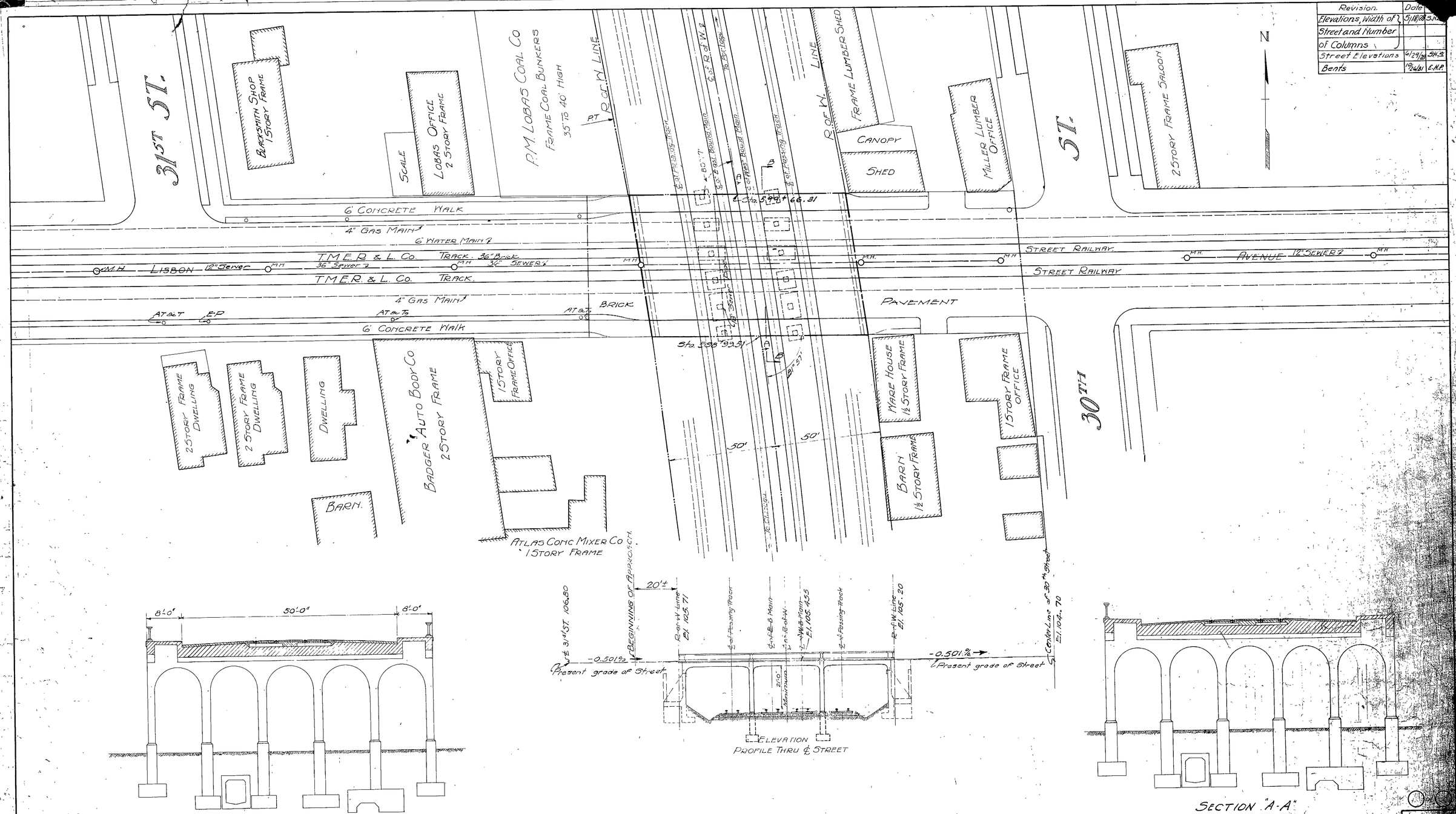
| Revision. | Date | |
|---|---|---|
| Elevations, Width of Street and Number of Columns | 5/18/20 | S.H.G. |
| Street Elevations | 6/29/20 | S.H.G. |
| Bents | 12/26/21 | E.H.P. |




Approved:— _____
Commissioner of Public Works
City of Milwaukee

A.F.E. 4939.

C.M. & ST. P. RY.

ENGINEERING DEPARTMENT.

NORTHERN DIVISION GRADE SEPARATION
MILWAUKEE WIS.
WATERTOWN PLANK ROAD TO FOND DU LAC AVE.
LISBON AVE. CROSSING OVERHEAD

Chicago: Sept. 18-1920. Drawing No. E.B.S.N.

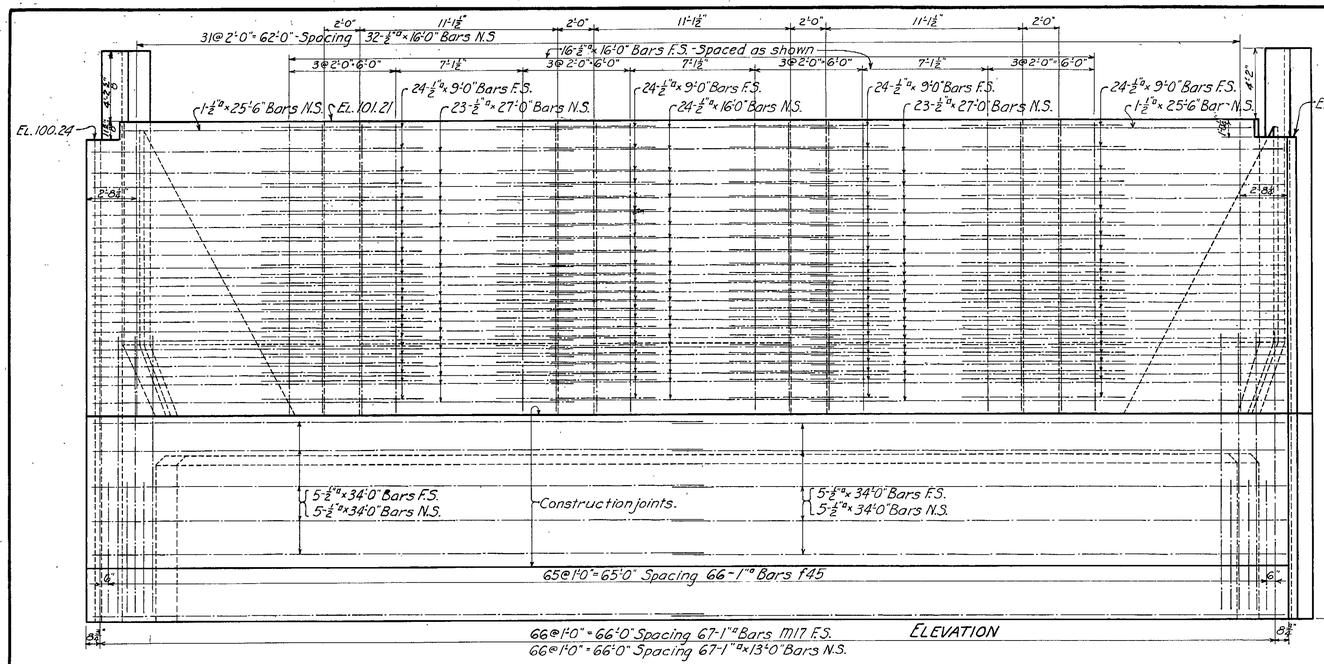
Correct: Chas. H. Bairhright, Engr. of Design.

Approved: C. A. Loweth, Chief Engr.

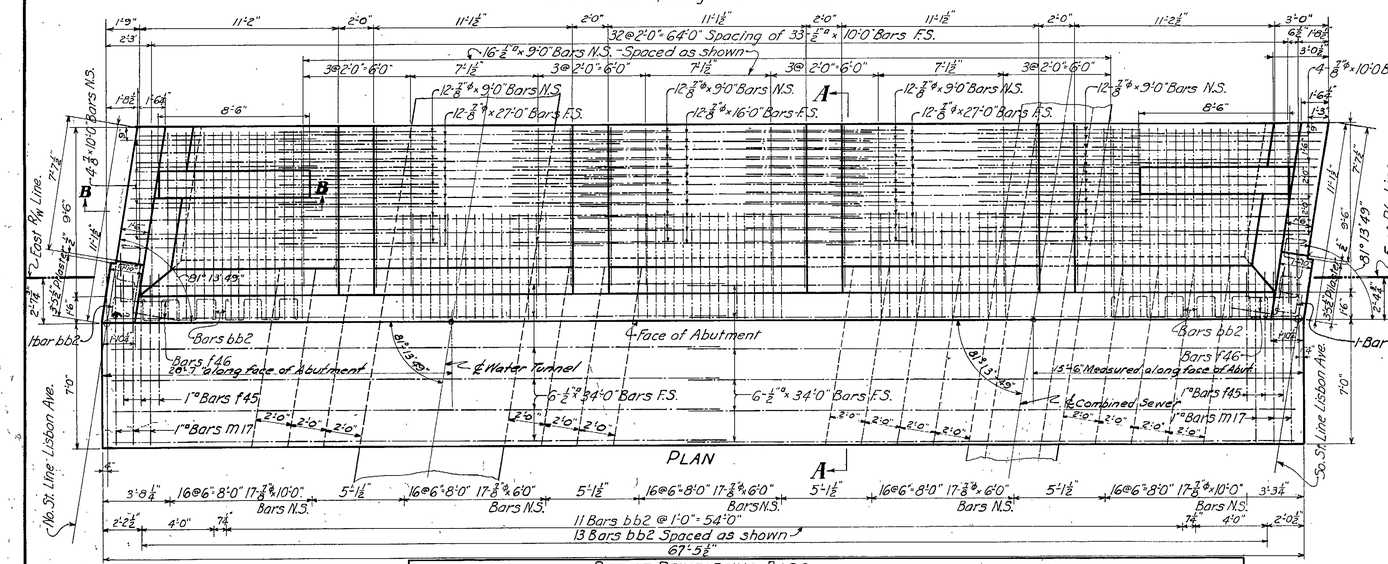
C.N.R. T.F. C.M.&S.P.R.Y.

