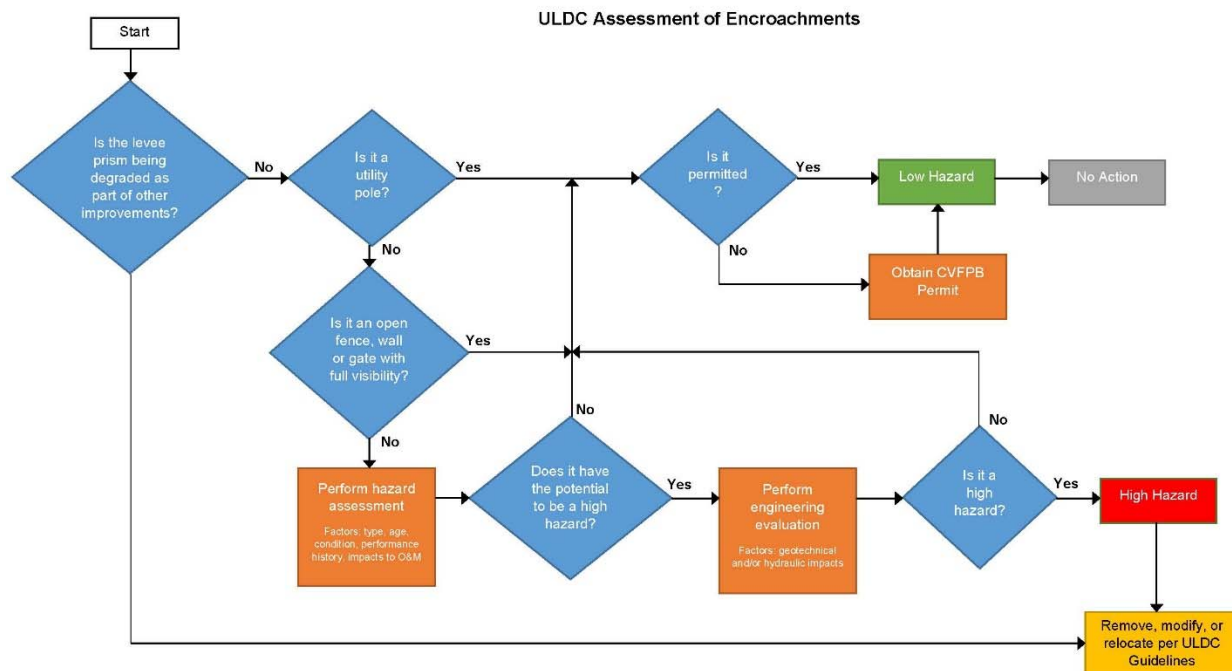


Figure 1 - Encroachment Assessment Process

3.3 Analysis

For the purposes of the analysis, existing encroachment were identified as shown in **EXHIBIT 1**. The analysis of encroachments consisted of first performing a preliminary hazard assessment

as described previously. This hazard assessment considered type, age, condition, performance history, and impacts to operations and maintenance in determining whether an encroachment had a potential to be a high hazard. Encroachments that did not have the potential to be a high hazard were deemed a Low Hazard. An engineering evaluation was performed on the remaining encroachments that were determined to have the potential to be a high hazard. A summary of this engineering evaluation is shown below in Table 1.

Table 1 - Potentially High Hazard Encroachments

Station from	Station to	Description	Geotechnical Analyses?	Final Assessment
112+73	116+98	wood fence and structures along backyards at Weston Ranch	No	High
142+97	143+50	storm drain pump station at Weston Ranch	Yes	Low
158+62	160+00	agricultural structures and tank	No	High
326+40	327+17	building and deck at River Mill	Yes	Low
683+37	683+48	small agricultural structure	No	High
806+64	815+40	mobile homes and structures at Oak Shores	No	High

Cutoff walls have already been recommended adjacent to the Weston Ranch pump station and the River Mill building as part of the seepage analyses under ULDC Item 7.5. Stability tests were performed at these two locations that revealed that the encroachments do not pose a significant impact to the levee structural integrity. Furthermore, these two locations are at levee reaches that have historically performed well. Therefore, these two encroachments were each deemed a Low Hazard.

The remaining encroachments listed in Table 1 were determined to substantially interfere with the operation and maintenance of the levee in addition to flood fight capability. Therefore, these encroachments were each deemed a High Hazard, and no further geotechnical analyses were performed.

4.0 DEFICIENCY RESULTS

The levee encroachments that were identified as a Low Hazard are indicated below in Table 2. These encroachments are in good condition, have historically performed well, and do not interfere with operations and maintenance. Therefore, they are deemed compliant and no further action is required, except for permitting as required.

Table 2 - Levee Encroachments - Low Hazard

Station from	Station to	Description
	0+00	pipe gate RD17-01
	3+57	utility pole
	5+70	utility pole
	7+23	utility pole
	13+66	pipe gate
	16+01	pipe gate

Station from	Station to	Description
	51+05	pipe gate
	100+83	wrought iron fence with missing gate
142+97	143+50	storm drain pump station at Weston Ranch
	158+22	wrought iron gate
	165+49	wrought iron gate
	177+12	wrought iron gate
	189+03	pipe gate RD17-06
	208+75	utility pole
	215+32	utility pole
	227+39	pipe gate RD17-07
	255+06	pipe gate RD17-08
	266+92	pipe gate RD17-09
	292+06	pipe gate RD17-10
	314+36	chainlink gate
	314+51	tide gauge station
	314+83	utility pole
	315+60	chainlink gate
	321+28	chainlink gate
	323+30	chainlink gate RD17-12
323+91	326+40	wrought iron fence along levee toe at River Mill
326+40	327+17	building and deck at River Mill
	326+73	chainlink gate RD17-13
	327+54	utility pole
	327+89	stairs
	328+25	utility pole
	330+74	chainlink gate
	332+38	utility pole
	337+64	chainlink gate RD17-15
	337+74	utility pole
	340+15	utility pole
	344+96	utility pole
	361+65	chainlink gate RD17-16
	383+87	chainlink gate RD17-17
	392+13	pipe gate RD17-18
	395+79	chainlink gate RD17-19
	419+30	chainlink gate RD17-20

Station from	Station to	Description
	444+94	utility pole
	447+55	pipe gate
	455+95	pipe gate RD17-22
	470+25	pipe gate RD17-23
	471+44	pipe gate RD17-24
	478+30	pipe gate RD17-25
478+44	481+85	chainlink fence along levee toe
	482+47	chainlink gate RD17-26
	485+67	stairs
	488+45	pipe gate RD17-27
	488+74	stairs
	489+15	pipe gate RD17-28
	490+74	stairs
	492+15	pipe gate RD17-29
	492+91	stairs
	493+68	pipe gate RD17-30
	497+18	utility pole
	500+67	utility pole
	504+40	utility pole
	507+63	pipe gate RD17-31
508+33	509+12	guardrail
	515+27	utility pole
	574+42	pipe gate
	582+67	street light
	695+86	pipe gate RD17-35
	695+89	chainlink gate
708+00	713+39	chainlink fence along levee toe
716+71	719+91	chainlink fence along levee toe
	762+33	pipe gate RD17-40
	765+20	chainlink gate RD17-41
765+50	766+60	cable fence
	766+69	pipe gate
	766+77	street light
	768+75	pipe gate RD17-43
772+51	774+29	guardrail
790+82	791+04	utility tower

Station from	Station to	Description
794+94	795+21	utility tower
799+48		pipe gate RD17-44
799+95		pipe gate RD17-45
800+25		chainlink gate
815+55	822+15	chainlink fence along levee slope
816+49		chainlink gate
853+12		pipe gate RD17-51
853+67		utility pole
853+70		pipe gate
943+17		pipe gate RD17-53
944+58		pipe gate RD17-54
972+44		pipe gate

The levee sections that were identified as a High Hazard are indicated below in Table 3. These sections are deemed deficient.

Table 3 - Levee Encroachments - High Hazard

Station from	Station to	Description
112+73	116+98	wood fence and structures along backyards at Weston Ranch
158+62	160+00	agricultural structures and tank
683+37	683+48	small agricultural structure
806+64	815+40	mobile homes and structures at Oak Shores

It is recommended that all encroachments deemed a High Hazard be reconstructed in compliance with ULDC guidelines. The wood fence at Weston Ranch will need to be replaced with a wrought-iron fence or chainlink fence in order to increase visibility. All other structures will need to be removed. Resolution to the identified deficiencies has been addressed as indicated in the proposed ULDC improvement plans and cost estimate. Figure 2 consists of an overall map that summarizes the deficiencies of the RD17 levee system with respect to levee encroachments.

5.0 ENCROACHMENT REMEDIATION PLAN

For all Low Hazard encroachments, an encroachment remediation plan is required to address eventual permitting of all such encroachments not currently permitted. It is recommended that the Cities of Lathrop and Manteca work with RD17 and the Central Valley Flood Protection Board (CVFPB) to research and document which Low Hazard encroachments currently are permitted. It is also recommended that a target schedule of 5 years be established to permit 50 percent of the currently noncompliant encroachments and that the remaining 50 percent be permitted in the subsequent 5 years.

