GeoSyntec Consultants

GEOSYNTEC CONSULTANTS
COMPUTATION COVER SHEET

Client: International Uranium Corporation **Project:** White Mesa Mill, Pond 4A
Project/Proposal #: sc0349 **Task #:** 1

Title of Computations: Emergency Spillway Concrete Pavement

Computations By:
SIGNATURE — DATE: 1/6/06
Steven M. Fitzwilliam, Sr. Project Engineer
PRINTED NAME AND TITLE

Assumptions and Procedures Checked By (Peer Reviewer):
SIGNATURE — DATE: 1/6/06
Gregory T. Corcoran, Associate
PRINTED NAME AND TITLE

Computations Checked By:
SIGNATURE — DATE: 1/6/06
Gregory T. Corcoran, Associate
PRINTED NAME AND TITLE

Computations Backchecked By (Originator):
SIGNATURE — DATE: 1/6/06
Steven M. Fitzwilliam, Sr. Project Engineer
PRINTED NAME AND TITLE

Approved By (PM or Designate):
SIGNATURE — DATE: 1/6/06
Gregory T. Corcoran, Associate
PRINTED NAME AND TITLE

Approval Notes: _____

Revisions: (Number and Initial All Revisions)

No.	Sheet	Date	By	Checked By	Approval
1	3	9/22/06	SF	GTC	GTC

Written by: Steve Fitzwilliam Date: 05/01/06 (YY MM DD) Reviewed by: Greg Corcoran GC Date: 06/01/06 (YY MM DD)

Client: IUC Project: White Mesa Mill, Pond 4A Project/Proposal No.: SC0349 Task No.:

Where A is the area of the circle (based on tire pressure and tire load, Attachment E) and D is the diameter of the circle. Rearranging and solving for D:

$$D = 2\sqrt{\frac{A}{\pi}} = 2\sqrt{\frac{50\,in^2}{3.14}} = 8.0\,in$$

Therefore a circle with a 8.0-in. diameter has an area approximately equal to the contact area of one vehicle wheel (50-in^2).

Next, the distance between wheels on the axle must be incorporated into the design method. The length between the back two wheels on a pick-up truck is utilized to determine the equivalent forklift axle wheel spacing. This distance was assumed to be 60-in.

The equivalent wheel base, equivalent contact circle diameter, and the D/k value are then utilized to determine the basic bending moment in the slab (in-lb/in) that results per kip of wheel load applied. From Figure A2.2.2 (Attachment C), we see that the basic bending moment due to the two wheels is ~~165~~ 200 plus 5 in-lb/in/kip, which results in a total moment of approximately ~~170~~ 205 in-lb/in per kip stress. This value is multiplied by the "wheel" load to give the design moment. Based on a total vehicle operating weight of 10,000 lbs. The wheel load is:

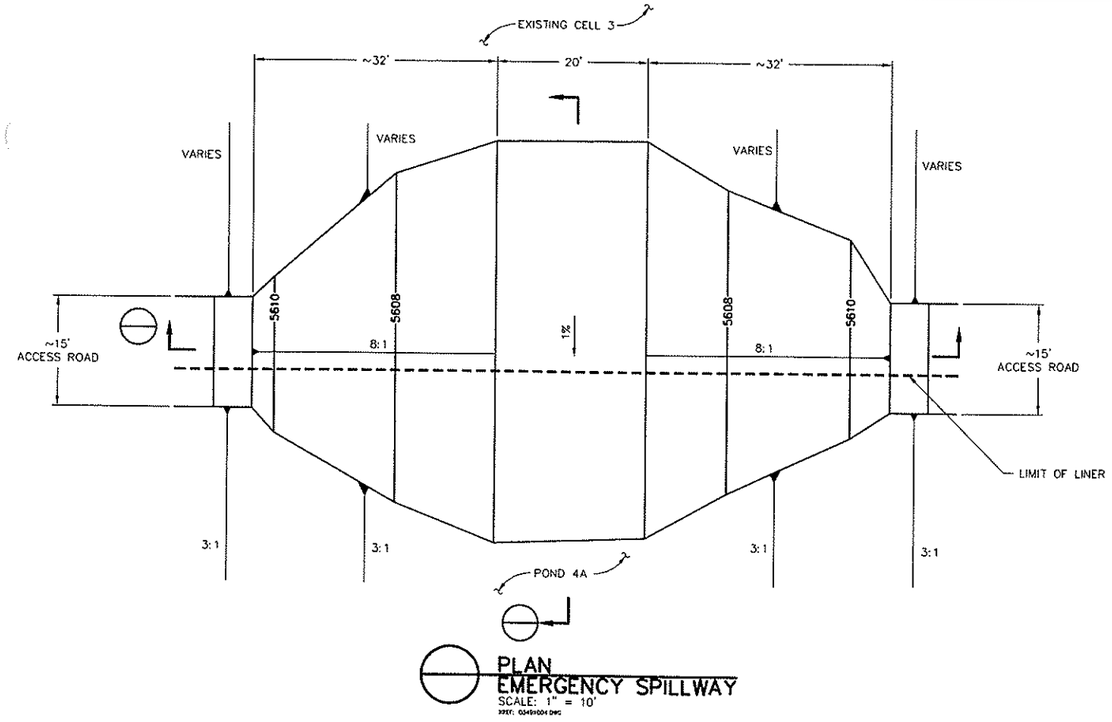
$$"Wheel\ load" = \frac{Total\ axle\ weight}{\#\ of\ wheels} = \frac{8{,}000\,lbs}{2} = 4{,}000\,\frac{lbs}{wheel} = 4.0\,\frac{kip}{wheel}$$

Multiplying the basic moment by the "wheel load", the resulting design moment is:

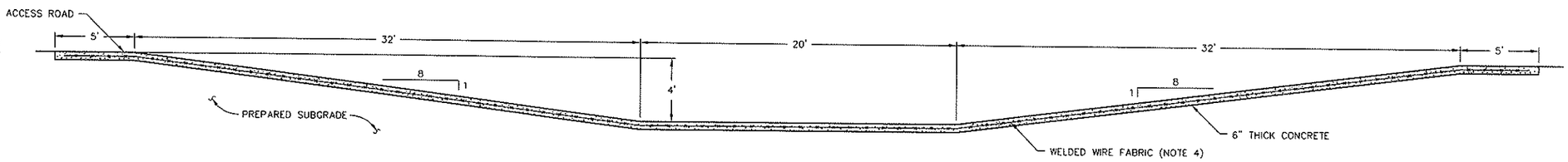
$$Design\ moment = basic\ moment \times wheel\ load = \left(205\,\frac{\frac{in-lb}{in}}{kip}\right) \times (4.0\,kip) = 820\,\frac{in-lb}{in}$$

This design moment and the total allowable flexural stress are utilized to assess if the initial guess for slab thickness is valid. The total allowable flexural stress is the MOR (f_r) divided by a safety factor (SF). For concentrated loads, ACI 360 recommends a SF value between 1.7 and 2.0. For this design, the lower value of 1.7 will be utilized. The 1.7 SF value results in a total allowable tensile stress of:

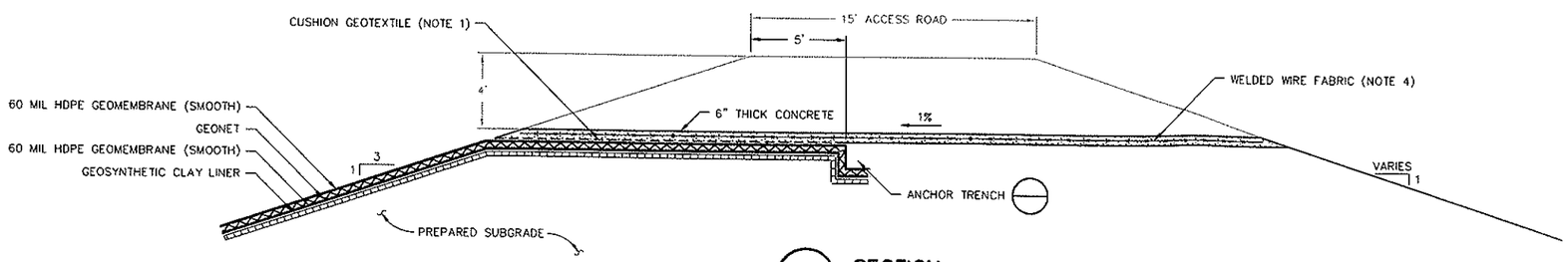
$$\frac{MOR}{SF} = \frac{411\,psi}{1.7} = 242\,psi$$



