STANDARD DETAILS

—FOR—

SEWERS

DEPARTMENT OF PUBLIC WORKS

Bureau of Surveys

PHILADELPHIA

1902

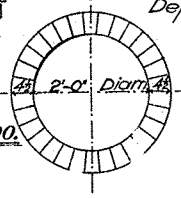
GEORGE S. WEBSTER,
Chief Engineer.

GENERAL SECTIONS of CIRCULAR SEWERS.

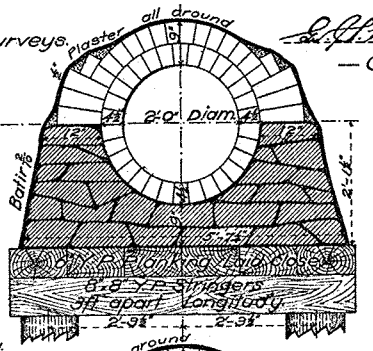
12" 6" 0 1' 2'
SCALE

Dep't. of Public Works — Bureau of Surveys.
— Jan. 1896. —

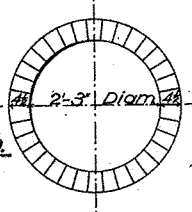
Chief Engineer.



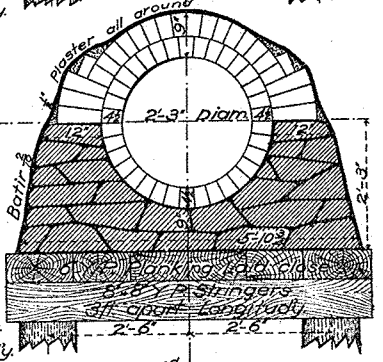
Min. Gr. 0.24 p.100.



12" Y.P. Piles 3 ft. apart Longitudy.

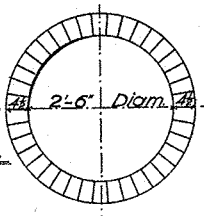


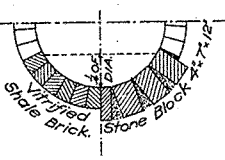
Min. Gr. 0.2 p.100.

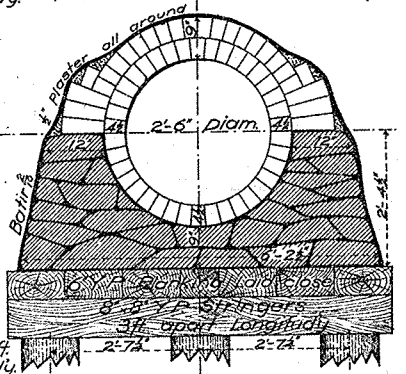


12" Y.P. Piles 3 ft. apart Longitudy.

Stone Block and Vitrified Brick Inverts.

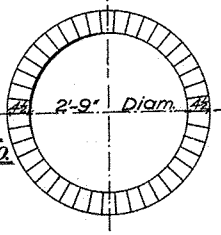






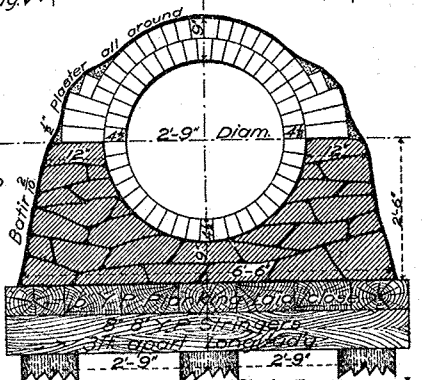
12" Y.P. Piles 3 ft. apart Longitudy.

Piles and Platform, if required, will be paid for at the price in the contract when ordered by the Chief Engineer.



Min. Gr. 0.15 p.100.

NOTE+ Filling over top of Sewer to be of least three feet deep, and with a slope not less than 1½ to 1.



12" Y.P. Piles 3 ft. apart Longitudy.

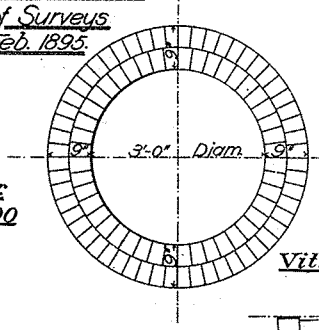
Min. Sections in Natural Foundations.

Max. Sec. in Artificial Foundations. Platform and Piles where directed.

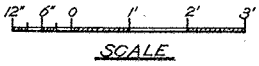
GENERAL SECTIONS of CIRCULAR SEWERS.

Dep't. of Public Works
Bureau of Surveys
Feb. 1895.

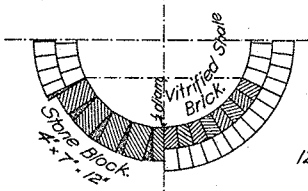
D. F. Webster
Chief Engineer.

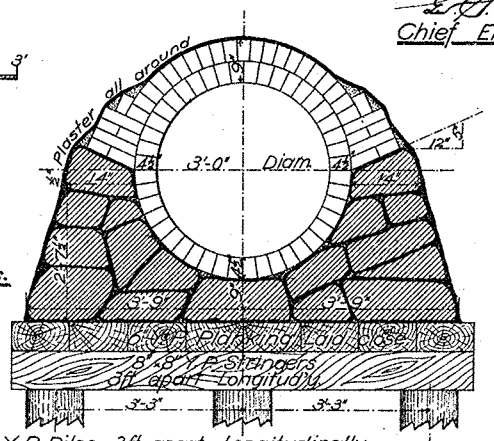


Min. Gr.
0.13 p.100



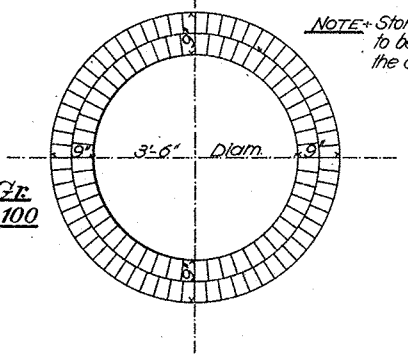
Stone Block
and
Vitrified Brick Inverts.



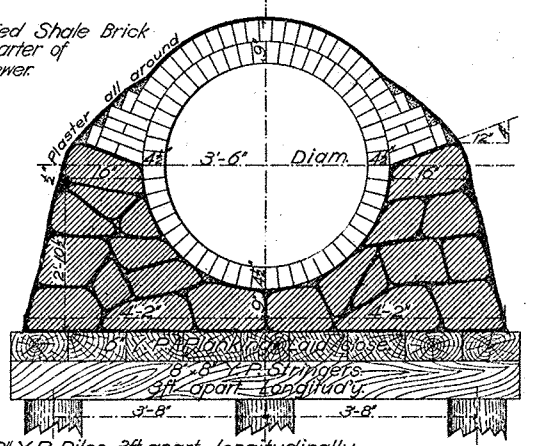


12" Y.P. Piles 3ft. apart Longitudinally.

NOTE:- Stone Block or Vitrified Shale Brick to be at least one quarter of the diam. of Brick Sewer.



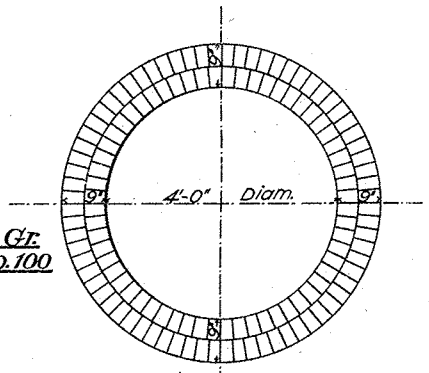
Min. Gr.
0.11 p.100



12" Y.P. Piles 3ft. apart Longitudinally.

Piles and Platform, if required, will be paid for at the price in the contract when ordered by the Chief Engineer.

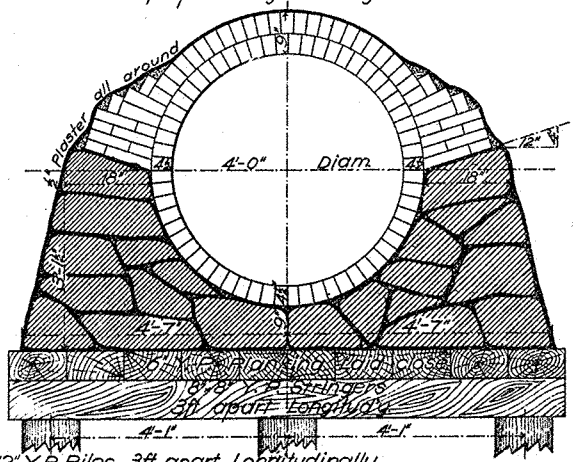
NOTE:- Filling over top of Sewer to be at least three feet deep, and with a slope not less than ½ to 1



Min. Gr.
0.09 p.100

Minimum Sections in
Natural Foundations.

NOTE:-
Use double Ring of
Brickwork in either
Earth or Rock Excavation



12" Y.P. Piles 3ft. apart Longitudinally.

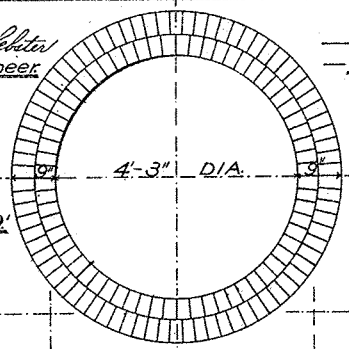
Maximum Sections in Artificial Foundations.
Platform and Piles where directed.

General Sections of Circular Sewers.

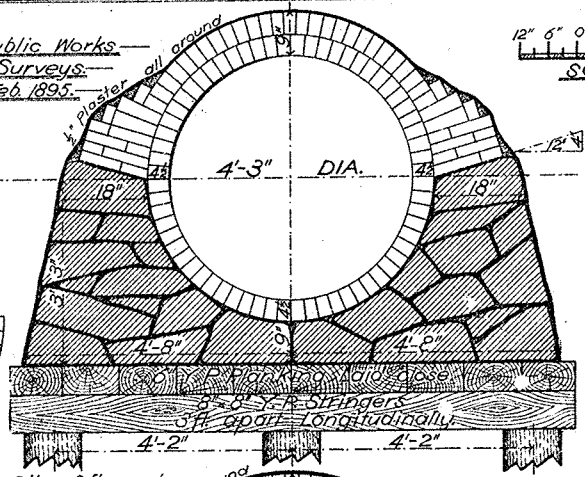
L. C. Webster
Chief Engineer.

Dept. of Public Works
Bureau of Surveys.
Feb. 1895.

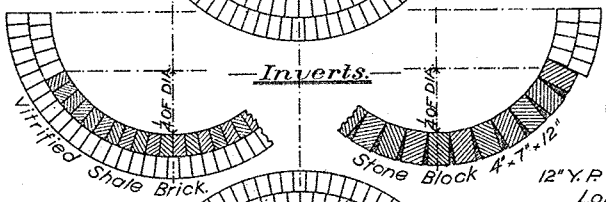
12" 6" 0 1' 2'
SCALE.

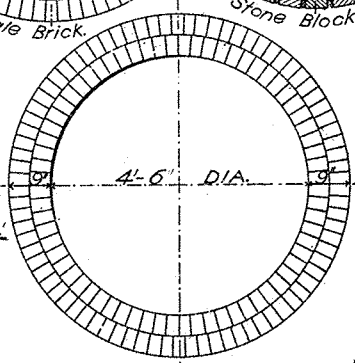


Min. Gr.
0.09 p. 100'



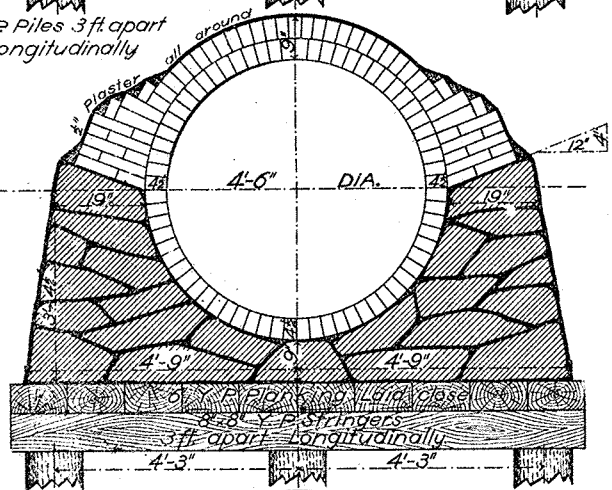
Inverts.