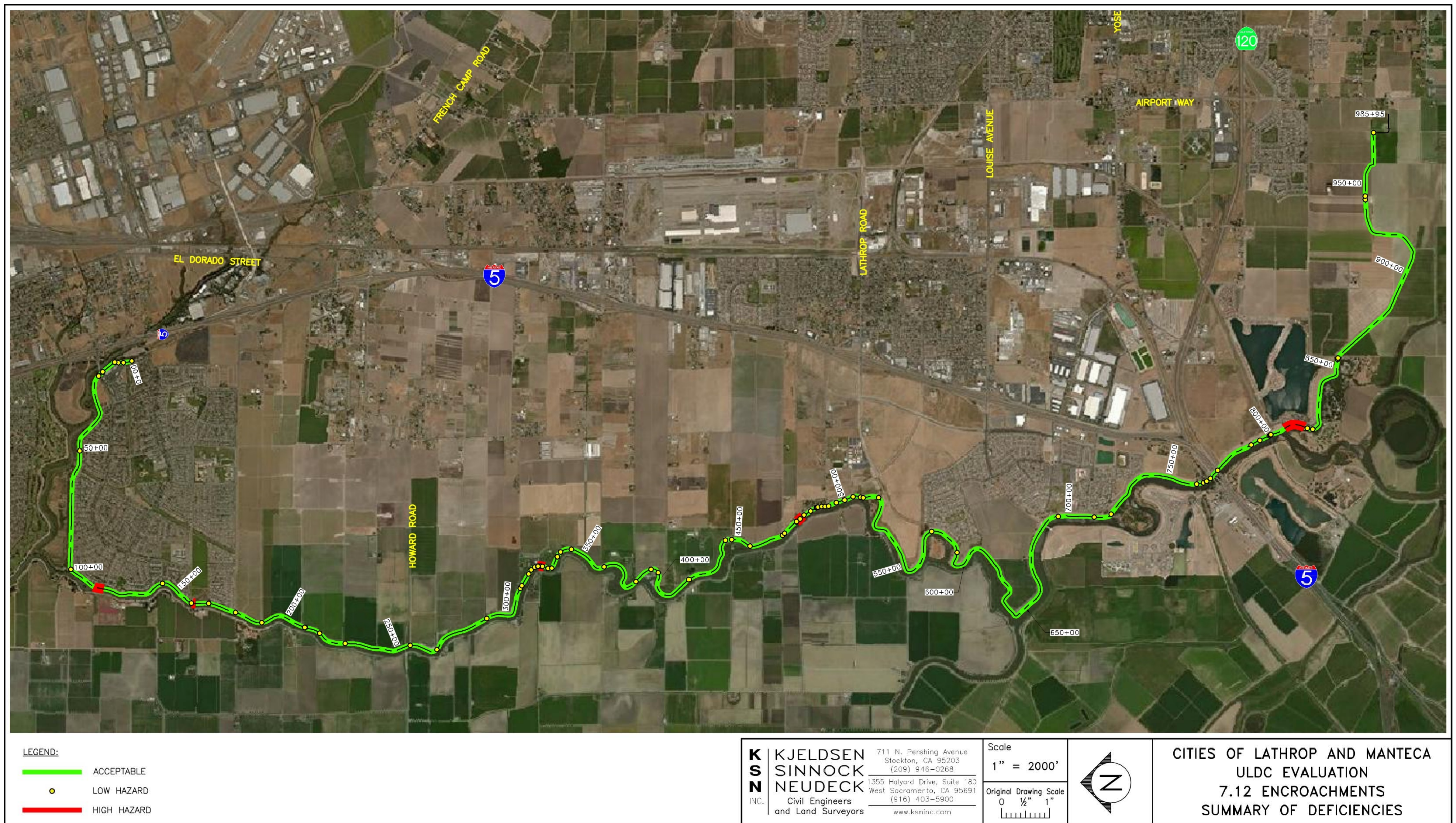


Figure 2 - Summary of Deficiencies

Cities of Lathrop and Manteca

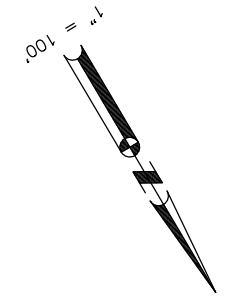
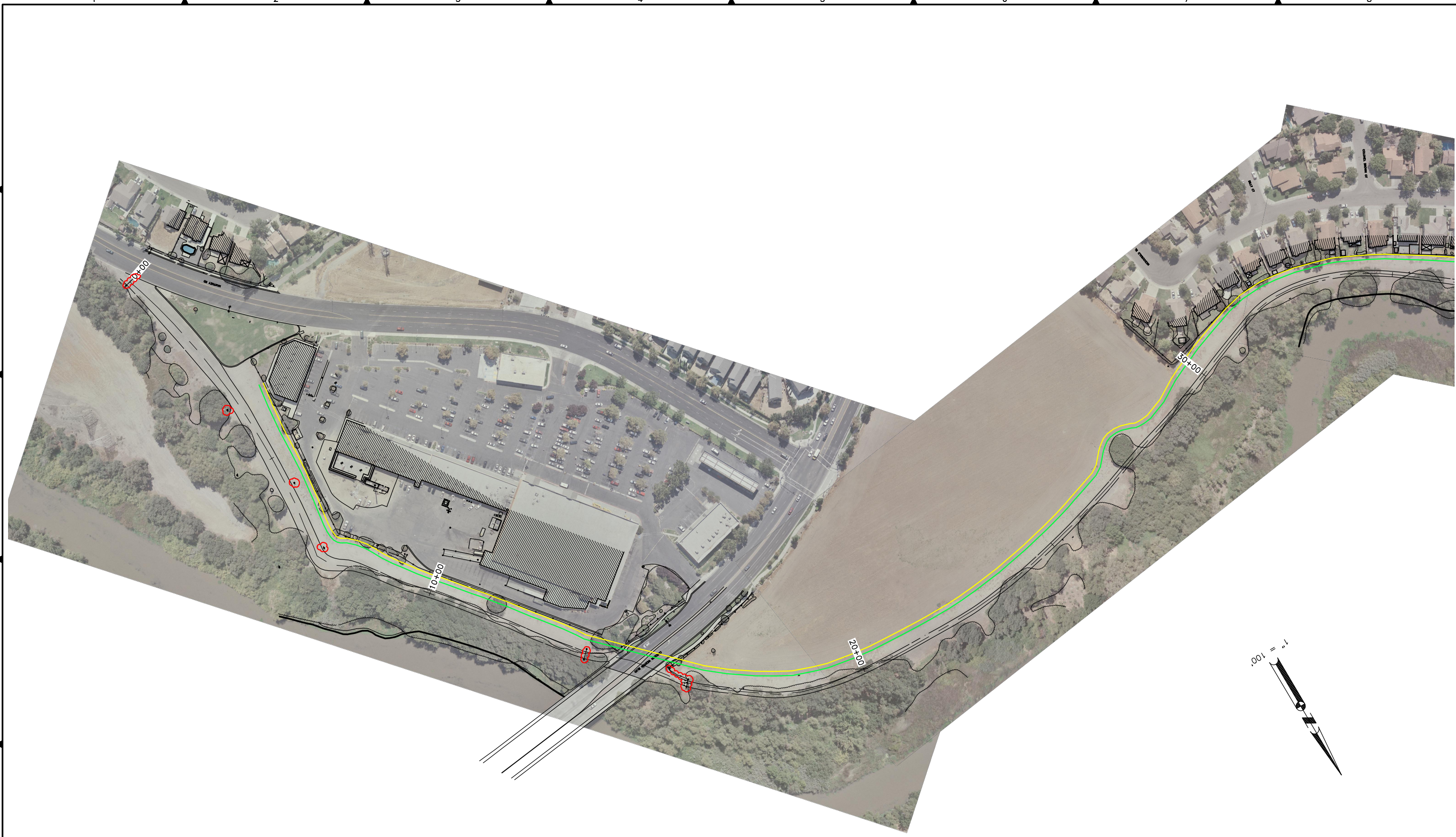
ULDC Evaluation

7.12 Encroachments

EXHIBIT 1




Existing Encroachments

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PRELIMINARY
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LEGEND:

	LEVEE TOE
	10' OFFSET FROM LEVEE TOE
	IDENTIFIED ENCROACHMENT

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 and Land Surveyors

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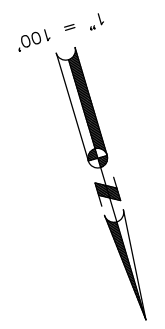
7.12 ENCROACHMENTS
PLAN VIEW
 STA. 0+00 TO 30+00

Revisions				
No.	Description	Date	By	Apprd. By

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Date AUGUST 2015
Sheet Number 1 Of 33
Project File No. 2255-0030

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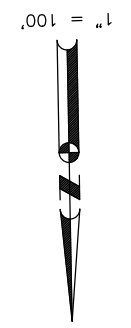
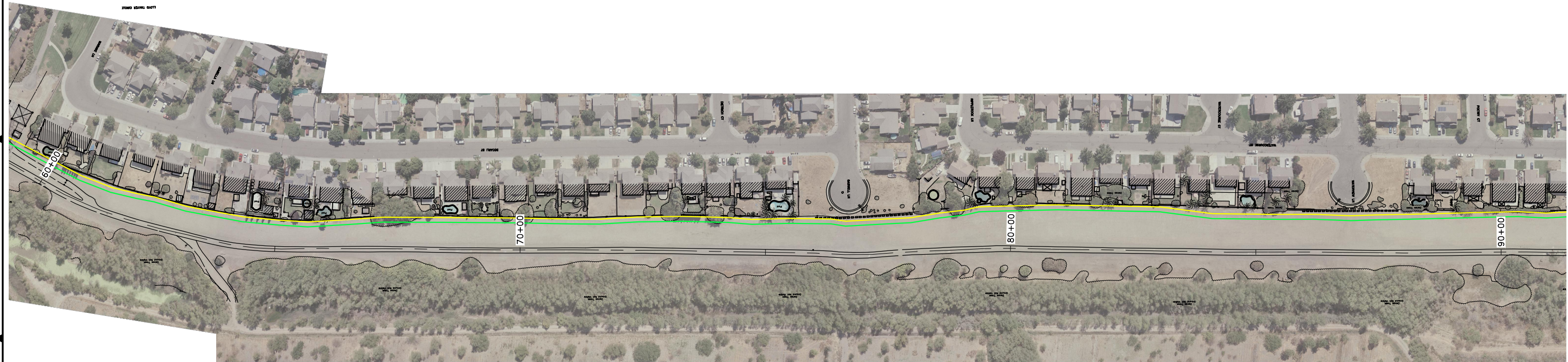
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Revisions				
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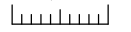
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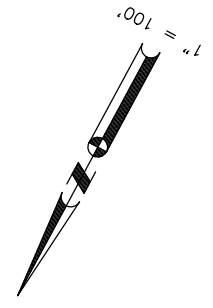
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 PLAN VIEW
 STA. 60+00 TO 90+00**

Revisions				
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	IDENTIFIED ENCROACHMENT

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7.12 ENCROACHMENTS
PLAN VIEW
STA. 90+00 TO 120+00

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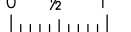
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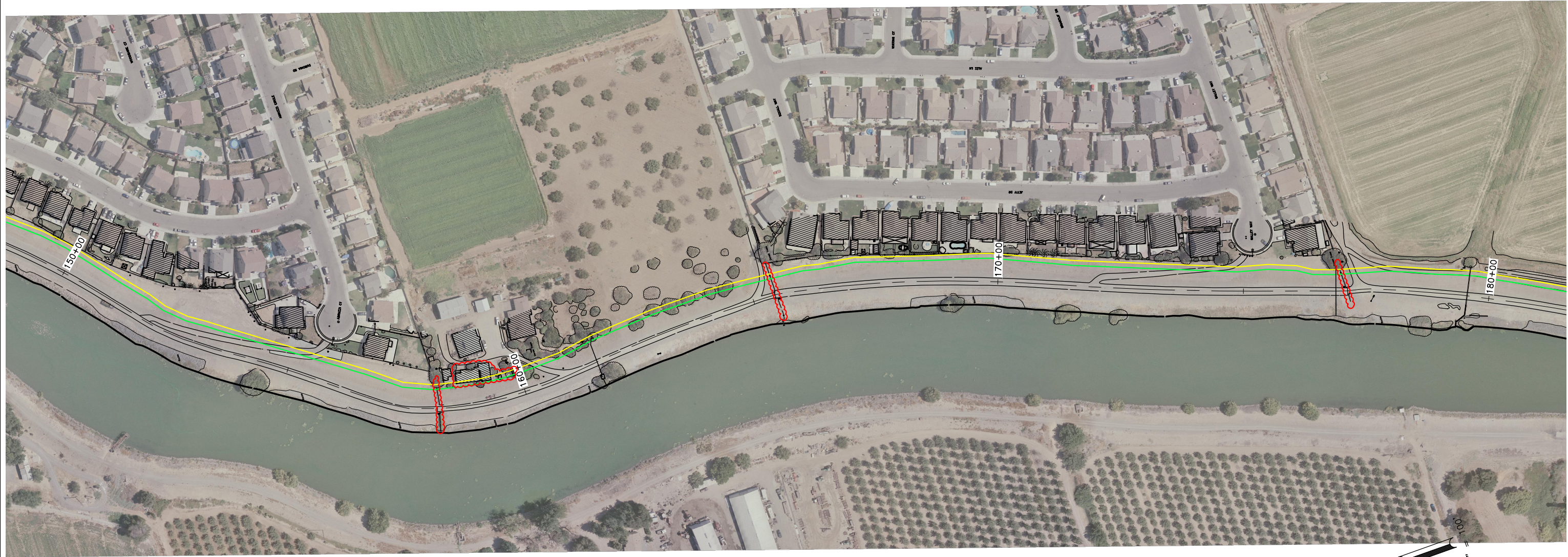
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 PLAN VIEW
 STA. 120+00 TO 150+00**