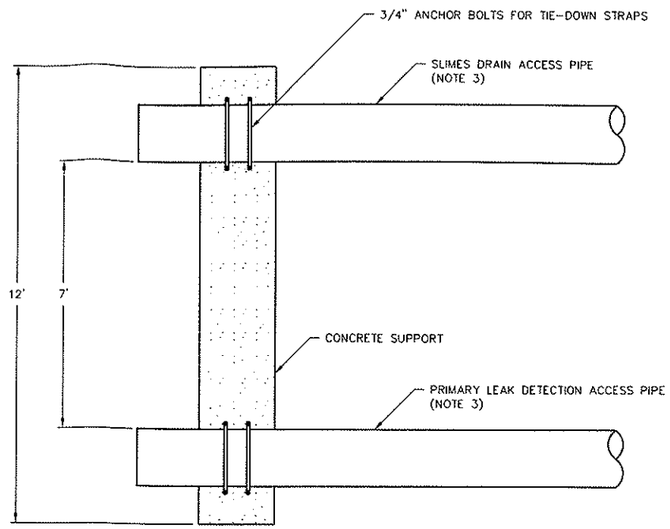
PLAN
EMERGENCY SPILLWAY
SCALE: 1" = 10'

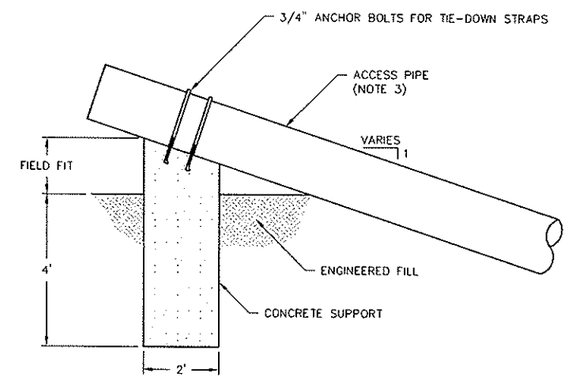


SECTION
EMERGENCY SPILLWAY
SCALE: 1" = 4'



SECTION
EMERGENCY SPILLWAY
SCALE: 1" = 4'





DETAIL
PIPE SUPPORT
SCALE: 1" = 2'

NOTES:

1. CUSHION GEOTEXTILE SHALL BE PLACED OVERLYING PRIMARY GEOMEMBRANE WHERE CONCRETE IS INSTALLED.
2. DETAILS ARE SHOWN TO SCALE INDICATED EXCEPT FOR THE GEOSYNTHETICS, WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY. SOIL THICKNESS ARE MINIMUMS.
3. EXPOSED PVC PIPE SHALL BE PAINTED TO MINIMIZE DAMAGE DUES TO UV DAMAGE.
4. WELDED WIRE FABRIC SHALL BE INSTALLED AT MIDSECTION OF CONCRETE SLAB.

PERMIT DRAWINGS
NOT FOR CONSTRUCTION

INTERNATIONAL URANIUM (USA) CORPORATION
GEOSYNTEC CONSULTANTS
11305 RANCHO BERNARDO ROAD, SUITE 101
SAN DIEGO, CALIFORNIA 92127
TELEPHONE: (858) 674-6559

PROJECT:
POND 4A, WHITE MESA MILL
BLANDING, UTAH

TITLE:
LINING SYSTEM DETAILS III

MARK	DATE	REVISION	BY	APPROVED

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

SEAL

DATE:	NOVEMBER 2005	SCALE:	AS SHOWN
DESIGN BY:	GTC	JOB NO.:	SC0349-01
DRAWN BY:	SLB	FILE NO:	0349C007
CHECKED BY:	GTC	DOCUMENT NO:	-----
REVIEWED BY:	GTC	DRAWING NO:	7 OF 7
APPROVED BY:	GTC		

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