



**CUY-90-14.90**

**PID 77332/85531**

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**APPENDIX EX-04**

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**Shoring Details  
(Reference Document)**

State of Ohio  
Department of Transportation  
Jolene M. Molitoris, Director

**Innerbelt Bridge  
Construction Contract Group 1 (CCG1)**



## RICHLAND ENGINEERING LIMITED

29 North Park Street, Mansfield, Ohio 44902 • 419/524-0074 FAX 419/524-1812  
93111

November 24, 1997

Randall S. Over, P.E.  
Ohio Department of Transportation  
District Twelve  
5500 Transportation Boulevard  
Garfield Heights, Ohio 44125-5396

Attn: Mr. Mike Karhan

Re: Project No. 457 (97)  
CUY-90-15.24  
Revised Shoring Submission

Gentlemen:

We reviewed Great Lakes Construction Co. revised anchor structure sheeting and shoring submission dated November 21, 1997 (copy enclosed). We recommend approval of the submission.

The Contractor should be aware that 8 foot wide steel plates will not fit between soldier piles on 8 foot centers. The soldier piles must be held to 8 foot centers to avoid the rock anchors.

Please contact us if you have any questions.

Very truly yours,

RICHLAND ENGINEERING LIMITED

Dean A. Palmer, P.E.

DAP:js

Enc.

cc by Fax: Kirk Gegick  
George Maki  
Mike Malloy

# THE GREAT LAKES CONSTRUCTION CO.

6600 East Schaaf Road  
P.O. Box 318055  
Independence, OH 44131-8055

(216) 901-9000  
FAX: (216) 642-8693  
ENG/EST FAX: (216) 328-2202



DATE 11-21-97

TIME 11:15

SHEET 1 OF 4

TO: ATTENTION: KIRK GEGICK

COMPANY: ODOT

FAX NO.: 861-4754

SENT BY: BRIAN SABBATORE

DIRECT NO: 901-9886

**RIVLAND ENGINEERING LIMITED**  
 DATE: 11/24/97  
 BY: DAK/DT  
 REVIEWED AS NOTED  
 REVISE AND RESUBMIT  
 REJECTED.  
 Review is for conformance with requirements  
 of drawings and specifications only.

SUBJECT: PROS 457 (97)

COMMENTS: SHEET 1 OF 3 & 2 OF 3 HAVE BEEN REVISED  
AND SHOULD ADDRESS THE CONCERNS EXPRESSED  
BY REL. SHEET 1 HAS BEEN CHANGED BY DELETING  
ONE DRILLED SHAFT. SHEET 2 HAS BEEN REVISED  
NOTING 2 PLATES INSTEAD OF 1 FOR EACH BAY.  
POSITIVE DRAINAGE TO RELIEVE ANY HYDROSTATIC PRESSURE  
BEHIND THE WALL WILL BE PROVIDED BY THE OPEN SEAMS/JOINTS  
AROUND THE PERIMETER OF THE PLATES.

