

(A0006891)

Burk-Kleinpeter, Inc.  
Engineers, Architects, Planners, Environmental Scientists  
4176 Canal Street, New Orleans, LA 70119

Canal St. Canal Pump Station

Job No. 9104	Design By: <del>SE</del>	Date: 1/14/92	Checked By:	Page of 1 5
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Sheet Pile Analysis for Walls at  
17th Street Canal.

For bending moments and tip elevations  
see Eustis' reports. Applicable pages  
are enclosed.

Sheet pile under T-wall: [Assume  $F_b = 18 \text{ ksi}$ ]  
Moment = 13.1 ft-kip,  $S_{req} = 8.73 \text{ in}^3$   
 $S(\text{specified}) = 10 \text{ in}^3$ , Tip Elev. = -10.5

I-Wall:

Max moment (7' cantilever) = 37.4 ft-kip  
 $S_{req} = 24.93 \text{ in}^3$ ,  $S(\text{specified}) = 25 \text{ in}^3$ , Tip EL = -21.5

Emergency sheet pile:

Existing levee protection level = El. 12.75 (Mr.  
Chuck Shadie of COE, 1/8/92), Degraded  
levee crown = El. 6.5 (See Plans), Cantilever = 6.15'  
Moment < 37.4 ft-kip (See I-Wall above),  
Tip El. = -23.25



**EUSTIS ENGINEERING**  
 GEOTECHNICAL ENGINEERS  
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 SEP 16 1991  
 BURK-KLEINPETER

12 September 1991

Burk-Kleinpeter, Inc.  
 4176 Canal Street  
 New Orleans, Louisiana 70119

Attention Mr. Fred Fereidooni

Gentlemen:

Additional Analyses  
 Jefferson Parish  
 Pump Station at Canal Street Canal  
 Metairie, Louisiana

In accordance with a request by Mr. Fred Fereidooni, additional analyses have been made for the proposed floodwall and intake basin wingwalls based on the furnished revised conditions. It is understood that the back wall and side walls of the sump have not been revised and, therefore, the recommendations contained in our report remains valid for these retaining walls.

The floodwall analysis discussed in Paragraph 24 and shown on Figure 5 of our report was based on a levee crown at el 10 NGVD. As requested, additional floodwall analyses were made for a levee crown at el 12 and el 8 NGVD. The results of the additional analyses with the values contained in the report are summarized in the following tabulation.

Elevation of Levee Crown - NGVD	Recommended Sheetpile Tip Elevation - NGVD	Maximum Bending Moment Ft-Kips/LF
(3' Cant.) 12 GF	-2.5	4.2
(5' 4 ) 10 GF	-10.5	13.1
(7' 4 ) 8 GF	-21.5	37.4

~~Revised conditions for the wingwalls forming the sides of the intake basin include lateral support provided by steel struts near~~

placed on the bottom of the excavation to provide a stable working platform. Placement of concrete for slabs that will provide lateral support must be accomplished carefully to obtain proper contact with the sheetpiles in order to minimize lateral deflection of the walls. If weep holes are provided in the bottom slab, a non-woven filter fabric should be placed on the 6-in. thick pad to prevent exfiltration of soil through the weep holes.

22. It is emphasized that recommendations regarding sheetpile tip elevation, maximum bending moment and required lateral resistance contained in Paragraph 20 are based on the operating condition. Often, loading conditions during construction are more severe than the end of construction and/or operating conditions. Therefore, it is important that specifications require the contractor to submit his excavation and dewatering plan, including methods and sequence of operations, for review and approval prior to initiation of the work.

#### Floodwall and Cutoff Wall

23. Furnished Information. Furnished information and drawings indicate that the existing levee will be degraded to el 10 NGVD and a cantilever floodwall will be installed for flood protection. The furnished cross-section is shown on Figure 5. It is understood that the design high water level coincides with the top of the floodwall which is at el 15 NGVD.

24. Floodwall Analysis. Computations considered both "Q"-case and "S"-case soil shear strengths and included a factor of safety of 1.5 applied to the assigned strengths. A net lateral pressure diagram using the "S"-case soil shear strengths which govern the design is shown on Figure 5, along with the results of the computations. Based on this diagram, a sheetpile penetration to el -10.5 NGVD is required and the maximum bending moment is 13.1

ft-kips per linear foot. In accordance with Corps of Engineers criteria, a still water level (SWL) of el 12.5 NGVD was used to perform a seepage analysis of the floodwall. Using Lane's Weighted Creep (LWC) Method, a creep ratio (L/h) of slightly above 3 was determined, which is acceptable.

