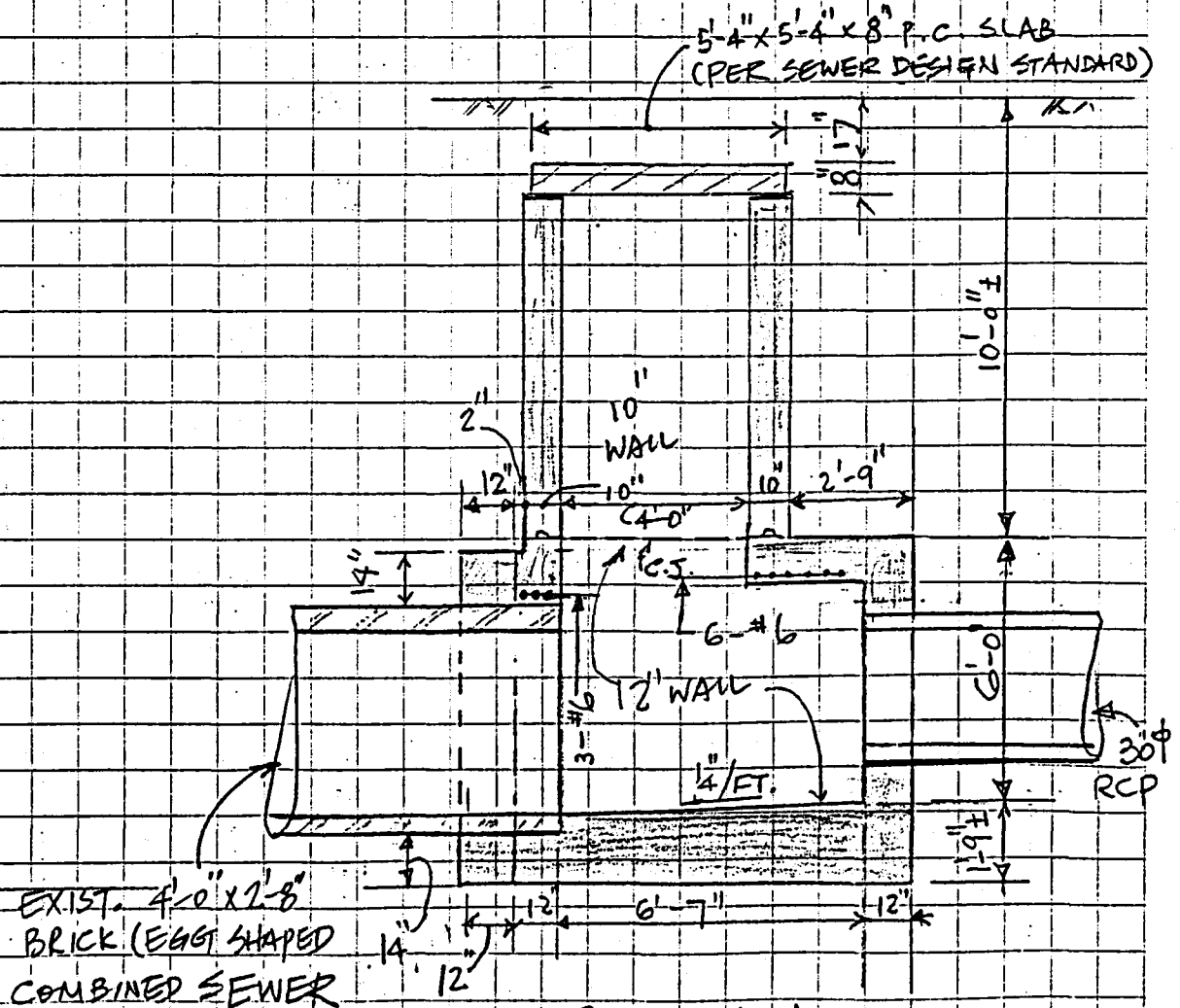
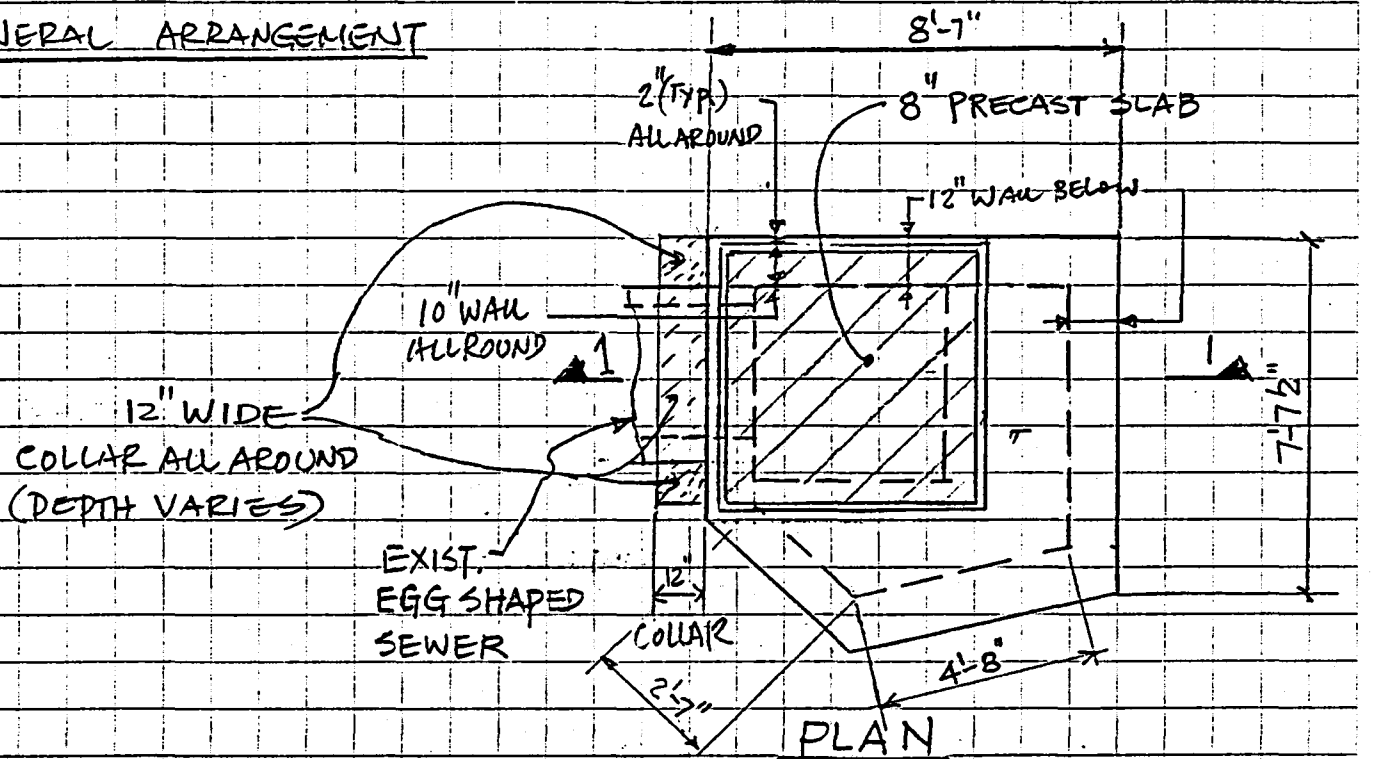