Revisions				
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LEGEND:

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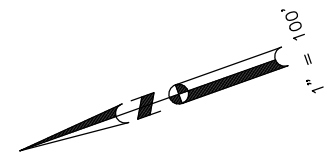
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**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 150+00 TO 180+00**

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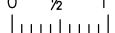
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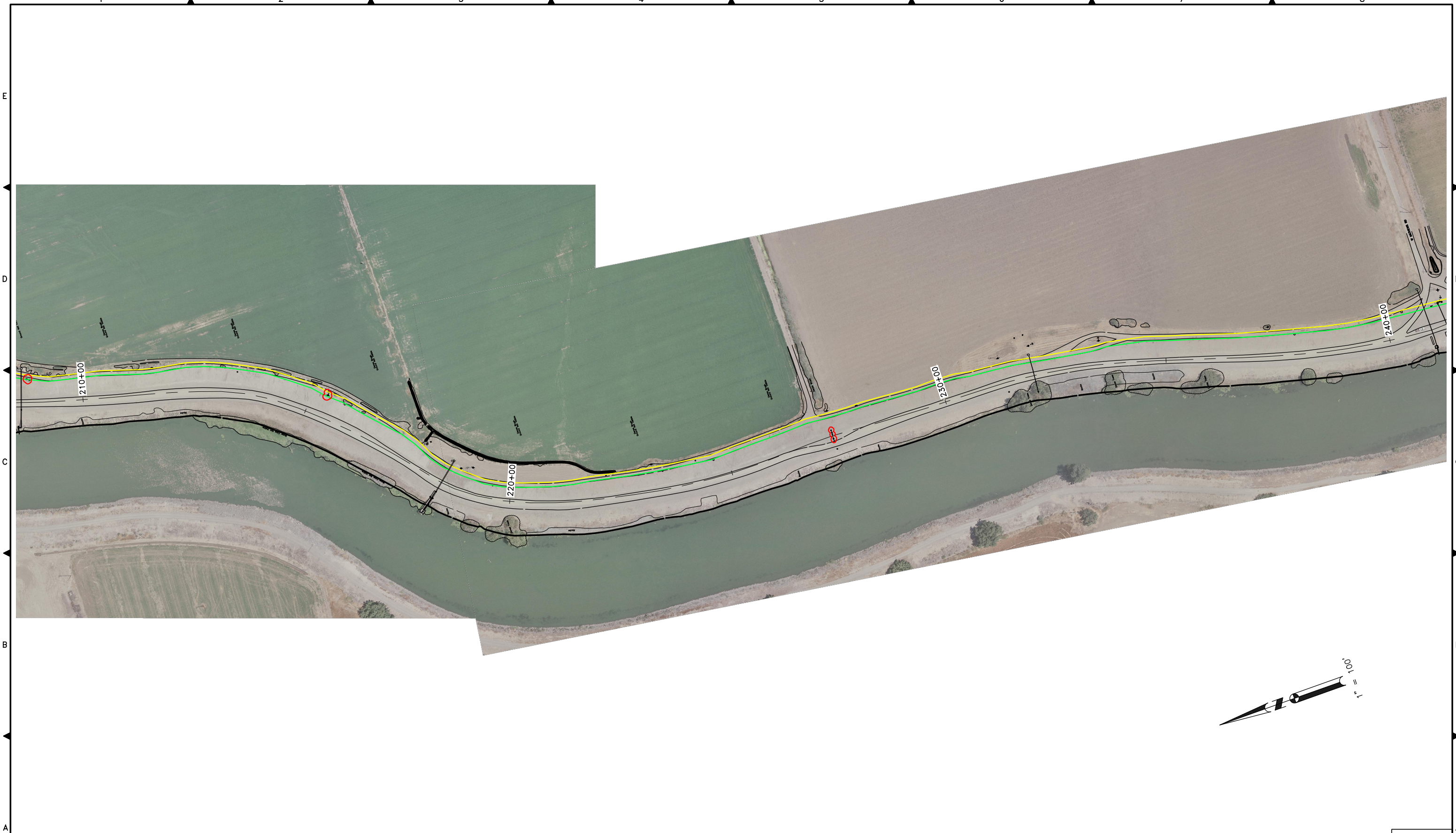
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 STA. 180+00 TO 210+00**

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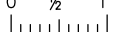
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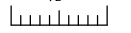
LEGEND:

	LEVEE TOE
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 STA. 240+00 TO 270+00**

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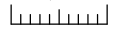
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	10' OFFSET FROM LEVEE TOE
	IDENTIFIED ENCROACHMENT

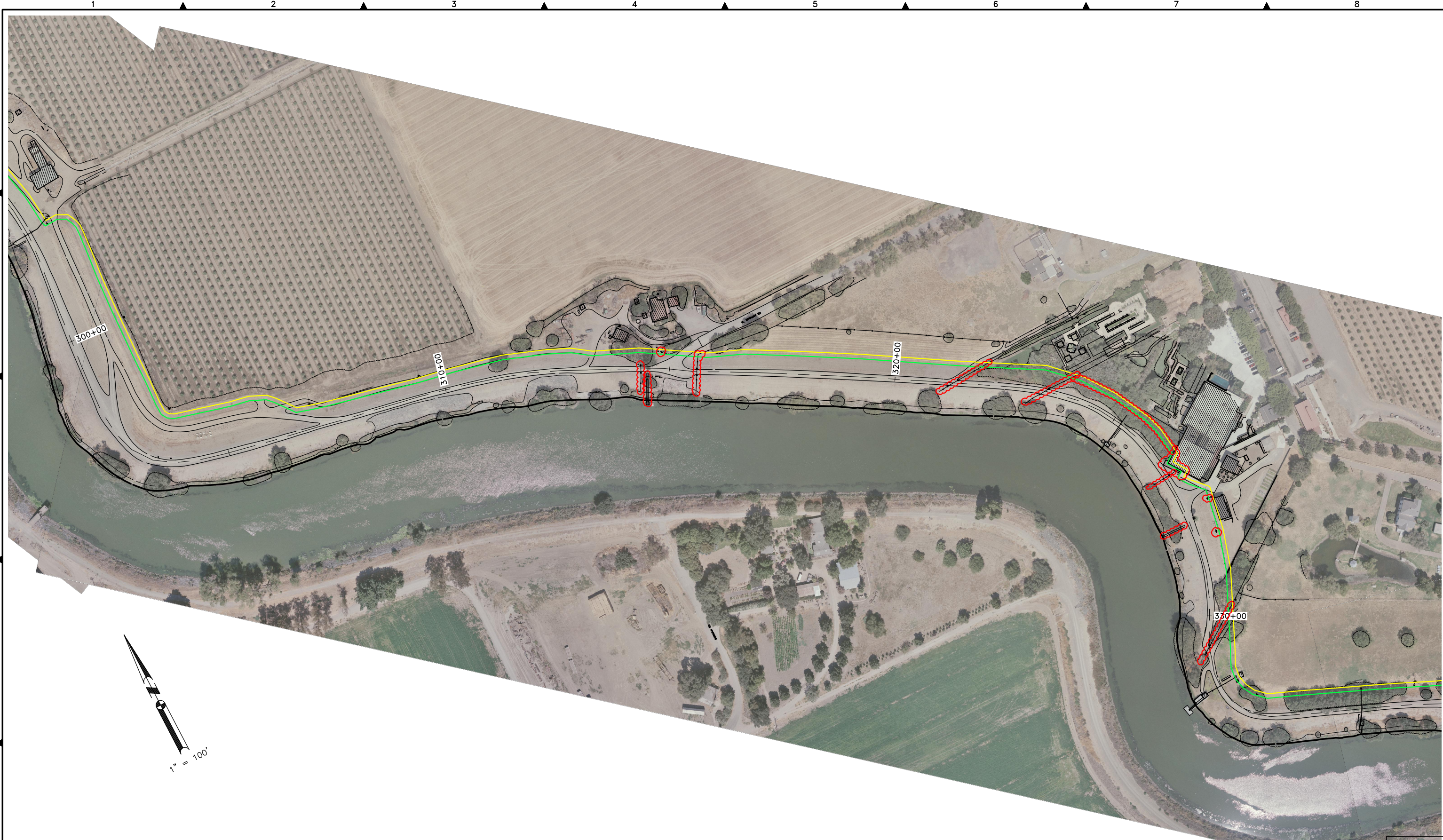
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**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 270+00 TO 300+00**

Revisions				
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LEGEND:

—	LEVEE TOE
—	10' OFFSET FROM LEVEE TOE
—	IDENTIFIED ENCROACHMENT

K S N INC.
KJELDEN SINNOCK NEUDECK
 Civil Engineers and Land Surveyors
 711 N Pershing Avenue
 Stockton, CA 95203
 209-946-0268
 1355 Halyard Drive, Suite 100
 West Sacramento, CA 95691
 916-403-5900
 www.ksninc.com

CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA
7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 300+00 TO 330+00

Revisions			
No.	Description	Date	By




Design EEA	Scale 1" = 100'	Date AUGUST 2015
Drawn EEA	Original Drawing Scale 0 1/2" 1"	Sheet Number 11 Of 33
Check CHN		Project File No. 2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:23pm



PRELIMINARY
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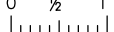
LEGEND:

	LEVEE TOE
	10' OFFSET FROM LEVEE TOE
	IDENTIFIED ENCROACHMENT

K S N INC.
KJELDSSEN SINNOCK NEUDECK
 Civil Engineers and Land Surveyors
 711 N Pershing Avenue
 Stockton, CA 95203
 209-946-0268
 1355 Halyard Drive, Suite 100
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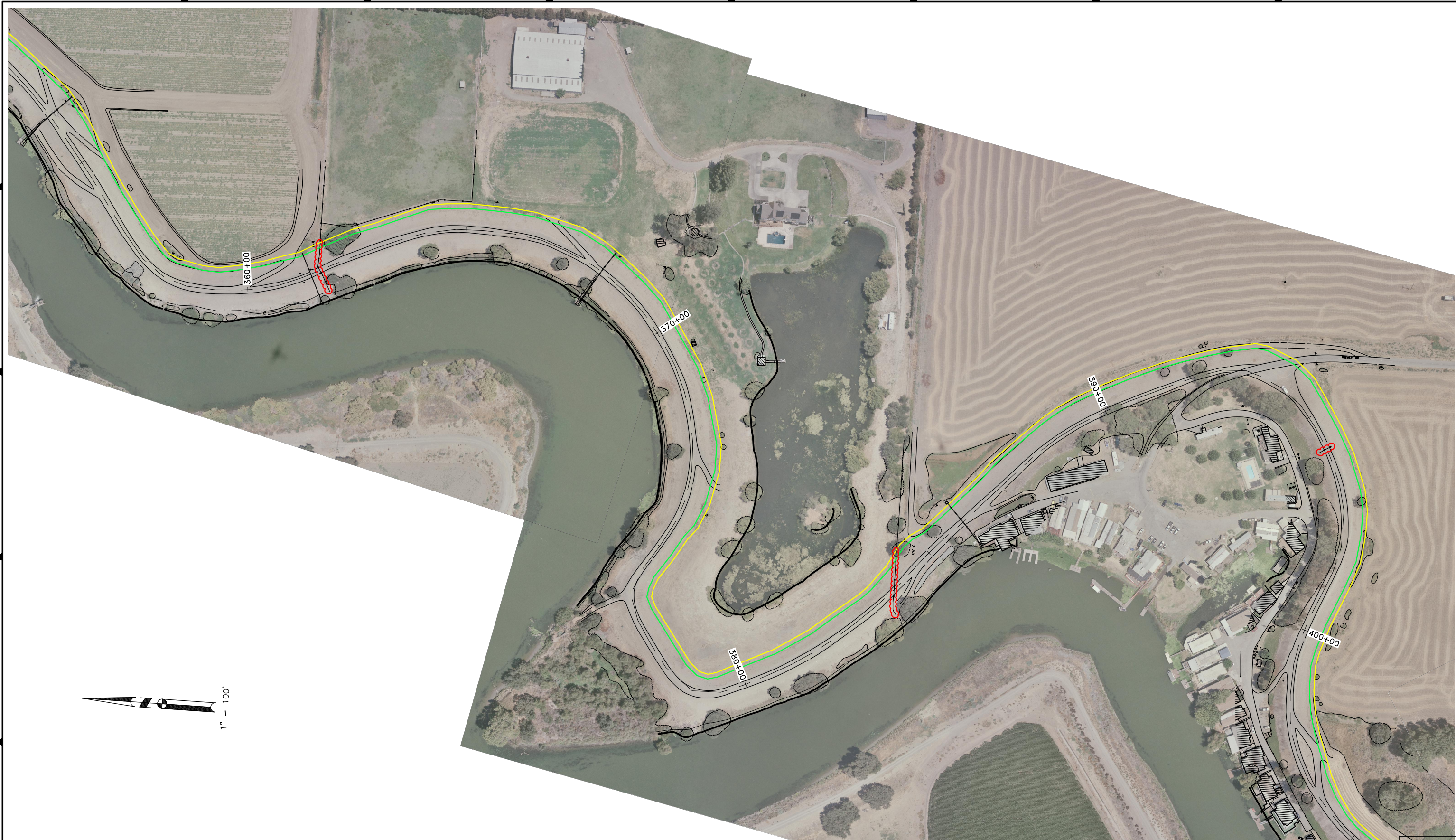
**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 330+00 TO 360+00**

Revisions				
No.	Description	Date	By	Apprd. By

Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1" 
Drawn EEA	
Check CHN	




Date
AUGUST 2015
 Sheet Number
12 Of **33**
 Project File No.
2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:25pm



PRELIMINARY
 NOT FOR CONSTRUCTION
 - FOR STUDY ONLY -

LEGEND:

	LEVEE TOE
	10' OFFSET FROM LEVEE TOE
	IDENTIFIED ENCROACHMENT

K S N INC.
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 Civil Engineers and Land Surveyors
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**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW**
 STA. 360+00 TO 390+00

Revisions				Design	Scale	Date	By	Apprd. By
No.	Description	Date	By	EEA				
				Drawn	1" = 100'	AUGUST 2015		
				EEA				
				Check	Original Drawing Scale 0 1/2" 1"	13		
				CHN				




Scale: 1" = 100'
 Original Drawing Scale: 0 1/2" 1"
 Date: AUGUST 2015
 Sheet Number: 13 Of 33
 Project File No.: 2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:26pm



PRELIMINARY
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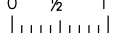
LEGEND:

	LEVEE TOE
	10' OFFSET FROM LEVEE TOE
	IDENTIFIED ENCROACHMENT

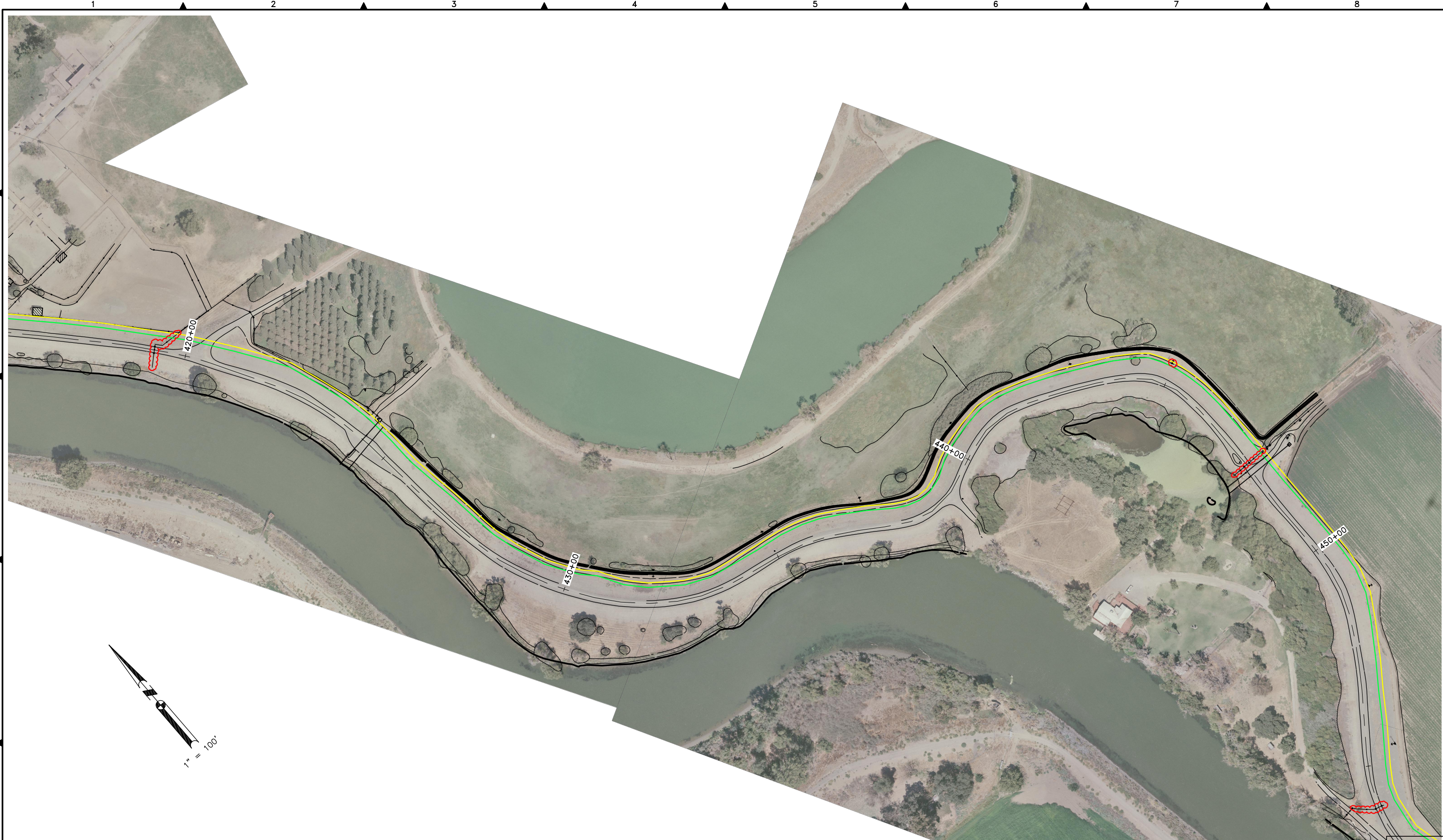
K S N KJELDTSEN SINNOCK NEUDECK INC.
 Civil Engineers and Land Surveyors
 711 N Pershing Avenue
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**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 390+00 TO 420+00**

Revisions				
No.	Description	Date	By	Apprd. By




Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1" 	Date AUGUST 2015
Drawn EEA		Sheet Number 14 Of 33
Check CHN		Project File No. 2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:28pm



PRELIMINARY
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LEGEND:

	LEVEE TOE
	10' OFFSET FROM LEVEE TOE
	IDENTIFIED ENCROACHMENT

K S N INC.
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**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 420+00 TO 450+00**

Revisions				
No.	Description	Date	By	Appr. By

Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1" 
Drawn EEA	
Check CHN	




Date
AUGUST 2015
 Sheet Number
15 Of 33
 Project File No.
2255-0030

FILE SPEC: C:\Users\vealmaaas\AppData\Local\Temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:30pm



PRELIMINARY
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LEGEND:

	LEVEE TOE
	10' OFFSET FROM LEVEE TOE
	IDENTIFIED ENCROACHMENT

KS KJELDSSEN
SN SINNOCK
N NEUDECK
 INC. Civil Engineers
 and Land Surveyors

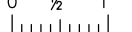
711 N Pershing Avenue
 Stockton, CA 95203
 209-946-0268

1355 Halyard Drive, Suite 100
 West Sacramento, CA 95691
 916-403-5900
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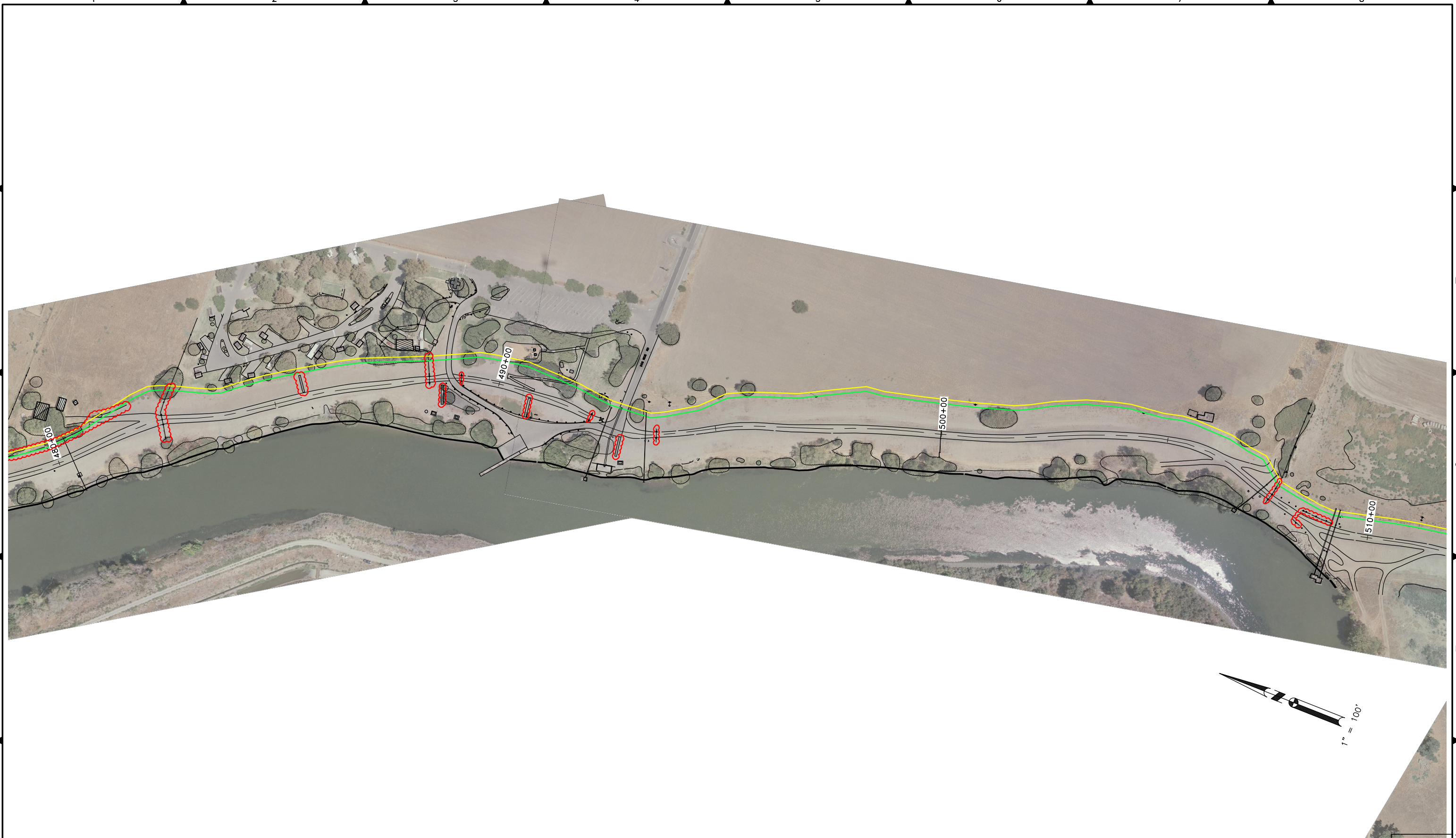
CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA