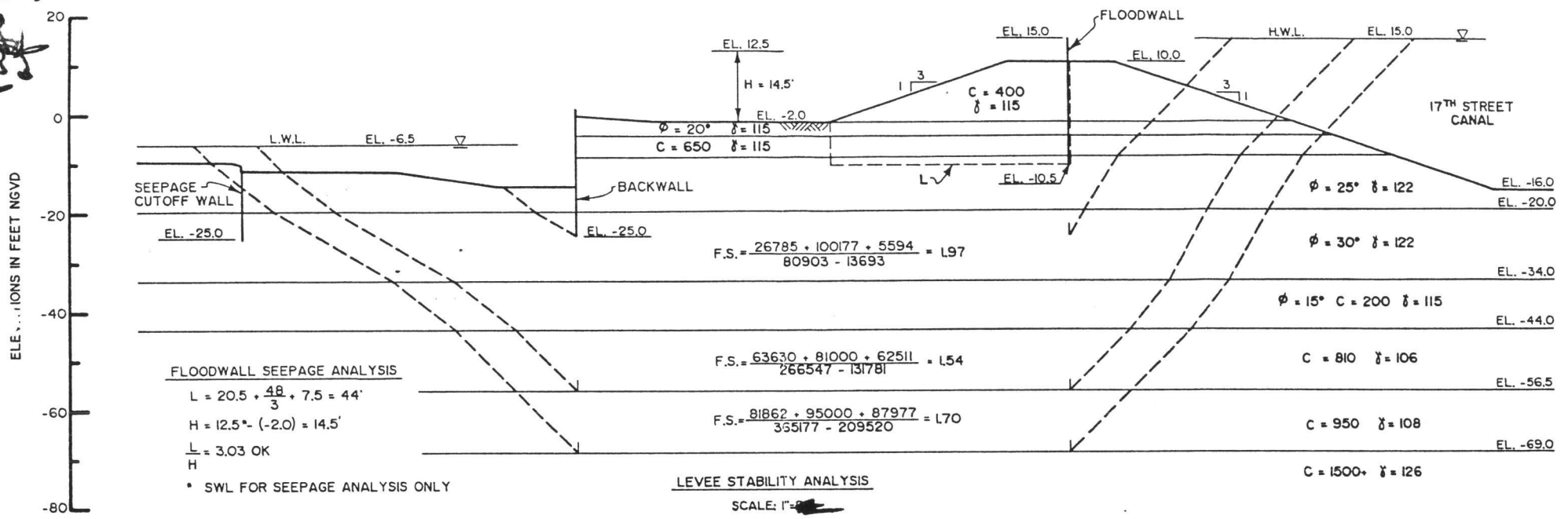
25. Cutoff Wall. Eustis Engineering recommends installation of a seepage cutoff and erosion control wall beneath the intake basin slab near the interface with the intake canal bottom as shown on Figure 5. This cutoff wall should be driven to a tip elevation of -25 NGVD. This cutoff wall, as well as the floodwall, should be driven to the required tip elevation without the aid of jetting and/or predrilling.

#### Slope Stability

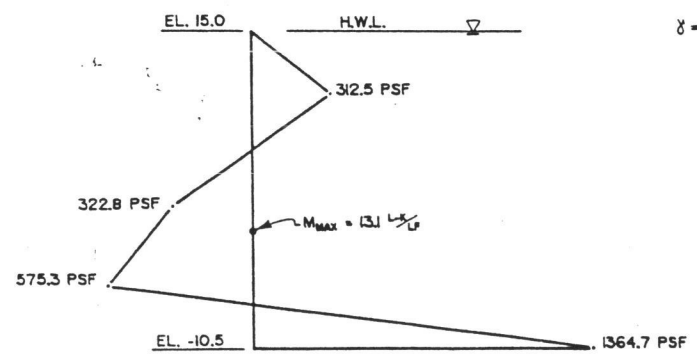
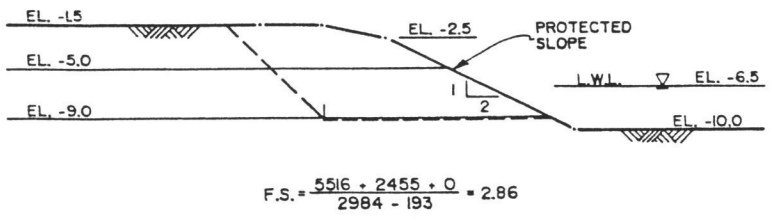
26. Furnished Information. Furnished information and drawings indicate that the existing levee crown will be degraded to el 10 NGVD and the side slopes will be shaped to a 1 vertical on 3 horizontal slope as shown on Figure 5. Also, the side slopes of the intake canal will be cut on 1 vertical to 2 horizontal slopes due to a limited right-of-way and to conform to the existing canal configuration.