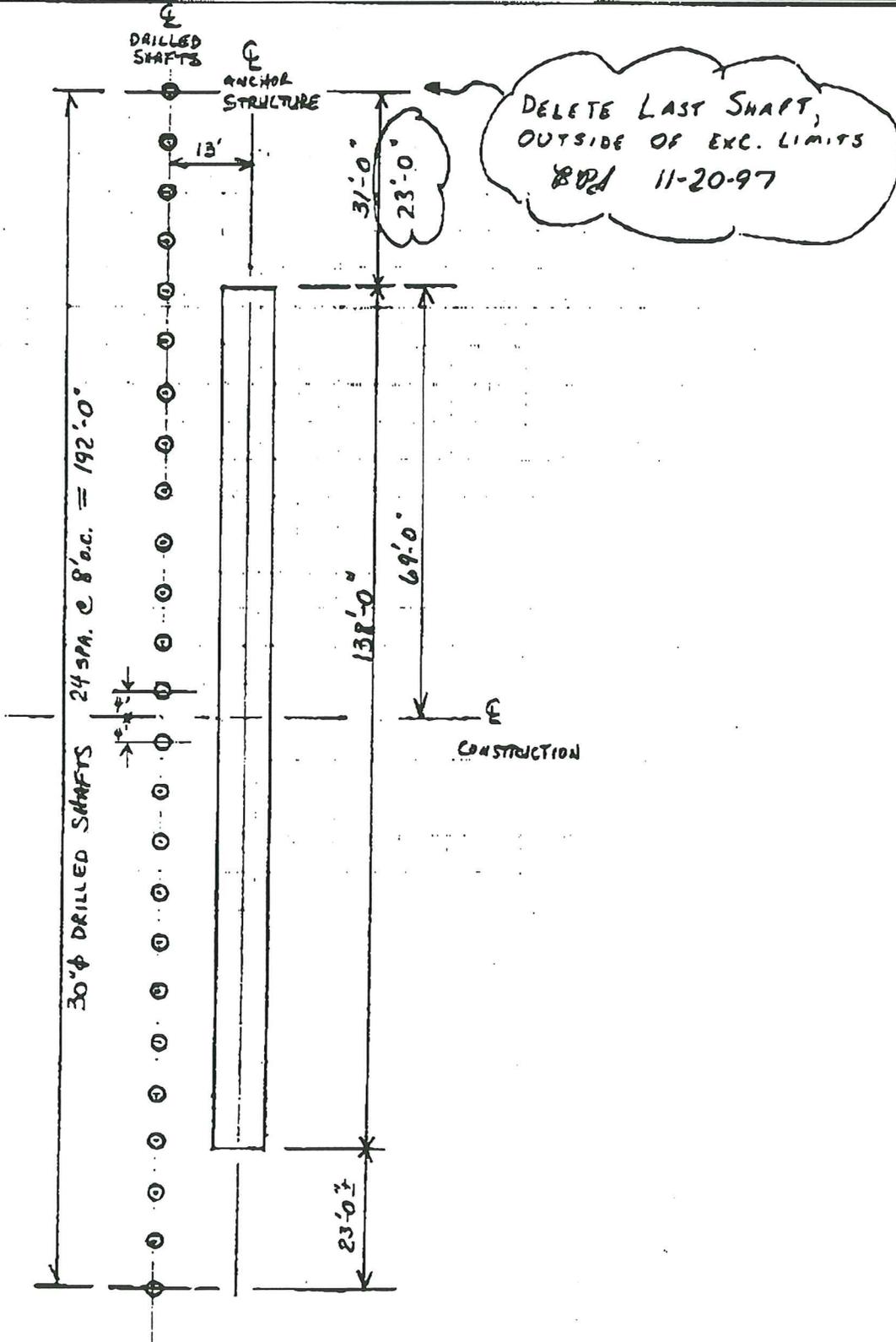


# THE GREAT LAKES CONSTRUCTION CO.

6600 SCHAAF ROAD • CLEVELAND, OHIO 44131-1398 • (216) 524-2970 FAX: (216) 642-8693

Project 457-97 I-90 PIER STABILIZATION by S.W. KISH  
Subject ANCHOR STRUCTURE SHEETING

Date 11-11-97  
Sheet No. 113





# RICHLAND ENGINEERING LIMITED

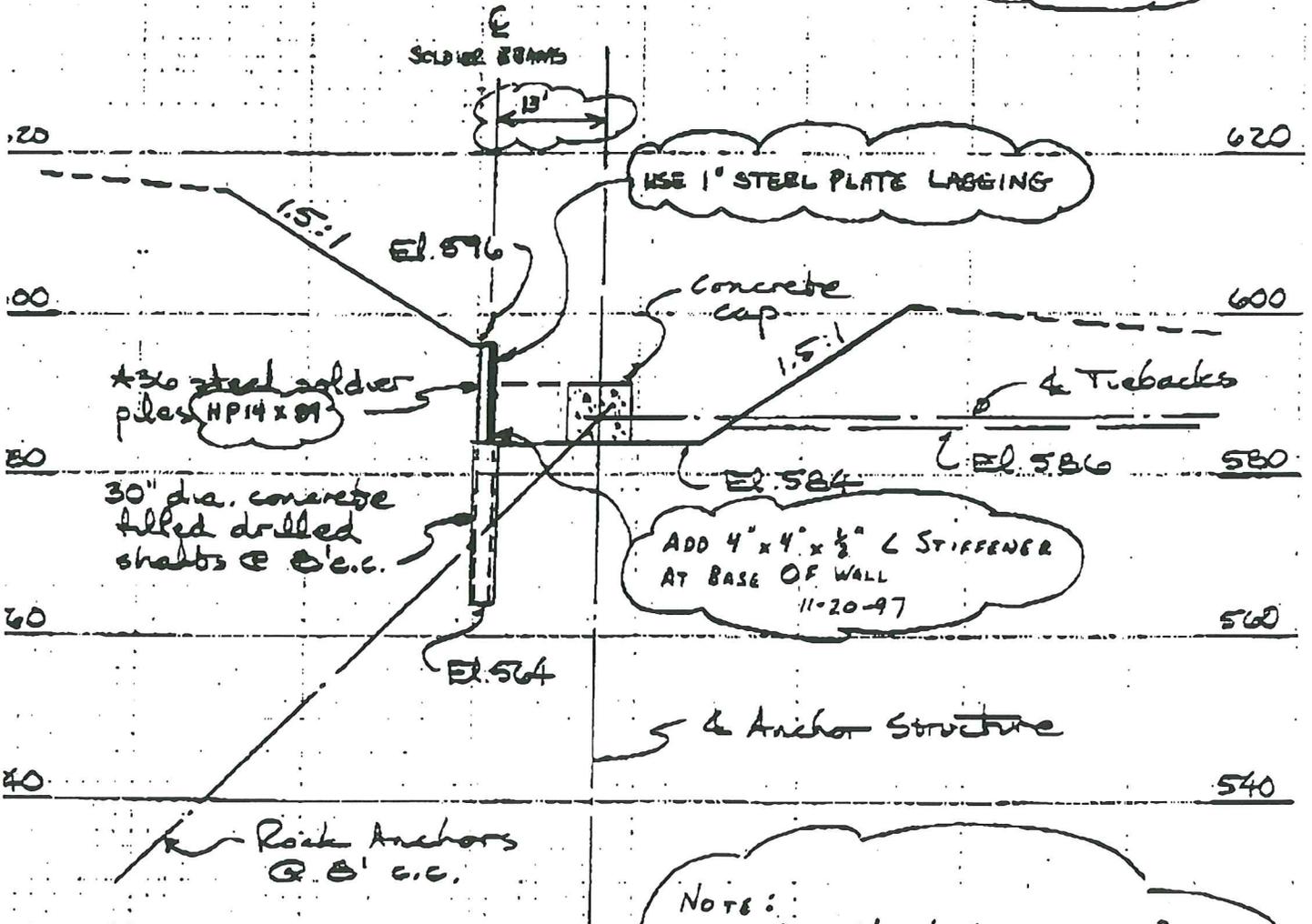
29 North Park Street, Mansfield, Ohio 44902 • 419/324-0074 • FAX 419/324-1872