**7.12 ENCROACHMENTS
 PLAN VIEW**
 STA. 450+00 TO 480+00

Revisions				
No.	Description	Date	By	Appvd. By




Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1" 	Date AUGUST 2015
Drawn EEA		Sheet Number 16 Of 33
Check CHN		Project File No. 2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:31pm



PRELIMINARY
 NOT FOR CONSTRUCTION
 - FOR STUDY ONLY -

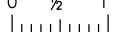
LEGEND:

	LEVEE TOE
	10' OFFSET FROM LEVEE TOE
	IDENTIFIED ENCROACHMENT

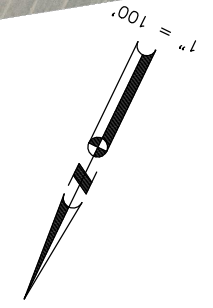
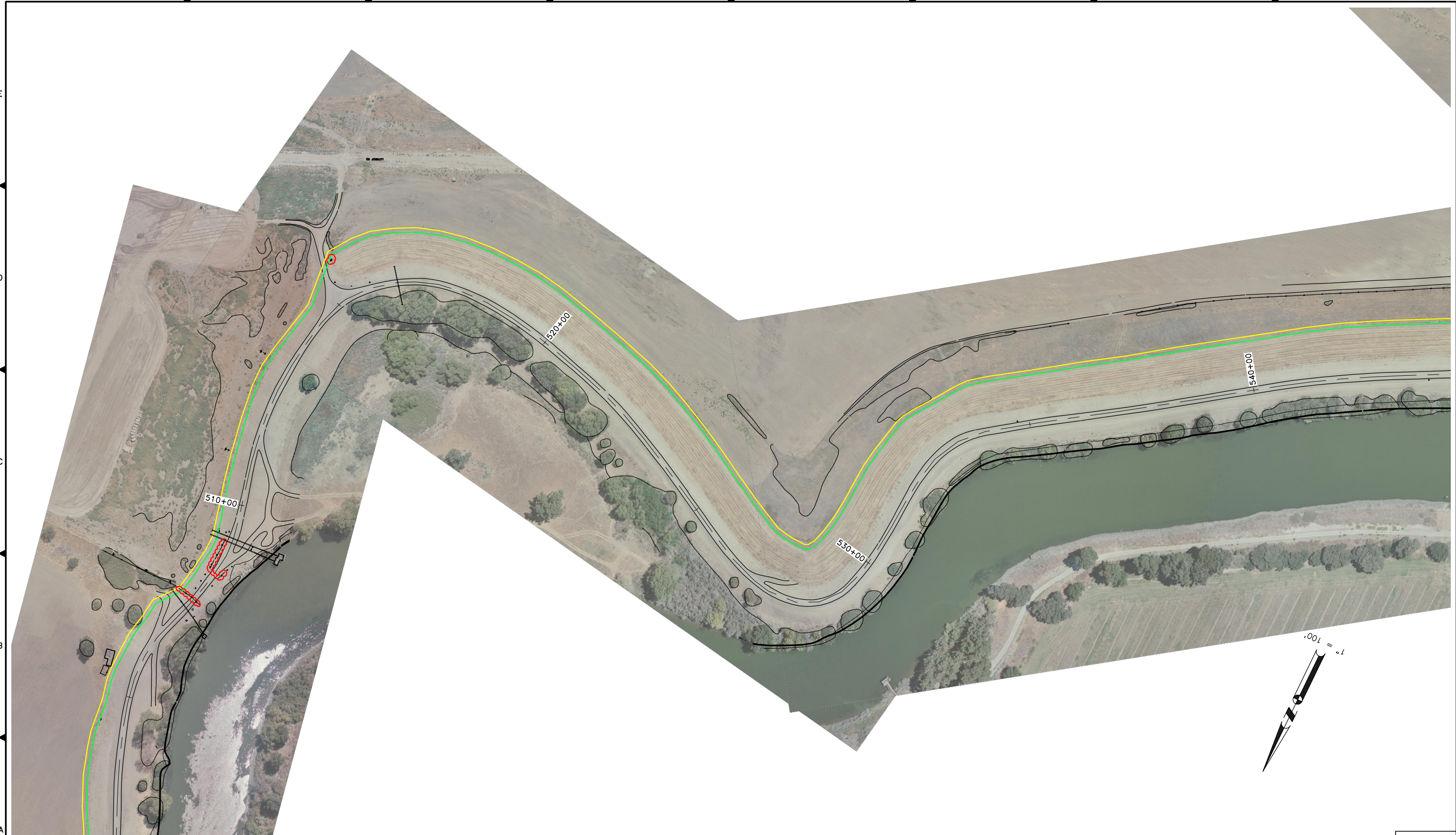
K S N INC.
KJELDEN SINNOCK NEUDECK
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**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 480+00 TO 510+00**

Revisions				
No.	Description	Date	By	App'd. By




Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1" 	Date AUGUST 2015
Drawn EEA		Sheet Number 17 Of 33
Check CHN		Project File No. 2255-0030

FILE SPEC: C:\Users\vealmaaas\AppData\Local\Temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:33pm



PRELIMINARY
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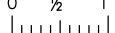
LEGEND:

	LEVEE TOE
	10' OFFSET FROM LEVEE TOE
	IDENTIFIED ENCROACHMENT

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**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 510+00 TO 540+00**

Revisions				
No.	Description	Date	By	Apprd. By

Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1" 
Drawn EEA	
Check CHN	

Date
AUGUST 2015
 Sheet Number
18 Of 33
 Project File No.
2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:35pm



PRELIMINARY
 NOT FOR CONSTRUCTION
 - FOR STUDY ONLY -

- LEGEND:**
- LEVEE TOE
 - 10' OFFSET FROM LEVEE TOE
 - IDENTIFIED ENCROACHMENT

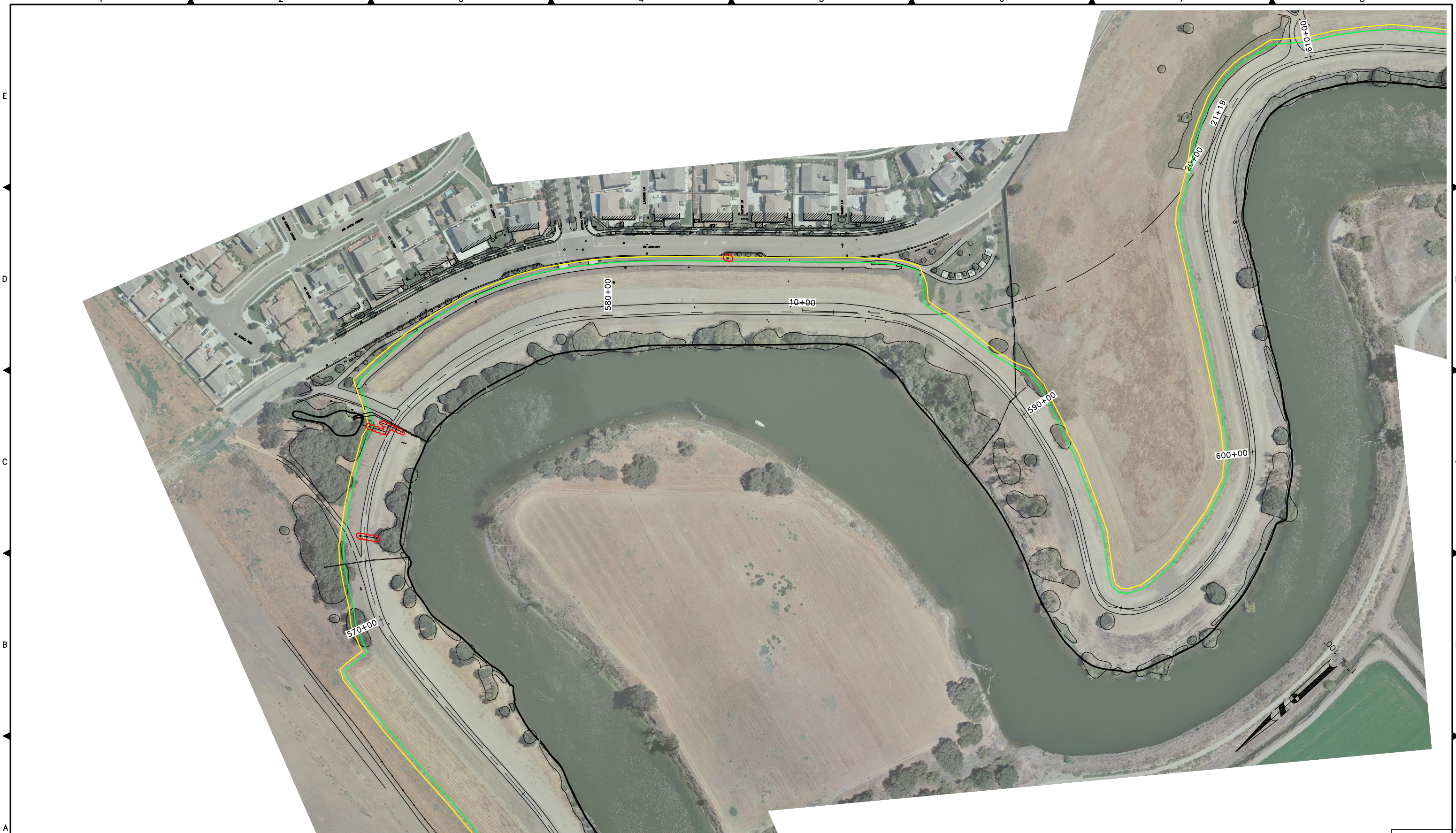
K S N KJELDSSEN SINNOCK NEUDECK INC.
 Civil Engineers and Land Surveyors
 711 N Pershing Avenue
 Stockton, CA 95203
 209-946-0268
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**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 540+00 TO 570+00**