27. Levee Analysis. Slope stability analyses were performed using the Corps of Engineers' Method of Planes based on a design high water level of el 15 NGVD in the 17th Street Canal and a low water level of el -6.5 NGVD in the intake basin/sump. Analysis of a potential failure plane at el -25 NGVD resulted in a factor of safety of 1.94, which indicates that the levee does not impose a surcharge load on the backwall of the sump. Analysis of potential failure planes at el -56.5 and el -69 NGVD resulted in a minimum factor of safety of 1.54 against failure of the levee into the sump/intake basin. This value is acceptable. The location of the

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**LEGEND**  
 C = COHESION IN PSF  
 $\phi$  = ANGLE OF INTERNAL FRICTION IN DEGREES  
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STABILITY AND FLOODWALL ANALYSES

JEFFERSON PARISH  
 PUMP STATION AT CANAL STREET CANAL  
 METAIRIE, LOUISIANA

*Eustis*  
 Pump Station at Canal Street  
 Canal  
 25 April, 1991

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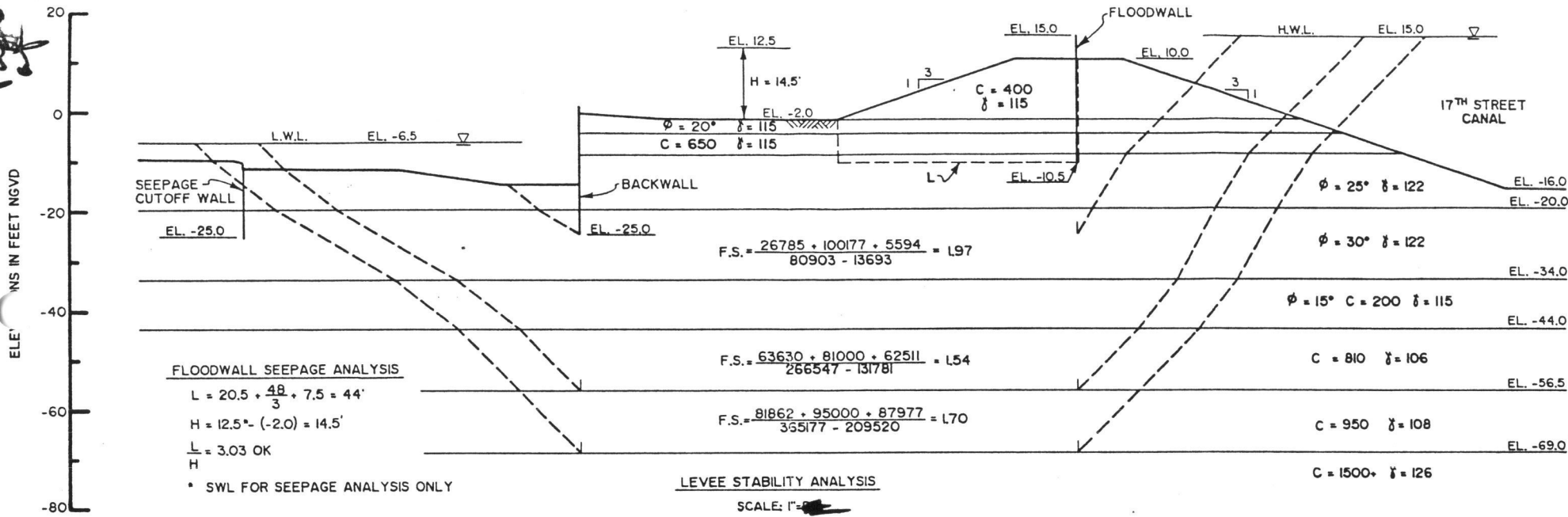
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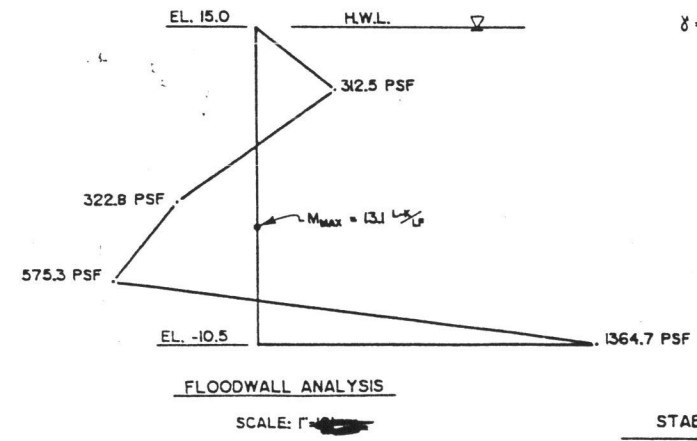
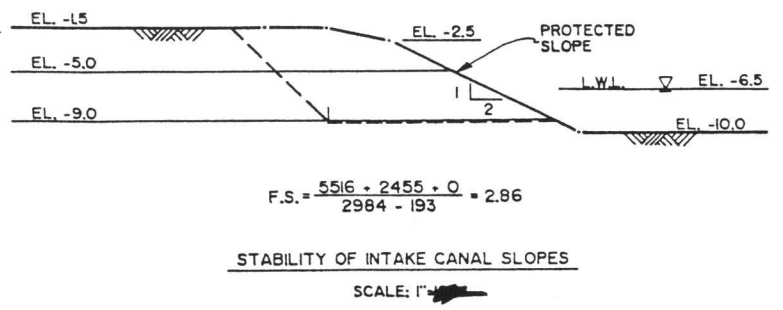
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*Eustis*  
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*Canal*  
*25 April, 1991*