A.230
P.27

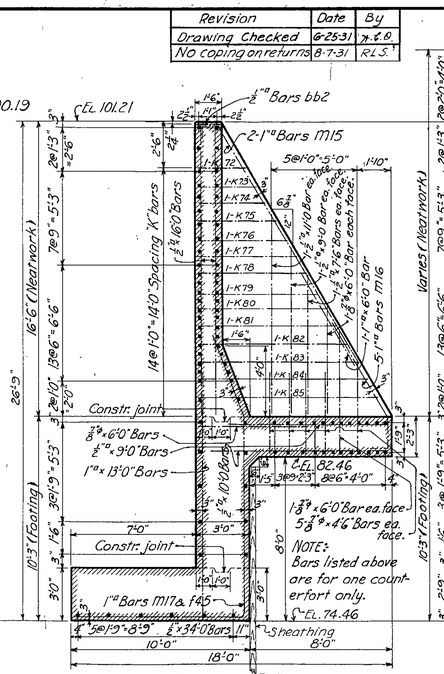
| Revision | Date | By |
|---|---|---|
| Drawing Checked | 6-25-31 | J.E.B. |
| No coping on returns | 8-7-31 | R.L.S. |



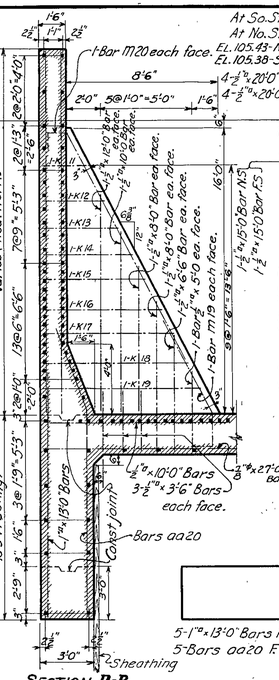

ELEVATION



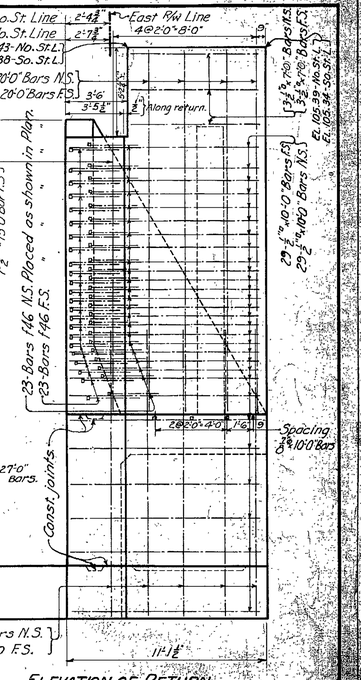

PLAN



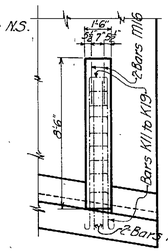

SECTION A-A



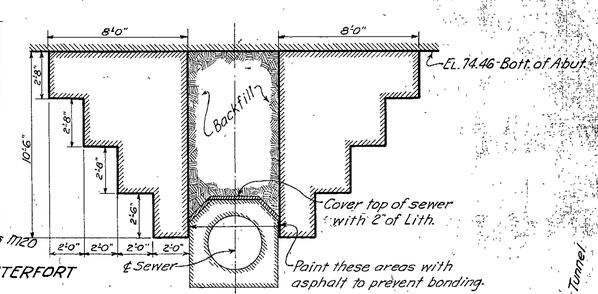

SECTION B-B



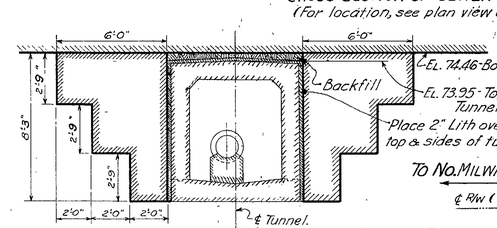

ELEVATION OF RETURN



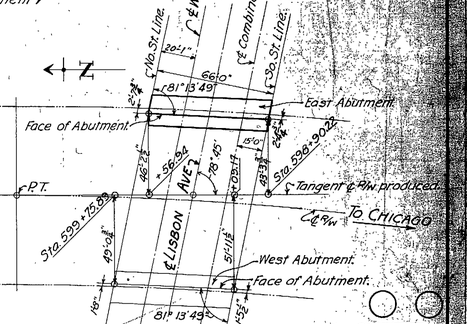

DETAIL OF END COUNTERFORT
(Top view)



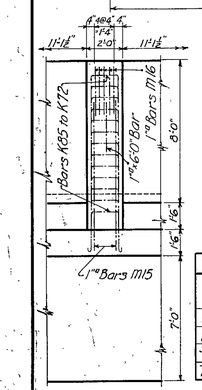

CROSS SECTION OF SEWER ENCASEMENT
(For location, see plan view of Abutment)




CROSS SECTION OF WATER TUNNEL ENCASEMENT
(For location, see plan view of Abutment)




LOCATION PLAN




DETAIL OF MAIN COUNTERFORT
(Top View)

## BILL OF CONCRETE

| Location | Class AA | Class A |
|---|---|---|
| Footing | 188.5 | |
| Neatwork | 121.5 | |
| Sewer & Tunnel Encasement | | 64.4 |
| Total Cu. Yds. | 310.0 | 64.4 |

## BILL OF REINFORCING BARS

### Straight Bars

| No. | Size | Length | Location: Lower Ftg. | Upper Ftg. | Main Wall | Return Wall | Counterforts: End | Main | Weight # |
|---|---|---|---|---|---|---|---|---|---|
| 12 | 1/2"ø | 3'-6" | | 12 | | | | | |
| 4 | " | 5'-0" | | 4 | | | | | |
| 4 | " | 6'-6" | | 4 | | | | | |
| 12 | " | 7'-0" | | | | 12 | | | |
| 8 | " | 9'-0" | | 4 | | | 4 | | |
| 120 | " | 9'-0" | | 16 | 96 | | | 8 | |
| 37 | " | 10'-0" | | 33 | | | 4 | | |
| 124 | " | 11'-0" | 4 | 20 | | 92 | | 8 | |
| 4 | " | 12'-0" | | | | | 4 | | |
| 72 | " | 16'-0" | | | 72 | | | | |
| 16 | " | 20'-0" | | | | 16 | | | |
| 2 | " | 25'-6" | | | 2 | | | | |
| 46 | " | 27'-0" | | | 46 | | | | |
| 32 | " | 34'-0" | 12 | 20 | | | | | |
| 4 | " | 15'-0" | | | | 4 | | | |
| 8 | " | 7'-6" | | | | | | 8 | 6 080 |
| 40 | 7/8"ø | 4'-6" | | 40 | | | | | |
| 67 | " | 6'-0" | | 59 | | | | 8 | |
| 48 | " | 9'-0" | | 48 | | | | | |
| 42 | " | 10'-0" | | 42 | | | | | |
| 12 | " | 16'-0" | | 12 | | | | | |
| 24 | " | 27'-0" | | 24 | | | | | |
| | | | | | | | | | 4 710 |
| 4 | 1"ø | 6'-0" | | | | | 4 | | |
| 77 | " | 13'-0" | 77 | | | | | | |
| | | | | | | | | | 3 530 |
| | | | | | | | | Total Wt. = | 14 320 |

### Bent Bars

| Type | Mark | No. | Size | Length | I | II | III | IV | V | VI | VII | Location | Weight # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bar "f" | f45 | 66 | 1"ø | 14'-6" | 7'-4" | | | | | | | Lower ftg. | 3 290 |
| | f46 | 92 | 1/2"ø | 5'-6" | 2'-9" | | | | | | | Main Wall corners | 435 |
| Bar "K" | K11 | 2 | " | 7'-6" | 6" | 7" | 2'-2 1/2" | 1'-0" | 2'-4 1/2" | 2 1/2" | | End counterfs | |
| | K12 | 2 | " | 9'-0" | 6" | 7" | 2'-11 1/2" | 1'-0" | 3'-2" | 2 1/2" | | " " | |
| | K13 | 2 | " | 10'-6" | 5 1/2" | 7" | 3'-9 1/2" | 1'-0" | 4'-0" | 2 1/2" | | " " | |
| | K14 | 2 | " | 12'-0" | 5" | 7" | 4'-7 1/2" | 1'-0" | 4'-9 1/2" | 2 1/2" | | " " | |
| | K15 | 2 | " | 13'-6" | 4" | 7" | 5'-4 1/2" | 1'-0" | 5'-7" | 2 1/2" | | " " | |
| | K16 | 2 | " | 15'-0" | 3" | 7" | 6'-1 1/2" | 1'-0" | 6'-4 1/2" | 2 1/2" | | " " | |
| | K17 | 2 | " | 16'-6" | 2" | 7" | 6'-11 1/2" | 1'-0" | 7'-1 1/2" | 2 1/2" | | " " | |
| | K18 | 2 | " | 18'-6" | 6" | 7" | 7'-8 1/2" | 1'-0" | 7'-11" | 2 1/2" | | " " | |
| | K19 | 2 | " | 20'-0" | 6" | 7" | 8'-6 1/2" | 1'-0" | 8'-8 1/2" | 2 1/2" | | " " | |
| Bar "m" | K72 | 4 | " | 8'-0" | 4" | 7" | 3'-3 1/2" | 1'-8 1/2" | 3'-6 1/2" | 2 1/2" | | Main " | |
| | K73 | 4 | " | 9'-6" | 6" | 7" | 2'-10 1/2" | 1'-8 1/2" | 3'-7" | 2 1/2" | | " " | |
| | K74 | 4 | " | 10'-6" | 5" | 7" | 3'-5 1/2" | 1'-8 1/2" | 3'-9" | 2 1/2" | | " " | |
| | K75 | 4 | " | 11'-6" | 4" | 7" | 4'-0 1/2" | 1'-8 1/2" | 4'-3" | 2 1/2" | | " " | |
| | K76 | 4 | " | 13'-0" | 6" | 7" | 4'-7 1/2" | 1'-8 1/2" | 4'-10" | 2 1/2" | | " " | |
| | K77 | 4 | " | 14'-0" | 6" | 7" | 5'-1 1/2" | 1'-8 1/2" | 5'-4" | 2 1/2" | | " " | |
| | K78 | 4 | " | 15'-0" | 5" | 7" | 5'-6 1/2" | 1'-8 1/2" | 5'-11" | 2 1/2" | | " " | |
| | K79 | 4 | " | 16'-0" | 4" | 7" | 6'-3 1/2" | 1'-8 1/2" | 6'-6" | 2 1/2" | | " " | |
| | K80 | 4 | " | 17'-6" | 6" | 7" | 6'-10 1/2" | 1'-8 1/2" | 7'-1" | 2 1/2" | | " " | |
| | K81 | 4 | " | 18'-6" | 5" | 7" | 7'-5 1/2" | 1'-8 1/2" | 7'-8" | 2 1/2" | | " " | |
| | K82 | 4 | " | 19'-6" | 4" | 7" | 8'-0 1/2" | 1'-8 1/2" | 8'-3" | 2 1/2" | | " " | |
| | K83 | 4 | " | 21'-0" | 6" | 7" | 8'-7 1/2" | 1'-8 1/2" | 8'-10" | 2 1/2" | | " " | |
| | K84 | 4 | " | 22'-6" | 5" | 7" | 9'-2 1/2" | 1'-8 1/2" | 9'-5" | 2 1/2" | | " " | |
| | K85 | 4 | " | 23'-0" | 4" | 7" | 9'-9 1/2" | 1'-8 1/2" | 10'-0" | 2 1/2" | | " " | 970 |
| Bar "aa" | M15 | 8 | 1"ø | 17'-0" | 2'-8" | 1'-2" | 7'-2" | 1'-6" | | | | Main counterfs | |
| | M16 | 20 | " | 9'-6" | 6'-8" | 2'-0" | 5'-9" | 3'-8" | | | | " " | |
| | M17 | 67 | " | 23'-9" | 4'-6" | 10'-0" | 4'-2" | 1'-7" | | | | Lower ftg. | 6 595 |
| | M19 | 4 | 7/8"ø | 8'-6" | 6'-0" | 2'-0" | 5'-3" | 2'-10" | | | | End counterfs | |
| | M20 | 4 | " | 18'-0" | 14'-0" | 1'-2" | 6'-7" | 1'-4" | | | | " " | 205 |
| | aa20 | 10 | 7/8"ø | 15'-0" | 5'-0" | 4'-8" | 1'-9" | | | | | Lower ftg. | 310 |
| Bar "bb" | bb2 | 15 | 1/2"ø | 11'-0" | 6" | 7" | 1'-4" | 1'-0" | 1'-2" | 4'-0" | 2 1/2" | Br. seat | 14.5 |
| | | | | | | | | | | | | Total Wt. = | 11 950 |

## Construction Notes

All edges, corners & articulating joints exposed to view after fill is made are to be beveled with 1" V-strips.
Every bar to be a deformed bar with effective section equivalent to that of size given.
All bars to be bent to a radius of 4 1/2 diameters on ℄ of bars, except as noted.
Minimum laps of bars, unless otherwise noted, to be 1'-3" for 1/2"ø bars; 2'-0" for 7/8"ø bars & 2'-3" for 1"ø bars.
Construction joints are to be made only where shown.