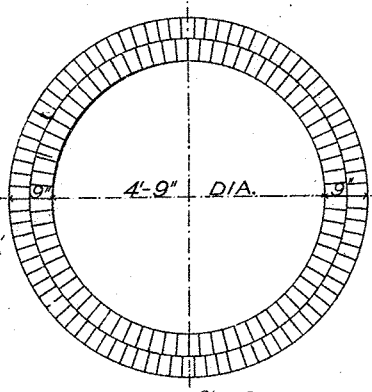


Min. Gr.
0.08 p. 100'

NOTE:- Filling over top of Sewer to be at least three feet deep, and with a slope not less than 1½ to 1

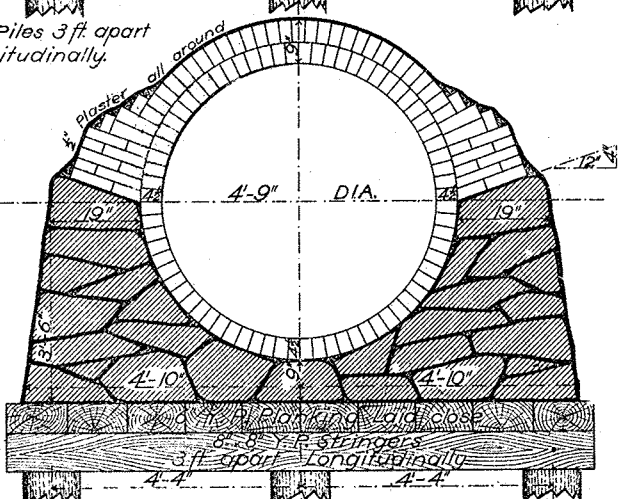


Piles and Platform, if required, will be paid for at the price in the contract when ordered by the Chief Engineer



Min. Gr.
0.07 p. 100'

NOTE:- Use double Ring of Brickwork in either Earth or Rock Excavation.



Minimum Sections in Natural Foundations.

Maximum Sections in Artificial Foundations. Platform and Piles where directed.

General Sections of Egg-Shaped Sewers.

L. G. Webster
— Chief Engineer —

— Dept. of Public Works — — Bureau of Surveys —
— Jan. 1896. —

— SCALE —

SINGLE RING
PREVIOUS TO 1932

1'-6" × 2'-3"
Min. Gr.
0.28 p.100

1'-8" × 2'-6"
Min. Gr.
0.24 p.100

2'-0" × 3'-0"
Min. Gr.
0.2 p.100

2'-4" × 3'-6"
Min. Gr.
0.15 p.100

Minimum Sections in Natural Foundations.

Stone Block and Vitrified Brick Inverts.

Vitrified Shale Brick

Stone Block

12" Y.P. Piles 3' apart Longitudinally.

1" Plaster all around

Batir à 1/6

Planking laid close

8"×8" Y.P. Stringers 3' apart Longitudinally

Piles and platform, if required, will be paid for at the price in the contract when ordered by the Chief Engineer

Maximum Sections in Artificial Foundations.

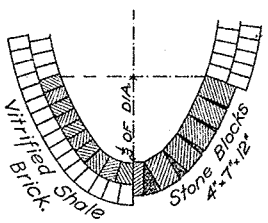
General Sections of Egg-Shaped Sewers.

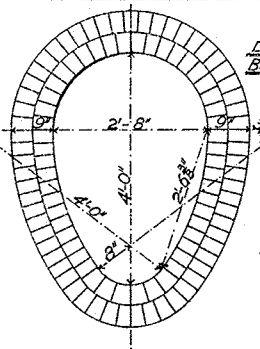
Dept of Public Works
Bureau of Surveys.
Feb. 1895.

Chief Engineer

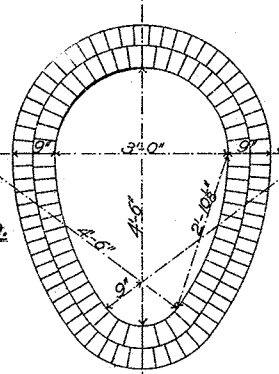
SCALE 12" 6" 0 1' 2 FT.

Stone Block and Vitrified Brick Inverts.



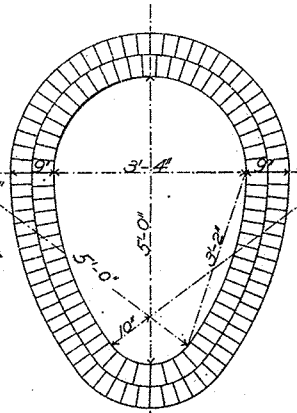


2'-8" × 4'-0"
Min. Gr.
0.13 p.100.



3'-0" × 4'-6"
Min. Gr.
0.11 p.100.

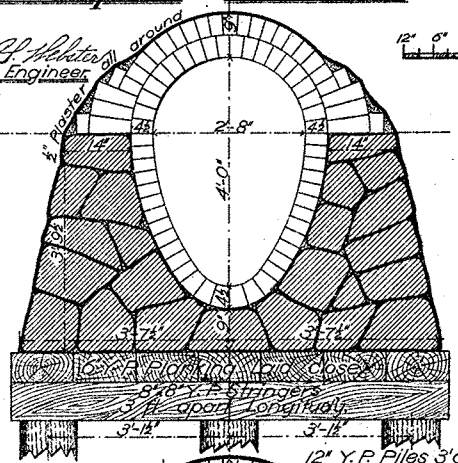
NOTE:
Use double Ring of Brickwork in either Earth or Rock Excavation.



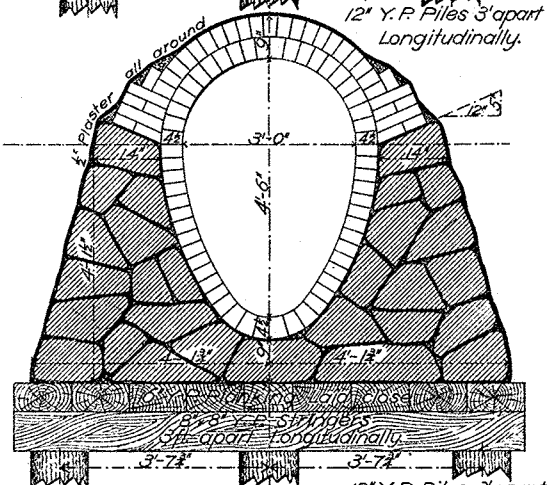
3'-4" × 5'-0"
Min. Gr.
0.10 p.100.

Minimum Sections in Natural Foundations.

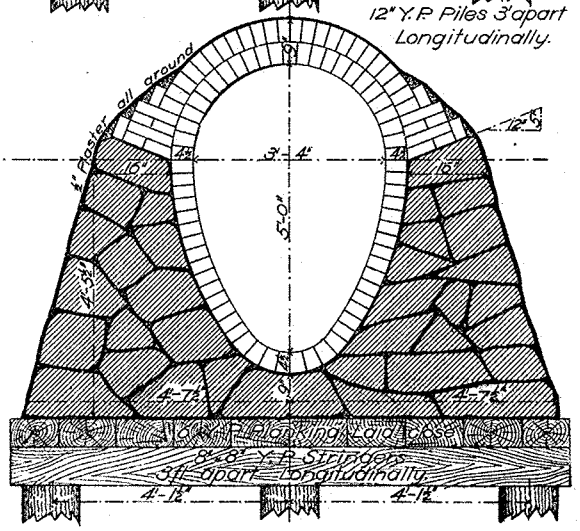
Piles and Platform, if required, will be paid for at the price in the contract when ordered by the Chief Engineer.



12" Y.P. Piles 3' apart Longitudinally.



12" Y.P. Piles 3' apart Longitudinally.



12" Y.P. Piles 3 ft apart Longitudinally.

Maximum Sections in Artificial Foundations.

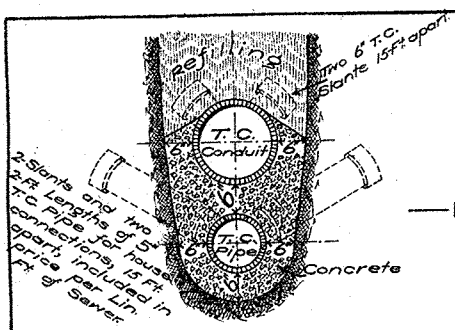
Terra Cotta Stands 6" inside dia. with closed ends, for house connections, 15 ft apart on each side of Sewer, unless otherwise ordered.
" " 12" " " " " inlet " as directed.
Filling over top of Sewer to be at least 3 ft. deep, and with a slope not less than 1½ to 1.

STANDARD CROSS SECTIONS
FOR
SEPARATE SYSTEM.

—Dep't. of Public Works— —Bureau of Surveys.—

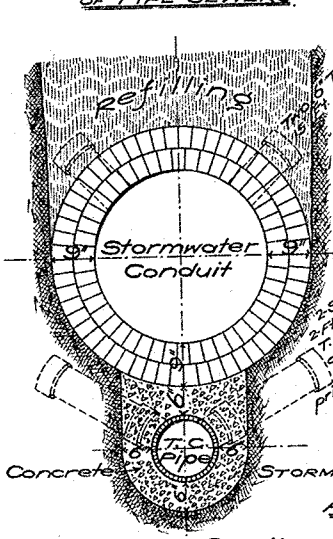
—Phila. Jan. 1897—

E. S. Chesbrough
Chief Engineer

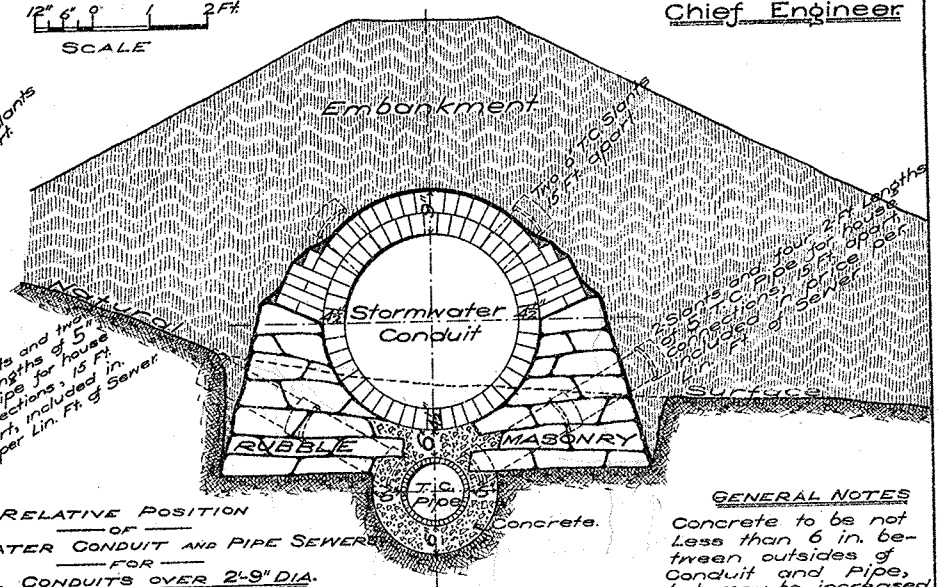


RELATIVE POSITION OF PIPE SEWERS.

SCALE 12" 6" 0 1 2 Ft.



Cross Section in Hard Earth.



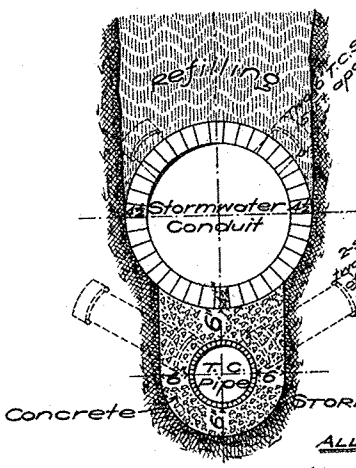
Cross Section in Full Cradle.

RELATIVE POSITION OF STORMWATER CONDUIT AND PIPE SEWERS FOR ALL CONDUITS OVER 2'-9" DIA.