Revisions				
No.	Description	Date	By	Apprd. By

Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1"	Date AUGUST 2015
Drawn EEA		Sheet Number 19 Of 33
Check CHN		Project File No. 2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:37pm



PRELIMINARY
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LEGEND:

—	LEVEE TOE
—	10' OFFSET FROM LEVEE TOE
—	IDENTIFIED ENCROACHMENT

K S N INC.
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 1355 Halyard Drive, Suite 100
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**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 570+00 TO 600+00**

Revisions			
No.	Description	Date	By

Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1"
Drawn EEA	
Check CHN	

Date
AUGUST 2015
 Sheet Number
20 Of 33
 Project File No.
2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:38pm



PRELIMINARY

NOT FOR CONSTRUCTION

- FOR STUDY ONLY -

LEGEND:

- LEVEE TOE
- 10' OFFSET FROM LEVEE TOE
- IDENTIFIED ENCROACHMENT

K S N INC. **KJELDSSEN SINNOCK NEUDECK**
 Civil Engineers and Land Surveyors
 711 N Pershing Avenue
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**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**

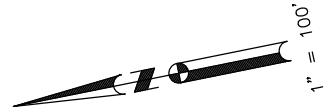
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 600+00 TO 630+00**

Revisions				
No.	Description	Date	By	Apprd. By

Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1"
Drawn EEA	
Check CHN	

Date AUGUST 2015
Sheet Number 21 Of 33
Project File No. 2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:40pm



PRELIMINARY
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 - FOR STUDY ONLY -

LEGEND:

—	LEVEE TOE
—	10' OFFSET FROM LEVEE TOE
—	IDENTIFIED ENCROACHMENT

K S N INC.
KJELDSEN SINNOCK NEUDECK
 Civil Engineers and Land Surveyors
 711 N Pershing Avenue
 Stockton, CA 95203
 209-946-0268
 1355 Halyard Drive, Suite 100
 West Sacramento, CA 95691
 916-403-5900
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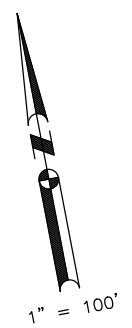
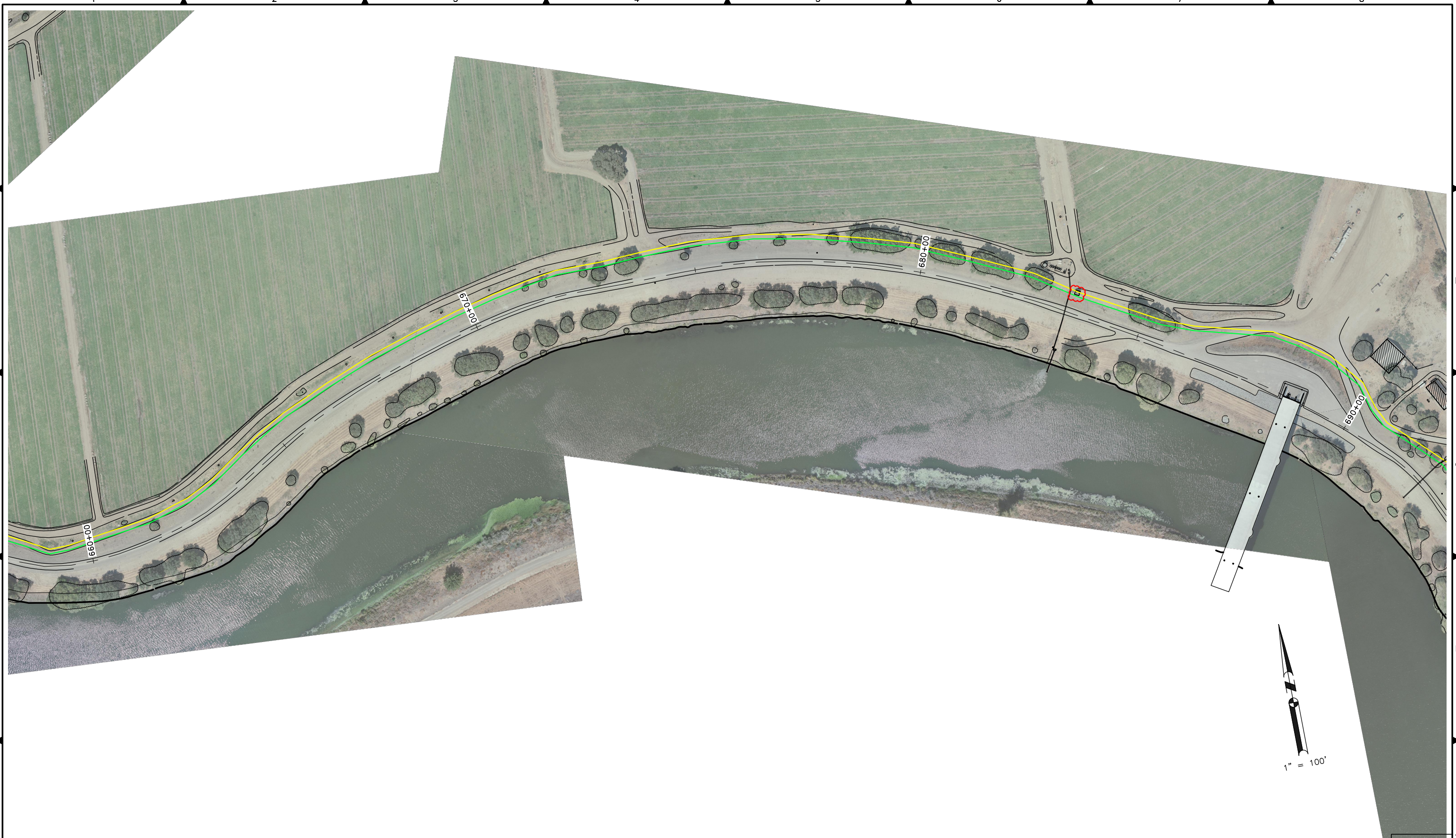
**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 630+00 TO 660+00**

Revisions				
No.	Description	Date	By	Apprd. By

Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1"
Drawn EEA	
Check CHN	

Date
AUGUST 2015
 Sheet Number
22 Of 33
 Project File No.
2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:42pm



PRELIMINARY
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 - FOR STUDY ONLY -

LEGEND:

—	LEVEE TOE
—	10' OFFSET FROM LEVEE TOE
—	IDENTIFIED ENCROACHMENT

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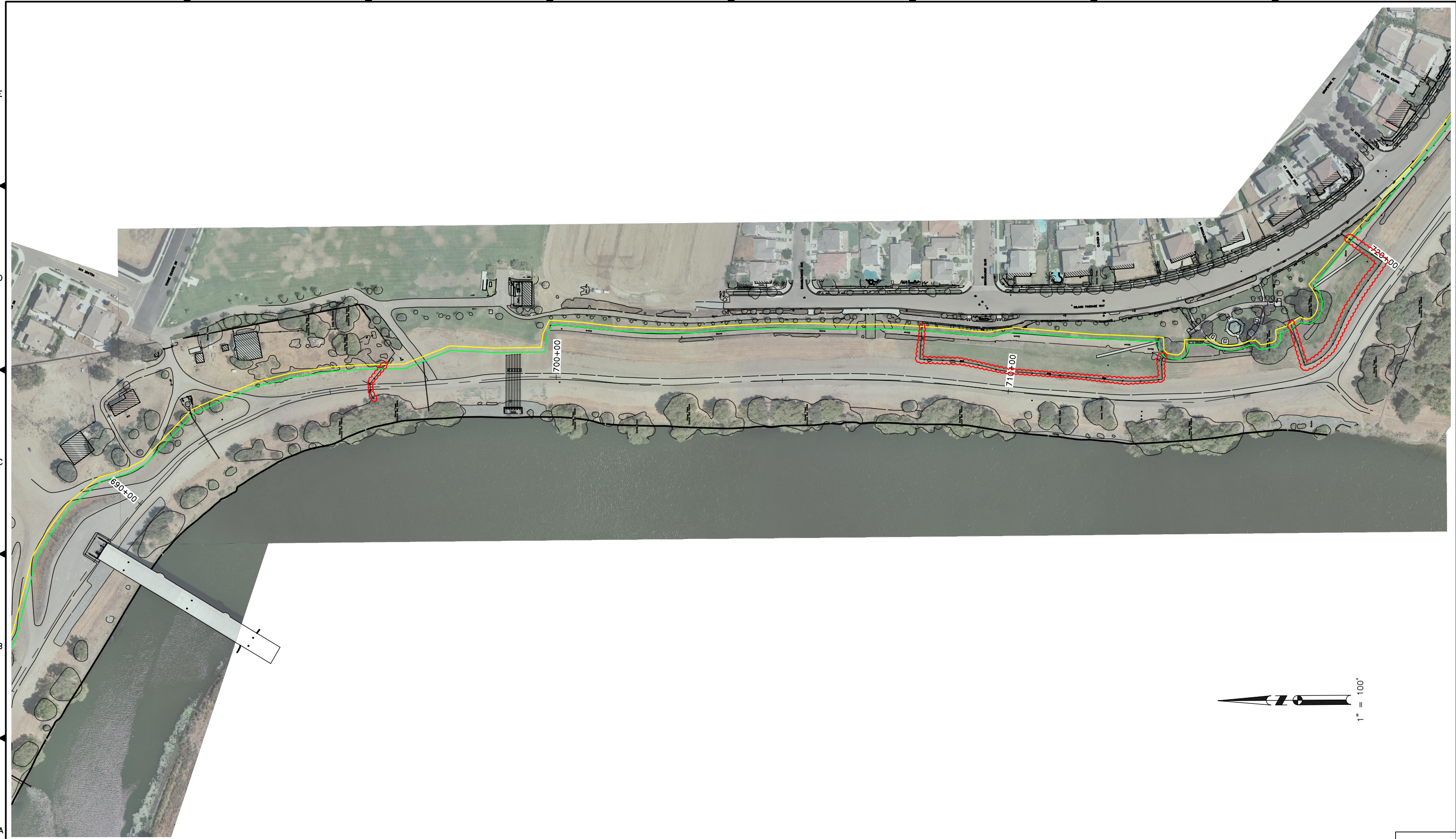
**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW**
 STA. 660+00 TO 690+00

Revisions				
No.	Description	Date	By	Apprd. By

Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1"
Drawn EEA	
Check CHN	

Date **AUGUST 2015**
 Sheet Number **23** Of **33**
 Project File No. **2255-0030**

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:43pm



PRELIMINARY
 NOT FOR CONSTRUCTION
 - FOR STUDY ONLY -

- LEGEND:**
- LEVEE TOE
 - 10' OFFSET FROM LEVEE TOE
 - IDENTIFIED ENCROACHMENT

K S N INC. **KJELDSSEN SINNOCK NEUDECK**
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**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW**
 STA. 690+00 TO 720+00