## General Notes

Location:- Lisbon Ave.; Milwaukee, Wis. Alignment:- Spiral
Grade:- 0.65% Compensated.
Bearing on Soil:- With D.L., L.L., Track Load & Horizontal Thrust ---- 2.7 Tons per sq. ft.
With above loads plus thrust due to contraction of Bridge ---- 3.0 Tons per Sq. ft.
If the material encountered is not suitable for these loads, drive piles.

Drg. No. General Plan ---- E-3506
Drg. No. West Abutment ---- E-9400
Drg. No. Bents ---- E-9396
Drg. No. Floor Plan ---- E-9394
Drg. No. Floor Sections ---- E-9395
Drg. No. Hand Railings ---- E-9398

A.F.E. 4 939

A- 3067
P- 18

C.M.St.P.&P.R.R.
Engineering Department

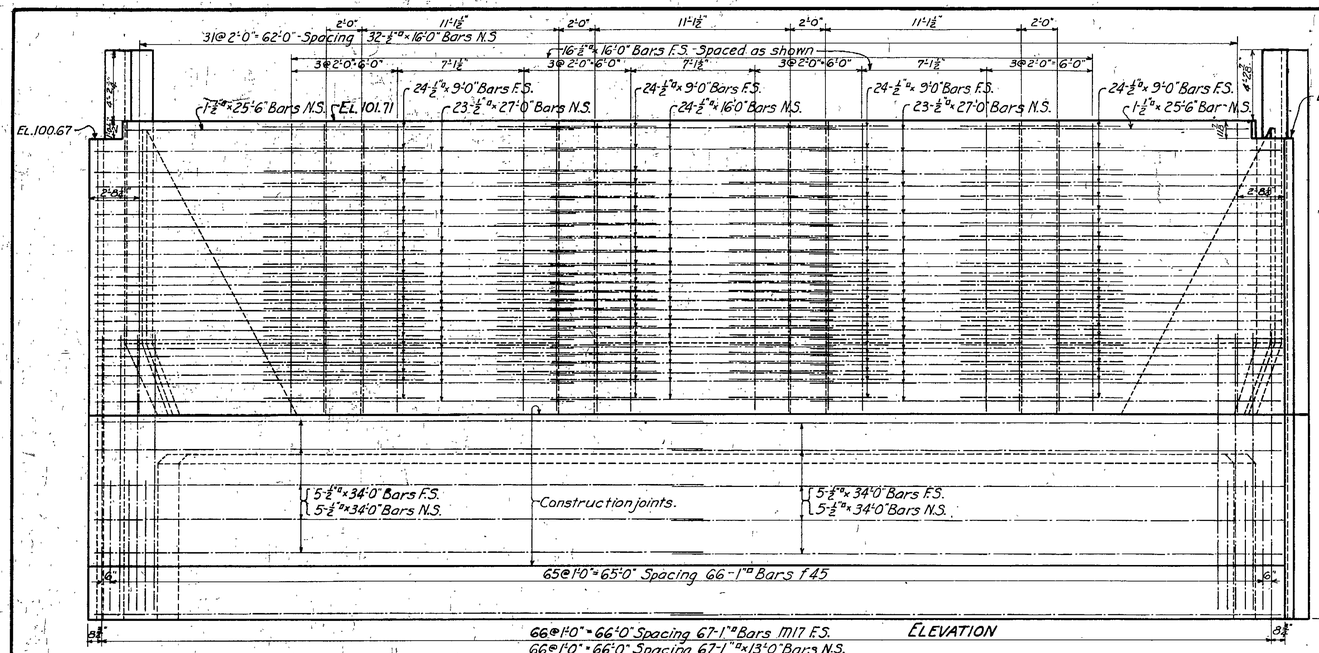
Northern Division Grade Separation, Milwaukee, Wis.
Watertown Plank Road to Fond-du-Lac Ave.

# Details of East Abutment - Lisbon Avenue Crossing

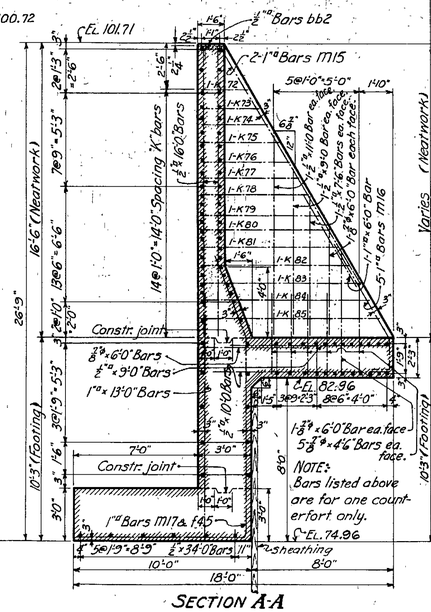
Chicago, April 21, 1931 — Drawing No. E-9399

Correct:- Approved:-
Eng^r of Design — Chief Engineer

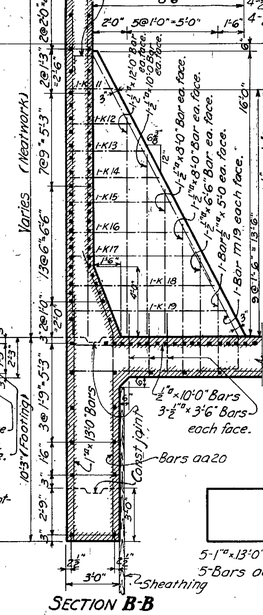
| Revision | Date | By |
|---|---|---|
| Drawing Checked | 6-25-31 | n.c.a. |
| No coping on returns | 8-5-31 | R.L.S. |



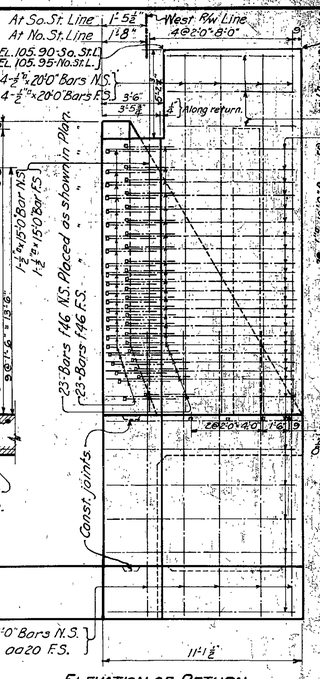

ELEVATION



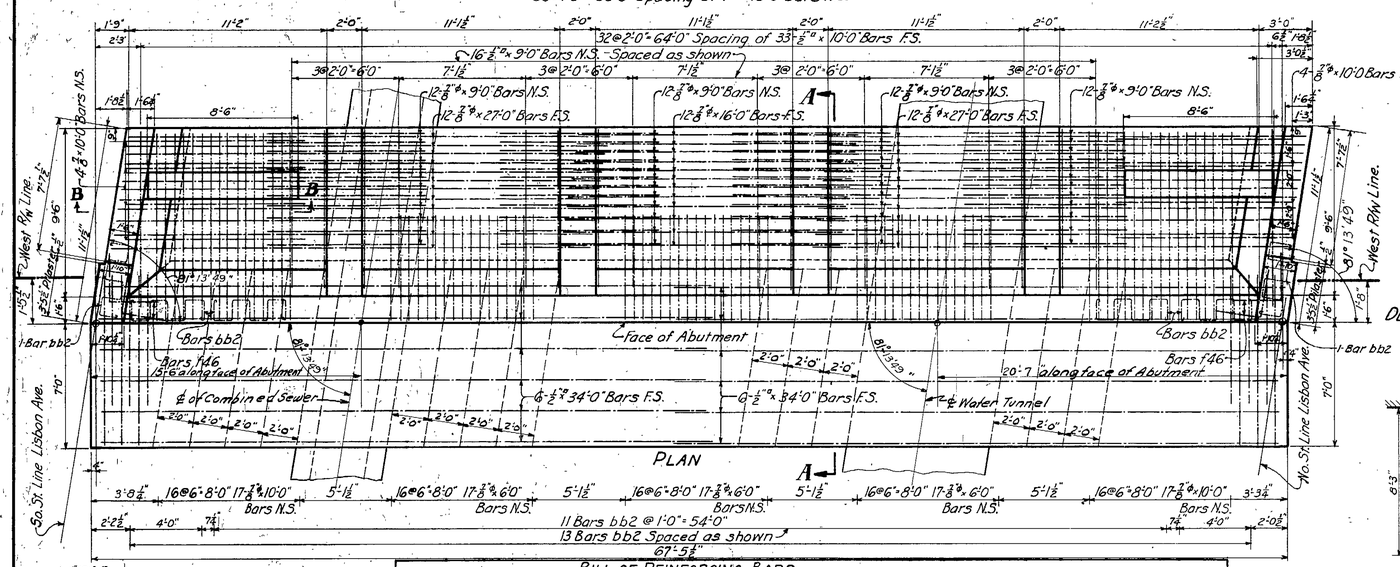

SECTION A-A



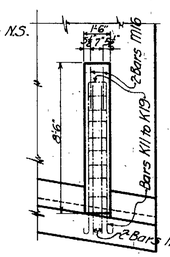

SECTION B-B



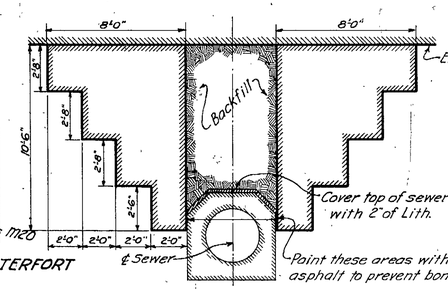

ELEVATION OF RETURN



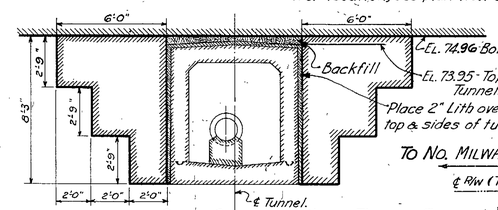

PLAN



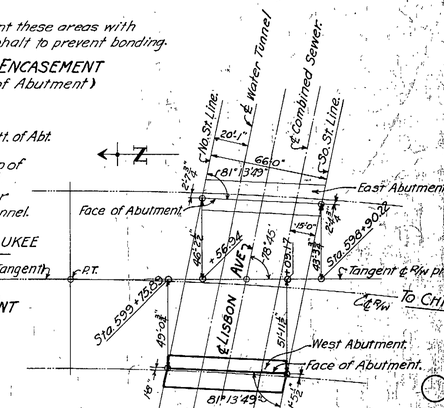

DETAIL OF END COUNTERFORT
(Top view)



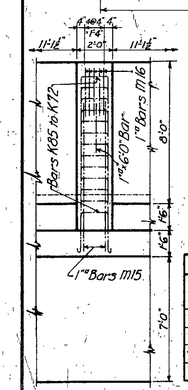

CROSS SECTION OF SEWER ENCASEMENT
(For location, see plan view of Abutment)




CROSS SECTION OF WATER TUNNEL ENCASEMENT
(For location, see plan view of Abutment)




LOCATION PLAN




DETAIL OF MAIN COUNTERFORT
(Top View)