GENERAL ARRANGEMENT





STV/SEELYE STEVENSON LUE & KNECHT.

CONSULTING ENGINEERS

JOB: ANTRAK-NORTH ACCESS TUNNEL

NOTES BY

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SEWER CHAMBER

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LOWER WALL DESIGN (12" THICK)

Data: Max depth of Wall 16'±
 L.L. SURCHARGE 1500 PSF
 K_a (Pressure at Rest) = 0.5
 Water table at 10'± below GRADE

DESIGN Wall Span VERTICALLY (6'-0"). PROVIDE ADD'L BARS
 USE LATERAL PRESSURE at 14' below grade for design

$$1) \text{Earth Pressure} = 10 \times 12.5 \times 0.5 + (14-10) \times (12.5-6.25) \times 0.5 = 750 \text{ PSF}$$

$$2) \text{Water Pressure} (14-10) \times 6.25 = 250$$

$$3) \text{Surcharge pressure} = 1500 \times 0.5 = 750$$

$$1,750 \text{ PSF}$$

$$BM = \pm \frac{1}{10} \times 1,750 \times 6.0^2 = 6,300 \text{ LB/FT.} = 6.3 \text{ K/FT.}$$

$$As = \frac{6.3 \times 12}{20 \times 85 \times (12-2.5)} = 0.468 \text{ IN}^2/\text{FT.}$$

USE #5@8" (0.47) E.W.
 E.F.

No. REINF REQ'D FOR 10" WALL

8" PRECAST CONC. ROOF PER "SEWER DESIGN STANDARDS"
 P.16.

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SEWER CHAMBER

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DESIGN OF INVERT MIN. THICKNESS 14" at END. (Span 7.58' ± 6.63')

Load From Roof (L.L.)

1500 psf.

Earth + Cover

290

$$\text{WALLS.} = \frac{150 \text{ psf} \times 16' \text{H} (7.58 + 6.62) \times 2}{12'' \times (8.58 \times 7.62)}$$

1040

2,830 psf.

AREA OF INVERT

$$\text{Max. B.M.} = \frac{1}{8} \times 2,830 \times 7.58^2 = 20,321 \text{ K.}$$

$$A_s = \frac{20,321 \times 12}{20 \times 85 (14 - 2.5)} = 1.247 \text{ sq. in./ft.}$$

USE #7 @ 6" (Top) E.W. (1.2)
#6 @ 12" (Btm) E.W.

Check SHEAR

$$V = 2,830 \times \frac{1}{2} \times 6.58 \text{ (clear span)} = 9,310 \text{ #}$$

$$V \text{ at 'd' from supp.} = 9,310 - 1' \times 2,830 = 6,480 \text{ #/ft.}$$

$$V_c = \frac{6,480}{12 \times (14 - 2.5)} = 47 \text{ psi} < 65 \text{ psi OK}$$

Check Bond

$$u = \frac{V}{\sum o_j d} = \frac{9,310}{\frac{20}{2 \times 7} \times (2 \times 2.75) \times 8.5 \times 11.5} = 173 \text{ psi} < \frac{3.4 \sqrt{f_c}}{D} = 212 \text{ psi. OK}$$