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CITY OF LODI COUNCIL COMMUNICATION

AGENDA TITLE: Receive Report Regarding Status of Mokelumne River Bank in the General Vicinity of Pigs Lake within Lodi Lake Nature Area

MEETING DATE: February 6, 2008

PREPARED BY: Interim Park and Recreation Director

RECOMMENDED ACTION: Receive report regarding status of Mokelumne River bank in the general vicinity of Pigs Lake within Lodi Lake Nature Area.

BACKGROUND INFORMATION: Lodi Lake Park comprises 114 acres. Lodi Lake Nature Area is a 58-acre long, irregularly shaped rectangle that consists of a unique natural riparian setting with six miles of trails. It serves as a local recreation area and an outdoor classroom primarily for grades K-6. The Nature Area is known throughout the state as a native area for many migratory and local bird species, and the area has an abundance of native tree species and adequate amount of under-story vegetation where it is commonplace to see wildlife such as deer, squirrels and beaver.

One of the many unique features within the Nature Area is a natural wetland pond known as Pigs Lake. In 1994, the Parks Division, with the cooperation of other agencies, repaired riverbank erosion adjacent to Pigs Lake. Scope of work included clearing of debris, fine grading, tilling, revegetation and associated work, as required to restore approximately 105 lineal feet of riverfront along the Mokelumne River and Pigs Lake at a cost of \$35,800. The State Wildlife Conservation Fund was the source of funding for the 1994 project.

The Parks Division is once again concerned about the same site. During the winter of 2005, Park staff observed rapid bank erosion due mainly to the high releases from Camanche Dam. On August 30, 2007, City staff accompanied engineers Bill Darsie and Stephen Sinnock of Kjeldsen, Sinnock and Neudeck Inc., on a tour and inspection of the Lodi Lake Nature Area erosion site. The primary purpose of the inspection was to look at the erosion site that is threatening a thin strip of land separating the Mokelumne River and Pigs Lake. An additional inspection was performed on October 13, 2007, after Lodi Lake had been drained for the season. The current area of concern is approximately 300 lineal feet and growing.

It is estimated that approximately 4 to 10 feet of embankment crest has eroded away. In some places, less than 15 feet of riverbank separate the river from Pigs Lake. Some of this erosion is naturally occurring; however, much is man induced. Staff fears that if the continuing erosion is not halted, there is a potential for a breach of the embankment that separates Pigs Lake and the Nature Area from the Mokelumne River. The degree of flooding in the Nature Area from a breach is unknown at this time.

APPROVED: _____
Blair King, City Manager

Staff is in the process of retaining the services of Kjeldsen, Sinnock & Neudeck, Inc. to develop plans and specifications for the repair work (proposed scope of work attached). No funding has been identified. The estimated costs are unknown. These Lodi Lake repairs have not been prioritized against any other maintenance needs within the Lodi parks system.

FISCAL IMPACT: With continued erosion, our engineering consultants and City staff anticipate some form of breach in the near future. When this happens, staff is certain the existing environmental conditions will change and impact the flora and fauna. The fiscal impacts are unknown at this time. No current funding is available.