## BILL OF REINFORCING BARS

### Straight Bars

| No. | Size | Length | Location: Lower Ftg. | Upper Ftg. | Main Wall | Return Wall | Counterforts: End | Counterforts: Main | Weight # |
|---|---|---|---|---|---|---|---|---|---|
| 12 | ½"ø | 3'-6" | | 12 | | | | | |
| 4 | " | 5'-0" | | 4 | | | | | |
| 4 | " | 6'-6" | | 4 | | | | | |
| 12 | " | 7'-0" | | | | 12 | | | |
| 8 | " | 8'-0" | | 4 | | | 4 | | |
| 120 | " | 9'-0" | | 16 | 96 | | | 8 | |
| 37 | " | 10'-0" | | 33 | | | 4 | | |
| 124 | " | 11'-0" | 4 | 20 | | 92 | | 8 | |
| 4 | " | 12'-0" | | | | | 4 | | |
| 72 | " | 18'-0" | | | 72 | | | | |
| 16 | " | 20'-0" | | | | 16 | | | |
| 2 | " | 25'-6" | | | 2 | | | | |
| 46 | " | 27'-0" | | | 46 | | | | |
| 92 | " | 34'-0" | 12 | | | | | | |
| 4 | " | 15'-0" | | | | 4 | | | |
| 8 | " | 7'-6" | | | | | 8 | | 6 080 |
| 40 | ⅞"ø | 4'-6" | | 40 | | | | | |
| 67 | " | 6'-0" | | 59 | | | | 8 | |
| 48 | " | 9'-0" | | 48 | | | | | |
| 42 | " | 10'-0" | | 42 | | | | | |
| 12 | " | 16'-0" | | 12 | | | | | |
| 24 | " | 27'-0" | | 24 | | | | | |
| | | | | | | | | | 4 710 |
| 4 | 1"ø | 6'-0" | | 59 | | | | 4 | |
| 77 | " | 13'-0" | 77 | | | | | | |
| | | | | | | | | | 3 530 |
| | | | | | | | | TOTAL WT. = | 14 320 |

### Bent Bars

| Type | Mark | No. | Size | Length | I | II | III | IV | V | VI | VII | Location | Weight # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bar "f" | f45 | 66 | 1"ø | 14'-6" | 7'-4" | | | | | | | Lower ftg. | 3 290 |
| | f46 | 92 | ½"ø | 5'-6" | 2'-9" | | | | | | | Main Wall corners | 435 |
| | K11 | 2 | " | 7'-6" | 6" | 7" | 2'-2½" | 1'-0" | 3'-4½" | 2¼" | | End counters | |
| | K12 | 2 | " | 9'-0" | 6" | 7" | 2'-11½" | 1'-0" | 3'-2" | 2¼" | | " " | |
| | K13 | 2 | " | 10'-6" | 5½" | 7" | 3'-3½" | 1'-0" | 4'-0" | 2¼" | | " " | |
| | K14 | 2 | " | 12'-0" | 5" | 7" | 4'-2½" | 1'-0" | 4'-9½" | 2¼" | | " " | |
| | K15 | 2 | " | 13'-6" | 4" | 7" | 5'-1½" | 1'-0" | 5'-7" | 2¼" | | " " | |
| | K16 | 2 | " | 15'-0" | 5" | 7" | 6'-1½" | 1'-0" | 6'-4½" | 2¼" | | " " | |
| | K17 | 2 | " | 16'-6" | 4" | 7" | 6'-11½" | 1'-0" | 7'-1½" | 2¼" | | " " | |
| | K18 | 2 | " | 18'-6" | 6" | 7" | 7'-8½" | 1'-0" | 7'-11" | 2¼" | | " " | |
| | K19 | 2 | " | 20'-0" | 6" | 7" | 8'-6½" | 1'-0" | 8'-9½" | 2¼" | | " " | |
| Bar "K" | K72 | 4 | " | 8'-0" | 4" | 7" | 2'-3½" | 1'-0" | 2'-6" | 2¼" | | Main | |
| | K73 | 4 | " | 9'-6" | 6" | 7" | 2'-10½" | 1'-0" | 3'-1" | 2¼" | | " " | |
| | K74 | 4 | " | 10'-6" | 5" | 7" | 3'-3½" | 1'-0" | 3'-8" | 2¼" | | " " | |
| | K75 | 4 | " | 11'-6" | 4" | 7" | 3'-8½" | 1'-0" | 4'-3" | 2¼" | | " " | |
| | K76 | 4 | " | 13'-0" | 6" | 7" | 4'-7½" | 1'-0" | 4'-10" | 2¼" | | " " | |
| | K77 | 4 | " | 14'-0" | 5" | 7" | 5'-1½" | 1'-0" | 5'-4" | 2¼" | | " " | |
| | K78 | 4 | " | 15'-0" | 5" | 7" | 5'-6½" | 1'-0" | 5'-11" | 2¼" | | " " | |
| | K79 | 4 | " | 16'-0" | 4" | 7" | 6'-3½" | 1'-0" | 6'-6" | 2¼" | | " " | |
| | K80 | 4 | " | 17'-6" | 6" | 7" | 6'-10½" | 1'-0" | 7'-1" | 2¼" | | " " | |
| | K81 | 4 | " | 18'-6" | 5" | 7" | 7'-5½" | 1'-0" | 7'-8" | 2¼" | | " " | |
| | K82 | 4 | " | 19'-6" | 4" | 7" | 8'-0½" | 1'-0" | 8'-0" | 2¼" | | " " | |
| | K83 | 4 | " | 21'-0" | 6" | 7" | 8'-9½" | 1'-0" | 8'-10" | 2¼" | | " " | |
| | K84 | 4 | " | 22'-6" | 5" | 7" | 9'-5½" | 1'-0" | 9'-5" | 2¼" | | " " | |
| | K85 | 4 | " | 23'-0" | 4" | 7" | 9'-9½" | 1'-0" | 10'-0" | 2¼" | | " " | 970 |
| Bar "m" | m16 | 8 | 1"ø | 17'-0" | 1'-6" | 1'-2½" | 7'-2½" | 12'-6½" | | | | Main counters | |
| | m16 | 20 | " | 9'-6" | 6'-8" | 2'-0" | 3'-9½" | 3'-2" | | | | " " | |
| | m19 | 67 | " | 23'-9" | 4'-6" | 10'-0" | 4'-2½" | 11'-1" | | | | Lower ftg. | 6 595 |
| | m19 | 4 | ⅞"ø | 8'-0" | 6'-0" | 2'-0" | 5'-3½" | 5'-08" | | | | End counters | |
| Bar "aa" | m20 | 4 | " | 16'-0" | 14'-0" | 1'-2½" | 6'-7½" | 12'-6½" | | | | " " | 205 |
| | aa20 | 10 | ⅝"ø | 15'-0" | 5'-0" | 4'-6" | 1'-9" | | | | | Lower ftg. | 310 |
| Bar "bb" | bb2 | 15 | ½"ø | 11'-0" | 6" | 7" | 11½" | 1'-0" | 1'-2" | 4'-0" | 2¼" | Bn. seat | 145 |
| | | | | | | | | | | | | TOTAL WT. = | 11 950 |

## BILL OF CONCRETE

| Location | Class AA Spec. Nov. 1, 1928 | Class A |
|---|---|---|
| Footing | 188.5 | |
| Neatwork | 121.5 | |
| Sewer & Tunnel Encasement | | 64.4 |
| TOTAL CU. YDS. | 310.0 | 64.4 |

## CONSTRUCTION NOTES

All edges, corners & articulating joints exposed to view after fill is made are to be beveled with 1" V-strips.
Every bar to be a deformed bar with effective section equivalent to that of size given.
All bars to be bent to a radius of 4½ diameters on ℄ of bars, except as noted.
Minimum laps of bars, unless otherwise noted, to be 1'-3" for ½"ø bars; 2'-0" for ⅞"ø bars & 2'-3" for 1"ø bars.
Construction joints are to be made only where shown.

A.F.E. 4 939

## GENERAL NOTES

LOCATION:- Lisbon Ave.; Milwaukee, Wis. ALIGNMENT:- Spiral
GRADE:- 0.65% Compensated.
BEARING ON SOIL:- With D.L., L.L., Track Load & Horizontal Thrust---- 2.7 Tons per sq. ft.
With above loads plus thrust due to contraction of Bridge---- 3.0 Tons per Sq. ft.
If the material encountered is not suitable for these loads, drive piles.

Drg. No. General Plan----- E-3506 Drg. No. Floor Plan---------- E-9394
Drg. No. East Abutment----- E-9399 Drg. No. Floor Sections----- E-9395
Drg. No. Bents---------- E-9396 Drg. No. Hand Railings------ E-9398

A. 3067
P. 7

C.M.ST.P.&P.R.R.
ENGINEERING DEPARTMENT

NORTHERN DIVISION GRADE SEPARATION
MILWAUKEE, WIS.
WATERTOWN PLANK ROAD TO FOND-DU-LAC AVE.

# DETAILS OF WEST ABUTMENT - LISBON AVENUE CROSSING

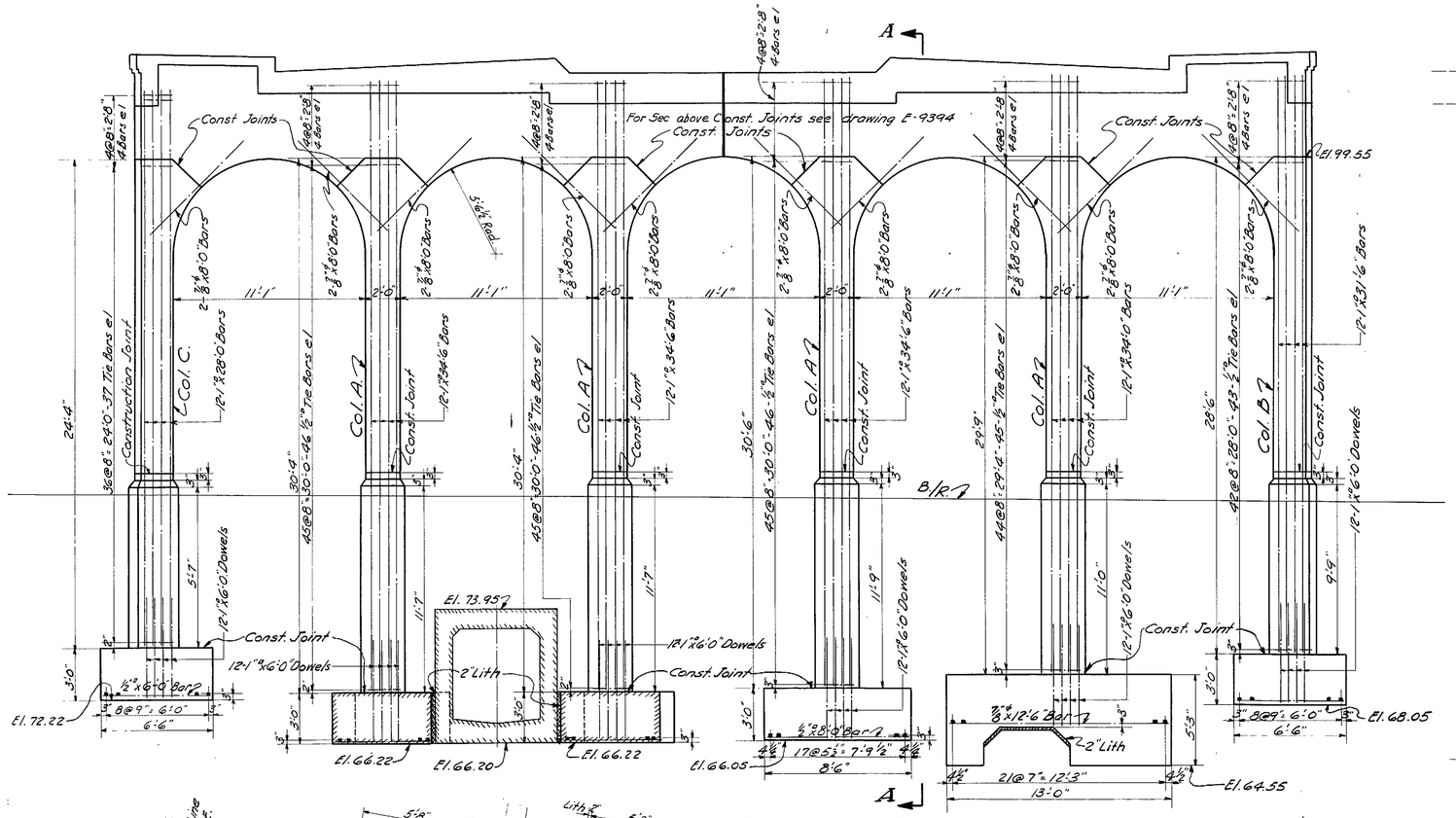
Chicago, April 21, 1931 DRAWING NO. E-9400