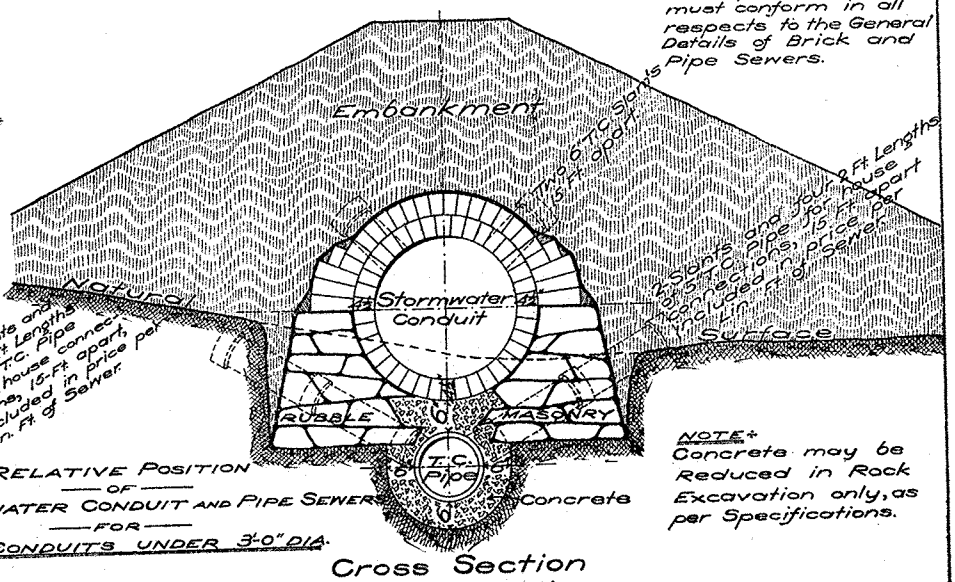
GENERAL NOTES

Concrete to be not Less than 6 in. between outsides of Conduit and Pipe, but may be increased in special cases when required.

The Cross Sections of the Separate System must conform in all respects to the General Details of Brick and Pipe Sewers.



Cross Section in Hard Earth.



Cross Section in Full Cradle.

RELATIVE POSITION OF STORMWATER CONDUIT AND PIPE SEWERS FOR ALL CONDUITS UNDER 3'-0" DIA.

NOTE. Concrete may be Reduced in Rock Excavation only, as per Specifications.

General Details for Pipe-Sewers.

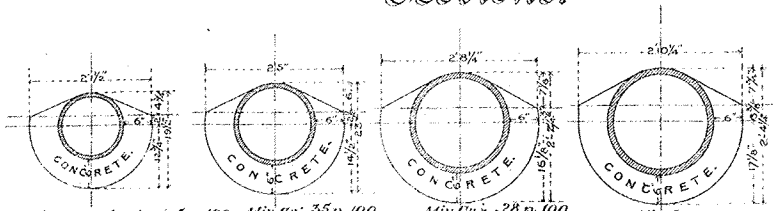
DEPT. OF PUBLIC WORKS
BUREAU OF SURVEYS
January, 1897.

City of Philadelphia.

Scale

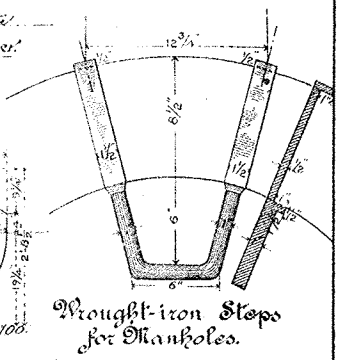
Chief Engineer.

Sections.



Minimum Grade .5 p. 100 diam. 12"
Min. Gr. .35 p. 100 15"
Min. Gr. .28 p. 100 18"
Min. Gr. 20"
Min. Gr. .2 per 100. 24"

Sewers must not have less than minimum grades, unless by special directions.

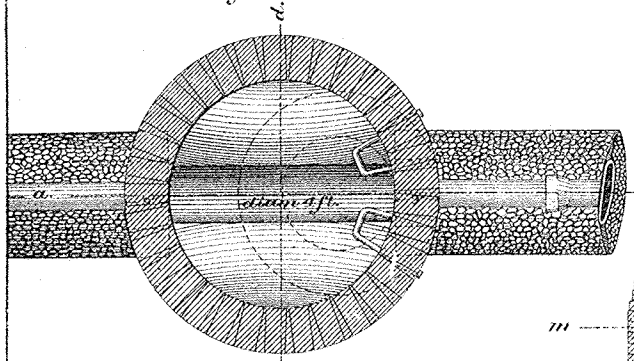


Wrought-iron Steps for Manholes.

House connections not less than 15 ft. apart on each side by means of single Y's.

Plan of Manhole.

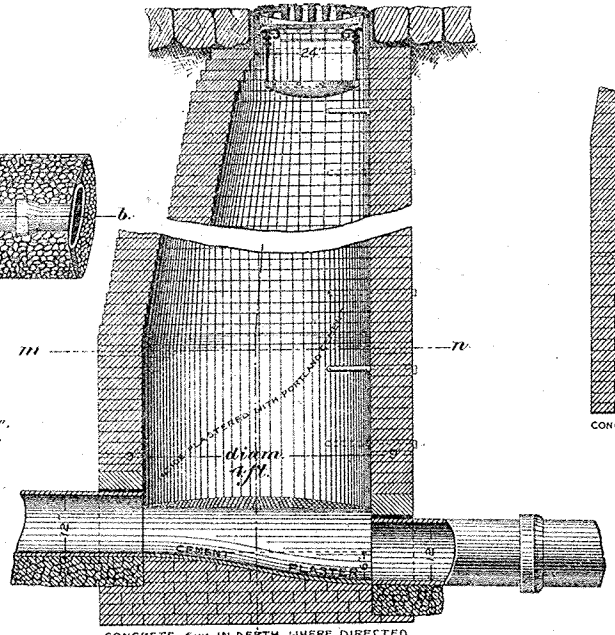
Horizontal Sections on m-n.



The channels in bottom of manholes for sewers on minimum grades may be built on that grade. Manholes on sewers of less than minimum grades must have flushing-gates.

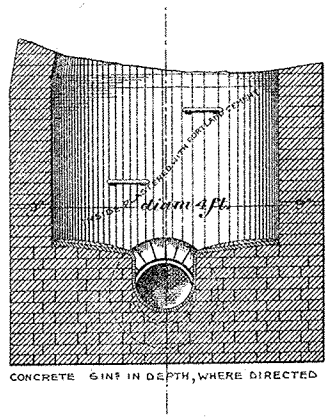
Portland-Cement used for all work inside of manhole.

Section a-b.



The top of pipe sewer must connect with brick-sewer not less than 1/5 its height from inside crown of arch.

Section c-d.



VII

General Details for Pipe Sewers,

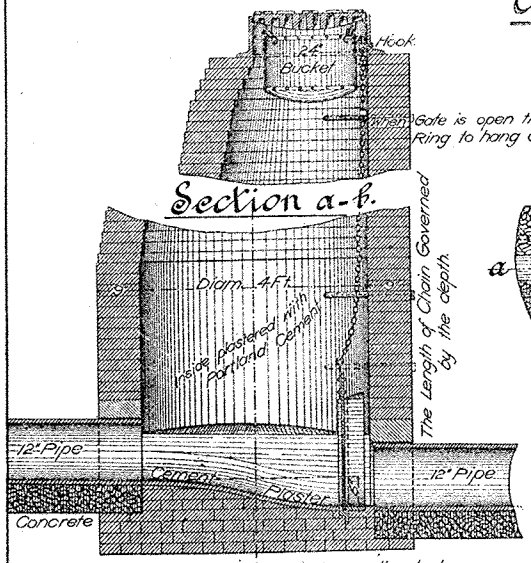
City of Philadelphia,

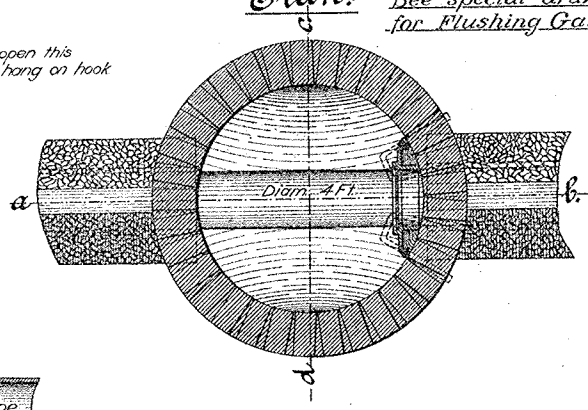
Dep't of Public Works.
Bureau of Surveys.

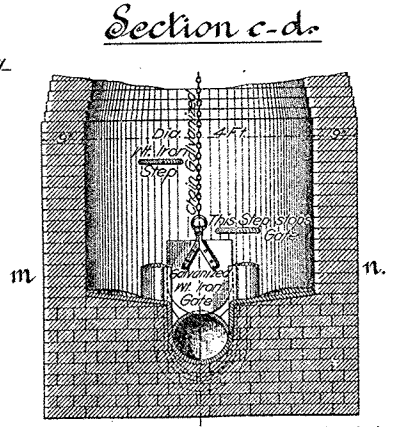
SCALE 0 1' 2' 3'

L. H. Hilter
Chief Engineer
Feb. 1895.

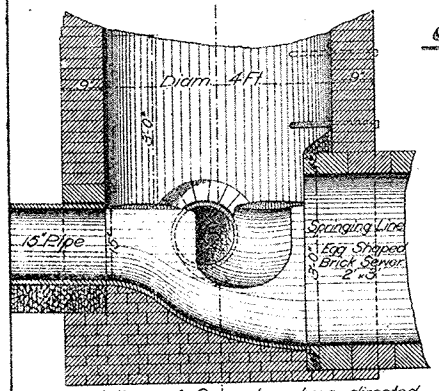
Manhole with Flushing-gate.







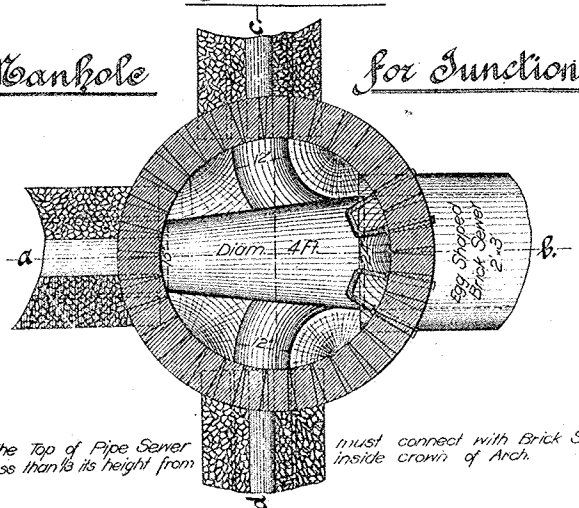
Portland Cement to be used for all work inside of manhole



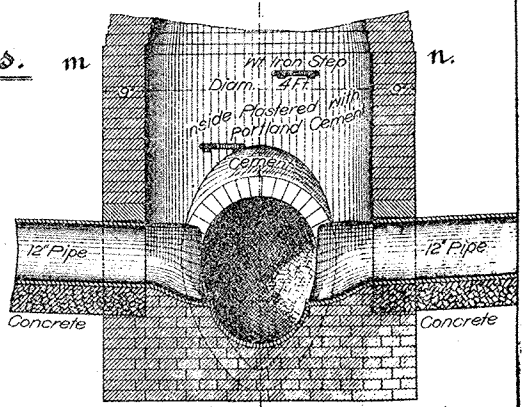
Section a-b.

Plan m-n.

Manhole for Junctions.



The Top of Pipe Sewer must connect with Brick Sewer not less than ⅛ its height from inside crown of Arch.



Section c-d.

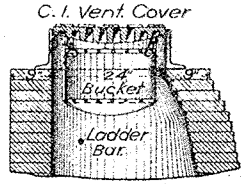
VIII

General Details for Egg-shaped Sewers,

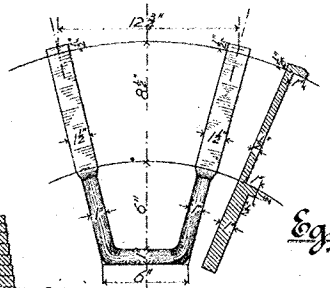
City of Philadelphia.

DEPT. OF PUBLIC WORKS.
BUREAU OF SURVEYS.
FEB. 1895.

Chief Engineer.

