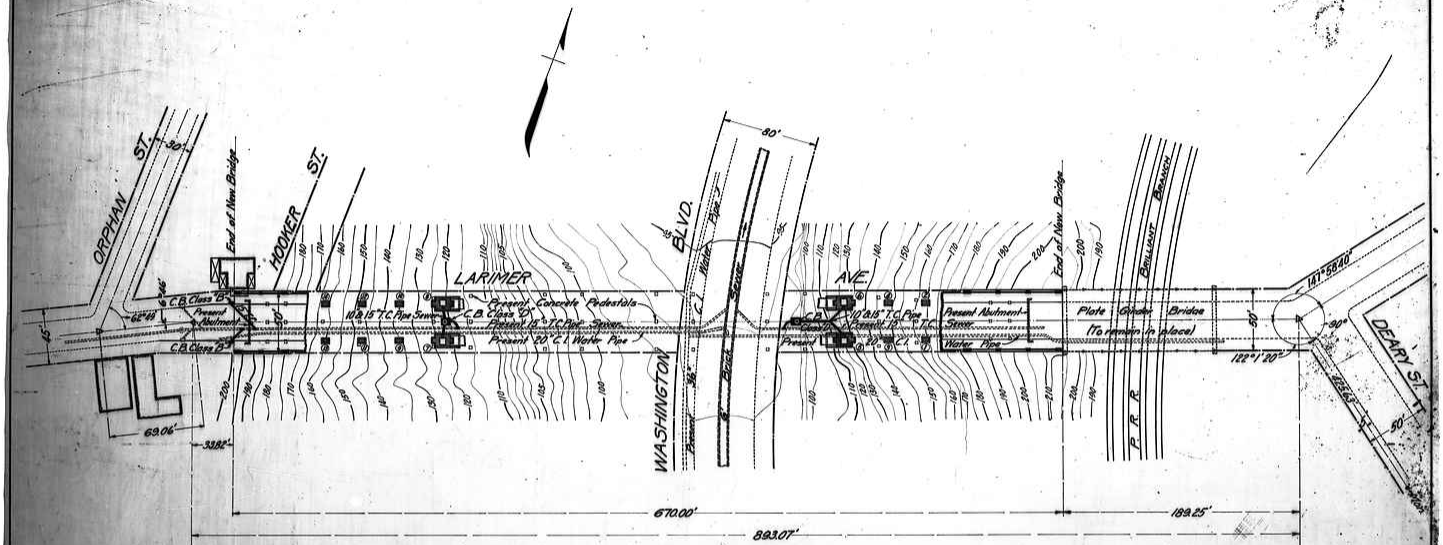


ESTIMATED COST $175,000

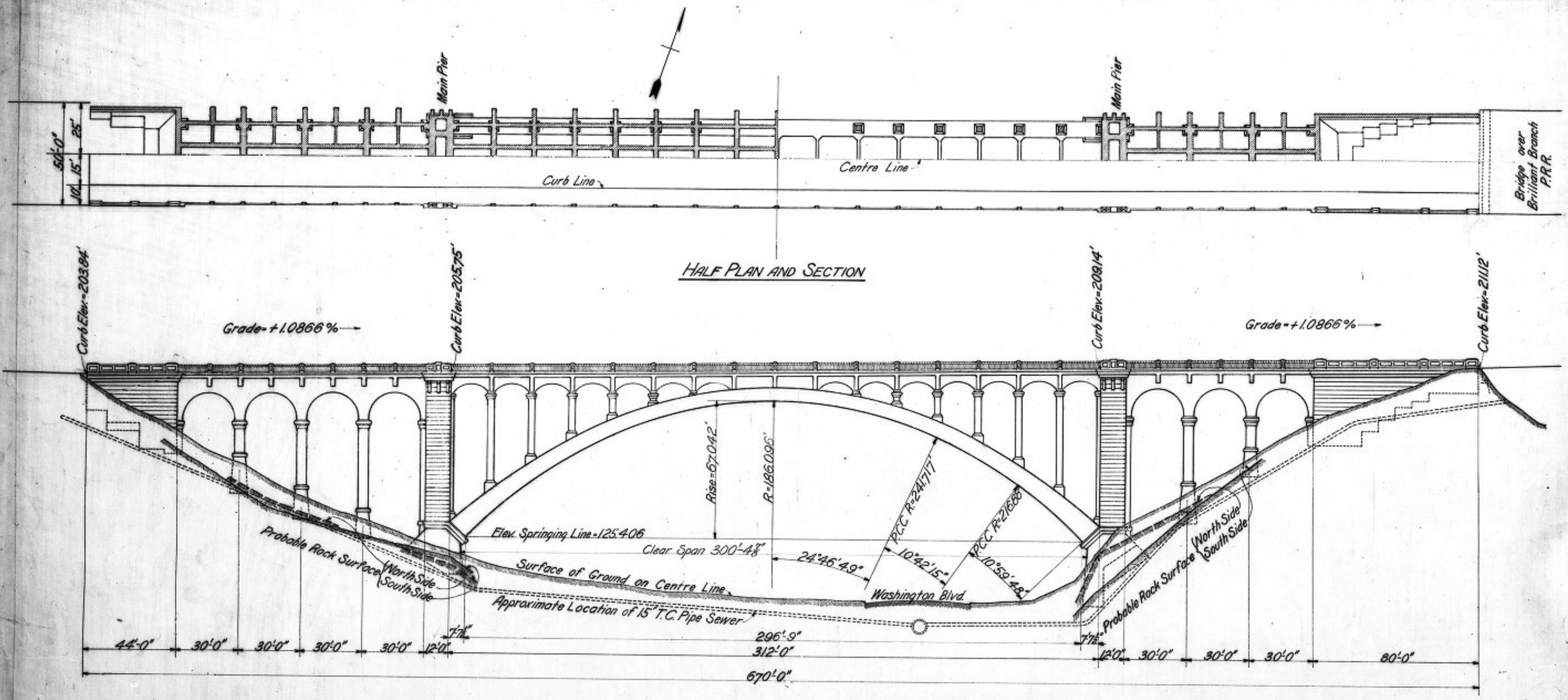
CHECKED Jan. 28-1911
Jas. P. Ferguson
CORRECT Feb. 3. 1911
APPROVED Mar. 6-1911
APPROVED May 6-1911
Jno. G. Armstrong

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONSTRUCTION

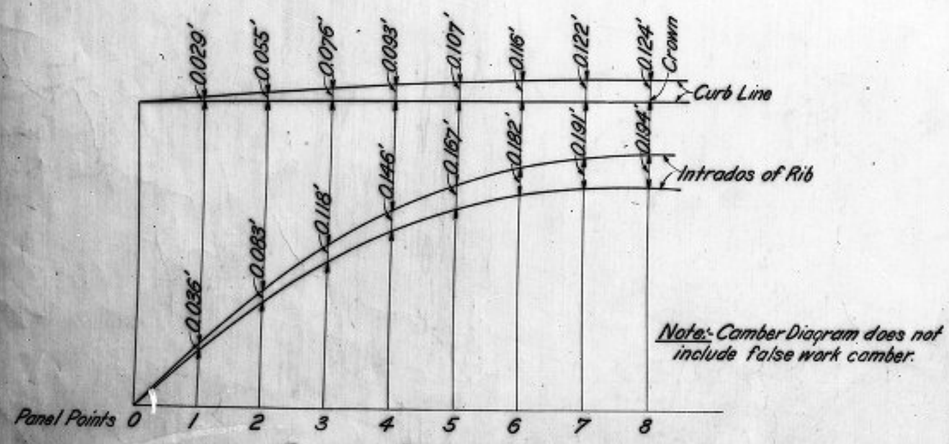
LARIMER AVE. BRIDGE

OVER WASHINGTON BLVD.
LOCATION PLAN

SCALE 1"=30'
JAN. 21, 1911
SHEET No. 1 OF 12

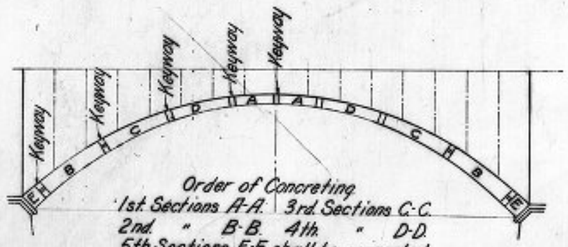


ELEVATION



Note:- Camber Diagram does not include false work camber.

CAMBER DIAGRAM
MAIN SPAN.



Order of Concreting.
1st. Sections A-A. 3rd. Sections C-C.
2nd. " B-B. 4th. " D-D.
5th. Sections E-E shall be concreted monolithic with Main Piers.

