CLIENT Amtrak				STV/SEELYE STEVENSON VALUE & KNECHT.
PROJECT North Access Connection	MADE	CHK.	REV.	JOB. NO. 6018
SUBJECT SEWER CHAMBER	Cheung			SHT. NO. 1
	12/30/83			

Precast Conc. Cover (8") ① one way slab

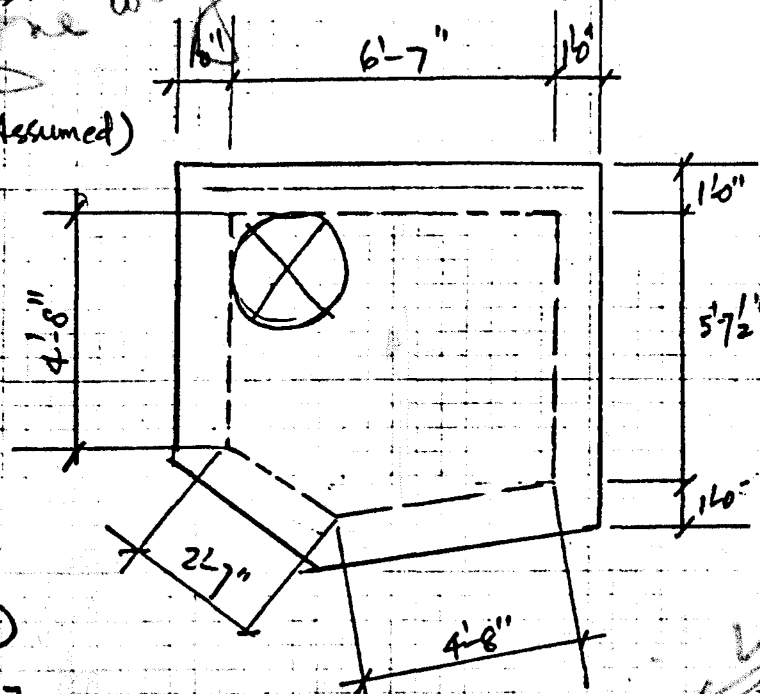
Design slab (two ways)

$7'\text{-}7'' \times 6'\text{-}7\tfrac{1}{2}'' = 7.58 \times 6.63'$ (Assumed)
 (b) (a)

Wt. of Earth $= 1.42' \times 120^{\#}/\text{c.f.}$ (17")
$= 170^{\#}/\square'$

wt. of cover $= 8 \times 12 = 96^{\#}/\square'$
$266 \approx 270^{\#}/\square'$

Total D.L $= 270^{\#}/\square'$



1) Load at short span (D.L)

$$= \frac{b^4}{a^4+b^4} \times 270 = \frac{7.58^4 \times 270}{6.63^4 + 7.58^4}$$

$$= \frac{3301}{1932+3301} \times 270 = 170^{\#}/\square'$$

$$\text{D.L. Moment} = \frac{1}{8} \times 0.17 \times 6.63^2 = \underline{0.94^{\text{k}}/\text{ft}}$$

2) L.L. at short span

Wheel load $= 16^{\text{k}} \times$ Impact $\qquad I = \frac{50}{L+125} = \frac{50}{6.63+125} = 0.38$

use 30% max

$= 16 \times 1.3 = 20.8^{\text{k}}$

$$P = \frac{b^3}{a^3+b^3} \times 20.8 = \frac{7.58^3 \times 20.8}{6.63^3 + 7.58^3} = \frac{436}{291+436} \times 20.8$$

$= 12.5^{\text{k}}/E \qquad E = 0.35X + 3.2 = 0.35 \times \left(\frac{6.63}{2}\right) + 3.2$
$= 4.36'$

$= 12.5/4.36 = 2.87^{\text{k}}/\text{ft}'$

② Use Max. L.L. 1.50 + O.W. KSF or {H 20 + O.W. KSF}

③ check for Shear + Bond

④ check for lifting & hooks

CLIENT Amtrak	STV/SEELYE STEVENSON VALUE & KNECHT.			
PROJECT North Access Connections	MADE	CHK.	REV.	JOB. NO.
SUBJECT Sewer Chamber	CLEUNG			SHT. NO.
	12/30/03			2