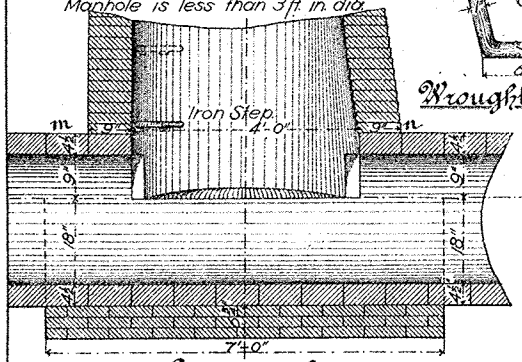


Ladder Bars to be used where Manhole is less than 3 ft. in dia.

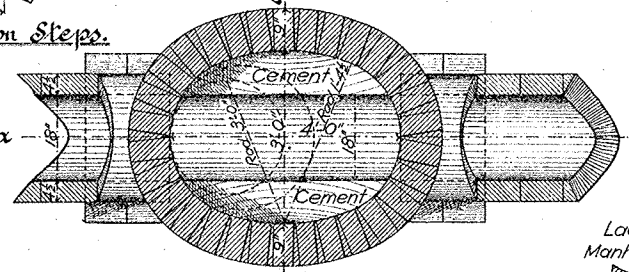


Wrought-iron Steps.

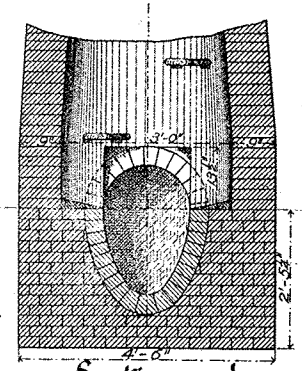
Manholes for Egg-shaped Sewers 1'6"x2'3" to 2'4"x3'6".



Section a-b.



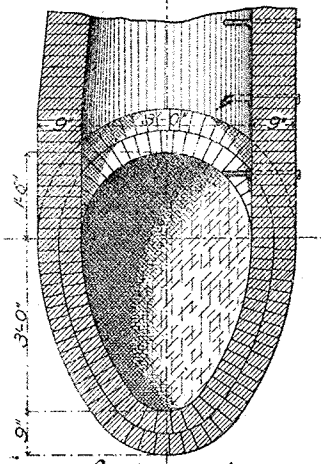
Plan m-n.



Section c-d.

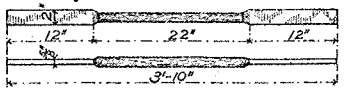
Ladder Bars to be used where Manhole is less than 3 ft. in diam.

Foundation of stone or concrete where directed.

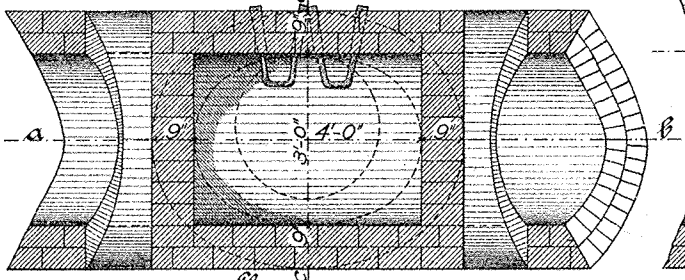


Section c-d.

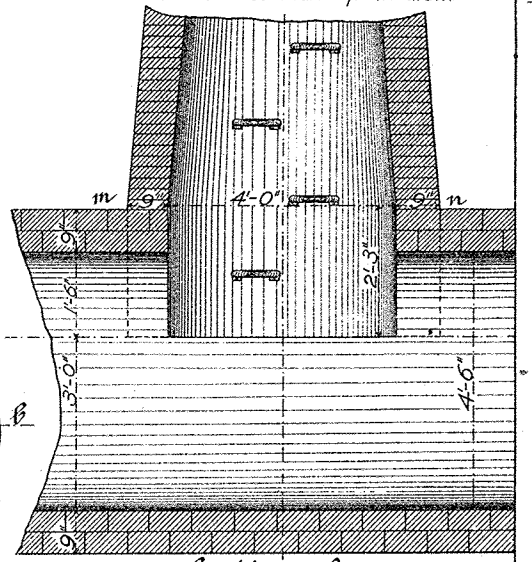
Wrought-iron Ladder Bar.



Portland Cement must be used for all work inside of manhole.



Plan m-n.

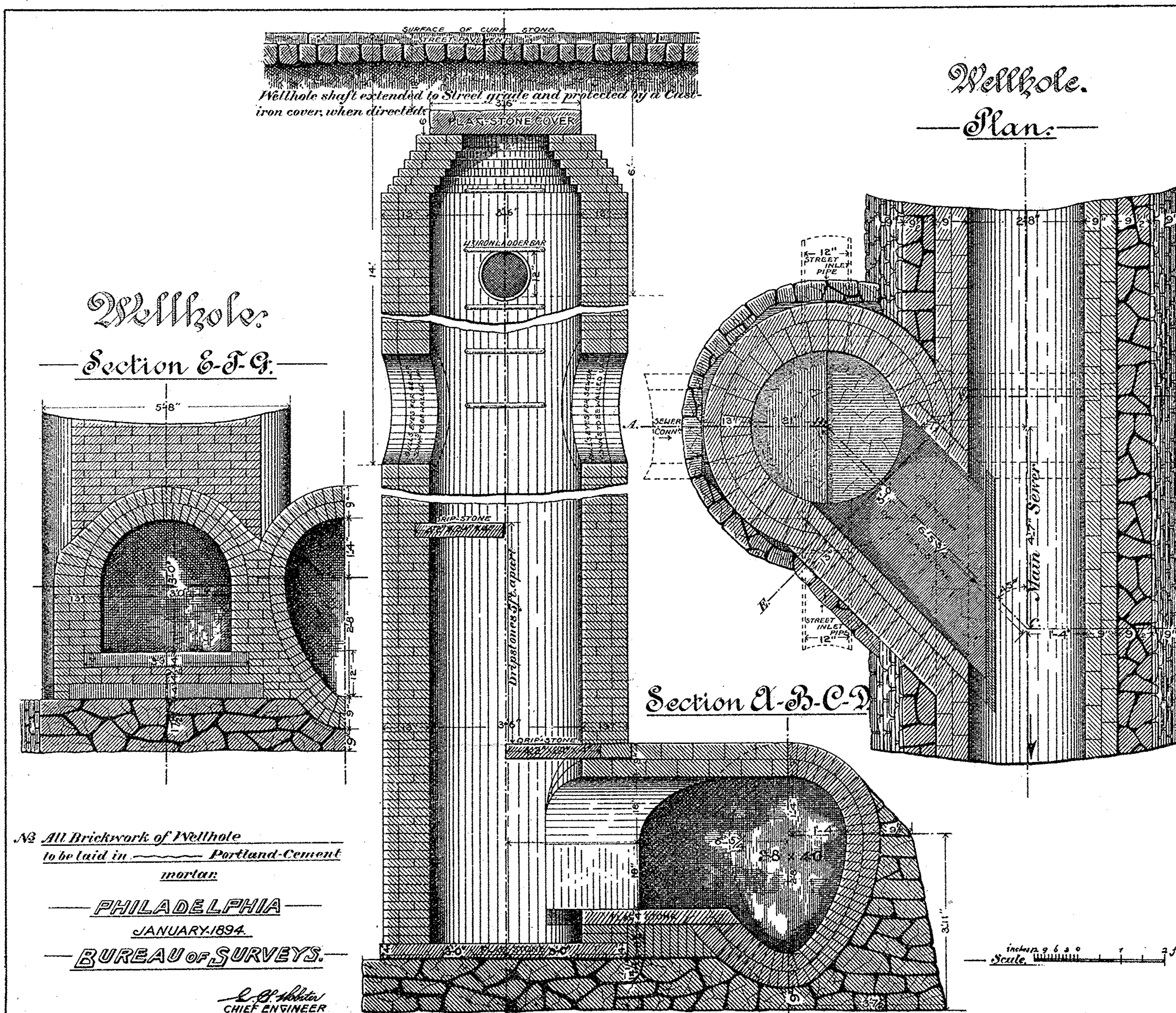


Section a-b.

Foundation of stone or concrete where directed.

Manholes for Egg-shaped Sewers of Medium Size.

IX

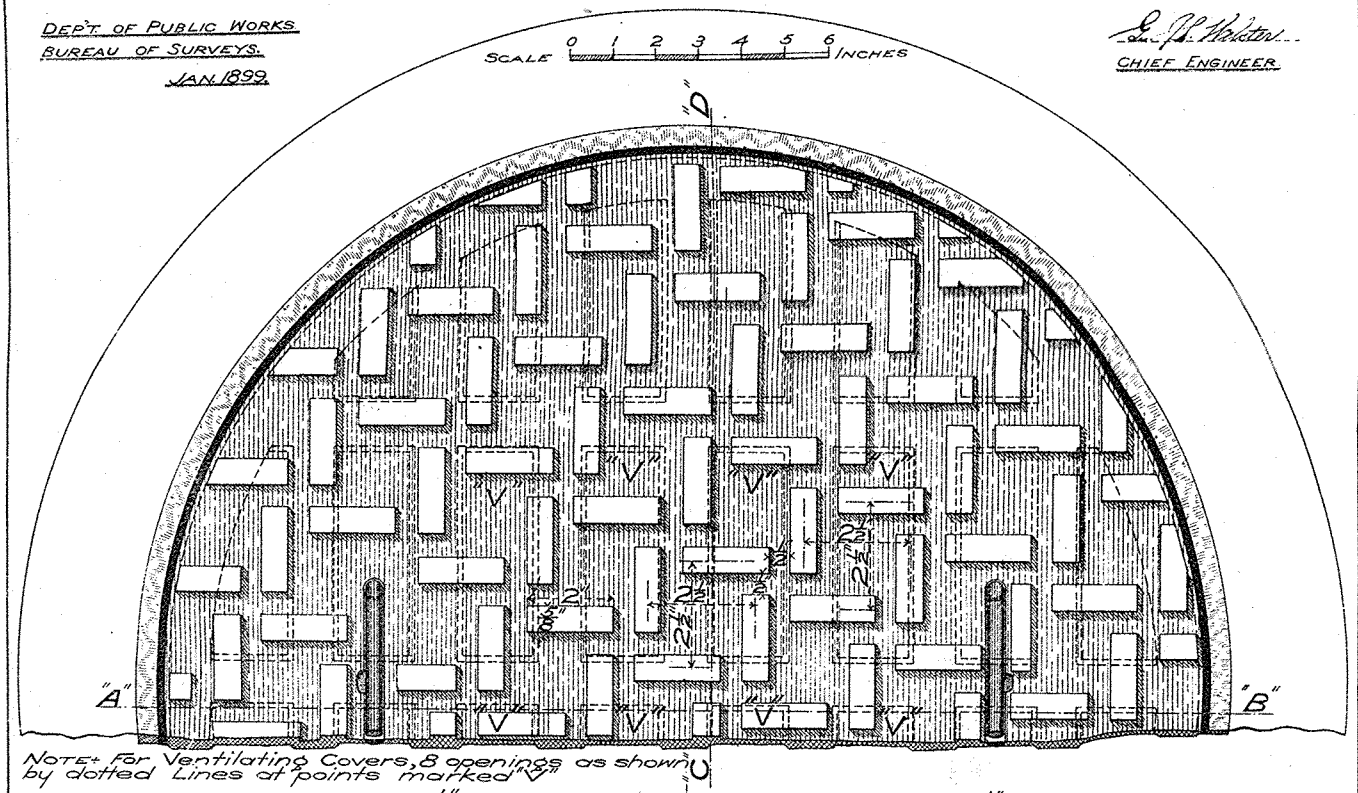

SURFACE OF CURB STONE
STREET PAVEMENT
Wellhole shaft extended to Street grade and protected by a Cast-iron cover, when directed.
PLAN-STONE COVER
IRON LADDER BAR
DRIP-STONE
Dripstones 5 ft. apart
Wellhole.
Section E-F-G.
Wellhole.
Plan.
STREET INLET PIPE
SEWER CONN.
Main 4'7" Sewer
Section A-B-C-D
No. All Brickwork of Wellhole to be laid in Portland-Cement mortar.
PHILADELPHIA
JANUARY 1894.
BUREAU OF SURVEYS.
CHIEF ENGINEER
Scale
X

CAST IRON MANHOLE COVER.