Sketch showing Order for Placing Concrete In Arch Ribs of Main Span

DESIGNED BY Geo. A. Ferguson
DRAWN BY W. F. Carpenter
CHECKED BY R. W. Newton

CHECKED Jan. 17-1911
Geo. A. Ferguson SECT. ENGR.
CORRECT Feb. 3 1911
Willis Whited DIV. ENGR.
APPROVED Mar. 6-1911
N. S. Stevenson CHIEF ENGR.
APPROVED Mar. 6-1911
Jno. G. Armstrong MAYOR

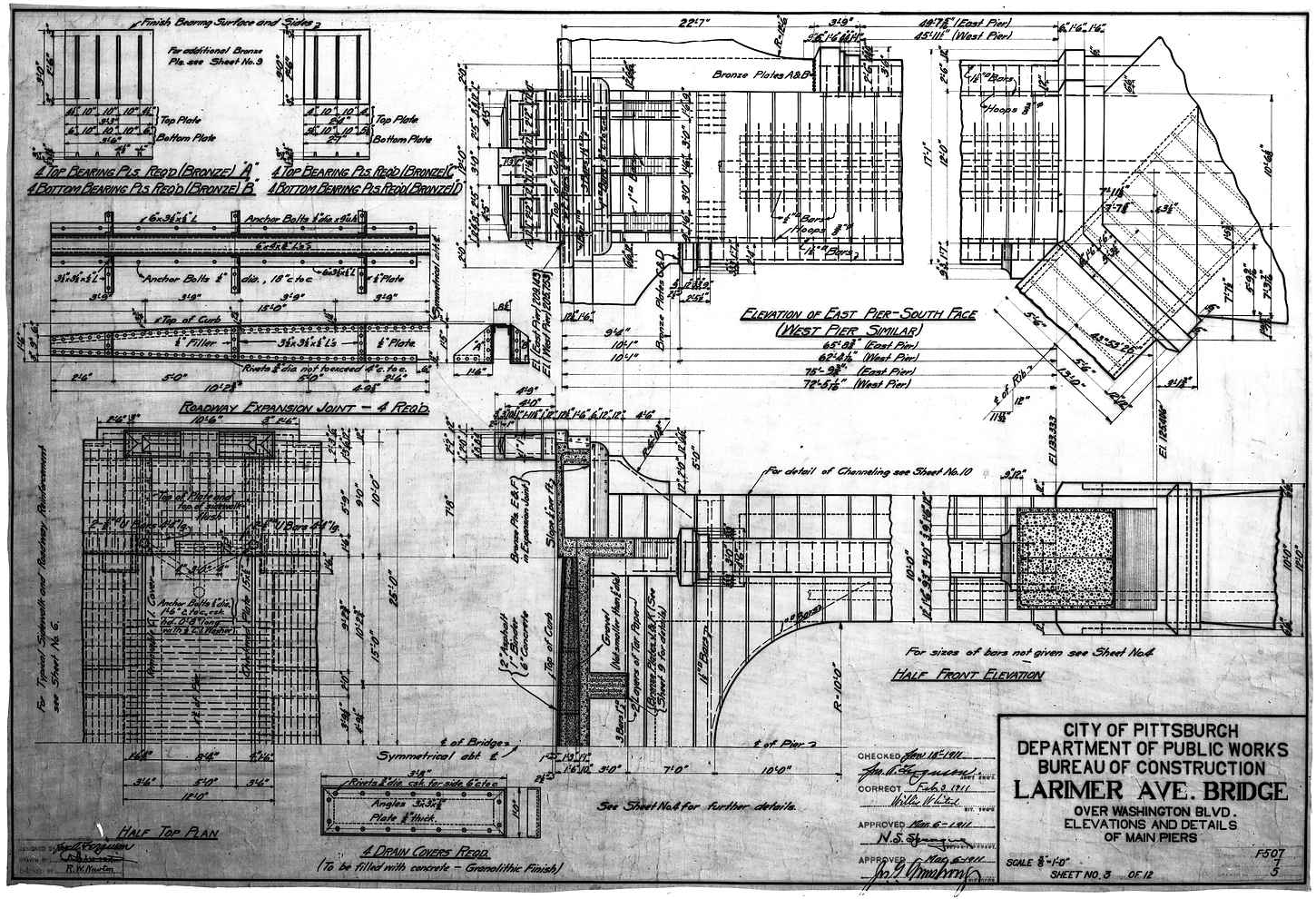
CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONSTRUCTION

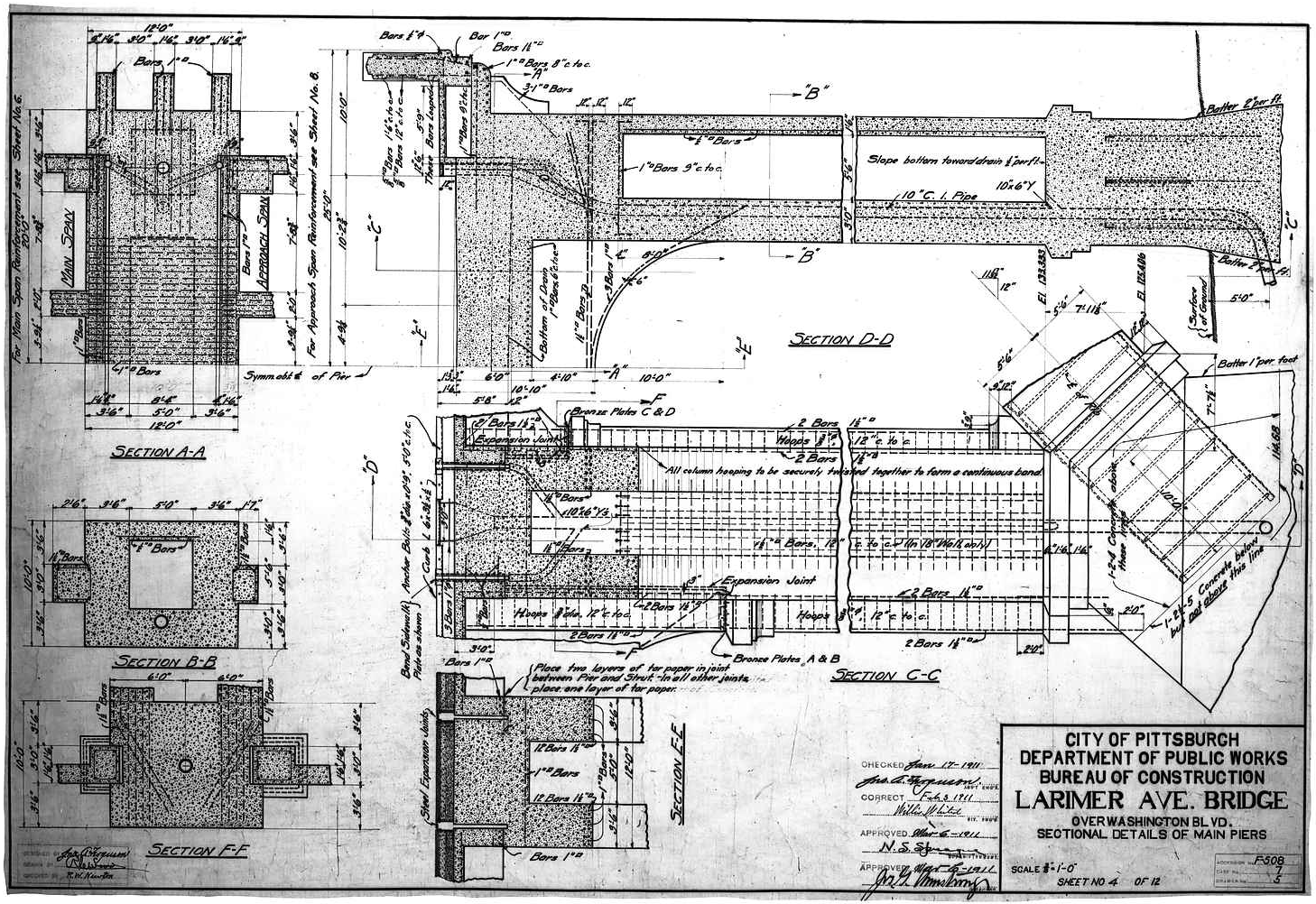
LARIMER AVE. BRIDGE

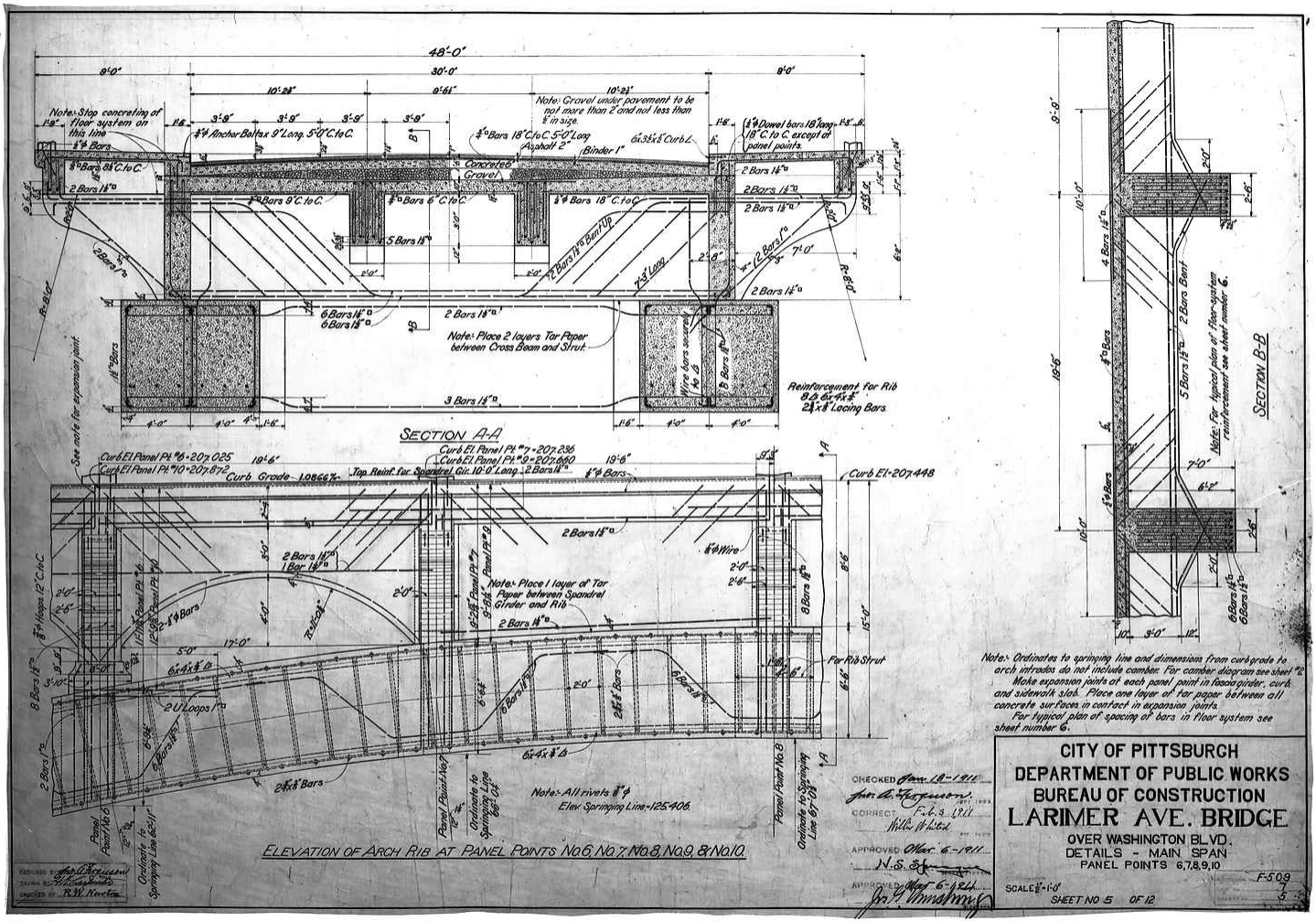
OVER WASHINGTON BLVD.
GENERAL DRAWING
PLAN AND ELEVATION

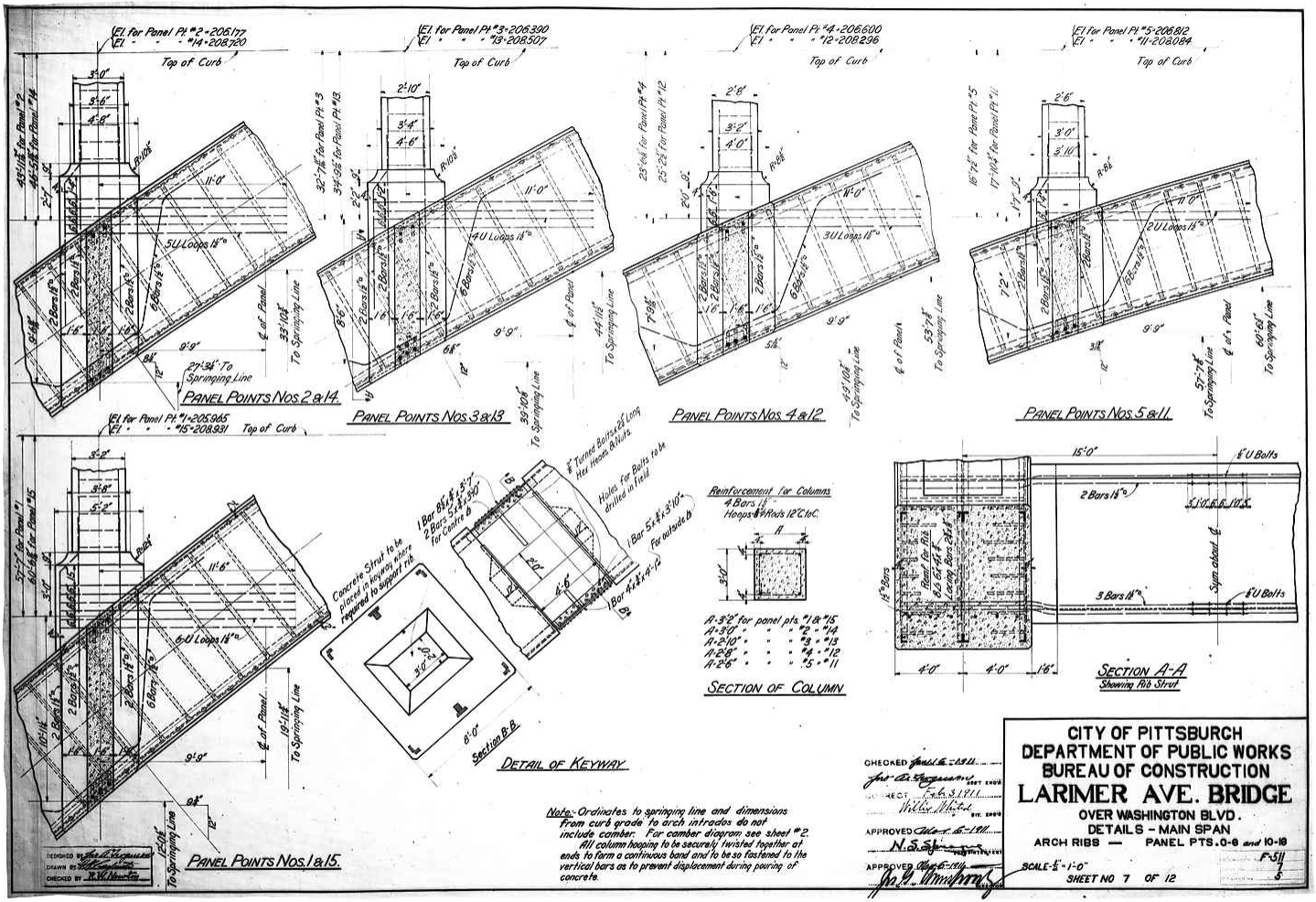
SCALE 1"=20'
SHEET NO. 2 OF 12

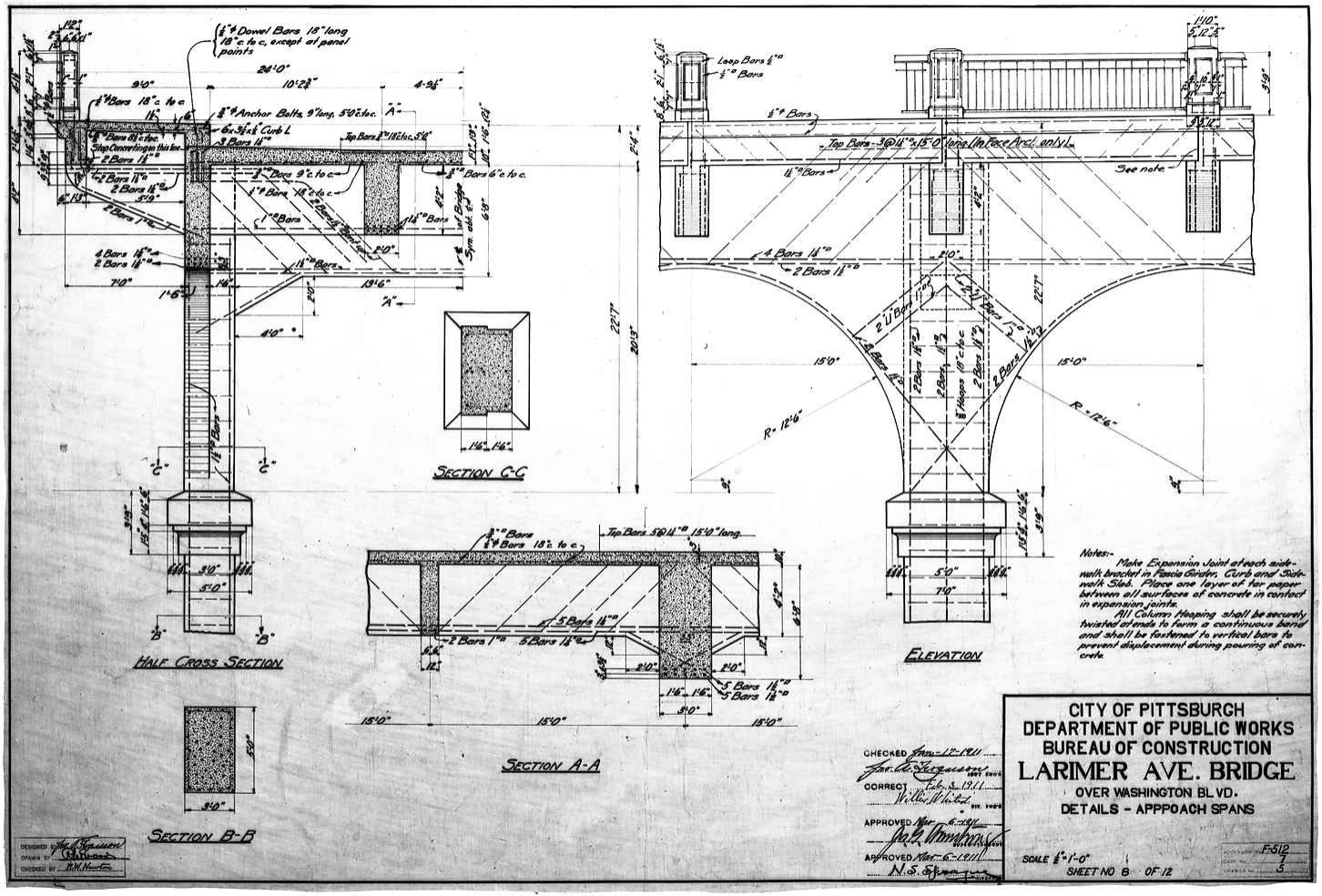
ACCESSION No. F-506
CASE No. 7
DRAWER No. 5