## CALCULATION SHEET

JOB NO. 93111 PROJECT NO. CJY-90-1524 SHEET NO. 2 OF 3  
 CALC. BY DAP CHECK BY \_\_\_\_\_ DATE 11/3/97  
 SUBJECT Anchor Structure Excavation

REVISED 11-11-97  
 by SWK (GLCC)  
 REVISED 11-20-97  
 BY BPS (GLCC)

### SKETCH NO. 2



ADD 4" x 4" x 1/2" L STIFFENER  
 AT BASE OF WALL  
 11-20-97

NOTE:  
 USE 2 EA. 8' x 6' x 1" PLATES PER BAY.  
 POSITIVE DRAINAGE AT BOTTOM OF 13' PLATE,  
 AT MID HT. JOINT BETWEEN PLATES AND AT  
 VERTICAL SEAM BETWEEN PLATES & H-PILE.  
 11-20-97

# THE GREAT LAKES CONSTRUCTION CO.

6600 SCHAAF ROAD • CLEVELAND, OHIO 44131-1398 • (216) 524-2970 FAX: (216) 642-8693

Project 457-97 I-90 PIER STABILIZATION By S.W. KISH Date 11-1-97  
 Subject ANCHOR STRUCTURE SHEETING Sheet No. 313

## I. LAGGING : STEEL PLATES

(a.) SOIL LOAD @ BASE OF SHEETING  
 $h = 12'$

$\gamma_w = 120 \text{ pcf}$   
 $K_a = 0.35$   
 $\phi = 35^\circ$  } AVAILABLE SOIL DATA

$$P = \gamma_w K_a (h+2)$$

$$= 120 (0.35) (12+2)$$

$$= 588 \text{ psf}$$

(b) CLEAR SPAN = PILE SPACING - FLANGE WIDTH  
 $= 8.00' - 1.21'$   
 $= 6.79'$   
 USE 7'

(c) Maximum Moment (LAGGING) =  $\frac{Pl^2}{12}$  due to effect of soil arching

$$M_{max} = \frac{588 (7)^2}{12} = 2401 \text{ ft. lbs}$$

(d.) Required Plate Thickness, d

$$Max. S_{req} = \frac{M_{max}}{S_b} = \frac{(2.4 \text{ ft.k})(12)}{0.6 (36 \text{ ksi})} = 1.33 \text{ in}^3$$

$$S_x = \frac{bd^2}{6} = \frac{12d^2}{6} = 2d^2 \text{ in}^3 \text{ for } 12" \text{ plate width}$$

$$2d^2 = 1.33 \text{ in}^3$$

$$d^2 = 0.667 \text{ in}^2$$

$$Min. d_{req} = 0.817 \text{ in}$$

USE 1" PLATE