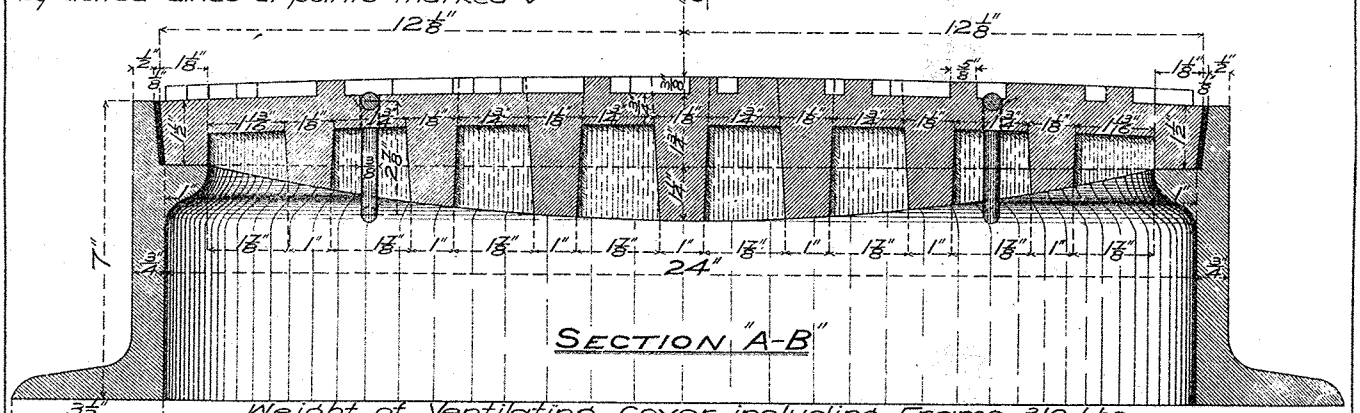
DEP'T. OF PUBLIC WORKS.
BUREAU OF SURVEYS.
JAN. 1899.

SCALE 0 1 2 3 4 5 6 INCHES

E. P. Haskell
CHIEF ENGINEER.

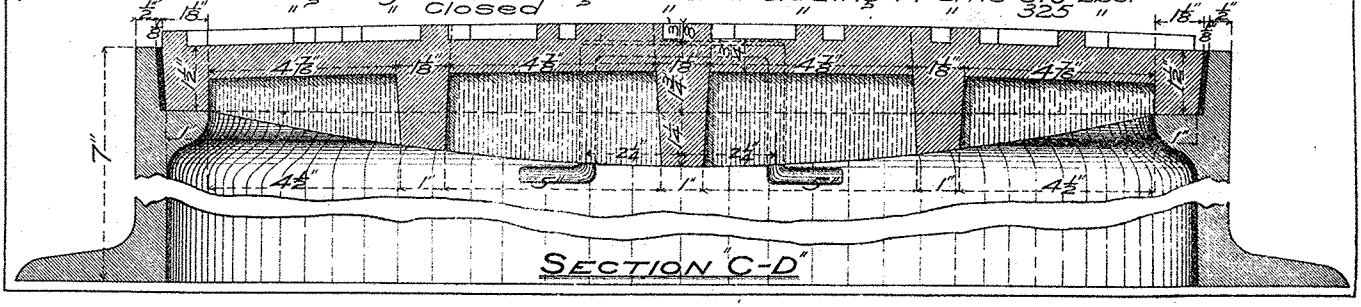


NOTE: For Ventilating Covers, 8 openings as shown by dotted Lines at points marked "V"



SECTION "A-B"

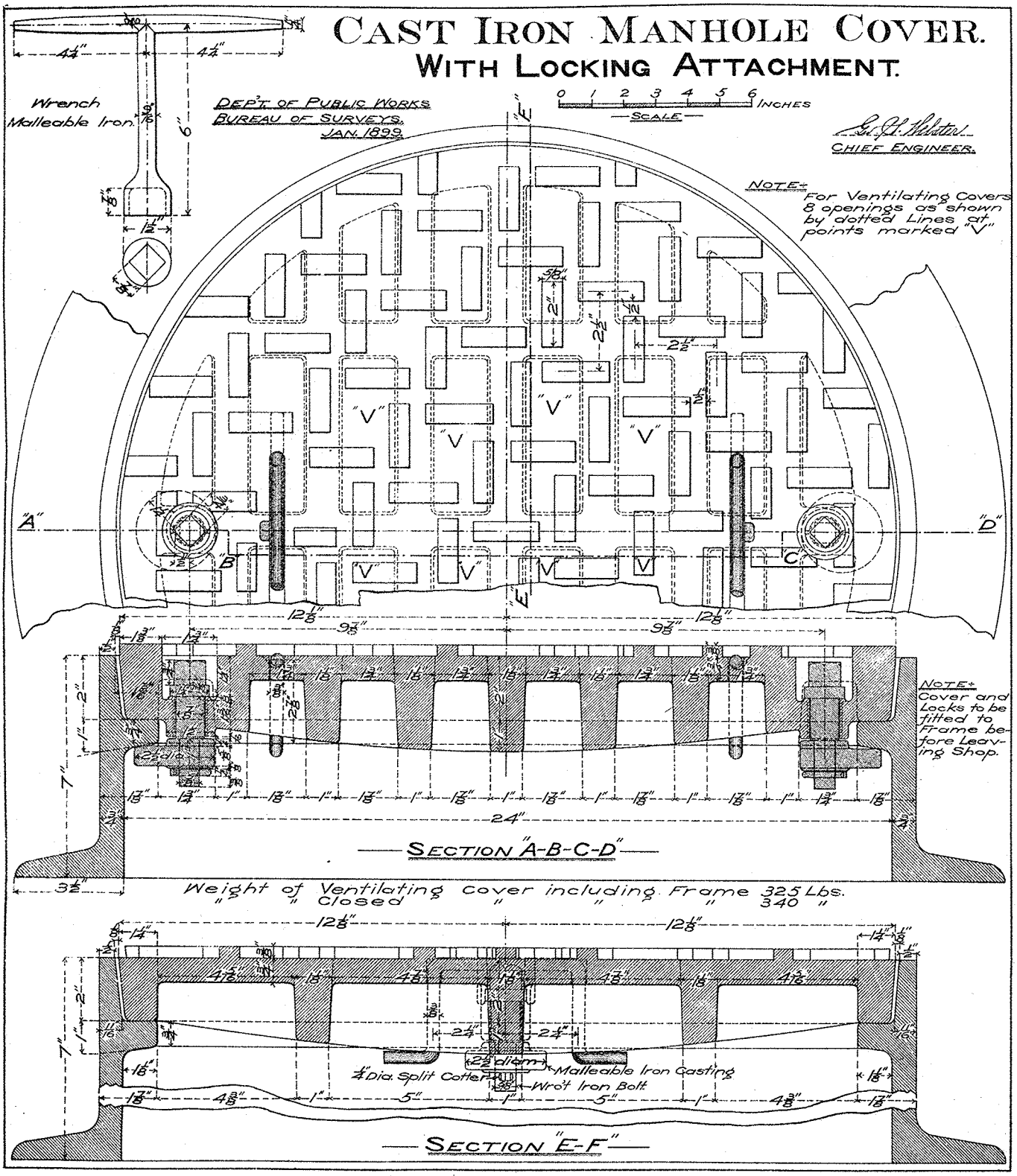
Weight of Ventilating Cover including Frame 310 Lbs.
" " Closed " " " 325 "



SECTION "C-D"

Lock

CAST IRON MANHOLE COVER.
WITH LOCKING ATTACHMENT.



Look

ASPHALTUM FILLED
CAST IRON MANHOLE COVERS AND FRAMES

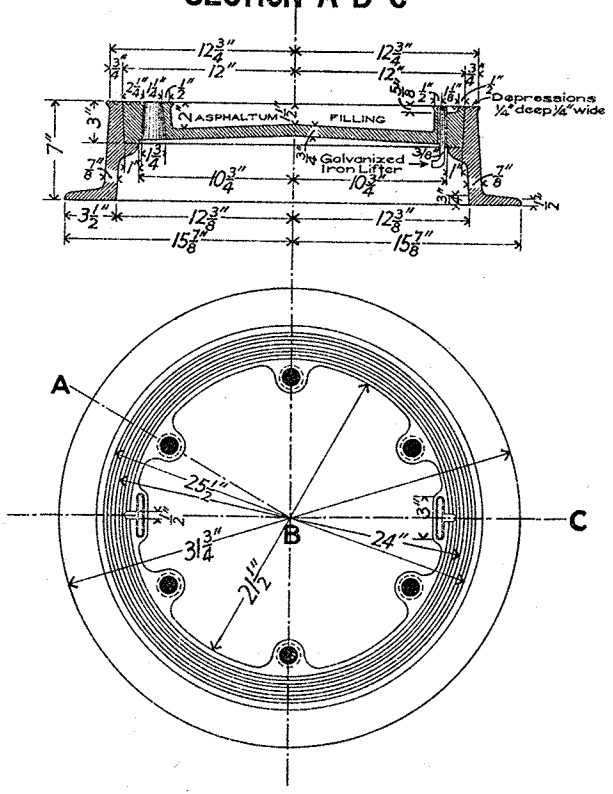
0 3 6 9 12 INS. 1 FT.

SCALE

DEPARTMENT OF PUBLIC WORKS
BUREAU OF SURVEYS
JANUARY 1900

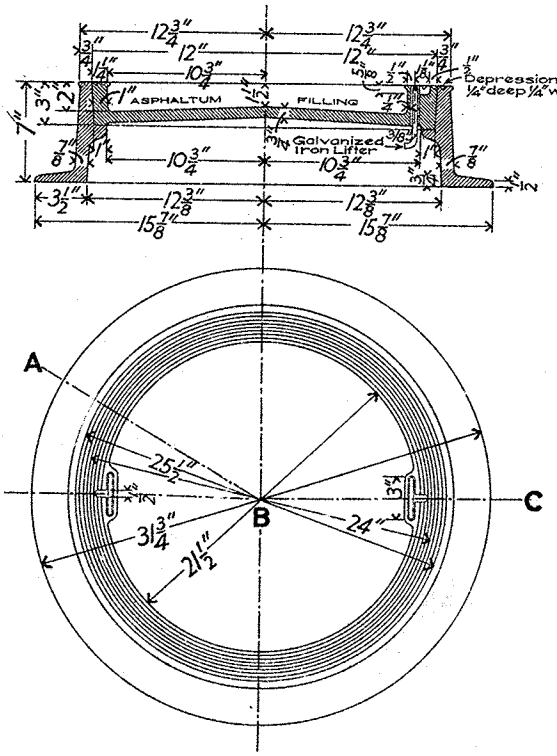
CHIEF ENGINEER

SECTION A-B-C



VENTILATING COVER AND FRAME

SECTION A-B-C



CLOSED COVER AND FRAME

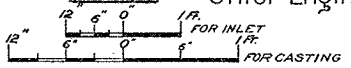
XIII

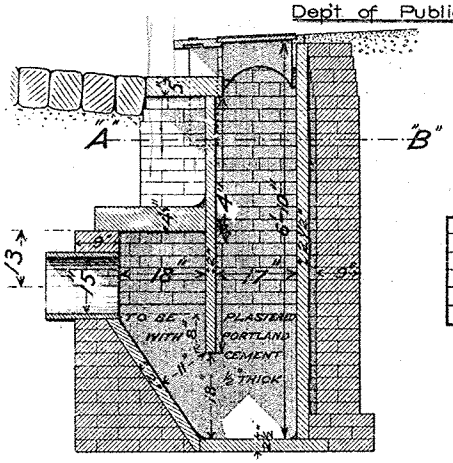
No 1. Open Mouth
Brick and Stone Inlet.

Dept of Public Works Bureau of Surveys
Phila. Jan. 1899.