Steve Dutra
Interim Parks and Recreation Director

SD:tl

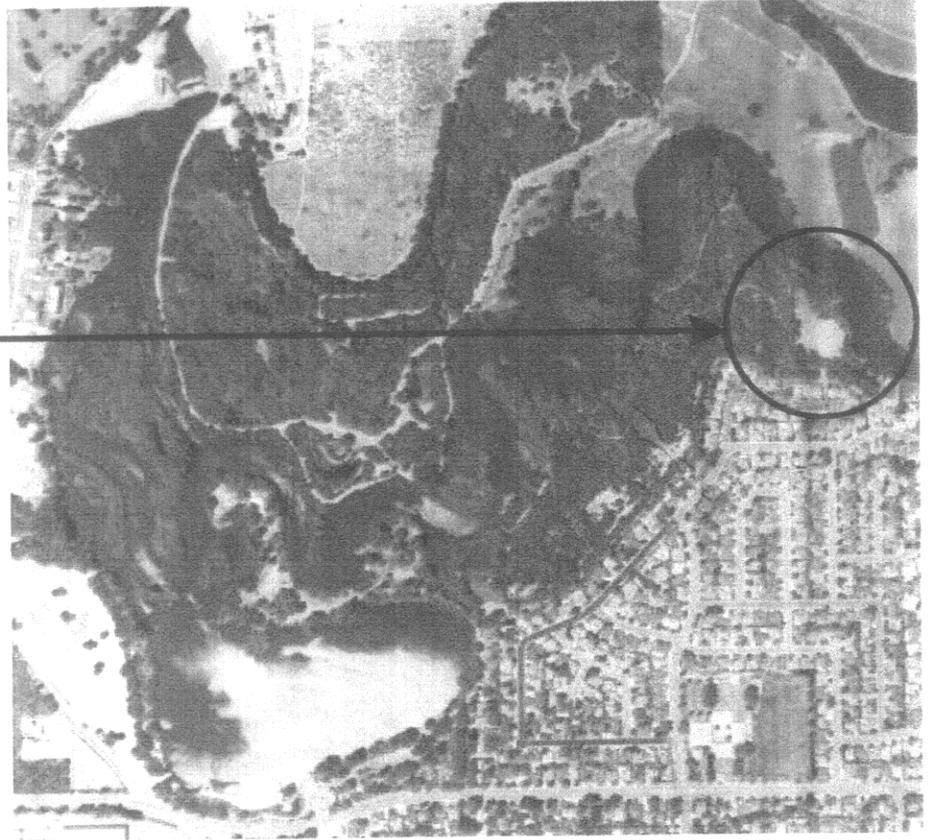
Attachments

cc: City Attorney
Park Project Coordinator

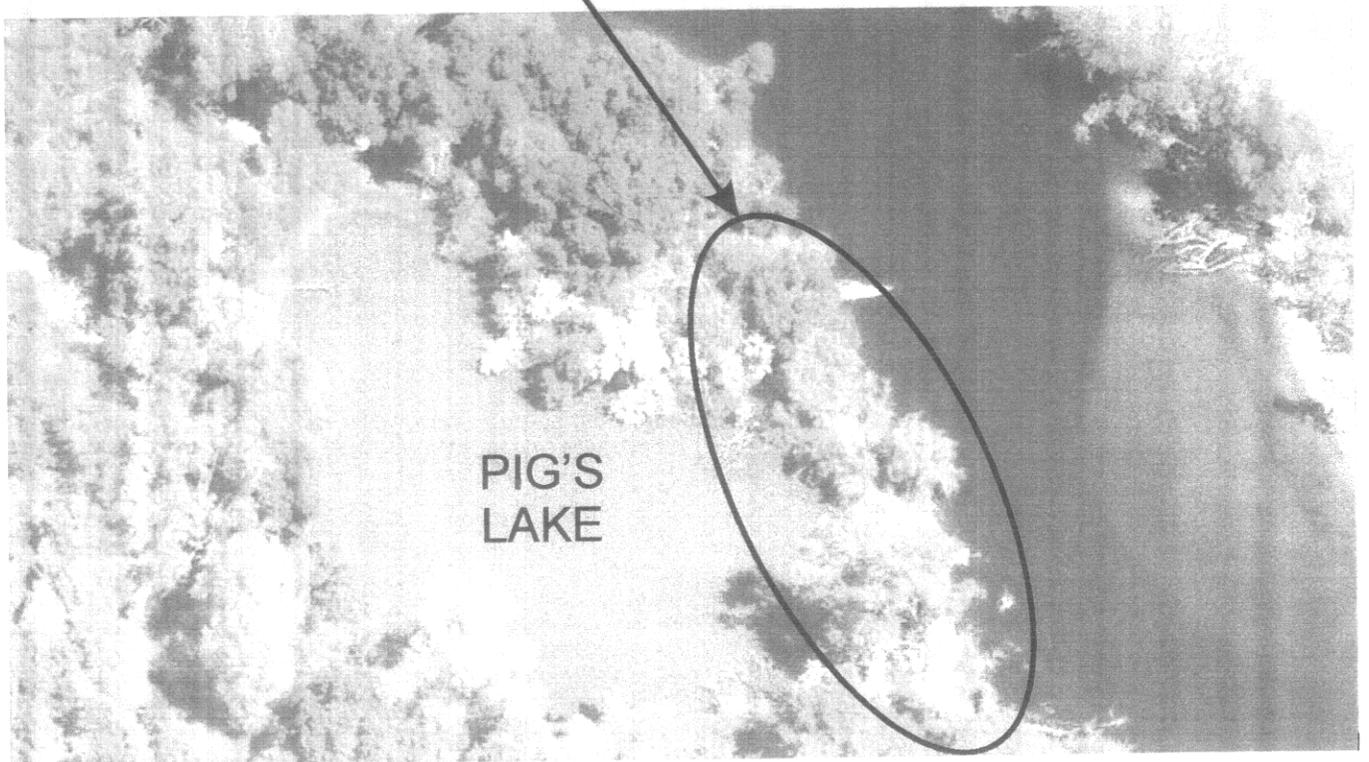
LODI LAKE PARK - PIG'S LAKE PROPOSED LEVEE REPAIR PROJECT