Correct:- Approved:-

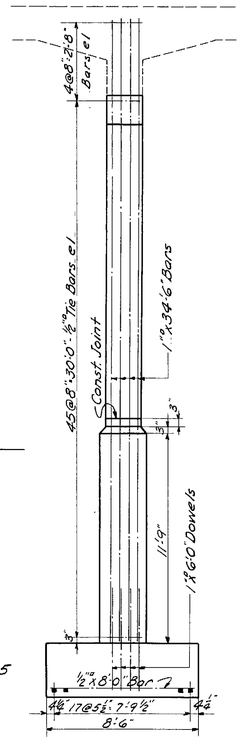
R.L.S. Engr. of Design Chief Engineer

R.L.S. 6-25-31

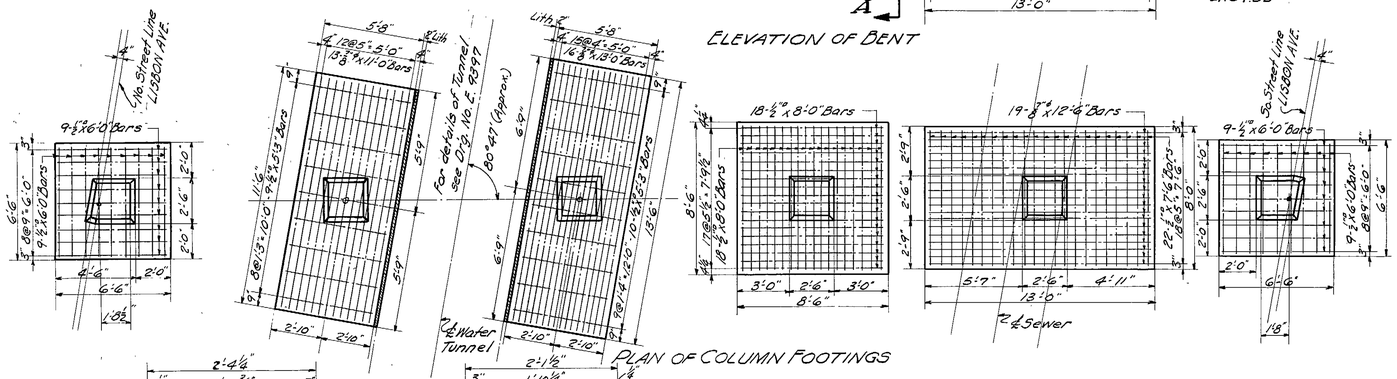
| Revision | Date | By. |
|---|---|---|
| Water tunnel & Details | 7-10-31 | W.C.O. |



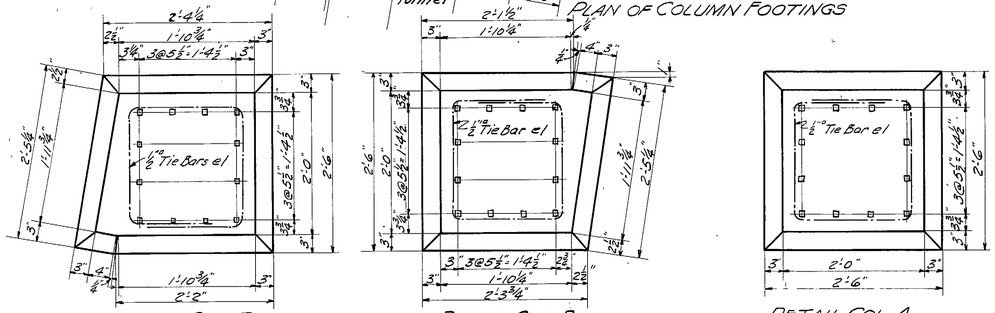

ELEVATION OF BENT



SECTION A-A



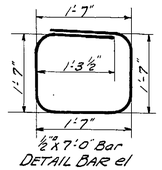

PLAN OF COLUMN FOOTINGS




DETAIL COL. C.

DETAIL COL. B

DETAIL COL. A



½" x 7'-0" Bar
DETAIL BAR el

| BILL OF MATERIAL | | | | | |
|---|---|---|---|---|---|
| Class "AA" Spec. Nov. 1, '28. CONCRETE (ONE BENT) | | | | | |
| NEATWORK | | | | 33.4 Cu. Yds | |
| FOOTING | | | | 50.0 " " | |
| TOTAL | | | | 83.4 " " | |
| REINFORCING BARS (ONE BENT) | | | | | |
| No. | Size | Length | Mk. | Location | Wt. # |
| 12 | 1" ø | 28'-0" | | Columns | |
| 12 | " | 31'-6" | | " | |
| 12 | " | 34'-0" | | " | |
| 36 | " | 34'-6" | | " | |
| 72 | 1" ø | 6'-0" | | Dowels | 9620 |
| 19 | 7/8" ø | 12'-6" | | Footing | |
| 20 | 7/8" ø | 8'-0" | | Fillets | 820 |
| 36 | ½" ø | 6'-0" | | Footing | |
| 22 | " | 7'-6" | | " | |
| 36 | " | 8'-0" | | " | |
| 287 | ½" ø | 7'-0" | e-1 | Columns | |
| | | | | | |
| | | | | | |
| 19 | ½" ø | 5'-3" | | Footing | 2385 |
| 13 | 7/8" ø | 11'-0" | | " | |
| 16 | 7/8" ø | 13'-0" | | " | 725 |
| | | | | | |
| | | | | | |
| | | | | Total Wt. | 13550 |

## CONSTRUCTION NOTES

All edges and corners exposed to view after fill is made are to be beveled with 1" V-strips.

Footing courses are to be brought to the top in one continuous run. No longitudinal joints permitted.

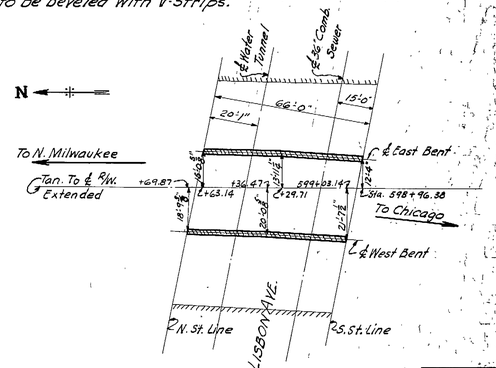
Every bar shall be a deformed bar with effective section equivalent to that of size given.

Foundations may be altered by the engineer in charge.

Bars to be bent to a radius of 4½ bar diameters.

Construction joints to be made only where shown.

Construction joints at top of footing and top of column are not to be beveled with V-strips.




LOCATION PLAN

A-306A
P-17

A.F.E.-4939

C.M.ST.P. & P.R.R.
ENGINEERING DEPARTMENT

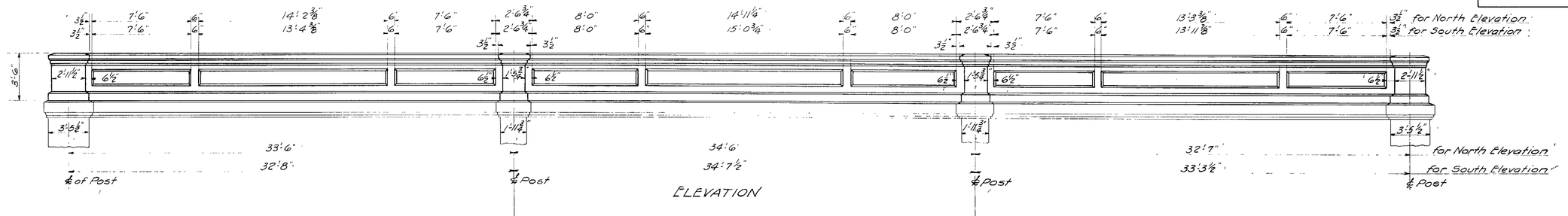
NORTHERN DIVISION GRADE SEPARATION
MILWAUKEE, WIS.
WATERTOWN PLANK ROAD TO FOND DU LAC AVENUE
DETAIL OF BENTS - LISBON AVE. CROSSING

Chicago - April 24, 1931 Drawing No. E-9396

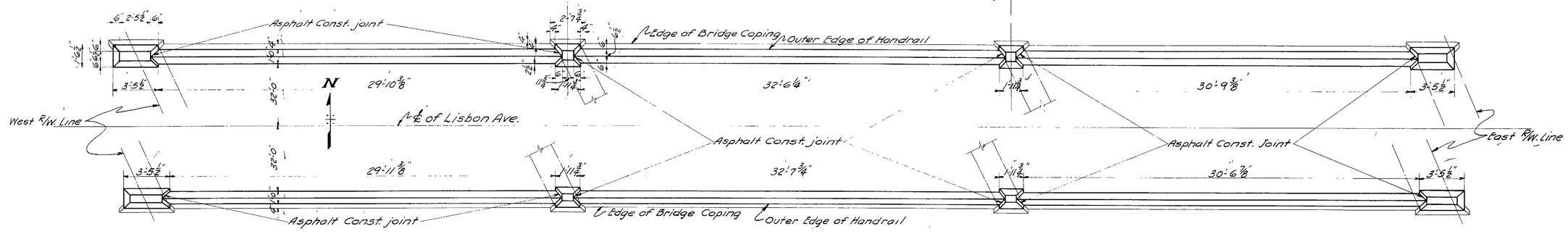
Correct:- Approved:-

Engr. of Design Chief Engineer

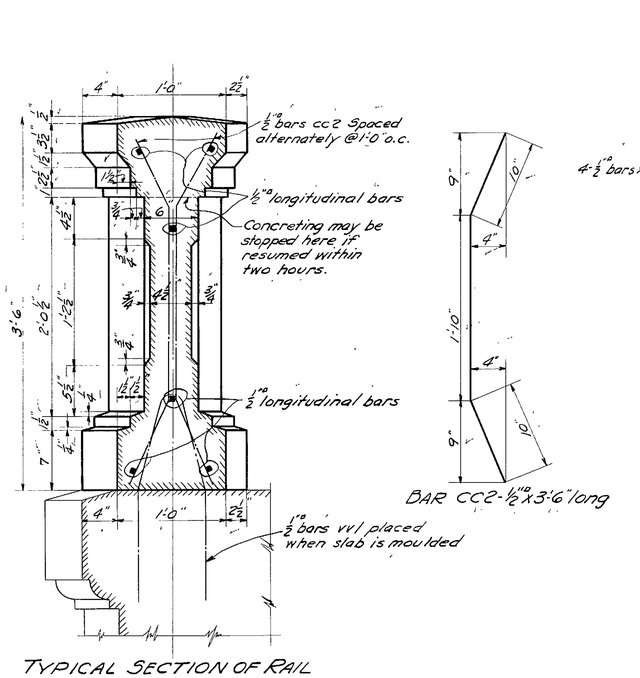
| Revisions | Date | By |
|---|---|---|
| General | 7/31/31 | E.E.B. |