G. Gl. Webster
Chief Engineer

Scales



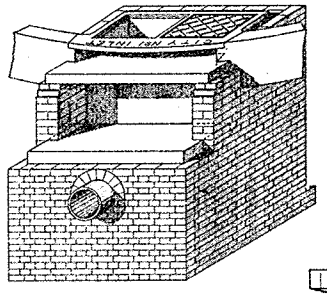


— Section "C-D" —

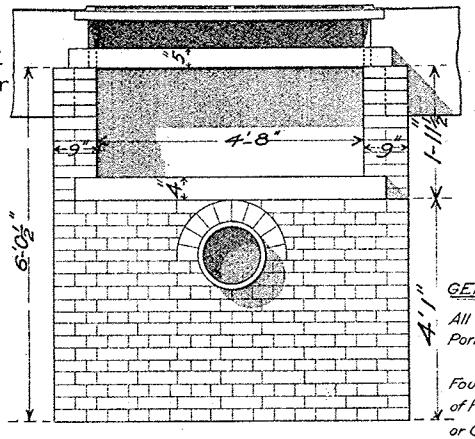
Bill of Flagging for Inlet

Drip Stone	1-4" × 5'-8" × 5"
Trap	"	4-4" × 5'-4" × 2"
Back	"	6'-10½" × 5'-4" × 2½"
Cover	"	2'-0" × 5'-4" × 4"
Inclined	"	2'-10" × 5'-4" × 2"
Bottom	"	2'-3" × 5'4" × 2½"

Weight of Castings
For Straight Curb 650 lbs
For Curved Curb 630 lbs



Isometrical View

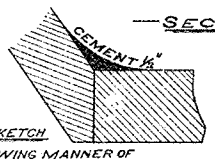


— Front View —

General Notes

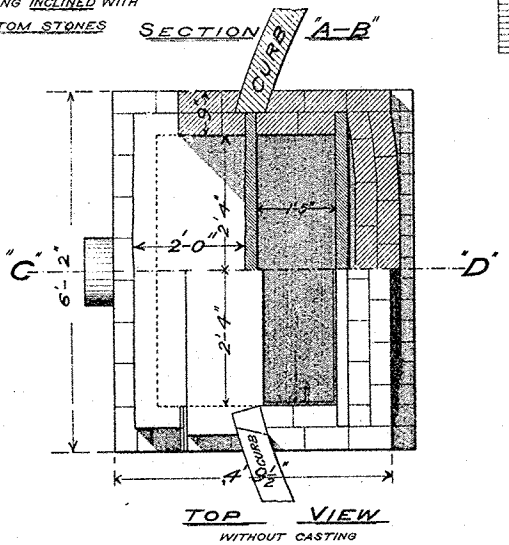
All Brickwork to be laid in Portland Cement Mortar.

Foundation of Inlet to be of Rubble Masonry, Timber or Concrete as directed.

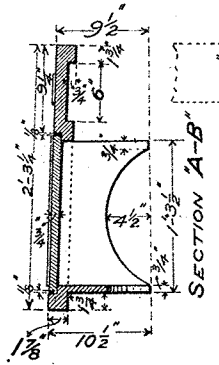


Sketch showing manner of joining Inclined with Bottom Stones

Section "A-B"

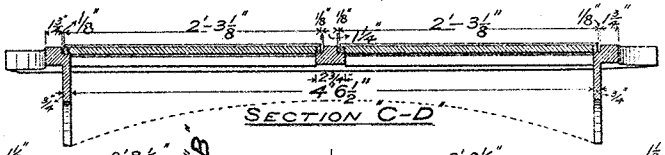


Top View
Without Casting

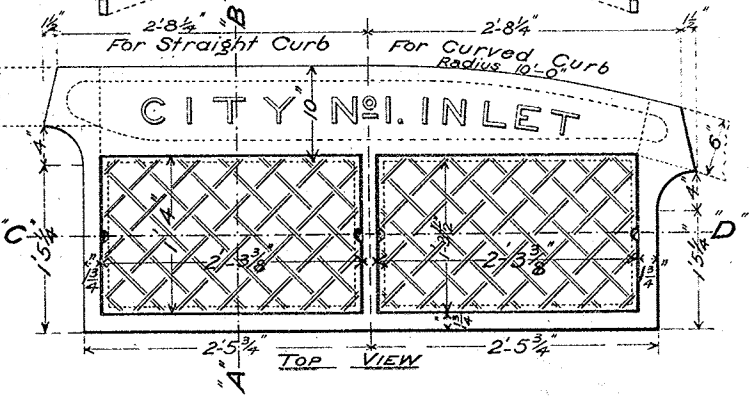


Section "A-B"

Details for Casting



Section C-D



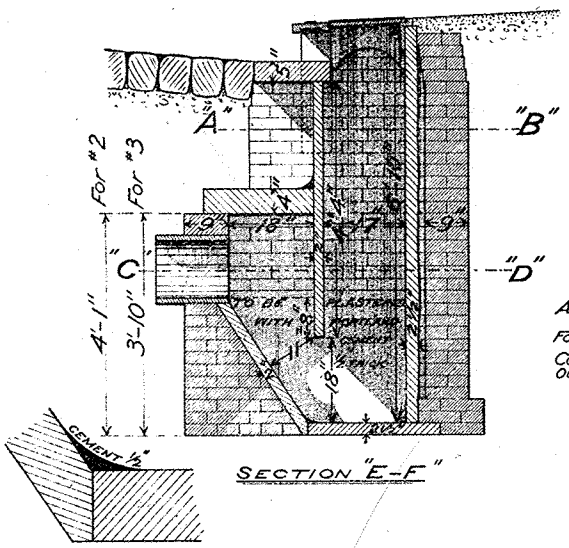
Top View

XIV

No 2 & 3. Open Mouth
Brick and Stone Inlets

Dept of Public Works Bureau of Surveys
Phila. Jan. 1899.

S. G. Webster
Chief Engineer

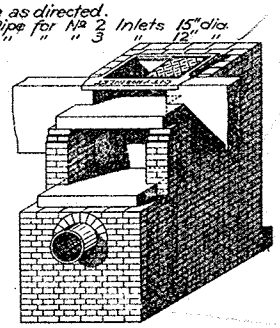


SECTION "E-F"

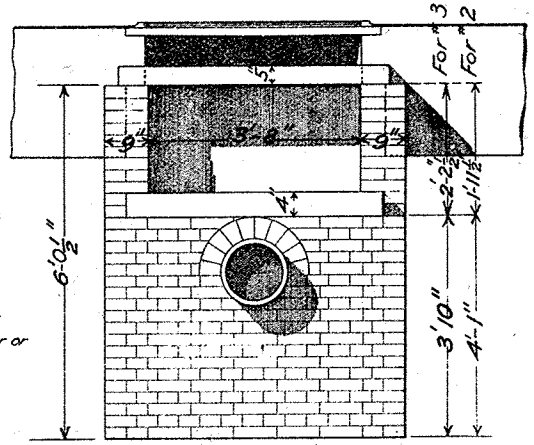
SCALE
12" 6" 0" 1' 2' 3'

GENERAL NOTES

All Brickwork to be laid in Portland Cement Mortar.
Foundation of Inlet to be of Rubble Masonry, Timber or Concrete as directed.
Outlet Pipe for No 2 Inlets 15" dia.
" " " " 3 " 12" "



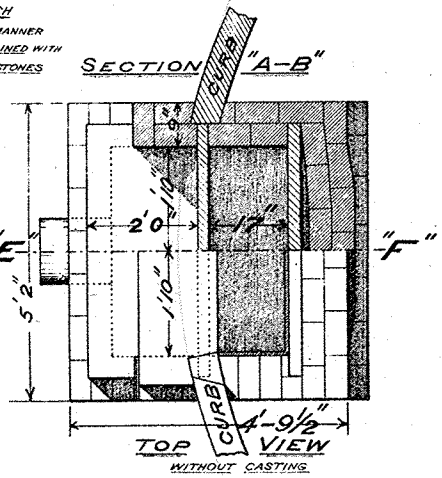
ISOMETRICAL VIEW



FRONT VIEW
INLET No 2

SKETCH
SHOWING MANNER
OF JOINING INCLINED WITH
BOTTOM STONES

SECTION "A-B"



TOP VIEW
WITHOUT CASTING

INLET No 2.

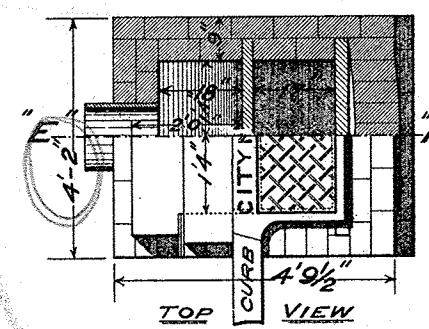
BILL of FLAGGING for INLET No 2.

Drip Stone	1	4" × 4'-8" × 5"
Trap	"	4'-4" × 4'-4" × 2"
Back	"	6'-10" × 4'-4" × 2½"
Cover	"	2'-0" × 4'-4" × 4"
Inclined	"	2'-10" × 4'-4" × 2"
Bottom	"	2'-3" × 4'-4" × 2½"

BILL of FLAGGING for INLET No 3.

Drip Stone	1	4" × 3'-8" × 5"
Trap	"	4'-4" × 3'-4" × 2"
Back	"	6'-10" × 3'-4" × 2½"
Cover	"	2'-0" × 3'-4" × 4"
Inclined	"	2'-10" × 3'-4" × 2"
Bottom	"	2'-3" × 3'-4" × 2½"

SECTION "C-D"



TOP VIEW

INLET No 3.

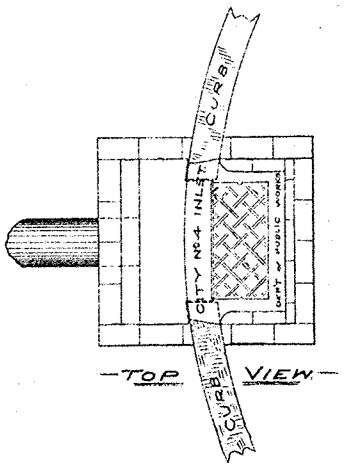
XV

No. 4 Open Mouth
Brick and Stone Inlet.

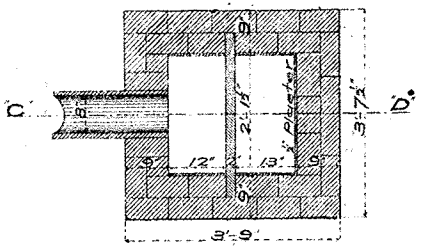
—Dept. of Public Works— —Bureau of Surveys.—
—— Phil'a. Jan. 1897. ——

D. H. Webster
Chief Engineer.

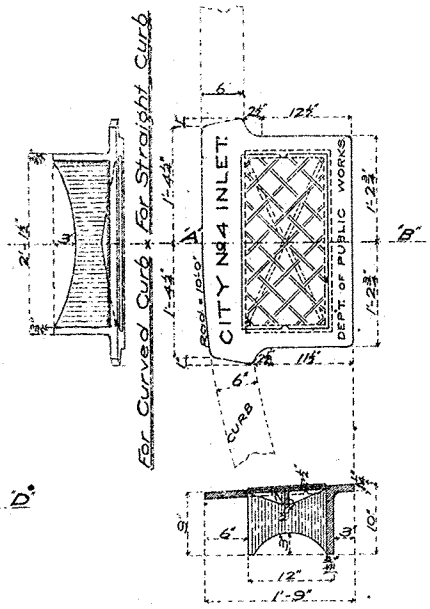
Scales { Inlet. 12" 6" 0 1 Ft.
Castings. 12" 6" 0 1 Ft.



—Top View—

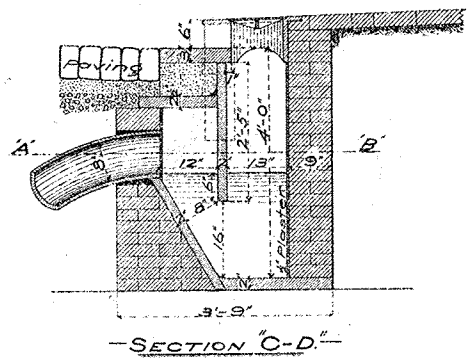


—Section "A-B"—



—Section "A-B"—

DETAILS FOR CASTING.



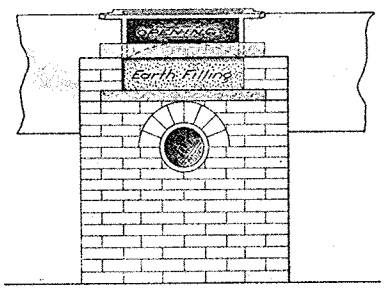
—Section "C-D."—

BILL OF FLAGGING FOR INLET.

Trap Stone	2" × 2'-5" × 2'-10"
Bottom "	2" × 2'-0" × 3'-7½"
Inclined "	2" × 2'-5" × 2'-10"
Drip "	3" × 1'-3" × 2'-10"
Cover "	2½" × 1'-4½" × 2'-10"

WEIGHT OF CASTINGS.