PROJECT LOCATION
PIG'S LAKE
LEVEE REPAIR

NORTH
↑
NTS



PROPOSED
PROJECT LOCATION



KJELDSSEN, SINNOCK & NEUDECK, INC.

CIVIL ENGINEERS AND LAND SURVEYORS

STEPHEN K. SINNOCK
CHRISTOPHER H. NEUDECK

KENNETH L. KJELDSSEN
RETIRED

711 NORTH PERSHING AVENUE
POST OFFICE BOX 844
STOCKTON, CALIFORNIA 95201-0844

TELEPHONE (209) 946-0268
FAX (209) 946-0296
E-MAIL ksn@ksninc.com

0007-0510

October 17, 2007

Mr. Steve Dutra
Lodi Parks & Recreation Department
125 N. Stockton Street
Lodi, CA 95240

Re: Lodi Lake Nature Area Erosion Along Mokelumne River

Dear Mr. Dutra,

On August 30, 2007 Bill Darsie and I participated in a tour and inspection of Lodi Lake erosion sites along the Mokelumne River with you and Mr. Richard Prima of the City of Lodi. The primary purpose of the inspection was to look at an erosion site that is threatening a thin strip of land separating the Mokelumne River and the Pig Lake. An additional inspection occurred on October 13, 2007 after Lodi Lake had been drained for the season. This additional inspection allowed for viewing the area that was not visible and under water during the first inspection. Kjeldsen, Sinnock & Neudeck, Inc. submits herewith its proposal to prepare a preliminary report discussing the likely causes of the erosion, a discussion of the options to remediate and restore the eroded areas, a discussion of the permitting issues related to the repairs and preliminary projections for the cost of the repairs.

Current Site Conditions

As shown in the attached photos, erosion has occurred on the right bank of the Mokelumne River upstream of the Lodi Lake dam in the vicinity of Pig Lake. The erosion site is approximately 300 feet in length and is located just downstream of a 180 degree bend in the River that causes the lower portions of the river bank at the site to be exposed to the hydraulic cutting action of the river. Erosion is occurring higher up on the river bank slope at the waterline due to wave run up from the wakes of watercraft. This wave erosion has caused undercutting of the bank up to 3 feet in some places. The soil at the site is predominately a cohesionless, fine silty sand that erodes quite readily.

There are several conditions occurring in this area of the river that may be contributing to the aggressive erosion of this particular segment of riverbank.

First, there is hydraulic erosion occurring below the waterline that has undermined and washed out a previous repair project that was completed in 1994 (see attached drawings dated 12/93). The erosion area is located on the outside of a bend in the river, where velocities tend to be the greatest. The previous repairs appear to have consisted of stacking a grid of tree roots and logs along the eroded bank and cabling them to existing live trees along the shoreline. Remnants of the trees and logs used for the 1994 repair project remain scattered throughout the river bottom and bank of the site as shown in the attached photos. The remnant trees and logs may be aggravating the hydraulic cutting action of the river as they could be creating eddies and turbulence that are contributing to the erosion of the river bank.

Second, there appears to be wave wash erosion occurring at the summer water line when Lodi Lake is full. The waves are generated by both boats and wind. This erosion is clearly defined and localized at the top of the waterside slope. The wave wash was observed during the August inspection when watercraft passed the site.

Third, the erosion may be aggravated by the annual draining of Lodi Lake. The rapid drawdown of the lake in the fall may contribute to the erosion by not allowing the saturated riverbank materials to gradually drain. A rapid drawdown may cause sloughing of the cohesionless sands on the upper portions of the riverbank.

Following a review of the 1994 repair project plans and the inspection observations, it is estimated that approximately 4 to 10 feet of the embankment crest has eroded away. In some places less than 15 feet of riverbank separate the river from Pig Lake.