Precast Conc. Cover

BM. due to L.L. $= \frac{1}{4} \times 2.87 \times 6.63$

$= 4.76^{IK}/ft$

$\therefore$ Total BM. = D.L + L.L = 0.94 + 4.76

$= 5.7^{IK}/ft$

8" slab

$A_s = \frac{5.7}{1.75 \times 6.5 \text{ d.}} = 0.54^{in^2}/ft$

USE #6 @ 6" (A_s=.88) ea. way

DESIGN OF WALLS

Span max = 7'-7" = 7.58'

USE 300#/s' surcharge.

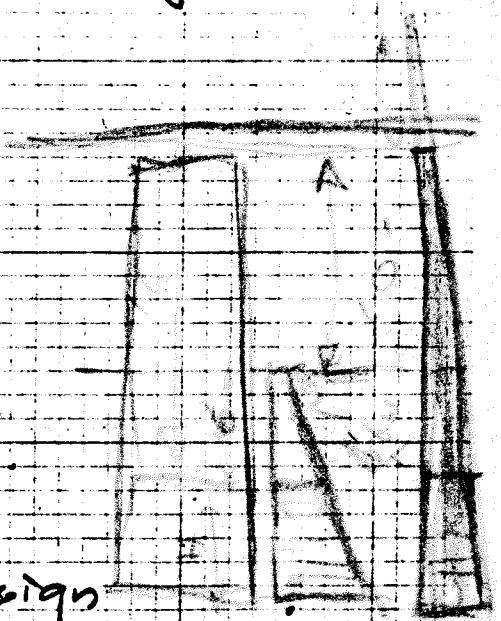
Wt. of Earth = 125#/cu.ft.

Ka = pressure at Rest = 0.5

Water Table above 10FT. Below Grade.

Depth of Chamber ≈ 16'

USE pressure 14FT below grade for design



$P_{surcharg} = 0.5 \times 300 = 150^{\#}/s'$

$P_{Earth} = \underbrace{10' \times 125 \times 0.5}_{\text{above W.T.}} + \underbrace{(14-10) \times 62.5 \times 0.5}_{\text{below water. } (125-62.5)} = 625 + 188 = 813^{\#}/s'$

$P_{water} = (14-10) \times 62.5 = 250^{\#}/s'$

$\therefore \Sigma P = 150 + 813 + 250 = 1213^{\#}/s'$

$\pm M = \frac{1}{12} \times 1.213 \times 7.58^2 = 5.8^{IK}/ft$

CLIENT Amtrak	STV/SEELYE STEVENSON VALUE & KNECHT.			
PROJECT North Access Connection	MADE	CHK.	REV.	JOB. NO. 1018
SUBJECT SEWER CHAMBER #1	C. LEUNG			SHT. NO. 3.
	12/31/83			

DESIGN OF WALLS

$$A_s = \frac{5.8}{1.75 \times (12 - 2.5)} = 0.35^{sq.in./ft}$$

(2" cover)

12" WALLS.

USE #5 @ 10" (A_s = 0.37) Horiz. EF.

#4 @ 12" Vert. EF

DESIGN OF INVERT

Load From Roof. 1. L.L. 20.8^K $= 20.8^K$

2. D.L. $0.27^{K/ft^2} \times 8.58 \times 7.63' = 17.7$

WALLS. $\leq 1.15 \times 16'' H \times (7.58 + 6.63) \times 2 \leq \frac{68.2}{106.7^K}$

Net Bearing Pressure $= \frac{106.7}{8.58 \times 7.63} = 1.63^{K/ft^2}$

$B.M. = \frac{1}{16} \times 1.63 \times 8^2 \times 0.8 = 5.2^{IK/ft}$

two ways ↑ continuity

Minimum thickness of Invert 18" at Midspan

$$A_s = \frac{5.2}{1.75 \times 14.5} = 0.204$$

Use #4 @ 12" T. & B. E.W