Straight Curb	230 Lbs.
Curved "	225 "



—Front View.—

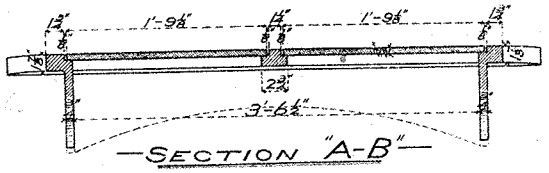
General Notes

All Brickwork to be Laid in Portland Cement Mortar.

All Brickwork inside of Inlet to be Plastered with Portland Cement Mortar.

Foundation of Inlet to be Rubble Masonry, Timber or Concrete when directed.

XVI



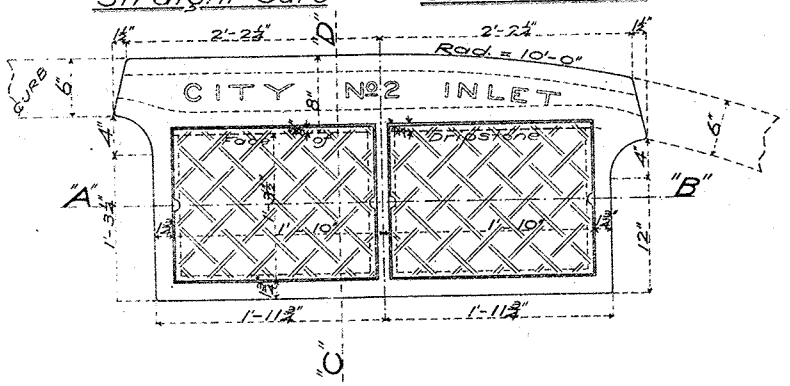
SECTION "A-B"

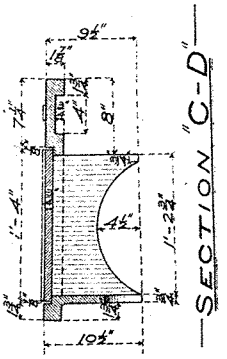
WEIGHTS OF CASTINGS

No 2	Curved	Curb	485 Lbs.
	Straight	"	495 "
No 3	Curved	"	340 "
	Straight	"	345 "

Half Section for Straight Curb

Half Section for Curved Curb





SECTION "C-D"

DETAILS OF CASTINGS FOR No 2 AND No 3 OPEN MOUTH INLETS

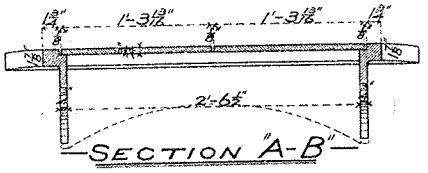
Dep't of Public Works — Bureau of Surveys

Phila. Jan. 1897

L. H. Webster

Chief Engineer

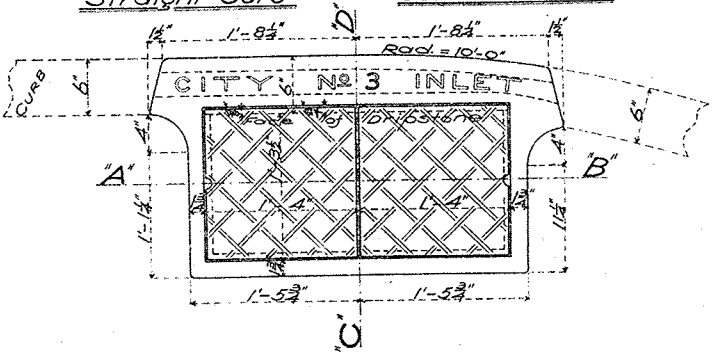
SCALE

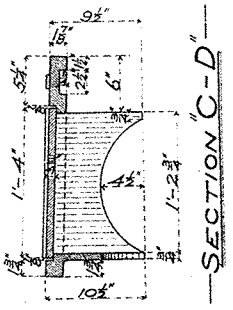


SECTION "A-B"

Half Section for Straight Curb

Half Section for Curved Curb





SECTION "C-D"

Lock

Nº1,2&3. GRATE TOP

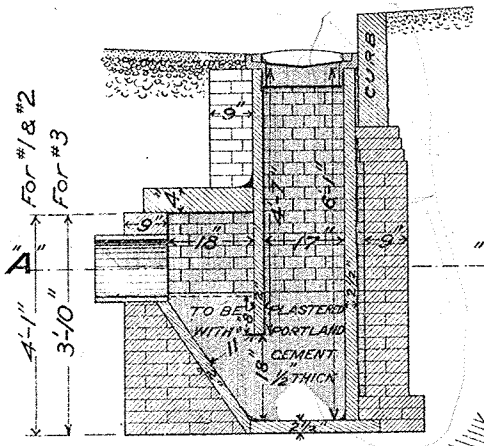
BRICK AND STONE INLETS.

Dept of Public Works Bureau of Surveys

Phila. Jan. 1899

H. H. Webster

Chief Engineer



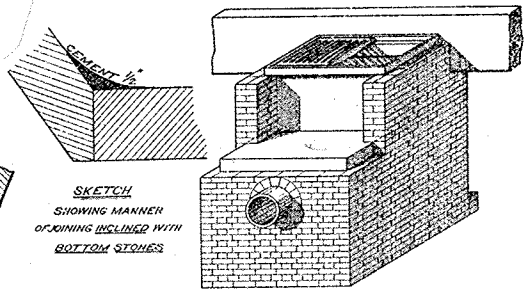
SECTION "C-D"

SCALE

12" 9 6 3 0 1 2 3'

BILL of FLAGGING for INLET Nº1.

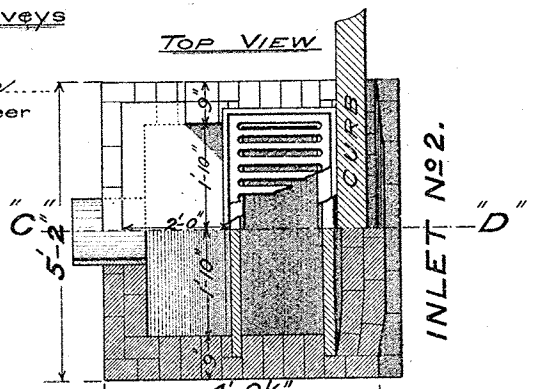
Trap Stone	4'-7" × 5'-4" × 2"
Back "	6'-1" × 5'-4" × 2½"
Cover "	2'-0" × 5'-4" × 4"
Inclined "	2'-10" × 5'-4" × 2"
Bottom "	2'-3" × 5'-4" × 2½"



SKETCH SHOWING MANNER OF JOINING INCLINED WITH BOTTOM STONES

ISOMETRICAL VIEW

TOP VIEW



INLET Nº2.

SECTION "A-B"

GENERAL NOTES

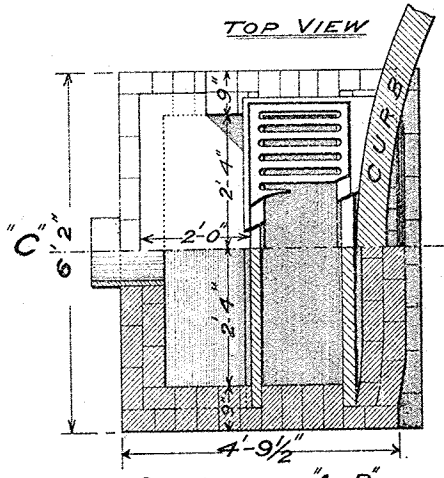
All Brickwork to be laid in Portland Cement Mortar.

Foundation of Inlet to be of Rubble Masonry, Timber or Concrete as directed.

Outlet Pipe for Nos. 1 & 2 Inlets 15" dia.

" " " " 3 " 12" "

TOP VIEW



INLET Nº1.

SECTION "A-B"

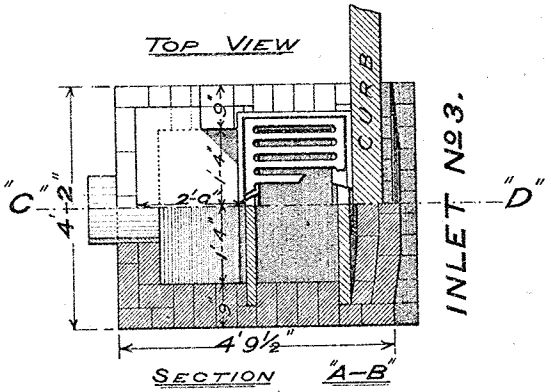
BILL of FLAGGING for INLET Nº2.

Trap Stone	4'-7" × 4'-4" × 2"
Back "	6'-1" × 4'-4" × 2½"
Cover "	2'-0" × 4'-4" × 4"
Inclined "	2'-10" × 4'-4" × 2"
Bottom "	2'-3" × 4'-4" × 2½"

BILL of FLAGGING for INLET Nº3.

Trap Stone	4'-7" × 3'-4" × 2"
Back "	6'-1" × 3'-4" × 2½"
Cover "	2'-0" × 3'-4" × 4"
Inclined "	2'-10" × 3'-4" × 2"
Bottom "	2'-3" × 3'-4" × 2½"

TOP VIEW



INLET Nº3.

SECTION "A-B"

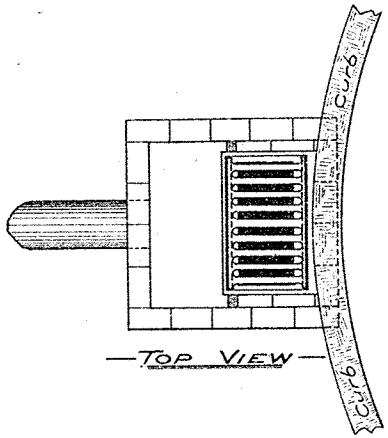
XVIII

No. 4 Grate Top
Brick and Stone Inlet

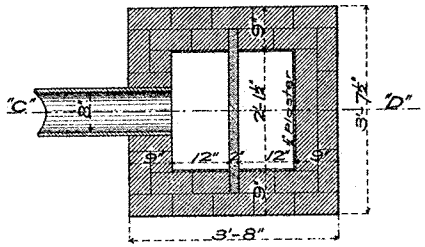
— Dept. of Public Works — — Bureau of Surveys —
— Phila. Jan. 1897 —

G. A. Webster
Chief Engineer

Scales. Inlet 12" 6" 0 1 Ft.
Casting 12" 6" 0 1 Ft.



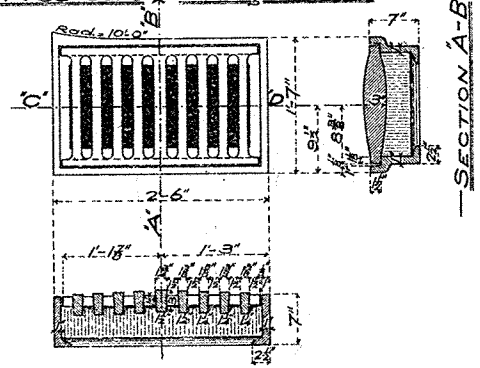
— Top View —



— Section "A-B" —

Details of Casting

— For —
Curved Curb & Straight Curb



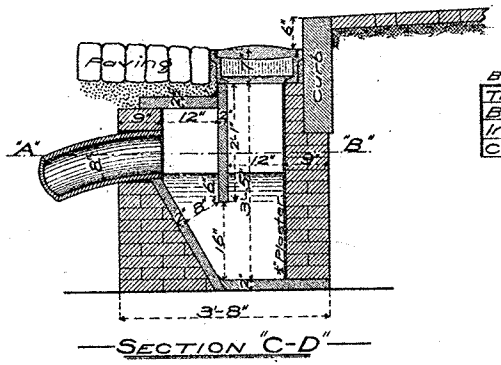
— Section "C-D" —

— General Notes —

All Brickwork to be Laid in Portland Cement Mortar.

All Brickwork inside of Inlet to be Plastered with Portland Cement Mortar.

Foundation of Inlet to be Rubble Masonry, Timber, or Concrete when directed.

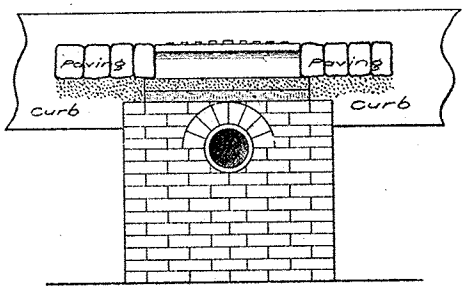


— Section "C-D" —

Bill of Flagging for Inlet.