If the continuing erosion is not addressed, there is a high potential for a breach of the embankment that separates Pig Lake and the Nature Area from the river.

The environmental review process for work in the river is complicated and is often very time consuming due to the number of State and Federal agencies, and the wide spectrum of protected species potentially involved. The environmental impacts resulting from not performing erosion protection repairs could be catastrophic for Pig Lake, the Nature Area and the entire Lodi Lake Park. The environmental issues associated with the site will likely dictate the repair options that are viable.

Based upon our understanding of the issues and the City's goals, it is our recommendation that the scope of work for the preliminary report include the following.

Proposed Scope of Work for Preliminary Report

The following is a description of the scope of services KSN proposes to provide to prepare a preliminary report.

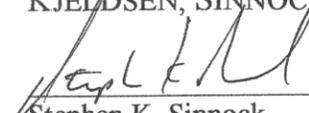
- Communicate with State and Federal Regulatory Agencies to develop an understanding and outline of the regulatory issues and concerns, and the scope of the permitting effort required for a repair project. The State and Federal agencies to be contacted will include the following:

- State Department of Fish & Game
 - U.S. Army Corps Of Engineers Regulatory
 - NOAA Marine Fisheries
 - US Fish & Wildlife Service
 - Central Valley Regional Water Quality Control Board
 - State Reclamation Board
 - Other Local, State and Federal agencies as necessary
- Perform detailed site inspection to determine the limits of the repair area and the general magnitude of the material quantities required for the repair and restoration of the riverbank.
 - Lay out limits of repair site
 - Determine typical cross-section of existing condition
 - Identify specific issues that would affect the repair options
 - Preliminary hydraulic evaluation
 - Preliminary assessment of soils
 - Review access routes to public streets
 - Prepare preliminary quantity calculations
- Evaluate the practicality of interim protective measures to minimize further loss of the riverbank.
 - May be necessary to limit damage this winter
 - Measures to limit erosion until more permanent repairs can be permitted
 - Geotechnical fabrics
 - Sand bags
 - Plastic sheeting
 - Thin band of riprap to stabilize slope
 - Communicate with regulatory agencies to determine what actions are allowable
- Perform preliminary site survey and prepare schematic site map
 - Prepare typical river bank cross-sections at erosion site
 - Determine actual length of erosion site
- Prepare letter report outlining initial findings and recommendations
 - Letter report will include discussions on the following
 - Probable causes of erosion
 - Permitting issues related to repairs
 - Erosion repair options
 - Preliminary quantity estimates for repair options
 - Preliminary cost estimates for repair options