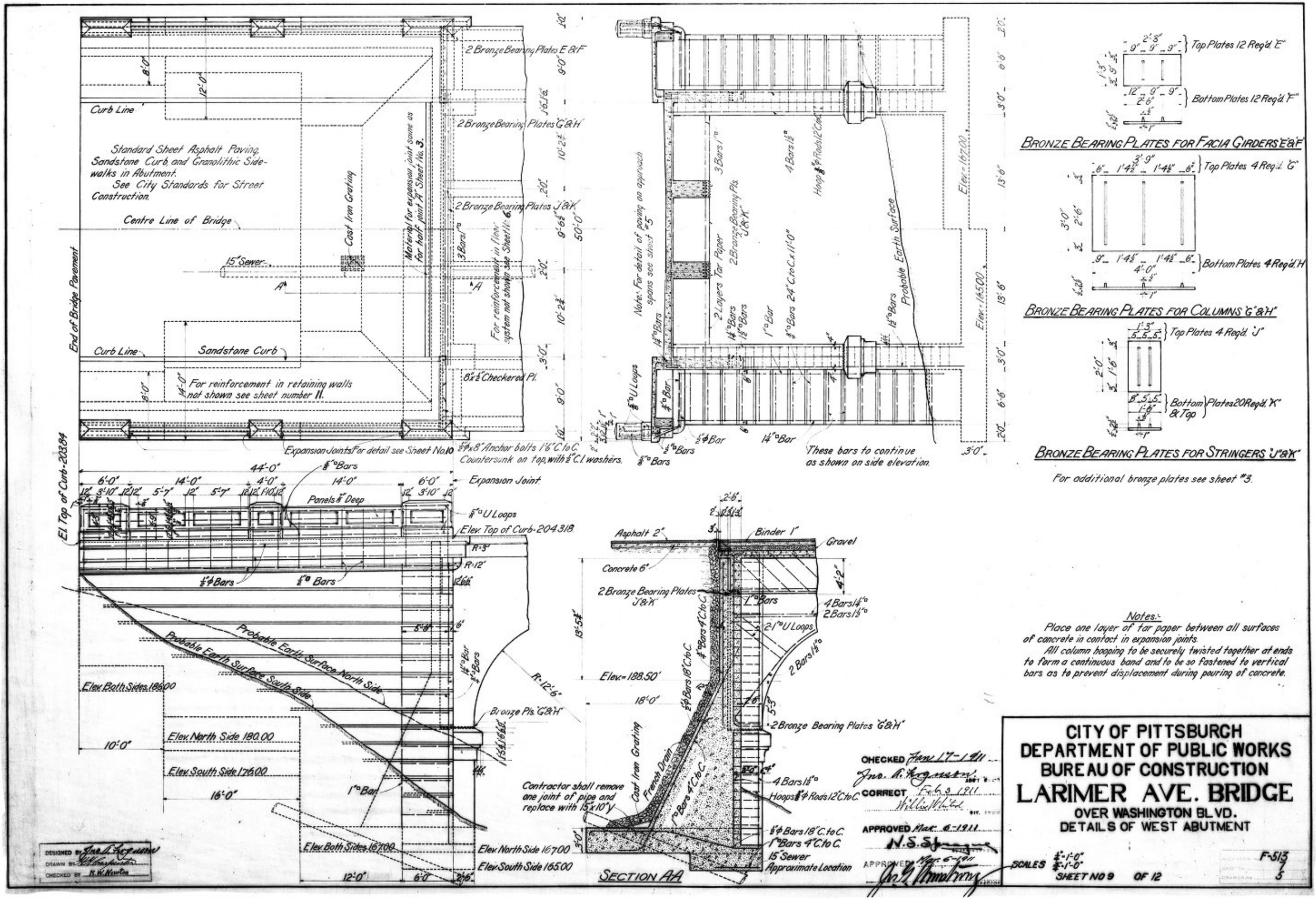

Finish Bearing Surface and Sides
For additional Bronze Pls. see Sheet No. 9
Top Plate
Bottom Plate
4 Top Bearing Pls. Reqd. (Bronze) A
4 Bottom Bearing Pls. Reqd. (Bronze) B
4 Top Bearing Pls. Reqd. (Bronze) C
4 Bottom Bearing Pls. Reqd. (Bronze) D
Anchor Bolts 1" dia. 18" c. to c.
Symmetrical about ℄
Top of Curb
Fillers
Plate
Rivets ¾" dia. not to exceed 4" c. to c.
Roadway Expansion Joint — 4 Reqd.
Bronze Plates A & B
Elevation of East Pier - South Face
(West Pier Similar)
65'-8⅜" (East Pier)
62'-4½" (West Pier)
75'-9⅜" (East Pier)
72'-5⅛" (West Pier)
Bronze Plates E & F
Slope 1 on 1½
For detail of Channeling see Sheet No. 10
For sizes of bars not given see Sheet No. 4
Half Front Elevation
Half Top Plan
Symmetrical about ℄
℄ of Bridge
℄ of Pier
See Sheet No. 4 for further details.
4 Drain Covers Reqd.
(To be filled with concrete - Granolithic Finish)
For Typical Sidewalk and Roadway Reinforcement see Sheet No. 6
Checked
Correct
Approved
Approved
CITY OF PITTSBURCH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONSTRUCTION
LARIMER AVE. BRIDGE
OVER WASHINGTON BLVD.
ELEVATIONS AND DETAILS
OF MAIN PIERS
SCALE ⅜"=1'-0"
SHEET NO. 3 OF 12
F507
7
3

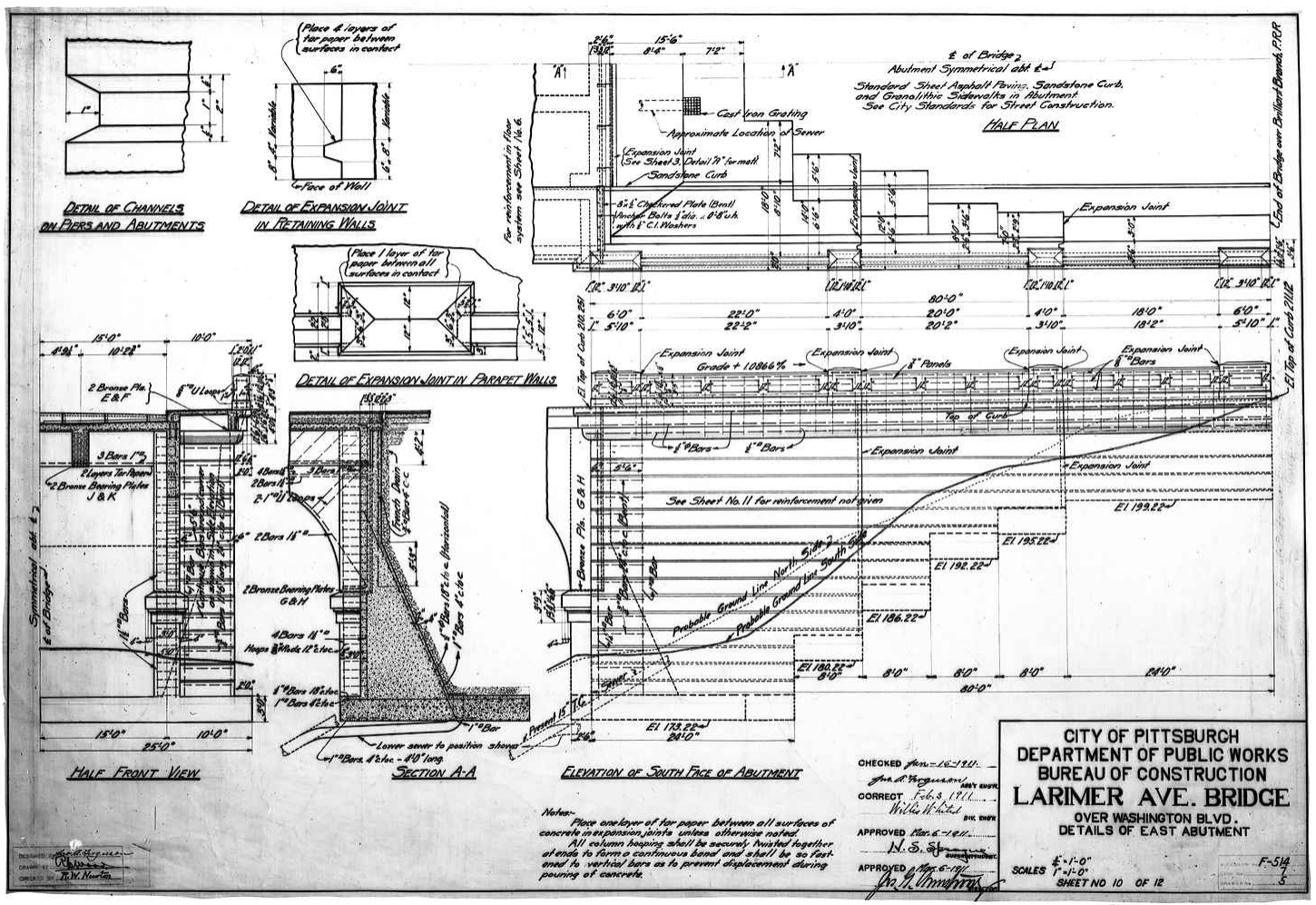

SECTION A-A
SECTION B-B
SECTION F-F
SECTION D-D
SECTION C-C
SECTION E-E
MAIN SPAN
APPROACH SPAN
For Main Span Reinforcement see Sheet No. 6.
For Approach Span Reinforcement see Sheet No. 8.
Symmetrical of Pier
Slope bottom toward drain ½" per ft.
10" C. I. Pipe
Bottom of Drain
Expansion Joint
Bronze Plates C & D
Bronze Plates A & B
All column hooping to be securely twisted together to form a continuous band.
Place two layers of tar paper in joint between Pier and Strut. In all other joints place one layer of tar paper.
Steel Expansion Joint
Anchor Bolts
Cast I. Bolster
Bend Subwalk Plate as shown
Surface of Ground
Batter 1" per foot
Batter 2" per ft.
1-2-4 Concrete above this line
1-2-5 Concrete below but not above this line
CHECKED June 12-1911
CORRECT Feb. 8 1911
APPROVED Mar. 6-1911
APPROVED May 4-1911
CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONSTRUCTION
LARIMER AVE. BRIDGE
OVER WASHINGTON BL VD.
SECTIONAL DETAILS OF MAIN PIERS
SCALE ⅜"=1'-0"
SHEET NO 4 OF 12
F-508

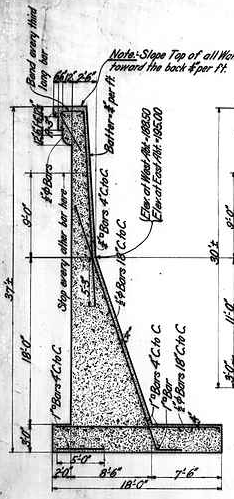

48'-0"
30'-0"
Note: Stop concreting of floor system on this line
Note: Gravel under pavement to be not more than 2" and not less than ¾" in size.
Note: Place 2 layers Tar Paper between Cross Beam and Strut.
Reinforcement for Rib
SECTION A-A
Note: Place 1 layer of Tar Paper between Spandrel Girder and Rib
Note: All rivets ⅞"φ
Elev. Springing Line-125.406
ELEVATION OF ARCH RIB AT PANEL POINTS No.6, No.7, No.8, No.9, & No.10.
SECTION B-B
Note: For typical plan of floor system reinforcement see sheet number 6.
Note: Ordinates to springing line and dimensions from curb grade to arch intrados do not include camber. For camber diagram see sheet #2
Make expansion joints at each panel point in fascia girder, curb, and sidewalk slab. Place one layer of tar paper between all concrete surfaces in contact in expansion joints.
For typical plan of spacing of bars in floor system see sheet number 6.
CITY OF PITTSBURCH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONSTRUCTION
LARIMER AVE. BRIDGE
OVER WASHINGTON BLVD.
DETAILS - MAIN SPAN
PANEL POINTS 6,7,8,9,10
SCALE ½"=1'-0"
SHEET NO 5 OF 12
F-509
5