ELEVATION



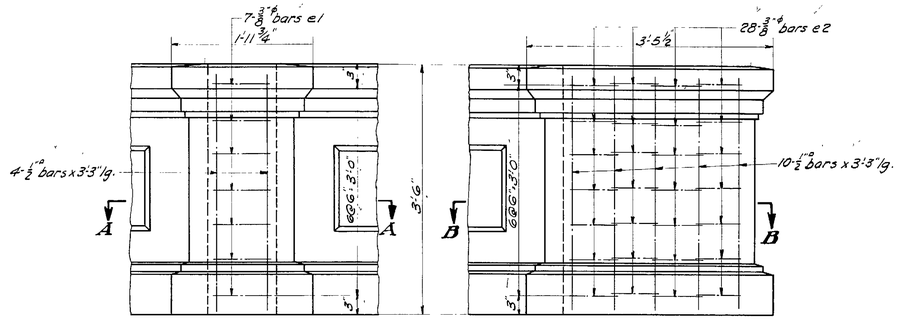

PLAN OF No. & So. HANDRAIL

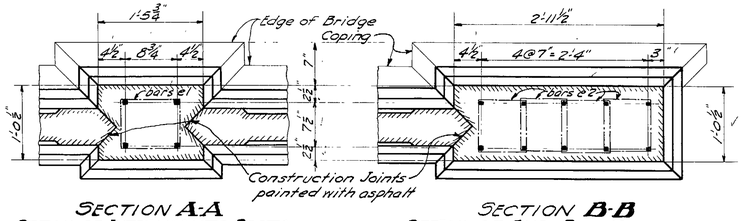



TYPICAL SECTION OF RAIL



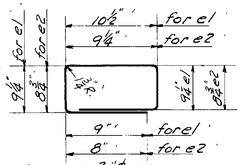
BAR CC2-½"ø x 3'-6" long




SECTION A-A
DETAIL OF INTERMEDIATE POSTS

SECTION B-B
DETAIL OF END POSTS




BAR e1-3/8" ø x 3'-9"
BAR e2-3/8" ø x 3'-3"

## CONSTRUCTION NOTES

Every bar shall be a deformed bar with effective section equivalent to that of size given.
Bars shall be bent to a radius of 4½ dias.
All longitudinal bar laps to be a minimum of 2'-0".
Construction joints between each post and rail shall be painted with asphalt to prevent bonding of same, and in no case shall longitudinal bars in rail extend into posts.
Washes on top of rail and posts to have a ¼" layer of mortar and shall be finished off to accurate form with a steel float.
Mortar shall be placed immediately after concrete is placed.

## GENERAL NOTES

| | |
|---|---|
| General Plan - | Drwg. No. E-3506 |
| Floor Slab - | " " E-9394 |
| Sections of Floor Slab - | " " E-9395 |

## BILL OF MATERIAL

CONCRETE - Class AA Spec. Nov. 1, 1928

| Location | Volume |
|---|---|
| Posts | 2.7 cu. yds |
| Rails | 15.3 " " |
| Total - | 18.0 " " |

STEEL

| No. | Size | Length | Mark | Location | Weight |
|---|---|---|---|---|---|
| 192 | ½"ø | 3'-6" | cc2 | Vertical in rail | |
| 48 | " | 16'-6" | | Horizontal in rail | |
| 24 | " | 17'-6" | | " " " | |
| 56 | ½"ø | 3'-3" | | Vertical in posts | |
| 28 | 3/8"ø | 3'-9" | e1 | Hor. in intermed. posts | |
| 112 | 3/8"ø | 3'-3" | e2 | " " end posts | |
| | | | | | |
| | | | | | |
| | | | | Total | 1960# |

A.F.E. 4939

C.M.St.P.&P.R.R.
ENGINEERING DEPARTMENT

NORTHERN DIVISION GRADE SEPARATION
MILWAUKEE, WIS.
WATERTOWN PLANK ROAD TO FOND DU LAC AVENUE
HANDRAIL FOR LISBON AVENUE.

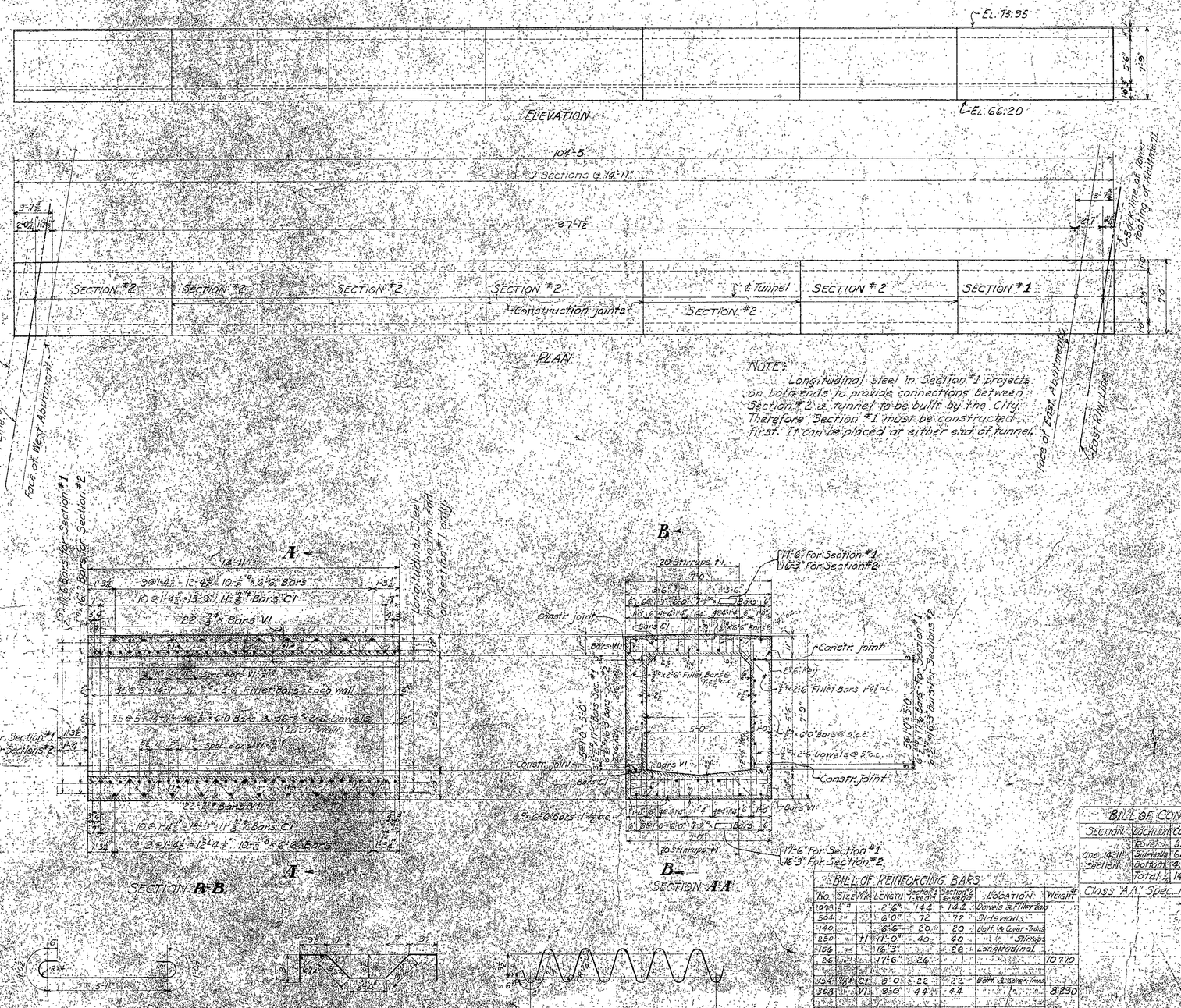
Chicago: July 29, 1931 — Drawing No. E-9398

Correct: — Approved:

R.L.S. E.E.B. — Eng'r of Design — Chief Engineer

A-306A
P-20

| Revision | Date | By |
|---|---|---|
| Stirrups Bar details | 6-4-31 | [illegible] |
| General Details | 7-9-31 | [illegible] |
| Note for Sec. #1 | 7-15-31 | [illegible] |




NOTE:
Longitudinal steel in Section #1 projects on both ends to provide connections between Section #2 & tunnel to be built by the City. Therefore Section #1 must be constructed first. It can be placed at either end of tunnel.

## CONSTRUCTION NOTES

Foundations may be altered by Eng'r in charge.
Construction joints to be made only where shown.
All bars to be deformed bars with effective section equivalent to that of size given.
All bars to bent to a radius of 4½ diam. on ℄ of bar, except as noted.
Minimum lap of bars - 1'-2" for ½" ⌀ bars.

## GENERAL NOTES

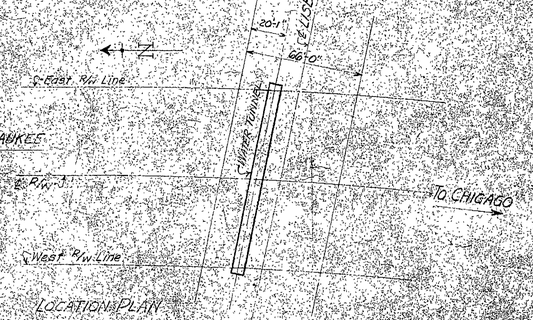
Location:- Lisbon Ave.; Milwaukee, Wis.
Alignment:- Spiral.
Grade:- 0.65% Compensated.
Drg. No. General Plan ..... E-3506
Drg. No. East Abutment ..... E-9399
Drg. No. West Abutment ..... E-9400
Drg. No. Bents ..... E-9396




| BILL OF REINFORCING BARS | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Size | Mk. | Length | Section #1 1-Reqd | Section #2 6-Reqd | Location | Weight |
| 1098 | ½" ⌀ | | 2'-6" | 144 | 144 | Dowels & Fillet Bars | |
| 504 | " | | 6'-0" | 72 | 72 | Sidewalls | |
| 140 | " | | 6'-6" | 20 | 20 | Bott. & Cover-Trans. | |
| 280 | " | T1 | 11'-0" | 40 | 40 | " " Stirrups | |
| 156 | " | | 16'-3" | | 26 | Longitudinal | |
| 26 | " | | 17'-6" | 26 | | " | 10770 |
| 154 | ⅞" ⌀ | C1 | 8'-0" | 22 | 22 | Bott. & Cover-Trans. | |
| 308 | " | V1 | 9'-0" | 44 | 44 | " " | 8290 |
| | | | | | | TOTAL WT. = | 19060 |

| BILL OF CONCRETE | | | | |
|---|---|---|---|---|
| SECTION | LOCATION | CU. YDS. | No. | TOTAL CU. YDS. |
| One 14'-11" Section | Cover | 3.72 | | |
| | Sidewalls | 6.23 | | |
| | Bottom | 4.35 | | |
| | Total | 14.3 | 7 | 100.1 |

Class "AA" Spec. Nov. 1, 1928.