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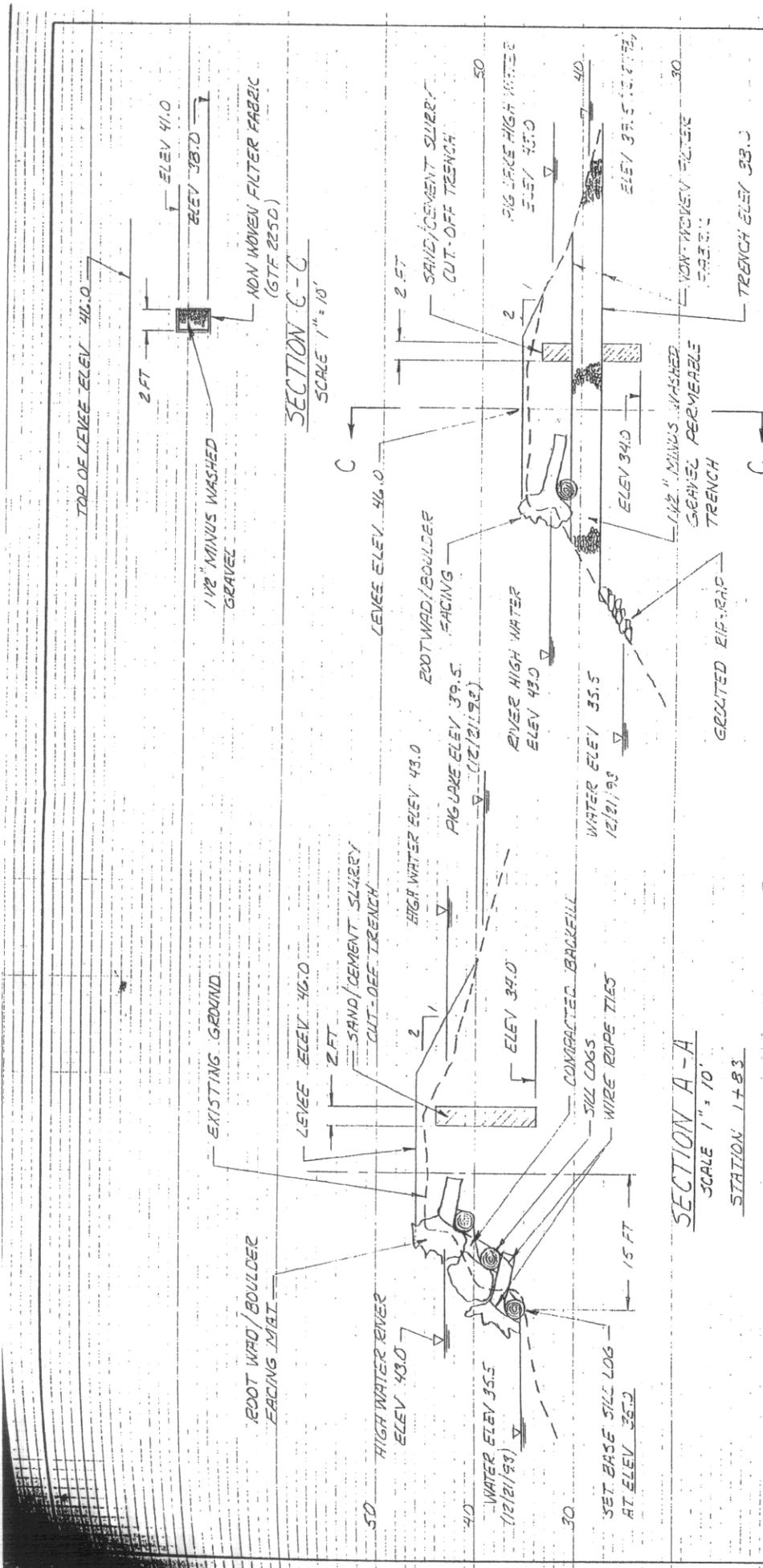
KSN proposes to provide the above described scope of work on a time and materials basis in accordance with our current Prevailing Wage Fee Schedule, for a not to exceed fee of \$4,900. We appreciate you having considered KSN for this project and we look forward to working with you and your staff. If you have any questions regarding this proposal, or if you require additional information, please call Bill Darsie, or myself, at (209) 946-0268.

Sincerely,
KJELDSSEN, SINNOCK & NEUDECK, INC.



Stephen K. Sinnock

w/enclosures



NOTES: 1. VOIDS BETWEEN STRUCTURES AND DISTURBED LEVEE SLOPES SHALL BE REVEGETATED WITH NATIVE SPECIES SEE PLANTING PLAN AND SCHEDULE
 2. ALL BACKFILL AND LEVEE EMBANKMENT SHALL BE COMPACTED TO 95% AS DETERMINED BY ASSHTO T-180

SECTION B-B
 SCALE 1" = 10'
 STATION 1+55

Contractor
 (1994)
 Armani Engineering
 Moor City
 Donald L. Lampe, P.E. 34930
 CAMPE ENGINEERING