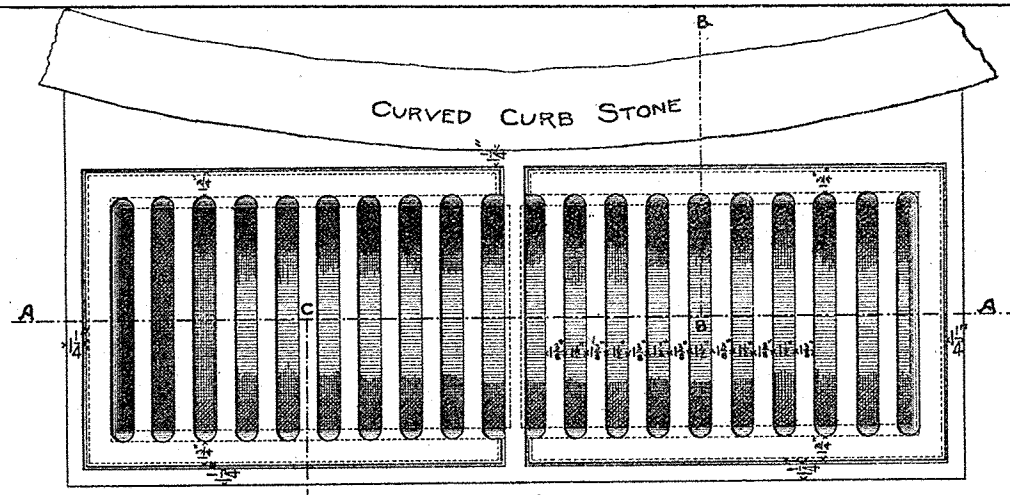
Trap Stone	2"	2'-1" × 2'-10"
Bottom "	2"	2'-0" × 3'-7½"
Inclined "	2"	2'-5" × 2'-10"
Cover "	2½"	1'-4½" × 2'-10"

Weight of Grating including Frame 315 lbs.

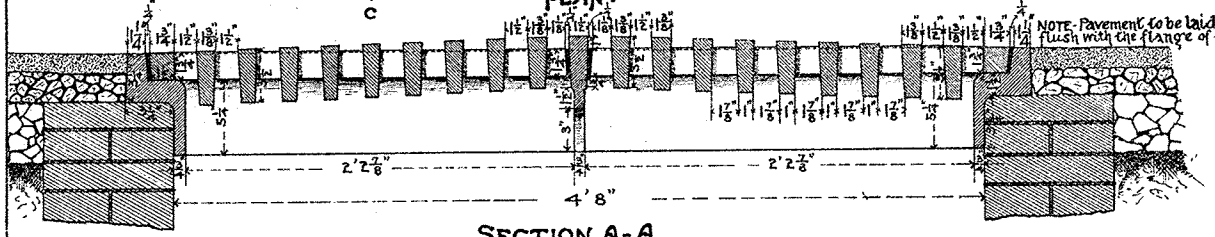


— Front View —

XIX



PLAN.



SECTION A-A

DESIGN FOR GRATE TOP
BRICK & STONE INLET
No 1

DEPT. OF PUBLIC WORKS
BUREAU OF SURVEYS
PHILADELPHIA

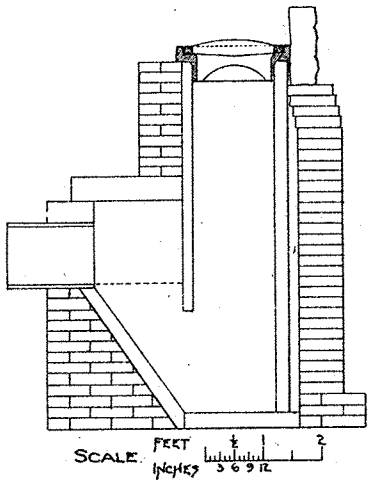
NOVEMBER 1893

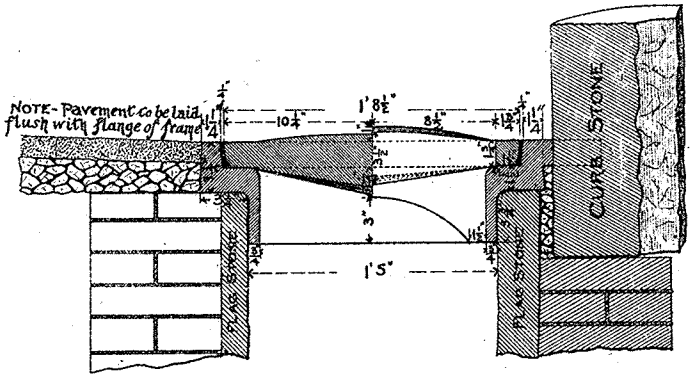
CHIEF ENGINEER.

SCALE- FEET 0
INCHES- 0 1 2 3 4 5 6 7 8 9 10 11 12

Weight of grating including frame 820 lbs

XX



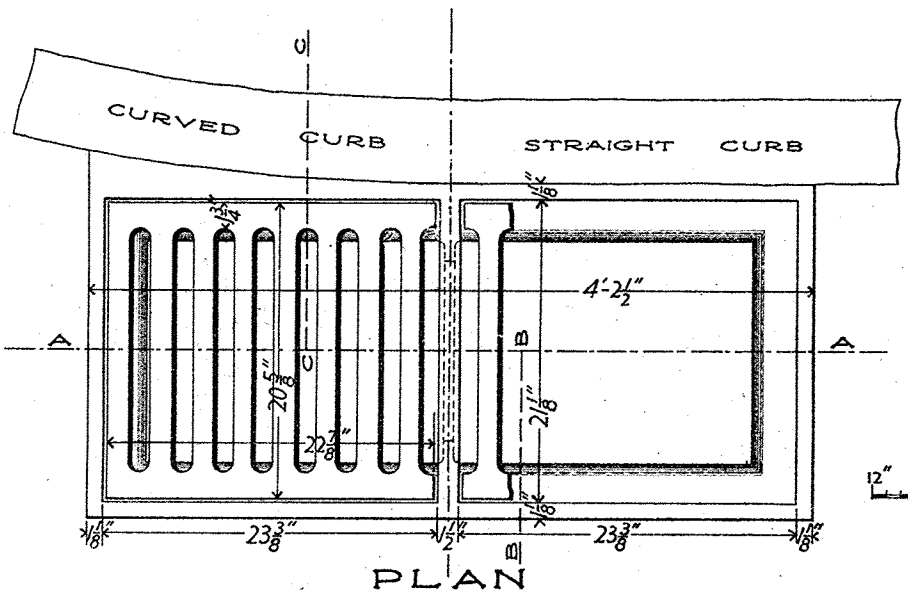


SECTION C-C SECTION B-B

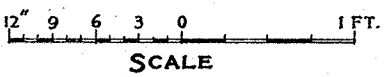
DESIGN FOR GRATE TOP
BRICK & STONE INLET
— No 2. —

DEPARTMENT OF PUBLIC WORKS
BUREAU OF SURVEYS
JANUARY 1900

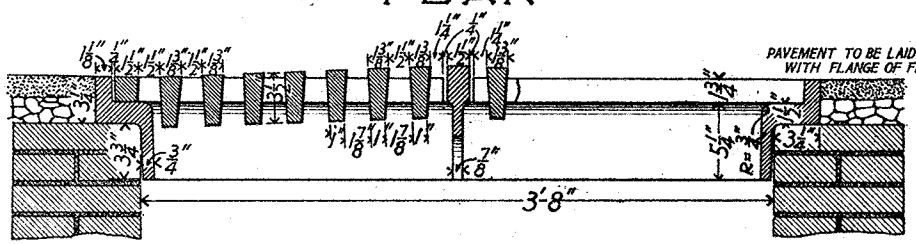
CHIEF ENGINEER



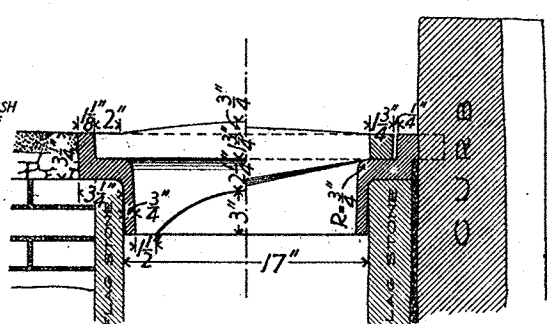
PLAN



SCALE

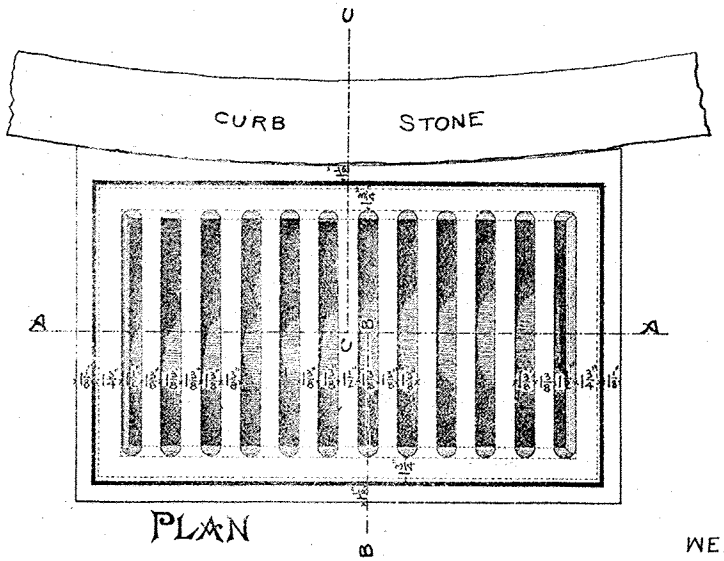


SECTION A-A

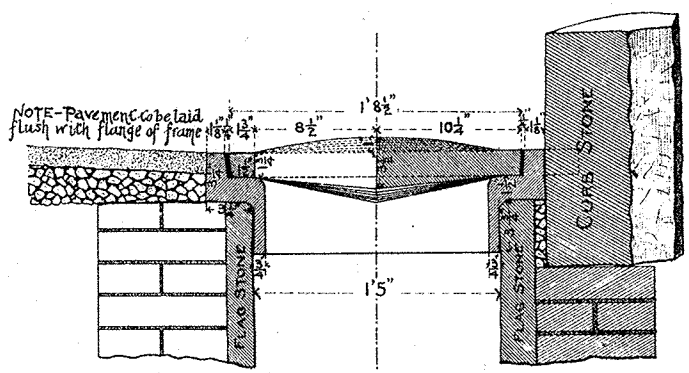


SECTION B-B SECTION C-C

WEIGHT OF FRAME AND GRATE 650 LBS.

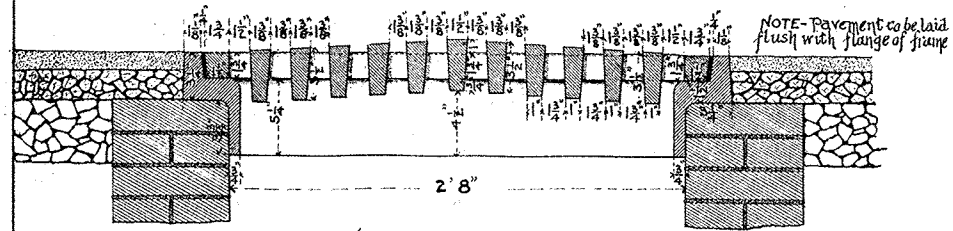


PLAN

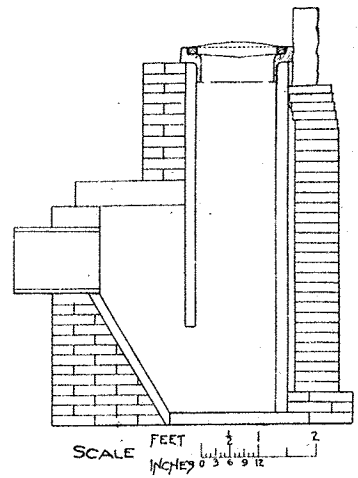


SECTION B-B | SECTION C-C

WEIGHT OF GRATING INCLUDING FRAME COMPLETE 490 LBS.



SECTION A-A



DESIGN FOR GRATE TOP

BRICK & STONE INLET No 3

DEPT. OF PUBLIC WORKS

BUREAU OF SURVEYS

PHILADELPHIA

SCALE FEET 0 1
INCHES 0 1 2 3 4 5 6 7 8 9 10 11 12

DECEMBER 1893

CHIEF ENGINEER

XXII