El. for Panel Pt. #2 = 206.177
El. " " " #14 = 208.720
Top of Curb
PANEL POINTS NOS. 2 & 14.
El. for Panel Pt. #3 = 206.390
El. " " " #13 = 208.507
Top of Curb
PANEL POINTS NOS. 3 & 13.
El. for Panel Pt. #4 = 206.600
El. " " " #12 = 208.296
Top of Curb
PANEL POINTS NOS. 4 & 12.
El. for Panel Pt. #5 = 206.812
El. " " " #11 = 208.084
Top of Curb
PANEL POINTS NOS. 5 & 11.
El. for Panel Pt. #1 = 205.965
El. " " " #15 = 208.931
Top of Curb
PANEL POINTS NOS. 1 & 15.
Concrete Strut to be placed in keyway where required to support rib
Section B-B
DETAIL OF KEYWAY
Reinforcement for Columns
4 Bars 1 1/8"
Hoops 5/8" Rods 12" C. to C.
A-3'-2" for panel pts. #1 & #15
A-3'-0" " " " #2 = #14
A-2'-10" " " " #3 = #13
A-2'-8" " " " #4 = #12
A-2'-6" " " " #5 = #11
SECTION OF COLUMN
SECTION A-A
Showing Rib Strut
Note:- Ordinates to springing line and dimensions from curb grade to arch intrados do not include camber. For camber diagram see sheet #2.
All column hooping to be securely twisted together at ends to form a continuous band and to be so fastened to the vertical bars as to prevent displacement during pouring of concrete.
CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONSTRUCTION
LARIMER AVE. BRIDGE
OVER WASHINGTON BLVD.
DETAILS - MAIN SPAN
ARCH RIBS — PANEL PTS. 0-6 and 10-16
SCALE - 1/4" = 1'-0"
SHEET NO 7 OF 12
F-511

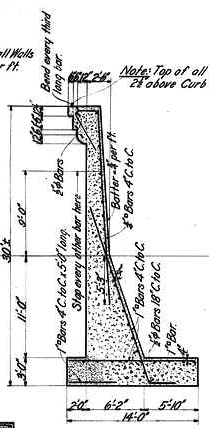

HALF CROSS SECTION
SECTION C-C
SECTION A-A
SECTION B-B
ELEVATION
Notes:-
Make Expansion Joint at each sidewalk bracket in Fascia Girder, Curb and Sidewalk Slab. Place one layer of tar paper between all surfaces of concrete in contact in expansion joints.
All Column Hooping shall be securely twisted at ends to form a continuous band and shall be fastened to vertical bars to prevent displacement during pouring of concrete.
CHECKED
CORRECT
APPROVED
APPROVED
CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONSTRUCTION
LARIMER AVE. BRIDGE
OVER WASHINGTON BLVD.
DETAILS - APPPOACH SPANS
SCALE
SHEET NO 8 OF 12
DESIGNED
DRAWN BY
CHECKED BY


Curb Line
Standard Sheet Asphalt Paving, Sandstone Curb and Granolithic Sidewalks in Abutment. See City Standards for Street Construction.
Centre Line of Bridge
15" Sewer
Cast Iron Grating
Material for expansion joint same as for half joint "A" Sheet No. 3.
2 Bronze Bearing Plates E & F
2 Bronze Bearing Plates G & H
2 Bronze Bearing Plates J & K
3 Bars 1"
For reinforcement in flow system not shown see Sheet No. 6
8"x½" Checkered Pl.
End of Bridge Pavement
Sandstone Curb
For reinforcement in retaining walls not shown see sheet number 11.
Expansion Joints For detail see Sheet No. 10
Expansion Joint
Panels ⅞" Deep
⅝" U Loops
Elev. Top of Curb-204.318
El. Top of Curb-203.84
Probable Earth Surface North Side
Probable Earth Surface South Side
Elev. Both Sides 186.00
Elev. North Side 180.00
Elev. South Side 176.00
Elev. Both Sides 167.00
Elev. North Side 167.00
Elev. South Side 165.00
Bronze Pls. G & H
1" Bar
Note: For detail of paving on approach spans see sheet #5
2 Layers Tar Paper
2 Bronze Bearing Pls. J & K
4 Bars 1½"
Hoop ⅝" Rods 12" C to C
Probable Earth Surface
Elev. = 167.00
Elev. = 165.00
⅝" U Loops
½" Bars
14" Bar
These bars to continue as shown on side elevation.
Asphalt 2"
Binder 1"
Gravel
Concrete 6"
2 Bronze Bearing Plates J & K
1" Bars
4 Bars 1½"
2 Bars 1½"
21 ⅝" U Loops
Elev. = 188.50'
2 Bronze Bearing Plates G & H
Cast Iron Grating
French Drain
Contractor shall remove one joint of pipe and replace with 15"x10" Y
4 Bars 1½"
Hoops ⅝" Rods 12" C to C
½" Bars 18" C to C
1" Bars 4" C to C
15" Sewer Approximate Location
SECTION AA
Top Plates 12 Req'd. "E"
Bottom Plates 12 Req'd. "F"
BRONZE BEARING PLATES FOR FACIA GIRDERS "E" & "F"
Top Plates 4 Req'd. "G"
Bottom Plates 4 Req'd. "H"
BRONZE BEARING PLATES FOR COLUMNS "G" & "H"
Top Plates 4 Req'd. "J"
Bottom & Top Plates 20 Req'd. "K"
BRONZE BEARING PLATES FOR STRINGERS "J" & "K"
For additional bronze plates see sheet #3.
Notes:-
Place one layer of tar paper between all surfaces of concrete in contact in expansion joints.
All column hooping to be securely twisted together at ends to form a continuous band and to be so fastened to vertical bars as to prevent displacement during pouring of concrete.
DESIGNED BY Jno. A. Ferguson
DRAWN BY
CHECKED BY H. W. Newton
CHECKED Jan. 17-1911
Jno. A. Ferguson
CORRECT Feb. 3 1911
APPROVED Mar. 6-1911
N. S. Sh
APPROVED Mar. 6-1911
CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONSTRUCTION
LARIMER AVE. BRIDGE
OVER WASHINGTON BLVD.
DETAILS OF WEST ABUTMENT
SCALES
SHEET NO 9 OF 12
F-513

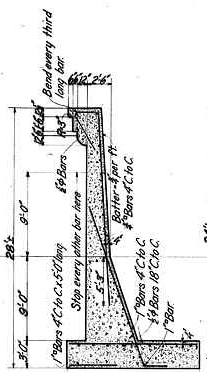

DETAIL OF CHANNELS ON PIERS AND ABUTMENTS
DETAIL OF EXPANSION JOINT IN RETAINING WALLS
(Place 4 layers of tar paper between surfaces in contact)
Face of Wall
DETAIL OF EXPANSION JOINT IN PARAPET WALLS
(Place 1 layer of tar paper between all surfaces in contact)
HALF FRONT VIEW
SECTION A-A
ELEVATION OF SOUTH FACE OF ABUTMENT
HALF PLAN
℄ of Bridge
Abutment Symmetrical about ℄
Standard Sheet Asphalt Paving, Sandstone Curb, and Granolithic Sidewalks in Abutment. See City Standards for Street Construction.
Cast Iron Grating
Approximate Location of Sewer
Expansion Joint (See Sheet 3, Detail "A" for mat)
Sandstone Curb
Expansion Joint
See Sheet No. 11 for reinforcement not given
Probable Ground Line North Side
Probable Ground Line South Side
Top of Curb
Grade + 1.0866%
Lower sewer to position shown
Notes:-
Place one layer of tar paper between all surfaces of concrete in expansion joints unless otherwise noted.
All column hooping shall be securely twisted together at ends to form a continuous band and shall be so fastened to vertical bars as to prevent displacement during pouring of concrete.
CHECKED Jan. 16, 1911
CHIEF ENGR.
CORRECT Feb. 3, 1911
DIV. ENGR.
APPROVED Mar. 6, 1911
SUPERINTENDENT
APPROVED Apr. 6, 1911
CITY OF PITTSBURCH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONSTRUCTION
LARIMER AVE. BRIDGE
OVER WASHINGTON BLVD.
DETAILS OF EAST ABUTMENT
SCALES ℄ = 1'-0" 1" = 1'-0"
SHEET NO 10 OF 12
F-514
DESIGNED BY
DRAWN BY
CHECKED BY R. W. Newton



