

Amtrak

LETTER OF TRANSMITTAL

SMITH

FROM: Mr. A. E. Shaw Jr., P. E.
 Director of Engineering, T & S
 Amtrak
 2000 Market St.
 Philadelphia, Pa. 19103

DATE: Dec. 5, 1988
 PROJECT: West Side Connection
 LOCATION: New York City
 ATTENTION: C. Patel
 RE:

TO: Mr. Magdi Farag, P. E. Chief
 Div. of Sewer Regul. & Control
 Bureau of Sewers
 N.Y.C. Dept. of Environmental Protection
 40 Worth St. Rm 922
 New York, NY 10013

IF ENCLOSURES ARE NOT AS INDICATED,
 NOTIFY:

Norm Satterthwaite
 215-557-4274

GENTLEMEN:

WE ARE SENDING YOU ☒ HEREWITH ☐ DELIVERED BY HAND ☐ UNDER SEPERATE COVER
 VIA _____ THE FOLLOWING ITEMS:
☐ PLANS ☐ PRINTS ☐ SHOP DRAWINGS ☐ SAMPLES ☐ SPECIFICATIONS ☐ ESTIMATES
☐ COPY OF LETTER ☒ OTHER (SPECIFY) _____

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1	—	Calculations (structural) for Manhole #14 & structural cap on existing manhole (3 sheets)

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REMARKS:

RECEIVED
 D.E.P. BUREAU OF SEWERS

DEC 12 1988

DIVISION OF
 SEWER REGULATION
 AND CONTROL

NRPC 793 (1/85)

SIGNED: *N. Satterthwaite* for AES
 TITLE: *Sc. Civil Engineer*

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12/12/88

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REMARKS:

55095
 12-14-88

By NS Date Subject WESTSIDE CONNECTION Sheet 1 of 3
 checked by Date Job No.

DESIGN STRUCTURAL CAP FOR EXISTING NATURAL: (2'Ø OPENING)

TOP OF BALUST $\approx$ ELEV 15.67

TOP OF CAP 13.00
2.67'

DEAD LOAD

BALUST: $2.67 \times 0.12 = 0.32$

CAP $0.67 \times 0.15 = 0.10$

0.42 k

LIVE LOAD (SGO)

$$w = \frac{60}{8.5 \times 5} = 1.41 \text{ k/sf}$$

$$\text{Total } w_{DL+LL} = 0.42 + 1.41 = 1.83 \text{ k}$$

Assume $L = 2'$ (CONSERVATIVE)

$$M_{max} = \frac{1}{8} \times 1.83 \times 2^2 = 0.915$$

$$d_{min} = \sqrt{\frac{915}{295}} = 1.76'$$

USE ϕ''

$$F_s = 24 \text{ ksi}$$

$$n = 8$$

$$k = 0.45 \times 4 = 1.8$$

$$k = 0.375$$

$$j = 0.875$$

$$A_s = \frac{915 \times 12}{24 \times 0.875 \times 4} = 0.13 \text{ in}^2$$

USE #6 @ 6" + E.W. $A_s = 0.88$

DESIGN MANHOLE # 14

Top of wall elev = 13.58 ±

Bottom of wall elev = 8.58 ±

Ballast elev = 15.67 ±

Height of wall = 5.25' ~ 5.5'

Top of ballast to bottom of wall = 7.94' ~ 7.5'

SURCHARGE (LIVE LOAD)

$$= \frac{60,000}{8.5 \times 5 \times 120} = 11.8'$$

FOR HORIZONTAL REINF: Assume wall loaded @ sides w/ earth pressure & live load surcharge and 5' max span. Use max loadings @ base of wall (conservative)

$w_1 (\text{earth}) = 7.5 \times 0.36 = 0.27$

$w_2 (\text{LL}) = 11.8 \times 0.36 = 0.42$
0.69

$M_{\text{max}} = 1.25 \times 0.69 \times 5^2 = 2.21^{\text{K}}$

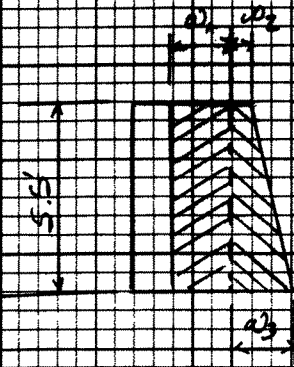
$d = 12 - 3 = 9"$

$A_s = \frac{2.21 \times 12}{24 \times 0.875 \times 9} = 0.14$

USE #4 @ 9" (As = 0.27)

FOR VERTICAL REINF: Assume wall acting like a sheeting w/ earth pressure and live load surcharge & 5.5' height of wall.

MASTOLES #14 (CONT'D)



$$w_1 = 11.8 \times .036 = 0.42$$

$$w_2 = 2 \times .036 = 0.07$$

$$w_3 = 7.5 \times .036 = 0.27$$

$$M_{max} = 0.42 \times \frac{5.5^2}{2} + 0.07 \times \frac{5.5^2}{2} + \frac{1}{2} \times 0.27 \times \frac{5.5^2}{3} = 8.4 \text{ in}^2$$

$$d = \frac{1}{2}(12) = 6"$$

$$A_s = \frac{8.4 \times 12}{24 \times .875 \times 6} = 0.8 \text{ in}^2$$

$$\text{USE \# 8 @ 9" } \quad A_s = 1.05 \text{ in}^2$$

Department of
Environmental Protection

[illegible]

~~I. Once~~ NAS 12/1/88
p14 handle

Mr. A.E. Shaw, Jr. P.E.
Director of Engineering, Track & Structures
National Railroad Passenger Corporation
200 Market Street
Philadelphia, PA 19103

Dear Mr. Shaw:

On September 16, 1988 and September 28, 1988, (by telephone) the above was requested by Mr. Chandrakant Patel of our office. In order to finally approve the project please submit the requested calculations.

Very truly yours,

Mae di Tang

MAGDI FARAG, P.E., CHIEF
Division of Sewer Regulation & Control
Office of the Chief Engineer