Revisions				Design	Scale	Date
No.	Description	Date	By	Apprd. By		
				EEA	1" = 100' Original Drawing Scale 0 1/2" 1"	AUGUST 2015
				EEA		24
				CHN		Of 33




Project File No.
 2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:45pm



PRELIMINARY
 NOT FOR CONSTRUCTION
 - FOR STUDY ONLY -


LEGEND:

	LEVEE TOE
	10' OFFSET FROM LEVEE TOE
	IDENTIFIED ENCROACHMENT

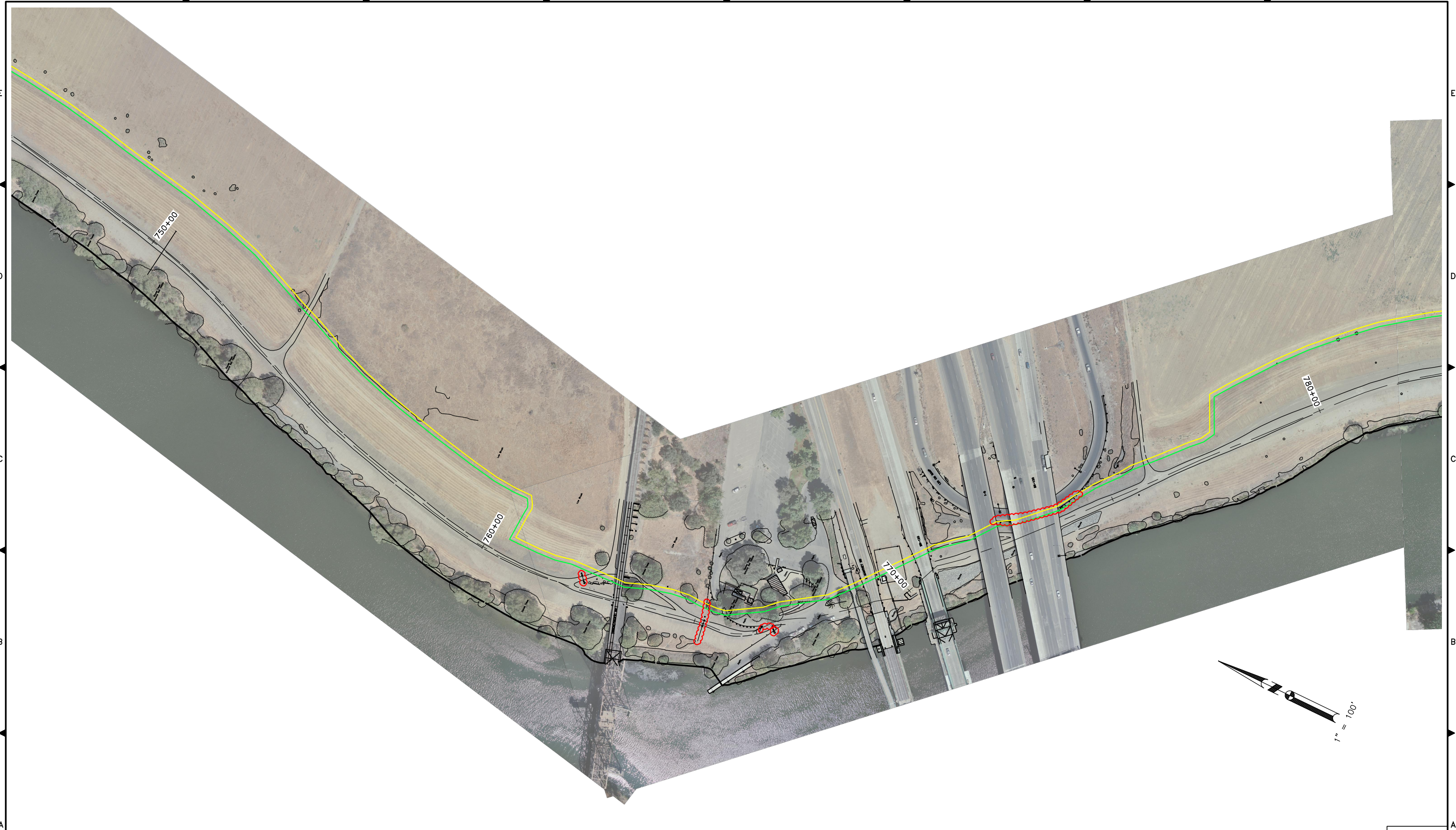
K S N INC.
KJELDSSEN SINNOCK NEUDECK
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**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 720+00 TO 750+00**

Revisions				
No.	Description	Date	By	Apprd. By

Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1" 	Date AUGUST 2015
Drawn EEA		Sheet Number 25 Of 33
Check CHN		Project File No. 2255-0030

FILE SPEC: C:\Users\vealmaaas\AppData\Local\Temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:47pm



PRELIMINARY

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- FOR STUDY ONLY -

LEGEND:

- LEVEE TOE
- 10' OFFSET FROM LEVEE TOE
- IDENTIFIED ENCROACHMENT

K S N INC. **KJELDSSEN SINNOCK NEUDECK**
 Civil Engineers and Land Surveyors
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**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**

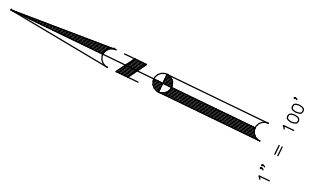
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 750+00 TO 780+00**

Revisions				
No.	Description	Date	By	Apprd. By

Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1"
Drawn EEA	
Check CHN	

Date AUGUST 2015
Sheet Number 26 Of 33
Project File No. 2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:48pm



PRELIMINARY
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 - FOR STUDY ONLY -

LEGEND:

—	LEVEE TOE
—	10' OFFSET FROM LEVEE TOE
—	IDENTIFIED ENCROACHMENT

K S N INC.
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**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 780+00 TO 810+00**

Revisions				
No.	Description	Date	By	Apprd. By

Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1"	Date AUGUST 2015
Drawn EEA		Sheet Number 27 Of 33
Check CHN		Project File No. 2255-0030

FILE SPEC: C:\Users\eamlaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:50pm



PRELIMINARY
 NOT FOR CONSTRUCTION
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LEGEND:

	LEVEE TOE
	10' OFFSET FROM LEVEE TOE
	IDENTIFIED ENCROACHMENT

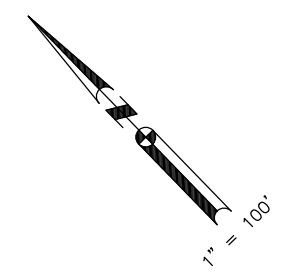
K S N KJELDSSEN SINNOCK NEUDECK INC.
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**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 810+00 TO 840+00**

Revisions				
No.	Description	Date	By	App'd. By




Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1" 	Date AUGUST 2015
Drawn EEA		Sheet Number 28 Of 33
Check CHN		Project File No. 2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:52pm



PRELIMINARY
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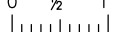
LEGEND:

	LEVEE TOE
	10' OFFSET FROM LEVEE TOE
	IDENTIFIED ENCROACHMENT

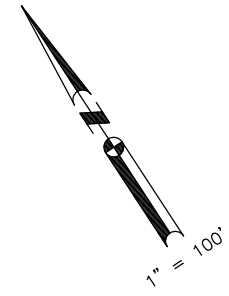
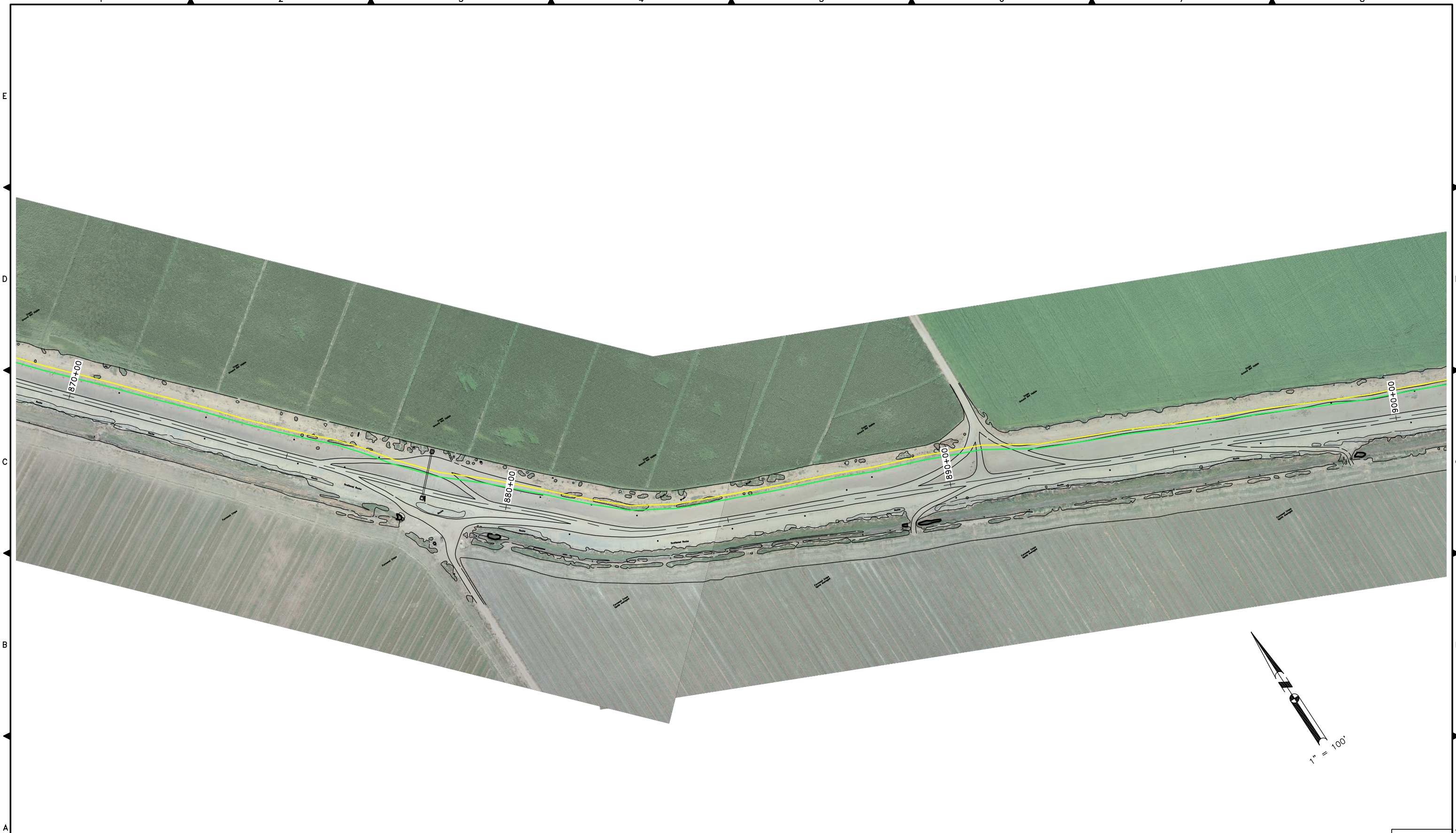
K S N KJELDEN S INNOCK NEUDECK INC.
 Civil Engineers and Land Surveyors
 711 N Pershing Avenue
 Stockton, CA 95203
 209-946-0268
 1355 Halyard Drive, Suite 100
 West Sacramento, CA 95691
 916-403-5900
 www.ksninc.com