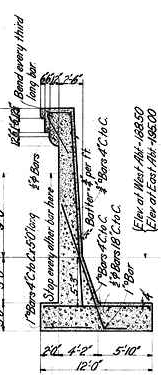
SECTION OF 37 FT. RETAINING WALL



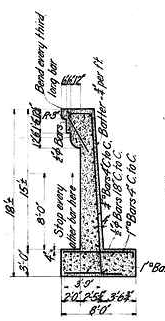
SECTION OF 30 FT. RETAINING WALL



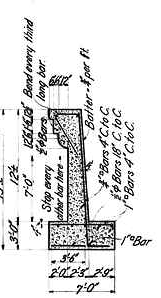
SECTION OF 28 FT. RETAINING WALL



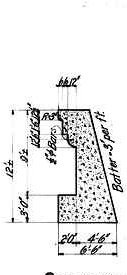
SECTION OF 24 FT. RETAINING WALL



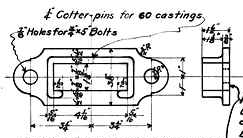
SECTION OF 18 FT. RETAINING WALL



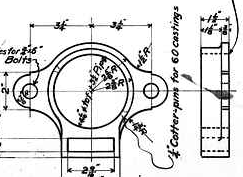
SECTION OF 15 FT. RETAINING WALL



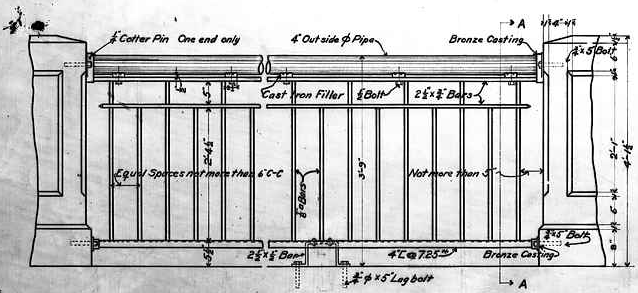
SECTION OF 12 FT. RETAINING WALL



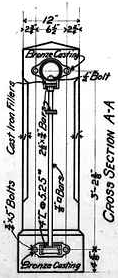
120 BRONZE CASTINGS REQUIRED



120 BRONZE CASTINGS REQUIRED



ELEVATION OF RAILING



CROSS SECTION A-A

DESIGNED BY Geo. D. Requard
DRAWN BY Geo. Shaberoff
CHECKED BY R. W. Newton

CHECKED Jan. 17, 1911
CORRECT Feb. 3, 1911
APPROVED Mar. 6, 1911
N. S. Stevenson
APPROVED Mar. 6, 1911
Joseph Armstrong

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONSTRUCTION

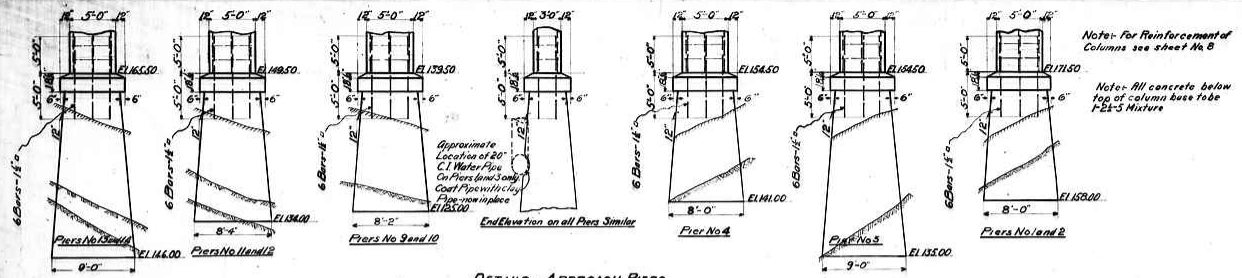
LARIMER AVE. BRIDGE

OVER WASHINGTON BLVD.
SECTIONS OF RETAINING WALLS AND DETAIL OF RAILING

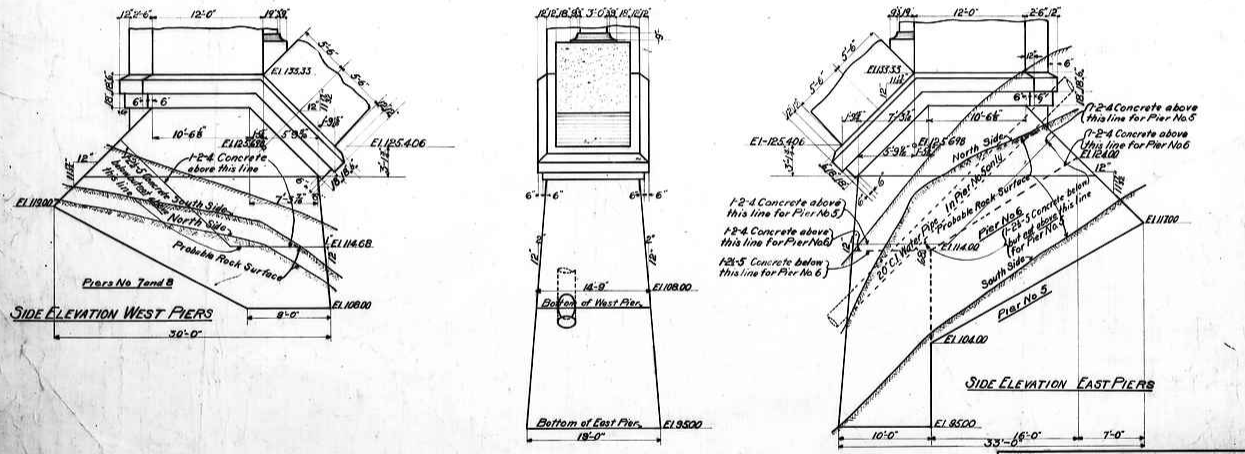
SCALES ¼"=1'-0" ½"=1'-0" ¼"=1'-0"

SHEET NO. 11 OF 12

WORK ORDER F-515
DRAWING No. 5
CONTRACT No.



DETAILS - APPROACH PIERS



DETAILS - MAIN PIERS FRONT ELEVATION

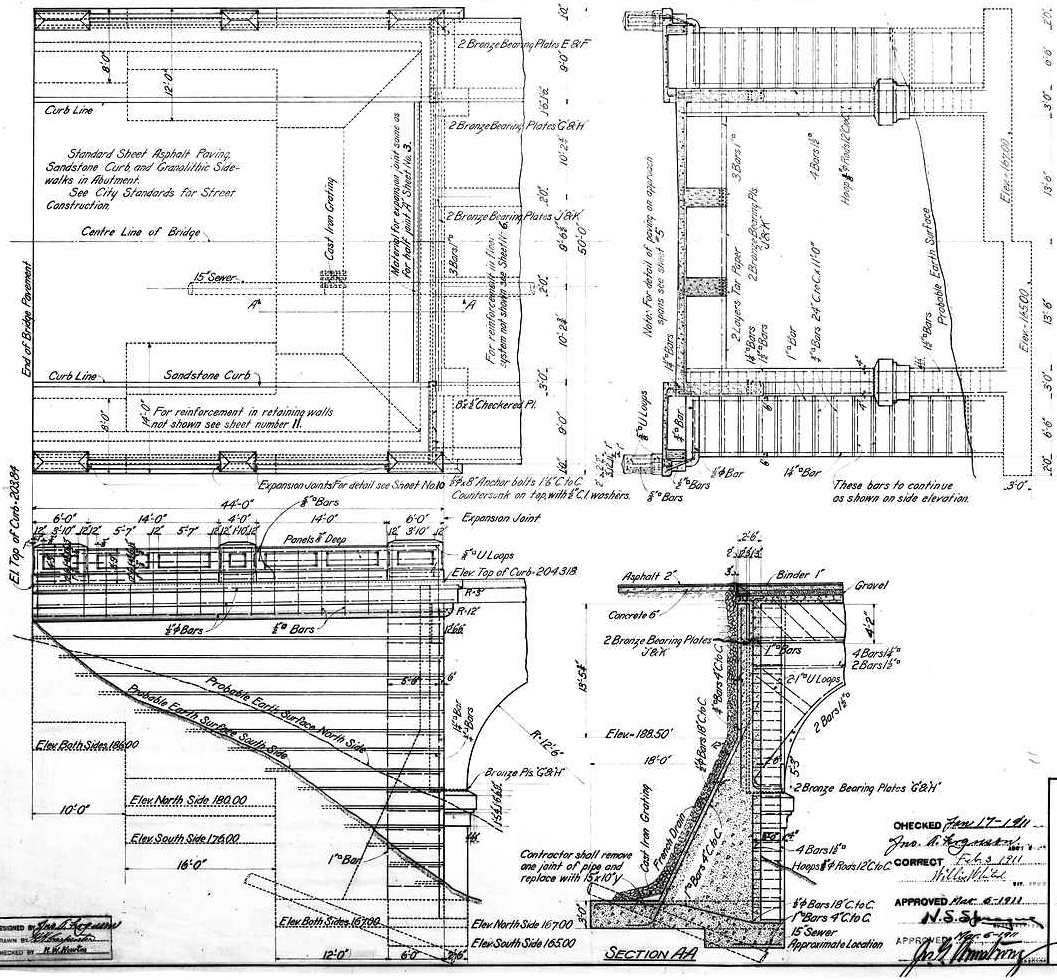
CHECKED Jan. 18, 1911
Jno. A. Fitzpatrick ASST. ENGR.
CORRECT Feb. 3 1911
Willis W. Lee DIV. ENGR.
APPROVED Mar. 6, 1911
N. S. Stevenson BUREAU ENGR.
APPROVED Mar. 6, 1911
Jas. H. Armstrong DIRECTOR

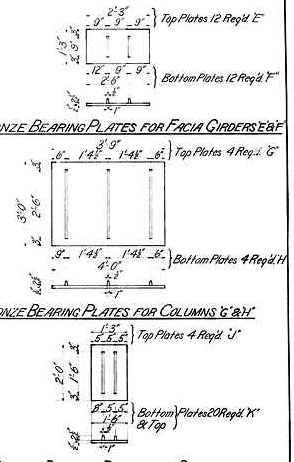
CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONSTRUCTION
LARIMER AVE. BRIDGE
OVER WASHINGTON BLVD.
DETAILS OF PIER FOUNDATIONS

SCALE 1/8"-1'-0"
SHEET NO 12 OF 12

DESIGNED BY Jno. A. Fitzpatrick
DRAWN BY Geo. Schlafly
CHECKED BY H. M. McCord

F-516





For additional bronze plates see sheet "3.

Notes:-

Place one layer of tar paper between all surfaces of concrete in contact in expansion joints.

All column hooping to be securely twisted together at ends to form a continuous band and to be so fastened to vertical bars as to prevent displacement during pouring of concrete.

CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONSTRUCTION
LARIMER AVE. BRIDGE
OVER WASHINGTON BLVD.
DETAILS OF WEST ABUTMENT

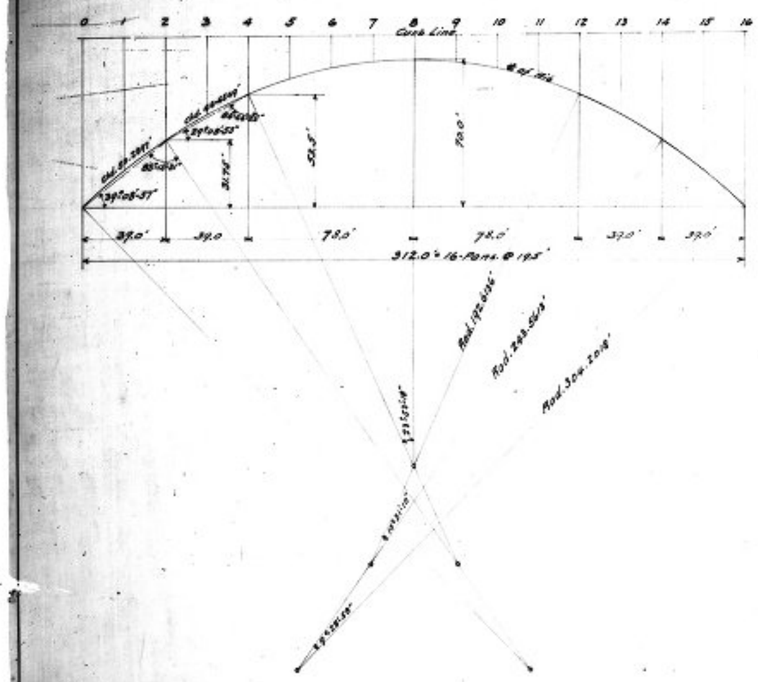
DESIGNED BY Jos. J. Kerwin
DRAWN BY
CHECKED BY H. W. Horton

CHECKED Jan. 17-1911
Jno. A. Gerrard
CORRECT Feb. 8 1911
APPROVED Mar. 8-1911
N. S. Sh
APPROVED Mar. 8-1911
Mayor of the City of Pittsburgh

SCALES 1/4"-1'-0" 1/2"-1'-0"

SHEET NO 9 OF 12

F-513
7
3



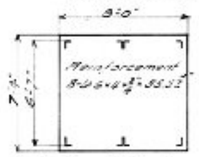
PANEL LOADS

	1 & 15	2 & 14	3 & 13	4 & 12	5 & 11	6 & 10	7 & 9	8
D.L. Floor System	177100	177100	177100	177100	177100	177100	177100	177100
D.L. Columns	76500	49800	35000	22100	12600	6500		
D.L. Rib	249500	225500	204200	192000	172000	160000	155600	152200
D.L. Total	494100	452400	416300	391200	361700	343600	332700	329300
D.L. Used	495000	453000	417000	392000	362000	344000	333000	330000
L.L. "	42400	42400	42400	42400	42400	42400	42400	42400

Rib assumed 8'-0" wide × 6'-6" deep at crown and increasing in depth towards spring as secant of angle of inclination of axis of rib with horizontal.

SECTION THROUGH RIB

At point of intersection of center line of rib and temperature and rib shortening thrust line



Effective Area

Concrete = 88 × 96 − 55.52 = 8392.48 □"

Steel = 52.55 × 15 = 832.80

9225.28 □"

Moment of Inertia

Concrete = 8.0 × 8.8^3 − 7793.96 = 5378838.04

Steel = 15 × (55.52 × 3.74^2 + 196.08) = 1169069.40

6547907.44

Hor. Thrust due to a change of 1° in temperature = $\frac{45 \times 2000000 \times 6547907.44 \times 0.000055}{4 \times 88^2}$ = 1147#

" " " " " " " 20° " " " = 1147 × 20 = 22940#

" " " " " " " 40° " " " = 1147 × 40 = 45880#

Hor. Thrust due to Rib Shortening @ 420 per □" = $\frac{45 \times 6547907.44 \times 420}{4 \times 88^2}$ = 43847#

SUMMARY OF STRESSES ON RIB

Panel Point	Dead Load Moment	Dead Load Thrust	Live Load Moment	Live Load Thrust	Temperature Moment	Temperature Thrust	Rib Shortening Moment	Rib Shortening Thrust	Maximum Moment	Maximum Thrust	Rib depth & area		Maximum Stress per sq. in. on edges of Rib
0			−3375500	− 253500	−1070500	− 16500			+ 1109000	− 4606400	d = 11.0'	Top	$\frac{-1109000 \times 6}{13449 \times 11} + \frac{4606400}{13449}$ = −45+343 = 388 #/□"
	+ 3509000	− 4368000	+ 3437500	− 239500	+2141000	+ 33000	+ 2046000	+ 31600	+ 11333500	− 4582900	A = 13449 □"	Bott.	$\frac{11333500 \times 6}{13449 \times 11} + \frac{4582900}{13449}$ = 460+338 = 798 #/□"
1			− 1418000	− 240500	− 675500	− 17900			− 1287000	− 4546200	d = 8.5'	Top	$\frac{1287000 \times 6}{10569 \times 8.5} + \frac{4546200}{10569}$ = 86+430 = 516 #/□"
	+ 655500	− 4358000	+ 1776000	− 253500	+ 1351000	+ 35800	+ 1291300	+ 34200	+ 5071800	− 4501500	A = 10569 □"	Bott.	$\frac{5071800 \times 6}{10569 \times 8.5} + \frac{4501500}{10569}$ = 339+430 = 769 #/□"
2	− 810600	− 4046000	− 704300	− 113500	− 342300	− 18700			− 1203000	− 4147500	d = 8.076'	Top	$\frac{1203000 \times 6}{10080 \times 8.076} + \frac{4147500}{10080}$ = 90+412 = 502 #/□"
			+ 810900	− 269000	+ 684500	+ 37400	+ 654200	+ 35700	+ 1339000	− 4211900	A = 10080 □"	Bott.	$\frac{1339000 \times 6}{10080 \times 8.076} + \frac{4211900}{10080}$ = 100+418 = 518 #/□"
3	− 758600	− 3793000	− 1366800	− 124500	− 64200	− 20100			− 2066800	− 3899200	d = 7.445'	Top	$\frac{2066800 \times 6}{9354 \times 7.445} + \frac{3899200}{9354}$ = 178+417 = 595 #/□"
			+ 1797500	− 319500	+ 128600	+ 40200	+ 122800	+ 38400	+ 1290100	− 4033900	A = 9354 □"	Bott.	$\frac{1290100 \times 6}{9354 \times 7.445} + \frac{4033900}{9354}$ = 111+431 = 542 #/□"
4	− 179500	− 3588000	− 1828300	− 149500	− 313400	− 42000	− 299400	− 40100	− 2620600	− 3819600	d = 7.108'	Top	$\frac{2620600 \times 6}{8966 \times 7.108} + \frac{3819600}{8966}$ = 247+426 = 673 #/□"
			+ 2236000	− 273500	+ 156700	+ 21000			+ 1913800	− 3880600	A = 8966 □"	Bott.	$\frac{1913800 \times 6}{8966 \times 7.108} + \frac{3880600}{8966}$ = 180+427 = 607 #/□"
5			− 1894000	− 182000	− 654000	− 43800	− 627000	− 41900	− 2834800	− 3696700	d = 6.822'	Top	$\frac{2834800 \times 6}{8636 \times 6.822} + \frac{3696700}{8636}$ = 259+428 = 687 #/□"
	+ 343200	− 3429000	+ 2135200	− 225000	+ 328000	+ 21900			+ 2179400	− 3674000	A = 8636 □"	Bott.	$\frac{2179400 \times 6}{8636 \times 6.822} + \frac{3674000}{8636}$ = 199+425 = 624 #/□"
6			− 1636500	− 167000	− 890000	− 45000	− 850600	− 43000	− 3048900	− 3572000	d = 6.638'	Top	$\frac{3048900 \times 6}{8424 \times 6.638} + \frac{3572000}{8424}$ = 327+424 = 751 #/□"
	+ 332200	− 3317000	+ 1740200	− 225000	+ 445000	+ 22500			+ 1666800	− 3562500	A = 8424 □"	Bott.	$\frac{1666800 \times 6}{8424 \times 6.638} + \frac{3562500}{8424}$ = 179+423 = 602 #/□"
7			− 1324000	− 160000	− 1027600	− 45600	− 982100	− 43600	− 2846200	− 3496200	d = 6.533'	Top	$\frac{2846200 \times 6}{8323 \times 6.533} + \frac{3496200}{8323}$ = 314+420 = 734 #/□"
	+ 487500	− 3247000	+ 1301700	− 225500	+ 513800	+ 22800			+ 1320900	− 3493300	A = 8323 □"	Bott.	$\frac{1320900 \times 6}{8323 \times 6.533} + \frac{3493300}{8323}$ = 146+420 = 566 #/□"
8			− 1201800	− 207500	+ 1070400	− 45900	− 1023000	− 43800	− 2652600	− 3507200	d = 6.5'	Top.	$\frac{2652600 \times 6}{8265 \times 6.5} + \frac{3507200}{8265}$ = 296+424 = 720 #/□"
	+ 642600	− 3210000	+ 1173000	− 172500	+ 535200	+ 22900			+ 1327800	− 3426300	A = 8265 □"	Bott.	$\frac{1327800 \times 6}{8265 \times 6.5} + \frac{3426300}{8265}$ = 148+416 = 564 #/□"

AREA ENCLOSED BETWEEN CHORD AND AXIS OF RIB

Pans. 0 to 2 and 14 to 16 = 1238.25 × 31.09 = 1269.34 Sq. ft.

" 2 to 4 = 1210.14 = 2476.50 + 848.25 × 56.49 = 3381.24 " "

" 4 to 12 = 8346.00 + 1681.46 = 10027.46 " "

14678.04 " "

Rise of Parabola having equal area = $\frac{14678.04 \times 3}{2 \times 312}$ = 70.571'

Intersection locus Ordinate for equal Parabola = 70.571 × $\frac{2}{3}$ = 84.6852' from chord

Intersection locus Ord. to be used = 84.6852 − (70.571 − 70.000) = 84.1142' above chord.