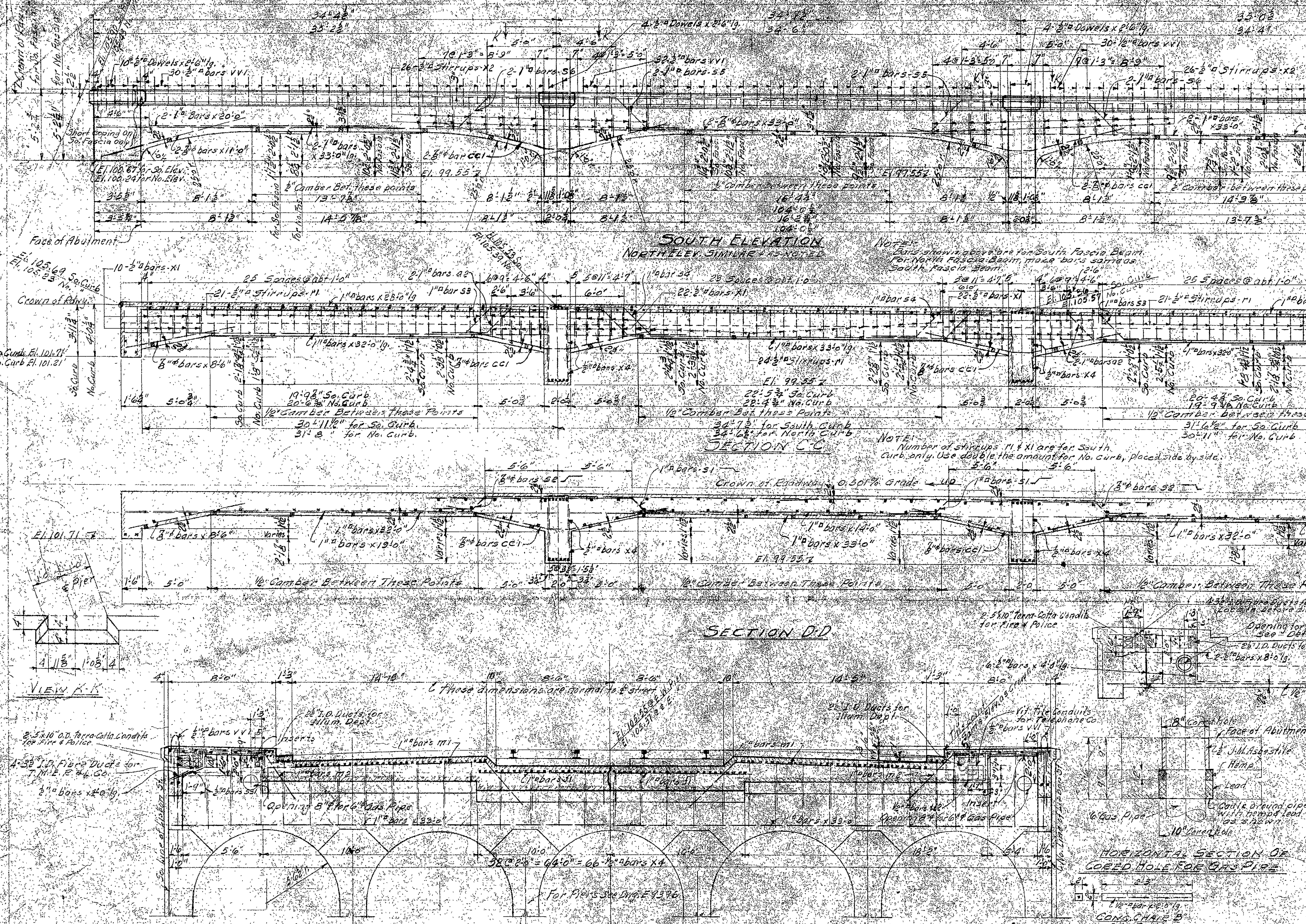


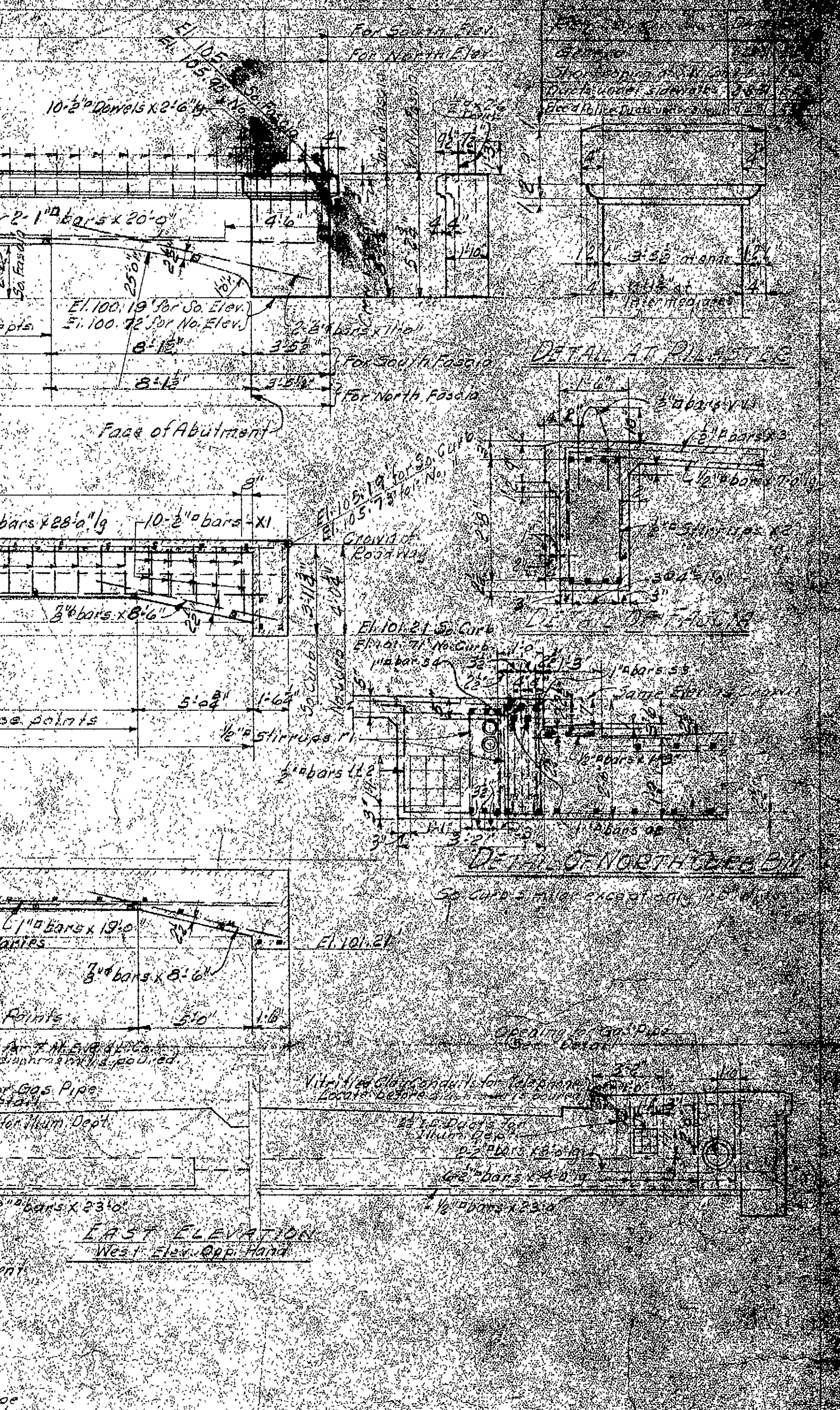

LOCATION PLAN

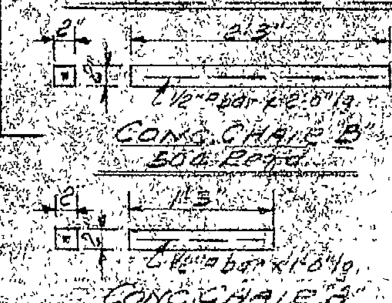
A.F.E. 4939

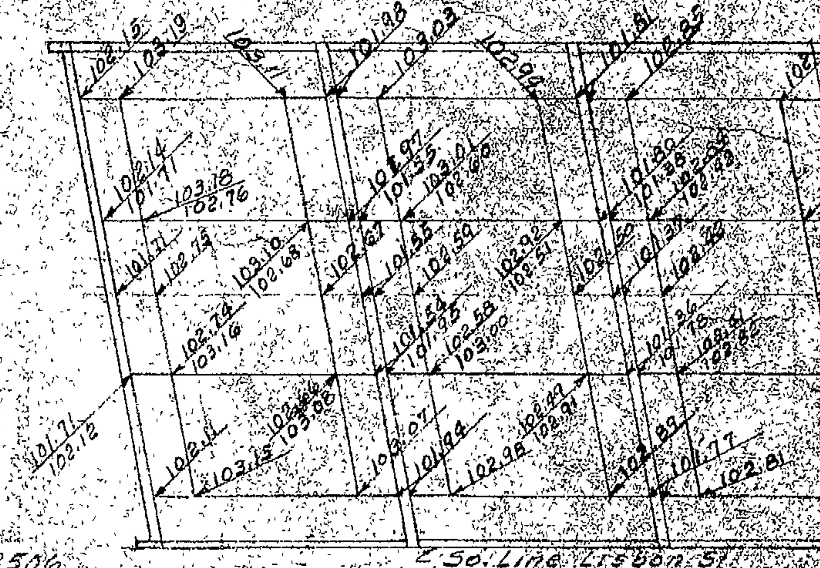
A-306A
P-21

C.M.St.P.& P.R.R.
ENGINEERING DEPARTMENT
NORTHERN DIVISION GRADE SEPARATION
MILWAUKEE, WIS.
WATERTOWN PLANK ROAD TO FOND-DU-LAC AVENUE
DETAILS OF WATER TUNNEL LISBON AVE.
Chicago, May 28, 1931 DRAWING No. E-9397
Correct: Approved:
Eng'r of Design Chief Engineer