**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 840+00 TO 870+00**

Revisions				
No.	Description	Date	By	Appr'd. By




Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1" 	Date AUGUST 2015
Drawn EEA		Sheet Number 29 Of 33
Check CHN		Project File No. 2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:54pm



PRELIMINARY
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 - FOR STUDY ONLY -

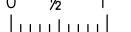
LEGEND:

	LEVEE TOE
	10' OFFSET FROM LEVEE TOE
	IDENTIFIED ENCROACHMENT

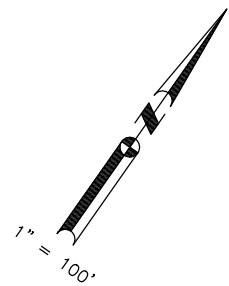
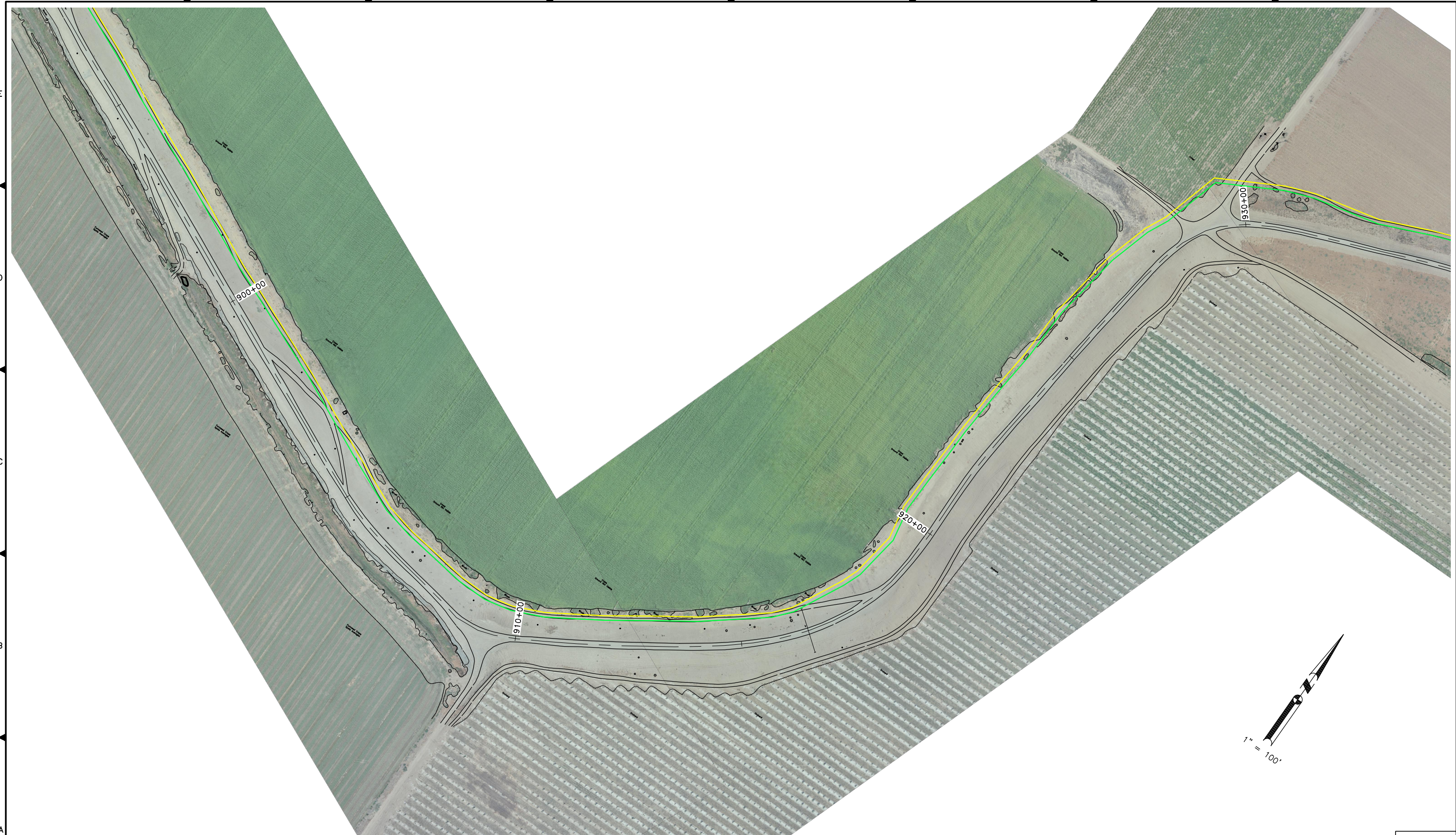
K S N INC.
KJELDSSEN SINNOCK NEUDECK
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**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 870+00 TO 900+00**

Revisions				
No.	Description	Date	By	Appr. By




Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/2" 1" 	Date AUGUST 2015
Drawn EEA		Sheet Number 30 Of 33
Check CHN		Project File No. 2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:56pm



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LEGEND:

	LEVEE TOE
	10' OFFSET FROM LEVEE TOE
	IDENTIFIED ENCROACHMENT

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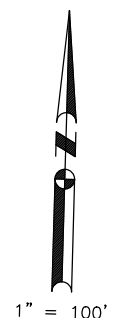
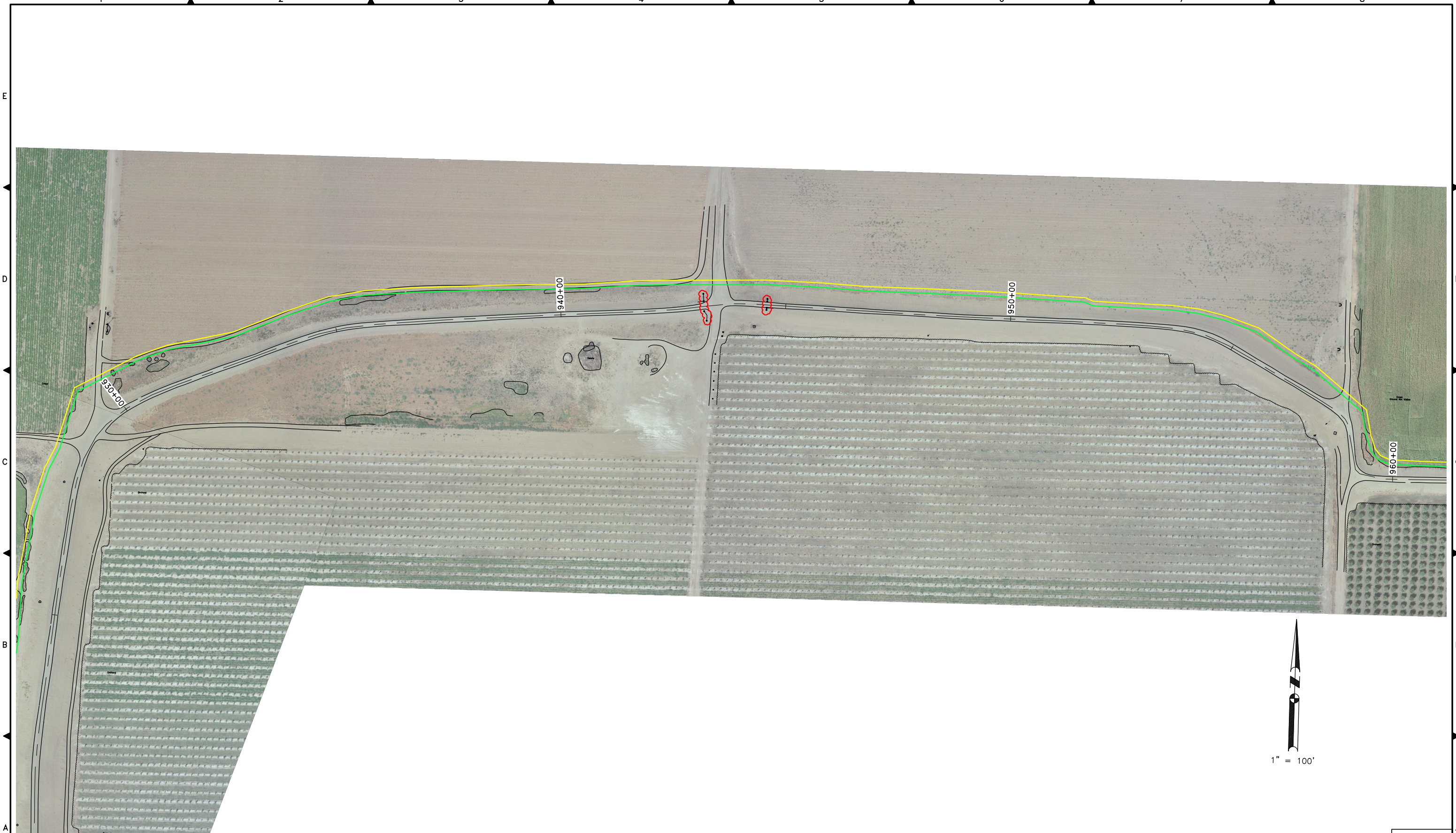
**CITIES OF LATHROP AND MANTECA
 ULDC EVALUATION
 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 900+00 TO 930+00**

Revisions				
No.	Description	Date	By	Apprd. By

Design EEA
 Drawn EEA
 Check CHN
 Scale
 1" = 100'
 Original Drawing Scale
 0 1/2" 1"


Date AUGUST 2015
 Sheet Number **31** Of 33
 Project File No. 2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:57pm



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- LEGEND:**
- LEVEE TOE
 - 10' OFFSET FROM LEVEE TOE
 - IDENTIFIED ENCROACHMENT

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**CITIES OF LATHROP AND MANTECA
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 SAN JOAQUIN COUNTY, CALIFORNIA**
**7.12 ENCROACHMENTS
 PLAN VIEW**
 STA. 930+00 TO 960+00

Revisions				Design	Scale 1" = 100' Original Drawing Scale 0 1/2" 1" 	Date	By	Apprd. By
No.	Description	Date	By	Apprd. By				

Design EEA
 Drawn EEA
 Check CHN
 Date **AUGUST 2015**
 Sheet Number **32** Of 33
 Project File No. 2255-0030

FILE SPEC: C:\Users\vealmaaas\appdata\local\temp\AcPublish_6308\ShL_7-12_Encroachments.dwg
 PLOT DATE: Nov 24, 2015 - 2:59pm



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LEGEND:

—	LEVEE TOE
—	10' OFFSET FROM LEVEE TOE
—	IDENTIFIED ENCROACHMENT

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N NEUDECK
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 and Land Surveyors

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**CITIES OF LATHROP AND MANTECA
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 SAN JOAQUIN COUNTY, CALIFORNIA**

**7.12 ENCROACHMENTS
 PLAN VIEW
 STA. 960+00 TO 972+25**

Revisions			
No.	Description	Date	By

Design EEA	Scale 1" = 100' Original Drawing Scale 0 1/8" 1"	Date AUGUST 2015
Drawn EEA		Sheet Number 33 Of 33
Check CHN		Project File No. 2255-0030