ORDINATES FOR PANEL LOADS

Load at	Left hand end Ordinate		Right hand end Ordinate	
1	$\frac{2 \times 70.571}{19} \times \frac{84.6852 - 2}{.6852}$	= − 254.04'	$\frac{2 \times 70.571}{19} \times \frac{3 - 5 \times .0625}{1 - .0625}$	= + 26.97'
2	" $\times \frac{3 \times .125 - 2}{.125}$	= − 103.50'	" $\times \frac{3 - 5 \times .125}{1 - .125}$	= + 25.53'
3	" $\times \frac{3 \times .1875 - 2}{.1875}$	= − 53.32'	" $\times \frac{3 - 5 \times .1875}{1 - .1875}$	= + 23.88'
4	" $\times \frac{3 \times .2500 - 2}{.25}$	= − 28.23'	" $\times \frac{3 - 5 \times .25}{1 - .25}$	= + 21.95'
5	" $\times \frac{3 \times .3125 - 2}{.3125}$	= − 13.17'	" $\times \frac{3 - 5 \times .3125}{1 - .3125}$	= + 19.75'
6	" $\times \frac{3 \times .375 - 2}{.375}$	= − 3.14'	" $\times \frac{3 - 5 \times .375}{1 - .375}$	= + 16.94'
7	" $\times \frac{3 \times .4375 - 2}{.4375}$	= + 4.03'	" $\times \frac{3 - 5 \times .4375}{1 - .4375}$	= + 13.59'
8	" $\times \frac{3 \times .5 - 2}{.5}$	= + 9.41'	" $\times \frac{3 - 5 \times .5}{1 - .5}$	= + 9.41'

DEAD LOADS

Floor System

Paving Rg. Asphalt	= 900# per lin. ft.	
" " Concrete	= 4500 "	
" Sidewalks Conc.	= 1300 "	
Hand Rail	= 100 "	
Floor Slab	= 3660 "	
Facia Girders	= 580 "	
Curb Girders	= 1760 "	
Stringers	= 1920 "	
	14720# "	
14720 × 19.5 = 287040# per Pan.		
Floor Beam	= 53570 " "	
Brackets	= 13610 " "	
	354220 " "	
÷ 2 = 177100# per pan. per Rib.		

Columns & Rib

Col. at 1	= 76500
" " 2	= 49800
" " 3	= 35000
" " 4	= 22100
" " 5	= 12600
" " 6	= 6500
Rib at 1	= 249500
" " 2	= 225500
" " 3	= 204200
" " 4	= 192000
" " 5	= 172000
" " 6	= 160000
" " 7	= 155600
" " 8	= 152200

Assumed Weights of Materials for Dead Loads

Paving Asphalt and Binder = 120# per cu. ft.

Concrete, paving, floor system & cols. = 142# " " "

Concrete Arch Ribs = 150# " " "

Hand Railing = 50# " lin. ft. per rail

Assumed Live Loads for Arch Ribs

Roadway - 1200# per lin. ft. each on two car tracks occupying 12' width and 80# per sq. ft. on Rg. floor not occupied by cars

Sidewalks - 60# per sq. ft.

DESIGNED BY J. G. Wilkerson

DRAWN BY do

CHECKED BY

CHECKED March 6th 1911

J. J. Wilkerson

CORRECT Mar. 6 1911

Willis White

APPROVED 3/6/1911

N. S. Thompson

APPROVED

CITY OF PITTSBURGH

DEPARTMENT OF PUBLIC WORKS

BUREAU OF CONSTRUCTION

LARIMER AVE. BRIDGE

STRESS CALCULATIONS

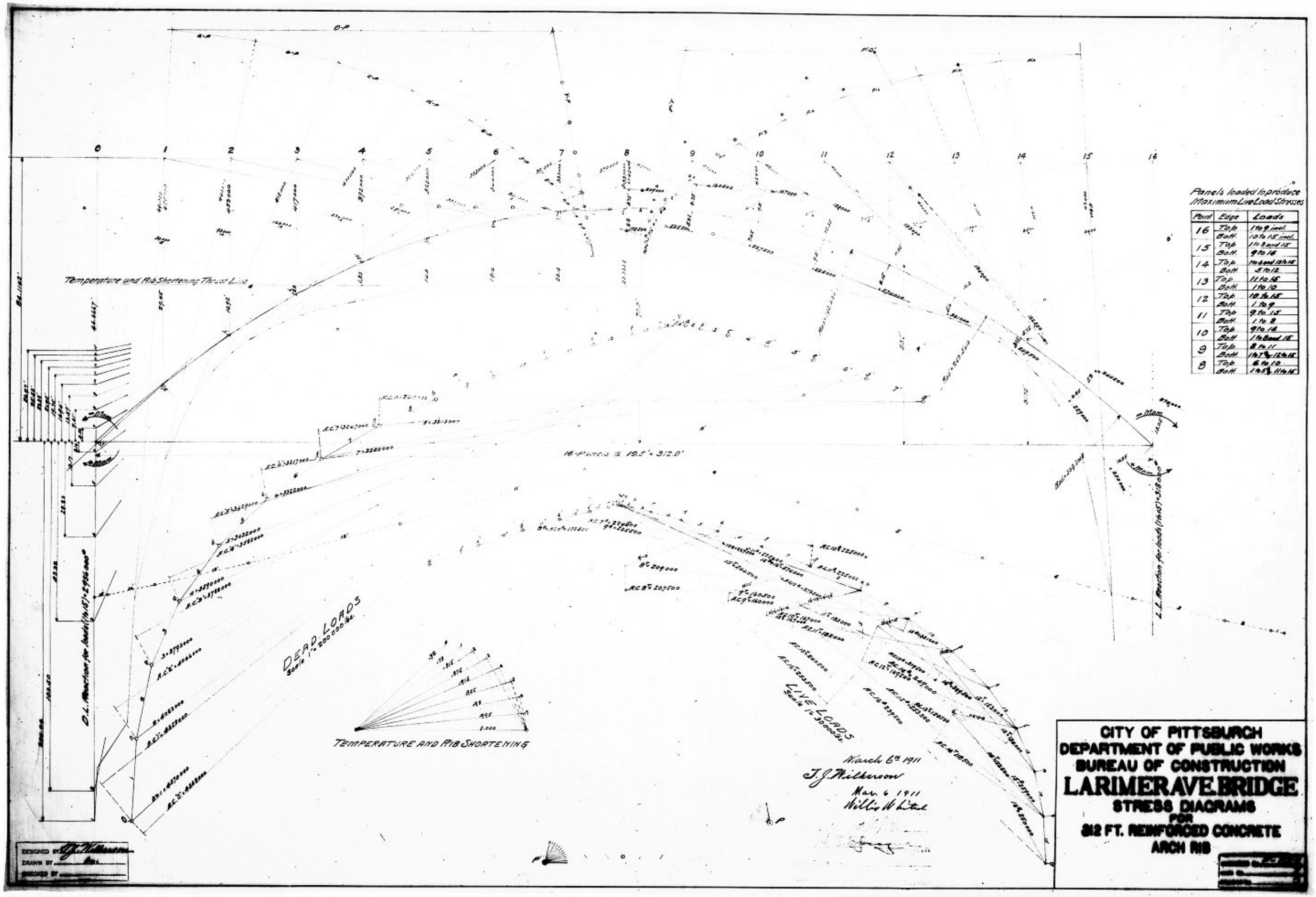
FOR

312 FT. REINFORCED CONCRETE ARCH RIB

ACCESSION No. F-623

CASE No.

DRAWING No. 3


Temperature and Rib Shortening Thrust Line
16 Panels @ 19.5' = 312.0'
DEAD LOADS
Scale 1" = 200,000 lbs.
LIVE LOADS
Scale 1" = 300,000 lbs.
TEMPERATURE AND RIB SHORTENING
D.L. Reaction for loads (1 to 15) = 2,956,000#
L.L. Reaction for loads (1 to 15) = 318,000#
Mom
Panels loaded to produce Maximum Live Load Stresses
Point | Edge | Loads
16 | Top | 1 to 9 incl.
Bott. | 10 to 15 incl.
15 | Top | 1 to 8 and 15
Bott. | 9 to 14
14 | Top | 1 to 6 and 13 to 15
Bott. | 5 to 12
13 | Top | 11 to 15
Bott. | 1 to 10
12 | Top | 10 to 15
Bott. | 1 to 9
11 | Top | 9 to 15
Bott. | 1 to 8
10 | Top | 9 to 14
Bott. | 1 to 8 and 15
9 | Top | 8 to 11
Bott. | 1 to 7 & 12 to 15
8 | Top | 6 to 10
Bott. | 1 to 5 & 11 to 15
March 6th 1911
J. J. Wilkinson
Mar. 6 1911
Willis W. Lilal
DESIGNED BY J. J. Wilkinson
DRAWN BY
CHECKED BY
CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONSTRUCTION
LARIMER AVE. BRIDGE
STRESS DIAGRAMS
FOR
312 FT. REINFORCED CONCRETE
ARCH RIB

DESIGNED BY
TRACED BY
CHECKED BY
SHAFT OF POLISHED SEA GREEN GRANITE
NOTE: SCALE FOR SHAFT 4"
APPROVED
DIVISION ENGINEER
APPROVED
SUPERINTENDENT
SECTION
GLASS
GLOBE
NOTE: UPPER HALF OF GLOBE HINGED TO LIFT UP.
THIS PANEL HINGED TO OPEN
BEVELLED PLATE GLASS
NOTE
SHOP DRAWINGS AND MODELS TO BE APPROVED BY THIS DEPARTMENT BEFORE PROCEEDING WITH THE WORK.
ANNO
DOMINI
MCMXI
FRONT ELEVATION
ONE HALF PLAN
LARIMER
AVENUE
SIDE ELEVATION
REAR ELEVATION
NOTE ALL OTHER DETAIL ON REAR TO BE SIMILAR TO FRONT.
CITY OF PITTSBURGH
DEPARTMENT OF PUBLIC WORKS
BUREAU OF CONSTRUCTION
DETAILS OF BRONZE LAMPS
LARIMER AVENUE BRIDGE
SCALE 3"=1'-0"
F-447
7
5