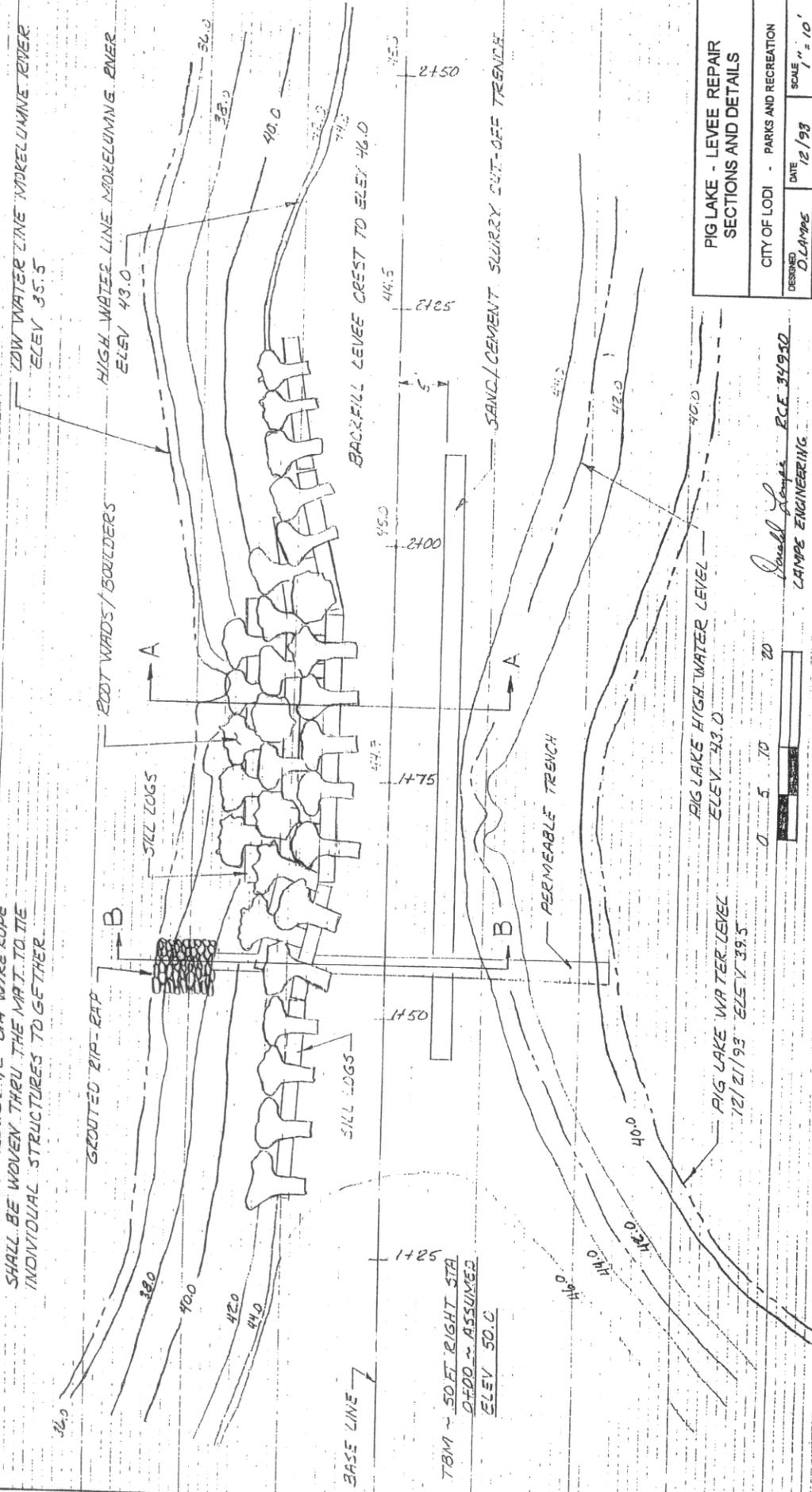
PIG LAKE - LEVEE REPAIR PLAN SHEET			
CITY OF LODI - PARKS AND RECREATION	DESIGNED BY	DATE	SCALE
	D. LAMPE	12/93	1" = 10'
Lampe Engineering		614 NORD HWY CHICO CA 95926	

NOTES:

1. LARGE Boulders MAY REPLACE ROOT WADS PLACED ALTERNATELY UP TO 50% OF TOTAL AREA ~ Boulders SHALL BE 3'-5' DIA

2. ROOT WADS/BOULDERS SHALL BE PLACED TIGHTLY, OVERLAPPING SILL LOGS AND SUBSEQUENT ROWS. 1/2" DIA WIRE ROPE SHALL BE WOVEN THRU THE MAT. TO TIE INDIVIDUAL STRUCTURES TOGETHER.

3. VOIDS BETWEEN STRUCTURES SHALL BE BACKFILLED AND PLANTED WITH NATIVE SPECIES. (SEE PLANTING SCHEDULE)



PIG LAKE - LEVEE REPAIR SECTIONS AND DETAILS

CITY OF LODI - PARKS AND RECREATION	DATE	SCALE
DESIGNED	12/93	1" = 10'
2/14/95		
Lampe Engineering		
644 NORD HWY CHICO CA 95928		

0 5 10 20
Donald Lampe
 ENGINEERING
 E.C.E. 329310

Lodi Lake Park
Mokelumne River/Pig Lake Erosion Sites