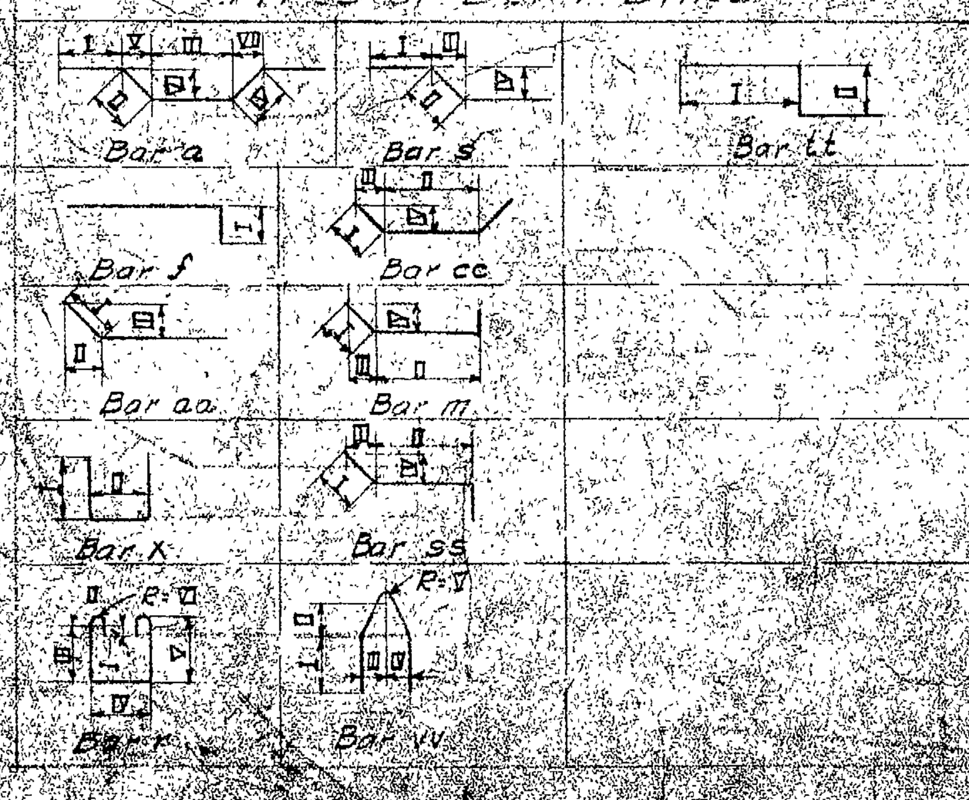



## TYPES OF BENT BARS




## LIST OF BENT BARS

| Mark | No. | Size | Length | I | II | III | IV | V | VI | VII | Location |
|---|---|---|---|---|---|---|---|---|---|---|---|
| a1 | 40 | 1⅛" ⌀ | 16'-3" | 2'-7" | 1'-10½" | 7'-4" | 1'-10½" | 1'-4" | 1'-4" | 1'-4" | Trans. Slab |
| a2 | 8 | 1" ⌀ | 16'-6" | 2'-6" | 2'-5¾" | 7'-0" | 2'-5¾" | 1'-9" | 1'-9" | 1'-9" | Curb Beam |
| f1 | 24 | 1" ⌀ | 13'-0" | 2'-0" | | | | | | | Cross Gird. |
| aa1 | 24 | ⅞" ⌀ | 8'-6" | 1'-3" | 1'-2⅝" | 0'-3" | | | | | Haunches |
| X1 | 192 | ½" ⌀ | 5'-4" | 2'-14 | 10½" | | | | | | Curb Beam |
| X2 | 104 | ½" ⌀ | 6'-6" | 2'-6" | 1'-2½" | | | | | | Fascia Beam |
| X3 | 100 | ½" ⌀ | 10'-0" | 1'-3" | 7'-9" | | | | | | Walks |
| X4 | 132 | ½" ⌀ | 8'-6" | 3'-6" | 1'-8" | | | | | | Cross Gird. |
| r1 | 198 | ½" ⌀ | 6'-10 | 0'-4" | 0'-7" | 2'-2" | 10½" | 2'-4½" | 2½" | | Curb beam |
| S1 | 76 | 1" ⌀ | 20'-0" | 2'-6" | 1'-10½" | 1'-4" | 1'-4" | | | | Roadway Slab |
| S2 | 76 | ⅞" ⌀ | 23'-0" | 2'-0" | 1'-10½" | 1'-4" | 1'-4" | | | | |
| S3 | 8 | 1" ⌀ | 30'-0" | 2'-6" | 2'-11¼" | 2'-1" | 2'-1" | | | | Curb Beam |
| S4 | 4 | 1" ⌀ | 35'-0" | 2'-6" | 2'-11¼" | 2'-1" | 2'-1" | | | | " " |
| S5 | 8 | 1" ⌀ | 22'-0" | 2'-6" | 3'-7½" | 2'-8" | 2'-8" | | | | Fascia |
| S6 | 8 | 1" ⌀ | 30'-0" | 2'-6" | 3'-9¾" | 2'-8" | 2'-8" | | | | " " |
| cc1 | 76 | ⅞" ⌀ | 16'-0" | 2'-0" | 6'-10" | 1'-5½" | | | | | Haunches |
| m1 | 24 | 1" ⌀ | 21'-6" | 3'-0" | 14'-6" | 2'-1½" | 2'-1½" | | | | Cross Gird. |
| m2 | 24 | 1" ⌀ | 12'-0" | 3'-0" | 7'-0" | 2'-1½" | 2'-1½" | | | | " " |
| SS1 | 48 | ½" ⌀ | 3'-9" | 1'-9" | 1'-0" | 0'-10½" | 1'-6" | | | | Sidewalk |
| tt1 | 47 | ½" ⌀ | 6'-6" | 3'-3" | 2'-2" | | | | | | " |
| VV1 | 184 | ½" ⌀ | 4'-6" | 1'-3" | 0'-9½" | 0'-4" | 0'-4" | 0'-1½" | | | Dowels for H. Rail |

Total weight 28,024 #

## BILL OF MATERIAL

Concrete: Class AA Specification Nov. 1st 1928
Total for Slab & Girders to Const. Joint 520 cu. yd.

### BILL OF STRAIGHT BARS

| No. | Size | Length | Trans. Slab | Rdwy. Slab | Walks | Cross Gird. | Curb Bms. | Fascia Bms. | Back Wall |
|---|---|---|---|---|---|---|---|---|---|
| 36 | ½" ⌀ | 1'-3" | | 36 | | | | | |
| 56 | " | 2'-6" | | | | | | 56 | |
| 24 | " | 4'-0" | | | | | | | 24 |
| 212 | " | 7'-0" | | | 212 | | | | |
| 8 | " | 8'-0" | | | | | | | 8 |
| 136 | " | 9'-6" | 136 | | | | | | |
| 70 | " | 14'-0" | | 70 | | | | | |
| 90 | " | 16'-0" | | 90 | | | | | |
| 8 | " | 23'-0" | | | | | | | 8 |
| 8 | " | 24'-0" | | | 8 | | | | |
| 30 | " | 33'-0" | | | 30 | | | | |
| 48 | " | 2'-0" | | 48 | | | | | |
| 44 | ⅞" ⌀ | 8'-6" | | 44 | | | | | |
| 8 | " | 11'-0" | | | | | | 8 | |
| 4 | " | 33'-0" | | | | | | 4 | |
| 9 | 1" ⌀ | 30'-0" | | | | | 9 | | |
| 16 | 1" ⌀ | 14'-0" | | 16 | | | | | |
| 72 | " | 19'-0" | | 72 | | | | | |
| 8 | " | 20'-0" | | | | | | 8 | |
| 14 | " | 28'-0" | | | | | 14 | | |
| 80 | " | 32'-0" | | 80 | | | | | |
| 56 | " | 33'-0" | | 24 | | 24 | | 8 | |
| 40 | 1⅛" ⌀ | 27'-0" | 40 | | | | | | |
| 12 | " | 33'-0" | 12 | | | | | | |
| 40 | 1⅛" ⌀ | 19'-0" | 40 | | | | | | |
| 48 | " | 30'-0" | 48 | | | | | | |
| 10 | 1⅛" ⌀ | 14'-0" | 10 | | | | | | |

Total weight 60,020 #

## GENERAL NOTES

For General Notes see General Plan — Dwg. E-3506
For Plan & other Sections See — Dwg. E-9394
For Intermediate Piers See — Dwg. E-9396
For Masonry Location Plan See — Dwg. E-9354

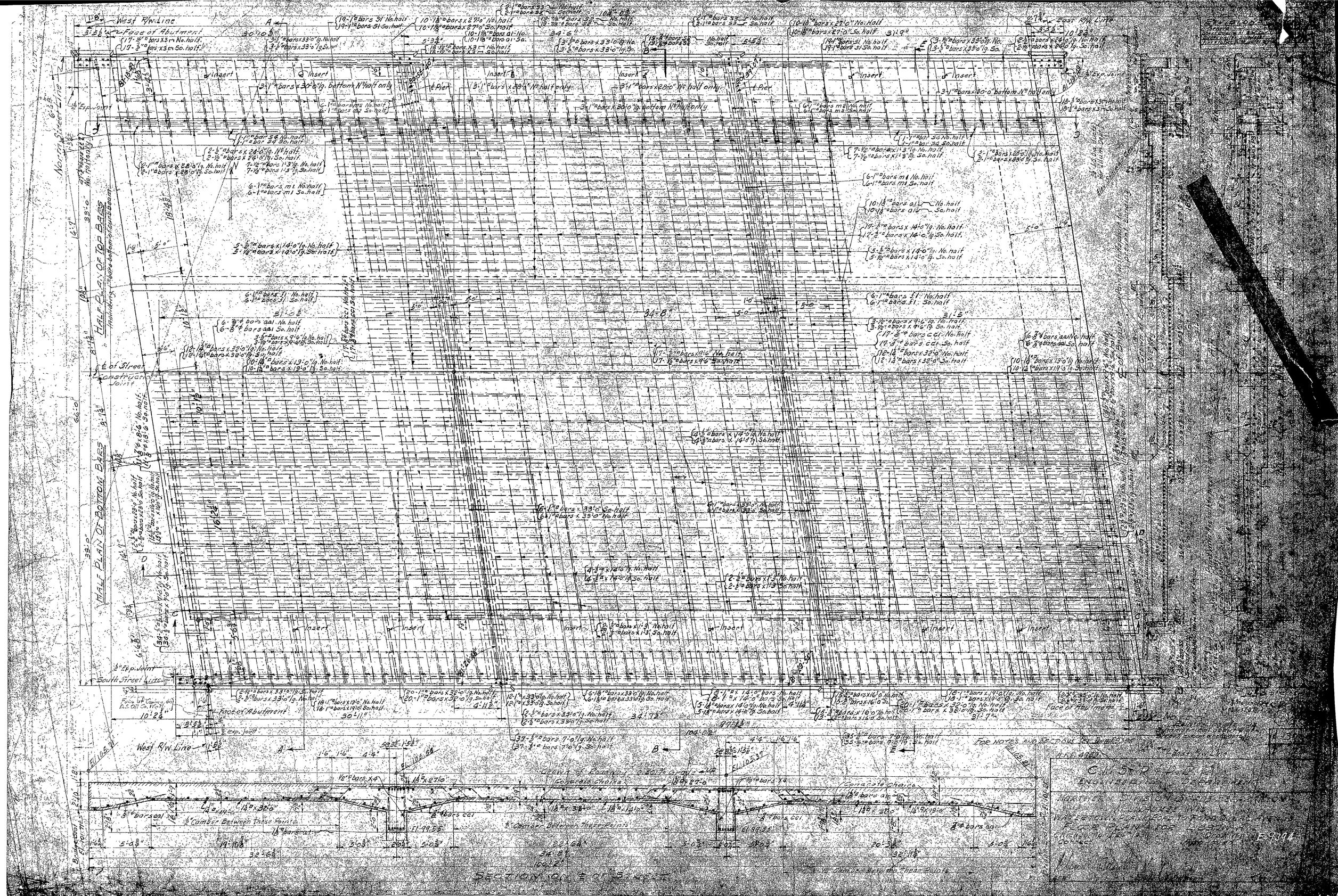
## CONSTRUCTION NOTES:

All edges, corners & articulating joints exposed to view after fill is made shall be beveled with 1" V strips. Do not place V strips at construction joints.
Every bar shall be deformed with effective section equivalent to size shown.
All bars shall be bent to a radius of 4½ dias. on ℄ of bar except as noted, and 45° bends of 1⅛" ⌀ bars, which shall be bent to a radius of 12 dias.
Minimum laps shall be 1'-3" for ½" ⌀ bars — 2'-0" for ⅞" ⌀ bars — 2'-3" for 1" ⌀ bars — 2'-7" for 1⅛" ⌀ bars & 2'-10" for 1¼" ⌀ bars, unless otherwise noted.
After forms are built & reinforcing bars are in position, place screed guides & set to proper elevation with an instrument.
Surface of roadway shall be finished with a screed or wooden float. Do not finish with metal trowel nor other metal tools. Surface to be given a smooth finish with as little disturbance to aggregates & mortar as possible.
Sidewalk finish shall be according to the City of Milwaukee Specification.
Metal reinforcement shall be accurately positioned & supported by ... [illegible]

AFE 4939

C. M. St. P. & P. R. R.
ENGINEERING DEPARTMENT

NORTHERN DIVISION GRADE SEPARATION
MILWAUKEE, WIS.
WAUWATOSA — PLANK ROAD TO POND DU LAC AVE.
FLOOR SECTIONS FOR LISBON AVE.
Chicago, April 27, 1933 — Drawing No. E-9395
Correct — Approved
Engr. of Design


HALF PLAN OF TOP BARS
HALF PLAN OF BOTTOM BARS
SECTION ON ℄ OF STREET
West R/W Line
East R/W Line
Face of Abutment
Insert
℄ Pier
Exp. Joint
Construction Joint
North Street Line
South Street Line
℄ of Street
Crown of Roadway
Concrete Choke
Camber Between These Points
For Notes on Sections See Dwg. 1
E-9904